

# **Correlation analysis among social networks measures for directed scale free network**



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A thesis submitted in partial fulfillment of the requirements for the  
degree of Bachelor of Science in Computer Science and Engineering

# **Declaration**

This thesis has been submitted to the department of Computer Science and Engineering, East West University in the partial fulfillment of the requirement for the degree of Bachelor of Science in Computer Science and Engineering by me under the supervision of Md, Sarwar kamal , Senior Lecturer at Department of CSE at East West University under the course 'CSE 497'. I also declare that this thesis has not been submitted elsewhere for the requirement of any degree or any other purposes. This thesis complies with the regulations of this University and meets the accepted standards with respect to originality and quality. We hereby release this thesis to the public. We also authorize the University or other individuals to make copies of this thesis as needed for scholarly research.

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# Letter of Acceptance

The thesis entitled “Correlation analysis among social networks measures for directed scale free network” submitted by RAKIB HASSAN PRAN, ID:2013-3-60-007 to the department of Computer Science & Engineering, East West University, Dhaka 1212, Bangladesh is accepted as satisfactory for partial fulfillments for the degree of Bachelor of Science in Computer Science & Engineering in August 2017.

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## **ABSTRACT:**

Directed scale free network is a network which exists in WWW (World Wide Web), phone call, E.Coli. metabolism, etc. There are many network measures which are used to apply on directed scale free network but it is not known how much they are statistical dependent or correlated with each other. In our research, we selected 12 popular social network measures which were applied on 48,945 directed scale free network graphs (almost all types of directed scale free network) which are generated by "Bela Bollobas, Christian Borgsy, Jennifer Chayesz, Oliver Riordanx's directed scale free graph" algorithm [1] and found out how much correlated these 12 social network measures with each other by using PEARSON CORRELATION. Then we found out which is better for computation time among correlated measures .We found out 9 measures are highly correlated among 12 measures. Our Core\_i7 processor computer needed more than 112 hours ( 4 days 16 hours) to find out highly correlated measures for directed scale free network .

## INTRODUCTION:

In our world, somehow everything is connected which implies that network exists in every place. Network science is developed day by day. Network science nowadays a technology that surrounds us from every corner of our day to day life. From one sense, it is a part and parcel of our life, like that it is help us unveil many mysteries of different aspects of science. It is now an essential part in computer science, physics, in case of micro-biology. Its importance is no less than that of mandatory part of it. From medical science to engineering, network science establish its strong hold to direct the way of victory.

In this paper, we are going to research on directed scale free network by applying 12 popular measures and finding out similarity among them. We are going to solve the two question which are

“1. Is there any statistical dependency (correlation) exists among 12 types of social network measures or analysis (SNA) algorithm if we apply these 12 types of algorithm on directed scale free network?”

“2. If correlation exists then, among correlated algorithms, which algorithm will take less computation time?”

So, we used “Bela Bollobas, Christian Borgsy, Jennifer Chayesz, Oliver Riordanx’s directed scale free graph”[1] algorithm and applied 12 popular social network measures on them and used core i7 processor computer to find out correlation among those network measures.



## SCALE FREE NETWORK PROPERTIES:

Scale free network is a network which degree distribution follows power law

In scale free network, the fraction  $P(k)$  of nodes in the network having  $k$  connections to other nodes goes for large values of  $k$  as

$$P(k) \sim k^{-\gamma} \quad \text{Or, } \lim_{k \rightarrow \infty} \frac{P(k)}{k^{-\gamma}} = 1$$

Where,  $\gamma$  is a parameter which value is generally in the range  $2 < \gamma < 3$ .

Here,

$$P(k) = \frac{\text{number of nodes which having } k \text{ connection}}{\text{total number of nodes}}$$

Directed scale free network is nothing but scale free network with directed edge which in degree distribution and out degree distribution follows power law.

## **SOCIAL NETWORK MEASURES:**

Social network measures mean ways of Social Network Analysis(SNA).

There are several types of social network measures. Different types of social network measures are used to measure different types of network attributes like as centrality, clustering , closeness , vitality , density ,etc. Each social network measure follows a specified algorithm to find out particular attribute of network.

In this research, we used 12 types of SNA algorithms which are given bellow:

1. Degree centrality[2]
2. In-degree centrality[2]
3. Out-degree centrality[2]
4. Square clustering[3]
5. Betweenness centrality[4][5][6][7]
6. Closeness vitality[8]
7. Closeness centrality[9]
8. Load centrality[10][11]
9. Clustering coefficient[12]
10. Eigenvector centrality[13][14]
11. Page rank[15][16]
12. Average neighbor degree[17]

## **DIRECTED SCALE FREE NETWORK GENERATION ALGORITHM MODEL:**

If we want to find out correlation among 12 SNA algorithms for directed scale free network then it's not enough for applying these algorithms for few directed scale free networks.

Other hand, it's impossible to apply these 12 SNA algorithms for all directed scale free networks of the world.

So, we need a technique to solve this problem.

We need to categorize directed scale free network by its type and generate possible types of directed scale free network. We used a DIRECTED SCALE FREE NETWORK GENERATION ALGORITHM for categorizing types and generating a large set of directed scale free networks.

We selected "Bela Bollobas, Christian Borgsy, Jennifer Chayesz, Oliver Riordanx's directed scale free graph" algorithm to generate a large set of random directed scale free network.

There are 5 parameters in this algorithm. These are  $\alpha, \beta, \gamma, \delta_{in}$  and  $\delta_{out}$ . We used these five parameters to categorized type of directed scale free network.

### **Model description:**

Here,  $\alpha, \beta, \gamma, \delta_{in}$  and  $\delta_{out}$  are 5 parameters where

$$\alpha + \beta + \gamma = 1 \dots \dots \dots eq(1)$$

$G(n)$  is a directed random graph with  $n$  edges,  $N(n)$  nodes.

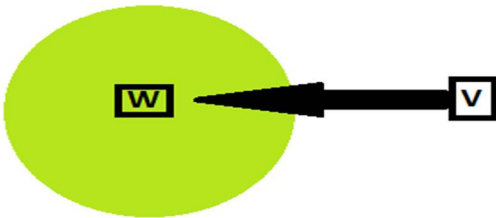
Set of nodes of  $G(n)$  is  $V_n$ ; so  $|V_n| = N(n)$ .

Set of edges of  $G(n)$  is  $E_n = \{(u,v) \in V_n \times V_n : (u,v) \in E_n\}$

In-degree of  $v$  is  $D_{in}(v)$  and out-degree of  $v$  is  $D_{out}(v)$ .

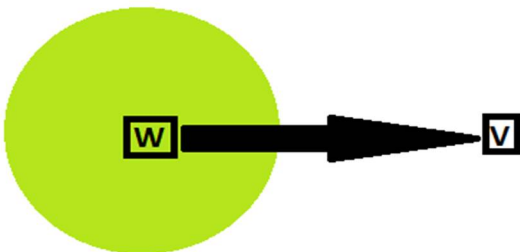
With probability  $\alpha$ , append to  $G(n-1)$ , a new node  $v \notin V_{n-1}$  and create directed edge  $v \rightarrow w \in V_{n-1}$  with probability

$$\frac{D_{in}(w) + \delta_{in}}{n - 1 + \delta_{in}N(n - 1)}$$



With probability  $\gamma$ , append to  $G(n-1)$ , a new node  $v \notin V_{n-1}$  and create directed edge  $w \in V_{n-1} \rightarrow v \notin V_{n-1}$  with probability

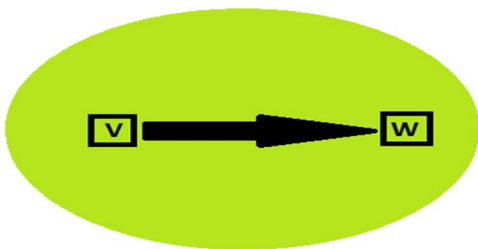
$$\frac{D_{out}(w) + \delta_{out}}{n - 1 + \delta_{out}N(n - 1)}$$



With probability  $\beta$ , create new directed edge between existing nodes.

Here, created edge  $v \in V_{n-1} \rightarrow w \in V_{n-1}$  with probability

$$\left(\frac{D_{in}(w) + \delta_{in}}{n-1 + \delta_{in}N(n-1)}\right) \left(\frac{D_{out}(v) + \delta_{out}}{n-1 + \delta_{out}N(n-1)}\right)$$



The proportion of nodes with in-degree  $i$  will be

$$p_i = \lim_{n \rightarrow \infty} \frac{N_i(n)}{N(n)}$$

Where,  $N(n)$ =number of nodes in  $V_n$  and  $N_i(n)$ =number of nodes with in-degree  $i$

The proportion of nodes with in-degree  $j$  will be

$$q_j = \lim_{n \rightarrow \infty} \frac{N_j(n)}{N(n)}$$

Where,  $N(n)$ =number of nodes in  $V_n$  and  $N_j(n)$ =number of nodes with out-degree  $j$

The  $p_i$  has power law tail so we get,

$$p_i \sim C_{IN} i^{-\alpha_{in}}$$

where,  $C_{IN}$  is positive constant and  $i \rightarrow \infty$  and  $\alpha_{in} + \gamma > 0$  and

$$X_{in} = \frac{\alpha + \beta + 1 + \delta_{in}(\alpha + \gamma)}{\alpha + \beta}, \delta_{in} \geq 0 \dots \dots \dots eq(2)$$

And

$$\delta_{in} = \frac{X_{in}(\alpha + \beta) - \alpha - \beta - 1}{\alpha + \gamma}, \delta_{in} \geq 0 \dots \dots \dots eq(3)$$

The  $q_i$  has power law tail so we get,

$$q_i \sim C_{out} i^{-X_{out}}$$

where,  $C_{out}$  is positive constant and  $i \rightarrow \infty$  and  $\gamma\delta_{in} + \alpha > 0$  and

$$X_{out} = \frac{\gamma + \beta + 1 + \delta_{out}(\alpha + \gamma)}{\gamma + \beta}, \delta_{out} \geq 0 \dots \dots \dots eq(4)$$

and

$$\delta_{out} = \frac{X_{out}(\gamma + \beta) - \gamma - \beta - 1}{\alpha + \gamma}, \delta_{out} \geq 0 \dots \dots \dots eq(5)$$

## METHODOLOGY:

Now, we are going to categorize the type of directed scale free network by using these 5 parameters.

Here,  $\alpha, \beta, \gamma, \delta_{in}$  and  $\delta_{out}$  must be greater than zero.

To avoid other uninteresting issues ,

we presumed that  $\alpha > 0, \beta > 0, \gamma > 0$

and  $\delta_{in} \geq 0$  and  $\delta_{out} \geq 0$

So, Let , lowest value of  $\alpha, \beta, \gamma$  (separately) is 0.1

If lowest value of  $\alpha, \beta, \gamma$  (separately) is 0.1 then,

because of  $\alpha + \beta + \gamma = 1$ ,

the highest value of  $\alpha, \beta, \gamma$  (separately) is 0.8.

Now, we are taking a set of value for  $\alpha, \beta, \gamma$  (separately)

Which is

{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8}

Here, lowest value is 0.1 and highest value is 0.8

Now, we are going to follow 2 procedures to generate the set of directed scale free network.

First procedure in nutshell:

- ▶ We used  $\alpha, \beta, \gamma, X_{in}, X_{out}$  to find out  $\delta_{in}, \delta_{out}$  where  $\delta_{in} \geq 0, \delta_{out} \geq 0$
- ▶ For  $\alpha, \beta, \gamma$ , for each we used the previous set which is {0.1, 0.2, 0.3, ..., 0.8}
- ▶ For  $X_{in}, X_{out}$ , for each we use the set {2.0, 2.05, 2.1, 2.15, ..., 2.95, 3.0}
- ▶ Then needed to justify these set by satisfying  $eq(1), eq(3), eq(5)$ , we got ,  
for  $\delta_{in}, \delta_{out}$ , for each a set with range of (0,4) which we'll describe it in experiment-1  
section.
- ▶ We use the range of (2,3) because almost all directed scale free network's  
 $X_{in}, X_{out}$  has value in this range which is given in next slide.

**Table 1**

<b>Network</b>	<b><math>X_{in}</math></b>	<b><math>X_{out}</math></b>	<b>REFERENCES</b>
WWW	2.1	2.45	Albert, Jeong, Barabasi 1999
WWW	2.1	2.38	Kumar <i>et al.</i> 1999
WWW	2.1	2.72	Broder <i>et al.</i> 2000
WWW , site	1.94		Huberman, Adamic 2000
E . Coli metabolism	2.2	2.2	Jeong <i>et al.</i> 2000
Phone call	2.1	2.1	Aiello <i>et al.</i> 2000

**Second procedure in nutshell:**



- ▶ We used  $\alpha, \beta, \gamma, \delta_{in}, \delta_{out}$  to find out  $X_{in}, X_{out}$  where  $2 \leq X_{in} \leq 3, 2 \leq X_{out} \leq 3$
- ▶ For  $\alpha, \beta, \gamma$ ; for each we used the previous set which is  $\{0.1, 0.2, 0.3, \dots, 0.8\}$
- ▶ For  $\delta_{in}, \delta_{out}$ ; for each we used the set  $\{0.0, 0.2, 0.4, 0.6, \dots, 3.8, 4.0\}$
- ▶ Then, needed to justify these set by satisfying  $eq(1), eq(2), eq(4)$ , we got ,  
for  $X_{in}, X_{out}$ , for each a set with range of (2,3).
- ▶ We used the range of (0,4) for  $\delta_{in}, \delta_{out}$  because we got this range  
from procedure1 which we'll describe in experiment1 section.

We did 2 experiments.

In experiment 1, we followed procedure 1.

In experiment 2, we followed procedure 2.

Both experiments were used to generate a large set of scale free network.

After generating these large set of networks, we applied 12 SNA algorithms on those network to identify correlation among algorithms.

### **EXPERIMENT-1:**

Now, we see from table 1, most of  $X_{in}$  and  $X_{out}$  has range  $2 < X_{in} < 3$  and  $2 < X_{out} < 3$

So, we are taking a set for  $X_{in}$  and  $X_{out}$  individually which is  $\{2.0, 2.05, 2.1, 2.15, 2.2, \dots, 2.95, 3\}$ .

This is a set from 2 to 3 with interval 0.5.

We generated a scatter diagram of  $\alpha$  vs  $\beta$  vs  $\gamma$  by using

$\alpha = \{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8\}$

$\beta = \{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8\}$

$\gamma = \{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8\}$

$X_{in} = \{2.0, 2.05, 2.1, 2.15, 2.2, \dots, 2.95, 3\}$

$X_{out} = \{2.0, 2.05, 2.1, 2.15, 2.2, \dots, 2.95, 3\}$

Putting these set's element in  $eq(1), eq(3), eq(5)$  and we found out for which  $\alpha, \beta, \gamma$  values satisfied  $eq(1), eq(3), eq(5)$ .

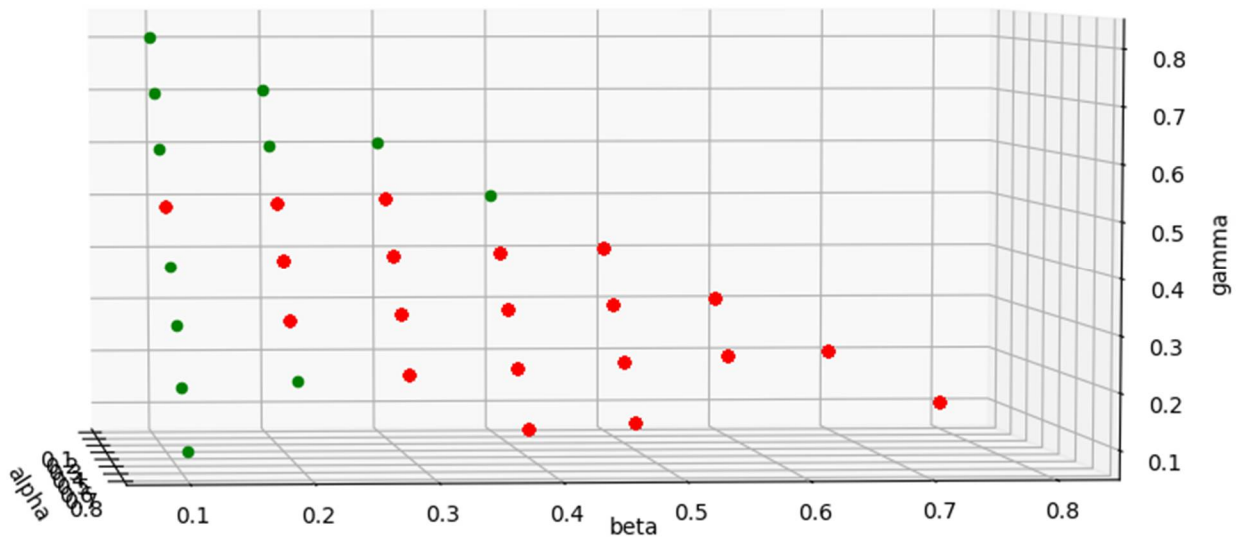


Fig: scatter diagram of  $\alpha$  vs  $\beta$  vs  $\gamma$

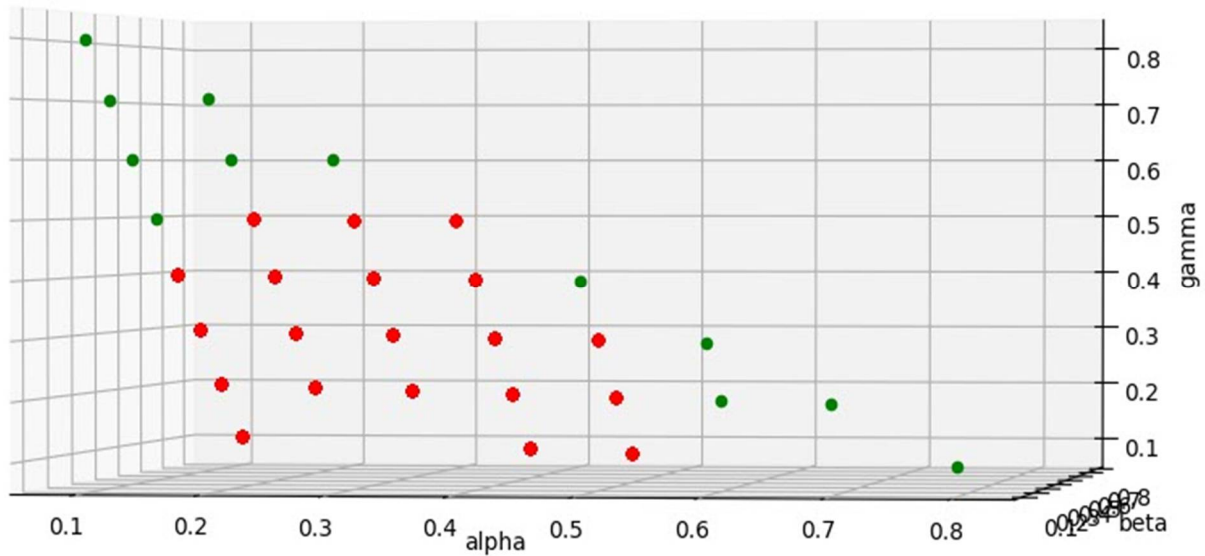


Fig: scatter diagram of  $\alpha$  vs  $\beta$  vs  $\gamma$

What we got from scatter diagram,

There are 32 types (red and blue points) of  $\alpha, \beta, \gamma$  combination which satisfied only  $eq(1)$

but 20 types (only red points) which satisfied  $eq(1), eq(3), eq(5)$

So, these 20 red points are our target points because it satisfied  $eq(1), eq(3), eq(5)$ .

But, by observing these 20 points, we found out that,

The elements  $\{0.6, 0.7, 0.8\}$  of  $\alpha$  and  $\gamma$  has no use among these 20 red points

So, we reconstructed our sets which are

$$\alpha = \{0.1, 0.2, 0.3, 0.4, 0.5\}$$

$$\beta = \{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8\}$$

$$\gamma = \{0.1, 0.2, 0.3, 0.4, 0.5\}$$

We generated a scatter diagram of  $X_{in}$  vs  $X_{out}$   
 and another scatter diagram of  $\delta_{in}$  vs  $\delta_{out}$   
 by satisfying  $eq(1), eq(3), eq(5)$  for putting value of

$$\alpha = \{0.1, 0.2, 0.3, 0.4, 0.5\}$$

$$\beta = \{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8\}$$

$$\gamma = \{0.1, 0.2, 0.3, 0.4, 0.5\}$$

$$X_{in} = \{2.0, 2.05, 2.1, 2.15, 2.2, \dots, 2.95, 3\}$$

$$X_{out} = \{2.0, 2.05, 2.1, 2.15, 2.2, \dots, 2.95, 3\}$$

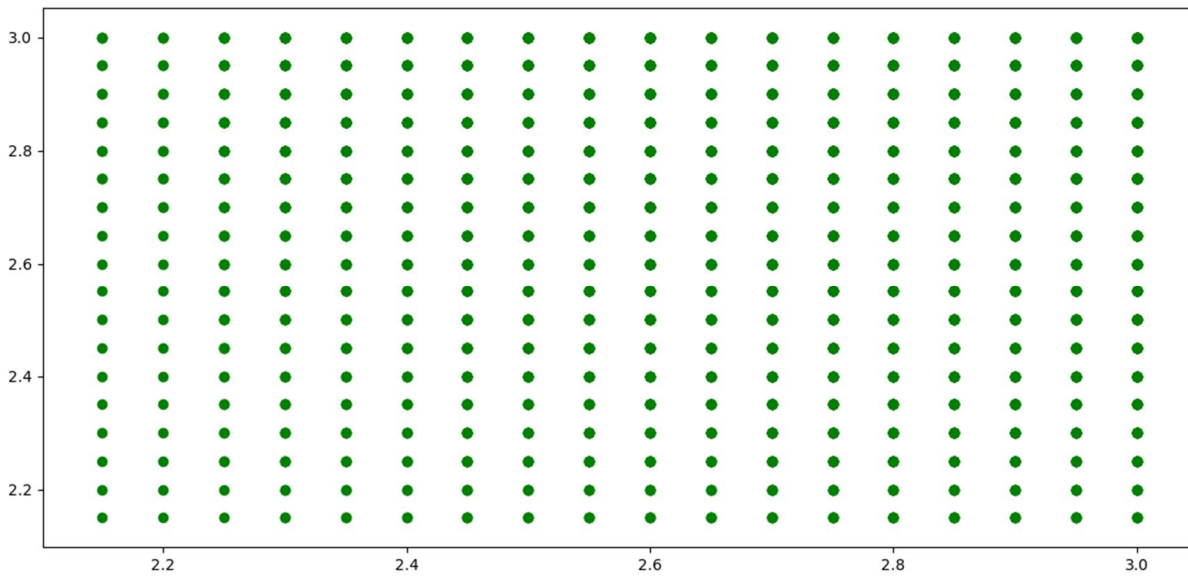


Fig: scatter diagram of  $X_{in}$  vs  $X_{out}$

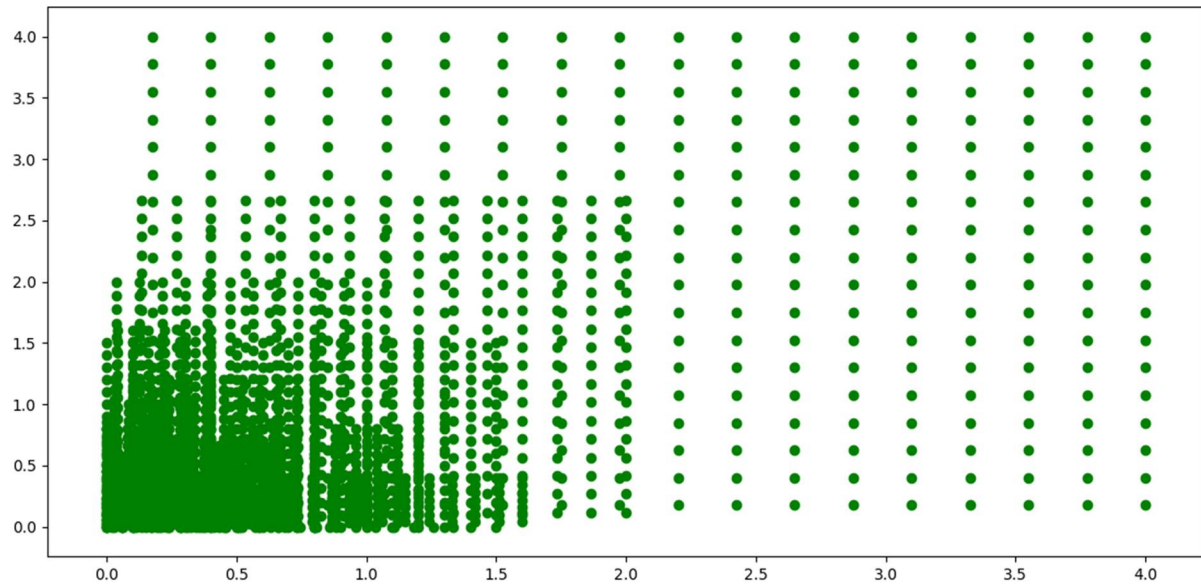


Fig: scatter diagram of  $\delta_{in}$  vs  $\delta_{out}$

So, we see that all element of  $X_{in}$  and  $X_{out}$  are not satisfying (1), eq(3), eq(5) . we needed to reconstruct the element of  $X_{in}$  and  $X_{out}$ .

we see from the graph( $X_{in}$  vs  $X_{out}$ ) that element 2.1 is not satisfied

the eq(3), eq(5) because of  $\delta_{in} < 0$  and  $\delta_{out} < 0$

But,  $\delta_{out} > -1$  and  $\delta_{out} > -1$

so, we considered  $\delta_{in} = 0$  and  $\delta_{out} = 0$  for element 2.1

So, we constructed,

$$X_{in} = \{2.1, 2.15, 2.2, \dots, 2.95, 3\}$$

$$X_{out} = \{2.1, 2.15, 2.2, \dots, 2.95, 3\}$$

We used 2.1 as element of  $X_{in}$  and  $X_{out}$  because Bela Bollobas's "directed scale free graphs" 's

"4.particular values" section considered  $\delta_{in} = -0.019$  as 0 when  $\alpha=0.41,\beta=0.49,\gamma=0.1$  and  $X_{in}=2.1$

Now, put these  $\alpha, \beta, \gamma, X_{in}, X_{out}$  set elements in table 2 and find out the combination

$\alpha$	$\beta$	$\gamma$	$X_{in}$	$X_{out}$
0.1	0.1	0.1	2.1	2.1
0.2	0.2	0.2	2.15	2.15
0.3	0.3	0.3	2.2	2.2
0.4	0.4	0.4	2.25	2.25
0.5	0.5	0.5	2.3	2.3
	0.6		2.35	2.35
	0.7		2.4	2.4
	0.8		2.45	2.45
			2.5	2.5
			2.55	2.55
			2.6	2.6
			2.65	2.65
			2.7	2.7
			2.75	2.75
			2.8	2.8
			2.85	2.85
			2.9	2.9
			2.95	2.95
			3	3

Now, we need to find out how many combination exists of table 1 and how many combination satisfy  $eq(1), eq(3), eq(5)$  except the combination with element 2.1.

► Combination exist  $=5C_1 \times 8C_1 \times 5C_1 \times 19C_1 \times 19C_1=72200$

We found out , among these 72200 combination , only 2354 combination satisfy  $eq(1), eq(3), eq(5)$ .We can say it by another way that, among these 72200 network types, only 2354 network types are scale free network types.

Now, we decided to generate these 2354 types of scale free network for 50,100 and 500 nodes.

We chose this small size of network to reduce our computation time

► We generated 5 random scale free networks for each type.

► So , the total number of scale free network for experiment 1

$$= 3 \times 5 \times 2354 = 35310$$

We divided experiment 1 into few parts because of proper analysis and computation time efficiency.

We divided this experiment by  $X_{in}$  and  $X_{out}$  comparison which are

i)  $X_{in} > X_{out}$

ii)  $X_{in} < X_{out}$

iii)  $X_{in} = X_{out}$

In experiment-1,

for each node type ( 50,100 and 500 ) , we got ,

► 5770 numbers of network for  $X_{in} > X_{out}$

► 5240 numbers of network for  $X_{in} < X_{out}$

► 760 numbers of network for  $X_{in} = X_{out}$

## EXPERIMENT-2:

Now, we see from experiment 1's graph ( $\delta_{in}$  vs  $\delta_{out}$ ) that, the range of  $\delta_{in}$  and  $\delta_{out}$  is (0,4)

So, we took a set from range (0,4) with interval of 0.2

which are

$$\delta_{in} = \{0.0, 0.2, 0.4, 0.6, \dots, 3.6, 3.8, 4.0\}$$

$$\delta_{out} = \{0.0, 0.2, 0.4, 0.6, \dots, 3.6, 3.8, 4.0\}$$

Now, according to EXPERIMENT1,

we took the set of  $\alpha, \beta, \gamma$  and also added set of  $\delta_{in}$  and  $\delta_{out}$

which are,

$$\alpha = \{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8\}$$

$$\beta = \{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8\}$$

$$\gamma = \{0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8\}$$

$$\delta_{in} = \{0.0, 0.2, 0.4, 0.6, \dots, 3.6, 3.8, 4.0\}$$

$$\delta_{out} = \{0.0, 0.2, 0.4, 0.6, \dots, 3.6, 3.8, 4.0\}$$

we drew scatter diagram of  $\alpha$  vs  $\beta$  vs  $\gamma$  by satisfying eq(1), eq(2), eq(4) for these sets elements.

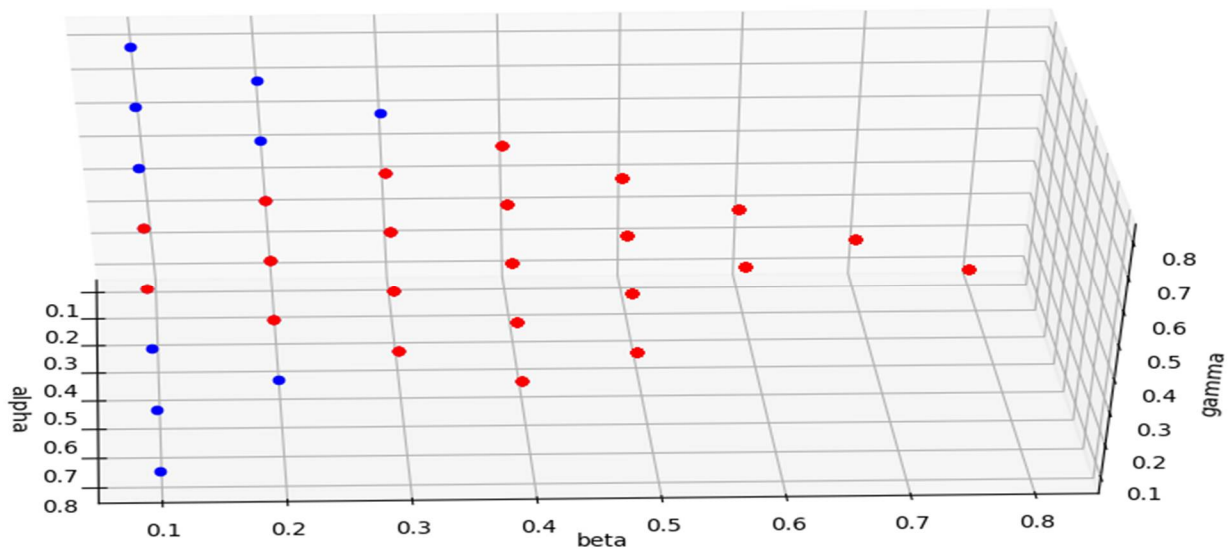


Fig: Scatter diagram of  $\alpha$  vs  $\beta$  vs  $\gamma$  for EXPERIMENT 2



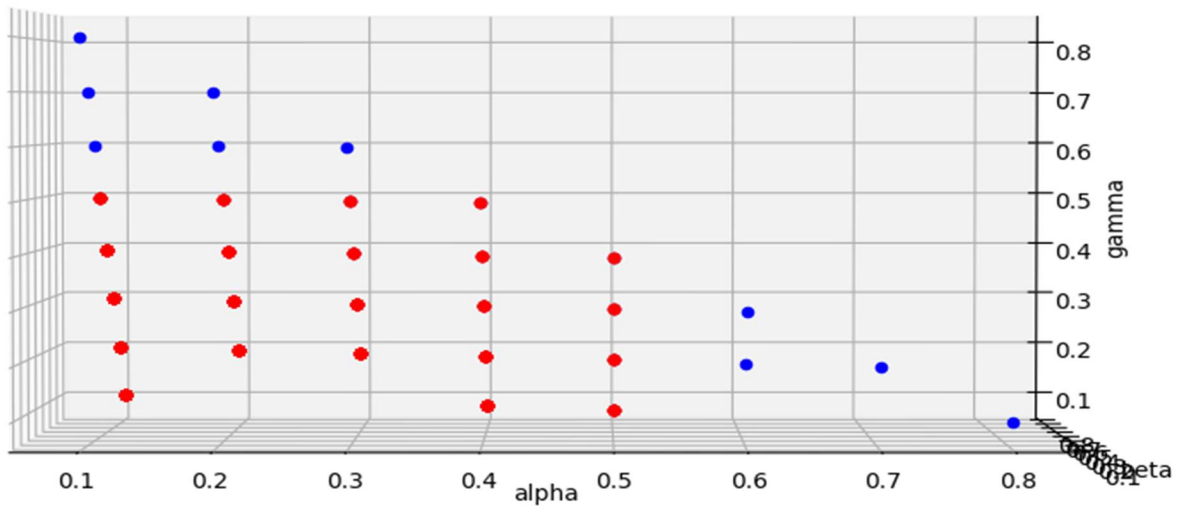


Fig: Scatter diagram of  $\alpha$  vs  $\beta$  vs  $\gamma$  for EXPERIMENT 2

What we got from scatter diagram,

There exists 32 points (red and blue points) which satisfy  $eq(1)$  (it is similar to experiment 1).

But there exists 22 points (only red points) which satisfy  $eq(1), eq(2), eq(4)$

This is not similar to experiment 1 because, in experiment 1, we found 20 red points which satisfy  $eq(1), eq(3)$  and  $eq(5)$ .

So, we can say that,

- ▶ EXPERIMENT\_2 is better than EXPERIMENT\_1 for  $\alpha, \beta, \gamma$ 's combination types

But, by observing these 22 points, we found out that,

The elements  $\{0.6, 0.7, 0.8\}$  of  $\alpha$  and  $\gamma$  has no use among these 20 red points which is similar to EXPERIMENT-1.

So, we reconstructed our sets which are

$$\alpha=\{0.1,0.2,0.3,0.4,0.5\}$$

$$\beta=\{0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8\}$$

$$\gamma=\{0.1,0.2,0.3,0.4,0.5\}$$

We generated a scatter diagram of  $X_{in}$  vs  $X_{out}$  and another scatter diagram of  $\delta_{in}$  vs  $\delta_{out}$  by satisfying  $eq(1)$ ,  $eq(3)$ ,  $eq(5)$  for putting value of

$$\alpha=\{0.1,0.2,0.3,0.4,0.5\}$$

$$\beta=\{0.1,0.2,0.3,0.4,0.5,0.6,0.7,0.8\}$$

$$\gamma=\{0.1,0.2,0.3,0.4,0.5\}$$

$$\delta_{in}=\{0.0,0.2,0.4,0.6,\dots,3.6,3.8,4.0\}$$

$$\delta_{out}=\{0.0,0.2,0.4,0.6,\dots,3.6,3.8,4.0\}$$

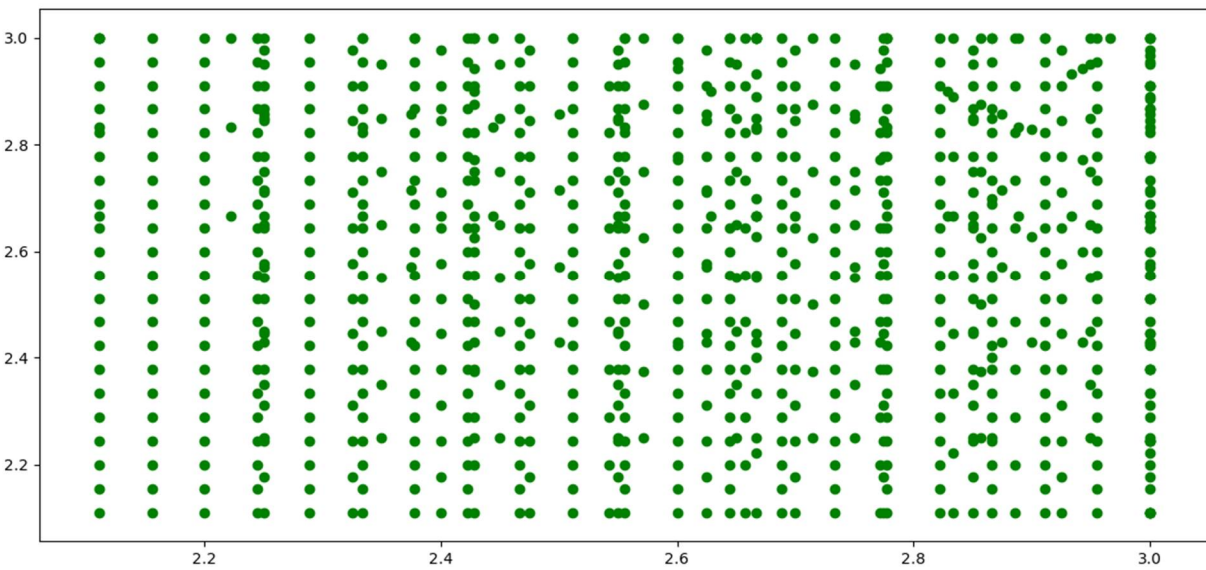


Fig: scatter diagram of  $X_{in}$  vs  $X_{out}$  for EXPERIMENT\_2

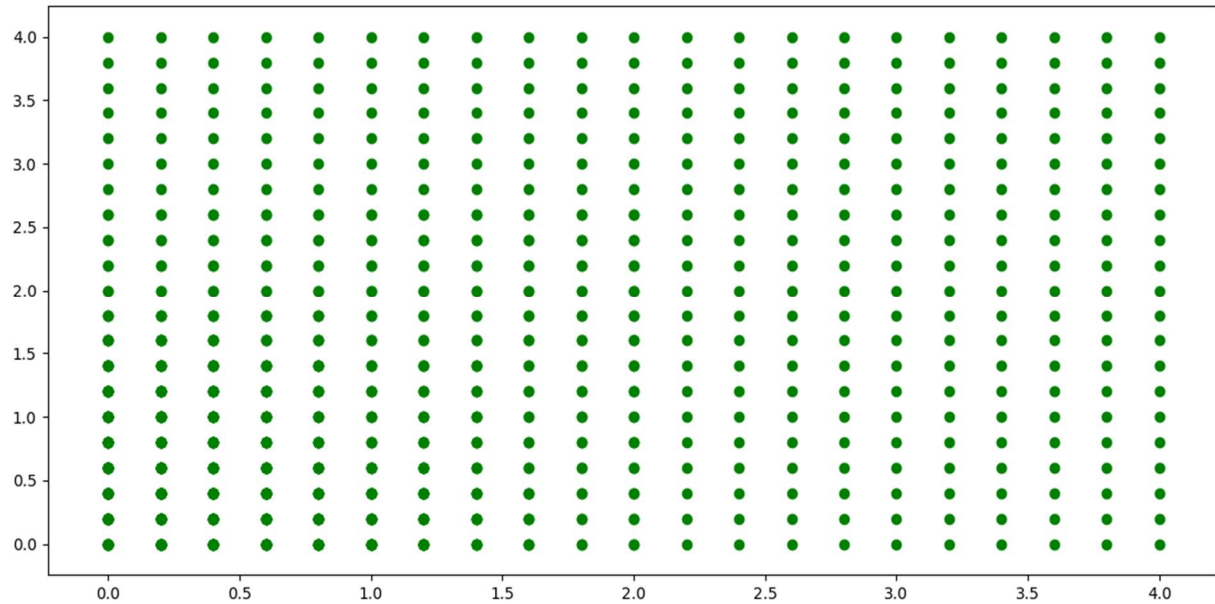


Fig: scatter diagram of  $\delta_{in}$  vs  $\delta_{out}$  for EXPERIMENT2

Now, we see from scatter diagram of  $X_{in}$  vs  $X_{out}$  for EXPERIMENT-2 ,

the range of  $X_{in}$  and  $X_{out}$  is (2.1,3.0) which we used it in EXPERIMENT-1 as taking the set of range of (2.1,3.0)(see table 2's  $X_{in}$  and  $X_{out}$  column).

We see,In experiment\_2,  $X_{in}$  and  $X_{out}$  is not welly distributed as experiment\_1.

we see from scatter diagram of  $\delta_{in}$  vs  $\delta_{out}$  for EXPERIMENT\_2,

all element of  $\delta_{in}$  and  $\delta_{out}$  are satisfying  $eq(1)$ ,  $eq(3)$ ,  $eq(5)$  .

In experiment\_2,  $\delta_{in}$  and  $\delta_{out}$  is more welly distributed than experiment\_1.

$\alpha$	$\beta$	$\gamma$	$\delta_{in}$	$\delta_{out}$
0.1	0.1	0.1	0.0	0.0
0.2	0.2	0.2	0.2	0.2
0.3	0.3	0.3	0.4	0.4
0.4	0.4	0.4	0.6	0.6
0.5	0.5	0.5	0.8	0.8
	0.6		1.0	1.0
	0.7		1.2	1.2
	0.8		1.4	1.4
			1.6	1.6
			1.8	1.8
			2.0	2.0
			2.2	2.2
			2.4	2.4
			2.6	2.6
			2.8	2.8
			3.0	3.0
			3.2	3.2
			3.4	3.4
			3.6	3.6
			3.8	3.8
			4.0	4.0

Now, we need to find out how many combination exist of table3 and how many combination satisfy  $eq(1), eq(2), eq(4)$

► Combination exist =  $5C_1 \times 8C_1 \times 5C_1 \times 21C_1 \times 21C_1 = 88200$

We found out, among these 88200 combination, only 909 combination satisfy  $eq(1), eq(2), eq(4)$

we can say it by another way that, among these 88200 network types, only 909 network types are scale free network types.

Now, we decided to generate these 909 types of scale free network.

For 50,100 and 500 nodes,

We chose this small size of network to reduce our computation time

We generated 5 random scale free networks for each type.

So , the total number of scale free network for experiment 2

$$= 3 \times 5 \times 909$$

$$= 13635$$

We divided experiment 2 into few parts because of proper analysis and computation time efficiency.

We divided this experiment by  $X_{in}$  and  $X_{out}$  comparison which are

$$\text{i) } X_{in} > X_{out}$$

$$\text{ii) } X_{in} < X_{out}$$

$$\text{iii) } X_{in} = X_{out}$$

In experiment-2,

For each node type (50,100 and 500) , we got ,

2290 numbers of network for  $X_{in} > X_{out}$

2070 numbers of network for  $X_{in} < X_{out}$

185 numbers of network for  $X_{in} = X_{out}$

## **CORRELATION:**

Now, we applied 12 social network measures on experiment 1 and experiment 2. These 12 social network measures are nothing but nodal analysis so we got measured value of each node for each measure which means 12 measured value for each node. We stored these values as matrix (we denoted these matrix as "nodal measure matrix").

In nodal measure matrix, rows represent social network measures and columns represent nodes.

So, we needed to compute statistical dependency among rows and stored these correlation into another matrix (which we denoted as "result matrix")

In result matrix, rows and columns both represent social network measures.

We chose PEARSON CORRELATION to find out statistical dependency among 12 social network measures for avoiding scaling issues between measures.

Pearson correlation is a nonparametric measures of statistical dependency which is used to compare the rank order outcome of the measures.

► **PEARSON CORRELATION:**

$$\frac{n \sum_{i=1}^n x_i y_i - \sum_{i=1}^n x_i \sum_{i=1}^n y_i}{\sqrt{n \sum_{i=1}^n x_i^2 - (\sum_{i=1}^n x_i)^2} \sqrt{n \sum_{i=1}^n y_i^2 - (\sum_{i=1}^n y_i)^2}}$$

Where,

$n$  = number of columns in nodal measure matrix = number of total nodes

$x_i$  =  $i$  th number of column of  $x$  th number of row in nodal measure matrix

=  $i$  th number of measure of  $x$  th number of node

$y_i = i$  th number of column of  $y$  th number of row in nodal measure matrix  
=  $i$  th number of measure of  $y$  th number of node

### **CODING LANGUAGE AND COMPUTING MACHINE:**

We used Python's Networkx package to compute the whole experiment. We used networkx built-in-function for measures which are available in networkx 1.10 documentation.

There are two built-in-function used for pagerank measures in networkx . One from "scipy" module and another from "numpy" module. We used both to identify which is better for computation time.

We used betweenness centrality as two procedures. One as betweenness centrality and other is betweenness centrality subset. Both are same except for computing with subset.

So, considering two page rank and two betweenness centrality,

the total number of measures we got, is 14.

So, we used 14 measures (including two page rank and two betweenness centrality)

which implies our "result matrix" are  $14 \times 14$  size matrix.

