Title: Studies on different Deployment Strategies and Clustering Process for Energy minimization of Wireless Sensor Networks using modified ACO Algorithm

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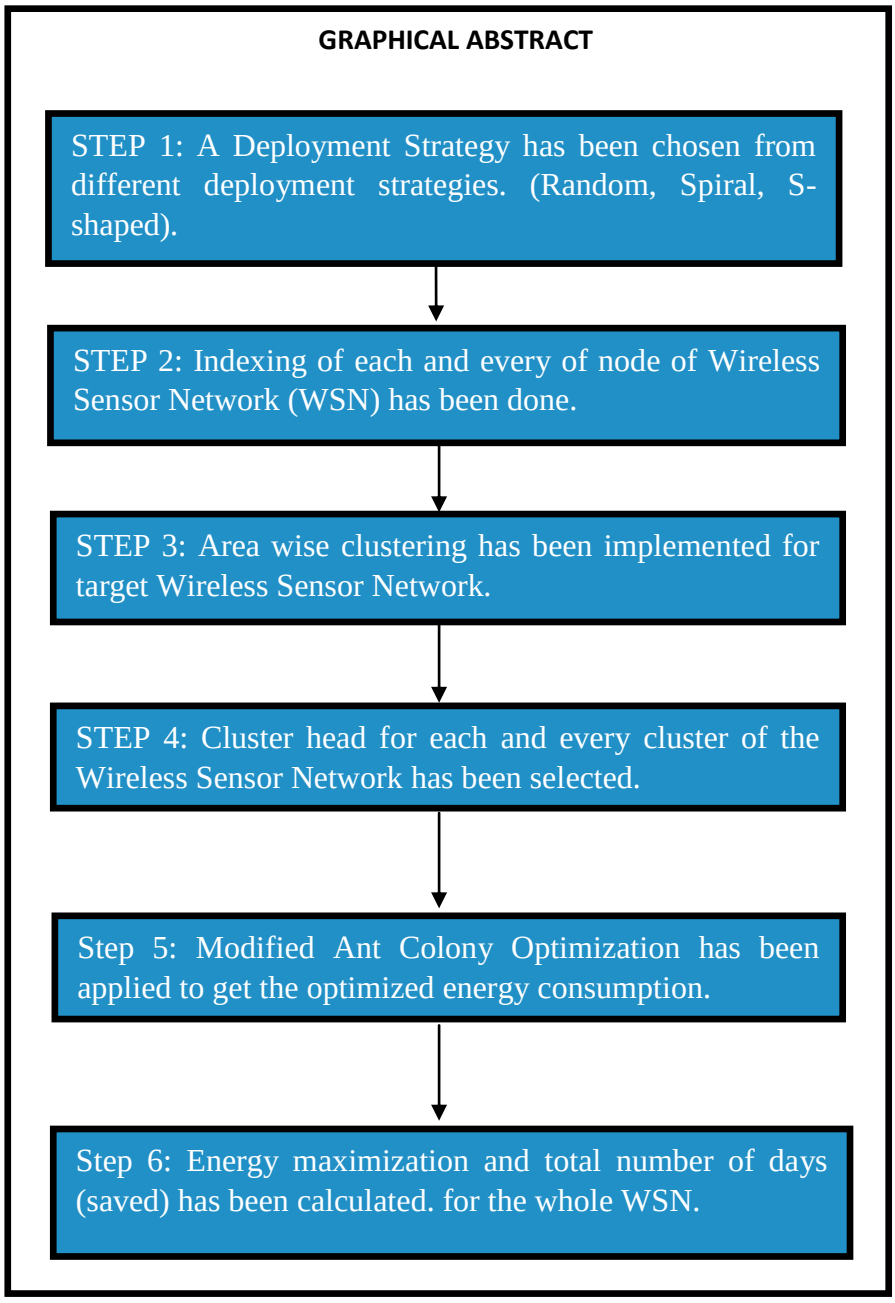

1. Abstract

In this paper, we have studied different deployment strategies and we have implemented area-wise clustering along with modified Ant Colony Optimization to minimize the energy.