### **COMPUTING MACHINE:**

Processor: Intel(R) Core(TM) i7-6500U CPU @ 2.50GHz (4 CPUs), ~2.6GHz

Operating System: Windows 10 Pro 64-bit

Memory: 4096MB RAM

Available OS Memory: 3934MB RAM

## MATRIX SIZE:

In experiment-1,

For 50 numbers of nodes, we got,

- ▶ 5770 numbers of network for  $X_{in} > X_{out}$

Which implies the nodal measure matrix size is  $14 \times 288500$

- ▶ 5240 numbers of network for  $X_{in} < X_{out}$

Which implies the nodal measure matrix size is  $14 \times 262000$

- ▶ 760 numbers of network for  $X_{in} = X_{out}$

Which implies the nodal measure matrix size is  $14 \times 38000$

In experiment-1,

For 100 numbers of nodes, we got,

- ▶ 5770 numbers of network for  $X_{in} > X_{out}$

Which implies the nodal measure matrix size is  $14 \times 577000$

- ▶ 5240 numbers of network for  $X_{in} < X_{out}$

Which implies the nodal measure matrix size is  $14 \times 524000$

- ▶ 760 numbers of network for  $X_{in} = X_{out}$

Which implies the nodal measure matrix size is  $14 \times 76000$

In experiment-1,



For 500 numbers of nodes, we got,

- ▶ 5770 numbers of network for  $X_{in} > X_{out}$

Which implies the nodal measure matrix size is  $14 \times 2885000$

- ▶ 5240 numbers of network for  $X_{in} < X_{out}$

Which implies the nodal measure matrix size is  $14 \times 2620000$

- ▶ 760 numbers of network for  $X_{in} = X_{out}$

Which implies the nodal measure matrix size is  $14 \times 380000$

**In experiment-1, the number of “nodal measured matrix” is 9**

In experiment-2,

For 50 numbers of nodes, we got,

- ▶ 2290 numbers of network for  $X_{in} > X_{out}$

Which implies the nodal measure matrix size is  $14 \times 114500$

- ▶ 2070 numbers of network for  $X_{in} < X_{out}$

Which implies the nodal measure matrix size is  $14 \times 103500$

- ▶ 185 numbers of network for  $X_{in} = X_{out}$

Which implies the nodal measure matrix size is  $14 \times 9250$

In experiment-2,

For 100 numbers of nodes, we got,

- ▶ 2290 numbers of network for  $X_{in} > X_{out}$

Which implies the nodal measure matrix size is  $14 \times 229000$

- ▶ 2070 numbers of network for  $X_{in} < X_{out}$

Which implies the nodal measure matrix size is  $14 \times 207000$

- ▶ 185 numbers of network for  $X_{in} = X_{out}$

Which implies the nodal measure matrix size is  $14 \times 18500$

In experiment-2,

For 500 numbers of nodes, we got,

- ▶ 2290 numbers of network for  $X_{in} > X_{out}$

Which implies the nodal measure matrix size is  $14 \times 1145000$

- ▶ 2070 numbers of network for  $X_{in} < X_{out}$

Which implies the nodal measure matrix size is  $14 \times 1035000$

- ▶ 185 numbers of network for  $X_{in} = X_{out}$

Which implies the nodal measure matrix size is  $14 \times 92500$

**So, In experient-2, the number of "nodal measured matrix" is 9.**

## Outputs:

Here,

0=Degree centrality

1=In-degree centrality

2=Out-degree centrality

3=Square clustering

4=Betweenness centrality

5=Closeness vitality

6=Closeness centrality

7=Load centrality

8=Clustering coefficient

9=Eigenvector centrality

10=Page rank numpy

11=Page rank scipy

12=Average neighbor degree

13=Betweenness centrality subset

**Output for 50 nodes:**

Xin>Xout for experiment-2:

0's length = 114500

0's and 0's correlation = 1.0

0's and 1's correlation = 0.8596093075827006	1's and 8's correlation = 0.2297087325927698	3's and 1's correlation = 0.42306728758044615
0's and 2's correlation = 0.9287268054538813	1's and 9's correlation = 0.8521291864595196	3's and 2's correlation = 0.7078203442534851
0's and 3's correlation = 0.653668049202256	1's and 10's correlation = 0.8522537314098902	3's and 3's correlation = 1.0
0's and 4's correlation = 0.8338347115939062	1's and 11's correlation = 0.8522828891773374	3's and 4's correlation = 0.5162014351327685
0's and 5's correlation = 0.5566244665206287	1's and 12's correlation = 0.005096786738192926	3's and 5's correlation = 0.3356254294136018
0's and 6's correlation = 0.5439981498288106	1's and 13's correlation = 0.7431954909272207	3's and 6's correlation = 0.3943102333697759
0's and 7's correlation = 0.8338913168774763	2's length = 114500	3's and 7's correlation = 0.5169656798910706
0's and 8's correlation = 0.24381883966008866	2's and 0's correlation = 0.9287268054538813	3's and 8's correlation = 0.13730480058144162
0's and 9's correlation = 0.7354900112059372	2's and 1's correlation = 0.6088992403419987	3's and 9's correlation = 0.33846395553037534
0's and 10's correlation = 0.7135217393919321	2's and 2's correlation = 1.0	3's and 10's correlation = 0.31258412526685014
0's and 11's correlation = 0.7135485667864886	2's and 3's correlation = 0.7078203442534851	3's and 11's correlation = 0.3125980942290544
0's and 12's correlation = 0.008790212029792572	2's and 4's correlation = 0.7552308851441636	3's and 12's correlation = 0.012260137779353216
0's and 13's correlation = 0.8338347115938979	2's and 5's correlation = 0.5101038605362074	3's and 13's correlation = 0.5162014351327685
1's length = 114500	2's and 6's correlation = 0.5772276754640564	4's length = 114500
1's and 0's correlation = 0.8596093075827006	2's and 7's correlation = 0.7557578035018739	4's and 0's correlation = 0.8338347115939062
1's and 1's correlation = 1.0	2's and 8's correlation = 0.2118414613304665	4's and 1's correlation = 0.7431954909272341
1's and 2's correlation = 0.6088992403419987	2's and 9's correlation = 0.5235056016550084	4's and 2's correlation = 0.7552308851441636
1's and 3's correlation = 0.42306728758044615	2's and 10's correlation = 0.48930971077683827	4's and 3's correlation = 0.5162014351327685
1's and 4's correlation = 0.7431954909272341	2's and 11's correlation = 0.48933020212370965	4's and 4's correlation = 1.0
1's and 5's correlation = 0.487917097161105	2's and 12's correlation = 0.009948305167260505	4's and 5's correlation = 0.7646768460411469
1's and 6's correlation = 0.36839971557333756	2's and 13's correlation = 0.7552308851441641	4's and 6's correlation = 0.5477385388135855
1's and 7's correlation = 0.7425904498277862	3's length = 114500	4's and 7's correlation = 0.9999226473523405
	3's and 0's correlation = 0.653668049202256	4's and 8's correlation = 0.2549928310776884

4's and 9's correlation = 0.7013680355188174	6's and 2's correlation = 0.5772276754640564	7's and 10's correlation = 0.728742643102304
4's and 10's correlation = 0.7295944207124754	6's and 3's correlation = 0.3943102333697759	7's and 11's correlation = 0.7287741252833074
4's and 11's correlation = 0.7296259387936098	6's and 4's correlation = 0.5477385388135855	7's and 12's correlation = 0.02565745755238038
4's and 12's correlation = 0.02575022048542133	6's and 5's correlation = 0.5707190301089765	7's and 13's correlation = 0.9999226473523144
4's and 13's correlation = 0.999999999999832	6's and 6's correlation = 1.0	8's length = 114500
5's length = 114500	6's and 7's correlation = 0.5486640615037492	8's and 0's correlation = 0.24381883966008866
5's and 0's correlation = 0.5566244665206287	6's and 8's correlation = 0.432295999512138	8's and 1's correlation = 0.2297087325927698
5's and 1's correlation = 0.487917097161105	6's and 9's correlation = 0.3036370138959999	8's and 2's correlation = 0.2118414613304665
5's and 2's correlation = 0.5101038605362074	6's and 10's correlation = 0.2616999572846249	8's and 3's correlation = 0.13730480058144162
5's and 3's correlation = 0.3356254294136018	6's and 11's correlation = 0.26171654081197665	8's and 4's correlation = 0.2549928310776884
5's and 4's correlation = 0.7646768460411469	6's and 12's correlation = 0.4986983537239209	8's and 5's correlation = 0.25021587761855013
5's and 5's correlation = 1.0	6's and 13's correlation = 0.5477385388135823	8's and 6's correlation = 0.432295999512138
5's and 6's correlation = 0.5707190301089765	7's length = 114500	8's and 7's correlation = 0.25533398762723225
5's and 7's correlation = 0.7661143032220997	7's and 0's correlation = 0.8338913168774763	8's and 8's correlation = 1.0
5's and 8's correlation = 0.25021587761855013	7's and 1's correlation = 0.7425904498277862	8's and 9's correlation = 0.20454939624011453
5's and 9's correlation = 0.485065373018528	7's and 2's correlation = 0.7557578035018739	8's and 10's correlation = 0.20529547164090545
5's and 10's correlation = 0.5190464875671741	7's and 3's correlation = 0.5169656798910706	8's and 11's correlation = 0.20530516088160444
5's and 11's correlation = 0.5190690537708437	7's and 4's correlation = 0.9999226473523405	8's and 12's correlation = 0.16042527485452376
5's and 12's correlation = 0.11218643011940693	7's and 5's correlation = 0.7661143032220997	8's and 13's correlation = 0.2549928310776748
5's and 13's correlation = 0.7646768460411272	7's and 6's correlation = 0.5486640615037492	9's length = 114500
6's length = 114500	7's and 7's correlation = 1.0	9's and 0's correlation = 0.7354900112059372
6's and 0's correlation = 0.5439981498288106	7's and 8's correlation = 0.25533398762723225	9's and 1's correlation = 0.8521291864595196
6's and 1's correlation = 0.36839971557333756	7's and 9's correlation = 0.7008484876139096	9's and 2's correlation = 0.5235056016550084

9's and 3's correlation = 0.33846395553037534	10's and 11's correlation = 0.9999999830462999	12's and 4's correlation = 0.02575022048542133
9's and 4's correlation = 0.7013680355188174	10's and 12's correlation = - 0.039916218021305745	12's and 5's correlation = 0.11218643011940693
9's and 5's correlation = 0.485065373018528	10's and 13's correlation = 0.7295944207124442	12's and 6's correlation = 0.4986983537239209
9's and 6's correlation = 0.3036370138959999	11's length = 114500	12's and 7's correlation = 0.02565745755238038
9's and 7's correlation = 0.7008484876139096	11's and 0's correlation = 0.7135485667864886	12's and 8's correlation = 0.16042527485452376
9's and 8's correlation = 0.20454939624011453	11's and 1's correlation = 0.8522828891773374	12's and 9's correlation = - 0.04525257876455578
9's and 9's correlation = 1.0	11's and 2's correlation = 0.48933020212370965	12's and 10's correlation = - 0.039916218021305745
9's and 10's correlation = 0.8325604036616353	11's and 3's correlation = 0.3125980942290544	12's and 11's correlation = - 0.039915286778664766
9's and 11's correlation = 0.8325879679704116	11's and 4's correlation = 0.7296259387936098	12's and 12's correlation = 1.0
9's and 12's correlation = - 0.04525257876455578	11's and 5's correlation = 0.5190690537708437	12's and 13's correlation = 0.025750220485417558
9's and 13's correlation = 0.7013680355188164	11's and 6's correlation = 0.26171654081197665	13's length = 114500
10's length = 114500	11's and 7's correlation = 0.7287741252833074	13's and 0's correlation = 0.8338347115938979
10's and 0's correlation = 0.7135217393919321	11's and 8's correlation = 0.20530516088160444	13's and 1's correlation = 0.7431954909272207
10's and 1's correlation = 0.8522537314098902	11's and 9's correlation = 0.8325879679704116	13's and 2's correlation = 0.7552308851441641
10's and 2's correlation = 0.48930971077683827	11's and 10's correlation = 0.9999999830462999	13's and 3's correlation = 0.5162014351327503
10's and 3's correlation = 0.31258412526685014	11's and 11's correlation = 1.0	13's and 4's correlation = 0.9999999999999832
10's and 4's correlation = 0.7295944207124754	11's and 12's correlation = - 0.039915286778664766	13's and 5's correlation = 0.7646768460411272
10's and 5's correlation = 0.5190464875671741	11's and 13's correlation = 0.7296259387935831	13's and 6's correlation = 0.5477385388135823
10's and 6's correlation = 0.2616999572846249	12's length = 114500	13's and 7's correlation = 0.9999226473523144
10's and 7's correlation = 0.728742643102304	12's and 0's correlation = 0.008790212029792572	13's and 8's correlation = 0.2549928310776748
10's and 8's correlation = 0.20529547164090545	12's and 1's correlation = 0.005096786738192926	13's and 9's correlation = 0.7013680355188164
10's and 9's correlation = 0.8325604036616353	12's and 2's correlation = 0.009948305167260505	13's and 10's correlation = 0.7295944207124442
10's and 10's correlation = 1.0	12's and 3's correlation = 0.012260137779353216	

13's and 11's correlation = 0.7296259387935831	4 and 0	11 and 9
13's and 12's correlation = 0.025750220485417558	4's and 7's correlation = 0.9999226473523405	11's and 10's correlation = 0.9999999830462999
13's and 13's correlation = 1.0	4 and 7	11 and 10
correlation>0.80:	4's and 13's correlation = 0.999999999999832	13's and 0's correlation = 0.8338347115938979
highly correlated=14	4 and 13	13 and 0
0's and 1's correlation = 0.8596093075827006	7's and 0's correlation = 0.8338913168774763	13's and 4's correlation = 0.999999999999832
0 and 1	7 and 0	13 and 4
0's and 2's correlation = 0.9287268054538813	7's and 4's correlation = 0.9999226473523405	13's and 7's correlation = 0.9999226473523144
0 and 2	7 and 4	13 and 7
0's and 4's correlation = 0.8338347115939062	7's and 13's correlation = 0.9999226473523144	highly correlated=14
0 and 4	7 and 13	mean time of 0=0.00017748816044570057 seconds
0's and 7's correlation = 0.8338913168774763	9's and 1's correlation = 0.8521291864595196	mean time of 1=3.456215671056223e- 05 seconds
0 and 7	9 and 1	mean time of 2=6.405536784875861e- 05 seconds
0's and 13's correlation = 0.8338347115938979	9's and 10's correlation = 0.8325604036616353	mean time of 3=0.0014040285843428565 seconds
0 and 13	9 and 10	mean time of 4=0.002664216845316658 seconds
1's and 0's correlation = 0.8596093075827006	9's and 11's correlation = 0.8325879679704116	mean time of 5=0.033633517073752055 seconds
1 and 0	9 and 11	mean time of 6=0.0008454355089945564 seconds
1's and 9's correlation = 0.8521291864595196	10's and 1's correlation = 0.8522537314098902	mean time of 7=0.002205266598530732 seconds
1 and 9	10 and 1	mean time of 8=0.0013054841470510159 seconds
1's and 10's correlation = 0.8522537314098902	10's and 9's correlation = 0.8325604036616353	mean time of 9=0.0013140466015411777 seconds
1 and 10	10 and 9	mean time of 10=0.0026050170956740735 seconds
1's and 11's correlation = 0.8522828891773374	10's and 11's correlation = 0.9999999830462999	mean time of 11=0.0017129468084943348 seconds
1 and 11	10 and 11	mean time of 12=0.0004994256007098735 seconds
2's and 0's correlation = 0.9287268054538813	11's and 1's correlation = 0.8522828891773374	mean time of 13=0.002445021883369013 seconds
2 and 0	11 and 1	
4's and 0's correlation = 0.8338347115939062	11's and 9's correlation = 0.8325879679704116	

time needed = 227.25145173072815  
seconds

458.0

>>>

Xin>Xout for exeiment-1:

0's length = 288500

0's and 0's correlation = 1.0

0's and 1's correlation =  
0.8390663962265779

0's and 2's correlation =  
0.9147738017026255

0's and 3's correlation =  
0.6322656997163169

0's and 4's correlation =  
0.8185979618281192

0's and 5's correlation =  
0.5894086008893837

0's and 6's correlation =  
0.5669825589347198

0's and 7's correlation =  
0.8184929344412227

0's and 8's correlation =  
0.2634116632761583

0's and 9's correlation =  
0.659551774527862

0's and 10's correlation =  
0.6393531505190782

0's and 11's correlation =  
0.63938472603325

0's and 12's correlation =  
0.05670828657966915

0's and 13's correlation =  
0.8185979618281971

1's length = 288500

1's and 0's correlation =  
0.8390663962265779

1's and 1's correlation = 1.0

1's and 2's correlation =  
0.5477864829051964

1's and 3's correlation =  
0.3920966371387206

1's and 4's correlation =  
0.7128329146365948

1's and 5's correlation =  
0.5095961911000315

1's and 6's correlation =  
0.3333992307971425

1's and 7's correlation =  
0.7122124719546923

1's and 8's correlation =  
0.23405364664728254

1's and 9's correlation =  
0.7937660695814224

1's and 10's correlation =  
0.798384764895308

1's and 11's correlation =  
0.7984202518271738

1's and 12's correlation =  
0.040014458498570375

1's and 13's correlation =  
0.7128329146366604

2's length = 288500

2's and 0's correlation =  
0.9147738017026255

2's and 1's correlation =  
0.5477864829051964

2's and 2's correlation = 1.0

2's and 3's correlation =  
0.6811605087638148

2's and 4's correlation =  
0.7295444378482847

2's and 5's correlation =  
0.5280052521461968

2's and 6's correlation =  
0.6243523649241545

2's and 7's correlation =  
0.7298436318213959

2's and 8's correlation =  
0.23128391674730125

2's and 9's correlation =  
0.4248636182069965

2's and 10's correlation =  
0.3903721978364477

2's and 11's correlation =  
0.39039440459123687

2's and 12's correlation =  
0.057494513883585736

2's and 13's correlation =  
0.7295444378483495

3's length = 288500

3's and 0's correlation =  
0.6322656997163169

3's and 1's correlation =  
0.3920966371387206

3's and 2's correlation =  
0.6811605087638148

3's and 3's correlation = 1.0

3's and 4's correlation =  
0.4668714412619237

3's and 5's correlation =  
0.30085559693164615

3's and 6's correlation =  
0.38238439655120177

3's and 7's correlation =  
0.46729141103362015

3's and 8's correlation =  
0.1416804492471803

3's and 9's correlation =  
0.2581067172802274

3's and 10's correlation =  
0.23291805428823006

3's and 11's correlation =  
0.2329319229009685

3's and 12's correlation =  
0.04404065130380544

3's and 13's correlation =  
0.4668714412619255

4's length = 288500

4's and 0's correlation =  
0.8185979618281192

4's and 1's correlation =  
0.7128329146365948

4's and 2's correlation =  
0.7295444378482847



4's and 3's correlation = 0.4668714412619237	5's and 11's correlation = 0.5225521796365189	7's and 4's correlation = 0.9999482326098849
4's and 4's correlation = 1.0	5's and 12's correlation = 0.14823359557543128	7's and 5's correlation = 0.8342333132586572
4's and 5's correlation = 0.833326621746841	5's and 13's correlation = 0.8333266217468424	7's and 6's correlation = 0.547670957589012
4's and 6's correlation = 0.547114814071748	6's length = 288500	7's and 7's correlation = 1.0
4's and 7's correlation = 0.9999482326098849	6's and 0's correlation = 0.5669825589347198	7's and 8's correlation = 0.2575294264033244
4's and 8's correlation = 0.2573603026281449	6's and 1's correlation = 0.3333992307971425	7's and 9's correlation = 0.6327793398480219
4's and 9's correlation = 0.633095450431711	6's and 2's correlation = 0.6243523649241545	7's and 10's correlation = 0.6555010821540275
4's and 10's correlation = 0.6560656648739613	6's and 3's correlation = 0.38238439655120177	7's and 11's correlation = 0.6555374984833363
4's and 11's correlation = 0.6561021067905614	6's and 4's correlation = 0.547114814071748	7's and 12's correlation = 0.07366068338466625
4's and 12's correlation = 0.07367575780072938	6's and 5's correlation = 0.5704490132093213	7's and 13's correlation = 0.9999482326099395
4's and 13's correlation = 1.0000000000000475	6's and 6's correlation = 1.0	8's length = 288500
5's length = 288500	6's and 7's correlation = 0.547670957589012	8's and 0's correlation = 0.2634116632761583
5's and 0's correlation = 0.5894086008893837	6's and 8's correlation = 0.40325476273120436	8's and 1's correlation = 0.23405364664728254
5's and 1's correlation = 0.5095961911000315	6's and 9's correlation = 0.23834186354802206	8's and 2's correlation = 0.23128391674730125
5's and 2's correlation = 0.5280052521461968	6's and 10's correlation = 0.19661559381642826	8's and 3's correlation = 0.1416804492471803
5's and 3's correlation = 0.30085559693164615	6's and 11's correlation = 0.1966316498878389	8's and 4's correlation = 0.2573603026281449
5's and 4's correlation = 0.833326621746841	6's and 12's correlation = 0.5334734157371108	8's and 5's correlation = 0.25327332971749583
5's and 5's correlation = 1.0	6's and 13's correlation = 0.5471148140717857	8's and 6's correlation = 0.40325476273120436
5's and 6's correlation = 0.5704490132093213	7's length = 288500	8's and 7's correlation = 0.2575294264033244
5's and 7's correlation = 0.8342333132586572	7's and 0's correlation = 0.8184929344412227	8's and 8's correlation = 1.0
5's and 8's correlation = 0.25327332971749583	7's and 1's correlation = 0.7122124719546923	8's and 9's correlation = 0.20101157939827746
5's and 9's correlation = 0.5016650822648501	7's and 2's correlation = 0.7298436318213959	8's and 10's correlation = 0.20170592837751172
5's and 10's correlation = 0.5225227055805296	7's and 3's correlation = 0.46729141103362015	8's and 11's correlation = 0.20171705474527596

8's and 12's correlation = 0.18271481381746846	10's and 5's correlation = 0.5225227055805296	11's and 13's correlation = 0.6561021067905642
8's and 13's correlation = 0.2573603026281402	10's and 6's correlation = 0.19661559381642826	12's length = 288500
9's length = 288500	10's and 7's correlation = 0.6555010821540275	12's and 0's correlation = 0.05670828657966915
9's and 0's correlation = 0.659551774527862	10's and 8's correlation = 0.20170592837751172	12's and 1's correlation = 0.040014458498570375
9's and 1's correlation = 0.7937660695814224	10's and 9's correlation = 0.7841166416990891	12's and 2's correlation = 0.057494513883585736
9's and 2's correlation = 0.4248636182069965	10's and 10's correlation = 1.0	12's and 3's correlation = 0.04404065130380544
9's and 3's correlation = 0.2581067172802274	10's and 11's correlation = 0.9999999818017081	12's and 4's correlation = 0.07367575780072938
9's and 4's correlation = 0.633095450431711	10's and 12's correlation = - 0.023115784486764886	12's and 5's correlation = 0.14823359557543128
9's and 5's correlation = 0.5016650822648501	10's and 13's correlation = 0.6560656648739756	12's and 6's correlation = 0.5334734157371108
9's and 6's correlation = 0.23834186354802206	11's length = 288500	12's and 7's correlation = 0.07366068338466625
9's and 7's correlation = 0.6327793398480219	11's and 0's correlation = 0.63938472603325	12's and 8's correlation = 0.18271481381746846
9's and 8's correlation = 0.20101157939827746	11's and 1's correlation = 0.7984202518271738	12's and 9's correlation = - 0.025236052798665854
9's and 9's correlation = 1.0	11's and 2's correlation = 0.39039440459123687	12's and 10's correlation = - 0.023115784486764886
9's and 10's correlation = 0.7841166416990891	11's and 3's correlation = 0.2329319229009685	12's and 11's correlation = - 0.023114952544179026
9's and 11's correlation = 0.7841485331650985	11's and 4's correlation = 0.6561021067905614	12's and 12's correlation = 1.0
9's and 12's correlation = - 0.025236052798665854	11's and 5's correlation = 0.5225521796365189	12's and 13's correlation = 0.07367575780072612
9's and 13's correlation = 0.6330954504317289	11's and 6's correlation = 0.1966316498878389	13's length = 288500
10's length = 288500	11's and 7's correlation = 0.6555374984833363	13's and 0's correlation = 0.8185979618281971
10's and 0's correlation = 0.6393531505190782	11's and 8's correlation = 0.20171705474527596	13's and 1's correlation = 0.7128329146366604
10's and 1's correlation = 0.798384764895308	11's and 9's correlation = 0.7841485331650985	13's and 2's correlation = 0.7295444378483495
10's and 2's correlation = 0.3903721978364477	11's and 10's correlation = 0.9999999818017081	13's and 3's correlation = 0.4668714412619255
10's and 3's correlation = 0.23291805428823006	11's and 11's correlation = 1.0	13's and 4's correlation = 1.0000000000000475
10's and 4's correlation = - 0.6560656648739613	11's and 12's correlation = - 0.023114952544179026	13's and 5's correlation = 0.8333266217468424

13's and 6's correlation = 0.5471148140717857	4 and 0	13 and 0
13's and 7's correlation = 0.9999482326099395	4's and 5's correlation = 0.833326621746841	13's and 4's correlation = 1.0000000000000475
13's and 8's correlation = 0.2573603026281402	4 and 5	13 and 4
13's and 9's correlation = 0.6330954504317289	4's and 7's correlation = 0.9999482326098849	13's and 5's correlation = 0.8333266217468424
13's and 10's correlation = 0.6560656648739756	4 and 7	13 and 5
13's and 11's correlation = 0.6561021067905642	4's and 13's correlation = 1.0000000000000475	13's and 7's correlation = 0.9999482326099395
13's and 12's correlation = 0.07367575780072612	4 and 13	13 and 7
13's and 13's correlation = 1.0	5's and 4's correlation = 0.833326621746841	highly correlated=12
highly correlated=12	5 and 4	mean time of 0=0.00017162943630119338 seconds
Correlation >= 0.80:	5's and 7's correlation = 0.8342333132586572	mean time of 1=7.077383209968976e- 05 seconds
0's and 1's correlation = 0.8390663962265779	5 and 7	mean time of 2=4.332850669450942e- 05 seconds
0 and 1	5's and 13's correlation = 0.8333266217468424	mean time of 3=0.0012573178554118403 seconds
0's and 2's correlation = 0.9147738017026255	5 and 13	mean time of 4=0.0024998196696078136 seconds
0 and 2	7's and 0's correlation = 0.8184929344412227	mean time of 5=0.027362992693274645 seconds
0's and 4's correlation = 0.8185979618281192	7 and 0	mean time of 6=0.0005707766402325556 seconds
0 and 4	7's and 4's correlation = 0.9999482326098849	mean time of 7=0.0014703852258480608 seconds
0's and 7's correlation = 0.8184929344412227	7 and 4	mean time of 8=0.0011087839896798753 seconds
0 and 7	7's and 5's correlation = 0.8342333132586572	mean time of 9=0.001400956496002356 seconds
0's and 13's correlation = 0.8185979618281971	7 and 5	mean time of 10=0.0022174239365232258 seconds
0 and 13	7's and 13's correlation = 0.9999482326099395	mean time of 11=0.0016834723887451807 seconds
1's and 0's correlation = 0.8390663962265779	7 and 13	mean time of 12=0.0004595095404719149 seconds
1 and 0	10's and 11's correlation = 0.999999818017081	mean time of 13=0.00207933102777967 seconds
2's and 0's correlation = 0.9147738017026255	10 and 11	time needed = 860.867561340332 seconds
2 and 0	11's and 10's correlation = 0.999999818017081	1154.0
4's and 0's correlation = 0.8185979618281192	11 and 10	
	13's and 0's correlation = 0.8185979618281971	

>>>

Xin==Xout for expeiment-2:

0's length = 9250

0's and 0's correlation = 1.0

0's and 1's correlation =  
0.8983225703532997

0's and 2's correlation =  
0.8984887012512314

0's and 3's correlation =  
0.4755074395437883

0's and 4's correlation =  
0.8207863737951394

0's and 5's correlation =  
0.5441307840592758

0's and 6's correlation =  
0.47554897925939904

0's and 7's correlation =  
0.8207486606534854

0's and 8's correlation =  
0.24313484160330892

0's and 9's correlation =  
0.7412214635702368

0's and 10's correlation =  
0.7683014142091535

0's and 11's correlation =  
0.7683173930279098

0's and 12's correlation = -  
0.01940017989193682

0's and 13's correlation =  
0.8207863737951395

1's length = 9250

1's and 0's correlation =  
0.8983225703532997

1's and 1's correlation = 1.0

1's and 2's correlation =  
0.6142654306331966

1's and 3's correlation =  
0.2889492767719749

1's and 4's correlation =  
0.7304027289733569

1's and 5's correlation =  
0.4924135113182388

1's and 6's correlation =  
0.3219015279441156

1's and 7's correlation =  
0.7299838879609865

1's and 8's correlation =  
0.21509462969004212

1's and 9's correlation =  
0.8251605964215658

1's and 10's correlation =  
0.8711871157734054

1's and 11's correlation =  
0.8712046020221651

1's and 12's correlation = -  
0.02718989149716661

1's and 13's correlation =  
0.7304027289733561

2's length = 9250

2's and 0's correlation =  
0.8984887012512314

2's and 1's correlation =  
0.6142654306331966

2's and 2's correlation = 1.0

2's and 3's correlation =  
0.5653409361982482

2's and 4's correlation =  
0.7443901196372952

2's and 5's correlation =  
0.48528960614880545

2's and 6's correlation =  
0.5324887858682124

2's and 7's correlation =  
0.7447408994585125

2's and 8's correlation =  
0.22177022685131112

2's and 9's correlation =  
0.5067977164200537

2's and 10's correlation =  
0.509445543943282

2's and 11's correlation =  
0.5094567710390399

2's and 12's correlation = -  
0.007676122147231019

2's and 13's correlation =  
0.7443901196372954

3's length = 9250

3's and 0's correlation =  
0.4755074395437883

3's and 1's correlation =  
0.2889492767719749

3's and 2's correlation =  
0.5653409361982482

3's and 3's correlation = 1.0

3's and 4's correlation =  
0.39947388709911913

3's and 5's correlation =  
0.2993489725438555

3's and 6's correlation =  
0.31264033835599814

3's and 7's correlation =  
0.40051388466626137

3's and 8's correlation =  
0.1304839901607916

3's and 9's correlation =  
0.2251095940174429

3's and 10's correlation =  
0.21756843440040782

3's and 11's correlation =  
0.21757463719063935

3's and 12's correlation =  
0.004237567209226128

3's and 13's correlation =  
0.399473887099119

4's length = 9250

4's and 0's correlation =  
0.8207863737951394

4's and 1's correlation =  
0.7304027289733569

4's and 2's correlation =  
0.7443901196372952

4's and 3's correlation =  
0.39947388709911913

4's and 4's correlation = 1.0	5's and 12's correlation = 0.04645964426268188	7's and 5's correlation = 0.7245957463144048
4's and 5's correlation = 0.7226684179626028	5's and 13's correlation = 0.722668417962601	7's and 6's correlation = 0.5120442965482072
4's and 6's correlation = 0.5109514977988489	6's length = 9250	7's and 7's correlation = 1.0
4's and 7's correlation = 0.9998994960216246	6's and 0's correlation = 0.47554897925939904	7's and 8's correlation = 0.25501934172997975
4's and 8's correlation = 0.25447571114648915	6's and 1's correlation = 0.3219015279441156	7's and 9's correlation = 0.7196347497117738
4's and 9's correlation = 0.7203494971199158	6's and 2's correlation = 0.5324887858682124	7's and 10's correlation = 0.7210503168847051
4's and 10's correlation = 0.7217539191083865	6's and 3's correlation = 0.31264033835599814	7's and 11's correlation = 0.721069404525829
4's and 11's correlation = 0.7217730043948072	6's and 4's correlation = 0.5109514977988489	7's and 12's correlation = -0.0163811909778073
4's and 12's correlation = -0.01625267984391603	6's and 5's correlation = 0.5201476370569535	7's and 13's correlation = 0.9998994960216191
4's and 13's correlation = 0.999999999999942	6's and 6's correlation = 1.0	8's length = 9250
5's length = 9250	6's and 7's correlation = 0.5120442965482072	8's and 0's correlation = 0.24313484160330892
5's and 0's correlation = 0.5441307840592758	6's and 8's correlation = 0.4339575756788049	8's and 1's correlation = 0.21509462969004212
5's and 1's correlation = 0.4924135113182388	6's and 9's correlation = 0.256897223142988	8's and 2's correlation = 0.22177022685131112
5's and 2's correlation = 0.48528960614880545	6's and 10's correlation = 0.22714753686334865	8's and 3's correlation = 0.1304839901607916
5's and 3's correlation = 0.2993489725438555	6's and 11's correlation = 0.22715791833085716	8's and 4's correlation = 0.25447571114648915
5's and 4's correlation = 0.7226684179626028	6's and 12's correlation = 0.449093592841482	8's and 5's correlation = 0.2547404504198152
5's and 5's correlation = 1.0	6's and 13's correlation = 0.5109514977988517	8's and 6's correlation = 0.4339575756788049
5's and 6's correlation = 0.5201476370569535	7's length = 9250	8's and 7's correlation = 0.25501934172997975
5's and 7's correlation = 0.7245957463144048	7's and 0's correlation = 0.8207486606534854	8's and 8's correlation = 1.0
5's and 8's correlation = 0.2547404504198152	7's and 1's correlation = 0.7299838879609865	8's and 9's correlation = 0.20931057978786644
5's and 9's correlation = 0.49881771447298673	7's and 2's correlation = 0.7447408994585125	8's and 10's correlation = 0.20872214163523833
5's and 10's correlation = 0.5181652502222186	7's and 3's correlation = 0.40051388466626137	8's and 11's correlation = 0.2087264195682524
5's and 11's correlation = 0.5181808213505003	7's and 4's correlation = 0.9998994960216246	8's and 12's correlation = 0.12410069341371546

8's and 13's correlation = 0.2544757111464882	10's and 6's correlation = 0.22714753686334865	12's length = 9250
9's length = 9250	10's and 7's correlation = 0.7210503168847051	12's and 0's correlation = - 0.01940017989193682
9's and 0's correlation = 0.7412214635702368	10's and 8's correlation = 0.20872214163523833	12's and 1's correlation = - 0.02718989149716661
9's and 1's correlation = 0.8251605964215658	10's and 9's correlation = 0.8674279026692303	12's and 2's correlation = - 0.007676122147231019
9's and 2's correlation = 0.5067977164200537	10's and 10's correlation = 1.0	12's and 3's correlation = 0.004237567209226128
9's and 3's correlation = 0.2251095940174429	10's and 11's correlation = 0.999999893855361	12's and 4's correlation = - 0.01625267984391603
9's and 4's correlation = 0.7203494971199158	10's and 12's correlation = - 0.06578414301683085	12's and 5's correlation = - 0.04645964426268188
9's and 5's correlation = 0.49881771447298673	10's and 13's correlation = 0.7217539191083866	12's and 6's correlation = 0.449093592841482
9's and 6's correlation = 0.256897223142988	11's length = 9250	12's and 7's correlation = - 0.0163811909778073
9's and 7's correlation = 0.7196347497117738	11's and 0's correlation = 0.7683173930279098	12's and 8's correlation = 0.12410069341371546
9's and 8's correlation = 0.20931057978786644	11's and 1's correlation = 0.8712046020221651	12's and 9's correlation = - 0.07364058515832855
9's and 9's correlation = 1.0	11's and 2's correlation = 0.5094567710390399	12's and 10's correlation = - 0.06578414301683085
9's and 10's correlation = 0.8674279026692303	11's and 3's correlation = 0.21757463719063935	12's and 11's correlation = - 0.06578357755321938
9's and 11's correlation = 0.8674445030890308	11's and 4's correlation = 0.7217730043948072	12's and 12's correlation = 1.0
9's and 12's correlation = - 0.07364058515832855	11's and 5's correlation = 0.5181808213505003	12's and 13's correlation = - 0.01625267984391691
9's and 13's correlation = 0.7203494971199141	11's and 6's correlation = 0.22715791833085716	13's length = 9250
10's length = 9250	11's and 7's correlation = 0.721069404525829	13's and 0's correlation = 0.8207863737951395
10's and 0's correlation = 0.7683014142091535	11's and 8's correlation = 0.2087264195682524	13's and 1's correlation = 0.7304027289733561
10's and 1's correlation = 0.8711871157734054	11's and 9's correlation = 0.8674445030890308	13's and 2's correlation = 0.7443901196372954
10's and 2's correlation = 0.509445543943282	11's and 10's correlation = 0.999999893855361	13's and 3's correlation = 0.399473887099119
10's and 3's correlation = 0.21756843440040782	11's and 11's correlation = 1.0	13's and 4's correlation = 0.9999999999999942
10's and 4's correlation = 0.7217539191083865	11's and 12's correlation = - 0.06578357755321938	13's and 5's correlation = 0.722668417962601
10's and 5's correlation = 0.5181652502222186	11's and 13's correlation = 0.721773004394807	13's and 6's correlation = 0.5109514977988517

13's and 7's correlation = 0.9998994960216191	1's and 11's correlation = 0.8712046020221651	10's and 11's correlation = 0.999999893855361
13's and 8's correlation = 0.2544757111464882	1 and 11	10 and 11
13's and 9's correlation = 0.7203494971199141	2's and 0's correlation = 0.8984887012512314	11's and 1's correlation = 0.8712046020221651
13's and 10's correlation = 0.7217539191083866	2 and 0	11 and 1
13's and 11's correlation = 0.721773004394807	4's and 0's correlation = 0.8207863737951394	11's and 9's correlation = 0.8674445030890308
13's and 12's correlation = - 0.01625267984391691	4 and 0	11 and 9
13's and 13's correlation = 1.0	4's and 7's correlation = 0.9998994960216246	11's and 10's correlation = 0.999999893855361
highly correlated=14	4 and 7	11 and 10
Correlation >= 0.80:	4's and 13's correlation = 0.9999999999999942	13's and 0's correlation = 0.8207863737951395
0's and 1's correlation = 0.8983225703532997	4 and 13	13 and 0
0 and 1	7's and 0's correlation = 0.8207486606534854	13's and 4's correlation = 0.9999999999999942
0's and 2's correlation = 0.8984887012512314	7 and 0	13 and 4
0 and 2	7's and 4's correlation = 0.9998994960216246	13's and 7's correlation = 0.9998994960216191
0's and 4's correlation = 0.8207863737951394	7 and 4	13 and 7
0 and 4	7's and 13's correlation = 0.9998994960216191	highly correlated=14
0's and 7's correlation = 0.8207486606534854	7 and 13	mean time of 0=0.0 seconds
0 and 7	9's and 1's correlation = 0.8251605964215658	mean time of 1=0.00016882484023635451 seconds
0's and 13's correlation = 0.8207863737951395	9 and 1	mean time of 2=5.432077356286951e- 06 seconds
0 and 13	9's and 10's correlation = 0.8674279026692303	mean time of 3=0.0015064574576712944 seconds
1's and 0's correlation = 0.8983225703532997	9 and 10	mean time of 4=0.003034979588276631 seconds
1 and 0	9's and 11's correlation = 0.8674445030890308	mean time of 5=0.035943492683204445 seconds
1's and 9's correlation = 0.8251605964215658	9 and 11	mean time of 6=0.0009645590911040435 seconds
1 and 9	10's and 1's correlation = 0.8711871157734054	mean time of 7=0.0024731146322714316 seconds
1's and 10's correlation = 0.8711871157734054	10 and 1	mean time of 8=0.000939838306323902 seconds
1 and 10	10's and 9's correlation = 0.8674279026692303	mean time of 9=0.0011490190351331555 seconds
	10 and 9	

mean time of 10=0.002227363070926151 seconds	0's and 12's correlation = 0.05382208811579274	2's and 5's correlation = 0.4978646105670758
mean time of 11=0.001238777830794051 seconds	0's and 13's correlation = 0.8062330618948634	2's and 6's correlation = 0.606355832580545
mean time of 12=0.00046574618365313557 seconds	1's length = 38000	2's and 7's correlation = 0.71067065742412
mean time of 13=0.004065779093149546 seconds	1's and 0's correlation = 0.8785688419449634	2's and 8's correlation = 0.25551816452486037
time needed = 13.947415113449097 seconds	1's and 1's correlation = 1.0	2's and 9's correlation = 0.4056217163463146
37.0	1's and 2's correlation = 0.5518889488005764	2's and 10's correlation = 0.4018280346496704
>>>	1's and 3's correlation = 0.31909409449200143	2's and 11's correlation = 0.4018420969606432
	1's and 4's correlation = 0.7100253215017112	2's and 12's correlation = 0.06852098171300455
Xin==Xout for exeiment-1:	1's and 5's correlation = 0.4970589082437103	2's and 13's correlation = 0.7103727681146358
	1's and 6's correlation = 0.29107650381309924	3's length = 38000
0's length = 38000	1's and 7's correlation = 0.7095753829454244	3's and 0's correlation = 0.5409919854143126
0's and 0's correlation = 1.0	1's and 8's correlation = 0.2259347909949178	3's and 1's correlation = 0.31909409449200143
0's and 1's correlation = 0.8785688419449634	1's and 9's correlation = 0.7658926978394185	3's and 2's correlation = 0.6311924653878892
0's and 2's correlation = 0.8831646088178572	1's and 10's correlation = 0.8170334176513153	3's and 3's correlation = 1.0
0's and 3's correlation = 0.5409919854143126	1's and 11's correlation = 0.8170538334091154	3's and 4's correlation = 0.39549409864914986
0's and 4's correlation = 0.8062330618948875	1's and 12's correlation = 0.025916526071723633	3's and 5's correlation = 0.26584322273758587
0's and 5's correlation = 0.5647320540956455	1's and 13's correlation = 0.7100253215016855	3's and 6's correlation = 0.3233211112330106
0's and 6's correlation = 0.5110077440842576	2's length = 38000	3's and 7's correlation = 0.39571046151919514
0's and 7's correlation = 0.8061505921272116	2's and 0's correlation = 0.8831646088178572	3's and 8's correlation = 0.1357338428216385
0's and 8's correlation = 0.2734289155489998	2's and 1's correlation = 0.5518889488005764	3's and 9's correlation = 0.20144903579774212
0's and 9's correlation = 0.6631151258498703	2's and 2's correlation = 1.0	3's and 10's correlation = 0.19610484974956402
0's and 10's correlation = 0.6897080489105295	2's and 3's correlation = 0.6311924653878892	3's and 11's correlation = 0.19611218460642552
0's and 11's correlation = 0.6897275864057415	2's and 4's correlation = 0.7103727681146608	



3's and 12's correlation = 0.04601319267143134	5's and 5's correlation = 1.0	6's and 13's correlation = 0.5117224875756854
3's and 13's correlation = 0.39549409864914814	5's and 6's correlation = 0.5135453160760748	7's length = 38000
4's length = 38000	5's and 7's correlation = 0.825149853161354	7's and 0's correlation = 0.8061505921272116
4's and 0's correlation = 0.8062330618948875	5's and 8's correlation = 0.23749997846561	7's and 1's correlation = 0.7095753829454244
4's and 1's correlation = 0.7100253215017112	5's and 9's correlation = 0.5146070716497282	7's and 2's correlation = 0.71067065742412
4's and 2's correlation = 0.7103727681146608	5's and 10's correlation = 0.5325799453029392	7's and 3's correlation = 0.39571046151919514
4's and 3's correlation = 0.39549409864914986	5's and 11's correlation = 0.5325975404678057	7's and 4's correlation = 0.9999500645195916
4's and 4's correlation = 1.0	5's and 12's correlation = 0.11729879005953554	7's and 5's correlation = 0.825149853161354
4's and 5's correlation = 0.8242154439696993	5's and 13's correlation = 0.8242154439697056	7's and 6's correlation = 0.512286152411966
4's and 6's correlation = 0.5117224875756956	6's length = 38000	7's and 7's correlation = 1.0
4's and 7's correlation = 0.9999500645195916	6's and 0's correlation = 0.5110077440842576	7's and 8's correlation = 0.25498721270761254
4's and 8's correlation = 0.25476074373645513	6's and 1's correlation = 0.29107650381309924	7's and 9's correlation = 0.6494629405923914
4's and 9's correlation = 0.6496908118652969	6's and 2's correlation = 0.606355832580545	7's and 10's correlation = 0.6702493285128854
4's and 10's correlation = 0.6706214640908378	6's and 3's correlation = 0.3233211112330106	7's and 11's correlation = 0.6702713382852882
4's and 11's correlation = 0.6706434746586905	6's and 4's correlation = 0.5117224875756956	7's and 12's correlation = 0.06077289462321546
4's and 12's correlation = 0.06075942336495917	6's and 5's correlation = 0.5135453160760748	7's and 13's correlation = 0.9999500645195667
4's and 13's correlation = 0.999999999999762	6's and 6's correlation = 1.0	8's length = 38000
5's length = 38000	6's and 7's correlation = 0.512286152411966	8's and 0's correlation = 0.2734289155489998
5's and 0's correlation = 0.5647320540956455	6's and 8's correlation = 0.3895367283808272	8's and 1's correlation = 0.2259347909949178
5's and 1's correlation = 0.4970589082437103	6's and 9's correlation = 0.19600907389490943	8's and 2's correlation = 0.25551816452486037
5's and 2's correlation = 0.4978646105670758	6's and 10's correlation = 0.1699139050330528	8's and 3's correlation = 0.1357338428216385
5's and 3's correlation = 0.26584322273758587	6's and 11's correlation = 0.1699243191683813	8's and 4's correlation = 0.25476074373645513
5's and 4's correlation = 0.8242154439696993	6's and 12's correlation = 0.5432211891047426	8's and 5's correlation = 0.23749997846561

8's and 6's correlation = 0.3895367283808272	10's length = 38000	11's and 7's correlation = 0.6702713382852882
8's and 7's correlation = 0.25498721270761254	10's and 0's correlation = 0.6897080489105295	11's and 8's correlation = 0.2115098100238071
8's and 8's correlation = 1.0	10's and 1's correlation = 0.8170334176513153	11's and 9's correlation = 0.8172970501618629
8's and 9's correlation = 0.20936957305213788	10's and 2's correlation = 0.4018280346496704	11's and 10's correlation = 0.9999999873761463
8's and 10's correlation = 0.21150205622498947	10's and 3's correlation = 0.19610484974956402	11's and 11's correlation = 1.0
8's and 11's correlation = 0.2115098100238071	10's and 4's correlation = 0.6706214640908378	11's and 12's correlation = - 0.03519940613575654
8's and 12's correlation = 0.16525063232755713	10's and 5's correlation = 0.5325799453029392	11's and 13's correlation = 0.6706434746586982
8's and 13's correlation = 0.2547607437364576	10's and 6's correlation = 0.1699139050330528	12's length = 38000
9's length = 38000	10's and 7's correlation = 0.6702493285128854	12's and 0's correlation = 0.05382208811579274
9's and 0's correlation = 0.6631151258498703	10's and 8's correlation = 0.21150205622498947	12's and 1's correlation = 0.025916526071723633
9's and 1's correlation = 0.7658926978394185	10's and 9's correlation = 0.8172778823008967	12's and 2's correlation = 0.06852098171300455
9's and 2's correlation = 0.4056217163463146	10's and 10's correlation = 1.0	12's and 3's correlation = 0.04601319267143134
9's and 3's correlation = 0.20144903579774212	10's and 11's correlation = 0.9999999873761463	12's and 4's correlation = 0.06075942336495917
9's and 4's correlation = 0.6496908118652969	10's and 12's correlation = - 0.0352003954268718	12's and 5's correlation = 0.11729879005953554
9's and 5's correlation = 0.5146070716497282	10's and 13's correlation = 0.6706214640908379	12's and 6's correlation = 0.5432211891047426
9's and 6's correlation = 0.19600907389490943	11's length = 38000	12's and 7's correlation = 0.06077289462321546
9's and 7's correlation = 0.6494629405923914	11's and 0's correlation = 0.6897275864057415	12's and 8's correlation = 0.16525063232755713
9's and 8's correlation = 0.20936957305213788	11's and 1's correlation = 0.8170538334091154	12's and 9's correlation = - 0.04053913881796531
9's and 9's correlation = 1.0	11's and 2's correlation = 0.4018420969606432	12's and 10's correlation = - 0.0352003954268718
9's and 10's correlation = 0.8172778823008967	11's and 3's correlation = 0.19611218460642552	12's and 11's correlation = - 0.03519940613575654
9's and 11's correlation = 0.8172970501618629	11's and 4's correlation = 0.6706434746586905	12's and 12's correlation = 1.0
9's and 12's correlation = - 0.04053913881796531	11's and 5's correlation = 0.5325975404678057	12's and 13's correlation = 0.06075942336496298
9's and 13's correlation = 0.6496908118653	11's and 6's correlation = 0.1699243191683813	13's length = 38000

13's and 0's correlation = 0.8062330618948634	0's and 13's correlation = 0.8062330618948634	7's and 4's correlation = 0.9999500645195916
13's and 1's correlation = 0.7100253215016855	0 and 13	7 and 4
13's and 2's correlation = 0.7103727681146358	1's and 0's correlation = 0.8785688419449634	7's and 5's correlation = 0.825149853161354
13's and 3's correlation = 0.39549409864914814	1 and 0	7 and 5
13's and 4's correlation = 0.999999999999762	1's and 10's correlation = 0.8170334176513153	7's and 13's correlation = 0.9999500645195667
13's and 5's correlation = 0.8242154439697056	1 and 10	7 and 13
13's and 6's correlation = 0.5117224875756854	1's and 11's correlation = 0.8170538334091154	9's and 10's correlation = 0.8172778823008967
13's and 7's correlation = 0.9999500645195667	1 and 11	9 and 10
13's and 8's correlation = 0.2547607437364576	2's and 0's correlation = 0.8831646088178572	9's and 11's correlation = 0.8172970501618629
13's and 9's correlation = 0.6496908118653	2 and 0	9 and 11
13's and 10's correlation = 0.6706214640908379	4's and 0's correlation = 0.8062330618948875	10's and 1's correlation = 0.8170334176513153
13's and 11's correlation = 0.6706434746586982	4 and 0	10 and 1
13's and 12's correlation = 0.06075942336496298	4's and 5's correlation = 0.8242154439696993	10's and 9's correlation = 0.8172778823008967
13's and 13's correlation = 1.0	4 and 5	10 and 9
highly correlated=16	4's and 7's correlation = 0.9999500645195916	10's and 11's correlation = 0.999999873761463
Correlation >= 0.80:	4 and 7	10 and 11
0's and 1's correlation = 0.8785688419449634	4's and 13's correlation = 0.999999999999762	11's and 1's correlation = 0.8170538334091154
0 and 1	4 and 13	11 and 1
0's and 2's correlation = 0.8831646088178572	5's and 4's correlation = 0.8242154439696993	11's and 9's correlation = 0.8172970501618629
0 and 2	5 and 4	11 and 9
0's and 4's correlation = 0.8062330618948875	5's and 7's correlation = 0.825149853161354	11's and 10's correlation = 0.999999873761463
0 and 4	5 and 7	11 and 10
0's and 7's correlation = 0.8061505921272116	5's and 13's correlation = 0.8242154439697056	13's and 0's correlation = 0.8062330618948634
0 and 7	5 and 13	13 and 0
	7's and 0's correlation = 0.8061505921272116	13's and 4's correlation = 0.999999999999762
	7 and 0	13 and 4

13's and 5's correlation = 0.8242154439697056		1's and 4's correlation = 0.7552496664500407
13 and 5	Xin<Xout for expeiment-2:	1's and 5's correlation = 0.502271083295952
13's and 7's correlation = 0.9999500645195667		1's and 6's correlation = 0.284901648193955
13 and 7	0's length = 103500	1's and 7's correlation = 0.754719984149404
highly correlated=16	0's and 0's correlation = 1.0	1's and 8's correlation = 0.21058917887400005
mean time of 0=0.00010937734654075221 seconds	0's and 1's correlation = 0.9231453716030683	1's and 9's correlation = 0.8433076462546485
mean time of 1=6.301591270848325e- 05 seconds	0's and 2's correlation = 0.8690473768836953	1's and 10's correlation = 0.899818556616934
mean time of 2=6.298548296878212e- 05 seconds	0's and 3's correlation = 0.43134409485199976	1's and 11's correlation = 0.8998323857790704
mean time of 3=0.0008633591626819811 seconds	0's and 4's correlation = 0.8379051280415943	1's and 12's correlation = - 0.030141371964334508
mean time of 4=0.002011330817875109 seconds	0's and 5's correlation = 0.5553652586660313	1's and 13's correlation = 0.755249666450045
mean time of 5=0.024849343927283035 seconds	0's and 6's correlation = 0.4464534334645907	2's length = 103500
mean time of 6=0.0008527605157149466 seconds	0's and 7's correlation = 0.8377679995891847	2's and 0's correlation = 0.8690473768836953
mean time of 7=0.0011935048981716759 seconds	0's and 8's correlation = 0.2618792756588226	2's and 1's correlation = 0.6120580209964457
mean time of 8=0.0009754259335367303 seconds	0's and 9's correlation = 0.786772040855471	2's and 2's correlation = 1.0
mean time of 9=0.0013898761648880808 seconds	0's and 10's correlation = 0.8156973175062979	2's and 3's correlation = 0.5663557359039122
mean time of 10=0.0019819764714491994 seconds	0's and 11's correlation = 0.8157112652167582	2's and 4's correlation = 0.751675205787565
mean time of 11=0.001777493953704834 seconds	0's and 12's correlation = - 0.021713549055936986	2's and 5's correlation = 0.4960370727927047
mean time of 12=0.0004953619680906597 seconds	0's and 13's correlation = 0.8379051280416122	2's and 6's correlation = 0.551727030055767
mean time of 13=0.0018379625521208112 seconds	1's length = 103500	2's and 7's correlation = 0.7520747525613682
time needed = 45.71493744850159 seconds	1's and 0's correlation = 0.9231453716030683	2's and 8's correlation = 0.26768803833181515
152.0	1's and 1's correlation = 1.0	2's and 9's correlation = 0.5331778855010728
>>>	1's and 2's correlation = 0.6120580209964457	2's and 10's correlation = 0.5199561815462032
	1's and 3's correlation = 0.24938182745298407	