BACKGROUND: Previously some deployment strategies were used to enhance the lifetime of WSN but in our research, we have implemented some novel deployment strategies (random, spiral, and s-pattern) along with a novel clustering process to get better results than the existing literature as shown in Table 5.

OBJECTIVE: The main objective of the research article is to enhance the lifetime of Wireless Sensor Network with the help of different deployment strategies, a novel clustering process, and a Meta-heuristic algorithm.

METHOD: We have implemented methods like deployment strategies, clustering, and modified versions of ACO to get the results.

RESULT: Random Deployment: 11.15 days to 15.09 days.
Spiral Deployment: 11.25 days to 15.23 days.
S-Pattern Deployment: 11.33 days to 15.33 days.

CONCLUSION: In this research, the lifetime of WSN has been increased to a significant margin theoretically. To choose the best result set among all the obtained results some parameters such as equivalent distribution, number of iterations, maximum energy has been set to a permissible range. To decide which type of deployment strategies should be applied to get the maximum amount of energy and increasing the lifetime of the overall network we can use the fuzzy set in future work. IN practical life the margin may not match with the theoretical result due to physical dependencies like some external environmental factors.

Keywords: Wireless Sensor Network, Deployment Strategy, Clustering Process, Ant Colony Optimization (ACO), Meta-heuristic Methods, Cluster Cell.

2. Introduction

Wireless sensor network (WSN) is employed in various fields like medicine, agriculture, meteorology, etc. WSN eases many tasks in real life especially in case of surveillance. It has got some inspiring problems like war field monitoring, Temperature Sensing, Pressure sensing, etc. Apart from sensing the major job of WSN is to transmit and receive data in the network. Wireless Sensor Network has a good range of applications in modern-day technology. WSN is a tiny device having sensing, communicative, processing, and storage units with power copy by a non-rechargeable battery. The WSN nodes are deployed within the target area to collect various sorts of important information and transfer that information to the sink node. Nowadays this sort of network is getting used during a modern army, environmental monitoring [1], battlefield monitoring [2] body area network, intelligent household, etc. The Sink node [3] is the controller communicative node acting as an administrator node in the WSN).

Depending upon the moving nature of WSN, it is classified into two types and those are static WSN [4] and dynamic WSN [5]. In the case of static WSN, the whole unit is mounted and

fixed to a certain fixed point (co-ordinate regarding the sink node). In the case of dynamic WSN, the node is dynamic, though the sink node is generally mounted to a fixed coordinate. Now depending upon the need and purpose the node is selected. In our experiment, static nodes were used where the coordinate of the sink node as well as typical nodes are fixed and permanent. [6]

In the case of a typical WSN design, the sensor nodes are deployed to cover the target area. [7].The sensor nodes are deployed to sense the required data like weather information or enemy related information and transfer it to the sink node may be directly or via another sensor node. Now in the case of our research, the target area has been clustered into a uniform cell. A cell structure is defined as the arrangement of cells in a particular network. The cell structure may be triangular or square in structure but not circular. A circular cell structure leaves out a lot of areas. Out of the remaining square was chosen as the triangular structure cannot cover more area as compared to the square cell structure. In this paper, our objective is to minimize the power consumption of a WSN. The traversal path is being minimized to cover every cell of the particular path as well as the traversal path between the sink node and cells. The movement of the ants motivated us in using Ant Colony Optimization though in this paper a modified version of ACO is being used (Ant Colony Optimization) which provides us the shortest path.