2's and 11's correlation = 0.519967075892179	4's and 4's correlation = 1.0	5's and 12's correlation = 0.03891435486984336
2's and 12's correlation = - 0.005877332812371175	4's and 5's correlation = 0.7547717662848868	5's and 13's correlation = 0.7547717662848843
2's and 13's correlation = 0.7516752057875707	4's and 6's correlation = 0.471220646980326	6's length = 103500
3's length = 103500	4's and 7's correlation = 0.9999113257307997	6's and 0's correlation = 0.4464534334645907
3's and 0's correlation = 0.43134409485199976	4's and 8's correlation = 0.2280905397547555	6's and 1's correlation = 0.284901648193955
3's and 1's correlation = 0.24938182745298407	4's and 9's correlation = 0.7525442521707375	6's and 2's correlation = 0.551727030055767
3's and 2's correlation = 0.5663557359039122	4's and 10's correlation = 0.7311699067325965	6's and 3's correlation = 0.29127443575738626
3's and 3's correlation = 1.0	4's and 11's correlation = 0.7311851072702269	6's and 4's correlation = 0.471220646980326
3's and 4's correlation = 0.3483698072104281	4's and 12's correlation = - 0.029398261702387574	6's and 5's correlation = 0.4780830421894251
3's and 5's correlation = 0.25900932398564364	4's and 13's correlation = 0.999999999999553	6's and 6's correlation = 1.0
3's and 6's correlation = 0.29127443575738626	5's length = 103500	6's and 7's correlation = 0.47205694234124945
3's and 7's correlation = 0.34902444679094236	5's and 0's correlation = 0.5553652586660313	6's and 8's correlation = 0.4100715134019991
3's and 8's correlation = 0.13180172250279626	5's and 1's correlation = 0.502271083295952	6's and 9's correlation = 0.2515562907930723
3's and 9's correlation = 0.21132403317591097	5's and 2's correlation = 0.4960370727927047	6's and 10's correlation = 0.1995305852959747
3's and 10's correlation = 0.1973642121889225	5's and 3's correlation = 0.25900932398564364	6's and 11's correlation = 0.19953943178758546
3's and 11's correlation = 0.19736901179328747	5's and 4's correlation = 0.7547717662848868	6's and 12's correlation = 0.47562147696228296
3's and 12's correlation = 0.008228169952732152	5's and 5's correlation = 1.0	6's and 13's correlation = 0.4712206469803224
3's and 13's correlation = 0.34836980721042266	5's and 6's correlation = 0.4780830421894251	7's length = 103500
4's length = 103500	5's and 7's correlation = 0.7565164334313834	7's and 0's correlation = 0.8377679995891847
4's and 0's correlation = 0.8379051280415943	5's and 8's correlation = 0.20266088121208706	7's and 1's correlation = 0.754719984149404
4's and 1's correlation = 0.7552496664500407	5's and 9's correlation = 0.5301479089732305	7's and 2's correlation = 0.7520747525613682
4's and 2's correlation = 0.751675205787565	5's and 10's correlation = 0.5269094220452439	7's and 3's correlation = 0.34902444679094236
4's and 3's correlation = 0.3483698072104281	5's and 11's correlation = 0.5269212461347718	7's and 4's correlation = 0.9999113257307997

7's and 5's correlation = 0.7565164334313834	8's and 13's correlation = 0.22809053975474536	10's and 6's correlation = 0.1995305852959747
7's and 6's correlation = 0.47205694234124945	9's length = 103500	10's and 7's correlation = 0.7305931110438253
7's and 7's correlation = 1.0	9's and 0's correlation = 0.786772040855471	10's and 8's correlation = 0.1961595642513653
7's and 8's correlation = 0.22835820947275434	9's and 1's correlation = 0.8433076462546485	10's and 9's correlation = 0.8914162809338408
7's and 9's correlation = 0.7518734086345078	9's and 2's correlation = 0.5331778855010728	10's and 10's correlation = 1.0
7's and 10's correlation = 0.7305931110438253	9's and 3's correlation = 0.21132403317591097	10's and 11's correlation = 0.9999999924276248
7's and 11's correlation = 0.7306083064919477	9's and 4's correlation = 0.7525442521707375	10's and 12's correlation = - 0.07549694580000481
7's and 12's correlation = - 0.029501199091895944	9's and 5's correlation = 0.5301479089732305	10's and 13's correlation = 0.7311699067325821
7's and 13's correlation = 0.9999113257307617	9's and 6's correlation = 0.2515562907930723	11's length = 103500
8's length = 103500	9's and 7's correlation = 0.7518734086345078	11's and 0's correlation = 0.8157112652167582
8's and 0's correlation = 0.2618792756588226	9's and 8's correlation = 0.20700051723939292	11's and 1's correlation = 0.8998323857790704
8's and 1's correlation = 0.21058917887400005	9's and 9's correlation = 1.0	11's and 2's correlation = 0.519967075892179
8's and 2's correlation = 0.26768803833181515	9's and 10's correlation = 0.8914162809338408	11's and 3's correlation = 0.19736901179328747
8's and 3's correlation = 0.13180172250279626	9's and 11's correlation = 0.8914296042664086	11's and 4's correlation = 0.7311851072702269
8's and 4's correlation = 0.2280905397547555	9's and 12's correlation = - 0.07679849771720022	11's and 5's correlation = 0.5269212461347718
8's and 5's correlation = 0.20266088121208706	9's and 13's correlation = 0.7525442521707171	11's and 6's correlation = 0.19953943178758546
8's and 6's correlation = 0.4100715134019991	10's length = 103500	11's and 7's correlation = 0.7306083064919477
8's and 7's correlation = 0.22835820947275434	10's and 0's correlation = 0.8156973175062979	11's and 8's correlation = 0.1961645827586736
8's and 8's correlation = 1.0	10's and 1's correlation = 0.899818556616934	11's and 9's correlation = 0.8914296042664086
8's and 9's correlation = 0.20700051723939292	10's and 2's correlation = 0.5199561815462032	11's and 10's correlation = 0.9999999924276248
8's and 10's correlation = 0.1961595642513653	10's and 3's correlation = 0.1973642121889225	11's and 11's correlation = 1.0
8's and 11's correlation = 0.1961645827586736	10's and 4's correlation = 0.7311699067325965	11's and 12's correlation = - 0.07549616270472109
8's and 12's correlation = 0.12260753579916686	10's and 5's correlation = 0.5269094220452439	11's and 13's correlation = 0.7311851072702241

12's length = 103500	13's and 7's correlation = 0.9999113257307617	1's and 9's correlation = 0.8433076462546485
12's and 0's correlation = - 0.021713549055936986	13's and 8's correlation = 0.22809053975474536	1 and 9
12's and 1's correlation = - 0.030141371964334508	13's and 9's correlation = 0.7525442521707171	1's and 10's correlation = 0.899818556616934
12's and 2's correlation = - 0.005877332812371175	13's and 10's correlation = 0.7311699067325821	1 and 10
12's and 3's correlation = 0.008228169952732152	13's and 11's correlation = 0.7311851072702241	1's and 11's correlation = 0.8998323857790704
12's and 4's correlation = - 0.029398261702387574	13's and 12's correlation = - 0.029398261702384913	1 and 11
12's and 5's correlation = 0.03891435486984336	13's and 13's correlation = 1.0	2's and 0's correlation = 0.8690473768836953
12's and 6's correlation = 0.47562147696228296	highly correlated=16	2 and 0
12's and 7's correlation = - 0.029501199091895944	Correlation >= 0.80:	4's and 0's correlation = 0.8379051280415943
12's and 8's correlation = 0.12260753579916686	0's and 1's correlation = 0.9231453716030683	4 and 0
12's and 9's correlation = - 0.07679849771720022	0 and 1	4's and 7's correlation = 0.9999113257307997
12's and 10's correlation = - 0.07549694580000481	0's and 2's correlation = 0.8690473768836953	4 and 7
12's and 11's correlation = - 0.07549616270472109	0 and 2	4's and 13's correlation = 0.9999999999999553
12's and 12's correlation = 1.0	0's and 4's correlation = 0.8379051280415943	4 and 13
12's and 13's correlation = - 0.029398261702384913	0 and 4	7's and 0's correlation = 0.8377679995891847
13's length = 103500	0's and 7's correlation = 0.8377679995891847	7 and 0
13's and 0's correlation = 0.8379051280416122	0 and 7	7's and 4's correlation = 0.9999113257307997
13's and 1's correlation = 0.755249666450045	0's and 10's correlation = 0.8156973175062979	7 and 4
13's and 2's correlation = 0.7516752057875707	0 and 10	7's and 13's correlation = 0.9999113257307617
13's and 3's correlation = 0.34836980721042266	0's and 11's correlation = 0.8157112652167582	7 and 13
13's and 4's correlation = 0.999999999999553	0 and 11	9's and 1's correlation = 0.8433076462546485
13's and 5's correlation = 0.7547717662848843	0's and 13's correlation = 0.8379051280416122	9 and 1
13's and 6's correlation = 0.4712206469803224	0 and 13	9's and 10's correlation = 0.8914162809338408
	1's and 0's correlation = 0.9231453716030683	9 and 10
	1 and 0	9's and 11's correlation = 0.8914296042664086
		9 and 11

10's and 0's correlation = 0.8156973175062979	mean time of 3=0.0011243873172336154 seconds	0's and 4's correlation = 0.8243171978164464
10 and 0	mean time of 4=0.0027998919648248794 seconds	0's and 5's correlation = 0.5863060713116578
10's and 1's correlation = 0.899818556616934	mean time of 5=0.03576384350873422 seconds	0's and 6's correlation = 0.4780709765287666
10 and 1	mean time of 6=0.0006793895205437849 seconds	0's and 7's correlation = 0.8240845587069078
10's and 9's correlation = 0.8914162809338408	mean time of 7=0.0021592879640883293 seconds	0's and 8's correlation = 0.2784508794194941
10 and 9	mean time of 8=0.0010876007126149347 seconds	0's and 9's correlation = 0.7078036184750276
10's and 11's correlation = 0.9999999924276248	mean time of 9=0.0014576763346575308 seconds	0's and 10's correlation = 0.7393558452111215
10 and 11	mean time of 10=0.00237158991864338 seconds	0's and 11's correlation = 0.7393725190547823
11's and 0's correlation = 0.8157112652167582	mean time of 11=0.0018732598438355081 seconds	0's and 12's correlation = 0.04344558803620324
11 and 0	mean time of 12=0.0004907443327604285 seconds	0's and 13's correlation = 0.8243171978165134
11's and 1's correlation = 0.8998323857790704	mean time of 13=0.003149866021197775 seconds	1's length = 262000
11 and 1	time needed = 196.59213280677795 seconds	1's and 0's correlation = 0.9065451369765827
11's and 9's correlation = 0.8914296042664086	414.0	1's and 1's correlation = 1.0
11 and 9	>>>	1's and 2's correlation = 0.5499119121926229
11's and 10's correlation = 0.9999999924276248		1's and 3's correlation = 0.2603196579196929
11 and 10		1's and 4's correlation = 0.7281089193493864
13's and 0's correlation = 0.8379051280416122		1's and 5's correlation = 0.5168884898669365
13 and 0	Xin<Xout for expeiment-1:	1's and 6's correlation = 0.2693231504016418
13's and 4's correlation = 0.999999999999553	0's length = 262000	1's and 7's correlation = 0.7275537626365052
13 and 4	0's and 0's correlation = 1.0	1's and 8's correlation = 0.2197278170412693
13's and 7's correlation = 0.9999113257307617	0's and 1's correlation = 0.9065451369765827	1's and 9's correlation = 0.7852557238524535
13 and 7	0's and 2's correlation = 0.8510748785538726	1's and 10's correlation = 0.840541637901401
highly correlated=16	0's and 3's correlation = 0.4602149154980338	
mean time of 0=0.0001056263412254444 seconds		
mean time of 1=9.81071720952573e-05 seconds		
mean time of 2=6.0368275296860844e- 05 seconds		



1's and 11's correlation =  
0.8405587326765516

1's and 12's correlation =  
0.014355219935634643

1's and 13's correlation =  
0.7281089193494632

2's length = 262000

2's and 0's correlation =  
0.8510748785538726

2's and 1's correlation =  
0.5499119121926229

2's and 2's correlation = 1.0

2's and 3's correlation =  
0.5868214818128975

2's and 4's correlation =  
0.7254027271561553

2's and 5's correlation =  
0.5171811081988671

2's and 6's correlation =  
0.6109540085413644

2's and 7's correlation =  
0.7256329436540675

2's and 8's correlation =  
0.2776573570625902

2's and 9's correlation =  
0.4237758473698972

2's and 10's correlation =  
0.4174399913439698

2's and 11's correlation =  
0.4174517202068184

2's and 12's correlation =  
0.06810946978630691

2's and 13's correlation =  
0.7254027271562569

3's length = 262000

3's and 0's correlation =  
0.4602149154980338

3's and 1's correlation =  
0.2603196579196929

3's and 2's correlation =  
0.5868214818128975

3's and 3's correlation = 1.0

3's and 4's correlation =  
0.36798582008060127

3's and 5's correlation =  
0.2720896485712662

3's and 6's correlation =  
0.3226704560289351

3's and 7's correlation =  
0.3683845339981343

3's and 8's correlation =  
0.1481876800245074

3's and 9's correlation =  
0.18630885758870255

3's and 10's correlation =  
0.17404051438302243

3's and 11's correlation =  
0.1740461942923133

3's and 12's correlation =  
0.050553342911345264

3's and 13's correlation =  
0.367985820080608

4's length = 262000

4's and 0's correlation =  
0.8243171978164464

4's and 1's correlation =  
0.7281089193493864

4's and 2's correlation =  
0.7254027271561553

4's and 3's correlation =  
0.36798582008060127

4's and 4's correlation = 1.0

4's and 5's correlation =  
0.8270995967055925

4's and 6's correlation =  
0.4842698227290932

4's and 7's correlation =  
0.999945849718949

4's and 8's correlation =  
0.23308911330530682

4's and 9's correlation =  
0.677427071863102

4's and 10's correlation =  
0.6741889329514559

4's and 11's correlation =  
0.6742067272526342

4's and 12's correlation =  
0.043208964245648816

4's and 13's correlation =  
1.000000000000023

5's length = 262000

5's and 0's correlation =  
0.5863060713116578

5's and 1's correlation =  
0.5168884898669365

5's and 2's correlation =  
0.5171811081988671

5's and 3's correlation =  
0.2720896485712662

5's and 4's correlation =  
0.8270995967055925

5's and 5's correlation = 1.0

5's and 6's correlation =  
0.4952449157723934

5's and 7's correlation =  
0.8282068708499151

5's and 8's correlation =  
0.2160184600431825

5's and 9's correlation =  
0.5514511011929203

5's and 10's correlation =  
0.5463242889969687

5's and 11's correlation =  
0.5463385239249066

5's and 12's correlation =  
0.10737909144284505

5's and 13's correlation =  
0.8270995967055884

6's length = 262000

6's and 0's correlation =  
0.4780709765287666

6's and 1's correlation =  
0.2693231504016418

6's and 2's correlation =  
0.6109540085413644

6's and 3's correlation =  
0.3226704560289351

6's and 4's correlation = 0.4842698227290932	7's and 12's correlation = 0.043230311621055874	9's and 5's correlation = 0.5514511011929203
6's and 5's correlation = 0.4952449157723934	7's and 13's correlation = 0.9999458497190001	9's and 6's correlation = 0.18919985129112965
6's and 6's correlation = 1.0	8's length = 262000	9's and 7's correlation = 0.6771403017065287
6's and 7's correlation = 0.4848271506446505	8's and 0's correlation = 0.2784508794194941	9's and 8's correlation = 0.20168097101150426
6's and 8's correlation = 0.37587674438882357	8's and 1's correlation = 0.2197278170412693	9's and 9's correlation = 1.0
6's and 9's correlation = 0.18919985129112965	8's and 2's correlation = 0.2776573570625902	9's and 10's correlation = 0.8529946661711586
6's and 10's correlation = 0.1529787441639509	8's and 3's correlation = 0.1481876800245074	9's and 11's correlation = 0.8530098825220535
6's and 11's correlation = 0.15298699228038531	8's and 4's correlation = 0.23308911330530682	9's and 12's correlation = - 0.046847952797674404
6's and 12's correlation = 0.5525920523433102	8's and 5's correlation = 0.2160184600431825	9's and 13's correlation = 0.6774270718631147
6's and 13's correlation = 0.48426982272911756	8's and 6's correlation = 0.37587674438882357	10's length = 262000
7's length = 262000	8's and 7's correlation = 0.23324005879556406	10's and 0's correlation = 0.7393558452111215
7's and 0's correlation = 0.8240845587069078	8's and 8's correlation = 1.0	10's and 1's correlation = 0.840541637901401
7's and 1's correlation = 0.7275537626365052	8's and 9's correlation = 0.20168097101150426	10's and 2's correlation = 0.4174399913439698
7's and 2's correlation = 0.7256329436540675	8's and 10's correlation = 0.20761030720197385	10's and 3's correlation = 0.17404051438302243
7's and 3's correlation = 0.3683845339981343	8's and 11's correlation = 0.2076155671957168	10's and 4's correlation = 0.6741889329514559
7's and 4's correlation = 0.999945849718949	8's and 12's correlation = 0.16788080273651382	10's and 5's correlation = 0.5463242889969687
7's and 5's correlation = 0.8282068708499151	8's and 13's correlation = 0.23308911330529977	10's and 6's correlation = 0.1529787441639509
7's and 6's correlation = 0.4848271506446505	9's length = 262000	10's and 7's correlation = 0.6738358670739931
7's and 7's correlation = 1.0	9's and 0's correlation = 0.7078036184750276	10's and 8's correlation = 0.20761030720197385
7's and 8's correlation = 0.23324005879556406	9's and 1's correlation = 0.7852557238524535	10's and 9's correlation = 0.8529946661711586
7's and 9's correlation = 0.6771403017065287	9's and 2's correlation = 0.4237758473698972	10's and 10's correlation = 1.0
7's and 10's correlation = 0.6738358670739931	9's and 3's correlation = 0.18630885758870255	10's and 11's correlation = 0.9999999917991702
7's and 11's correlation = 0.6738536550099304	9's and 4's correlation = 0.677427071863102	10's and 12's correlation = - 0.04642318243852075

10's and 13's correlation =  
0.6741889329514542

11's length = 262000

11's and 0's correlation =  
0.7393725190547823

11's and 1's correlation =  
0.8405587326765516

11's and 2's correlation =  
0.4174517202068184

11's and 3's correlation =  
0.1740461942923133

11's and 4's correlation =  
0.6742067272526342

11's and 5's correlation =  
0.5463385239249066

11's and 6's correlation =  
0.15298699228038531

11's and 7's correlation =  
0.6738536550099304

11's and 8's correlation =  
0.2076155671957168

11's and 9's correlation =  
0.8530098825220535

11's and 10's correlation =  
0.9999999917991702

11's and 11's correlation = 1.0

11's and 12's correlation = -  
0.04642256455577223

11's and 13's correlation =  
0.6742067272526427

12's length = 262000

12's and 0's correlation =  
0.04344558803620324

12's and 1's correlation =  
0.014355219935634643

12's and 2's correlation =  
0.06810946978630691

12's and 3's correlation =  
0.050553342911345264

12's and 4's correlation =  
0.043208964245648816

12's and 5's correlation =  
0.10737909144284505

12's and 6's correlation =  
0.5525920523433102

12's and 7's correlation =  
0.043230311621055874

12's and 8's correlation =  
0.16788080273651382

12's and 9's correlation = -  
0.046847952797674404

12's and 10's correlation = -  
0.04642318243852075

12's and 11's correlation = -  
0.04642256455577223

12's and 12's correlation = 1.0

12's and 13's correlation =  
0.04320896424564473

13's length = 262000

13's and 0's correlation =  
0.8243171978165134

13's and 1's correlation =  
0.7281089193494632

13's and 2's correlation =  
0.7254027271562569

13's and 3's correlation =  
0.367985820080608

13's and 4's correlation =  
1.000000000000023

13's and 5's correlation =  
0.8270995967055884

13's and 6's correlation =  
0.48426982272911756

13's and 7's correlation =  
0.9999458497190001

13's and 8's correlation =  
0.23308911330529977

13's and 9's correlation =  
0.6774270718631147

13's and 10's correlation =  
0.6741889329514542

13's and 11's correlation =  
0.6742067272526427

13's and 12's correlation =  
0.04320896424564473

13's and 13's correlation = 1.0

highly correlated=16

Correlation >= 0.80:

0's and 1's correlation =  
0.9065451369765827

0 and 1

0's and 2's correlation =  
0.8510748785538726

0 and 2

0's and 4's correlation =  
0.8243171978164464

0 and 4

0's and 7's correlation =  
0.8240845587069078

0 and 7

0's and 13's correlation =  
0.8243171978165134

0 and 13

1's and 0's correlation =  
0.9065451369765827

1 and 0

1's and 10's correlation =  
0.840541637901401

1 and 10

1's and 11's correlation =  
0.8405587326765516

1 and 11

2's and 0's correlation =  
0.8510748785538726

2 and 0

4's and 0's correlation =  
0.8243171978164464

4 and 0

4's and 5's correlation =  
0.8270995967055925

4 and 5

4's and 7's correlation =  
0.999945849718949

4 and 7

4's and 13's correlation =  
1.000000000000023

4 and 13

5's and 4's correlation =  
0.8270995967055925

5 and 4

5's and 7's correlation =  
0.8282068708499151

5 and 7

5's and 13's correlation =  
0.8270995967055884

5 and 13

7's and 0's correlation =  
0.8240845587069078

7 and 0

7's and 4's correlation =  
0.999945849718949

7 and 4

7's and 5's correlation =  
0.8282068708499151

7 and 5

7's and 13's correlation =  
0.9999458497190001

7 and 13

9's and 10's correlation =  
0.8529946661711586

9 and 10

9's and 11's correlation =  
0.8530098825220535

9 and 11

10's and 1's correlation =  
0.840541637901401

10 and 1

10's and 9's correlation =  
0.8529946661711586

10 and 9

10's and 11's correlation =  
0.9999999917991702

10 and 11

11's and 1's correlation =  
0.8405587326765516

11 and 1

11's and 9's correlation =  
0.8530098825220535

11 and 9

11's and 10's correlation =  
0.9999999917991702

11 and 10

13's and 0's correlation =  
0.8243171978165134

13 and 0

13's and 4's correlation =  
1.000000000000023

13 and 4

13's and 5's correlation =  
0.8270995967055884

13 and 5

13's and 7's correlation =  
0.9999458497190001

13 and 7

highly correlated=16

mean time of  
0=0.00013277430570762577 seconds

mean time of 1=6.852313762402716e-  
05 seconds

mean time of 2=6.321673174850813e-  
05 seconds

mean time of  
3=0.0007944105690672197 seconds

mean time of  
4=0.0023994008093389846 seconds

mean time of  
5=0.028714100914147063 seconds

mean time of  
6=0.0005959087655744479 seconds

mean time of  
7=0.0017207371369572996 seconds

mean time of  
8=0.001065961959707828 seconds

mean time of  
9=0.0015000923444296568 seconds

mean time of  
10=0.002374994936790175 seconds

mean time of  
11=0.001988134129356792 seconds

mean time of  
12=0.00043861087951951356 seconds

mean time of  
13=0.0023594305260490824 seconds

time needed = 776.9058504104614  
seconds

1048.0

>>>

## Output for 100 nodes:

Xin>Xout for experiment-2:

0's length = 229000

0's and 0's correlation = 1.0

0's and 1's correlation =  
0.8518546394196376

0's and 2's correlation =  
0.9319914059475674

0's and 3's correlation =  
0.5958879940339896

0's and 4's correlation =  
0.8549306130421696

0's and 5's correlation =  
0.5470088018721206

0's and 6's correlation =  
0.47335927748473977

0's and 7's correlation =  
0.8552274440756582

0's and 8's correlation =  
0.17761334287033326

0's and 9's correlation =  
0.7383444963120818

0's and 10's correlation =  
0.7256020474087573

0's and 11's correlation =  
0.7256663946960974

0's and 12's correlation =  
0.00784389872879273

0's and 13's correlation =  
0.8549306130421125

1's length = 229000

1's and 0's correlation =  
0.8518546394196376

1's and 1's correlation = 1.0

1's and 2's correlation =  
0.6040618624829415

1's and 3's correlation =  
0.34889417736836315

1's and 4's correlation =  
0.7676253013117896

1's and 5's correlation =  
0.4825598674712847

1's and 6's correlation =  
0.3295120127657318

1's and 7's correlation =  
0.7670157455566347

1's and 8's correlation =  
0.1714146087890376

1's and 9's correlation =  
0.8551594364451163

1's and 10's correlation =  
0.8755026132874467

1's and 11's correlation =  
0.8755746554235715

1's and 12's correlation =  
0.004368239337951021

1's and 13's correlation =  
0.7676253013117524

2's length = 229000

2's and 0's correlation =  
0.9319914059475674

2's and 1's correlation =  
0.6040618624829415

2's and 2's correlation = 1.0

2's and 3's correlation =  
0.6652016265194559

2's and 4's correlation =  
0.7695567500659972

2's and 5's correlation =  
0.49832787072947965

2's and 6's correlation =  
0.4921855396917676

2's and 7's correlation =  
0.7704302260872686

2's and 8's correlation =  
0.1516143278191587

2's and 9's correlation =  
0.5315910807974683

2's and 10's correlation =  
0.49812474999984535

2's and 11's correlation =  
0.49817279877004617

2's and 12's correlation =  
0.008911586763503905

2's and 13's correlation =  
0.7695567500659815

3's length = 229000

3's and 0's correlation =  
0.5958879940339896

3's and 1's correlation =  
0.34889417736836315

3's and 2's correlation =  
0.6652016265194559

3's and 3's correlation = 1.0

3's and 4's correlation =  
0.42858523394473225

3's and 5's correlation =  
0.29932901953450963

3's and 6's correlation =  
0.26861279282624073

3's and 7's correlation =  
0.4298162682154485

3's and 8's correlation =  
0.05515141690764778

3's and 9's correlation =  
0.28876503013141624

3's and 10's correlation =  
0.2600219953813525

3's and 11's correlation =  
0.26004690879768083

3's and 12's correlation =  
0.0009548938792259066

3's and 13's correlation =  
0.4285852339447252

4's length = 229000

4's and 0's correlation =  
0.8549306130421696

4's and 1's correlation =  
0.7676253013117896

4's and 2's correlation =  
0.7695567500659972

4's and 3's correlation =  
0.42858523394473225

4's and 4's correlation = 1.0

4's and 5's correlation =  
0.6935309086674802

4's and 6's correlation =  
0.48241744880821785

4's and 7's correlation =  
0.9999084496428656

4's and 8's correlation =  
0.19118211222046966

4's and 9's correlation =  
0.7240770085198142

4's and 10's correlation =  
0.7455334290099586

4's and 11's correlation =  
0.7456079088864922

4's and 12's correlation =  
0.020146220541269598

4's and 13's correlation =  
0.999999999999879

5's length = 229000

5's and 0's correlation =  
0.5470088018721206

5's and 1's correlation =  
0.4825598674712847

5's and 2's correlation =  
0.49832787072947965

5's and 3's correlation =  
0.29932901953450963

5's and 4's correlation = 0.6935309086674802	6's and 12's correlation = 0.4949402377030478	8's and 5's correlation = 0.20743623966807365
5's and 5's correlation = 1.0	6's and 13's correlation = 0.48241744880820664	8's and 6's correlation = 0.40776316219698283
5's and 6's correlation = 0.5455075805756591	7's length = 229000	8's and 7's correlation = 0.19166487098184187
5's and 7's correlation = 0.6958335796295402	7's and 0's correlation = 0.8552274440756582	8's and 8's correlation = 1.0
5's and 8's correlation = 0.20743623966807365	7's and 1's correlation = 0.7670157455566347	8's and 9's correlation = 0.14685512621952296
5's and 9's correlation = 0.47178910929302753	7's and 2's correlation = 0.7704302260872686	8's and 10's correlation = 0.15166519259738245
5's and 10's correlation = 0.5069819891980107	7's and 3's correlation = 0.4298162682154485	8's and 11's correlation = 0.15168319454365203
5's and 11's correlation = 0.5070359176487754	7's and 4's correlation = 0.9999084496428656	8's and 12's correlation = 0.16868619894737508
5's and 12's correlation = 0.09549083247089674	7's and 5's correlation = 0.6958335796295402	8's and 13's correlation = 0.1911821122204665
5's and 13's correlation = 0.6935309086674928	7's and 6's correlation = 0.4839063157838656	9's length = 229000
6's length = 229000	7's and 7's correlation = 1.0	9's and 0's correlation = 0.7383444963120818
6's and 0's correlation = 0.47335927748473977	7's and 8's correlation = 0.19166487098184187	9's and 1's correlation = 0.8551594364451163
6's and 1's correlation = 0.3295120127657318	7's and 9's correlation = 0.723487071581795	9's and 2's correlation = 0.5315910807974683
6's and 2's correlation = 0.4921855396917676	7's and 10's correlation = 0.744689418478985	9's and 3's correlation = 0.28876503013141624
6's and 3's correlation = 0.26861279282624073	7's and 11's correlation = 0.7447638328451675	9's and 4's correlation = 0.7240770085198142
6's and 4's correlation = 0.48241744880821785	7's and 12's correlation = 0.020056921518281475	9's and 5's correlation = 0.47178910929302753
6's and 5's correlation = 0.5455075805756591	7's and 13's correlation = 0.9999084496428561	9's and 6's correlation = 0.26669379450176156
6's and 6's correlation = 1.0	8's length = 229000	9's and 7's correlation = 0.723487071581795
6's and 7's correlation = 0.4839063157838656	8's and 0's correlation = 0.17761334287033326	9's and 8's correlation = 0.14685512621952296
6's and 8's correlation = 0.40776316219698283	8's and 1's correlation = 0.1714146087890376	9's and 9's correlation = 1.0
6's and 9's correlation = 0.26669379450176156	8's and 2's correlation = 0.1516143278191587	9's and 10's correlation = 0.8343015075831931
6's and 10's correlation = 0.23651339928068815	8's and 3's correlation = 0.05515141690764778	9's and 11's correlation = 0.8343671520117597
6's and 11's correlation = 0.23654787532262583	8's and 4's correlation = 0.19118211222046966	9's and 12's correlation = - 0.03687568478987619

9's and 13's correlation = 0.7240770085197973	11's and 6's correlation = 0.23654787532262583	13's length = 229000
10's length = 229000	11's and 7's correlation = 0.7447638328451675	13's and 0's correlation = 0.8549306130421125
10's and 0's correlation = 0.7256020474087573	11's and 8's correlation = 0.15168319454365203	13's and 1's correlation = 0.7676253013117524
10's and 1's correlation = 0.8755026132874467	11's and 9's correlation = 0.8343671520117597	13's and 2's correlation = 0.7695567500659815
10's and 2's correlation = 0.49812474999984535	11's and 10's correlation = 0.99999870432008	13's and 3's correlation = 0.4285852339447252
10's and 3's correlation = 0.2600219953813525	11's and 11's correlation = 1.0	13's and 4's correlation = 0.999999999999879
10's and 4's correlation = 0.7455334290099586	11's and 12's correlation = - 0.029290258597292385	13's and 5's correlation = 0.6935309086674928
10's and 5's correlation = 0.5069819891980107	11's and 13's correlation = 0.7456079088864583	13's and 6's correlation = 0.48241744880820664
10's and 6's correlation = 0.23651339928068815	12's length = 229000	13's and 7's correlation = 0.9999084496428561
10's and 7's correlation = 0.744689418478985	12's and 0's correlation = 0.00784389872879273	13's and 8's correlation = 0.1911821122204665
10's and 8's correlation = 0.15166519259738245	12's and 1's correlation = 0.004368239337951021	13's and 9's correlation = 0.7240770085197973
10's and 9's correlation = 0.8343015075831931	12's and 2's correlation = 0.008911586763503905	13's and 10's correlation = 0.7455334290099666
10's and 10's correlation = 1.0	12's and 3's correlation = 0.0009548938792259066	13's and 11's correlation = 0.7456079088864583
10's and 11's correlation = 0.99999870432008	12's and 4's correlation = 0.020146220541269598	13's and 12's correlation = 0.020146220541265844
10's and 12's correlation = - 0.029292396138742335	12's and 5's correlation = 0.09549083247089674	13's and 13's correlation = 1.0
10's and 13's correlation = 0.7455334290099666	12's and 6's correlation = 0.4949402377030478	highly correlated=14
11's length = 229000	12's and 7's correlation = 0.020056921518281475	Correlation >= 0.80:
11's and 0's correlation = 0.7256663946960974	12's and 8's correlation = 0.16868619894737508	0's and 1's correlation = 0.8518546394196376
11's and 1's correlation = 0.8755746554235715	12's and 9's correlation = - 0.03687568478987619	0 and 1
11's and 2's correlation = 0.49817279877004617	12's and 10's correlation = - 0.029292396138742335	0's and 2's correlation = 0.9319914059475674
11's and 3's correlation = 0.26004690879768083	12's and 11's correlation = - 0.029290258597292385	0 and 2
11's and 4's correlation = 0.7456079088864922	12's and 12's correlation = 1.0	0's and 4's correlation = 0.8549306130421696
11's and 5's correlation = 0.5070359176487754	12's and 13's correlation = 0.020146220541265844	0 and 4
		0's and 7's correlation = 0.8552274440756582

0 and 7	9 and 1	mean time of 2=0.0001042713764973603 seconds
0's and 13's correlation = 0.8549306130421125	9's and 10's correlation = 0.8343015075831931	mean time of 3=0.00528461766553197 seconds
0 and 13	9 and 10	mean time of 4=0.010215021116764785 seconds
1's and 0's correlation = 0.8518546394196376	9's and 11's correlation = 0.8343671520117597	mean time of 5=0.24768392716953327 seconds
1 and 0	9 and 11	mean time of 6=0.002436941055231219 seconds
1's and 9's correlation = 0.8551594364451163	10's and 1's correlation = 0.8755026132874467	mean time of 7=0.00795416019889465 seconds
1 and 9	10 and 1	mean time of 8=0.003021681985480296 seconds
1's and 10's correlation = 0.8755026132874467	10's and 9's correlation = 0.8343015075831931	mean time of 9=0.0017438217021492372 seconds
1 and 10	10 and 9	mean time of 10=0.006941008151358392 seconds
1's and 11's correlation = 0.8755746554235715	10's and 11's correlation = 0.999999870432008	mean time of 11=0.0024084325440585875 seconds
1 and 11	10 and 11	mean time of 12=0.0009875802494032414 seconds
2's and 0's correlation = 0.9319914059475674	11's and 1's correlation = 0.8755746554235715	mean time of 13=0.011013393006470525 seconds
2 and 0	11 and 1	time needed = 1036.6104745864868 seconds
4's and 0's correlation = 0.8549306130421696	11's and 9's correlation = 0.8343671520117597	458.0
4 and 0	11 and 9	experiment-2
4's and 7's correlation = 0.9999084496428656	11's and 10's correlation = 0.999999870432008	
4 and 7	11 and 10	
4's and 13's correlation = 0.999999999999879	13's and 0's correlation = 0.8549306130421125	Xin>Xout for experiment-1:
4 and 13	13 and 0	
7's and 0's correlation = 0.8552274440756582	13's and 4's correlation = 0.999999999999879	0's length = 577000
7 and 0	13 and 4	0's and 0's correlation = 1.0
7's and 4's correlation = 0.9999084496428656	13's and 7's correlation = 0.9999084496428561	0's and 1's correlation = 0.8297240979712606
7 and 4	13 and 7	0's and 2's correlation = 0.920852446005865
7's and 13's correlation = 0.9999084496428561	highly correlated=14	0's and 3's correlation = 0.5950424626390575
7 and 13	mean time of 0=0.00016567488424642636 seconds	
9's and 1's correlation = 0.8551594364451163	mean time of 1=0.00012457120887056708 seconds	



0's and 4's correlation = 0.837341508094307	1's and 11's correlation = 0.8237190473935047	3's and 4's correlation = 0.4232504664411024
0's and 5's correlation = 0.5679284770476326	1's and 12's correlation = 0.031022685167682897	3's and 5's correlation = 0.2737148869052953
0's and 6's correlation = 0.5018397047827099	1's and 13's correlation = 0.7346925171512914	3's and 6's correlation = 0.27654487964311764
0's and 7's correlation = 0.8372437808029695	2's length = 577000	3's and 7's correlation = 0.4236829355920148
0's and 8's correlation = 0.2016544084777467	2's and 0's correlation = 0.920852446005865	3's and 8's correlation = 0.06955330737254783
0's and 9's correlation = 0.6585647867860285	2's and 1's correlation = 0.5464152526888723	3's and 9's correlation = 0.23182354295492652
0's and 10's correlation = 0.6521818462632962	2's and 2's correlation = 1.0	3's and 10's correlation = 0.21706623498633607
0's and 11's correlation = 0.6522539052483272	2's and 3's correlation = 0.6588079085709782	3's and 11's correlation = 0.2170936356535313
0's and 12's correlation = 0.04359656635759964	2's and 4's correlation = 0.7431748852249198	3's and 12's correlation = 0.01871816103066136
0's and 13's correlation = 0.8373415080944587	2's and 5's correlation = 0.5064426483936848	3's and 13's correlation = 0.42325046644118175
1's length = 577000	2's and 6's correlation = 0.5372396593281448	4's length = 577000
1's and 0's correlation = 0.8297240979712606	2's and 7's correlation = 0.7435646215594245	4's and 0's correlation = 0.837341508094307
1's and 1's correlation = 1.0	2's and 8's correlation = 0.17421296916549328	4's and 1's correlation = 0.7346925171513463
1's and 2's correlation = 0.5464152526888723	2's and 9's correlation = 0.43118301047164803	4's and 2's correlation = 0.7431748852249198
1's and 3's correlation = 0.33501819532559807	2's and 10's correlation = 0.4032196000251201	4's and 3's correlation = 0.4232504664411024
1's and 4's correlation = 0.7346925171513463	2's and 11's correlation = 0.4032700051262666	4's and 4's correlation = 1.0
1's and 5's correlation = 0.49489543773910566	2's and 12's correlation = 0.0437438327258575	4's and 5's correlation = 0.77053252339014
1's and 6's correlation = 0.3088521172786979	2's and 13's correlation = 0.7431748852250157	4's and 6's correlation = 0.4876013562361137
1's and 7's correlation = 0.7339246793155103	3's length = 577000	4's and 7's correlation = 0.9999315648538221
1's and 8's correlation = 0.18375301910348296	3's and 0's correlation = 0.5950424626390575	4's and 8's correlation = 0.20658741333433026
1's and 9's correlation = 0.7973159808103839	3's and 1's correlation = 0.33501819532559807	4's and 9's correlation = 0.6486443527845748
1's and 10's correlation = 0.8236364243992174	3's and 2's correlation = 0.6588079085709782	4's and 10's correlation = 0.6742802961939923
	3's and 3's correlation = 1.0	

4's and 11's correlation = 0.6743638168610107	6's and 4's correlation = 0.4876013562361137	7's and 12's correlation = 0.056382872388069015
4's and 12's correlation = 0.0563562510818234	6's and 5's correlation = 0.5252229675395186	7's and 13's correlation = 0.9999315648537083
4's and 13's correlation = 0.999999999998662	6's and 6's correlation = 1.0	8's length = 577000
5's length = 577000	6's and 7's correlation = 0.48860298086503606	8's and 0's correlation = 0.2016544084777467
5's and 0's correlation = 0.5679284770476326	6's and 8's correlation = 0.3874485840751955	8's and 1's correlation = 0.18375301910348296
5's and 1's correlation = 0.49489543773910566	6's and 9's correlation = 0.21248696396016156	8's and 2's correlation = 0.17421296916549328
5's and 2's correlation = 0.5064426483936848	6's and 10's correlation = 0.18303745864299278	8's and 3's correlation = 0.06955330737254783
5's and 3's correlation = 0.2737148869052953	6's and 11's correlation = 0.18307036285420344	8's and 4's correlation = 0.20658741333433026
5's and 4's correlation = 0.77053252339014	6's and 12's correlation = 0.5329400111498945	8's and 5's correlation = 0.21046848487152747
5's and 5's correlation = 1.0	6's and 13's correlation = 0.48760135623621736	8's and 6's correlation = 0.3874485840751955
5's and 6's correlation = 0.5252229675395186	7's length = 577000	8's and 7's correlation = 0.20689209202791653
5's and 7's correlation = 0.7721815700323925	7's and 0's correlation = 0.8372437808029695	8's and 8's correlation = 1.0
5's and 8's correlation = 0.21046848487152747	7's and 1's correlation = 0.7339246793155103	8's and 9's correlation = 0.1475262920866443
5's and 9's correlation = 0.491181813984959	7's and 2's correlation = 0.7435646215594245	8's and 10's correlation = 0.1548931735718557
5's and 10's correlation = 0.5176228287089383	7's and 3's correlation = 0.4236829355920148	8's and 11's correlation = 0.1549126196327803
5's and 11's correlation = 0.5176870748713917	7's and 4's correlation = 0.9999315648538221	8's and 12's correlation = 0.18010264441319326
5's and 12's correlation = 0.11925561035262949	7's and 5's correlation = 0.7721815700323925	8's and 13's correlation = 0.20658741333436584
5's and 13's correlation = 0.7705325233902364	7's and 6's correlation = 0.48860298086503606	9's length = 577000
6's length = 577000	7's and 7's correlation = 1.0	9's and 0's correlation = 0.6585647867860285
6's and 0's correlation = 0.5018397047827099	7's and 8's correlation = 0.20689209202791653	9's and 1's correlation = 0.7973159808103839
6's and 1's correlation = 0.3088521172786979	7's and 9's correlation = 0.6483127201385758	9's and 2's correlation = 0.43118301047164803
6's and 2's correlation = 0.5372396593281448	7's and 10's correlation = 0.6736209241453691	9's and 3's correlation = 0.23182354295492652
6's and 3's correlation = 0.27654487964311764	7's and 11's correlation = 0.6737043814167479	9's and 4's correlation = 0.6486443527845748

9's and 5's correlation = 0.491181813984959	10's and 13's correlation = 0.6742802961941082	12's and 6's correlation = 0.5329400111498945
9's and 6's correlation = 0.21248696396016156	11's length = 577000	12's and 7's correlation = 0.056382872388069015
9's and 7's correlation = 0.6483127201385758	11's and 0's correlation = 0.6522539052483272	12's and 8's correlation = 0.18010264441319326
9's and 8's correlation = 0.1475262920866443	11's and 1's correlation = 0.8237190473935047	12's and 9's correlation = - 0.02405933493373991
9's and 9's correlation = 1.0	11's and 2's correlation = 0.4032700051262666	12's and 10's correlation = - 0.01984427727760466
9's and 10's correlation = 0.787724180180899	11's and 3's correlation = 0.2170936356535313	12's and 11's correlation = - 0.019842598858765433
9's and 11's correlation = 0.7877975641226383	11's and 4's correlation = 0.6743638168610107	12's and 12's correlation = 1.0
9's and 12's correlation = - 0.02405933493373991	11's and 5's correlation = 0.5176870748713917	12's and 13's correlation = 0.05635625108182449
9's and 13's correlation = 0.6486443527846945	11's and 6's correlation = 0.18307036285420344	13's length = 577000
10's length = 577000	11's and 7's correlation = 0.6737043814167479	13's and 0's correlation = 0.8373415080944587
10's and 0's correlation = 0.6521818462632962	11's and 8's correlation = 0.1549126196327803	13's and 1's correlation = 0.7346925171512914
10's and 1's correlation = 0.8236364243992174	11's and 9's correlation = 0.7877975641226383	13's and 2's correlation = 0.7431748852250157
10's and 2's correlation = 0.4032196000251201	11's and 10's correlation = 0.9999998617840946	13's and 3's correlation = 0.42325046644118175
10's and 3's correlation = 0.21706623498633607	11's and 11's correlation = 1.0	13's and 4's correlation = 0.999999999998662
10's and 4's correlation = 0.6742802961939923	11's and 12's correlation = - 0.019842598858765433	13's and 5's correlation = 0.7705325233902364
10's and 5's correlation = 0.5176228287089383	11's and 13's correlation = 0.6743638168611368	13's and 6's correlation = 0.48760135623621736
10's and 6's correlation = 0.18303745864299278	12's length = 577000	13's and 7's correlation = 0.9999315648537083
10's and 7's correlation = 0.6736209241453691	12's and 0's correlation = 0.04359656635759964	13's and 8's correlation = 0.20658741333436584
10's and 8's correlation = 0.1548931735718557	12's and 1's correlation = 0.031022685167682897	13's and 9's correlation = 0.6486443527846945
10's and 9's correlation = 0.787724180180899	12's and 2's correlation = 0.0437438327258575	13's and 10's correlation = 0.6742802961941082
10's and 10's correlation = 1.0	12's and 3's correlation = 0.01871816103066136	13's and 11's correlation = 0.6743638168611368
10's and 11's correlation = 0.9999998617840946	12's and 4's correlation = 0.0563562510818234	13's and 12's correlation = 0.05635625108182449
10's and 12's correlation = - 0.01984427727760466	12's and 5's correlation = 0.11925561035262949	13's and 13's correlation = 1.0

highly correlated=11

Correlation >= 0.80:

0's and 1's correlation =  
0.8297240979712606

0 and 1

0's and 2's correlation =  
0.920852446005865

0 and 2

0's and 4's correlation =  
0.837341508094307

0 and 4

0's and 7's correlation =  
0.8372437808029695

0 and 7

0's and 13's correlation =  
0.8373415080944587

0 and 13

1's and 0's correlation =  
0.8297240979712606

1 and 0

1's and 10's correlation =  
0.8236364243992174

1 and 10

1's and 11's correlation =  
0.8237190473935047

1 and 11

2's and 0's correlation =  
0.920852446005865

2 and 0

4's and 0's correlation =  
0.837341508094307

4 and 0

4's and 7's correlation =  
0.9999315648538221

4 and 7

4's and 13's correlation =  
0.999999999998662

4 and 13

7's and 0's correlation =  
0.8372437808029695

7 and 0

7's and 4's correlation =  
0.9999315648538221

7 and 4

7's and 13's correlation =  
0.9999315648537083

7 and 13

10's and 1's correlation =  
0.8236364243992174

10 and 1

10's and 11's correlation =  
0.999998617840946

10 and 11

11's and 1's correlation =  
0.8237190473935047

11 and 1

11's and 10's correlation =  
0.999998617840946

11 and 10

13's and 0's correlation =  
0.8373415080944587

13 and 0

13's and 4's correlation =  
0.999999999998662

13 and 4

13's and 7's correlation =  
0.9999315648537083

13 and 7

highly correlated=11

mean time of  
0=0.000233058830274453 seconds

mean time of  
1=0.00012457498851227387 seconds

mean time of 2=7.853516259681e-05  
seconds

mean time of  
3=0.0034016514568229687 seconds

mean time of  
4=0.007865565984253246 seconds

mean time of 5=0.17490618695832622  
seconds

mean time of  
6=0.0017907006281913877 seconds

mean time of  
7=0.0053590379513322375 seconds

mean time of  
8=0.002335952224929783 seconds

mean time of  
9=0.0016282337377141625 seconds

mean time of  
10=0.006507459959496246 seconds

mean time of  
11=0.002145819275589915 seconds

mean time of  
12=0.0009671487676002331 seconds

mean time of  
13=0.008307000793245471 seconds

time needed = 2792.5017318725586  
seconds

1154.0

>>>

Xin==Xout for experiment-2:

0's length = 18500

0's and 0's correlation = 1.0

0's and 1's correlation =  
0.9034466057206556

0's and 2's correlation =  
0.8996785539561272

0's and 3's correlation =  
0.424457594376846

0's and 4's correlation =  
0.824532907415164

0's and 5's correlation =  
0.5226489515374917

0's and 6's correlation = 0.408366741882549	1's and 13's correlation = 0.7373515187529507	3's and 6's correlation = 0.16334670670825982
0's and 7's correlation = 0.8249740185720582	2's length = 18500	3's and 7's correlation = 0.2936863290213999
0's and 8's correlation = 0.19346853954253315	2's and 0's correlation = 0.8996785539561272	3's and 8's correlation = 0.061187622128484
0's and 9's correlation = 0.750921869983648	2's and 1's correlation = 0.6256610003826675	3's and 9's correlation = 0.19701869505210393
0's and 10's correlation = 0.8065409083771328	2's and 2's correlation = 1.0	3's and 10's correlation = 0.2410017342821813
0's and 11's correlation = 0.8065802434935403	2's and 3's correlation = 0.5052819018097076	3's and 11's correlation = 0.2410127667714273
0's and 12's correlation = - 0.011285184551360577	2's and 4's correlation = 0.749523167216845	3's and 12's correlation = 0.0029841152850482193
0's and 13's correlation = 0.8245329074151638	2's and 5's correlation = 0.48269504983975114	3's and 13's correlation = 0.2924810754896336
1's length = 18500	2's and 6's correlation = 0.45700708485235714	4's length = 18500
1's and 0's correlation = 0.9034466057206556	2's and 7's correlation = 0.7507535238135853	4's and 0's correlation = 0.824532907415164
1's and 1's correlation = 1.0	2's and 8's correlation = 0.18813442188244064	4's and 1's correlation = 0.7373515187529488
1's and 2's correlation = 0.6256610003826675	2's and 9's correlation = 0.5261291093499328	4's and 2's correlation = 0.749523167216845
1's and 3's correlation = 0.26228799722279367	2's and 10's correlation = 0.5512273328329013	4's and 3's correlation = 0.2924810754896367
1's and 4's correlation = 0.7373515187529488	2's and 11's correlation = 0.5512575269464319	4's and 4's correlation = 1.0
1's and 5's correlation = 0.4599308859493282	2's and 12's correlation = - 0.0010676836269586528	4's and 5's correlation = 0.6586187213283798
1's and 6's correlation = 0.280941059505637	2's and 13's correlation = 0.7495231672168474	4's and 6's correlation = 0.4467147055141407
1's and 7's correlation = 0.736931533041524	3's length = 18500	4's and 7's correlation = 0.9998807244117549
1's and 8's correlation = 0.16096673718238383	3's and 0's correlation = 0.424457594376846	4's and 8's correlation = 0.20136724205014453
1's and 9's correlation = 0.8251886623991594	3's and 1's correlation = 0.26228799722279367	4's and 9's correlation = 0.748010118412757
1's and 10's correlation = 0.8999299082983379	3's and 2's correlation = 0.5052819018097076	4's and 10's correlation = 0.7493888060539835
1's and 11's correlation = 0.899970546882397	3's and 3's correlation = 1.0	4's and 11's correlation = 0.7494331735404722
1's and 12's correlation = - 0.0191174969249519	3's and 4's correlation = 0.2924810754896367	4's and 12's correlation = - 0.013882977281190827
	3's and 5's correlation = 0.26406743106664293	

4's and 13's correlation = 1.000000000000004	6's and 6's correlation = 1.0	8's length = 18500
5's length = 18500	6's and 7's correlation = 0.44852684378662616	8's and 0's correlation = 0.19346853954253315
5's and 0's correlation = 0.5226489515374917	6's and 8's correlation = 0.4261535151326321	8's and 1's correlation = 0.16096673718238383
5's and 1's correlation = 0.4599308859493282	6's and 9's correlation = 0.23355348592834282	8's and 2's correlation = 0.18813442188244064
5's and 2's correlation = 0.48269504983975114	6's and 10's correlation = 0.20182980846420934	8's and 3's correlation = 0.061187622128484
5's and 3's correlation = 0.26406743106664293	6's and 11's correlation = 0.20185178311692514	8's and 4's correlation = 0.20136724205014453
5's and 4's correlation = 0.6586187213283798	6's and 12's correlation = 0.4249405571667171	8's and 5's correlation = 0.19246491286921147
5's and 5's correlation = 1.0	6's and 13's correlation = 0.44671470551413966	8's and 6's correlation = 0.4261535151326321
5's and 6's correlation = 0.4783650448133551	7's length = 18500	8's and 7's correlation = 0.20194818530268116
5's and 7's correlation = 0.6619656122944354	7's and 0's correlation = 0.8249740185720582	8's and 8's correlation = 1.0
5's and 8's correlation = 0.19246491286921147	7's and 1's correlation = 0.736931533041524	8's and 9's correlation = 0.15582278283410453
5's and 9's correlation = 0.46287359753955654	7's and 2's correlation = 0.7507535238135853	8's and 10's correlation = 0.14238745026075428
5's and 10's correlation = 0.4936315590387974	7's and 3's correlation = 0.2936863290213999	8's and 11's correlation = 0.14239894032885553
5's and 11's correlation = 0.49365994089473336	7's and 4's correlation = 0.9998807244117549	8's and 12's correlation = 0.11507209311358854
5's and 12's correlation = 0.030354200765492653	7's and 5's correlation = 0.6619656122944354	8's and 13's correlation = 0.2013672420501447
5's and 13's correlation = 0.6586187213283835	7's and 6's correlation = 0.44852684378662616	9's length = 18500
6's length = 18500	7's and 7's correlation = 1.0	9's and 0's correlation = 0.750921869983648
6's and 0's correlation = 0.408366741882549	7's and 8's correlation = 0.20194818530268116	9's and 1's correlation = 0.8251886623991594
6's and 1's correlation = 0.280941059505637	7's and 9's correlation = 0.7472685407623815	9's and 2's correlation = 0.5261291093499328
6's and 2's correlation = 0.45700708485235714	7's and 10's correlation = 0.7488424763905859	9's and 3's correlation = 0.19701869505210393
6's and 3's correlation = 0.16334670670825982	7's and 11's correlation = 0.7488867916227053	9's and 4's correlation = 0.748010118412757
6's and 4's correlation = 0.4467147055141407	7's and 12's correlation = - 0.013994179810728598	9's and 5's correlation = 0.46287359753955654
6's and 5's correlation = 0.4783650448133551	7's and 13's correlation = 0.9998807244117621	9's and 6's correlation = 0.23355348592834282

9's and 7's correlation = 0.7472685407623815	11's and 0's correlation = 0.8065802434935403	12's and 7's correlation = - 0.013994179810728598
9's and 8's correlation = 0.15582278283410453	11's and 1's correlation = 0.899970546882397	12's and 8's correlation = 0.11507209311358854
9's and 9's correlation = 1.0	11's and 2's correlation = 0.5512575269464319	12's and 9's correlation = - 0.05443963482818397
9's and 10's correlation = 0.8664831261371481	11's and 3's correlation = 0.2410127667714273	12's and 10's correlation = - 0.049461523703796806
9's and 11's correlation = 0.8665234033211539	11's and 4's correlation = 0.7494331735404722	12's and 11's correlation = - 0.04946017887037118
9's and 12's correlation = - 0.05443963482818397	11's and 5's correlation = 0.49365994089473336	12's and 12's correlation = 1.0
9's and 13's correlation = 0.7480101184127516	11's and 6's correlation = 0.20185178311692514	12's and 13's correlation = - 0.013882977281190142
10's length = 18500	11's and 7's correlation = 0.7488867916227053	13's length = 18500
10's and 0's correlation = 0.8065409083771328	11's and 8's correlation = 0.14239894032885553	13's and 0's correlation = 0.8245329074151638
10's and 1's correlation = 0.8999299082983379	11's and 9's correlation = 0.8665234033211539	13's and 1's correlation = 0.7373515187529507
10's and 2's correlation = 0.5512273328329013	11's and 10's correlation = 0.9999999429587301	13's and 2's correlation = 0.7495231672168474
10's and 3's correlation = 0.2410017342821813	11's and 11's correlation = 1.0	13's and 3's correlation = 0.2924810754896336
10's and 4's correlation = 0.7493888060539835	11's and 12's correlation = - 0.04946017887037118	13's and 4's correlation = 1.0000000000000004
10's and 5's correlation = 0.4936315590387974	11's and 13's correlation = 0.7494331735404728	13's and 5's correlation = 0.6586187213283835
10's and 6's correlation = 0.20182980846420934	12's length = 18500	13's and 6's correlation = 0.44671470551413966
10's and 7's correlation = 0.7488424763905859	12's and 0's correlation = - 0.011285184551360577	13's and 7's correlation = 0.9998807244117621
10's and 8's correlation = 0.14238745026075428	12's and 1's correlation = - 0.0191174969249519	13's and 8's correlation = 0.2013672420501447
10's and 9's correlation = 0.8664831261371481	12's and 2's correlation = - 0.0010676836269586528	13's and 9's correlation = 0.7480101184127516
10's and 10's correlation = 1.0	12's and 3's correlation = 0.0029841152850482193	13's and 10's correlation = 0.7493888060539823
10's and 11's correlation = 0.9999999429587301	12's and 4's correlation = - 0.013882977281190827	13's and 11's correlation = 0.7494331735404728
10's and 12's correlation = - 0.049461523703796806	12's and 5's correlation = 0.030354200765492653	13's and 12's correlation = - 0.013882977281190142
10's and 13's correlation = 0.7493888060539823	12's and 6's correlation = 0.4249405571667171	13's and 13's correlation = 1.0
11's length = 18500		highly correlated=16

Correlation >= 0.80:	4 and 0	11 and 0
0's and 1's correlation = 0.9034466057206556	4's and 7's correlation = 0.9998807244117549	11's and 1's correlation = 0.899970546882397
0 and 1	4 and 7	11 and 1
0's and 2's correlation = 0.8996785539561272	4's and 13's correlation = 1.000000000000004	11's and 9's correlation = 0.8665234033211539
0 and 2	4 and 13	11 and 9
0's and 4's correlation = 0.824532907415164	7's and 0's correlation = 0.8249740185720582	11's and 10's correlation = 0.9999999429587301
0 and 4	7 and 0	11 and 10
0's and 7's correlation = 0.8249740185720582	7's and 4's correlation = 0.9998807244117549	13's and 0's correlation = 0.8245329074151638
0 and 7	7 and 4	13 and 0
0's and 10's correlation = 0.8065409083771328	7's and 13's correlation = 0.9998807244117621	13's and 4's correlation = 1.000000000000004
0 and 10	7 and 13	13 and 4
0's and 11's correlation = 0.8065802434935403	9's and 1's correlation = 0.8251886623991594	13's and 7's correlation = 0.9998807244117621
0 and 11	9 and 1	13 and 7
0's and 13's correlation = 0.8245329074151638	9's and 10's correlation = 0.8664831261371481	highly correlated=16
0 and 13	9 and 10	mean time of 0=0.00016913542876372467 seconds
1's and 0's correlation = 0.9034466057206556	9's and 11's correlation = 0.8665234033211539	mean time of 1=0.00016893051766060494 seconds
1 and 0	9 and 11	mean time of 2=0.0 seconds
1's and 9's correlation = 0.8251886623991594	10's and 0's correlation = 0.8065409083771328	mean time of 3=0.003463290188763593 seconds
1 and 9	10 and 0	mean time of 4=0.01258582166723303 seconds
1's and 10's correlation = 0.8999299082983379	10's and 1's correlation = 0.8999299082983379	mean time of 5=0.28212742805480956 seconds
1 and 10	10 and 1	mean time of 6=0.0026187046154125316 seconds
1's and 11's correlation = 0.899970546882397	10's and 9's correlation = 0.8664831261371481	mean time of 7=0.008202163593189137 seconds
1 and 11	10 and 9	mean time of 8=0.0031390976261448217 seconds
2's and 0's correlation = 0.8996785539561272	10's and 11's correlation = 0.9999999429587301	mean time of 9=0.0015285878568082243 seconds
2 and 0	10 and 11	mean time of 10=0.006931574280197556 seconds
4's and 0's correlation = 0.824532907415164	11's and 0's correlation = 0.8065802434935403	



mean time of 11=0.0020268362921637456 seconds	0's and 10's correlation = 0.710392786683613	2's and 3's correlation = 0.5421638562916223
mean time of 12=0.0010976559407002216 seconds	0's and 11's correlation = 0.7104441187840804	2's and 4's correlation = 0.7216140920994629
mean time of 13=0.012245405042493666 seconds	0's and 12's correlation = 0.05333034786020993	2's and 5's correlation = 0.4716422215230623
time needed = 73.67065954208374 seconds	0's and 13's correlation = 0.8183795414040061	2's and 6's correlation = 0.5270211437387952
37.0	1's length = 76000	2's and 7's correlation = 0.7221089296798621
experiment-2	1's and 0's correlation = 0.8776078943604801	2's and 8's correlation = 0.2051554287960746
	1's and 1's correlation = 1.0	2's and 9's correlation = 0.4136698958646469
	1's and 2's correlation = 0.5542222993192125	2's and 10's correlation = 0.4203289105478758
	1's and 3's correlation = 0.2685848932577495	2's and 11's correlation = 0.42036555058745007
	1's and 4's correlation = 0.7212973781473445	2's and 12's correlation = 0.05978441583732571
Xin==Xout for experiment-1:	1's and 5's correlation = 0.4745078367155748	2's and 13's correlation = 0.72161409209947
	1's and 6's correlation = 0.27553204205974463	3's length = 76000
0's length = 76000	1's and 7's correlation = 0.7204228880852795	3's and 0's correlation = 0.46222688982523064
0's and 0's correlation = 1.0	1's and 8's correlation = 0.17425571250985775	3's and 1's correlation = 0.2685848932577495
0's and 1's correlation = 0.8776078943604801	1's and 9's correlation = 0.7581759309106915	3's and 2's correlation = 0.5421638562916223
0's and 2's correlation = 0.8854100745992667	1's and 10's correlation = 0.838646318457361	3's and 3's correlation = 1.0
0's and 3's correlation = 0.46222688982523064	1's and 11's correlation = 0.8387004539604362	3's and 4's correlation = 0.30773731345598193
0's and 4's correlation = 0.8183795414040309	1's and 12's correlation = 0.033844118033268526	3's and 5's correlation = 0.21654098100052843
0's and 5's correlation = 0.5366032910764821	1's and 13's correlation = 0.7212973781473437	3's and 6's correlation = 0.2090566751131949
0's and 6's correlation = 0.4573852953101977	2's length = 76000	3's and 7's correlation = 0.30861640826582565
0's and 7's correlation = 0.8181761969904029	2's and 0's correlation = 0.8854100745992667	3's and 8's correlation = 0.07766870352321284
0's and 8's correlation = 0.21546120312276398	2's and 1's correlation = 0.5542222993192125	3's and 9's correlation = 0.17077665588163674
0's and 9's correlation = 0.6616215012279271	2's and 2's correlation = 1.0	

3's and 10's correlation = 0.18517635462503365	5's and 3's correlation = 0.21654098100052843	6's and 11's correlation = 0.1578872556472776
3's and 11's correlation = 0.1851902725273954	5's and 4's correlation = 0.7587480163278918	6's and 12's correlation = 0.5223395127675502
3's and 12's correlation = 0.025310979902584706	5's and 5's correlation = 1.0	6's and 13's correlation = 0.46289130862924704
3's and 13's correlation = 0.3077373134559766	5's and 6's correlation = 0.47532479859109966	7's length = 76000
4's length = 76000	5's and 7's correlation = 0.7607176359333008	7's and 0's correlation = 0.8181761969904029
4's and 0's correlation = 0.8183795414040309	5's and 8's correlation = 0.18941525548627092	7's and 1's correlation = 0.7204228880852795
4's and 1's correlation = 0.7212973781473445	5's and 9's correlation = 0.5001792371957189	7's and 2's correlation = 0.7221089296798621
4's and 2's correlation = 0.7216140920994629	5's and 10's correlation = 0.5233132805651529	7's and 3's correlation = 0.30861640826582565
4's and 3's correlation = 0.30773731345598193	5's and 11's correlation = 0.5233527795900049	7's and 4's correlation = 0.999917135180774
4's and 4's correlation = 1.0	5's and 12's correlation = 0.09602895816290699	7's and 5's correlation = 0.7607176359333008
4's and 5's correlation = 0.7587480163278918	5's and 13's correlation = 0.7587480163278751	7's and 6's correlation = 0.4640515211570746
4's and 6's correlation = 0.4628913086292375	6's length = 76000	7's and 7's correlation = 1.0
4's and 7's correlation = 0.999917135180774	6's and 0's correlation = 0.4573852953101977	7's and 8's correlation = 0.2055156826958011
4's and 8's correlation = 0.20519893917012108	6's and 1's correlation = 0.27553204205974463	7's and 9's correlation = 0.6628615976533244
4's and 9's correlation = 0.6633543413362354	6's and 2's correlation = 0.5270211437387952	7's and 10's correlation = 0.6778296664546589
4's and 10's correlation = 0.6783823380133478	6's and 3's correlation = 0.2090566751131949	7's and 11's correlation = 0.6778844025830498
4's and 11's correlation = 0.6784371281451889	6's and 4's correlation = 0.4628913086292375	7's and 12's correlation = 0.0500558642928842
4's and 12's correlation = 0.049975676949614314	6's and 5's correlation = 0.47532479859109966	7's and 13's correlation = 0.9999171351807694
4's and 13's correlation = 0.9999999999999896	6's and 6's correlation = 1.0	8's length = 76000
5's length = 76000	6's and 7's correlation = 0.4640515211570746	8's and 0's correlation = 0.21546120312276398
5's and 0's correlation = 0.5366032910764821	6's and 8's correlation = 0.3802233988334431	8's and 1's correlation = 0.17425571250985775
5's and 1's correlation = 0.4745078367155748	6's and 9's correlation = 0.1870800897754855	8's and 2's correlation = 0.2051554287960746
5's and 2's correlation = 0.4716422215230623	6's and 10's correlation = 0.15786383458383732	8's and 3's correlation = 0.07766870352321284

8's and 4's correlation = 0.20519893917012108	9's and 12's correlation = - 0.02488232222598652	11's and 5's correlation = 0.5233527795900049
8's and 5's correlation = 0.18941525548627092	9's and 13's correlation = 0.6633543413362237	11's and 6's correlation = 0.1578872556472776
8's and 6's correlation = 0.3802233988334431	10's length = 76000	11's and 7's correlation = 0.6778844025830498
8's and 7's correlation = 0.2055156826958011	10's and 0's correlation = 0.710392786683613	11's and 8's correlation = 0.1538913035366153
8's and 8's correlation = 1.0	10's and 1's correlation = 0.838646318457361	11's and 9's correlation = 0.8123513645978202
8's and 9's correlation = 0.15109087180770694	10's and 2's correlation = 0.4203289105478758	11's and 10's correlation = 0.999999904147569
8's and 10's correlation = 0.15387837875211688	10's and 3's correlation = 0.18517635462503365	11's and 11's correlation = 1.0
8's and 11's correlation = 0.1538913035366153	10's and 4's correlation = 0.6783823380133478	11's and 12's correlation = - 0.023353497484672945
8's and 12's correlation = 0.1799369638627287	10's and 5's correlation = 0.5233132805651529	11's and 13's correlation = 0.6784371281451879
8's and 13's correlation = 0.20519893917011903	10's and 6's correlation = 0.15786383458383732	12's length = 76000
9's length = 76000	10's and 7's correlation = 0.6778296664546589	12's and 0's correlation = 0.05333034786020993
9's and 0's correlation = 0.6616215012279271	10's and 8's correlation = 0.15387837875211688	12's and 1's correlation = 0.033844118033268526
9's and 1's correlation = 0.7581759309106915	10's and 9's correlation = 0.8123028730522268	12's and 2's correlation = 0.05978441583732571
9's and 2's correlation = 0.4136698958646469	10's and 10's correlation = 1.0	12's and 3's correlation = 0.025310979902584706
9's and 3's correlation = 0.17077665588163674	10's and 11's correlation = 0.999999904147569	12's and 4's correlation = 0.049975676949614314
9's and 4's correlation = 0.6633543413362354	10's and 12's correlation = - 0.02335628717432311	12's and 5's correlation = 0.09602895816290699
9's and 5's correlation = 0.5001792371957189	10's and 13's correlation = 0.678382338013341	12's and 6's correlation = 0.5223395127675502
9's and 6's correlation = 0.1870800897754855	11's length = 76000	12's and 7's correlation = 0.0500558642928842
9's and 7's correlation = 0.6628615976533244	11's and 0's correlation = 0.7104441187840804	12's and 8's correlation = 0.1799369638627287
9's and 8's correlation = 0.15109087180770694	11's and 1's correlation = 0.8387004539604362	12's and 9's correlation = - 0.02488232222598652
9's and 9's correlation = 1.0	11's and 2's correlation = 0.42036555058745007	12's and 10's correlation = - 0.02335628717432311
9's and 10's correlation = 0.8123028730522268	11's and 3's correlation = 0.1851902725273954	12's and 11's correlation = - 0.023353497484672945
9's and 11's correlation = 0.8123513645978202	11's and 4's correlation = 0.6784371281451889	12's and 12's correlation = 1.0

12's and 13's correlation = 0.049975676949615945	0's and 7's correlation = 0.8181761969904029	9's and 11's correlation = 0.8123513645978202
13's length = 76000	0 and 7	9 and 11
13's and 0's correlation = 0.8183795414040061	0's and 13's correlation = 0.8183795414040061	10's and 1's correlation = 0.838646318457361
13's and 1's correlation = 0.7212973781473437	0 and 13	10 and 1
13's and 2's correlation = 0.72161409209947	1's and 0's correlation = 0.8776078943604801	10's and 9's correlation = 0.8123028730522268
13's and 3's correlation = 0.3077373134559766	1 and 0	10 and 9
13's and 4's correlation = 0.999999999999896	1's and 10's correlation = 0.838646318457361	10's and 11's correlation = 0.999999904147569
13's and 5's correlation = 0.7587480163278751	1 and 10	10 and 11
13's and 6's correlation = 0.46289130862924704	1's and 11's correlation = 0.8387004539604362	11's and 1's correlation = 0.8387004539604362
13's and 7's correlation = 0.9999171351807694	1 and 11	11 and 1
13's and 8's correlation = 0.20519893917011903	2's and 0's correlation = 0.8854100745992667	11's and 9's correlation = 0.8123513645978202
13's and 9's correlation = 0.6633543413362237	2 and 0	11 and 9
13's and 10's correlation = 0.678382338013341	4's and 0's correlation = 0.8183795414040309	11's and 10's correlation = 0.999999904147569
13's and 11's correlation = 0.6784371281451879	4 and 0	11 and 10
13's and 12's correlation = 0.049975676949615945	4's and 7's correlation = 0.999917135180774	13's and 0's correlation = 0.8183795414040061
13's and 13's correlation = 1.0	4 and 7	13 and 0
highly correlated=13	4's and 13's correlation = 0.999999999999896	13's and 4's correlation = 0.999999999999896
Correlation >= 0.80:	4 and 13	13 and 4
0's and 1's correlation = 0.8776078943604801	7's and 0's correlation = 0.8181761969904029	13's and 7's correlation = 0.9999171351807694
0 and 1	7 and 0	13 and 7
0's and 2's correlation = 0.8854100745992667	7's and 4's correlation = 0.999917135180774	highly correlated=13
0 and 2	7 and 4	mean time of 0=0.00017234181102953458 seconds
0's and 4's correlation = 0.8183795414040309	7's and 13's correlation = 0.9999171351807694	mean time of 1=4.644299808301424e- 05 seconds
0 and 4	7 and 13	mean time of 2=0.00012462986143011795 seconds
	9's and 10's correlation = 0.8123028730522268	mean time of 3=0.002522477350736919 seconds
	9 and 10	

mean time of 4=0.008283384222733347 seconds	0's and 6's correlation = 0.37937857982938383	1's and 13's correlation = 0.7704395100965288
mean time of 5=0.1888520265880384 seconds	0's and 7's correlation = 0.858710452665223	2's length = 207000
mean time of 6=0.0018660990815413626 seconds	0's and 8's correlation = 0.1941500132980178	2's and 0's correlation = 0.8543281453895268
mean time of 7=0.005546667073902331 seconds	0's and 9's correlation = 0.7965203952774285	2's and 1's correlation = 0.6021863044067244
mean time of 8=0.0019306452650772897 seconds	0's and 10's correlation = 0.8492436973386159	2's and 2's correlation = 1.0
mean time of 9=0.002259737253189087 seconds	0's and 11's correlation = 0.8492697447131	2's and 3's correlation = 0.4691971585938091
mean time of 10=0.005668308232959948 seconds	0's and 12's correlation = - 0.018636863017194614	2's and 4's correlation = 0.7723687485792342
mean time of 11=0.002106330582970067 seconds	0's and 13's correlation = 0.8586276683803444	2's and 5's correlation = 0.4835291346165208
mean time of 12=0.0007482381243454783 seconds	1's length = 207000	2's and 6's correlation = 0.4814323328239132
mean time of 13=0.008638963573857357 seconds	1's and 0's correlation = 0.9293972467530615	2's and 7's correlation = 0.7732347308947147
time needed = 221.47337317466736 seconds	1's and 1's correlation = 1.0	2's and 8's correlation = 0.21042043320152135
152.0	1's and 2's correlation = 0.6021863044067244	2's and 9's correlation = 0.5400259875526846
experiment-1	1's and 3's correlation = 0.1845841320782988	2's and 10's correlation = 0.5342243462769243
	1's and 4's correlation = 0.7704395100965727	2's and 11's correlation = 0.5342445695481876
Xin<Xout for experiment-2:	1's and 5's correlation = 0.47260955682656136	2's and 12's correlation = - 0.0025593359898413016
	1's and 6's correlation = 0.2408761110267736	2's and 13's correlation = 0.7723687485791711
0's length = 207000	1's and 7's correlation = 0.7699517099994857	3's length = 207000
0's and 0's correlation = 1.0	1's and 8's correlation = 0.14880414695366453	3's and 0's correlation = 0.33707584537730184
0's and 1's correlation = 0.9293972467530615	1's and 9's correlation = 0.8400320361468672	3's and 1's correlation = 0.1845841320782988
0's and 2's correlation = 0.8543281453895268	1's and 10's correlation = 0.9251394552856445	3's and 2's correlation = 0.4691971585938091
0's and 3's correlation = 0.33707584537730184	1's and 11's correlation = 0.9251651050274567	3's and 3's correlation = 1.0
0's and 4's correlation = 0.8586276683804228	1's and 12's correlation = - 0.026810333616898933	3's and 4's correlation = 0.2510744962448265
0's and 5's correlation = 0.5312077131488855		3's and 5's correlation = 0.23001623454099532

3's and 6's correlation = 0.1586944593609685	4's and 13's correlation = 0.999999999999939	6's and 6's correlation = 1.0
3's and 7's correlation = 0.2522793092742871	5's length = 207000	6's and 7's correlation = 0.4058955061586755
3's and 8's correlation = 0.07342942310811328	5's and 0's correlation = 0.5312077131488855	6's and 8's correlation = 0.3842535503858206
3's and 9's correlation = 0.1516281029053252	5's and 1's correlation = 0.47260955682656136	6's and 9's correlation = 0.2164847182282208
3's and 10's correlation = 0.15959242276448415	5's and 2's correlation = 0.4835291346165208	6's and 10's correlation = 0.17371950677909775
3's and 11's correlation = 0.15960019554863447	5's and 3's correlation = 0.23001623454099532	6's and 11's correlation = 0.17373489902246447
3's and 12's correlation = 0.0002642724004686509	5's and 4's correlation = 0.6830054519596225	6's and 12's correlation = 0.47039078485369296
3's and 13's correlation = 0.2510744962448216	5's and 5's correlation = 1.0	6's and 13's correlation = 0.40458584745624016
4's length = 207000	5's and 6's correlation = 0.43733246745599497	7's length = 207000
4's and 0's correlation = 0.8586276683804228	5's and 7's correlation = 0.6859034992039993	7's and 0's correlation = 0.858710452665223
4's and 1's correlation = 0.7704395100965727	5's and 8's correlation = 0.15858811070009338	7's and 1's correlation = 0.7699517099994857
4's and 2's correlation = 0.7723687485792342	5's and 9's correlation = 0.5005063716920091	7's and 2's correlation = 0.7732347308947147
4's and 3's correlation = 0.2510744962448265	5's and 10's correlation = 0.5024957755329853	7's and 3's correlation = 0.2522793092742871
4's and 4's correlation = 1.0	5's and 11's correlation = 0.5025150286410741	7's and 4's correlation = 0.999895440467772
4's and 5's correlation = 0.6830054519596225	5's and 12's correlation = 0.02641902745162233	7's and 5's correlation = 0.6859034992039993
4's and 6's correlation = 0.40458584745628934	5's and 13's correlation = 0.6830054519596105	7's and 6's correlation = 0.4058955061586755
4's and 7's correlation = 0.999895440467772	6's length = 207000	7's and 7's correlation = 1.0
4's and 8's correlation = 0.16607073410371392	6's and 0's correlation = 0.37937857982938383	7's and 8's correlation = 0.16642611302575985
4's and 9's correlation = 0.7773243840907444	6's and 1's correlation = 0.2408761110267736	7's and 9's correlation = 0.7765419339914554
4's and 10's correlation = 0.7503362413363571	6's and 2's correlation = 0.4814323328239132	7's and 10's correlation = 0.7498457617865343
4's and 11's correlation = 0.7503634701459231	6's and 3's correlation = 0.1586944593609685	7's and 11's correlation = 0.7498730012933517
4's and 12's correlation = - 0.02757755126578715	6's and 4's correlation = 0.40458584745628934	7's and 12's correlation = - 0.027730738168047227
	6's and 5's correlation = 0.43733246745599497	7's and 13's correlation = 0.9998954404677783

8's length = 207000	9's and 7's correlation = 0.7765419339914554	11's and 0's correlation = 0.8492697447131
8's and 0's correlation = 0.1941500132980178	9's and 8's correlation = 0.14543470822188556	11's and 1's correlation = 0.9251651050274567
8's and 1's correlation = 0.14880414695366453	9's and 9's correlation = 1.0	11's and 2's correlation = 0.5342445695481876
8's and 2's correlation = 0.21042043320152135	9's and 10's correlation = 0.8892485452460227	11's and 3's correlation = 0.15960019554863447
8's and 3's correlation = 0.07342942310811328	9's and 11's correlation = 0.889272282326223	11's and 4's correlation = 0.7503634701459231
8's and 4's correlation = 0.16607073410371392	9's and 12's correlation = - 0.0621381491282267	11's and 5's correlation = 0.5025150286410741
8's and 5's correlation = 0.15858811070009338	9's and 13's correlation = 0.7773243840907337	11's and 6's correlation = 0.17373489902246447
8's and 6's correlation = 0.3842535503858206	10's length = 207000	11's and 7's correlation = 0.7498730012933517
8's and 7's correlation = 0.16642611302575985	10's and 0's correlation = 0.8492436973386159	11's and 8's correlation = 0.13809610750683535
8's and 8's correlation = 1.0	10's and 1's correlation = 0.9251394552856445	11's and 9's correlation = 0.889272282326223
8's and 9's correlation = 0.14543470822188556	10's and 2's correlation = 0.5342243462769243	11's and 10's correlation = 0.9999999530341954
8's and 10's correlation = 0.13808904439279485	10's and 3's correlation = 0.15959242276448415	11's and 11's correlation = 1.0
8's and 11's correlation = 0.13809610750683535	10's and 4's correlation = 0.7503362413363571	11's and 12's correlation = - 0.059659613245887824
8's and 12's correlation = 0.137643880297355	10's and 5's correlation = 0.5024957755329853	11's and 13's correlation = 0.7503634701459062
8's and 13's correlation = 0.16607073410371173	10's and 6's correlation = 0.17371950677909775	12's length = 207000
9's length = 207000	10's and 7's correlation = 0.7498457617865343	12's and 0's correlation = - 0.018636863017194614
9's and 0's correlation = 0.7965203952774285	10's and 8's correlation = 0.13808904439279485	12's and 1's correlation = - 0.026810333616898933
9's and 1's correlation = 0.8400320361468672	10's and 9's correlation = 0.8892485452460227	12's and 2's correlation = - 0.0025593359898413016
9's and 2's correlation = 0.5400259875526846	10's and 10's correlation = 1.0	12's and 3's correlation = 0.0002642724004686509
9's and 3's correlation = 0.1516281029053252	10's and 11's correlation = 0.9999999530341954	12's and 4's correlation = - 0.02757755126578715
9's and 4's correlation = 0.7773243840907444	10's and 12's correlation = - 0.05966202027010081	12's and 5's correlation = 0.02641902745162233
9's and 5's correlation = 0.5005063716920091	10's and 13's correlation = 0.7503362413363418	12's and 6's correlation = 0.47039078485369296
9's and 6's correlation = 0.2164847182282208	11's length = 207000	

12's and 7's correlation = - 0.027730738168047227	Correlation >= 0.80:	4 and 0
12's and 8's correlation = 0.137643880297355	0's and 1's correlation = 0.9293972467530615	4's and 7's correlation = 0.999895440467772
12's and 9's correlation = - 0.0621381491282267	0 and 1	4 and 7
12's and 10's correlation = - 0.05966202027010081	0's and 2's correlation = 0.8543281453895268	4's and 13's correlation = 0.9999999999999939
12's and 11's correlation = - 0.059659613245887824	0 and 2	4 and 13
12's and 12's correlation = 1.0	0's and 4's correlation = 0.8586276683804228	7's and 0's correlation = 0.858710452665223
12's and 13's correlation = - 0.02757755126578904	0 and 4	7 and 0
13's length = 207000	0's and 7's correlation = 0.858710452665223	7's and 4's correlation = 0.999895440467772
13's and 0's correlation = 0.8586276683803444	0 and 7	7 and 4
13's and 1's correlation = 0.7704395100965288	0's and 10's correlation = 0.8492436973386159	7's and 13's correlation = 0.9998954404677783
13's and 2's correlation = 0.7723687485791711	0 and 10	7 and 13
13's and 3's correlation = 0.2510744962448216	0's and 11's correlation = 0.8492697447131	9's and 1's correlation = 0.8400320361468672
13's and 4's correlation = 0.9999999999999939	0 and 11	9 and 1
13's and 5's correlation = 0.6830054519596105	0's and 13's correlation = 0.8586276683803444	9's and 10's correlation = 0.8892485452460227
13's and 6's correlation = 0.40458584745624016	0 and 13	9 and 10
13's and 7's correlation = 0.9998954404677783	1's and 0's correlation = 0.9293972467530615	9's and 11's correlation = 0.889272282326223
13's and 8's correlation = 0.16607073410371173	1 and 0	9 and 11
13's and 9's correlation = 0.7773243840907337	1's and 9's correlation = 0.8400320361468672	10's and 0's correlation = 0.8492436973386159
13's and 10's correlation = 0.7503362413363418	1 and 9	10 and 0
13's and 11's correlation = 0.7503634701459062	1's and 10's correlation = 0.9251394552856445	10's and 1's correlation = 0.9251394552856445
13's and 12's correlation = - 0.02757755126578904	1 and 10	10 and 1
13's and 13's correlation = 1.0	1's and 11's correlation = 0.9251651050274567	10's and 9's correlation = 0.8892485452460227
highly correlated=16	1 and 11	10 and 9
	2's and 0's correlation = 0.8543281453895268	10's and 11's correlation = 0.9999999530341954
	2 and 0	10 and 11
	4's and 0's correlation = 0.8586276683804228	11's and 0's correlation = 0.8492697447131



11 and 0	mean time of 10=0.007026422311718337 seconds	0's and 10's correlation = 0.7660162720675773
11's and 1's correlation = 0.9251651050274567	mean time of 11=0.0021168484204057334 seconds	0's and 11's correlation = 0.7660539345312173
11 and 1	mean time of 12=0.0009910543183773613 seconds	0's and 12's correlation = 0.0353817549884735
11's and 9's correlation = 0.889272282326223	mean time of 13=0.011820173148371747 seconds	0's and 13's correlation = 0.8411435297024685
11 and 9	time needed = 949.0403001308441 seconds	1's length = 524000
11's and 10's correlation = 0.9999999530341954	414.0	1's and 0's correlation = 0.9147029725663729
11 and 10	experiment-2	1's and 1's correlation = 1.0
13's and 0's correlation = 0.8586276683803444	>>>	1's and 2's correlation = 0.5586961166360921
13 and 0		1's and 3's correlation = 0.19280880298451528
13's and 4's correlation = 0.999999999999939		1's and 4's correlation = 0.7452118655508181
13 and 4		1's and 5's correlation = 0.4934605423039503
13's and 7's correlation = 0.9998954404677783	Xin<Xout for experiment-1:	1's and 6's correlation = 0.24211368243520015
13 and 7		1's and 7's correlation = 0.7444414303871102
highly correlated=16	0's length = 524000	1's and 8's correlation = 0.16754086314207584
mean time of 0=0.00024251811170347646 seconds	0's and 0's correlation = 1.0	1's and 9's correlation = 0.7836179017229642
mean time of 1=0.00014343998858318236 seconds	0's and 1's correlation = 0.9147029725663729	1's and 10's correlation = 0.8625745270105717
mean time of 2=0.00011371126497425319 seconds	0's and 2's correlation = 0.8462126316052869	1's and 11's correlation = 0.8626134022796464
mean time of 3=0.003150705899593335 seconds	0's and 3's correlation = 0.36327453038461643	1's and 12's correlation = 0.008339801228776303
mean time of 4=0.011083516176196111 seconds	0's and 4's correlation = 0.8411435297023876	1's and 13's correlation = 0.7452118655508312
mean time of 5=0.26920621901894537 seconds	0's and 5's correlation = 0.5582376289765365	2's length = 524000
mean time of 6=0.0027287778071159326 seconds	0's and 6's correlation = 0.4174196806182905	2's and 0's correlation = 0.8462126316052869
mean time of 7=0.008420382375302522 seconds	0's and 7's correlation = 0.8408423376299595	2's and 1's correlation = 0.5586961166360921
mean time of 8=0.002298474427006671 seconds	0's and 8's correlation = 0.22049940869754825	2's and 2's correlation = 1.0
mean time of 9=0.0017014273122888833 seconds	0's and 9's correlation = 0.7163895567491922	

2's and 3's correlation = 0.49131264494349813	3's and 10's correlation = 0.15252760279818056	5's and 3's correlation = 0.23385313361250848
2's and 4's correlation = 0.7436739530713763	3's and 11's correlation = 0.1525371914030508	5's and 4's correlation = 0.7633664914475218
2's and 5's correlation = 0.49501478953764644	3's and 12's correlation = 0.024626529494690883	5's and 5's correlation = 1.0
2's and 6's correlation = 0.5374234670855949	3's and 13's correlation = 0.2841613032936398	5's and 6's correlation = 0.4485687297053337
2's and 7's correlation = 0.7440716559698152	4's length = 524000	5's and 7's correlation = 0.7653634799969987
2's and 8's correlation = 0.23161730578956727	4's and 0's correlation = 0.8411435297023876	5's and 8's correlation = 0.17940154177796375
2's and 9's correlation = 0.43700786439066963	4's and 1's correlation = 0.7452118655508181	5's and 9's correlation = 0.5357349395528394
2's and 10's correlation = 0.43474955925536013	4's and 2's correlation = 0.7436739530713763	5's and 10's correlation = 0.5284148050424429
2's and 11's correlation = 0.4347755949020887	4's and 3's correlation = 0.28416130329358846	5's and 11's correlation = 0.5284458354455802
2's and 12's correlation = 0.061616373964921194	4's and 4's correlation = 1.0	5's and 12's correlation = 0.08711206230055392
2's and 13's correlation = 0.7436739530712504	4's and 5's correlation = 0.7633664914475218	5's and 13's correlation = 0.7633664914476327
3's length = 524000	4's and 6's correlation = 0.4229277439379608	6's length = 524000
3's and 0's correlation = 0.36327453038461643	4's and 7's correlation = 0.9999234803277256	6's and 0's correlation = 0.4174196806182905
3's and 1's correlation = 0.19280880298451528	4's and 8's correlation = 0.18579069450336833	6's and 1's correlation = 0.24211368243520015
3's and 2's correlation = 0.49131264494349813	4's and 9's correlation = 0.6910368207085968	6's and 2's correlation = 0.5374234670855949
3's and 3's correlation = 1.0	4's and 10's correlation = 0.68197705521607	6's and 3's correlation = 0.20034428574235252
3's and 4's correlation = 0.28416130329358846	4's and 11's correlation = 0.6820166155972657	6's and 4's correlation = 0.4229277439379608
3's and 5's correlation = 0.23385313361250848	4's and 12's correlation = 0.031247517634343986	6's and 5's correlation = 0.4485687297053337
3's and 6's correlation = 0.20034428574235252	4's and 13's correlation = 0.999999999998693	6's and 6's correlation = 1.0
3's and 7's correlation = 0.2847822623287152	5's length = 524000	6's and 7's correlation = 0.42390185731875996
3's and 8's correlation = 0.0922462863398861	5's and 0's correlation = 0.5582376289765365	6's and 8's correlation = 0.36616879722038076
3's and 9's correlation = 0.1549146137382916	5's and 1's correlation = 0.4934605423039503	6's and 9's correlation = 0.16528410689899717
	5's and 2's correlation = 0.49501478953764644	6's and 10's correlation = 0.1352668354697989

6's and 11's correlation = 0.13528264224486677	8's and 4's correlation = 0.18579069450336833	9's and 12's correlation = - 0.04242703654580858
6's and 12's correlation = 0.5553937621588689	8's and 5's correlation = 0.17940154177796375	9's and 13's correlation = 0.691036820708721
6's and 13's correlation = 0.42292774393804117	8's and 6's correlation = 0.36616879722038076	10's length = 524000
7's length = 524000	8's and 7's correlation = 0.18611370868601643	10's and 0's correlation = 0.7660162720675773
7's and 0's correlation = 0.8408423376299595	8's and 8's correlation = 1.0	10's and 1's correlation = 0.8625745270105717
7's and 1's correlation = 0.7444414303871102	8's and 9's correlation = 0.14609901966875727	10's and 2's correlation = 0.43474955925536013
7's and 2's correlation = 0.7440716559698152	8's and 10's correlation = 0.15021610102861555	10's and 3's correlation = 0.15252760279818056
7's and 3's correlation = 0.2847822623287152	8's and 11's correlation = 0.15022500012318796	10's and 4's correlation = 0.68197705521607
7's and 4's correlation = 0.9999234803277256	8's and 12's correlation = 0.17978652806991866	10's and 5's correlation = 0.5284148050424429
7's and 5's correlation = 0.7653634799969987	8's and 13's correlation = 0.18579069450340563	10's and 6's correlation = 0.1352668354697989
7's and 6's correlation = 0.42390185731875996	9's length = 524000	10's and 7's correlation = 0.6815892456567478
7's and 7's correlation = 1.0	9's and 0's correlation = 0.7163895567491922	10's and 8's correlation = 0.15021610102861555
7's and 8's correlation = 0.18611370868601643	9's and 1's correlation = 0.7836179017229642	10's and 9's correlation = 0.8487960612402459
7's and 9's correlation = 0.6906841863041071	9's and 2's correlation = 0.43700786439066963	10's and 10's correlation = 1.0
7's and 10's correlation = 0.6815892456567478	9's and 3's correlation = 0.1549146137382916	10's and 11's correlation = 0.9999999435756264
7's and 11's correlation = 0.6816287936627371	9's and 4's correlation = 0.6910368207085968	10's and 12's correlation = - 0.040919469040766036
7's and 12's correlation = 0.03132166502965517	9's and 5's correlation = 0.5357349395528394	10's and 13's correlation = 0.6819770552161781
7's and 13's correlation = 0.9999234803275779	9's and 6's correlation = 0.16528410689899717	11's length = 524000
8's length = 524000	9's and 7's correlation = 0.6906841863041071	11's and 0's correlation = 0.7660539345312173
8's and 0's correlation = 0.22049940869754825	9's and 8's correlation = 0.14609901966875727	11's and 1's correlation = 0.8626134022796464
8's and 1's correlation = 0.16754086314207584	9's and 9's correlation = 1.0	11's and 2's correlation = 0.4347755949020887
8's and 2's correlation = 0.23161730578956727	9's and 10's correlation = 0.8487960612402459	11's and 3's correlation = 0.1525371914030508
8's and 3's correlation = 0.0922462863398861	9's and 11's correlation = 0.848831278477346	11's and 4's correlation = 0.6820166155972657

11's and 5's correlation = 0.5284458354455802

11's and 6's correlation = 0.13528264224486677

11's and 7's correlation = 0.6816287936627371

11's and 8's correlation = 0.15022500012318796

11's and 9's correlation = 0.848831278477346

11's and 10's correlation = 0.9999999435756264

11's and 11's correlation = 1.0

11's and 12's correlation = - 0.04091819435188639

11's and 13's correlation = 0.6820166155973807

12's length = 524000

12's and 0's correlation = 0.0353817549884735

12's and 1's correlation = 0.008339801228776303

12's and 2's correlation = 0.061616373964921194

12's and 3's correlation = 0.024626529494690883

12's and 4's correlation = 0.031247517634343986

12's and 5's correlation = 0.08711206230055392

12's and 6's correlation = 0.5553937621588689

12's and 7's correlation = 0.03132166502965517

12's and 8's correlation = 0.17978652806991866

12's and 9's correlation = - 0.04242703654580858

12's and 10's correlation = - 0.040919469040766036

12's and 11's correlation = - 0.04091819435188639

12's and 12's correlation = 1.0

12's and 13's correlation = 0.03124751763433466

13's length = 524000

13's and 0's correlation = 0.8411435297024685

13's and 1's correlation = 0.7452118655508312

13's and 2's correlation = 0.7436739530712504

13's and 3's correlation = 0.2841613032936398

13's and 4's correlation = 0.999999999998693

13's and 5's correlation = 0.7633664914476327

13's and 6's correlation = 0.42292774393804117

13's and 7's correlation = 0.9999234803275779

13's and 8's correlation = 0.18579069450340563

13's and 9's correlation = 0.691036820708721

13's and 10's correlation = 0.6819770552161781

13's and 11's correlation = 0.6820166155973807

13's and 12's correlation = 0.03124751763433466

13's and 13's correlation = 1.0

highly correlated=13

Correlation >= 0.80:

0's and 1's correlation = 0.9147029725663729

0 and 1

0's and 2's correlation = 0.8462126316052869

0 and 2

0's and 4's correlation = 0.8411435297023876

0 and 4

0's and 7's correlation = 0.8408423376299595

0 and 7

0's and 13's correlation = 0.8411435297024685

0 and 13

1's and 0's correlation = 0.9147029725663729

1 and 0

1's and 10's correlation = 0.8625745270105717

1 and 10

1's and 11's correlation = 0.8626134022796464

1 and 11

2's and 0's correlation = 0.8462126316052869

2 and 0

4's and 0's correlation = 0.8411435297023876

4 and 0

4's and 7's correlation = 0.9999234803277256

4 and 7

4's and 13's correlation = 0.999999999998693

4 and 13

7's and 0's correlation = 0.8408423376299595

7 and 0

7's and 4's correlation = 0.9999234803277256

7 and 4

7's and 13's correlation = 0.9999234803275779

7 and 13

9's and 10's correlation = 0.8487960612402459

9 and 10

9's and 11's correlation = 0.848831278477346	mean time of 4=0.008353166088803123 seconds	0's and 6's correlation = 0.310834492316494
9 and 11	mean time of 5=0.18901440032565867 seconds	0's and 7's correlation = 0.847569237115191
10's and 1's correlation = 0.8625745270105717	mean time of 6=0.0019914639815119387 seconds	0's and 8's correlation = 0.08545340817398724
10 and 1	mean time of 7=0.005567446737799026 seconds	0's and 9's correlation = 0.7016582000771745
10's and 9's correlation = 0.8487960612402459	mean time of 8=0.0019002315652279454 seconds	0's and 10's correlation = 0.7150085432061523
10 and 9	mean time of 9=0.001734351065322643 seconds	0's and 11's correlation = 0.7153001216483984
10's and 11's correlation = 0.9999999435756264	mean time of 10=0.006023012636272052 seconds	0's and 12's correlation = 0.005281621394234876
10 and 11	mean time of 11=0.002162705850965194 seconds	0's and 13's correlation = 0.8460261232236794
11's and 1's correlation = 0.8626134022796464	mean time of 12=0.0009752604342598951 seconds	1's length = 1145000
11 and 1	mean time of 13=0.008783309013788937 seconds	1's and 0's correlation = 0.8111198421992727
11's and 9's correlation = 0.848831278477346	time needed = 2420.3043961524963 seconds	1's and 1's correlation = 1.0
11 and 9	1048.0	1's and 2's correlation = 0.5776791736389305
11's and 10's correlation = 0.9999999435756264	experiment-1	1's and 3's correlation = 0.24984523172698148
11 and 10	>>>	1's and 4's correlation = 0.7722039773387452
13's and 0's correlation = 0.8411435297024685	<b>Output for 500 nodes:</b>	1's and 5's correlation = 0.46619549699886864
13 and 0	Xin>Xout for experiment-2:	1's and 6's correlation = 0.238464669093071
13's and 4's correlation = 0.999999999998693	0's length = 1145000	1's and 7's correlation = 0.7725972607741814
13 and 4	0's and 0's correlation = 1.0	1's and 8's correlation = 0.09499359786038786
13's and 7's correlation = 0.9999234803275779	0's and 1's correlation = 0.8111198421992727	1's and 9's correlation = 0.8470668704273643
13 and 7	0's and 2's correlation = 0.9459834674687513	1's and 10's correlation = 0.9105617866977945
highly correlated=13	0's and 3's correlation = 0.5292832994142793	1's and 11's correlation = 0.9109024113815275
mean time of 0=0.00020088453329246463 seconds	0's and 4's correlation = 0.8460261232237435	1's and 12's correlation = 0.004329015188168821
mean time of 1=0.00013455853207420756 seconds	0's and 5's correlation = 0.5340124087455534	
mean time of 2=0.00011436475142267824 seconds		
mean time of 3=0.0021715760231018066 seconds		