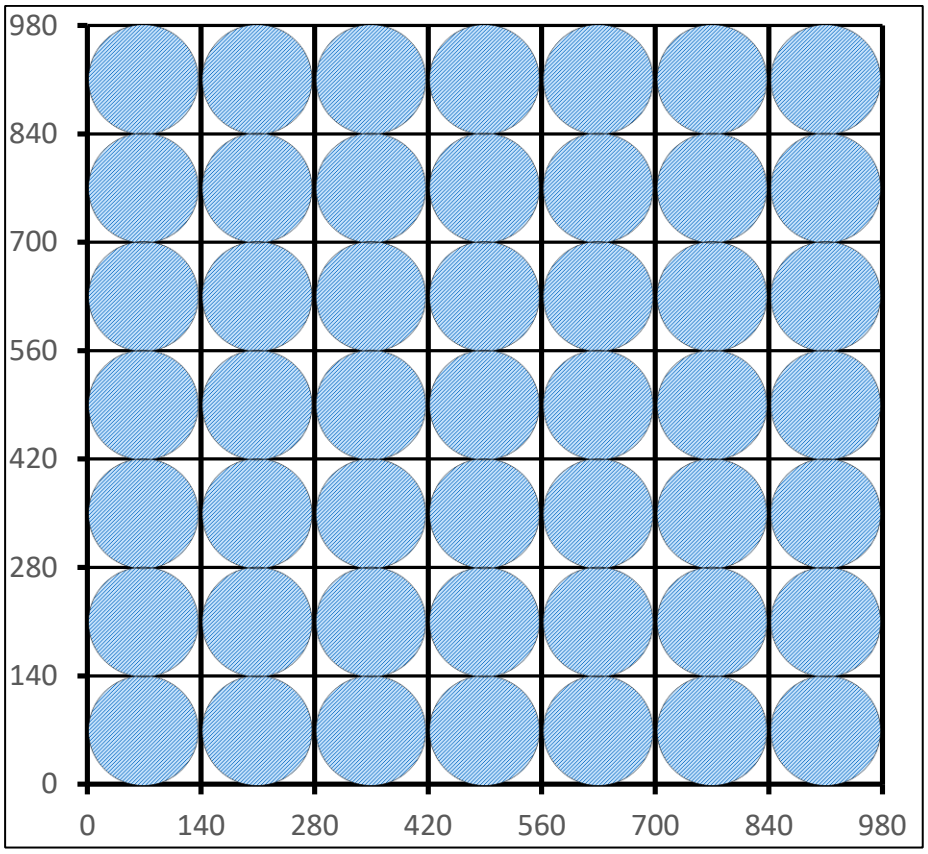

Figure1: Clusterization of the whole area using circular cluster cell structure.

The shaded circle indicates the square structure (Figure 1). The cell structures that are covering the whole area, in that case, a big uncover is found between the adjacent clusters.

And this big uncover area leads to wastage of space [8]. Due to this reason, circular clustering has not been adopted.