1's and 13's correlation = 0.7722039773388407

2's length = 1145000

2's and 0's correlation = 0.9459834674687513

2's and 1's correlation = 0.5776791736389305

2's and 2's correlation = 1.0

2's and 3's correlation = 0.6001766589084558

2's and 4's correlation = 0.7526682249336257

2's and 5's correlation = 0.4868478184450224

2's and 6's correlation = 0.30161604252431856

2's and 7's correlation = 0.754603801231397

2's and 8's correlation = 0.06660203340592769

2's and 9's correlation = 0.5096884836656266

2's and 10's correlation = 0.49312338885814033

2's and 11's correlation = 0.4933415009081051

2's and 12's correlation = 0.0049713888510439065

2's and 13's correlation = 0.7526682249337285

3's length = 1145000

3's and 0's correlation = 0.5292832994142793

3's and 1's correlation = 0.24984523172698148

3's and 2's correlation = 0.6001766589084558

3's and 3's correlation = 1.0

3's and 4's correlation = 0.2595665697645279

3's and 5's correlation = 0.25372535729488704

3's and 6's correlation = 0.08932617611061859

3's and 7's correlation = 0.26143098557226935

3's and 8's correlation = 0.002101448427751053

3's and 9's correlation = 0.188511611229587

3's and 10's correlation = 0.17553280737470248

3's and 11's correlation = 0.1755976453836496

3's and 12's correlation = 0.002609378841962061

3's and 13's correlation = 0.2595665697645661

4's length = 1145000

4's and 0's correlation = 0.8460261232237435

4's and 1's correlation = 0.7722039773387452

4's and 2's correlation = 0.7526682249336257

4's and 3's correlation = 0.2595665697645279

4's and 4's correlation = 1.0

4's and 5's correlation = 0.554035268063344

4's and 6's correlation = 0.32138317746810025

4's and 7's correlation = 0.9998865556363089

4's and 8's correlation = 0.09284771853377823

4's and 9's correlation = 0.7502741164968918

4's and 10's correlation = 0.7683458450080098

4's and 11's correlation = 0.7686982041520166

4's and 12's correlation = 0.008451184508886156

4's and 13's correlation = 0.999999999997065

5's length = 1145000

5's and 0's correlation = 0.5340124087455534

5's and 1's correlation = 0.46619549699886864

5's and 2's correlation = 0.4868478184450224

5's and 3's correlation = 0.25372535729488704

5's and 4's correlation = 0.554035268063344

5's and 5's correlation = 1.0

5's and 6's correlation = 0.48082082167600604

5's and 7's correlation = 0.5591033332331813

5's and 8's correlation = 0.13453359436359896

5's and 9's correlation = 0.45301588866033704

5's and 10's correlation = 0.4882857629980496

5's and 11's correlation = 0.4885141873951835

5's and 12's correlation = 0.04898299405161688

5's and 13's correlation = 0.5540352680634187

6's length = 1145000

6's and 0's correlation = 0.310834492316494

6's and 1's correlation = 0.238464669093071

6's and 2's correlation = 0.30161604252431856

6's and 3's correlation = 0.08932617611061859

6's and 4's correlation = 0.32138317746810025

6's and 5's correlation = 0.48082082167600604

6's and 6's correlation = 1.0	8's length = 1145000	9's and 7's correlation = 0.7502687167210117
6's and 7's correlation = 0.32411419853803375	8's and 0's correlation = 0.08545340817398724	9's and 8's correlation = 0.07588425465693201
6's and 8's correlation = 0.35065115761780546	8's and 1's correlation = 0.09499359786038786	9's and 9's correlation = 1.0
6's and 9's correlation = 0.18954422588255096	8's and 2's correlation = 0.06660203340592769	9's and 10's correlation = 0.8421895156147586
6's and 10's correlation = 0.17882542863104167	8's and 3's correlation = 0.002101448427751053	9's and 11's correlation = 0.842507129597902
6's and 11's correlation = 0.1789634120325536	8's and 4's correlation = 0.09284771853377823	9's and 12's correlation = -0.019194253468674677
6's and 12's correlation = 0.40653040103649857	8's and 5's correlation = 0.13453359436359896	9's and 13's correlation = 0.7502741164970396
6's and 13's correlation = 0.32138317746811135	8's and 6's correlation = 0.35065115761780546	10's length = 1145000
7's length = 1145000	8's and 7's correlation = 0.09356872665973803	10's and 0's correlation = 0.7150085432061523
7's and 0's correlation = 0.847569237115191	8's and 8's correlation = 1.0	10's and 1's correlation = 0.9105617866977945
7's and 1's correlation = 0.7725972607741814	8's and 9's correlation = 0.07588425465693201	10's and 2's correlation = 0.49312338885814033
7's and 2's correlation = 0.754603801231397	8's and 10's correlation = 0.08434410125680313	10's and 3's correlation = 0.17553280737470248
7's and 3's correlation = 0.26143098557226935	8's and 11's correlation = 0.08439632764008725	10's and 4's correlation = 0.7683458450080098
7's and 4's correlation = 0.9998865556363089	8's and 12's correlation = 0.14917099534361442	10's and 5's correlation = 0.4882857629980496
7's and 5's correlation = 0.5591033332331813	8's and 13's correlation = 0.09284771853379861	10's and 6's correlation = 0.17882542863104167
7's and 6's correlation = 0.32411419853803375	9's length = 1145000	10's and 7's correlation = 0.7684415216624048
7's and 7's correlation = 1.0	9's and 0's correlation = 0.7016582000771745	10's and 8's correlation = 0.08434410125680313
7's and 8's correlation = 0.09356872665973803	9's and 1's correlation = 0.8470668704273643	10's and 9's correlation = 0.8421895156147586
7's and 9's correlation = 0.7502687167210117	9's and 2's correlation = 0.5096884836656266	10's and 10's correlation = 1.0
7's and 10's correlation = 0.7684415216624048	9's and 3's correlation = 0.188511611229587	10's and 11's correlation = 0.9999887450192969
7's and 11's correlation = 0.7687940182961068	9's and 4's correlation = 0.7502741164968918	10's and 12's correlation = -0.011510778020878762
7's and 12's correlation = 0.008401124394577447	9's and 5's correlation = 0.45301588866033704	10's and 13's correlation = 0.7683458450081565
7's and 13's correlation = 0.9998865556359962	9's and 6's correlation = 0.18954422588255096	11's length = 1145000

11's and 0's correlation = 0.7153001216483984	12's and 7's correlation = 0.008401124394577447	Correlation >= 0.80:
11's and 1's correlation = 0.9109024113815275	12's and 8's correlation = 0.14917099534361442	0's and 1's correlation = 0.8111198421992727
11's and 2's correlation = 0.4933415009081051	12's and 9's correlation = - 0.019194253468674677	0 and 1
11's and 3's correlation = 0.1755976453836496	12's and 10's correlation = - 0.011510778020878762	0's and 2's correlation = 0.9459834674687513
11's and 4's correlation = 0.7686982041520166	12's and 11's correlation = - 0.01149914056200804	0 and 2
11's and 5's correlation = 0.4885141873951835	12's and 12's correlation = 1.0	0's and 4's correlation = 0.8460261232237435
11's and 6's correlation = 0.1789634120325536	12's and 13's correlation = 0.008451184508894437	0 and 4
11's and 7's correlation = 0.7687940182961068	13's length = 1145000	0's and 7's correlation = 0.847569237115191
11's and 8's correlation = 0.08439632764008725	13's and 0's correlation = 0.8460261232236794	0 and 7
11's and 9's correlation = 0.842507129597902	13's and 1's correlation = 0.7722039773388407	0's and 13's correlation = 0.8460261232236794
11's and 10's correlation = 0.9999887450192969	13's and 2's correlation = 0.7526682249337285	0 and 13
11's and 11's correlation = 1.0	13's and 3's correlation = 0.2595665697645661	1's and 0's correlation = 0.8111198421992727
11's and 12's correlation = - 0.01149914056200804	13's and 4's correlation = 0.999999999997065	1 and 0
11's and 13's correlation = 0.7686982041521626	13's and 5's correlation = 0.5540352680634187	1's and 9's correlation = 0.8470668704273643
12's length = 1145000	13's and 6's correlation = 0.32138317746811135	1 and 9
12's and 0's correlation = 0.005281621394234876	13's and 7's correlation = 0.9998865556359962	1's and 10's correlation = 0.9105617866977945
12's and 1's correlation = 0.004329015188168821	13's and 8's correlation = 0.09284771853379861	1 and 10
12's and 2's correlation = 0.0049713888510439065	13's and 9's correlation = 0.7502741164970396	1's and 11's correlation = 0.9109024113815275
12's and 3's correlation = - 0.002609378841962061	13's and 10's correlation = 0.7683458450081565	1 and 11
12's and 4's correlation = 0.008451184508886156	13's and 11's correlation = 0.7686982041521626	2's and 0's correlation = 0.9459834674687513
12's and 5's correlation = 0.04898299405161688	13's and 12's correlation = 0.008451184508894437	2 and 0
12's and 6's correlation = 0.40653040103649857	13's and 13's correlation = 1.0	4's and 0's correlation = 0.8460261232237435
	highly correlated=14	4 and 0
		4's and 7's correlation = 0.9998865556363089
		4 and 7
		4's and 13's correlation = 0.999999999997065



4 and 13	13 and 0	
7's and 0's correlation = 0.847569237115191	13's and 4's correlation = 0.999999999997065	Xin>Xout for experiment-1:
7 and 0	13 and 4	
7's and 4's correlation = 0.9998865556363089	13's and 7's correlation = 0.9998865556359962	0's length = 2885000
7 and 4	13 and 7	0's and 0's correlation = 1.0
7's and 13's correlation = 0.9998865556359962	highly correlated=14	0's and 1's correlation = 0.799845704367003
7 and 13	mean time of 0=0.0009675448638382958 seconds	0's and 2's correlation = 0.9371631444368114
9's and 1's correlation = 0.8470668704273643	mean time of 1=0.0005115683942903078 seconds	0's and 3's correlation = 0.4728604757027937
9 and 1	mean time of 2=0.0005874616089866671 seconds	0's and 4's correlation = 0.8365374102133402
9's and 10's correlation = 0.8421895156147586	mean time of 3=0.07493159812610743 seconds	0's and 5's correlation = 0.5244544668852887
9 and 10	mean time of 4=0.2541895923656147 seconds	0's and 6's correlation = 0.3465431164020125
9's and 11's correlation = 0.842507129597902	mean time of 5=28.486266685885635 seconds	0's and 7's correlation = 0.8371827858521182
9 and 11	mean time of 6=0.056427235582509935 seconds	0's and 8's correlation = 0.10092036250087322
10's and 1's correlation = 0.9105617866977945	mean time of 7=0.1989421287478318 seconds	0's and 9's correlation = 0.6296208603271134
10 and 1	mean time of 8=0.06225350736010023 seconds	0's and 10's correlation = 0.6587753712201625
10's and 9's correlation = 0.8421895156147586	mean time of 9=0.020625131827775048 seconds	0's and 11's correlation = 0.6592242874901275
10 and 9	mean time of 10=0.11107209686629116 seconds	0's and 12's correlation = 0.026239316906542645
10's and 11's correlation = 0.9999887450192969	mean time of 11=0.015081341714317622 seconds	0's and 13's correlation = 0.8365374102130969
10 and 11	mean time of 12=0.0063000589479004976 seconds	1's length = 2885000
11's and 1's correlation = 0.9109024113815275	mean time of 13=0.2728557083804535 seconds	1's and 0's correlation = 0.799845704367003
11 and 1	time needed = 70907.80959439278 seconds	1's and 1's correlation = 1.0
11's and 9's correlation = 0.842507129597902	458.0	1's and 2's correlation = 0.5401792907775788
11 and 9	experiment-2	1's and 3's correlation = 0.20483101136765702
11's and 10's correlation = 0.9999887450192969	>>>	
11 and 10		
13's and 0's correlation = 0.8460261232236794		

1's and 4's correlation = 0.7432328229619494	2's and 11's correlation = 0.4202210903623046	4's and 4's correlation = 1.0
1's and 5's correlation = 0.46217883367818924	2's and 12's correlation = 0.02369980398698171	4's and 5's correlation = 0.6146259386143138
1's and 6's correlation = 0.2395564533194658	2's and 13's correlation = 0.7408801182071127	4's and 6's correlation = 0.3375281808999788
1's and 7's correlation = 0.7427489365514252	3's length = 2885000	4's and 7's correlation = 0.9998958068741238
1's and 8's correlation = 0.10059929610450934	3's and 0's correlation = 0.4728604757027937	4's and 8's correlation = 0.10320123426203497
1's and 9's correlation = 0.7914614345758367	3's and 1's correlation = 0.20483101136765702	4's and 9's correlation = 0.6614915609332722
1's and 10's correlation = 0.8666376731726271	3's and 2's correlation = 0.5439334238581185	4's and 10's correlation = 0.6974753953749813
1's and 11's correlation = 0.8671782987929993	3's and 3's correlation = 1.0	4's and 11's correlation = 0.6979966684364808
1's and 12's correlation = 0.022519724648848147	3's and 4's correlation = 0.24013944405037918	4's and 12's correlation = 0.028876754683603706
1's and 13's correlation = 0.7432328229624665	3's and 5's correlation = 0.19907570528989563	4's and 13's correlation = 0.999999999990979
2's length = 2885000	3's and 6's correlation = 0.08429612135458345	5's length = 2885000
2's and 0's correlation = 0.9371631444368114	3's and 7's correlation = 0.24132406007705692	5's and 0's correlation = 0.5244544668852887
2's and 1's correlation = 0.5401792907775788	3's and 8's correlation = 0.005956567292895791	5's and 1's correlation = 0.46217883367818924
2's and 2's correlation = 1.0	3's and 9's correlation = 0.13789299032328553	5's and 2's correlation = 0.46668068424038356
2's and 3's correlation = 0.5439334238581185	3's and 10's correlation = 0.1354022621711893	5's and 3's correlation = 0.19907570528989563
2's and 4's correlation = 0.7408801182067063	3's and 11's correlation = 0.13549982721624176	5's and 4's correlation = 0.6146259386143138
2's and 5's correlation = 0.46668068424038356	3's and 12's correlation = 0.000615026376650187	5's and 5's correlation = 1.0
2's and 6's correlation = 0.34663809051584143	3's and 13's correlation = 0.2401394440505072	5's and 6's correlation = 0.4519416649783323
2's and 7's correlation = 0.742066277725757	4's length = 2885000	5's and 7's correlation = 0.6188612871132158
2's and 8's correlation = 0.08302369572017501	4's and 0's correlation = 0.8365374102133402	5's and 8's correlation = 0.1283671934803684
2's and 9's correlation = 0.42272723675672036	4's and 1's correlation = 0.7432328229619494	5's and 9's correlation = 0.458221668665994
2's and 10's correlation = 0.41990592204050325	4's and 2's correlation = 0.7408801182067063	5's and 10's correlation = 0.49651010498612147
	4's and 3's correlation = 0.24013944405037918	5's and 11's correlation = 0.4968789010645577

5's and 12's correlation = 0.07118069169939367	7's and 5's correlation = 0.6188612871132158	8's and 13's correlation = 0.10320123426210501
5's and 13's correlation = 0.6146259386148029	7's and 6's correlation = 0.33976501588560337	9's length = 2885000
6's length = 2885000	7's and 7's correlation = 1.0	9's and 0's correlation = 0.6296208603271134
6's and 0's correlation = 0.3465431164020125	7's and 8's correlation = 0.10379394947981226	9's and 1's correlation = 0.7914614345758367
6's and 1's correlation = 0.2395564533194658	7's and 9's correlation = 0.6615282556214057	9's and 2's correlation = 0.42272723675672036
6's and 2's correlation = 0.34663809051584143	7's and 10's correlation = 0.6972395900822007	9's and 3's correlation = 0.13789299032328553
6's and 3's correlation = 0.08429612135458345	7's and 11's correlation = 0.6977606900819165	9's and 4's correlation = 0.6614915609332722
6's and 4's correlation = 0.3375281808999788	7's and 12's correlation = 0.02899995180536922	9's and 5's correlation = 0.458221668665994
6's and 5's correlation = 0.4519416649783323	7's and 13's correlation = 0.9998958068732315	9's and 6's correlation = 0.15312759476172896
6's and 6's correlation = 1.0	8's length = 2885000	9's and 7's correlation = 0.6615282556214057
6's and 7's correlation = 0.33976501588560337	8's and 0's correlation = 0.10092036250087322	9's and 8's correlation = 0.07033438291239912
6's and 8's correlation = 0.3301057911536692	8's and 1's correlation = 0.10059929610450934	9's and 9's correlation = 1.0
6's and 9's correlation = 0.15312759476172896	8's and 2's correlation = 0.08302369572017501	9's and 10's correlation = 0.795660650662308
6's and 10's correlation = 0.14400166681288235	8's and 3's correlation = 0.005956567292895791	9's and 11's correlation = 0.796134947300241
6's and 11's correlation = 0.1441656642060153	8's and 4's correlation = 0.10320123426203497	9's and 12's correlation = - 0.012287056288931763
6's and 12's correlation = 0.4507051712110155	8's and 5's correlation = 0.1283671934803684	9's and 13's correlation = 0.6614915609335947
6's and 13's correlation = 0.33752818089977865	8's and 6's correlation = 0.3301057911536692	10's length = 2885000
7's length = 2885000	8's and 7's correlation = 0.10379394947981226	10's and 0's correlation = 0.6587753712201625
7's and 0's correlation = 0.8371827858521182	8's and 8's correlation = 1.0	10's and 1's correlation = 0.8666376731726271
7's and 1's correlation = 0.7427489365514252	8's and 9's correlation = 0.07033438291239912	10's and 2's correlation = 0.41990592204050325
7's and 2's correlation = 0.742066277725757	8's and 10's correlation = 0.08007639820015476	10's and 3's correlation = 0.1354022621711893
7's and 3's correlation = 0.24132406007705692	8's and 11's correlation = 0.08014513909300823	10's and 4's correlation = 0.6974753953749813
7's and 4's correlation = 0.9998958068741238	8's and 12's correlation = 0.16840589526839264	10's and 5's correlation = 0.49651010498612147

10's and 6's correlation =  
0.14400166681288235

10's and 7's correlation =  
0.6972395900822007

10's and 8's correlation =  
0.08007639820015476

10's and 9's correlation =  
0.795660650662308

10's and 10's correlation = 1.0

10's and 11's correlation =  
0.9999840312724776

10's and 12's correlation = -  
0.008441368237798166

10's and 13's correlation =  
0.6974753953753495

11's length = 2885000

11's and 0's correlation =  
0.6592242874901275

11's and 1's correlation =  
0.8671782987929993

11's and 2's correlation =  
0.4202210903623046

11's and 3's correlation =  
0.13549982721624176

11's and 4's correlation =  
0.6979966684364808

11's and 5's correlation =  
0.4968789010645577

11's and 6's correlation =  
0.1441656642060153

11's and 7's correlation =  
0.6977606900819165

11's and 8's correlation =  
0.08014513909300823

11's and 9's correlation =  
0.796134947300241

11's and 10's correlation =  
0.9999840312724776

11's and 11's correlation = 1.0

11's and 12's correlation = -  
0.008428114610071515

11's and 13's correlation =  
0.6979966684368241

12's length = 2885000

12's and 0's correlation =  
0.026239316906542645

12's and 1's correlation =  
0.022519724648848147

12's and 2's correlation =  
0.02369980398698171

12's and 3's correlation =  
0.000615026376650187

12's and 4's correlation =  
0.028876754683603706

12's and 5's correlation =  
0.07118069169939367

12's and 6's correlation =  
0.4507051712110155

12's and 7's correlation =  
0.02899995180536922

12's and 8's correlation =  
0.16840589526839264

12's and 9's correlation = -  
0.012287056288931763

12's and 10's correlation = -  
0.008441368237798166

12's and 11's correlation = -  
0.008428114610071515

12's and 12's correlation = 1.0

12's and 13's correlation =  
0.028876754683627697

13's length = 2885000

13's and 0's correlation =  
0.8365374102130969

13's and 1's correlation =  
0.7432328229624665

13's and 2's correlation =  
0.7408801182071127

13's and 3's correlation =  
0.2401394440505072

13's and 4's correlation =  
0.999999999999079

13's and 5's correlation =  
0.6146259386148029

13's and 6's correlation =  
0.33752818089977865

13's and 7's correlation =  
0.9998958068732315

13's and 8's correlation =  
0.10320123426210501

13's and 9's correlation =  
0.6614915609335947

13's and 10's correlation =  
0.6974753953753495

13's and 11's correlation =  
0.6979966684368241

13's and 12's correlation =  
0.028876754683627697

13's and 13's correlation = 1.0

highly correlated=10

Correlation >= 0.80:

0's and 2's correlation =  
0.9371631444368114

0 and 2

0's and 4's correlation =  
0.8365374102133402

0 and 4

0's and 7's correlation =  
0.8371827858521182

0 and 7

0's and 13's correlation =  
0.8365374102130969

0 and 13

1's and 10's correlation =  
0.8666376731726271

1 and 10

1's and 11's correlation =  
0.8671782987929993

1 and 11

2's and 0's correlation =  
0.9371631444368114

2 and 0

4's and 0's correlation =  
0.8365374102133402

4 and 0

4's and 7's correlation = 0.9998958068741238	mean time of 1=0.0004527742362724846 seconds	0's and 2's correlation = 0.8976975742375832
4 and 7	mean time of 2=0.0005096556615581545 seconds	0's and 3's correlation = 0.37953422645626644
4's and 13's correlation = 0.9999999999990979	mean time of 3=0.04084783430942423 seconds	0's and 4's correlation = 0.7908331283264277
4 and 13	mean time of 4=0.1955754958984137 seconds	0's and 5's correlation = 0.5566140216741702
7's and 0's correlation = 0.8371827858521182	mean time of 5=31.389896091348792 seconds	0's and 6's correlation = 0.24870098205681318
7 and 0	mean time of 6=0.03620994140618389 seconds	0's and 7's correlation = 0.793254206906016
7's and 4's correlation = 0.9998958068741238	mean time of 7=0.12400463681080519 seconds	0's and 8's correlation = 0.08513002050000029
7 and 4	mean time of 8=0.07382246931462809 seconds	0's and 9's correlation = 0.7047745022707965
7's and 13's correlation = 0.9998958068732315	mean time of 9=0.043404088565753694 seconds	0's and 10's correlation = 0.8497612630627476
7 and 13	mean time of 10=0.10309671863939361 seconds	0's and 11's correlation = 0.8498218779655295
10's and 1's correlation = 0.8666376731726271	mean time of 11=0.03675810580030471 seconds	0's and 12's correlation = - 0.010229195838639639
10 and 1	mean time of 12=0.005057989579965998 seconds	0's and 13's correlation = 0.7908331283264143
10's and 11's correlation = 0.9999840312724776	mean time of 13=0.21780053490782528 seconds	1's length = 92500
10 and 11	time needed = 120278.09518170357 seconds	1's and 0's correlation = 0.9049884424438155
11's and 1's correlation = 0.8671782987929993	1154.0	1's and 1's correlation = 1.0
11 and 1	experiment-1	1's and 2's correlation = 0.6249535928055845
11's and 10's correlation = 0.9999840312724776	>>>	1's and 3's correlation = 0.23375019960990515
11 and 10		1's and 4's correlation = 0.7100704329894768
13's and 0's correlation = 0.8365374102130969		1's and 5's correlation = 0.49801491897512307
13 and 0	Xin==Xout for experiment-2:	1's and 6's correlation = 0.17515488949216512
13's and 4's correlation = 0.9999999999990979		1's and 7's correlation = 0.7117272955396562
13 and 4	0's length = 92500	1's and 8's correlation = 0.06984417710383266
13's and 7's correlation = 0.9998958068732315	0's and 0's correlation = 1.0	
13 and 7	0's and 1's correlation = 0.9049884424438155	
highly correlated=10		
mean time of 0=0.0009155154848016114 seconds		

1's and 9's correlation = 0.7683072964906383	3's and 2's correlation = 0.4543448721416899	4's and 10's correlation = 0.7709702810604583
1's and 10's correlation = 0.9397049691996812	3's and 3's correlation = 1.0	4's and 11's correlation = 0.7710392978748124
1's and 11's correlation = 0.9397653536129761	3's and 4's correlation = 0.21574089613074676	4's and 12's correlation = - 0.016648027291200483
1's and 12's correlation = - 0.014165704511511704	3's and 5's correlation = 0.25245142992980396	4's and 13's correlation = 1.000000000000012
1's and 13's correlation = 0.7100704329894413	3's and 6's correlation = 0.04260786471021757	5's length = 92500
2's length = 92500	3's and 7's correlation = 0.21829081592477126	5's and 0's correlation = 0.5566140216741702
2's and 0's correlation = 0.8976975742375832	3's and 8's correlation = 0.003363822179098883	5's and 1's correlation = 0.49801491897512307
2's and 1's correlation = 0.6249535928055845	3's and 9's correlation = 0.13766754030929196	5's and 2's correlation = 0.5055892342621381
2's and 2's correlation = 1.0	3's and 10's correlation = 0.20915231654309807	5's and 3's correlation = 0.25245142992980396
2's and 3's correlation = 0.4543448721416899	3's and 11's correlation = 0.20916567485746893	5's and 4's correlation = 0.5438061225103176
2's and 4's correlation = 0.7157540207195835	3's and 12's correlation = - 0.0028420111984691987	5's and 5's correlation = 1.0
2's and 5's correlation = 0.5055892342621381	3's and 13's correlation = 0.21574089613074734	5's and 6's correlation = 0.4113187880077557
2's and 6's correlation = 0.2749555000707841	4's length = 92500	5's and 7's correlation = 0.550222468965297
2's and 7's correlation = 0.7184806579352299	4's and 0's correlation = 0.7908331283264277	5's and 8's correlation = 0.1196009236969877
2's and 8's correlation = 0.08387526720556018	4's and 1's correlation = 0.7100704329894768	5's and 9's correlation = 0.4585944445136732
2's and 9's correlation = 0.4975248928306723	4's and 2's correlation = 0.7157540207195835	5's and 10's correlation = 0.5379181195288668
2's and 10's correlation = 0.5860593149167385	4's and 3's correlation = 0.21574089613074676	5's and 11's correlation = 0.5379671699031235
2's and 11's correlation = 0.5861080029258307	4's and 4's correlation = 1.0	5's and 12's correlation = - 0.011020866389891094
2's and 12's correlation = - 0.004099233191334014	4's and 5's correlation = 0.5438061225103176	5's and 13's correlation = 0.5438061225103175
2's and 13's correlation = 0.7157540207195627	4's and 6's correlation = 0.28790717241982305	6's length = 92500
3's length = 92500	4's and 7's correlation = 0.9998590504248833	6's and 0's correlation = 0.24870098205681318
3's and 0's correlation = 0.37953422645626644	4's and 8's correlation = 0.09438294139559328	6's and 1's correlation = 0.17515488949216512
3's and 1's correlation = 0.23375019960990515	4's and 9's correlation = 0.77801763603575	6's and 2's correlation = 0.2749555000707841

6's and 3's correlation = 0.04260786471021757	7's and 11's correlation = 0.7724617472783282	9's and 4's correlation = 0.77801763603575
6's and 4's correlation = 0.28790717241982305	7's and 12's correlation = - 0.01690171950892358	9's and 5's correlation = 0.4585944445136732
6's and 5's correlation = 0.4113187880077557	7's and 13's correlation = 0.99985905042489	9's and 6's correlation = 0.15706571588879625
6's and 6's correlation = 1.0	8's length = 92500	9's and 7's correlation = 0.7777175281754104
6's and 7's correlation = 0.2905641458549191	8's and 0's correlation = 0.08513002050000029	9's and 8's correlation = 0.07658145263749269
6's and 8's correlation = 0.35667439320712363	8's and 1's correlation = 0.06984417710383266	9's and 9's correlation = 1.0
6's and 9's correlation = 0.15706571588879625	8's and 2's correlation = 0.08387526720556018	9's and 10's correlation = 0.8594730720363238
6's and 10's correlation = 0.14122411149594039	8's and 3's correlation = 0.003363822179098883	9's and 11's correlation = 0.8595268286374447
6's and 11's correlation = 0.14125217366065554	8's and 4's correlation = 0.09438294139559328	9's and 12's correlation = - 0.03670773550278532
6's and 12's correlation = 0.3079982708184196	8's and 5's correlation = 0.1196009236969877	9's and 13's correlation = 0.7780176360357558
6's and 13's correlation = 0.28790717241983105	8's and 6's correlation = 0.35667439320712363	10's length = 92500
7's length = 92500	8's and 7's correlation = 0.09505791386653707	10's and 0's correlation = 0.8497612630627476
7's and 0's correlation = 0.793254206906016	8's and 8's correlation = 1.0	10's and 1's correlation = 0.9397049691996812
7's and 1's correlation = 0.7117272955396562	8's and 9's correlation = 0.07658145263749269	10's and 2's correlation = 0.5860593149167385
7's and 2's correlation = 0.7184806579352299	8's and 10's correlation = 0.0694886452720287	10's and 3's correlation = 0.20915231654309807
7's and 3's correlation = 0.21829081592477126	8's and 11's correlation = 0.06949935000126554	10's and 4's correlation = 0.7709702810604583
7's and 4's correlation = 0.9998590504248833	8's and 12's correlation = 0.09089576112237674	10's and 5's correlation = 0.5379181195288668
7's and 5's correlation = 0.550222468965297	8's and 13's correlation = 0.09438294139559436	10's and 6's correlation = 0.14122411149594039
7's and 6's correlation = 0.2905641458549191	9's length = 92500	10's and 7's correlation = 0.7723927100148651
7's and 7's correlation = 1.0	9's and 0's correlation = 0.7047745022707965	10's and 8's correlation = 0.0694886452720287
7's and 8's correlation = 0.09505791386653707	9's and 1's correlation = 0.7683072964906383	10's and 9's correlation = 0.8594730720363238
7's and 9's correlation = 0.7777175281754104	9's and 2's correlation = 0.4975248928306723	10's and 10's correlation = 1.0
7's and 10's correlation = 0.7723927100148651	9's and 3's correlation = 0.13766754030929196	10's and 11's correlation = 0.9999981232293972

10's and 12's correlation = -  
0.026681562234115868

10's and 13's correlation =  
0.7709702810604695

11's length = 92500

11's and 0's correlation =  
0.8498218779655295

11's and 1's correlation =  
0.9397653536129761

11's and 2's correlation =  
0.5861080029258307

11's and 3's correlation =  
0.20916567485746893

11's and 4's correlation =  
0.7710392978748124

11's and 5's correlation =  
0.5379671699031235

11's and 6's correlation =  
0.14125217366065554

11's and 7's correlation =  
0.7724617472783282

11's and 8's correlation =  
0.06949935000126554

11's and 9's correlation =  
0.8595268286374447

11's and 10's correlation =  
0.9999981232293972

11's and 11's correlation = 1.0

11's and 12's correlation = -  
0.02668104262420946

11's and 13's correlation =  
0.7710392978748108

12's length = 92500

12's and 0's correlation = -  
0.010229195838639639

12's and 1's correlation = -  
0.014165704511511704

12's and 2's correlation = -  
0.004099233191334014

12's and 3's correlation = -  
0.0028420111984691987

12's and 4's correlation = -  
0.016648027291200483

12's and 5's correlation = -  
0.011020866389891094

12's and 6's correlation =  
0.3079982708184196

12's and 7's correlation = -  
0.01690171950892358

12's and 8's correlation =  
0.09089576112237674

12's and 9's correlation = -  
0.03670773550278532

12's and 10's correlation = -  
0.026681562234115868

12's and 11's correlation = -  
0.02668104262420946

12's and 12's correlation = 1.0

12's and 13's correlation = -  
0.016648027291199876

13's length = 92500

13's and 0's correlation =  
0.7908331283264143

13's and 1's correlation =  
0.7100704329894413

13's and 2's correlation =  
0.7157540207195627

13's and 3's correlation =  
0.21574089613074734

13's and 4's correlation =  
1.000000000000012

13's and 5's correlation =  
0.5438061225103175

13's and 6's correlation =  
0.28790717241983105

13's and 7's correlation =  
0.99985905042489

13's and 8's correlation =  
0.09438294139559436

13's and 9's correlation =  
0.7780176360357558

13's and 10's correlation =  
0.7709702810604695

13's and 11's correlation =  
0.7710392978748108

13's and 12's correlation = -  
0.016648027291199876

13's and 13's correlation = 1.0

highly correlated=12

Correlation >= 0.80:

0's and 1's correlation =  
0.9049884424438155

0 and 1

0's and 2's correlation =  
0.8976975742375832

0 and 2

0's and 10's correlation =  
0.8497612630627476

0 and 10

0's and 11's correlation =  
0.8498218779655295

0 and 11

1's and 0's correlation =  
0.9049884424438155

1 and 0

1's and 10's correlation =  
0.9397049691996812

1 and 10

1's and 11's correlation =  
0.9397653536129761

1 and 11

2's and 0's correlation =  
0.8976975742375832

2 and 0

4's and 7's correlation =  
0.9998590504248833

4 and 7

4's and 13's correlation =  
1.000000000000012

4 and 13

7's and 4's correlation =  
0.9998590504248833

7 and 4



7's and 13's correlation =  
0.99985905042489

7 and 13

9's and 10's correlation =  
0.8594730720363238

9 and 10

9's and 11's correlation =  
0.8595268286374447

9 and 11

10's and 0's correlation =  
0.8497612630627476

10 and 0

10's and 1's correlation =  
0.9397049691996812

10 and 1

10's and 9's correlation =  
0.8594730720363238

10 and 9

10's and 11's correlation =  
0.9999981232293972

10 and 11

11's and 0's correlation =  
0.8498218779655295

11 and 0

11's and 1's correlation =  
0.9397653536129761

11 and 1

11's and 9's correlation =  
0.8595268286374447

11 and 9

11's and 10's correlation =  
0.9999981232293972

11 and 10

13's and 4's correlation =  
1.000000000000012

13 and 4

13's and 7's correlation =  
0.99985905042489

13 and 7

highly correlated=12

mean time of  
0=0.0010137184246166331 seconds

mean time of  
1=0.000675751711871173 seconds

mean time of  
2=0.00042275480321935703 seconds

mean time of 3=0.04628853540162783  
seconds

mean time of 4=0.2638752164067449  
seconds

mean time of 5=31.95725946039767  
seconds

mean time of 6=0.06364967500841295  
seconds

mean time of 7=0.2228732598794473  
seconds

mean time of  
8=0.021647747142894847 seconds

mean time of  
9=0.006609852249557908 seconds

mean time of  
10=0.11406543834789379 seconds

mean time of  
11=0.008045190089457744 seconds

mean time of  
12=0.006525450783806878 seconds

mean time of  
13=0.29617952913851353 seconds

time needed = 6276.750885486603  
seconds

37.0

experiment-2

Xin==Xout for experiment-1

0's length = 380000

0's and 0's correlation = 1.0

0's and 1's correlation =  
0.8887231236028617

0's and 2's correlation =  
0.8931636946141123

0's and 3's correlation =  
0.3965125637186587

0's and 4's correlation =  
0.8057574470407728

0's and 5's correlation =  
0.4951314037374301

0's and 6's correlation =  
0.31839398317050754

0's and 7's correlation =  
0.8063055561474188

0's and 8's correlation =  
0.11911157275940987

0's and 9's correlation =  
0.6392564190105747

0's and 10's correlation =  
0.7590909210474384

0's and 11's correlation =  
0.7593936971324109

0's and 12's correlation =  
0.02417084718709873

0's and 13's correlation =  
0.8057574470406482

1's length = 380000

1's and 0's correlation =  
0.8887231236028617

1's and 1's correlation = 1.0

1's and 2's correlation =  
0.5875982713509723

1's and 3's correlation =  
0.2314451640192641

1's and 4's correlation =  
0.7165090789800029

1's and 5's correlation =  
0.440786523725046

1's and 6's correlation =  
0.20251453380542278

1's and 7's correlation =  
0.7160514550470518

1's and 8's correlation =  
0.09388425367737549

1's and 9's correlation = 0.7263128564920919	3's and 2's correlation = 0.47279682173858734	4's and 10's correlation = 0.7169881045722027
1's and 10's correlation = 0.8808589565811912	3's and 3's correlation = 1.0	4's and 11's correlation = 0.7173220269541132
1's and 11's correlation = 0.88118971122092	3's and 4's correlation = 0.1675979231796138	4's and 12's correlation = 0.017175198817519007
1's and 12's correlation = 0.010006274035904553	3's and 5's correlation = 0.1560500840205777	4's and 13's correlation = 1.0000000000000222
1's and 13's correlation = 0.7165090789798144	3's and 6's correlation = 0.04679362492898757	5's length = 380000
2's length = 380000	3's and 7's correlation = 0.16886043133660822	5's and 0's correlation = 0.4951314037374301
2's and 0's correlation = 0.8931636946141123	3's and 8's correlation = 0.008281066668199609	5's and 1's correlation = 0.440786523725046
2's and 1's correlation = 0.5875982713509723	3's and 9's correlation = 0.100536129800121	5's and 2's correlation = 0.4414958855795461
2's and 2's correlation = 1.0	3's and 10's correlation = 0.153970705617597	5's and 3's correlation = 0.1560500840205777
2's and 3's correlation = 0.47279682173858734	3's and 11's correlation = 0.15402325307280215	5's and 4's correlation = 0.6040470143552252
2's and 4's correlation = 0.7192673588199263	3's and 12's correlation = 0.0011830145610544924	5's and 5's correlation = 1.0
2's and 5's correlation = 0.4414958855795461	3's and 13's correlation = 0.16759792317960143	5's and 6's correlation = 0.3951638992472818
2's and 6's correlation = 0.36329858359282363	4's length = 380000	5's and 7's correlation = 0.6088241302754261
2's and 7's correlation = 0.720683696570341	4's and 0's correlation = 0.8057574470407728	5's and 8's correlation = 0.11712379066509258
2's and 8's correlation = 0.11813154463630121	4's and 1's correlation = 0.7165090789800029	5's and 9's correlation = 0.4555934769760039
2's and 9's correlation = 0.41577610922329084	4's and 2's correlation = 0.7192673588199263	5's and 10's correlation = 0.5086825237839186
2's and 10's correlation = 0.47567463888378864	4's and 3's correlation = 0.1675979231796138	5's and 11's correlation = 0.5089112710515854
2's and 11's correlation = 0.4758845689913277	4's and 4's correlation = 1.0	5's and 12's correlation = 0.041857245665102336
2's and 12's correlation = 0.03284536196996103	4's and 5's correlation = 0.6040470143552252	5's and 13's correlation = 0.6040470143552691
2's and 13's correlation = 0.7192673588197513	4's and 6's correlation = 0.31449065538000615	6's length = 380000
3's length = 380000	4's and 7's correlation = 0.9998781886550424	6's and 0's correlation = 0.31839398317050754
3's and 0's correlation = 0.3965125637186587	4's and 8's correlation = 0.10860006178979094	6's and 1's correlation = 0.20251453380542278
3's and 1's correlation = 0.2314451640192641	4's and 9's correlation = 0.6840622551815213	6's and 2's correlation = 0.36329858359282363

6's and 3's correlation = 0.04679362492898757	7's and 11's correlation = 0.7173088303023667	9's and 4's correlation = 0.6840622551815213
6's and 4's correlation = 0.31449065538000615	7's and 12's correlation = 0.017263367054966467	9's and 5's correlation = 0.4555934769760039
6's and 5's correlation = 0.3951638992472818	7's and 13's correlation = 0.9998781886550693	9's and 6's correlation = 0.13203381049471039
6's and 6's correlation = 1.0	8's length = 380000	9's and 7's correlation = 0.6838219378152653
6's and 7's correlation = 0.31671497621109584	8's and 0's correlation = 0.11911157275940987	9's and 8's correlation = 0.07538567616479841
6's and 8's correlation = 0.3262798227073564	8's and 1's correlation = 0.09388425367737549	9's and 9's correlation = 1.0
6's and 9's correlation = 0.13203381049471039	8's and 2's correlation = 0.11813154463630121	9's and 10's correlation = 0.8101755834067096
6's and 10's correlation = 0.12158765897452571	8's and 3's correlation = 0.008281066668199609	9's and 11's correlation = 0.8104645858971409
6's and 11's correlation = 0.1216927157017075	8's and 4's correlation = 0.10860006178979094	9's and 12's correlation = - 0.019717958371279126
6's and 12's correlation = 0.40554487094461483	8's and 5's correlation = 0.11712379066509258	9's and 13's correlation = 0.6840622551814936
6's and 13's correlation = 0.314490655380068	8's and 6's correlation = 0.3262798227073564	10's length = 380000
7's length = 380000	8's and 7's correlation = 0.10918306378180576	10's and 0's correlation = 0.7590909210474384
7's and 0's correlation = 0.8063055561474188	8's and 8's correlation = 1.0	10's and 1's correlation = 0.8808589565811912
7's and 1's correlation = 0.7160514550470518	8's and 9's correlation = 0.07538567616479841	10's and 2's correlation = 0.47567463888378864
7's and 2's correlation = 0.720683696570341	8's and 10's correlation = 0.08118355948789341	10's and 3's correlation = 0.153970705617597
7's and 3's correlation = 0.16886043133660822	8's and 11's correlation = 0.08122476045400827	10's and 4's correlation = 0.7169881045722027
7's and 4's correlation = 0.9998781886550424	8's and 12's correlation = 0.1480806057538148	10's and 5's correlation = 0.5086825237839186
7's and 5's correlation = 0.6088241302754261	8's and 13's correlation = 0.10860006178978103	10's and 6's correlation = 0.12158765897452571
7's and 6's correlation = 0.31671497621109584	9's length = 380000	10's and 7's correlation = 0.7169750283535965
7's and 7's correlation = 1.0	9's and 0's correlation = 0.6392564190105747	10's and 8's correlation = 0.08118355948789341
7's and 8's correlation = 0.10918306378180576	9's and 1's correlation = 0.7263128564920919	10's and 9's correlation = 0.8101755834067096
7's and 9's correlation = 0.6838219378152653	9's and 2's correlation = 0.41577610922329084	10's and 10's correlation = 1.0
7's and 10's correlation = 0.7169750283535965	9's and 3's correlation = 0.100536129800121	10's and 11's correlation = 0.9999909255515622

10's and 12's correlation = -  
0.017127221651596455

10's and 13's correlation =  
0.7169881045721622

11's length = 380000

11's and 0's correlation =  
0.7593936971324109

11's and 1's correlation =  
0.88118971122092

11's and 2's correlation =  
0.4758845689913277

11's and 3's correlation =  
0.15402325307280215

11's and 4's correlation =  
0.7173220269541132

11's and 5's correlation =  
0.5089112710515854

11's and 6's correlation =  
0.1216927157017075

11's and 7's correlation =  
0.7173088303023667

11's and 8's correlation =  
0.08122476045400827

11's and 9's correlation =  
0.8104645858971409

11's and 10's correlation =  
0.9999909255515622

11's and 11's correlation = 1.0

11's and 12's correlation = -  
0.017121926281351604

11's and 13's correlation =  
0.7173220269540677

12's length = 380000

12's and 0's correlation =  
0.02417084718709873

12's and 1's correlation =  
0.010006274035904553

12's and 2's correlation =  
0.03284536196996103

12's and 3's correlation =  
0.0011830145610544924

12's and 4's correlation =  
0.017175198817519007

12's and 5's correlation =  
0.041857245665102336

12's and 6's correlation =  
0.40554487094461483

12's and 7's correlation =  
0.017263367054966467

12's and 8's correlation =  
0.1480806057538148

12's and 9's correlation = -  
0.019717958371279126

12's and 10's correlation = -  
0.017127221651596455

12's and 11's correlation = -  
0.017121926281351604

12's and 12's correlation = 1.0

12's and 13's correlation =  
0.017175198817513178

13's length = 380000

13's and 0's correlation =  
0.8057574470406482

13's and 1's correlation =  
0.7165090789798144

13's and 2's correlation =  
0.7192673588197513

13's and 3's correlation =  
0.16759792317960143

13's and 4's correlation =  
1.0000000000000222

13's and 5's correlation =  
0.6040470143552691

13's and 6's correlation =  
0.314490655380068

13's and 7's correlation =  
0.9998781886550693

13's and 8's correlation =  
0.10860006178978103

13's and 9's correlation =  
0.6840622551814936

13's and 10's correlation =  
0.7169881045721622

13's and 11's correlation =  
0.7173220269540677

13's and 12's correlation =  
0.017175198817513178

13's and 13's correlation = 1.0

highly correlated=13

Correlation >= 0.80:

0's and 1's correlation =  
0.8887231236028617

0 and 1

0's and 2's correlation =  
0.8931636946141123

0 and 2

0's and 4's correlation =  
0.8057574470407728

0 and 4

0's and 7's correlation =  
0.8063055561474188

0 and 7

0's and 13's correlation =  
0.8057574470406482

0 and 13

1's and 0's correlation =  
0.8887231236028617

1 and 0

1's and 10's correlation =  
0.8808589565811912

1 and 10

1's and 11's correlation =  
0.88118971122092

1 and 11

2's and 0's correlation =  
0.8931636946141123

2 and 0

4's and 0's correlation =  
0.8057574470407728

4 and 0

4's and 7's correlation =  
0.9998781886550424

4 and 7

4's and 13's correlation =  
1.0000000000000222

4 and 13

7's and 0's correlation =  
0.8063055561474188

7 and 0

7's and 4's correlation =  
0.9998781886550424

7 and 4

7's and 13's correlation =  
0.9998781886550693

7 and 13

9's and 10's correlation =  
0.8101755834067096

9 and 10

9's and 11's correlation =  
0.8104645858971409

9 and 11

10's and 1's correlation =  
0.8808589565811912

10 and 1

10's and 9's correlation =  
0.8101755834067096

10 and 9

10's and 11's correlation =  
0.9999909255515622

10 and 11

11's and 1's correlation =  
0.88118971122092

11 and 1

11's and 9's correlation =  
0.8104645858971409

11 and 9

11's and 10's correlation =  
0.9999909255515622

11 and 10

13's and 0's correlation =  
0.8057574470406482

13 and 0

13's and 4's correlation =  
1.0000000000000222

13 and 4

13's and 7's correlation =  
0.9998781886550693

13 and 7

highly correlated=13

mean time of  
0=0.0008907001269491096 seconds

mean time of  
1=0.0004118376656582481 seconds

mean time of  
2=0.0002467337407563862 seconds

mean time of 3=0.02341249334184747  
seconds

mean time of 4=0.16958577350566262  
seconds

mean time of 5=89.23741984179145  
seconds

mean time of 6=0.03833054586460716  
seconds

mean time of 7=0.12783290837940417  
seconds

mean time of  
8=0.018120057018179644 seconds

mean time of 9=0.00964772293442174  
seconds

mean time of  
10=0.10043163989719592 seconds

mean time of  
11=0.008671586764486212 seconds

mean time of  
12=0.004749920179969386 seconds

mean time of 13=0.192278285089292  
seconds

time needed = 15593.376278162  
seconds

152.0

experiment-1

>>>

Xin<Xout for experiment-2:

0's and 0's correlation = 1.0

0's and 1's correlation =  
0.9437759039778075

0's and 2's correlation =  
0.8279604984355668

0's and 3's correlation =  
0.2118337024980152

0's and 4's correlation =  
0.8524105040347872

0's and 5's correlation =  
0.5177890669536599

0's and 6's correlation =  
0.2408382051200407

0's and 7's correlation =  
0.8539876245843326

0's and 8's correlation =  
0.09410421106634331

0's and 9's correlation =  
0.7894461354177151

0's and 10's correlation =  
0.8894360664066023

0's and 11's correlation =  
0.8895091096201658

0's and 12's correlation = -  
0.009553586286700227

0's and 13's correlation =  
0.8524105040348476

1's length = 1035000

1's and 0's correlation =  
0.9437759039778075

1's and 1's correlation = 1.0

1's and 2's correlation =  
0.596021078368679

1's and 3's correlation =  
0.11351933913061293

1's and 4's correlation = 0.7646797842341175	2's and 11's correlation = 0.5432385408655175	4's and 4's correlation = 1.0
1's and 5's correlation = 0.46475338602548266	2's and 12's correlation = 0.0014289373866858675	4's and 5's correlation = 0.547461799466335
1's and 6's correlation = 0.14860258492503672	2's and 13's correlation = 0.7732845860876353	4's and 6's correlation = 0.25968143821721706
1's and 7's correlation = 0.7659174954011356	3's length = 1035000	4's and 7's correlation = 0.9998694059142775
1's and 8's correlation = 0.062912762877016	3's and 0's correlation = 0.2118337024980152	4's and 8's correlation = 0.07500658411221055
1's and 9's correlation = 0.8089556311518488	3's and 1's correlation = 0.11351933913061293	4's and 9's correlation = 0.8126224344231807
1's and 10's correlation = 0.953341288732317	3's and 2's correlation = 0.32196093139135135	4's and 10's correlation = 0.7509903488782271
1's and 11's correlation = 0.953412961069791	3's and 3's correlation = 1.0	4's and 11's correlation = 0.7510674837292934
1's and 12's correlation = - 0.014521781947378088	3's and 4's correlation = 0.11116705032908844	4's and 12's correlation = - 0.020510315785681757
1's and 13's correlation = 0.7646797842342501	3's and 5's correlation = 0.1543358593033014	4's and 13's correlation = 0.99999999997532
2's length = 1035000	3's and 6's correlation = 0.024793811039466592	5's length = 1035000
2's and 0's correlation = 0.8279604984355668	3's and 7's correlation = 0.11215862175099267	5's and 0's correlation = 0.5177890669536599
2's and 1's correlation = 0.596021078368679	3's and 8's correlation = 0.010455790840163992	5's and 1's correlation = 0.46475338602548266
2's and 2's correlation = 1.0	3's and 9's correlation = 0.07663849995776585	5's and 2's correlation = 0.4692912372918501
2's and 3's correlation = 0.32196093139135135	3's and 10's correlation = 0.0962618768461631	5's and 3's correlation = 0.1543358593033014
2's and 4's correlation = 0.7732845860874715	3's and 11's correlation = 0.09628277952817613	5's and 4's correlation = 0.547461799466335
2's and 5's correlation = 0.4692912372918501	3's and 12's correlation = - 0.0005222688465710976	5's and 5's correlation = 1.0
2's and 6's correlation = 0.3328975813612463	3's and 13's correlation = 0.11116705032910659	5's and 6's correlation = 0.3854150018562055
2's and 7's correlation = 0.7750157153997832	4's length = 1035000	5's and 7's correlation = 0.5526509506337204
2's and 8's correlation = 0.12185068968840289	4's and 0's correlation = 0.8524105040347872	5's and 8's correlation = 0.10075298933209058
2's and 9's correlation = 0.5452418456326481	4's and 1's correlation = 0.7646797842341175	5's and 9's correlation = 0.47792415774506813
2's and 10's correlation = 0.543182705011436	4's and 2's correlation = 0.7732845860874715	5's and 10's correlation = 0.4892085478848247
	4's and 3's correlation = 0.11116705032908844	5's and 11's correlation = 0.48926268597767536

5's and 12's correlation = 0.0003865215096810687	7's and 5's correlation = 0.5526509506337204	8's and 13's correlation = 0.07500658411223472
5's and 13's correlation = 0.5474617994664088	7's and 6's correlation = 0.2617894493316883	9's length = 1035000
6's length = 1035000	7's and 7's correlation = 1.0	9's and 0's correlation = 0.7894461354177151
6's and 0's correlation = 0.2408382051200407	7's and 8's correlation = 0.07552510667211305	9's and 1's correlation = 0.8089556311518488
6's and 1's correlation = 0.14860258492503672	7's and 9's correlation = 0.8124374510112955	9's and 2's correlation = 0.5452418456326481
6's and 2's correlation = 0.3328975813612463	7's and 10's correlation = 0.7522612978921449	9's and 3's correlation = 0.07663849995776585
6's and 3's correlation = 0.024793811039466592	7's and 11's correlation = 0.7523385252842203	9's and 4's correlation = 0.8126224344231807
6's and 4's correlation = 0.25968143821721706	7's and 12's correlation = - 0.020728599733612876	9's and 5's correlation = 0.47792415774506813
6's and 5's correlation = 0.3854150018562055	7's and 13's correlation = 0.9998694059139969	9's and 6's correlation = 0.14495761101518218
6's and 6's correlation = 1.0	8's length = 1035000	9's and 7's correlation = 0.8124374510112955
6's and 7's correlation = 0.2617894493316883	8's and 0's correlation = 0.09410421106634331	9's and 8's correlation = 0.058627430858678525
6's and 8's correlation = 0.32503807689762393	8's and 1's correlation = 0.0629127628777016	9's and 9's correlation = 1.0
6's and 9's correlation = 0.14495761101518218	8's and 2's correlation = 0.12185068968840289	9's and 10's correlation = 0.8570118338910363
6's and 10's correlation = 0.10835437319711703	8's and 3's correlation = 0.010455790840163992	9's and 11's correlation = 0.8570792362030634
6's and 11's correlation = 0.10839087914610931	8's and 4's correlation = 0.07500658411221055	9's and 12's correlation = - 0.037753987481930235
6's and 12's correlation = 0.3704692703548918	8's and 5's correlation = 0.10075298933209058	9's and 13's correlation = 0.8126224344233043
6's and 13's correlation = 0.2596814382172972	8's and 6's correlation = 0.32503807689762393	10's length = 1035000
7's length = 1035000	8's and 7's correlation = 0.07552510667211305	10's and 0's correlation = 0.8894360664066023
7's and 0's correlation = 0.8539876245843326	8's and 8's correlation = 1.0	10's and 1's correlation = 0.953341288732317
7's and 1's correlation = 0.7659174954011356	8's and 9's correlation = 0.058627430858678525	10's and 2's correlation = 0.543182705011436
7's and 2's correlation = 0.7750157153997832	8's and 10's correlation = 0.05379093385046656	10's and 3's correlation = 0.0962618768461631
7's and 3's correlation = 0.11215862175099267	8's and 11's correlation = 0.05380287470073078	10's and 4's correlation = 0.7509903488782271
7's and 4's correlation = 0.9998694059142775	8's and 12's correlation = 0.13359900143097236	10's and 5's correlation = 0.4892085478848247

10's and 6's correlation = 0.10835437319711703

10's and 7's correlation = 0.7522612978921449

10's and 8's correlation = 0.05379093385046565

10's and 9's correlation = 0.8570118338910363

10's and 10's correlation = 1.0

10's and 11's correlation = 0.9999982238467005

10's and 12's correlation = -0.03014772875528258

10's and 13's correlation = 0.7509903488783392

11's length = 1035000

11's and 0's correlation = 0.8895091096201658

11's and 1's correlation = 0.953412961069791

11's and 2's correlation = 0.5432385408655175

11's and 3's correlation = 0.09628277952817613

11's and 4's correlation = 0.7510674837292934

11's and 5's correlation = 0.48926268597767536

11's and 6's correlation = 0.10839087914610931

11's and 7's correlation = 0.7523385252842203

11's and 8's correlation = 0.05380287470073078

11's and 9's correlation = 0.8570792362030634

11's and 10's correlation = 0.9999982238467005

11's and 11's correlation = 1.0

11's and 12's correlation = -0.03014238551970227

11's and 13's correlation = 0.7510674837294226

12's length = 1035000

12's and 0's correlation = -0.009553586286700227

12's and 1's correlation = -0.014521781947378088

12's and 2's correlation = 0.0014289373866858675

12's and 3's correlation = -0.0005222688465710976

12's and 4's correlation = -0.020510315785681757

12's and 5's correlation = 0.0003865215096810687

12's and 6's correlation = 0.3704692703548918

12's and 7's correlation = -0.020728599733612876

12's and 8's correlation = 0.13359900143097236

12's and 9's correlation = -0.037753987481930235

12's and 10's correlation = -0.03014772875528258

12's and 11's correlation = -0.03014238551970227

12's and 12's correlation = 1.0

12's and 13's correlation = -0.020510315785671918

13's length = 1035000

13's and 0's correlation = 0.8524105040348476

13's and 1's correlation = 0.7646797842342501

13's and 2's correlation = 0.7732845860876353

13's and 3's correlation = 0.11116705032910659

13's and 4's correlation = 0.999999999997532

13's and 5's correlation = 0.5474617994664088

13's and 6's correlation = 0.2596814382172972

13's and 7's correlation = 0.9998694059139969

13's and 8's correlation = 0.07500658411223472

13's and 9's correlation = 0.8126224344233043

13's and 10's correlation = 0.7509903488783392

13's and 11's correlation = 0.7510674837294226

13's and 12's correlation = -0.020510315785671918

13's and 13's correlation = 1.0

highly correlated=19

Correlation >= 0.80:

0's and 1's correlation = 0.9437759039778075

0 and 1

0's and 2's correlation = 0.8279604984355668

0 and 2

0's and 4's correlation = 0.8524105040347872

0 and 4

0's and 7's correlation = 0.8539876245843326

0 and 7

0's and 10's correlation = 0.8894360664066023

0 and 10

0's and 11's correlation = 0.8895091096201658

0 and 11

0's and 13's correlation = 0.8524105040348476

0 and 13

1's and 0's correlation = 0.9437759039778075

1 and 0



1's and 9's correlation = 0.8089556311518488	9's and 4's correlation = 0.8126224344231807	13's and 0's correlation = 0.8524105040348476
1 and 9	9 and 4	13 and 0
1's and 10's correlation = 0.953341288732317	9's and 7's correlation = 0.8124374510112955	13's and 4's correlation = 0.999999999997532
1 and 10	9 and 7	13 and 4
1's and 11's correlation = 0.953412961069791	9's and 10's correlation = 0.8570118338910363	13's and 7's correlation = 0.9998694059139969
1 and 11	9 and 10	13 and 7
2's and 0's correlation = 0.8279604984355668	9's and 11's correlation = 0.8570792362030634	13's and 9's correlation = 0.8126224344233043
2 and 0	9 and 11	13 and 9
4's and 0's correlation = 0.8524105040347872	9's and 13's correlation = 0.8126224344233043	highly correlated=19
4 and 0	9 and 13	mean time of 0=0.0009815065181197752 seconds
4's and 7's correlation = 0.9998694059142775	10's and 0's correlation = 0.8894360664066023	mean time of 1=0.0004981457899158127 seconds
4 and 7	10 and 0	mean time of 2=0.00047569597400904854 seconds
4's and 9's correlation = 0.8126224344231807	10's and 1's correlation = 0.953341288732317	mean time of 3=0.035231244736823486 seconds
4 and 9	10 and 1	mean time of 4=0.27483377214791116 seconds
4's and 13's correlation = 0.999999999997532	10's and 9's correlation = 0.8570118338910363	mean time of 5=31.675362830576688 seconds
4 and 13	10 and 9	mean time of 6=0.0627306400289858 seconds
7's and 0's correlation = 0.8539876245843326	10's and 11's correlation = 0.9999982238467005	mean time of 7=0.21866843539159656 seconds
7 and 0	10 and 11	mean time of 8=0.043442908577297046 seconds
7's and 4's correlation = 0.9998694059142775	11's and 0's correlation = 0.8895091096201658	mean time of 9=0.0143768768955544 seconds
7 and 4	11 and 0	mean time of 10=0.1147608306672838 seconds
7's and 9's correlation = 0.8124374510112955	11's and 1's correlation = 0.953412961069791	mean time of 11=0.0197733657947485 seconds
7 and 9	11 and 1	mean time of 12=0.007159719720554812 seconds
7's and 13's correlation = 0.9998694059139969	11's and 9's correlation = 0.8570792362030634	mean time of 13=0.30127199145330896 seconds
7 and 13	11 and 9	
9's and 1's correlation = 0.8089556311518488	11's and 10's correlation = 0.9999982238467005	
9 and 1	11 and 10	

time needed = 70690.4855120182  
seconds

414.0

experiment-2

>>>

Xin<Xout for experiment-1:

0's length = 2620000

0's and 0's correlation = 1.0

0's and 1's correlation =  
0.9291525960953735

0's and 2's correlation =  
0.8195021282100511

0's and 3's correlation =  
0.21376794533020044

0's and 4's correlation =  
0.8426024691472132

0's and 5's correlation =  
0.494181267262618

0's and 6's correlation =  
0.2806505166259268

0's and 7's correlation =  
0.8430318556304889

0's and 8's correlation =  
0.11613666508648936

0's and 9's correlation =  
0.7139012379659456

0's and 10's correlation =  
0.8179856299403505

0's and 11's correlation =  
0.8181743188921166

0's and 12's correlation =  
0.02407841650608746

0's and 13's correlation =  
0.8426024691471117

1's length = 2620000

1's and 0's correlation =  
0.9291525960953735

1's and 1's correlation = 1.0

1's and 2's correlation =  
0.5495783248238654

1's and 3's correlation =  
0.10650337889938626

1's and 4's correlation =  
0.7429817171959167

1's and 5's correlation =  
0.43417029698568577

1's and 6's correlation =  
0.1614055348164489

1's and 7's correlation =  
0.7429517594655415

1's and 8's correlation =  
0.0788200215185166

1's and 9's correlation =  
0.7554475296334736

1's and 10's correlation =  
0.8997796994240467

1's and 11's correlation =  
0.8999720959975991

1's and 12's correlation =  
0.005754342827918563

1's and 13's correlation =  
0.7429817171962966

2's length = 2620000

2's and 0's correlation =  
0.8195021282100511

2's and 1's correlation =  
0.5495783248238654

2's and 2's correlation = 1.0

2's and 3's correlation =  
0.31798039132843253

2's and 4's correlation =  
0.7524026158814121

2's and 5's correlation =  
0.4437349971612145

2's and 6's correlation =  
0.38401675120053047

2's and 7's correlation =  
0.7534193842707334

2's and 8's correlation =  
0.14026534273572389

2's and 9's correlation =  
0.4422392263116933

2's and 10's correlation =  
0.4537166711861103

2's and 11's correlation =  
0.4538448326257448

2's and 12's correlation =  
0.0454925908866791

2's and 13's correlation =  
0.7524026158821139

3's length = 2620000

3's and 0's correlation =  
0.21376794533020044

3's and 1's correlation =  
0.10650337889938626

3's and 2's correlation =  
0.31798039132843253

3's and 3's correlation = 1.0

3's and 4's correlation =  
0.1366037073953316

3's and 5's correlation =  
0.1509788132098448

3's and 6's correlation =  
0.03801666936035985

3's and 7's correlation =  
0.13752748845989823

3's and 8's correlation =  
0.020630939044439692

3's and 9's correlation =  
0.09215953137807723

3's and 10's correlation =  
0.10299315236229073

3's and 11's correlation =  
0.10302198175914891

3's and 12's correlation =  
0.001926711271766214

3's and 13's correlation =  
0.13660370739542949

4's length = 2620000

4's and 0's correlation =  
0.8426024691472132

4's and 1's correlation =  
0.7429817171959167

4's and 2's correlation = 0.7524026158814121	5's and 10's correlation = 0.4837896893443758	7's and 3's correlation = 0.13752748845989823
4's and 3's correlation = 0.1366037073953316	5's and 11's correlation = 0.483919753634694	7's and 4's correlation = 0.9998835290785963
4's and 4's correlation = 1.0	5's and 12's correlation = 0.05324436640159044	7's and 5's correlation = 0.6021553067926577
4's and 5's correlation = 0.5977368289100242	5's and 13's correlation = 0.5977368289105622	7's and 6's correlation = 0.2816548421117806
4's and 6's correlation = 0.27973609441828584	6's length = 2620000	7's and 7's correlation = 1.0
4's and 7's correlation = 0.9998835290785963	6's and 0's correlation = 0.2806505166259268	7's and 8's correlation = 0.09123478982675769
4's and 8's correlation = 0.0907142452274084	6's and 1's correlation = 0.1614055348164489	7's and 9's correlation = 0.7119102440258743
4's and 9's correlation = 0.7118848683371899	6's and 2's correlation = 0.38401675120053047	7's and 10's correlation = 0.6926145715796831
4's and 10's correlation = 0.6921212990736169	6's and 3's correlation = 0.03801666936035985	7's and 11's correlation = 0.6928013513045894
4's and 11's correlation = 0.6923078544526121	6's and 4's correlation = 0.27973609441828584	7's and 12's correlation = 0.01334924222967936
4's and 12's correlation = 0.01323820331965119	6's and 5's correlation = 0.36860090160428555	7's and 13's correlation = 0.999883529077576
4's and 13's correlation = 0.999999999989752	6's and 6's correlation = 1.0	8's length = 2620000
5's length = 2620000	6's and 7's correlation = 0.2816548421117806	8's and 0's correlation = 0.11613666508648936
5's and 0's correlation = 0.494181267262618	6's and 8's correlation = 0.31452622159041527	8's and 1's correlation = 0.0788200215185166
5's and 1's correlation = 0.43417029698568577	6's and 9's correlation = 0.11252533208435328	8's and 2's correlation = 0.14026534273572389
5's and 2's correlation = 0.4437349971612145	6's and 10's correlation = 0.0898493938265995	8's and 3's correlation = 0.020630939044439692
5's and 3's correlation = 0.1509788132098448	6's and 11's correlation = 0.08990241507249504	8's and 4's correlation = 0.0907142452274084
5's and 4's correlation = 0.5977368289100242	6's and 12's correlation = 0.4787539047395635	8's and 5's correlation = 0.10677424088945807
5's and 5's correlation = 1.0	6's and 13's correlation = 0.27973609441806035	8's and 6's correlation = 0.31452622159041527
5's and 6's correlation = 0.36860090160428555	7's length = 2620000	8's and 7's correlation = 0.09123478982675769
5's and 7's correlation = 0.6021553067926577	7's and 0's correlation = 0.8430318556304889	8's and 8's correlation = 1.0
5's and 8's correlation = 0.10677424088945807	7's and 1's correlation = 0.7429517594655415	8's and 9's correlation = 0.06411527676611764
5's and 9's correlation = 0.4843301106201373	7's and 2's correlation = 0.7534193842707334	8's and 10's correlation = 0.06588806022189292

8's and 11's correlation = 0.06591035339544075	10's and 4's correlation = 0.6921212990736169	11's and 12's correlation = - 0.022912040911271022
8's and 12's correlation = 0.1789962549858248	10's and 5's correlation = 0.4837896893443758	11's and 13's correlation = 0.6923078544531124
8's and 13's correlation = 0.09071424522748643	10's and 6's correlation = 0.0898493938265995	12's length = 2620000
9's length = 2620000	10's and 7's correlation = 0.6926145715796831	12's and 0's correlation = 0.02407841650608746
9's and 0's correlation = 0.7139012379659456	10's and 8's correlation = 0.06588806022189292	12's and 1's correlation = 0.005754342827918563
9's and 1's correlation = 0.7554475296334736	10's and 9's correlation = 0.8255061592128443	12's and 2's correlation = 0.0454925908866791
9's and 2's correlation = 0.4422392263116933	10's and 10's correlation = 1.0	12's and 3's correlation = 0.001926711271766214
9's and 3's correlation = 0.09215953137807723	10's and 11's correlation = 0.9999962695916724	12's and 4's correlation = 0.01323820331965119
9's and 4's correlation = 0.7118848683371899	10's and 12's correlation = - 0.02291797471402503	12's and 5's correlation = - 0.05324436640159044
9's and 5's correlation = 0.4843301106201373	10's and 13's correlation = 0.6921212990741148	12's and 6's correlation = 0.4787539047395635
9's and 6's correlation = 0.11252533208435328	11's length = 2620000	12's and 7's correlation = 0.01334924222967936
9's and 7's correlation = 0.7119102440258743	11's and 0's correlation = 0.8181743188921166	12's and 8's correlation = 0.1789962549858248
9's and 8's correlation = 0.06411527676611764	11's and 1's correlation = 0.8999720959975991	12's and 9's correlation = - 0.026423830665572984
9's and 9's correlation = 1.0	11's and 2's correlation = 0.4538448326257448	12's and 10's correlation = - 0.02291797471402503
9's and 10's correlation = 0.8255061592128443	11's and 3's correlation = 0.10302198175914891	12's and 11's correlation = - 0.022912040911271022
9's and 11's correlation = 0.8256704657118819	11's and 4's correlation = 0.6923078544526121	12's and 12's correlation = 1.0
9's and 12's correlation = - 0.026423830665572984	11's and 5's correlation = 0.483919753634694	12's and 13's correlation = 0.013238203319677094
9's and 13's correlation = 0.7118848683377074	11's and 6's correlation = 0.08990241507249504	13's length = 2620000
10's length = 2620000	11's and 7's correlation = 0.6928013513045894	13's and 0's correlation = 0.8426024691471117
10's and 0's correlation = 0.8179856299403505	11's and 8's correlation = 0.06591035339544075	13's and 1's correlation = 0.7429817171962966
10's and 1's correlation = 0.8997796994240467	11's and 9's correlation = 0.8256704657118819	13's and 2's correlation = 0.7524026158821139
10's and 2's correlation = 0.4537166711861103	11's and 10's correlation = 0.9999962695916724	13's and 3's correlation = 0.13660370739542949
10's and 3's correlation = 0.10299315236229073	11's and 11's correlation = 1.0	13's and 4's correlation = 0.999999999989752

13's and 5's correlation = 0.5977368289105622	1's and 0's correlation = 0.9291525960953735	10's and 1's correlation = 0.8997796994240467
13's and 6's correlation = 0.27973609441806035	1 and 0	10 and 1
13's and 7's correlation = 0.999883529077576	1's and 10's correlation = 0.8997796994240467	10's and 9's correlation = 0.8255061592128443
13's and 8's correlation = 0.09071424522748643	1 and 10	10 and 9
13's and 9's correlation = 0.7118848683377074	1's and 11's correlation = 0.8999720959975991	10's and 11's correlation = 0.9999962695916724
13's and 10's correlation = 0.6921212990741148	1 and 11	10 and 11
13's and 11's correlation = 0.6923078544531124	2's and 0's correlation = 0.8195021282100511	11's and 0's correlation = 0.8181743188921166
13's and 12's correlation = 0.013238203319677094	2 and 0	11 and 0
13's and 13's correlation = 1.0	4's and 0's correlation = 0.8426024691472132	11's and 1's correlation = 0.8999720959975991
highly correlated=15	4 and 0	11 and 1
Correlation >= 0.80:	4's and 7's correlation = 0.9998835290785963	11's and 9's correlation = 0.8256704657118819
0's and 1's correlation = 0.9291525960953735	4 and 7	11 and 9
0 and 1	4's and 13's correlation = 0.999999999989752	11's and 10's correlation = 0.9999962695916724
0's and 2's correlation = 0.8195021282100511	4 and 13	11 and 10
0 and 2	7's and 0's correlation = 0.8430318556304889	13's and 0's correlation = 0.8426024691471117
0's and 4's correlation = 0.8426024691472132	7 and 0	13 and 0
0 and 4	7's and 4's correlation = 0.9998835290785963	13's and 4's correlation = 0.999999999989752
0's and 7's correlation = 0.8430318556304889	7 and 4	13 and 4
0 and 7	7's and 13's correlation = 0.999883529077576	13's and 7's correlation = 0.999883529077576
0's and 10's correlation = 0.8179856299403505	7 and 13	13 and 7
0 and 10	9's and 10's correlation = 0.8255061592128443	highly correlated=15
0's and 11's correlation = 0.8181743188921166	9 and 10	mean time of 0=0.0009718282987143248 seconds
0 and 11	9's and 11's correlation = 0.8256704657118819	mean time of 1=0.00043043576124060246 seconds
0's and 13's correlation = 0.8426024691471117	9 and 11	mean time of 2=0.0004308823410791295 seconds
0 and 13	10's and 0's correlation = 0.8179856299403505	mean time of 3=0.01891497632929387 seconds

mean time of 4=0.19811967547613246  
seconds

mean time of 5=33.27579513824623  
seconds

mean time of 6=0.03865469771487112  
seconds

mean time of 7=0.13002397104074026  
seconds

mean time of 8=0.05527692255173021  
seconds

mean time of 9=0.03923277245223067  
seconds

mean time of 10=0.1031958605496938  
seconds

mean time of  
11=0.03440031491163123 seconds

mean time of 12=0.0053422185755868  
seconds

mean time of  
13=0.22297984479947855 seconds

time needed = 111053.6341187954  
seconds

1048.0

experiment-1

>>>

## OUTPUT ANALYSIS:

In experiment-1,

5770 number of network (50 number of nodes per graph) for  $X_{in} > [X]_{out}$ ,

We created groups of correlated measures (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Group 3:

Degree centrality

Out-degree centrality

Group 4:

Closeness vitality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group 5:

Page rank scipy

Page rank numpy

In experiment-1,

5770 number of network (100 number of nodes per graph) for  $X_{in} > [X]_{out}$ ,

We created groups of correlated measures (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Group 3:

Degree centrality

Out-degree centrality

Group 4:

Page rank scipy

Page rank numpy

In-degree centrality

In experiment-1,

5770 number of network (500 number of nodes per graph) for  $X_{in} > \llbracket X \rrbracket_{out}$ ,

We created groups of correlated measures (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Group 3:

Degree centrality

Out-degree centrality



Group 4:

Page rank scipy

Page rank numpy

In-degree centrality

what we see from here , we get same result from 50,100 and 500 nodes except for 50 nodes betweenness centrality.

In experiment-1,

5240 number of network (50 number of nodes per graph) for  $X_{in} < [X]_{out}$  ,

We created groups of correlated measures (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Group 3:

Degree centrality

Out-degree centrality

Group 4:

Closeness vitality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group 5:

Page rank scipy

Page rank numpy

In-degree centrality

Group 6:

Eigenvector centrality

Page rank scipy

Page rank numpy

In experiment-1,

5240 number of network (100 number of nodes per graph) for  $X_{in} < [X]_{out}$ ,

We created groups of correlated measures (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Group 3:

Degree centrality

Out-degree centrality

Group 4:

Page rank scipy

Page rank numpy

In-degree centrality

Group 5:

Eigenvector centrality

Page rank scipy

Page rank numpy

In experiment-1,

5240 number of network (500 number of nodes per graph) for  $X_{in} < [X]_{out}$ ,

We created groups of correlated measures (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Page rank scipy

Page rank numpy

Group 3:

Degree centrality

Out-degree centrality

Group 4:

Eigenvector centrality

Page rank scipy

Page rank numpy

In experiment-1,

760 number of network (50 number of nodes per graph) for  $X_{in} = \llbracket X \rrbracket_{out}$ ,

We created groups of correlated measures (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Group 3:

Degree centrality

Out-degree centrality

Group 4:

Closeness vitality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group 5:

Page rank scipy

Page rank numpy

In-degree centrality

Group 6:

Eigenvector centrality

Page rank scipy

Page rank numpy

In experiment-1,

760 number of network (100 number of nodes per graph) for  $X_{in} = [X]_{out}$ ,

We created groups of correlated measures (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Group 3:

Degree centrality

Out-degree centrality

Group 4:

Page rank scipy

Page rank numpy

In-degree centrality

Group 5:

Eigenvector centrality

Page rank scipy

Page rank numpy

In experiment-1,

760 number of network (500 number of nodes per graph) for  $X_{in} = \llbracket X \rrbracket_{out}$ ,

We created groups of correlated measures (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Group 3:

Degree centrality

Out-degree centrality

Group 4:

Page rank scipy

Page rank numpy

In-degree centrality

Group 5:

Eigenvector centrality

Page rank scipy

Page rank numpy

In experiment-2, we found out,  
more correlated measures exist than in experiment-1.

experiment-1 all results exist in experiment-2.

But experiment-2's *X<sub>in</sub>* and *X<sub>out</sub>* are not well distributed,  
so, it is easily predictable that extra correlated measures of experiment-2  
(which are not in experiment-1) are not true for all kinds of directed scale-free  
network.

**RESULT:**

What we see, 50,100,500 nodes have common groups. So, these groups member are highly correlated for directed scale free graph.

We consider highly correlation is greater than or equal 0.8.

So, highly correlated group where members are highly correlated with each other

These highly correlated groups are:

**Xin>Xout for experiment-1:**

Highly correlated (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality



Group 3:

Degree centrality

Out-degree centrality

Group 4:

In-degree centrality

Page rank scipy

Page rank numpy

### **Xin<Xout for experiment-1:**

Highly correlated (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Group 3:

Degree centrality

Out-degree centrality

Group 4:

In-degree centrality

Page rank scipy

Page rank numpy

Group 5:

Eigen-vector centrality

Page rank scipy

Page rank numpy

**Xin=Xout for experiment-1:**

Highly correlated (correlation  $\geq 0.80$ ):

Group1:

Degree centrality

Betweenness centrality

Load centrality

Betweenness centrality subset

Group2:

Degree centrality

In-degree centrality

Group 3:

Degree centrality

Out-degree centrality

Group 4:

In-degree centrality

Page rank scipy

Page rank numpy

Group 5:

Eigen-vector centrality

Page rank scipy

Page rank numpy

## GRAPH TYPES:

Now, we are giving the graph's type bellow which were generated by "B. Bollobás, C. Borgs, J. Chayes, and O. Riordan, Directed scale-free graphs"[1] algorithm and used to find the correlation among 12 measures.

### Experiment-1's graph types for $X_{in} > X_{out}$ :

In experiment-1, each 5 graph's types are same but graphs are different from each other; because they are random graphs.

But for showing graphs types,

we are going to show one graph type from each similar 5 graph's types.

For example, Here, we skip showing 1 no.,2 no.,3 no.,4 no. graph's type because they are similar to 5 no. graph's type. We represent 5 no graph's type behalf of 1 no.,2 no.,3 no.,4 no. graph's type.

5 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=0.070000000000000028, x_{in}=2.7, x_{out}=2.15$

10 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=0.160000000000000014, x_{in}=2.7, x_{out}=2.2$

15 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=0.25, x_{in}=2.7, x_{out}=2.25$

20 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=0.33999999999999986, x_{in}=2.7, x_{out}=2.3$

25 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=0.430000000000000006, x_{in}=2.7, x_{out}=2.35$

30 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=0.520000000000000005, x_{in}=2.7, x_{out}=2.4$

35 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=0.610000000000000003, x_{in}=2.7, x_{out}=2.45$

40 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=0.700000000000000002, x_{in}=2.7, x_{out}=2.5$

45 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=0.79, x_{in}=2.7, x_{out}=2.55$

50 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.040000000000000036,delta\_out=0.88000000000000008,xin=2.7,xout=2.6  
55 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.040000000000000036,delta\_out=0.9699999999999998,xin=2.7,xout=2.65  
60 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.07000000000000028,xin=2.75,xout=2.15  
65 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.16000000000000014,xin=2.75,xout=2.2  
70 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.25,xin=2.75,xout=2.25  
75 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.3399999999999986,xin=2.75,xout=2.3  
80 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.4300000000000006,xin=2.75,xout=2.35  
85 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.5200000000000005,xin=2.75,xout=2.4  
90 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.6100000000000003,xin=2.75,xout=2.45  
95 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.7000000000000002,xin=2.75,xout=2.5  
100 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.79,xin=2.75,xout=2.55  
105 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.8800000000000008,xin=2.75,xout=2.6  
110 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=0.9699999999999998,xin=2.75,xout=2.65  
115 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=1.0600000000000005,xin=2.75,xout=2.7  
120 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.07000000000000028,xin=2.8,xout=2.15  
125 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.16000000000000014,xin=2.8,xout=2.2  
130 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.25,xin=2.8,xout=2.25  
135 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.3399999999999986,xin=2.8,xout=2.3  
140 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.4300000000000006,xin=2.8,xout=2.35  
145 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.5200000000000005,xin=2.8,xout=2.4  
150 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.6100000000000003,xin=2.8,xout=2.45  
155 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.7000000000000002,xin=2.8,xout=2.5  
160 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.79,xin=2.8,xout=2.55  
165 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.8800000000000008,xin=2.8,xout=2.6  
170 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=0.9699999999999998,xin=2.8,xout=2.65  
175 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=1.0600000000000005,xin=2.8,xout=2.7  
180 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=1.1500000000000004,xin=2.8,xout=2.75  
185 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.21999999999999975,delta\_out=0.07000000000000028,xin=2.85,xout=2.15  
190 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.21999999999999975,delta\_out=0.16000000000000014,xin=2.85,xout=2.2  
195 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.21999999999999975,delta\_out=0.25,xin=2.85,xout=2.25  
200 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.21999999999999975,delta\_out=0.3399999999999986,xin=2.85,xout=2.3  
205 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.21999999999999975,delta\_out=0.4300000000000006,xin=2.85,xout=2.35  
210 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.21999999999999975,delta\_out=0.5200000000000005,xin=2.85,xout=2.4

215 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2199999999999975,delta\_out=0.6100000000000003,xin=2.85,xout=2.45  
220 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2199999999999975,delta\_out=0.7000000000000002,xin=2.85,xout=2.5  
225 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2199999999999975,delta\_out=0.79,xin=2.85,xout=2.55  
230 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2199999999999975,delta\_out=0.8800000000000008,xin=2.85,xout=2.6  
235 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2199999999999975,delta\_out=0.969999999999998,xin=2.85,xout=2.65  
240 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2199999999999975,delta\_out=1.0600000000000005,xin=2.85,xout=2.7  
245 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2199999999999975,delta\_out=1.1500000000000004,xin=2.85,xout=2.75  
250 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2199999999999975,delta\_out=1.2400000000000002,xin=2.85,xout=2.8  
255 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.07000000000000028,xin=2.9,xout=2.15  
260 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.16000000000000014,xin=2.9,xout=2.2  
265 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.25,xin=2.9,xout=2.25  
270 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.3399999999999986,xin=2.9,xout=2.3  
275 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.4300000000000006,xin=2.9,xout=2.35  
280 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.5200000000000005,xin=2.9,xout=2.4  
285 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.6100000000000003,xin=2.9,xout=2.45  
290 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.7000000000000002,xin=2.9,xout=2.5  
295 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.79,xin=2.9,xout=2.55  
300 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.8800000000000008,xin=2.9,xout=2.6  
305 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=0.969999999999998,xin=2.9,xout=2.65  
310 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=1.0600000000000005,xin=2.9,xout=2.7  
315 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=1.1500000000000004,xin=2.9,xout=2.75  
320 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=1.2400000000000002,xin=2.9,xout=2.8  
325 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.279999999999998,delta\_out=1.33,xin=2.9,xout=2.85  
330 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.3399999999999986,delta\_out=0.07000000000000028,xin=2.95,xout=2.15  
335 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.3399999999999986,delta\_out=0.16000000000000014,xin=2.95,xout=2.2  
340 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.3399999999999986,delta\_out=0.25,xin=2.95,xout=2.25  
345 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.3399999999999986,delta\_out=0.3399999999999986,xin=2.95,xout=2.3  
350 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.3399999999999986,delta\_out=0.4300000000000006,xin=2.95,xout=2.35  
355 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.3399999999999986,delta\_out=0.5200000000000005,xin=2.95,xout=2.4  
360 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.3399999999999986,delta\_out=0.6100000000000003,xin=2.95,xout=2.45  
365 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.3399999999999986,delta\_out=0.7000000000000002,xin=2.95,xout=2.5  
370 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.3399999999999986,delta\_out=0.79,xin=2.95,xout=2.55  
375 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.3399999999999986,delta\_out=0.8800000000000008,xin=2.95,xout=2.6

380 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3399999999999986, \delta_{out}=0.969999999999998, x_{in}=2.95, x_{out}=2.65$

385 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3399999999999986, \delta_{out}=1.0600000000000005, x_{in}=2.95, x_{out}=2.7$

390 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3399999999999986, \delta_{out}=1.1500000000000004, x_{in}=2.95, x_{out}=2.75$

395 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3399999999999986, \delta_{out}=1.2400000000000002, x_{in}=2.95, x_{out}=2.8$

400 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3399999999999986, \delta_{out}=1.33, x_{in}=2.95, x_{out}=2.85$

405 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3399999999999986, \delta_{out}=1.42, x_{in}=2.95, x_{out}=2.9$

410 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.07000000000000028, x_{in}=3.0, x_{out}=2.15$

415 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.16000000000000014, x_{in}=3.0, x_{out}=2.2$

420 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.25, x_{in}=3.0, x_{out}=2.25$

425 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.3399999999999986, x_{in}=3.0, x_{out}=2.3$

430 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.4300000000000006, x_{in}=3.0, x_{out}=2.35$

435 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.5200000000000005, x_{in}=3.0, x_{out}=2.4$

440 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.6100000000000003, x_{in}=3.0, x_{out}=2.45$

445 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.7000000000000002, x_{in}=3.0, x_{out}=2.5$

450 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.79, x_{in}=3.0, x_{out}=2.55$

455 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.8800000000000008, x_{in}=3.0, x_{out}=2.6$

460 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=0.969999999999998, x_{in}=3.0, x_{out}=2.65$

465 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=1.0600000000000005, x_{in}=3.0, x_{out}=2.7$

470 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=1.1500000000000004, x_{in}=3.0, x_{out}=2.75$

475 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=1.2400000000000002, x_{in}=3.0, x_{out}=2.8$

480 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=1.33, x_{in}=3.0, x_{out}=2.85$

485 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=1.42, x_{in}=3.0, x_{out}=2.9$

490 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3999999999999947, \delta_{out}=1.5100000000000007, x_{in}=3.0, x_{out}=2.95$

495 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=0.087499999999998, x_{in}=2.45, x_{out}=2.15$

500 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=0.1999999999999962, x_{in}=2.45, x_{out}=2.2$

505 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=0.3124999999999944, x_{in}=2.45, x_{out}=2.25$

510 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=0.4249999999999927, x_{in}=2.45, x_{out}=2.3$

515 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=0.537499999999991, x_{in}=2.45, x_{out}=2.35$

520 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=0.649999999999989, x_{in}=2.45, x_{out}=2.4$

525 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.1249999999999956, \delta_{out}=0.087499999999998, x_{in}=2.5, x_{out}=2.15$

530 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.1249999999999956, \delta_{out}=0.1999999999999962, x_{in}=2.5, x_{out}=2.2$

535 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.1249999999999956, \delta_{out}=0.3124999999999944, x_{in}=2.5, x_{out}=2.25$

540 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.1249999999999956, \delta_{out}=0.4249999999999927, x_{in}=2.5, x_{out}=2.3$

545 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.1249999999999956, \delta_{out}=0.537499999999991, x_{in}=2.5, x_{out}=2.35$

550 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.1249999999999956, \delta_{out}=0.649999999999989, x_{in}=2.5, x_{out}=2.4$

555 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.1249999999999956, \delta_{out}=0.762499999999998, x_{in}=2.5, x_{out}=2.45$

560 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.212499999999988, \delta_{out}=0.087499999999998, x_{in}=2.55, x_{out}=2.15$

565 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.212499999999988, \delta_{out}=0.199999999999962, x_{in}=2.55, x_{out}=2.2$

570 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.212499999999988, \delta_{out}=0.312499999999944, x_{in}=2.55, x_{out}=2.25$

575 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.212499999999988, \delta_{out}=0.424999999999927, x_{in}=2.55, x_{out}=2.3$

580 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.212499999999988, \delta_{out}=0.537499999999991, x_{in}=2.55, x_{out}=2.35$

585 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.212499999999988, \delta_{out}=0.649999999999989, x_{in}=2.55, x_{out}=2.4$

590 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.212499999999988, \delta_{out}=0.762499999999998, x_{in}=2.55, x_{out}=2.45$

595 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.212499999999988, \delta_{out}=0.874999999999997, x_{in}=2.55, x_{out}=2.5$

600 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.299999999999916, \delta_{out}=0.087499999999998, x_{in}=2.6, x_{out}=2.15$

605 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.299999999999916, \delta_{out}=0.199999999999962, x_{in}=2.6, x_{out}=2.2$

610 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.299999999999916, \delta_{out}=0.312499999999944, x_{in}=2.6, x_{out}=2.25$

615 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.299999999999916, \delta_{out}=0.424999999999927, x_{in}=2.6, x_{out}=2.3$

620 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.299999999999916, \delta_{out}=0.537499999999991, x_{in}=2.6, x_{out}=2.35$

625 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.299999999999916, \delta_{out}=0.649999999999989, x_{in}=2.6, x_{out}=2.4$

630 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.299999999999916, \delta_{out}=0.762499999999998, x_{in}=2.6, x_{out}=2.45$

635 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.299999999999916, \delta_{out}=0.874999999999997, x_{in}=2.6, x_{out}=2.5$

640 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.299999999999916, \delta_{out}=0.987499999999984, x_{in}=2.6, x_{out}=2.55$

645 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.387499999999995, \delta_{out}=0.087499999999998, x_{in}=2.65, x_{out}=2.15$

650 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.387499999999995, \delta_{out}=0.199999999999962, x_{in}=2.65, x_{out}=2.2$

655 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.387499999999995, \delta_{out}=0.312499999999944, x_{in}=2.65, x_{out}=2.25$

660 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.387499999999995, \delta_{out}=0.424999999999927, x_{in}=2.65, x_{out}=2.3$

665 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.387499999999995, \delta_{out}=0.537499999999991, x_{in}=2.65, x_{out}=2.35$

670 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.387499999999995, \delta_{out}=0.649999999999989, x_{in}=2.65, x_{out}=2.4$

675 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.387499999999995, \delta_{out}=0.762499999999998, x_{in}=2.65, x_{out}=2.45$

680 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.387499999999995, \delta_{out}=0.874999999999997, x_{in}=2.65, x_{out}=2.5$

685 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.387499999999995, \delta_{out}=0.987499999999984, x_{in}=2.65, x_{out}=2.55$

690 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.387499999999995, \delta_{out}=1.099999999999992, x_{in}=2.65, x_{out}=2.6$

695 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.474999999999987, \delta_{out}=0.087499999999998, x_{in}=2.7, x_{out}=2.15$

700 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.474999999999987, \delta_{out}=0.199999999999962, x_{in}=2.7, x_{out}=2.2$

705 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.474999999999987, \delta_{out}=0.312499999999944, x_{in}=2.7, x_{out}=2.25$



710 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4749999999999987, \delta_{out}=0.4249999999999927, x_{in}=2.7, x_{out}=2.3$

715 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4749999999999987, \delta_{out}=0.5374999999999991, x_{in}=2.7, x_{out}=2.35$

720 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4749999999999987, \delta_{out}=0.6499999999999989, x_{in}=2.7, x_{out}=2.4$

725 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4749999999999987, \delta_{out}=0.7624999999999998, x_{in}=2.7, x_{out}=2.45$

730 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4749999999999987, \delta_{out}=0.8749999999999997, x_{in}=2.7, x_{out}=2.5$

735 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4749999999999987, \delta_{out}=0.9874999999999984, x_{in}=2.7, x_{out}=2.55$

740 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4749999999999987, \delta_{out}=1.0999999999999992, x_{in}=2.7, x_{out}=2.6$

745 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4749999999999987, \delta_{out}=1.2124999999999999, x_{in}=2.7, x_{out}=2.65$

750 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=0.0874999999999998, x_{in}=2.75, x_{out}=2.15$

755 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=0.1999999999999962, x_{in}=2.75, x_{out}=2.2$

760 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=0.3124999999999944, x_{in}=2.75, x_{out}=2.25$

765 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=0.4249999999999927, x_{in}=2.75, x_{out}=2.3$

770 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=0.5374999999999991, x_{in}=2.75, x_{out}=2.35$

775 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=0.6499999999999989, x_{in}=2.75, x_{out}=2.4$

780 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=0.7624999999999998, x_{in}=2.75, x_{out}=2.45$

785 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=0.8749999999999997, x_{in}=2.75, x_{out}=2.5$

790 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=0.9874999999999984, x_{in}=2.75, x_{out}=2.55$

795 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=1.0999999999999992, x_{in}=2.75, x_{out}=2.6$

800 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=1.2124999999999999, x_{in}=2.75, x_{out}=2.65$

805 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.5624999999999991, \delta_{out}=1.3249999999999988, x_{in}=2.75, x_{out}=2.7$

810 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=0.0874999999999998, x_{in}=2.8, x_{out}=2.15$

815 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=0.1999999999999962, x_{in}=2.8, x_{out}=2.2$

820 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=0.3124999999999944, x_{in}=2.8, x_{out}=2.25$

825 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=0.4249999999999927, x_{in}=2.8, x_{out}=2.3$

830 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=0.5374999999999991, x_{in}=2.8, x_{out}=2.35$

835 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=0.6499999999999989, x_{in}=2.8, x_{out}=2.4$

840 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=0.7624999999999998, x_{in}=2.8, x_{out}=2.45$

845 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=0.8749999999999997, x_{in}=2.8, x_{out}=2.5$

850 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=0.9874999999999984, x_{in}=2.8, x_{out}=2.55$

855 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=1.0999999999999992, x_{in}=2.8, x_{out}=2.6$

860 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=1.2124999999999999, x_{in}=2.8, x_{out}=2.65$

865 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=1.3249999999999988, x_{in}=2.8, x_{out}=2.7$

870 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6499999999999995, \delta_{out}=1.4374999999999987, x_{in}=2.8, x_{out}=2.75$

875 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=0.0874999999999998, x_{in}=2.85, x_{out}=2.15$

880 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=0.1999999999999962, x_{in}=2.85, x_{out}=2.2$

885 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=0.3124999999999944, x_{in}=2.85, x_{out}=2.25$

890 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=0.4249999999999927, x_{in}=2.85, x_{out}=2.3$

895 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=0.537499999999991, x_{in}=2.85, x_{out}=2.35$

900 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=0.649999999999989, x_{in}=2.85, x_{out}=2.4$

905 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=0.762499999999998, x_{in}=2.85, x_{out}=2.45$

910 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=0.874999999999997, x_{in}=2.85, x_{out}=2.5$

915 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=0.987499999999984, x_{in}=2.85, x_{out}=2.55$

920 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=1.099999999999992, x_{in}=2.85, x_{out}=2.6$

925 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=1.212499999999999, x_{in}=2.85, x_{out}=2.65$

930 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=1.324999999999988, x_{in}=2.85, x_{out}=2.7$

935 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=1.437499999999987, x_{in}=2.85, x_{out}=2.75$

940 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.7374999999999998, \delta_{out}=1.549999999999985, x_{in}=2.85, x_{out}=2.8$

945 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=0.087499999999998, x_{in}=2.9, x_{out}=2.15$

950 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=0.1999999999999962, x_{in}=2.9, x_{out}=2.2$

955 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=0.3124999999999944, x_{in}=2.9, x_{out}=2.25$

960 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=0.4249999999999927, x_{in}=2.9, x_{out}=2.3$

965 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=0.537499999999991, x_{in}=2.9, x_{out}=2.35$

970 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=0.649999999999989, x_{in}=2.9, x_{out}=2.4$

975 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=0.762499999999998, x_{in}=2.9, x_{out}=2.45$

980 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=0.874999999999997, x_{in}=2.9, x_{out}=2.5$

985 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=0.987499999999984, x_{in}=2.9, x_{out}=2.55$

990 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=1.099999999999992, x_{in}=2.9, x_{out}=2.6$

995 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=1.212499999999999, x_{in}=2.9, x_{out}=2.65$

1000 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=1.324999999999988, x_{in}=2.9, x_{out}=2.7$

1005 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=1.437499999999987, x_{in}=2.9, x_{out}=2.75$

1010 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=1.549999999999985, x_{in}=2.9, x_{out}=2.8$

1015 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.824999999999991, \delta_{out}=1.662499999999994, x_{in}=2.9, x_{out}=2.85$

1020 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.912499999999994, \delta_{out}=0.087499999999998, x_{in}=2.95, x_{out}=2.15$

1025 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.912499999999994, \delta_{out}=0.1999999999999962, x_{in}=2.95, x_{out}=2.2$

1030 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.912499999999994, \delta_{out}=0.3124999999999944, x_{in}=2.95, x_{out}=2.25$

1035 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.912499999999994, \delta_{out}=0.4249999999999927, x_{in}=2.95, x_{out}=2.3$

1040 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=0.5374999999999991,xin=2.95,xout=2.35  
1045 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=0.6499999999999989,xin=2.95,xout=2.4  
1050 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=0.7624999999999998,xin=2.95,xout=2.45  
1055 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=0.8749999999999997,xin=2.95,xout=2.5  
1060 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=0.9874999999999984,xin=2.95,xout=2.55  
1065 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=1.0999999999999992,xin=2.95,xout=2.6  
1070 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=1.212499999999999,xin=2.95,xout=2.65  
1075 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=1.3249999999999988,xin=2.95,xout=2.7  
1080 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=1.4374999999999987,xin=2.95,xout=2.75  
1085 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=1.5499999999999985,xin=2.95,xout=2.8  
1090 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=1.6624999999999994,xin=2.95,xout=2.85  
1095 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=1.7749999999999992,xin=2.95,xout=2.9  
1100 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=0.0874999999999998,xin=3.0,xout=2.15  
1105 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=0.1999999999999962,xin=3.0,xout=2.2  
1110 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=0.3124999999999944,xin=3.0,xout=2.25  
1115 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=0.4249999999999927,xin=3.0,xout=2.3  
1120 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=0.5374999999999991,xin=3.0,xout=2.35  
1125 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=0.6499999999999989,xin=3.0,xout=2.4  
1130 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=0.7624999999999998,xin=3.0,xout=2.45  
1135 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=0.8749999999999997,xin=3.0,xout=2.5  
1140 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=0.9874999999999984,xin=3.0,xout=2.55  
1145 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=1.0999999999999992,xin=3.0,xout=2.6  
1150 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=1.212499999999999,xin=3.0,xout=2.65  
1155 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=1.3249999999999988,xin=3.0,xout=2.7  
1160 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=1.4374999999999987,xin=3.0,xout=2.75  
1165 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=1.5499999999999985,xin=3.0,xout=2.8  
1170 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=1.6624999999999994,xin=3.0,xout=2.85  
1175 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=1.7749999999999992,xin=3.0,xout=2.9  
1180 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=1.887499999999999,xin=3.0,xout=2.95  
1185 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.13333333333333194,delta\_out=0.1166666666666638,xin=2.3,xout=2.15  
1190 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.13333333333333194,delta\_out=0.266666666666669,xin=2.3,xout=2.2  
1195 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.13333333333333194,delta\_out=0.416666666666663,xin=2.3,xout=2.25  
1200 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.266666666666661,delta\_out=0.1166666666666638,xin=2.35,xout=2.15

1205 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.2666666666666661,delta\_out=0.2666666666666669,xin=2.35,xout=2.2

1210 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.2666666666666661,delta\_out=0.4166666666666663,xin=2.35,xout=2.25

1215 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.2666666666666661,delta\_out=0.5666666666666663,xin=2.35,xout=2.3

1220 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.399999999999998,delta\_out=0.11666666666666638,xin=2.4,xout=2.15

1225 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.399999999999998,delta\_out=0.2666666666666669,xin=2.4,xout=2.2

1230 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.399999999999998,delta\_out=0.4166666666666663,xin=2.4,xout=2.25

1235 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.399999999999998,delta\_out=0.5666666666666663,xin=2.4,xout=2.3

1240 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.399999999999998,delta\_out=0.7166666666666661,xin=2.4,xout=2.35

1245 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.533333333333333,delta\_out=0.11666666666666638,xin=2.45,xout=2.15

1250 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.533333333333333,delta\_out=0.2666666666666669,xin=2.45,xout=2.2

1255 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.533333333333333,delta\_out=0.4166666666666663,xin=2.45,xout=2.25

1260 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.533333333333333,delta\_out=0.5666666666666663,xin=2.45,xout=2.3

1265 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.533333333333333,delta\_out=0.7166666666666661,xin=2.45,xout=2.35

1270 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.533333333333333,delta\_out=0.8666666666666658,xin=2.45,xout=2.4

1275 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6666666666666656,delta\_out=0.11666666666666638,xin=2.5,xout=2.15

1280 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6666666666666656,delta\_out=0.2666666666666669,xin=2.5,xout=2.2

1285 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6666666666666656,delta\_out=0.4166666666666663,xin=2.5,xout=2.25

1290 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6666666666666656,delta\_out=0.5666666666666663,xin=2.5,xout=2.3

1295 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6666666666666656,delta\_out=0.7166666666666661,xin=2.5,xout=2.35

1300 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6666666666666656,delta\_out=0.8666666666666658,xin=2.5,xout=2.4

1305 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6666666666666656,delta\_out=1.016666666666667,xin=2.5,xout=2.45

1310 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.7999999999999984,delta\_out=0.11666666666666638,xin=2.55,xout=2.15

1315 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.7999999999999984,delta\_out=0.2666666666666669,xin=2.55,xout=2.2

1320 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.7999999999999984,delta\_out=0.4166666666666663,xin=2.55,xout=2.25

1325 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.7999999999999984,delta\_out=0.5666666666666663,xin=2.55,xout=2.3

1330 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.7999999999999984,delta\_out=0.7166666666666661,xin=2.55,xout=2.35

1335 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.7999999999999984,delta\_out=0.8666666666666658,xin=2.55,xout=2.4

1340 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.7999999999999984,delta\_out=1.016666666666667,xin=2.55,xout=2.45

1345 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.7999999999999984,delta\_out=1.166666666666667,xin=2.55,xout=2.5

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1355 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.933333333333332,delta\_out=0.2666666666666669,xin=2.6,xout=2.2

1360 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.933333333333332,delta\_out=0.4166666666666663,xin=2.6,xout=2.25

1365 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.933333333333332,delta\_out=0.5666666666666663,xin=2.6,xout=2.3

1370 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.933333333333332,delta\_out=0.716666666666661,xin=2.6,xout=2.35  
1375 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.933333333333332,delta\_out=0.866666666666658,xin=2.6,xout=2.4  
1380 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.933333333333332,delta\_out=1.016666666666667,xin=2.6,xout=2.45  
1385 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.933333333333332,delta\_out=1.166666666666667,xin=2.6,xout=2.5  
1390 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.933333333333332,delta\_out=1.316666666666665,xin=2.6,xout=2.55  
1395 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.066666666666653,delta\_out=0.1166666666666638,xin=2.65,xout=2.15  
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5315 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=1.2000000000000001,delta\_out=0.6599999999999997,xin=3.0,xout=2.9  
5320 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=1.2000000000000001,delta\_out=0.73,xin=3.0,xout=2.95  
5325 no. graph's alpha=0.4,beta=0.1,gamma=0.5,delta\_in=0.0,delta\_out=0.0222222222222224,xin=3.0,xout=2.7

5330 no. graph's alpha=0.4,beta=0.1,gamma=0.5,delta\_in=0.0,delta\_out=0.055555555555555536,xin=3.0,xout=2.75  
5335 no. graph's alpha=0.4,beta=0.1,gamma=0.5,delta\_in=0.0,delta\_out=0.088888888888888873,xin=3.0,xout=2.8  
5340 no. graph's alpha=0.4,beta=0.1,gamma=0.5,delta\_in=0.0,delta\_out=0.122222222222222208,xin=3.0,xout=2.85  
5345 no. graph's alpha=0.4,beta=0.1,gamma=0.5,delta\_in=0.0,delta\_out=0.155555555555555545,xin=3.0,xout=2.9  
5350 no. graph's alpha=0.4,beta=0.1,gamma=0.5,delta\_in=0.0,delta\_out=0.1888888888888888,xin=3.0,xout=2.95  
5355 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.06250000000000061,delta\_out=0.02500000000000577,xin=2.75,xout=2.7  
5360 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.1000000000000037,delta\_out=0.02500000000000577,xin=2.8,xout=2.7  
5365 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.1000000000000037,delta\_out=0.0625000000000033,xin=2.8,xout=2.75  
5370 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.1375000000000068,delta\_out=0.02500000000000577,xin=2.85,xout=2.7  
5375 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.1375000000000068,delta\_out=0.0625000000000033,xin=2.85,xout=2.75  
5380 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.1375000000000068,delta\_out=0.100000000000009,xin=2.85,xout=2.8  
5385 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.1750000000000043,delta\_out=0.02500000000000577,xin=2.9,xout=2.7  
5390 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.1750000000000043,delta\_out=0.0625000000000033,xin=2.9,xout=2.75  
5395 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.1750000000000043,delta\_out=0.100000000000009,xin=2.9,xout=2.8  
5400 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.1750000000000043,delta\_out=0.137500000000004,xin=2.9,xout=2.85  
5405 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.2125000000000074,delta\_out=0.02500000000000577,xin=2.95,xout=2.7  
5410 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.2125000000000074,delta\_out=0.0625000000000033,xin=2.95,xout=2.75  
5415 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.2125000000000074,delta\_out=0.100000000000009,xin=2.95,xout=2.8  
5420 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.2125000000000074,delta\_out=0.137500000000004,xin=2.95,xout=2.85  
5425 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.2125000000000074,delta\_out=0.1750000000000016,xin=2.95,xout=2.9  
5430 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.250000000000005,delta\_out=0.02500000000000577,xin=3.0,xout=2.7  
5435 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.250000000000005,delta\_out=0.0625000000000033,xin=3.0,xout=2.75  
5440 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.250000000000005,delta\_out=0.100000000000009,xin=3.0,xout=2.8  
5445 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.250000000000005,delta\_out=0.137500000000004,xin=3.0,xout=2.85  
5450 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.250000000000005,delta\_out=0.1750000000000016,xin=3.0,xout=2.9  
5455 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.250000000000005,delta\_out=0.2125000000000047,xin=3.0,xout=2.95  
5460 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.3214285714285713,delta\_out=0.0285714285714286,xin=2.75,xout=2.7  
5465 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.37142857142857083,delta\_out=0.0285714285714286,xin=2.8,xout=2.7  
5470 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.37142857142857083,delta\_out=0.07142857142857117,xin=2.8,xout=2.75  
5475 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.42142857142857104,delta\_out=0.0285714285714286,xin=2.85,xout=2.7  
5480 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.42142857142857104,delta\_out=0.07142857142857117,xin=2.85,xout=2.75  
5485 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.42142857142857104,delta\_out=0.11428571428571407,xin=2.85,xout=2.8  
5490 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.47142857142857125,delta\_out=0.0285714285714286,xin=2.9,xout=2.7

5495 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.47142857142857125,delta\_out=0.07142857142857117,xin=2.9,xout=2.75  
5500 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.47142857142857125,delta\_out=0.11428571428571407,xin=2.9,xout=2.8  
5505 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.47142857142857125,delta\_out=0.15714285714285697,xin=2.9,xout=2.85  
5510 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5214285714285715,delta\_out=0.0285714285714286,xin=2.95,xout=2.7  
5515 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5214285714285715,delta\_out=0.07142857142857117,xin=2.95,xout=2.75  
5520 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5214285714285715,delta\_out=0.11428571428571407,xin=2.95,xout=2.8  
5525 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5214285714285715,delta\_out=0.15714285714285697,xin=2.95,xout=2.85  
5530 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5214285714285715,delta\_out=0.1999999999999987,xin=2.95,xout=2.9  
5535 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5714285714285711,delta\_out=0.0285714285714286,xin=3.0,xout=2.7  
5540 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5714285714285711,delta\_out=0.07142857142857117,xin=3.0,xout=2.75  
5545 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5714285714285711,delta\_out=0.11428571428571407,xin=3.0,xout=2.8  
5550 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5714285714285711,delta\_out=0.15714285714285697,xin=3.0,xout=2.85  
5555 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5714285714285711,delta\_out=0.1999999999999987,xin=3.0,xout=2.9  
5560 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5714285714285711,delta\_out=0.24285714285714277,xin=3.0,xout=2.95  
5565 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.6666666666666672,delta\_out=0.0333333333333373,xin=2.75,xout=2.7  
5570 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.733333333333332,delta\_out=0.0333333333333373,xin=2.8,xout=2.7  
5575 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.733333333333332,delta\_out=0.0833333333333413,xin=2.8,xout=2.75  
5580 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.8000000000000006,delta\_out=0.0333333333333373,xin=2.85,xout=2.7  
5585 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.8000000000000006,delta\_out=0.0833333333333413,xin=2.85,xout=2.75  
5590 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.8000000000000006,delta\_out=0.133333333333338,xin=2.85,xout=2.8  
5595 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.8666666666666666,delta\_out=0.0333333333333373,xin=2.9,xout=2.7  
5600 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.8666666666666666,delta\_out=0.0833333333333413,xin=2.9,xout=2.75  
5605 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.8666666666666666,delta\_out=0.133333333333338,xin=2.9,xout=2.8  
5610 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.8666666666666666,delta\_out=0.183333333333342,xin=2.9,xout=2.85  
5615 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.933333333333334,delta\_out=0.0333333333333373,xin=2.95,xout=2.7  
5620 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.933333333333334,delta\_out=0.0833333333333413,xin=2.95,xout=2.75  
5625 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.933333333333334,delta\_out=0.133333333333338,xin=2.95,xout=2.8  
5630 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.933333333333334,delta\_out=0.183333333333342,xin=2.95,xout=2.85  
5635 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.933333333333334,delta\_out=0.2333333333333386,xin=2.95,xout=2.9  
5640 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=1.0000000000000007,delta\_out=0.0333333333333373,xin=3.0,xout=2.7  
5645 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=1.0000000000000007,delta\_out=0.0833333333333413,xin=3.0,xout=2.75  
5650 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=1.0000000000000007,delta\_out=0.133333333333338,xin=3.0,xout=2.8  
5655 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=1.0000000000000007,delta\_out=0.183333333333342,xin=3.0,xout=2.85

5660 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=1.0000000000000007,delta\_out=0.2333333333333386,xin=3.0,xout=2.9  
5665 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=1.0000000000000007,delta\_out=0.2833333333333427,xin=3.0,xout=2.95  
5670 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.1500000000000004,delta\_out=0.04000000000000036,xin=2.75,xout=2.7  
5675 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.2400000000000002,delta\_out=0.04000000000000036,xin=2.8,xout=2.7  
5680 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.2400000000000002,delta\_out=0.0999999999999964,xin=2.8,xout=2.75  
5685 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.33,delta\_out=0.04000000000000036,xin=2.85,xout=2.7  
5690 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.33,delta\_out=0.0999999999999964,xin=2.85,xout=2.75  
5695 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.33,delta\_out=0.1599999999999997,xin=2.85,xout=2.8  
5700 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.42,delta\_out=0.04000000000000036,xin=2.9,xout=2.7  
5705 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.42,delta\_out=0.0999999999999964,xin=2.9,xout=2.75  
5710 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.42,delta\_out=0.1599999999999997,xin=2.9,xout=2.8  
5715 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.42,delta\_out=0.2199999999999975,xin=2.9,xout=2.85  
5720 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.5100000000000007,delta\_out=0.04000000000000036,xin=2.95,xout=2.7  
5725 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.5100000000000007,delta\_out=0.0999999999999964,xin=2.95,xout=2.75  
5730 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.5100000000000007,delta\_out=0.1599999999999997,xin=2.95,xout=2.8  
5735 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.5100000000000007,delta\_out=0.2199999999999975,xin=2.95,xout=2.85  
5740 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.5100000000000007,delta\_out=0.2799999999999998,xin=2.95,xout=2.9  
5745 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.6000000000000005,delta\_out=0.04000000000000036,xin=3.0,xout=2.7  
5750 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.6000000000000005,delta\_out=0.0999999999999964,xin=3.0,xout=2.75  
5755 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.6000000000000005,delta\_out=0.1599999999999997,xin=3.0,xout=2.8  
5760 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.6000000000000005,delta\_out=0.2199999999999975,xin=3.0,xout=2.85  
5765 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.6000000000000005,delta\_out=0.2799999999999998,xin=3.0,xout=2.9  
5770 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.6000000000000005,delta\_out=0.3399999999999986,xin=3.0,xout=2.95

### Experiment-1's graph types for $X_{in} < X_{out}$ :

In experiment-1, each 5 graph's types are same but graphs are different from each other; because they are random graphs.

But for showing graphs types, we are going to show one graph type from each similar 5 graph's types.

For example, Here, we skip showing 1 no.,2 no.,3 no.,4 no. graph's type because they are similar to 5 no. graph's type. We represent 5 no graph's type behalf of 1 no.,2 no.,3 no.,4 no. graph's type.

- 5 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=1.1500000000000004, x_{in}=2.7, x_{out}=2.75$
- 10 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=1.2400000000000002, x_{in}=2.7, x_{out}=2.8$
- 15 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=1.33, x_{in}=2.7, x_{out}=2.85$
- 20 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=1.42, x_{in}=2.7, x_{out}=2.9$
- 25 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=1.5100000000000007, x_{in}=2.7, x_{out}=2.95$
- 30 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.040000000000000036, \delta_{out}=1.6000000000000005, x_{in}=2.7, x_{out}=3.0$
- 35 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0999999999999964, \delta_{out}=1.2400000000000002, x_{in}=2.75, x_{out}=2.8$
- 40 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0999999999999964, \delta_{out}=1.33, x_{in}=2.75, x_{out}=2.85$
- 45 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0999999999999964, \delta_{out}=1.42, x_{in}=2.75, x_{out}=2.9$
- 50 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0999999999999964, \delta_{out}=1.5100000000000007, x_{in}=2.75, x_{out}=2.95$
- 55 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0999999999999964, \delta_{out}=1.6000000000000005, x_{in}=2.75, x_{out}=3.0$
- 60 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.159999999999997, \delta_{out}=1.33, x_{in}=2.8, x_{out}=2.85$
- 65 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.159999999999997, \delta_{out}=1.42, x_{in}=2.8, x_{out}=2.9$
- 70 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.159999999999997, \delta_{out}=1.5100000000000007, x_{in}=2.8, x_{out}=2.95$
- 75 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.159999999999997, \delta_{out}=1.6000000000000005, x_{in}=2.8, x_{out}=3.0$
- 80 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.2199999999999975, \delta_{out}=1.42, x_{in}=2.85, x_{out}=2.9$
- 85 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.2199999999999975, \delta_{out}=1.5100000000000007, x_{in}=2.85, x_{out}=2.95$
- 90 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.2199999999999975, \delta_{out}=1.6000000000000005, x_{in}=2.85, x_{out}=3.0$
- 95 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.279999999999998, \delta_{out}=1.5100000000000007, x_{in}=2.9, x_{out}=2.95$
- 100 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.279999999999998, \delta_{out}=1.6000000000000005, x_{in}=2.9, x_{out}=3.0$
- 105 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.3399999999999986, \delta_{out}=1.6000000000000005, x_{in}=2.95, x_{out}=3.0$
- 110 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=0.874999999999997, x_{in}=2.45, x_{out}=2.5$
- 115 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=0.9874999999999984, x_{in}=2.45, x_{out}=2.55$
- 120 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=1.099999999999992, x_{in}=2.45, x_{out}=2.6$
- 125 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=1.212499999999999, x_{in}=2.45, x_{out}=2.65$
- 130 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=1.3249999999999988, x_{in}=2.45, x_{out}=2.7$
- 135 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=1.4374999999999987, x_{in}=2.45, x_{out}=2.75$
- 140 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=1.5499999999999985, x_{in}=2.45, x_{out}=2.8$



145 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=1.6624999999999994, x_{in}=2.45, x_{out}=2.85$

150 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=1.7749999999999992, x_{in}=2.45, x_{out}=2.9$

155 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=1.8874999999999999, x_{in}=2.45, x_{out}=2.95$

160 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.03750000000000031, \delta_{out}=1.9999999999999999, x_{in}=2.45, x_{out}=3.0$

165 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.12499999999999956, \delta_{out}=0.9874999999999984, x_{in}=2.5, x_{out}=2.55$

170 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.12499999999999956, \delta_{out}=1.0999999999999992, x_{in}=2.5, x_{out}=2.6$

175 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.12499999999999956, \delta_{out}=1.2124999999999999, x_{in}=2.5, x_{out}=2.65$

180 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.12499999999999956, \delta_{out}=1.3249999999999988, x_{in}=2.5, x_{out}=2.7$

185 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.12499999999999956, \delta_{out}=1.4374999999999987, x_{in}=2.5, x_{out}=2.75$

190 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.12499999999999956, \delta_{out}=1.5499999999999985, x_{in}=2.5, x_{out}=2.8$

195 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.12499999999999956, \delta_{out}=1.6624999999999994, x_{in}=2.5, x_{out}=2.85$

200 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.12499999999999956, \delta_{out}=1.7749999999999992, x_{in}=2.5, x_{out}=2.9$

205 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.12499999999999956, \delta_{out}=1.8874999999999999, x_{in}=2.5, x_{out}=2.95$

210 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.12499999999999956, \delta_{out}=1.9999999999999999, x_{in}=2.5, x_{out}=3.0$

215 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.21249999999999988, \delta_{out}=1.0999999999999992, x_{in}=2.55, x_{out}=2.6$

220 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.21249999999999988, \delta_{out}=1.2124999999999999, x_{in}=2.55, x_{out}=2.65$

225 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.21249999999999988, \delta_{out}=1.3249999999999988, x_{in}=2.55, x_{out}=2.7$

230 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.21249999999999988, \delta_{out}=1.4374999999999987, x_{in}=2.55, x_{out}=2.75$

235 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.21249999999999988, \delta_{out}=1.5499999999999985, x_{in}=2.55, x_{out}=2.8$

240 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.21249999999999988, \delta_{out}=1.6624999999999994, x_{in}=2.55, x_{out}=2.85$

245 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.21249999999999988, \delta_{out}=1.7749999999999992, x_{in}=2.55, x_{out}=2.9$

250 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.21249999999999988, \delta_{out}=1.8874999999999999, x_{in}=2.55, x_{out}=2.95$

255 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.21249999999999988, \delta_{out}=1.9999999999999999, x_{in}=2.55, x_{out}=3.0$

260 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.29999999999999916, \delta_{out}=1.2124999999999999, x_{in}=2.6, x_{out}=2.65$

265 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.29999999999999916, \delta_{out}=1.3249999999999988, x_{in}=2.6, x_{out}=2.7$

270 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.29999999999999916, \delta_{out}=1.4374999999999987, x_{in}=2.6, x_{out}=2.75$

275 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.29999999999999916, \delta_{out}=1.5499999999999985, x_{in}=2.6, x_{out}=2.8$

280 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.29999999999999916, \delta_{out}=1.6624999999999994, x_{in}=2.6, x_{out}=2.85$

285 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.29999999999999916, \delta_{out}=1.7749999999999992, x_{in}=2.6, x_{out}=2.9$

290 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.29999999999999916, \delta_{out}=1.8874999999999999, x_{in}=2.6, x_{out}=2.95$

295 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.29999999999999916, \delta_{out}=1.9999999999999999, x_{in}=2.6, x_{out}=3.0$

300 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.3874999999999995, \delta_{out}=1.3249999999999988, x_{in}=2.65, x_{out}=2.7$

305 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.3874999999999995, \delta_{out}=1.4374999999999987, x_{in}=2.65, x_{out}=2.75$

310 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.3874999999999995,delta\_out=1.549999999999985,xin=2.65,xout=2.8  
315 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.3874999999999995,delta\_out=1.662499999999994,xin=2.65,xout=2.85  
320 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.3874999999999995,delta\_out=1.774999999999992,xin=2.65,xout=2.9  
325 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.3874999999999995,delta\_out=1.887499999999999,xin=2.65,xout=2.95  
330 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.3874999999999995,delta\_out=1.999999999999999,xin=2.65,xout=3.0  
335 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4749999999999987,delta\_out=1.437499999999987,xin=2.7,xout=2.75  
340 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4749999999999987,delta\_out=1.549999999999985,xin=2.7,xout=2.8  
345 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4749999999999987,delta\_out=1.662499999999994,xin=2.7,xout=2.85  
350 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4749999999999987,delta\_out=1.774999999999992,xin=2.7,xout=2.9  
355 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4749999999999987,delta\_out=1.887499999999999,xin=2.7,xout=2.95  
360 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4749999999999987,delta\_out=1.999999999999999,xin=2.7,xout=3.0  
365 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.562499999999991,delta\_out=1.549999999999985,xin=2.75,xout=2.8  
370 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.562499999999991,delta\_out=1.662499999999994,xin=2.75,xout=2.85  
375 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.562499999999991,delta\_out=1.774999999999992,xin=2.75,xout=2.9  
380 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.562499999999991,delta\_out=1.887499999999999,xin=2.75,xout=2.95  
385 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.562499999999991,delta\_out=1.999999999999999,xin=2.75,xout=3.0  
390 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.649999999999995,delta\_out=1.662499999999994,xin=2.8,xout=2.85  
395 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.649999999999995,delta\_out=1.774999999999992,xin=2.8,xout=2.9  
400 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.649999999999995,delta\_out=1.887499999999999,xin=2.8,xout=2.95  
405 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.649999999999995,delta\_out=1.999999999999999,xin=2.8,xout=3.0  
410 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.737499999999998,delta\_out=1.774999999999992,xin=2.85,xout=2.9  
415 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.737499999999998,delta\_out=1.887499999999999,xin=2.85,xout=2.95  
420 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.737499999999998,delta\_out=1.999999999999999,xin=2.85,xout=3.0  
425 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.824999999999991,delta\_out=1.887499999999999,xin=2.9,xout=2.95  
430 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.824999999999991,delta\_out=1.999999999999999,xin=2.9,xout=3.0  
435 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.912499999999994,delta\_out=1.999999999999999,xin=2.95,xout=3.0  
440 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.1333333333333194,delta\_out=0.716666666666661,xin=2.3,xout=2.35  
445 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.1333333333333194,delta\_out=0.866666666666658,xin=2.3,xout=2.4  
450 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.1333333333333194,delta\_out=1.016666666666667,xin=2.3,xout=2.45  
455 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.1333333333333194,delta\_out=1.166666666666667,xin=2.3,xout=2.5  
460 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.1333333333333194,delta\_out=1.316666666666665,xin=2.3,xout=2.55  
465 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.1333333333333194,delta\_out=1.466666666666663,xin=2.3,xout=2.6  
470 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.1333333333333194,delta\_out=1.616666666666666,xin=2.3,xout=2.65

475 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.1333333333333333194, \delta_{out}=1.7666666666666657, x_{in}=2.3, x_{out}=2.7$

480 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.1333333333333333194, \delta_{out}=1.9166666666666654, x_{in}=2.3, x_{out}=2.75$

485 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.1333333333333333194, \delta_{out}=2.066666666666665, x_{in}=2.3, x_{out}=2.8$

490 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.1333333333333333194, \delta_{out}=2.2166666666666663, x_{in}=2.3, x_{out}=2.85$

495 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.1333333333333333194, \delta_{out}=2.3666666666666663, x_{in}=2.3, x_{out}=2.9$

500 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.1333333333333333194, \delta_{out}=2.5166666666666657, x_{in}=2.3, x_{out}=2.95$

505 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.1333333333333333194, \delta_{out}=2.6666666666666656, x_{in}=2.3, x_{out}=3.0$

510 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=0.8666666666666658, x_{in}=2.35, x_{out}=2.4$

515 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=1.016666666666667, x_{in}=2.35, x_{out}=2.45$

520 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=1.166666666666667, x_{in}=2.35, x_{out}=2.5$

525 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=1.316666666666665, x_{in}=2.35, x_{out}=2.55$

530 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=1.466666666666663, x_{in}=2.35, x_{out}=2.6$

535 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=1.616666666666666, x_{in}=2.35, x_{out}=2.65$

540 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=1.7666666666666657, x_{in}=2.35, x_{out}=2.7$

545 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=1.9166666666666654, x_{in}=2.35, x_{out}=2.75$

550 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=2.066666666666665, x_{in}=2.35, x_{out}=2.8$

555 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=2.216666666666663, x_{in}=2.35, x_{out}=2.85$

560 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=2.366666666666663, x_{in}=2.35, x_{out}=2.9$

565 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=2.5166666666666657, x_{in}=2.35, x_{out}=2.95$

570 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2666666666666661, \delta_{out}=2.6666666666666656, x_{in}=2.35, x_{out}=3.0$

575 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=1.016666666666667, x_{in}=2.4, x_{out}=2.45$

580 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=1.166666666666667, x_{in}=2.4, x_{out}=2.5$

585 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=1.316666666666665, x_{in}=2.4, x_{out}=2.55$

590 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=1.466666666666663, x_{in}=2.4, x_{out}=2.6$

595 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=1.616666666666666, x_{in}=2.4, x_{out}=2.65$

600 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=1.7666666666666657, x_{in}=2.4, x_{out}=2.7$

605 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=1.9166666666666654, x_{in}=2.4, x_{out}=2.75$

610 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=2.066666666666665, x_{in}=2.4, x_{out}=2.8$

615 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=2.216666666666663, x_{in}=2.4, x_{out}=2.85$

620 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=2.366666666666663, x_{in}=2.4, x_{out}=2.9$

625 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=2.5166666666666657, x_{in}=2.4, x_{out}=2.95$

630 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.399999999999988, \delta_{out}=2.6666666666666656, x_{in}=2.4, x_{out}=3.0$

635 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.5333333333333333, \delta_{out}=1.166666666666667, x_{in}=2.45, x_{out}=2.5$

640 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.533333333333333, \delta_{out}=1.316666666666665, x_{in}=2.45, x_{out}=2.55$

645 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.533333333333333, \delta_{out}=1.466666666666663, x_{in}=2.45, x_{out}=2.6$

650 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.533333333333333, \delta_{out}=1.616666666666666, x_{in}=2.45, x_{out}=2.65$

655 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.533333333333333, \delta_{out}=1.766666666666657, x_{in}=2.45, x_{out}=2.7$

660 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.533333333333333, \delta_{out}=1.916666666666654, x_{in}=2.45, x_{out}=2.75$

665 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.533333333333333, \delta_{out}=2.06666666666665, x_{in}=2.45, x_{out}=2.8$

670 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.533333333333333, \delta_{out}=2.216666666666663, x_{in}=2.45, x_{out}=2.85$

675 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.533333333333333, \delta_{out}=2.366666666666663, x_{in}=2.45, x_{out}=2.9$

680 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.533333333333333, \delta_{out}=2.516666666666657, x_{in}=2.45, x_{out}=2.95$

685 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.533333333333333, \delta_{out}=2.666666666666656, x_{in}=2.45, x_{out}=3.0$

690 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.666666666666656, \delta_{out}=1.31666666666665, x_{in}=2.5, x_{out}=2.55$

695 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.666666666666656, \delta_{out}=1.466666666666663, x_{in}=2.5, x_{out}=2.6$

700 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.666666666666656, \delta_{out}=1.61666666666666, x_{in}=2.5, x_{out}=2.65$

705 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.666666666666656, \delta_{out}=1.766666666666657, x_{in}=2.5, x_{out}=2.7$

710 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.666666666666656, \delta_{out}=1.916666666666654, x_{in}=2.5, x_{out}=2.75$

715 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.666666666666656, \delta_{out}=2.06666666666665, x_{in}=2.5, x_{out}=2.8$

720 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.666666666666656, \delta_{out}=2.216666666666663, x_{in}=2.5, x_{out}=2.85$

725 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.666666666666656, \delta_{out}=2.366666666666663, x_{in}=2.5, x_{out}=2.9$

730 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.666666666666656, \delta_{out}=2.516666666666657, x_{in}=2.5, x_{out}=2.95$

735 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.666666666666656, \delta_{out}=2.666666666666656, x_{in}=2.5, x_{out}=3.0$

740 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.799999999999984, \delta_{out}=1.466666666666663, x_{in}=2.55, x_{out}=2.6$

745 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.799999999999984, \delta_{out}=1.61666666666666, x_{in}=2.55, x_{out}=2.65$

750 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.799999999999984, \delta_{out}=1.766666666666657, x_{in}=2.55, x_{out}=2.7$

755 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.799999999999984, \delta_{out}=1.916666666666654, x_{in}=2.55, x_{out}=2.75$

760 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.799999999999984, \delta_{out}=2.06666666666665, x_{in}=2.55, x_{out}=2.8$

765 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.799999999999984, \delta_{out}=2.216666666666663, x_{in}=2.55, x_{out}=2.85$

770 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.799999999999984, \delta_{out}=2.366666666666663, x_{in}=2.55, x_{out}=2.9$

775 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.799999999999984, \delta_{out}=2.516666666666657, x_{in}=2.55, x_{out}=2.95$

780 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.799999999999984, \delta_{out}=2.666666666666656, x_{in}=2.55, x_{out}=3.0$

785 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.933333333333332, \delta_{out}=1.61666666666666, x_{in}=2.6, x_{out}=2.65$

790 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.933333333333332, \delta_{out}=1.766666666666657, x_{in}=2.6, x_{out}=2.7$

795 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.933333333333332, \delta_{out}=1.916666666666654, x_{in}=2.6, x_{out}=2.75$

800 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.933333333333332, \delta_{out}=2.06666666666665, x_{in}=2.6, x_{out}=2.8$

805 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.933333333333332, \delta_{out}=2.216666666666663, x_{in}=2.6, x_{out}=2.85$

810 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.933333333333332, \delta_{out}=2.366666666666663, x_{in}=2.6, x_{out}=2.9$

815 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.933333333333332, \delta_{out}=2.5166666666666657, x_{in}=2.6, x_{out}=2.95$

820 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.933333333333332, \delta_{out}=2.6666666666666656, x_{in}=2.6, x_{out}=3.0$

825 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.0666666666666653, \delta_{out}=1.7666666666666657, x_{in}=2.65, x_{out}=2.7$

830 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.0666666666666653, \delta_{out}=1.9166666666666654, x_{in}=2.65, x_{out}=2.75$

835 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.0666666666666653, \delta_{out}=2.066666666666665, x_{in}=2.65, x_{out}=2.8$

840 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.0666666666666653, \delta_{out}=2.216666666666663, x_{in}=2.65, x_{out}=2.85$

845 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.0666666666666653, \delta_{out}=2.366666666666663, x_{in}=2.65, x_{out}=2.9$

850 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.0666666666666653, \delta_{out}=2.5166666666666657, x_{in}=2.65, x_{out}=2.95$

855 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.0666666666666653, \delta_{out}=2.6666666666666656, x_{in}=2.65, x_{out}=3.0$

860 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.200000000000002, \delta_{out}=1.9166666666666654, x_{in}=2.7, x_{out}=2.75$

865 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.200000000000002, \delta_{out}=2.066666666666665, x_{in}=2.7, x_{out}=2.8$

870 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.200000000000002, \delta_{out}=2.216666666666663, x_{in}=2.7, x_{out}=2.85$

875 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.200000000000002, \delta_{out}=2.366666666666663, x_{in}=2.7, x_{out}=2.9$

880 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.200000000000002, \delta_{out}=2.5166666666666657, x_{in}=2.7, x_{out}=2.95$

885 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.200000000000002, \delta_{out}=2.6666666666666656, x_{in}=2.7, x_{out}=3.0$

890 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.333333333333321, \delta_{out}=2.066666666666665, x_{in}=2.75, x_{out}=2.8$

895 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.333333333333321, \delta_{out}=2.216666666666663, x_{in}=2.75, x_{out}=2.85$

900 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.333333333333321, \delta_{out}=2.366666666666663, x_{in}=2.75, x_{out}=2.9$

905 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.333333333333321, \delta_{out}=2.5166666666666657, x_{in}=2.75, x_{out}=2.95$

910 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.333333333333321, \delta_{out}=2.6666666666666656, x_{in}=2.75, x_{out}=3.0$

915 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.4666666666666655, \delta_{out}=2.216666666666663, x_{in}=2.8, x_{out}=2.85$

920 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.4666666666666655, \delta_{out}=2.366666666666663, x_{in}=2.8, x_{out}=2.9$

925 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.4666666666666655, \delta_{out}=2.5166666666666657, x_{in}=2.8, x_{out}=2.95$

930 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.4666666666666655, \delta_{out}=2.6666666666666656, x_{in}=2.8, x_{out}=3.0$

935 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.599999999999999, \delta_{out}=2.366666666666663, x_{in}=2.85, x_{out}=2.9$

940 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.599999999999999, \delta_{out}=2.5166666666666657, x_{in}=2.85, x_{out}=2.95$

945 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.599999999999999, \delta_{out}=2.6666666666666656, x_{in}=2.85, x_{out}=3.0$

950 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.733333333333325, \delta_{out}=2.5166666666666657, x_{in}=2.9, x_{out}=2.95$

955 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.733333333333325, \delta_{out}=2.6666666666666656, x_{in}=2.9, x_{out}=3.0$

960 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=1.8666666666666658, \delta_{out}=2.6666666666666656, x_{in}=2.95, x_{out}=3.0$

965 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=0.174999999999996, \delta_{out}=0.4000000000000036, x_{in}=2.15, x_{out}=2.2$

970 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=0.624999999999989,xin=2.15,xout=2.25  
975 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=0.849999999999985,xin=2.15,xout=2.3  
980 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=1.0750000000000004,xin=2.15,xout=2.35  
985 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=1.3,xin=2.15,xout=2.4  
990 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=1.524999999999997,xin=2.15,xout=2.45  
995 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=1.749999999999993,xin=2.15,xout=2.5  
1000 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=1.974999999999999,xin=2.15,xout=2.55  
1005 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=2.2000000000000006,xin=2.15,xout=2.6  
1010 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=2.424999999999998,xin=2.15,xout=2.65  
1015 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=2.65,xin=2.15,xout=2.7  
1020 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=2.874999999999996,xin=2.15,xout=2.75  
1025 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=3.099999999999999,xin=2.15,xout=2.8  
1030 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=3.324999999999999,xin=2.15,xout=2.85  
1035 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=3.549999999999985,xin=2.15,xout=2.9  
1040 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=3.7750000000000004,xin=2.15,xout=2.95  
1045 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.1749999999999996,delta\_out=4.0,xin=2.15,xout=3.0  
1050 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=0.624999999999989,xin=2.2,xout=2.25  
1055 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=0.849999999999985,xin=2.2,xout=2.3  
1060 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=1.0750000000000004,xin=2.2,xout=2.35  
1065 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=1.3,xin=2.2,xout=2.4  
1070 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=1.524999999999997,xin=2.2,xout=2.45  
1075 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=1.749999999999993,xin=2.2,xout=2.5  
1080 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=1.974999999999999,xin=2.2,xout=2.55  
1085 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=2.2000000000000006,xin=2.2,xout=2.6  
1090 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=2.424999999999998,xin=2.2,xout=2.65  
1095 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=2.65,xin=2.2,xout=2.7  
1100 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=2.874999999999996,xin=2.2,xout=2.75  
1105 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=3.099999999999999,xin=2.2,xout=2.8  
1110 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=3.324999999999999,xin=2.2,xout=2.85  
1115 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=3.549999999999985,xin=2.2,xout=2.9  
1120 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=3.7750000000000004,xin=2.2,xout=2.95  
1125 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.40000000000000036,delta\_out=4.0,xin=2.2,xout=3.0  
1130 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=0.849999999999985,xin=2.25,xout=2.3

1135 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=1.075000000000004,xin=2.25,xout=2.35  
1140 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=1.3,xin=2.25,xout=2.4  
1145 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=1.524999999999997,xin=2.25,xout=2.45  
1150 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=1.749999999999993,xin=2.25,xout=2.5  
1155 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=1.974999999999999,xin=2.25,xout=2.55  
1160 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=2.200000000000006,xin=2.25,xout=2.6  
1165 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=2.424999999999998,xin=2.25,xout=2.65  
1170 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=2.65,xin=2.25,xout=2.7  
1175 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=2.874999999999996,xin=2.25,xout=2.75  
1180 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=3.099999999999999,xin=2.25,xout=2.8  
1185 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=3.324999999999999,xin=2.25,xout=2.85  
1190 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=3.549999999999985,xin=2.25,xout=2.9  
1195 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=3.775000000000004,xin=2.25,xout=2.95  
1200 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=4.0,xin=2.25,xout=3.0  
1205 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=1.075000000000004,xin=2.3,xout=2.35  
1210 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=1.3,xin=2.3,xout=2.4  
1215 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=1.524999999999997,xin=2.3,xout=2.45  
1220 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=1.749999999999993,xin=2.3,xout=2.5  
1225 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=1.974999999999999,xin=2.3,xout=2.55  
1230 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=2.200000000000006,xin=2.3,xout=2.6  
1235 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=2.424999999999998,xin=2.3,xout=2.65  
1240 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=2.65,xin=2.3,xout=2.7  
1245 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=2.874999999999996,xin=2.3,xout=2.75  
1250 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=3.099999999999999,xin=2.3,xout=2.8  
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1260 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=3.549999999999985,xin=2.3,xout=2.9  
1265 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=3.775000000000004,xin=2.3,xout=2.95  
1270 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=4.0,xin=2.3,xout=3.0  
1275 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.075000000000004,delta\_out=1.3,xin=2.35,xout=2.4  
1280 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.075000000000004,delta\_out=1.524999999999997,xin=2.35,xout=2.45  
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1305 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.0750000000000004,delta\_out=2.65,xin=2.35,xout=2.7  
1310 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.0750000000000004,delta\_out=2.8749999999999996,xin=2.35,xout=2.75  
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1360 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.3,delta\_out=2.4249999999999998,xin=2.4,xout=2.65  
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5225 no. graph's alpha=0.5,beta=0.4,gamma=0.1,delta\_in=1.033333333333337,delta\_out=0.0,xin=2.8,xout=3.0  
5230 no. graph's alpha=0.5,beta=0.4,gamma=0.1,delta\_in=1.108333333333334,delta\_out=0.0,xin=2.85,xout=3.0  
5235 no. graph's alpha=0.5,beta=0.4,gamma=0.1,delta\_in=1.183333333333333,delta\_out=0.0,xin=2.9,xout=3.0  
5240 no. graph's alpha=0.5,beta=0.4,gamma=0.1,delta\_in=1.258333333333334,delta\_out=0.0,xin=2.95,xout=3.0

## Experiment-1's graph types for Xin=Xout:

In experiment-1, each 5 graph's types are same but graphs are different from each other; because they are random graphs.

But for showing graphs types,

we are going to show one graph type from each similar 5 graph's types.

For example, Here, we skip showing 1 no.,2 no.,3 no.,4 no. graph's type because they are similar to 5 no. graph's type. We represent 5 no graph's type behalf of 1 no.,2 no.,3 no.,4 no. graph's type.

- 5 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.040000000000000036,delta\_out=1.06000000000000005,xin=2.7,xout=2.7
- 10 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.09999999999999964,delta\_out=1.1500000000000004,xin=2.75,xout=2.75
- 15 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.1599999999999997,delta\_out=1.2400000000000002,xin=2.8,xout=2.8
- 20 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.21999999999999975,delta\_out=1.33,xin=2.85,xout=2.85
- 25 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2799999999999998,delta\_out=1.42,xin=2.9,xout=2.9
- 30 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.33999999999999986,delta\_out=1.5100000000000007,xin=2.95,xout=2.95
- 35 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.39999999999999947,delta\_out=1.6000000000000005,xin=3.0,xout=3.0
- 40 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.03750000000000031,delta\_out=0.7624999999999998,xin=2.45,xout=2.45
- 45 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.12499999999999956,delta\_out=0.8749999999999997,xin=2.5,xout=2.5
- 50 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.21249999999999988,delta\_out=0.9874999999999984,xin=2.55,xout=2.55
- 55 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.29999999999999916,delta\_out=1.0999999999999992,xin=2.6,xout=2.6
- 60 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.3874999999999995,delta\_out=1.212499999999999,xin=2.65,xout=2.65
- 65 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.47499999999999987,delta\_out=1.3249999999999988,xin=2.7,xout=2.7
- 70 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.5624999999999991,delta\_out=1.4374999999999987,xin=2.75,xout=2.75
- 75 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.6499999999999995,delta\_out=1.5499999999999985,xin=2.8,xout=2.8
- 80 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.7374999999999998,delta\_out=1.6624999999999994,xin=2.85,xout=2.85
- 85 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.8249999999999991,delta\_out=1.7749999999999992,xin=2.9,xout=2.9
- 90 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9124999999999994,delta\_out=1.887499999999999,xin=2.95,xout=2.95
- 95 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.9999999999999987,delta\_out=1.999999999999999,xin=3.0,xout=3.0
- 100 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.133333333333333194,delta\_out=0.5666666666666663,xin=2.3,xout=2.3
- 105 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.2666666666666661,delta\_out=0.7166666666666661,xin=2.35,xout=2.35
- 110 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.3999999999999988,delta\_out=0.8666666666666658,xin=2.4,xout=2.4
- 115 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.533333333333333,delta\_out=1.0166666666666667,xin=2.45,xout=2.45



120 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6666666666666656,delta\_out=1.166666666666667,xin=2.5,xout=2.5  
125 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.799999999999984,delta\_out=1.316666666666665,xin=2.55,xout=2.55  
130 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.933333333333332,delta\_out=1.466666666666663,xin=2.6,xout=2.6  
135 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.066666666666653,delta\_out=1.616666666666666,xin=2.65,xout=2.65  
140 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.200000000000002,delta\_out=1.766666666666657,xin=2.7,xout=2.7  
145 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.333333333333321,delta\_out=1.916666666666654,xin=2.75,xout=2.75  
150 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.466666666666655,delta\_out=2.06666666666665,xin=2.8,xout=2.8  
155 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.59999999999999,delta\_out=2.216666666666663,xin=2.85,xout=2.85  
160 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.733333333333325,delta\_out=2.366666666666663,xin=2.9,xout=2.9  
165 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.866666666666658,delta\_out=2.516666666666657,xin=2.95,xout=2.95  
170 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.999999999999993,delta\_out=2.666666666666656,xin=3.0,xout=3.0  
175 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.174999999999996,delta\_out=0.174999999999996,xin=2.15,xout=2.15  
180 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.4000000000000036,delta\_out=0.4000000000000036,xin=2.2,xout=2.2  
185 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.624999999999989,delta\_out=0.624999999999989,xin=2.25,xout=2.25  
190 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.849999999999985,delta\_out=0.849999999999985,xin=2.3,xout=2.3  
195 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.075000000000004,delta\_out=1.075000000000004,xin=2.35,xout=2.35  
200 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.3,delta\_out=1.3,xin=2.4,xout=2.4  
205 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.524999999999997,delta\_out=1.524999999999997,xin=2.45,xout=2.45  
210 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.749999999999993,delta\_out=1.749999999999993,xin=2.5,xout=2.5  
215 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.97499999999999,delta\_out=1.97499999999999,xin=2.55,xout=2.55  
220 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=2.200000000000006,delta\_out=2.200000000000006,xin=2.6,xout=2.6  
225 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=2.42499999999998,delta\_out=2.42499999999998,xin=2.65,xout=2.65  
230 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=2.65,delta\_out=2.65,xin=2.7,xout=2.7  
235 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=2.874999999999996,delta\_out=2.874999999999996,xin=2.75,xout=2.75  
240 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=3.09999999999999,delta\_out=3.09999999999999,xin=2.8,xout=2.8  
245 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=3.32499999999999,delta\_out=3.32499999999999,xin=2.85,xout=2.85  
250 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=3.549999999999985,delta\_out=3.549999999999985,xin=2.9,xout=2.9  
255 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=3.775000000000004,delta\_out=3.775000000000004,xin=2.95,xout=2.95  
260 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=4.0,delta\_out=4.0,xin=3.0,xout=3.0  
265 no. graph's alpha=0.2,beta=0.3,gamma=0.5,delta\_in=0.0,delta\_out=0.857142857142858,xin=3.0,xout=3.0  
270 no. graph's alpha=0.2,beta=0.4,gamma=0.4,delta\_in=0.033333333333334096,delta\_out=0.600000000000004,xin=2.7,xout=2.7  
275 no. graph's alpha=0.2,beta=0.4,gamma=0.4,delta\_in=0.0833333333333376,delta\_out=0.666666666666672,xin=2.75,xout=2.75  
280 no. graph's alpha=0.2,beta=0.4,gamma=0.4,delta\_in=0.1333333333333344,delta\_out=0.733333333333332,xin=2.8,xout=2.8

285 no. graph's alpha=0.2,beta=0.4,gamma=0.4,delta\_in=0.18333333333333385,delta\_out=0.8000000000000006,xin=2.85,xout=2.85  
290 no. graph's alpha=0.2,beta=0.4,gamma=0.4,delta\_in=0.2333333333333335,delta\_out=0.8666666666666666,xin=2.9,xout=2.9  
295 no. graph's alpha=0.2,beta=0.4,gamma=0.4,delta\_in=0.28333333333333394,delta\_out=0.9333333333333334,xin=2.95,xout=2.95  
300 no. graph's alpha=0.2,beta=0.4,gamma=0.4,delta\_in=0.3333333333333336,delta\_out=1.0000000000000007,xin=3.0,xout=3.0  
305 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.03000000000000025,delta\_out=0.3200000000000003,xin=2.45,xout=2.45  
310 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.10000000000000009,delta\_out=0.3999999999999999,xin=2.5,xout=2.5  
315 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.16999999999999948,delta\_out=0.48,xin=2.55,xout=2.55  
320 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.23999999999999977,delta\_out=0.56,xin=2.6,xout=2.6  
325 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.3099999999999996,delta\_out=0.6400000000000001,xin=2.65,xout=2.65  
330 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.3799999999999999,delta\_out=0.7200000000000002,xin=2.7,xout=2.7  
335 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.44999999999999973,delta\_out=0.8000000000000003,xin=2.75,xout=2.75  
340 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.5199999999999996,delta\_out=0.8799999999999994,xin=2.8,xout=2.8  
345 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.5899999999999999,delta\_out=0.9600000000000004,xin=2.85,xout=2.85  
350 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.6599999999999997,delta\_out=1.0399999999999996,xin=2.9,xout=2.9  
355 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.73,delta\_out=1.1200000000000006,xin=2.95,xout=2.95  
360 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.7999999999999994,delta\_out=1.2000000000000006,xin=3.0,xout=3.0  
365 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.0,delta\_out=5.551115123125783e-16,xin=2.25,xout=2.25  
370 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.10000000000000009,delta\_out=0.09999999999999953,xin=2.3,xout=2.3  
375 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.20000000000000018,delta\_out=0.20000000000000073,xin=2.35,xout=2.35  
380 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.30000000000000027,delta\_out=0.2999999999999997,xin=2.4,xout=2.4  
385 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.40000000000000036,delta\_out=0.4000000000000009,xin=2.45,xout=2.45  
390 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.5000000000000004,delta\_out=0.4999999999999999,xin=2.5,xout=2.5  
395 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.6000000000000005,delta\_out=0.6,xin=2.55,xout=2.55  
400 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.7000000000000006,delta\_out=0.7000000000000001,xin=2.6,xout=2.6  
405 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.8000000000000007,delta\_out=0.8000000000000002,xin=2.65,xout=2.65  
410 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.9000000000000008,delta\_out=0.9000000000000002,xin=2.7,xout=2.7  
415 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.9999999999999998,delta\_out=1.0000000000000002,xin=2.75,xout=2.75  
420 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=1.0999999999999998,delta\_out=1.0999999999999992,xin=2.8,xout=2.8  
425 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=1.2,delta\_out=1.2000000000000004,xin=2.85,xout=2.85  
430 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=1.2999999999999999,delta\_out=1.2999999999999994,xin=2.9,xout=2.9  
435 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=1.4000000000000001,delta\_out=1.4000000000000006,xin=2.95,xout=2.95  
440 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=1.5000000000000002,delta\_out=1.5000000000000007,xin=3.0,xout=3.0  
445 no. graph's alpha=0.3,beta=0.2,gamma=0.5,delta\_in=0.0,delta\_out=0.4999999999999996,xin=3.0,xout=3.0

450 no. graph's  $\alpha=0.3, \beta=0.3, \gamma=0.4, \delta_{in}=0.0285714285714286, \delta_{out}=0.27142857142857135, x_{in}=2.7, x_{out}=2.7$

455 no. graph's  $\alpha=0.3, \beta=0.3, \gamma=0.4, \delta_{in}=0.07142857142857117, \delta_{out}=0.32142857142857095, x_{in}=2.75, x_{out}=2.75$

460 no. graph's  $\alpha=0.3, \beta=0.3, \gamma=0.4, \delta_{in}=0.11428571428571407, \delta_{out}=0.37142857142857116, x_{in}=2.8, x_{out}=2.8$

465 no. graph's  $\alpha=0.3, \beta=0.3, \gamma=0.4, \delta_{in}=0.15714285714285697, \delta_{out}=0.4214285714285714, x_{in}=2.85, x_{out}=2.85$

470 no. graph's  $\alpha=0.3, \beta=0.3, \gamma=0.4, \delta_{in}=0.1999999999999987, \delta_{out}=0.4714285714285709, x_{in}=2.9, x_{out}=2.9$

475 no. graph's  $\alpha=0.3, \beta=0.3, \gamma=0.4, \delta_{in}=0.24285714285714277, \delta_{out}=0.5214285714285711, x_{in}=2.95, x_{out}=2.95$

480 no. graph's  $\alpha=0.3, \beta=0.3, \gamma=0.4, \delta_{in}=0.28571428571428537, \delta_{out}=0.5714285714285707, x_{in}=3.0, x_{out}=3.0$

485 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.0250000000000021, \delta_{out}=0.0249999999999984, x_{in}=2.45, x_{out}=2.45$

490 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.0833333333333304, \delta_{out}=0.0833333333333341, x_{in}=2.5, x_{out}=2.5$

495 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.1416666666666589, \delta_{out}=0.1416666666666625, x_{in}=2.55, x_{out}=2.55$

500 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.1999999999999946, \delta_{out}=0.1999999999999982, x_{in}=2.6, x_{out}=2.6$

505 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.258333333333333, \delta_{out}=0.2583333333333264, x_{in}=2.65, x_{out}=2.65$

510 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.316666666666666, \delta_{out}=0.316666666666662, x_{in}=2.7, x_{out}=2.7$

515 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.3749999999999944, \delta_{out}=0.374999999999998, x_{in}=2.75, x_{out}=2.75$

520 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.433333333333333, \delta_{out}=0.433333333333326, x_{in}=2.8, x_{out}=2.8$

525 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.491666666666666, \delta_{out}=0.491666666666662, x_{in}=2.85, x_{out}=2.85$

530 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.549999999999994, \delta_{out}=0.549999999999998, x_{in}=2.9, x_{out}=2.9$

535 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.608333333333333, \delta_{out}=0.608333333333334, x_{in}=2.95, x_{out}=2.95$

540 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.666666666666659, \delta_{out}=0.666666666666662, x_{in}=3.0, x_{out}=3.0$

545 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=0.3200000000000003, \delta_{out}=0.0300000000000025, x_{in}=2.45, x_{out}=2.45$

550 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=0.399999999999999, \delta_{out}=0.1000000000000009, x_{in}=2.5, x_{out}=2.5$

555 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=0.48, \delta_{out}=0.1699999999999948, x_{in}=2.55, x_{out}=2.55$

560 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=0.56, \delta_{out}=0.2399999999999977, x_{in}=2.6, x_{out}=2.6$

565 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=0.640000000000001, \delta_{out}=0.309999999999996, x_{in}=2.65, x_{out}=2.65$

570 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=0.720000000000002, \delta_{out}=0.379999999999999, x_{in}=2.7, x_{out}=2.7$

575 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=0.800000000000003, \delta_{out}=0.4499999999999973, x_{in}=2.75, x_{out}=2.75$

580 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=0.879999999999994, \delta_{out}=0.519999999999996, x_{in}=2.8, x_{out}=2.8$

585 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=0.960000000000004, \delta_{out}=0.589999999999999, x_{in}=2.85, x_{out}=2.85$

590 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=1.04, \delta_{out}=0.659999999999997, x_{in}=2.9, x_{out}=2.9$

595 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=1.120000000000001, \delta_{out}=0.73, x_{in}=2.95, x_{out}=2.95$

600 no. graph's  $\alpha=0.3, \beta=0.5, \gamma=0.2, \delta_{in}=1.200000000000001, \delta_{out}=0.799999999999994, x_{in}=3.0, x_{out}=3.0$

605 no. graph's  $\alpha=0.4, \beta=0.1, \gamma=0.5, \delta_{in}=0.0, \delta_{out}=0.222222222222193, x_{in}=3.0, x_{out}=3.0$

610 no. graph's  $\alpha=0.4, \beta=0.2, \gamma=0.4, \delta_{in}=0.0250000000000003, \delta_{out}=0.02500000000000577, x_{in}=2.7, x_{out}=2.7$

615 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.06250000000000061,delta\_out=0.06250000000000033,xin=2.75,xout=2.75  
620 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.10000000000000037,delta\_out=0.10000000000000009,xin=2.8,xout=2.8  
625 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.13750000000000068,delta\_out=0.13750000000000004,xin=2.85,xout=2.85  
630 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.17500000000000043,delta\_out=0.17500000000000016,xin=2.9,xout=2.9  
635 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.21250000000000074,delta\_out=0.21250000000000047,xin=2.95,xout=2.95  
640 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.25000000000000005,delta\_out=0.25000000000000002,xin=3.0,xout=3.0  
645 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.2714285714285711,delta\_out=0.0285714285714286,xin=2.7,xout=2.7  
650 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.3214285714285713,delta\_out=0.07142857142857117,xin=2.75,xout=2.75  
655 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.37142857142857083,delta\_out=0.11428571428571407,xin=2.8,xout=2.8  
660 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.42142857142857104,delta\_out=0.15714285714285697,xin=2.85,xout=2.85  
665 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.47142857142857125,delta\_out=0.1999999999999987,xin=2.9,xout=2.9  
670 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5214285714285715,delta\_out=0.24285714285714277,xin=2.95,xout=2.95  
675 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.5714285714285711,delta\_out=0.28571428571428537,xin=3.0,xout=3.0  
680 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.60000000000000004,delta\_out=0.03333333333333373,xin=2.7,xout=2.7  
685 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.6666666666666672,delta\_out=0.08333333333333413,xin=2.75,xout=2.75  
690 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.7333333333333332,delta\_out=0.1333333333333338,xin=2.8,xout=2.8  
695 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.80000000000000006,delta\_out=0.1833333333333342,xin=2.85,xout=2.85  
700 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.8666666666666666,delta\_out=0.23333333333333386,xin=2.9,xout=2.9  
705 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.933333333333334,delta\_out=0.2833333333333427,xin=2.95,xout=2.95  
710 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=1.00000000000000007,delta\_out=0.3333333333333339,xin=3.0,xout=3.0  
715 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.06000000000000005,delta\_out=0.04000000000000036,xin=2.7,xout=2.7  
720 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.15000000000000004,delta\_out=0.0999999999999964,xin=2.75,xout=2.75  
725 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.24000000000000002,delta\_out=0.159999999999997,xin=2.8,xout=2.8  
730 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.33,delta\_out=0.2199999999999975,xin=2.85,xout=2.85  
735 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.42,delta\_out=0.279999999999998,xin=2.9,xout=2.9  
740 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.51000000000000007,delta\_out=0.3399999999999986,xin=2.95,xout=2.95  
745 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.60000000000000005,delta\_out=0.3999999999999947,xin=3.0,xout=3.0  
750 no. graph's alpha=0.5,beta=0.2,gamma=0.3,delta\_in=0.499999999999996,delta\_out=0.0,xin=3.0,xout=3.0  
755 no. graph's alpha=0.5,beta=0.3,gamma=0.2,delta\_in=0.8571428571428577,delta\_out=0.0,xin=3.0,xout=3.0  
760 no. graph's alpha=0.5,beta=0.4,gamma=0.1,delta\_in=1.333333333333334,delta\_out=0.0,xin=3.0,xout=3.0

## Experiment-2's graph types for $X_{in} > X_{out}$ :

In experiment-2, each 5 graph's types are same but graphs are different from each other; because they are random graphs.

But for showing graphs types,

we are going to show one graph type from each similar 5 graph's types.

For example, Here, we skip showing 1 no., 2 no., 3 no., 4 no. graph's type because they are similar to 5 no. graph's type. We represent 5 no. graph's type behalf of 1 no., 2 no., 3 no., 4 no. graph's type.

5 no. graph's  $\alpha=0.1, \beta=0.4, \gamma=0.5, \delta_{in}=0.0, \delta_{out}=0.0, x_{in}=3.0, x_{out}=2.111111111111111$

10 no. graph's  $\alpha=0.1, \beta=0.4, \gamma=0.5, \delta_{in}=0.0, \delta_{out}=0.2, x_{in}=3.0, x_{out}=2.244444444444444$

15 no. graph's  $\alpha=0.1, \beta=0.4, \gamma=0.5, \delta_{in}=0.0, \delta_{out}=0.4, x_{in}=3.0, x_{out}=2.377777777777777$

20 no. graph's  $\alpha=0.1, \beta=0.4, \gamma=0.5, \delta_{in}=0.0, \delta_{out}=0.6, x_{in}=3.0, x_{out}=2.511111111111110$

25 no. graph's  $\alpha=0.1, \beta=0.4, \gamma=0.5, \delta_{in}=0.0, \delta_{out}=0.8, x_{in}=3.0, x_{out}=2.644444444444444$

30 no. graph's  $\alpha=0.1, \beta=0.4, \gamma=0.5, \delta_{in}=0.0, \delta_{out}=1.0, x_{in}=3.0, x_{out}=2.777777777777777$

35 no. graph's  $\alpha=0.1, \beta=0.4, \gamma=0.5, \delta_{in}=0.0, \delta_{out}=1.2, x_{in}=3.0, x_{out}=2.911111111111111$

40 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0, \delta_{out}=0.0, x_{in}=2.666666666666667, x_{out}=2.111111111111111$

45 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0, \delta_{out}=0.2, x_{in}=2.666666666666667, x_{out}=2.222222222222222$

50 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0, \delta_{out}=0.4, x_{in}=2.666666666666667, x_{out}=2.333333333333335$

55 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0, \delta_{out}=0.6, x_{in}=2.666666666666667, x_{out}=2.444444444444446$

60 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0, \delta_{out}=0.8, x_{in}=2.666666666666667, x_{out}=2.555555555555554$

65 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.0, \delta_{out}=1.0, x_{in}=2.666666666666667, x_{out}=2.666666666666665$

70 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.2, \delta_{out}=0.0, x_{in}=2.833333333333335, x_{out}=2.111111111111111$

75 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.2, \delta_{out}=0.2, x_{in}=2.833333333333335, x_{out}=2.222222222222223$

80 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.2, \delta_{out}=0.4, x_{in}=2.833333333333335, x_{out}=2.333333333333335$

85 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.2, \delta_{out}=0.6, x_{in}=2.833333333333335, x_{out}=2.444444444444446$

90 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.2, \delta_{out}=0.8, x_{in}=2.833333333333335, x_{out}=2.555555555555554$

95 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.2, \delta_{out}=1.0, x_{in}=2.833333333333335, x_{out}=2.666666666666665$

100 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2,delta\_out=1.2,xin=2.833333333333335,xout=2.777777777777777

105 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.4,delta\_out=0.0,xin=3.0,xout=2.111111111111111

110 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.4,delta\_out=0.2,xin=3.0,xout=2.222222222222223

115 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.4,delta\_out=0.4,xin=3.0,xout=2.333333333333335

120 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.4,delta\_out=0.6,xin=3.0,xout=2.444444444444446

125 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.4,delta\_out=0.8,xin=3.0,xout=2.555555555555554

130 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.4,delta\_out=1.0,xin=3.0,xout=2.666666666666665

135 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.4,delta\_out=1.2,xin=3.0,xout=2.777777777777777

140 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.4,delta\_out=1.4,xin=3.0,xout=2.888888888888889

145 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.0,delta\_out=0.0,xin=2.428571428571429,xout=2.111111111111111

150 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.0,delta\_out=0.2,xin=2.428571428571429,xout=2.2

155 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.0,delta\_out=0.4,xin=2.428571428571429,xout=2.288888888888889

160 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.0,delta\_out=0.6,xin=2.428571428571429,xout=2.377777777777778

165 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.2,delta\_out=0.0,xin=2.542857142857143,xout=2.111111111111111

170 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.2,delta\_out=0.2,xin=2.542857142857143,xout=2.2

175 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.2,delta\_out=0.4,xin=2.542857142857143,xout=2.288888888888889

180 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.2,delta\_out=0.6,xin=2.542857142857143,xout=2.377777777777778

185 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.2,delta\_out=0.8,xin=2.542857142857143,xout=2.466666666666667

190 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4,delta\_out=0.0,xin=2.657142857142857,xout=2.111111111111111

195 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4,delta\_out=0.2,xin=2.657142857142857,xout=2.2

200 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4,delta\_out=0.4,xin=2.657142857142857,xout=2.288888888888889

205 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4,delta\_out=0.6,xin=2.657142857142857,xout=2.377777777777778

210 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4,delta\_out=0.8,xin=2.657142857142857,xout=2.466666666666667

215 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4,delta\_out=1.0,xin=2.657142857142857,xout=2.555555555555556

220 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.4,delta\_out=1.2,xin=2.657142857142857,xout=2.644444444444444

225 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.6,delta\_out=0.0,xin=2.7714285714285714,xout=2.111111111111111

230 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.6,delta\_out=0.2,xin=2.7714285714285714,xout=2.2

235 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.6,delta\_out=0.4,xin=2.7714285714285714,xout=2.288888888888889

240 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.6,delta\_out=0.6,xin=2.7714285714285714,xout=2.377777777777778

245 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.6,delta\_out=0.8,xin=2.7714285714285714,xout=2.466666666666667

250 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.6,delta\_out=1.0,xin=2.7714285714285714,xout=2.555555555555556

255 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.6,delta\_out=1.2,xin=2.7714285714285714,xout=2.644444444444444

260 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.6,delta\_out=1.4,xin=2.7714285714285714,xout=2.733333333333334

265 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.8, \delta_{out}=0.0, x_{in}=2.885714285714286, x_{out}=2.111111111111111$

270 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.8, \delta_{out}=0.2, x_{in}=2.885714285714286, x_{out}=2.2$

275 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.8, \delta_{out}=0.4, x_{in}=2.885714285714286, x_{out}=2.288888888888889$

280 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.8, \delta_{out}=0.6, x_{in}=2.885714285714286, x_{out}=2.377777777777778$

285 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.8, \delta_{out}=0.8, x_{in}=2.885714285714286, x_{out}=2.466666666666667$

290 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.8, \delta_{out}=1.0, x_{in}=2.885714285714286, x_{out}=2.555555555555556$

295 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.8, \delta_{out}=1.2, x_{in}=2.885714285714286, x_{out}=2.644444444444444$

300 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.8, \delta_{out}=1.4, x_{in}=2.885714285714286, x_{out}=2.733333333333334$

305 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.8, \delta_{out}=1.6, x_{in}=2.885714285714286, x_{out}=2.822222222222224$

310 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=0.0, x_{in}=2.25, x_{out}=2.111111111111111$

315 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=0.2, x_{in}=2.25, x_{out}=2.177777777777778$

320 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=0.4, x_{in}=2.25, x_{out}=2.244444444444445$

325 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=0.0, x_{in}=2.325, x_{out}=2.111111111111111$

330 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=0.2, x_{in}=2.325, x_{out}=2.177777777777778$

335 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=0.4, x_{in}=2.325, x_{out}=2.244444444444445$

340 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=0.6, x_{in}=2.325, x_{out}=2.311111111111113$

345 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.4, \delta_{out}=0.0, x_{in}=2.4, x_{out}=2.111111111111111$

350 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.4, \delta_{out}=0.2, x_{in}=2.4, x_{out}=2.177777777777778$

355 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.4, \delta_{out}=0.4, x_{in}=2.4, x_{out}=2.244444444444445$

360 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.4, \delta_{out}=0.6, x_{in}=2.4, x_{out}=2.311111111111113$

365 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.4, \delta_{out}=0.8, x_{in}=2.4, x_{out}=2.377777777777778$

370 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.6, \delta_{out}=0.0, x_{in}=2.475, x_{out}=2.111111111111111$

375 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.6, \delta_{out}=0.2, x_{in}=2.475, x_{out}=2.177777777777778$

380 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.6, \delta_{out}=0.4, x_{in}=2.475, x_{out}=2.244444444444445$

385 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.6, \delta_{out}=0.6, x_{in}=2.475, x_{out}=2.311111111111113$

390 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.6, \delta_{out}=0.8, x_{in}=2.475, x_{out}=2.377777777777778$

395 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.6, \delta_{out}=1.0, x_{in}=2.475, x_{out}=2.444444444444445$

400 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.8, \delta_{out}=0.0, x_{in}=2.550000000000003, x_{out}=2.111111111111111$

405 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.8, \delta_{out}=0.2, x_{in}=2.550000000000003, x_{out}=2.177777777777778$

410 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.8, \delta_{out}=0.4, x_{in}=2.550000000000003, x_{out}=2.244444444444445$

415 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.8, \delta_{out}=0.6, x_{in}=2.550000000000003, x_{out}=2.311111111111113$

420 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.8, \delta_{out}=0.8, x_{in}=2.550000000000003, x_{out}=2.377777777777778$

425 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.8, \delta_{out}=1.0, x_{in}=2.550000000000003, x_{out}=2.444444444444445$





595 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.6,delta\_out=1.0,xin=2.8500000000000005,xout=2.4444444444444445  
600 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.6,delta\_out=1.2,xin=2.8500000000000005,xout=2.5111111111111111  
605 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.6,delta\_out=1.4,xin=2.8500000000000005,xout=2.5777777777777784  
610 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.6,delta\_out=1.6,xin=2.8500000000000005,xout=2.6444444444444444  
615 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.6,delta\_out=1.8,xin=2.8500000000000005,xout=2.7111111111111117  
620 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.6,delta\_out=2.0,xin=2.8500000000000005,xout=2.777777777777778  
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2095 no. graph's alpha=0.3,beta=0.2,gamma=0.5,delta\_in=0.0,delta\_out=0.2,xin=3.0,xout=2.6571428571428575

2100 no. graph's alpha=0.3,beta=0.2,gamma=0.5,delta\_in=0.0,delta\_out=0.4,xin=3.0,xout=2.885714285714286

2105 no. graph's alpha=0.3,beta=0.3,gamma=0.4,delta\_in=0.0,delta\_out=0.0,xin=2.666666666666667,xout=2.428571428571429

2110 no. graph's alpha=0.3,beta=0.3,gamma=0.4,delta\_in=0.0,delta\_out=0.2,xin=2.666666666666667,xout=2.628571428571429

2115 no. graph's alpha=0.3,beta=0.3,gamma=0.4,delta\_in=0.2,delta\_out=0.0,xin=2.9,xout=2.428571428571429

2120 no. graph's alpha=0.3,beta=0.3,gamma=0.4,delta\_in=0.2,delta\_out=0.2,xin=2.9,xout=2.628571428571429

2125 no. graph's alpha=0.3,beta=0.3,gamma=0.4,delta\_in=0.2,delta\_out=0.4,xin=2.9,xout=2.8285714285714287

2130 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.2,delta\_out=0.0,xin=2.6,xout=2.428571428571429

2135 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.4,delta\_out=0.0,xin=2.7714285714285714,xout=2.428571428571429

2140 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.4,delta\_out=0.2,xin=2.7714285714285714,xout=2.6

2145 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.6,delta\_out=0.0,xin=2.942857142857143,xout=2.428571428571429

2150 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.6,delta\_out=0.2,xin=2.942857142857143,xout=2.6

2155 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.6,delta\_out=0.4,xin=2.942857142857143,xout=2.7714285714285714

2160 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.4,delta\_out=0.0,xin=2.5,xout=2.428571428571429

2165 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.6,delta\_out=0.0,xin=2.625,xout=2.428571428571429

2170 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.6,delta\_out=0.2,xin=2.625,xout=2.5714285714285716

2175 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.8,delta\_out=0.0,xin=2.75,xout=2.428571428571429

2180 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.8,delta\_out=0.2,xin=2.75,xout=2.5714285714285716

2185 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.8,delta\_out=0.4,xin=2.75,xout=2.7142857142857144

2190 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=1.0,delta\_out=0.0,xin=2.8749999999999996,xout=2.428571428571429

2195 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=1.0,delta\_out=0.2,xin=2.8749999999999996,xout=2.5714285714285716

2200 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=1.0,delta\_out=0.4,xin=2.8749999999999996,xout=2.7142857142857144

2205 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=1.0,delta\_out=0.6,xin=2.8749999999999996,xout=2.857142857142857

2210 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=1.2,delta\_out=0.0,xin=2.9999999999999996,xout=2.428571428571429

2215 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=1.2,delta\_out=0.2,xin=2.9999999999999996,xout=2.5714285714285716

2220 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=1.2,delta\_out=0.4,xin=2.9999999999999996,xout=2.7142857142857144

2225 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=1.2,delta\_out=0.6,xin=2.9999999999999996,xout=2.857142857142857

2230 no. graph's alpha=0.4,beta=0.1,gamma=0.5,delta\_in=0.0,delta\_out=0.0,xin=3.0,xout=2.666666666666667

2235 no. graph's alpha=0.4,beta=0.1,gamma=0.5,delta\_in=0.0,delta\_out=0.2,xin=3.0,xout=2.966666666666667

2240 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.2,delta\_out=0.0,xin=2.933333333333333,xout=2.666666666666665

2245 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.4,delta\_out=0.0,xin=2.8285714285714287,xout=2.666666666666667  
2250 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.6,delta\_out=0.0,xin=2.7,xout=2.666666666666665  
2255 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.8,delta\_out=0.0,xin=2.85,xout=2.666666666666665  
2260 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=1.0,delta\_out=0.0,xin=2.999999999999996,xout=2.666666666666665  
2265 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=1.0,delta\_out=0.2,xin=2.999999999999996,xout=2.866666666666667  
2270 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.2,delta\_out=0.0,xin=2.777777777777777,xout=2.666666666666667  
2275 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.4,delta\_out=0.0,xin=2.888888888888889,xout=2.666666666666667  
2280 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.4,delta\_out=0.2,xin=2.888888888888889,xout=2.833333333333335  
2285 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.6,delta\_out=0.0,xin=3.0,xout=2.666666666666667  
2290 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.6,delta\_out=0.2,xin=3.0,xout=2.833333333333335

### Experiment-2's graph types for $X_{in} < X_{out}$ :

In experiment-2, each 5 graph's types are same but graphs are different from each other; because they are random graphs.

But for showing graphs types,

we are going to show one graph type from each similar 5 graph's types.

For example, Here, we skip showing 1 no.,2 no.,3 no.,4 no. graph's type because they are similar to 5 no. graph's type. We represent 5 no graph's type behalf of 1 no.,2 no.,3 no.,4 no. graph's type.

5 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.0,delta\_out=1.2,xin=2.666666666666667,xout=2.777777777777777  
10 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.0,delta\_out=1.4,xin=2.666666666666667,xout=2.888888888888889  
15 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.0,delta\_out=1.6,xin=2.666666666666667,xout=3.0  
20 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2,delta\_out=1.4,xin=2.833333333333335,xout=2.888888888888889  
25 no. graph's alpha=0.1,beta=0.5,gamma=0.4,delta\_in=0.2,delta\_out=1.6,xin=2.833333333333335,xout=3.0  
30 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.0,delta\_out=0.8,xin=2.428571428571429,xout=2.466666666666667  
35 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.0,delta\_out=1.0,xin=2.428571428571429,xout=2.555555555555556  
40 no. graph's alpha=0.1,beta=0.6,gamma=0.3,delta\_in=0.0,delta\_out=1.2,xin=2.428571428571429,xout=2.644444444444444

45 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.0, \delta_{out}=1.4, x_{in}=2.428571428571429, x_{out}=2.733333333333334$

50 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.0, \delta_{out}=1.6, x_{in}=2.428571428571429, x_{out}=2.822222222222224$

55 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.0, \delta_{out}=1.8, x_{in}=2.428571428571429, x_{out}=2.911111111111114$

60 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.2, \delta_{out}=1.0, x_{in}=2.542857142857143, x_{out}=2.555555555555556$

65 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.2, \delta_{out}=1.2, x_{in}=2.542857142857143, x_{out}=2.644444444444444$

70 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.2, \delta_{out}=1.4, x_{in}=2.542857142857143, x_{out}=2.733333333333334$

75 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.2, \delta_{out}=1.6, x_{in}=2.542857142857143, x_{out}=2.822222222222224$

80 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.2, \delta_{out}=1.8, x_{in}=2.542857142857143, x_{out}=2.911111111111114$

85 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4, \delta_{out}=1.4, x_{in}=2.657142857142857, x_{out}=2.733333333333334$

90 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4, \delta_{out}=1.6, x_{in}=2.657142857142857, x_{out}=2.822222222222224$

95 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.4, \delta_{out}=1.8, x_{in}=2.657142857142857, x_{out}=2.911111111111114$

100 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6, \delta_{out}=1.6, x_{in}=2.7714285714285714, x_{out}=2.822222222222224$

105 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.6, \delta_{out}=1.8, x_{in}=2.7714285714285714, x_{out}=2.911111111111114$

110 no. graph's  $\alpha=0.1, \beta=0.6, \gamma=0.3, \delta_{in}=0.8, \delta_{out}=1.8, x_{in}=2.885714285714286, x_{out}=2.911111111111114$

115 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=0.6, x_{in}=2.25, x_{out}=2.311111111111113$

120 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=0.8, x_{in}=2.25, x_{out}=2.377777777777778$

125 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=1.0, x_{in}=2.25, x_{out}=2.444444444444445$

130 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=1.2, x_{in}=2.25, x_{out}=2.511111111111111$

135 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=1.4, x_{in}=2.25, x_{out}=2.577777777777778$

140 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=1.6, x_{in}=2.25, x_{out}=2.644444444444444$

145 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=1.8, x_{in}=2.25, x_{out}=2.711111111111117$

150 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=2.0, x_{in}=2.25, x_{out}=2.777777777777778$

155 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=2.2, x_{in}=2.25, x_{out}=2.844444444444445$

160 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=2.4, x_{in}=2.25, x_{out}=2.911111111111114$

165 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=2.6, x_{in}=2.25, x_{out}=2.977777777777778$

170 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=0.8, x_{in}=2.325, x_{out}=2.377777777777778$

175 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=1.0, x_{in}=2.325, x_{out}=2.444444444444445$

180 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=1.2, x_{in}=2.325, x_{out}=2.511111111111111$

185 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=1.4, x_{in}=2.325, x_{out}=2.577777777777778$

190 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=1.6, x_{in}=2.325, x_{out}=2.644444444444444$

195 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=1.8, x_{in}=2.325, x_{out}=2.711111111111117$

200 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=2.0, x_{in}=2.325, x_{out}=2.777777777777778$

205 no. graph's  $\alpha=0.1, \beta=0.7, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=2.2, x_{in}=2.325, x_{out}=2.844444444444445$

210 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.2,delta\_out=2.4,xin=2.325,xout=2.9111111111111114  
215 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.2,delta\_out=2.6,xin=2.325,xout=2.9777777777777783  
220 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.4,delta\_out=1.0,xin=2.4,xout=2.444444444444445  
225 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.4,delta\_out=1.2,xin=2.4,xout=2.511111111111111  
230 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.4,delta\_out=1.4,xin=2.4,xout=2.5777777777777784  
235 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.4,delta\_out=1.6,xin=2.4,xout=2.6444444444444444  
240 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.4,delta\_out=1.8,xin=2.4,xout=2.7111111111111117  
245 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.4,delta\_out=2.0,xin=2.4,xout=2.777777777777778  
250 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.4,delta\_out=2.2,xin=2.4,xout=2.844444444444445  
255 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.4,delta\_out=2.4,xin=2.4,xout=2.9111111111111114  
260 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.4,delta\_out=2.6,xin=2.4,xout=2.9777777777777783  
265 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6,delta\_out=1.2,xin=2.475,xout=2.511111111111111  
270 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6,delta\_out=1.4,xin=2.475,xout=2.5777777777777784  
275 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6,delta\_out=1.6,xin=2.475,xout=2.6444444444444444  
280 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6,delta\_out=1.8,xin=2.475,xout=2.7111111111111117  
285 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6,delta\_out=2.0,xin=2.475,xout=2.777777777777778  
290 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6,delta\_out=2.2,xin=2.475,xout=2.844444444444445  
295 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6,delta\_out=2.4,xin=2.475,xout=2.9111111111111114  
300 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.6,delta\_out=2.6,xin=2.475,xout=2.9777777777777783  
305 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.8,delta\_out=1.4,xin=2.5500000000000003,xout=2.5777777777777784  
310 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.8,delta\_out=1.6,xin=2.5500000000000003,xout=2.6444444444444444  
315 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.8,delta\_out=1.8,xin=2.5500000000000003,xout=2.7111111111111117  
320 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.8,delta\_out=2.0,xin=2.5500000000000003,xout=2.777777777777778  
325 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.8,delta\_out=2.2,xin=2.5500000000000003,xout=2.844444444444445  
330 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.8,delta\_out=2.4,xin=2.5500000000000003,xout=2.9111111111111114  
335 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=0.8,delta\_out=2.6,xin=2.5500000000000003,xout=2.9777777777777783  
340 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.0,delta\_out=1.6,xin=2.6250000000000004,xout=2.6444444444444444  
345 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.0,delta\_out=1.8,xin=2.6250000000000004,xout=2.7111111111111117  
350 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.0,delta\_out=2.0,xin=2.6250000000000004,xout=2.777777777777778  
355 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.0,delta\_out=2.2,xin=2.6250000000000004,xout=2.844444444444445  
360 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.0,delta\_out=2.4,xin=2.6250000000000004,xout=2.9111111111111114  
365 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.0,delta\_out=2.6,xin=2.6250000000000004,xout=2.9777777777777783  
370 no. graph's alpha=0.1,beta=0.7,gamma=0.2,delta\_in=1.2,delta\_out=1.8,xin=2.7000000000000006,xout=2.7111111111111117









870 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.8,delta\_out=3.8,xin=2.2888888888888888,xout=2.9555555555555557  
875 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=0.8,delta\_out=4.0,xin=2.2888888888888888,xout=3.0  
880 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.0,delta\_out=1.2,xin=2.3333333333333335,xout=2.3777777777777778  
885 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.0,delta\_out=1.4,xin=2.3333333333333335,xout=2.4222222222222225  
890 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.0,delta\_out=1.6,xin=2.3333333333333335,xout=2.466666666666667  
895 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.0,delta\_out=1.8,xin=2.3333333333333335,xout=2.5111111111111115  
900 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.0,delta\_out=2.0,xin=2.3333333333333335,xout=2.5555555555555554  
905 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.0,delta\_out=2.2,xin=2.3333333333333335,xout=2.5999999999999996  
910 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.0,delta\_out=2.4,xin=2.3333333333333335,xout=2.6444444444444444  
915 no. graph's alpha=0.1,beta=0.8,gamma=0.1,delta\_in=1.0,delta\_out=2.6,xin=2.3333333333333335,xout=2.6888888888888887  
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1545 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.4,delta\_out=0.8,xin=2.7142857142857144,xout=2.75

1550 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.4,delta\_out=1.0,xin=2.7142857142857144,xout=2.8749999999999996

1555 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.4,delta\_out=1.2,xin=2.7142857142857144,xout=2.9999999999999996

1560 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.6,delta\_out=1.0,xin=2.857142857142857,xout=2.8749999999999996

1565 no. graph's alpha=0.2,beta=0.5,gamma=0.3,delta\_in=0.6,delta\_out=1.2,xin=2.857142857142857,xout=2.9999999999999996

1570 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.0,delta\_out=0.2,xin=2.25,xout=2.3499999999999996

1575 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.0,delta\_out=0.4,xin=2.25,xout=2.4499999999999997

1580 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.0,delta\_out=0.6,xin=2.25,xout=2.55

1585 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.0,delta\_out=0.8,xin=2.25,xout=2.65

1590 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.0,delta\_out=1.0,xin=2.25,xout=2.75

1595 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.0,delta\_out=1.2,xin=2.25,xout=2.8499999999999996

1600 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.0,delta\_out=1.4,xin=2.25,xout=2.9499999999999997

1605 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.2,delta\_out=0.4,xin=2.3499999999999996,xout=2.4499999999999997

1610 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.2,delta\_out=0.6,xin=2.3499999999999996,xout=2.55

1615 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.2,delta\_out=0.8,xin=2.3499999999999996,xout=2.65

1620 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.2,delta\_out=1.0,xin=2.3499999999999996,xout=2.75

1625 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.2,delta\_out=1.2,xin=2.3499999999999996,xout=2.8499999999999996

1630 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.2,delta\_out=1.4,xin=2.3499999999999996,xout=2.9499999999999997

1635 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.4,delta\_out=0.6,xin=2.4499999999999997,xout=2.55

1640 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.4,delta\_out=0.8,xin=2.4499999999999997,xout=2.65

1645 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.4,delta\_out=1.0,xin=2.4499999999999997,xout=2.75

1650 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.4,delta\_out=1.2,xin=2.4499999999999997,xout=2.8499999999999996

1655 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.4,delta\_out=1.4,xin=2.4499999999999997,xout=2.9499999999999997

1660 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.6,delta\_out=0.8,xin=2.55,xout=2.65

1665 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.6,delta\_out=1.0,xin=2.55,xout=2.75

1670 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.6,delta\_out=1.2,xin=2.55,xout=2.8499999999999996

1675 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.6,delta\_out=1.4,xin=2.55,xout=2.9499999999999997

1680 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.8,delta\_out=1.0,xin=2.65,xout=2.75

1685 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.8,delta\_out=1.2,xin=2.65,xout=2.8499999999999996

1690 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=0.8,delta\_out=1.4,xin=2.65,xout=2.9499999999999997

1695 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=1.0,delta\_out=1.2,xin=2.75,xout=2.8499999999999996  
1700 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=1.0,delta\_out=1.4,xin=2.75,xout=2.9499999999999997  
1705 no. graph's alpha=0.2,beta=0.6,gamma=0.2,delta\_in=1.2,delta\_out=1.4,xin=2.8499999999999996,xout=2.9499999999999997  
1710 no. graph's alpha=0.3,beta=0.3,gamma=0.4,delta\_in=0.0,delta\_out=0.4,xin=2.666666666666667,xout=2.8285714285714287  
1715 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.0,delta\_out=0.2,xin=2.428571428571429,xout=2.6  
1720 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.0,delta\_out=0.4,xin=2.428571428571429,xout=2.7714285714285714  
1725 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.0,delta\_out=0.6,xin=2.428571428571429,xout=2.942857142857143  
1730 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.2,delta\_out=0.4,xin=2.6,xout=2.7714285714285714  
1735 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.2,delta\_out=0.6,xin=2.6,xout=2.942857142857143  
1740 no. graph's alpha=0.3,beta=0.4,gamma=0.3,delta\_in=0.4,delta\_out=0.6,xin=2.7714285714285714,xout=2.942857142857143  
1745 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.0,delta\_out=0.0,xin=2.25,xout=2.428571428571429  
1750 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.0,delta\_out=0.2,xin=2.25,xout=2.5714285714285716  
1755 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.0,delta\_out=0.4,xin=2.25,xout=2.7142857142857144  
1760 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.0,delta\_out=0.6,xin=2.25,xout=2.857142857142857  
1765 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.2,delta\_out=0.0,xin=2.3749999999999996,xout=2.428571428571429  
1770 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.2,delta\_out=0.2,xin=2.3749999999999996,xout=2.5714285714285716  
1775 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.2,delta\_out=0.4,xin=2.3749999999999996,xout=2.7142857142857144  
1780 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.2,delta\_out=0.6,xin=2.3749999999999996,xout=2.857142857142857  
1785 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.4,delta\_out=0.2,xin=2.5,xout=2.5714285714285716  
1790 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.4,delta\_out=0.4,xin=2.5,xout=2.7142857142857144  
1795 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.4,delta\_out=0.6,xin=2.5,xout=2.857142857142857  
1800 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.6,delta\_out=0.4,xin=2.625,xout=2.7142857142857144  
1805 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.6,delta\_out=0.6,xin=2.625,xout=2.857142857142857  
1810 no. graph's alpha=0.3,beta=0.5,gamma=0.2,delta\_in=0.8,delta\_out=0.6,xin=2.75,xout=2.857142857142857  
1815 no. graph's alpha=0.4,beta=0.2,gamma=0.4,delta\_in=0.0,delta\_out=0.2,xin=2.666666666666667,xout=2.933333333333333  
1820 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.0,delta\_out=0.0,xin=2.428571428571429,xout=2.666666666666667  
1825 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.0,delta\_out=0.2,xin=2.428571428571429,xout=2.9  
1830 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.2,delta\_out=0.0,xin=2.628571428571429,xout=2.666666666666667  
1835 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.2,delta\_out=0.2,xin=2.628571428571429,xout=2.9  
1840 no. graph's alpha=0.4,beta=0.3,gamma=0.3,delta\_in=0.4,delta\_out=0.2,xin=2.8285714285714287,xout=2.9  
1845 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.0,delta\_out=0.0,xin=2.25,xout=2.666666666666667  
1850 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.0,delta\_out=0.2,xin=2.25,xout=2.866666666666667  
1855 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.2,delta\_out=0.0,xin=2.4,xout=2.666666666666667

1860 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.2,delta\_out=0.2,xin=2.4,xout=2.866666666666667

1865 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.4,delta\_out=0.0,xin=2.55,xout=2.666666666666665

1870 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.4,delta\_out=0.2,xin=2.55,xout=2.866666666666667

1875 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.6,delta\_out=0.2,xin=2.7,xout=2.866666666666667

1880 no. graph's alpha=0.4,beta=0.4,gamma=0.2,delta\_in=0.8,delta\_out=0.2,xin=2.85,xout=2.866666666666667

1885 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.0,delta\_out=0.0,xin=2.111111111111111,xout=2.666666666666667

1890 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.0,delta\_out=0.2,xin=2.111111111111111,xout=2.833333333333335

1895 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.0,delta\_out=0.4,xin=2.111111111111111,xout=3.0

1900 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.2,delta\_out=0.0,xin=2.222222222222223,xout=2.666666666666667

1905 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.2,delta\_out=0.2,xin=2.222222222222223,xout=2.833333333333335

1910 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.2,delta\_out=0.4,xin=2.222222222222223,xout=3.0

1915 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.4,delta\_out=0.0,xin=2.333333333333335,xout=2.666666666666667

1920 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.4,delta\_out=0.2,xin=2.333333333333335,xout=2.833333333333335

1925 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.4,delta\_out=0.4,xin=2.333333333333335,xout=3.0

1930 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.6,delta\_out=0.0,xin=2.444444444444446,xout=2.666666666666667

1935 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.6,delta\_out=0.2,xin=2.444444444444446,xout=2.833333333333335

1940 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.6,delta\_out=0.4,xin=2.444444444444446,xout=3.0

1945 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.8,delta\_out=0.0,xin=2.555555555555554,xout=2.666666666666667

1950 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.8,delta\_out=0.2,xin=2.555555555555554,xout=2.833333333333335

1955 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=0.8,delta\_out=0.4,xin=2.555555555555554,xout=3.0

1960 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.0,delta\_out=0.0,xin=2.666666666666665,xout=2.666666666666667

1965 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.0,delta\_out=0.2,xin=2.666666666666665,xout=2.833333333333335

1970 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.0,delta\_out=0.4,xin=2.666666666666665,xout=3.0

1975 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.2,delta\_out=0.2,xin=2.777777777777777,xout=2.833333333333335

1980 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.2,delta\_out=0.4,xin=2.777777777777777,xout=3.0

1985 no. graph's alpha=0.4,beta=0.5,gamma=0.1,delta\_in=1.4,delta\_out=0.4,xin=2.888888888888889,xout=3.0

1990 no. graph's alpha=0.5,beta=0.1,gamma=0.4,delta\_in=0.0,delta\_out=0.0,xin=2.666666666666667,xout=3.0

1995 no. graph's alpha=0.5,beta=0.1,gamma=0.4,delta\_in=0.2,delta\_out=0.0,xin=2.966666666666667,xout=3.0

2000 no. graph's alpha=0.5,beta=0.2,gamma=0.3,delta\_in=0.0,delta\_out=0.0,xin=2.428571428571429,xout=3.0

2005 no. graph's alpha=0.5,beta=0.2,gamma=0.3,delta\_in=0.2,delta\_out=0.0,xin=2.6571428571428575,xout=3.0

2010 no. graph's alpha=0.5,beta=0.2,gamma=0.3,delta\_in=0.4,delta\_out=0.0,xin=2.885714285714286,xout=3.0

2015 no. graph's alpha=0.5,beta=0.3,gamma=0.2,delta\_in=0.0,delta\_out=0.0,xin=2.25,xout=3.0

2020 no. graph's alpha=0.5,beta=0.3,gamma=0.2,delta\_in=0.2,delta\_out=0.0,xin=2.425,xout=3.0

2025 no. graph's  $\alpha=0.5, \beta=0.3, \gamma=0.2, \delta_{in}=0.4, \delta_{out}=0.0, x_{in}=2.6, x_{out}=3.0$   
2030 no. graph's  $\alpha=0.5, \beta=0.3, \gamma=0.2, \delta_{in}=0.6, \delta_{out}=0.0, x_{in}=2.7749999999999995, x_{out}=3.0$   
2035 no. graph's  $\alpha=0.5, \beta=0.3, \gamma=0.2, \delta_{in}=0.8, \delta_{out}=0.0, x_{in}=2.95, x_{out}=3.0$   
2040 no. graph's  $\alpha=0.5, \beta=0.4, \gamma=0.1, \delta_{in}=0.0, \delta_{out}=0.0, x_{in}=2.111111111111111, x_{out}=3.0$   
2045 no. graph's  $\alpha=0.5, \beta=0.4, \gamma=0.1, \delta_{in}=0.2, \delta_{out}=0.0, x_{in}=2.2444444444444445, x_{out}=3.0$   
2050 no. graph's  $\alpha=0.5, \beta=0.4, \gamma=0.1, \delta_{in}=0.4, \delta_{out}=0.0, x_{in}=2.377777777777778, x_{out}=3.0$   
2055 no. graph's  $\alpha=0.5, \beta=0.4, \gamma=0.1, \delta_{in}=0.6, \delta_{out}=0.0, x_{in}=2.5111111111111106, x_{out}=3.0$   
2060 no. graph's  $\alpha=0.5, \beta=0.4, \gamma=0.1, \delta_{in}=0.8, \delta_{out}=0.0, x_{in}=2.644444444444444, x_{out}=3.0$   
2065 no. graph's  $\alpha=0.5, \beta=0.4, \gamma=0.1, \delta_{in}=1.0, \delta_{out}=0.0, x_{in}=2.777777777777778, x_{out}=3.0$   
2070 no. graph's  $\alpha=0.5, \beta=0.4, \gamma=0.1, \delta_{in}=1.2, \delta_{out}=0.0, x_{in}=2.911111111111111, x_{out}=3.0$

### Experiment-2's graph types for $X_{in}=X_{out}$ :

In experiment-2, each 5 graph's types are same but graphs are different from each other; because they are random graphs.

But for showing graphs types,

we are going to show one graph type from each similar 5 graph's types.

For example, Here, we skip showing 1 no., 2 no., 3 no., 4 no. graph's type because they are similar to 5 no. graph's type. We represent 5 no. graph's type behalf of 1 no., 2 no., 3 no., 4 no. graph's type.

5 no. graph's  $\alpha=0.1, \beta=0.5, \gamma=0.4, \delta_{in}=0.4, \delta_{out}=1.6, x_{in}=3.0, x_{out}=3.0$   
10 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=0.0, \delta_{out}=0.0, x_{in}=2.111111111111111, x_{out}=2.111111111111111$   
15 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=0.2, \delta_{out}=0.2, x_{in}=2.155555555555554, x_{out}=2.155555555555554$   
20 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=0.4, \delta_{out}=0.4, x_{in}=2.199999999999997, x_{out}=2.199999999999997$   
25 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=0.6, \delta_{out}=0.6, x_{in}=2.244444444444445, x_{out}=2.244444444444445$   
30 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=0.8, \delta_{out}=0.8, x_{in}=2.288888888888888, x_{out}=2.288888888888888$   
35 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=1.0, \delta_{out}=1.0, x_{in}=2.333333333333335, x_{out}=2.333333333333335$   
40 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=1.2, \delta_{out}=1.2, x_{in}=2.377777777777778, x_{out}=2.377777777777778$   
45 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=1.4, \delta_{out}=1.4, x_{in}=2.422222222222225, x_{out}=2.422222222222225$



50 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=1.6, \delta_{out}=1.6, x_{in}=2.466666666666667, x_{out}=2.466666666666667$

55 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=1.8, \delta_{out}=1.8, x_{in}=2.511111111111115, x_{out}=2.511111111111115$

60 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=2.0, \delta_{out}=2.0, x_{in}=2.555555555555554, x_{out}=2.555555555555554$

65 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=2.2, \delta_{out}=2.2, x_{in}=2.599999999999996, x_{out}=2.599999999999996$

70 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=2.4, \delta_{out}=2.4, x_{in}=2.644444444444444, x_{out}=2.644444444444444$

75 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=2.6, \delta_{out}=2.6, x_{in}=2.688888888888887, x_{out}=2.688888888888887$

80 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=2.8, \delta_{out}=2.8, x_{in}=2.733333333333334, x_{out}=2.733333333333334$

85 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=3.0, \delta_{out}=3.0, x_{in}=2.777777777777777, x_{out}=2.777777777777777$

90 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=3.2, \delta_{out}=3.2, x_{in}=2.822222222222224, x_{out}=2.822222222222224$

95 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=3.4, \delta_{out}=3.4, x_{in}=2.866666666666667, x_{out}=2.866666666666667$

100 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=3.6, \delta_{out}=3.6, x_{in}=2.911111111111111, x_{out}=2.911111111111111$

105 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=3.8, \delta_{out}=3.8, x_{in}=2.955555555555557, x_{out}=2.955555555555557$

110 no. graph's  $\alpha=0.1, \beta=0.8, \gamma=0.1, \delta_{in}=4.0, \delta_{out}=4.0, x_{in}=3.0, x_{out}=3.0$

115 no. graph's  $\alpha=0.2, \beta=0.6, \gamma=0.2, \delta_{in}=0.0, \delta_{out}=0.0, x_{in}=2.25, x_{out}=2.25$

120 no. graph's  $\alpha=0.2, \beta=0.6, \gamma=0.2, \delta_{in}=0.2, \delta_{out}=0.2, x_{in}=2.349999999999996, x_{out}=2.349999999999996$

125 no. graph's  $\alpha=0.2, \beta=0.6, \gamma=0.2, \delta_{in}=0.4, \delta_{out}=0.4, x_{in}=2.449999999999997, x_{out}=2.449999999999997$

130 no. graph's  $\alpha=0.2, \beta=0.6, \gamma=0.2, \delta_{in}=0.6, \delta_{out}=0.6, x_{in}=2.55, x_{out}=2.55$

135 no. graph's  $\alpha=0.2, \beta=0.6, \gamma=0.2, \delta_{in}=0.8, \delta_{out}=0.8, x_{in}=2.65, x_{out}=2.65$

140 no. graph's  $\alpha=0.2, \beta=0.6, \gamma=0.2, \delta_{in}=1.0, \delta_{out}=1.0, x_{in}=2.75, x_{out}=2.75$

145 no. graph's  $\alpha=0.2, \beta=0.6, \gamma=0.2, \delta_{in}=1.2, \delta_{out}=1.2, x_{in}=2.849999999999996, x_{out}=2.849999999999996$

150 no. graph's  $\alpha=0.2, \beta=0.6, \gamma=0.2, \delta_{in}=1.4, \delta_{out}=1.4, x_{in}=2.949999999999997, x_{out}=2.949999999999997$

155 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.0, \delta_{out}=0.0, x_{in}=2.428571428571429, x_{out}=2.428571428571429$

160 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.2, \delta_{out}=0.2, x_{in}=2.6, x_{out}=2.6$

165 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.4, \delta_{out}=0.4, x_{in}=2.7714285714285714, x_{out}=2.7714285714285714$

170 no. graph's  $\alpha=0.3, \beta=0.4, \gamma=0.3, \delta_{in}=0.6, \delta_{out}=0.6, x_{in}=2.942857142857143, x_{out}=2.942857142857143$

175 no. graph's  $\alpha=0.4, \beta=0.2, \gamma=0.4, \delta_{in}=0.0, \delta_{out}=0.0, x_{in}=2.666666666666665, x_{out}=2.666666666666665$

180 no. graph's  $\alpha=0.4, \beta=0.2, \gamma=0.4, \delta_{in}=0.2, \delta_{out}=0.2, x_{in}=2.933333333333333, x_{out}=2.933333333333333$

185 no. graph's  $\alpha=0.4, \beta=0.5, \gamma=0.1, \delta_{in}=1.6, \delta_{out}=0.4, x_{in}=3.0, x_{out}=3.0$

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