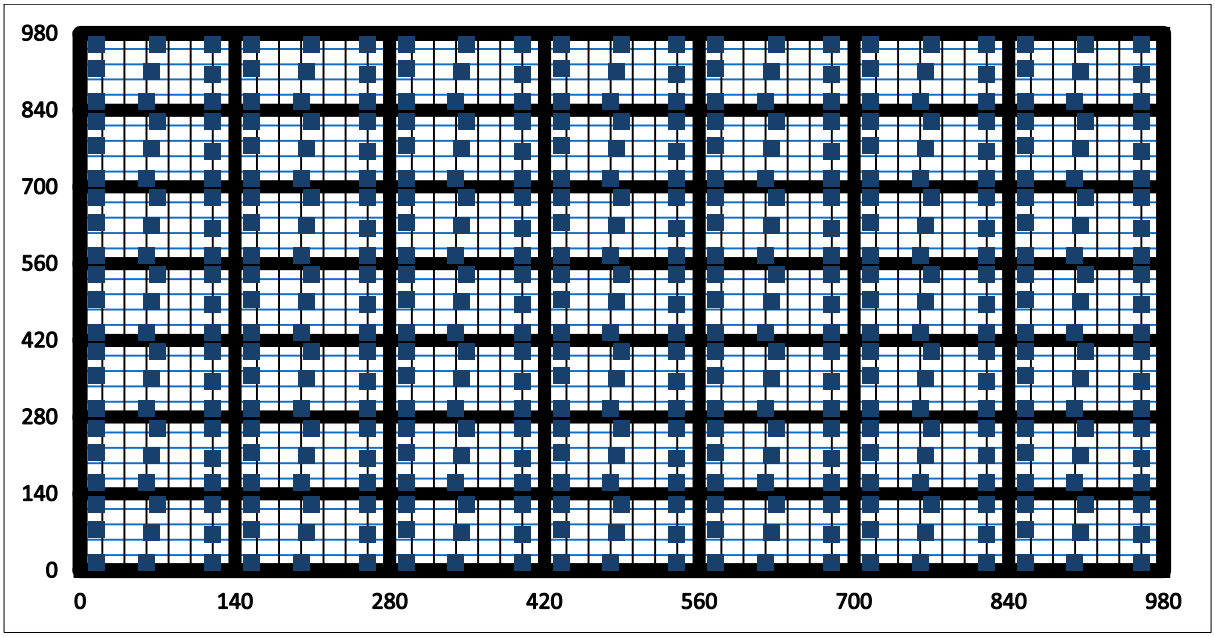

Figure 2: Clusterization of the whole area using square cluster cell structure

The whole area has been divided into multiple square structures (Figure 2). The dotted line in the figure denotes the position of WSN nodes. The nodes have been arranged in such a way that the maximum area covered by each node and also the uniformity is also maintained. This deployment will be varied in the case of real-life WSN deployment.

Each cell consists of more than one sensor node (denoted as N). The sink node (denoted as SN) acts as a control point as if the local server node. The main aim of the network is to transfer information [9] from one node of a particular cell to another node of an adjacent cell to minimize the total power consumption. Each cell is considered as one cluster and each cluster having a sensor node active node which will continue the communication to an adjacent cluster. The active node of each cluster is called Cluster-Head (denoted as CH) [10] The CH is connected with another CH and thus a network is established. The established network will persist until any CH becomes fully exhausted due to a shortage of power backup and after that, the exhausted CH will be replaced by another CH and so on until all cluster heads of the cluster become exhausted. Here two types of communication will take place i.e., inter-cluster communication (CH-CH communication) [3] or Sink-Cluster communication (SN-CH communication).
The WSN lifetime is dependent on the battery life of the WSN. The lifetime of WSN depends upon so many design factors like the Deployment Strategy of WSN nodes and the Clustering Process. The deployment strategy has a great effect on the power consumption and network coverage of sensor networks. In the clustering process, the area is divided into many clusters for creating the congestion-free transmission. After clustering, some specific nodes are selected to design the network and some of them are designated as cluster head or leader node for those clusters. After that, a modified version of the ACO algorithm has been implemented for getting the shortest path to design an effective and concise network for the minimization

of energy. The obtained result by applying different deployment strategies has been compared with an identical network of various literature. A significant amount of energy saving has been observed and recorded for the proposed algorithm. The obtained result has been compared with some existing literature and it claimed better results than other implemented results of some exiting literature.

In section 3 we have done the literature survey which indicates the related work about WSN by different scholars. Then comes the solution methodology in section 4 where we have discussed how a modified ACO helps to find the shortest path. Then in sections 5 and 6, we have done numerical data analysis and data representation where we displayed the data in terms of tables and pictures. In section 7 we have done the Result Analysis which has been represented in terms of "number of days" the network can sustain. Lastly, we have done a conclusion in section 8 which discussed the scope for future work.

3. Literature Survey

[11]have suggested a new power optimization technique to increase network lifetime.[12] have proposed the technique of DPM (Dynamic Power Management) which helps to control the duty cycle efficiently which helps in minimize power consumption.[13]explained how minimized handshaking helps in reducing the optimized power level which in turn increases the lifetime of the WSN. [14] discussed how to maintain a balance between data packets size and transmission energy. Small data packet size increases the transmission energy while large data packet size will be difficult to transmit hence can result in loss of data.[15] suggested the concept of a UAV (unmanned aerial vehicle) that helps in establishing a flexible movement path that helps in reliable communication. [16] Expressed the concept of IWSMACO which is a modified version of ACO (Ant colony optimization) based on the information weight factor. [17] Suggested MLACO (method based on ant colony optimization) which uses supervised and unsupervised learning algorithms. [18] Introduce a hybrid algorithm based on fuzzy logic unequal clustering and ACO. Here fuzzy logic is used to select cluster heads. [19] Explained how the LEACH cluster algorithm can be used to select cluster heads which reduces the consumption of energy. [20] Suggested that deployment is an important concept of WSN. [21] Proposed deployment can be classified as deterministic and non-deterministic. [22] Introduced a new meta-heuristic algorithm called SE (Search Economics) to solve the deployment problem of WSN. [23] Proposed MODS (Multi-Objective deployment strategy) for solving the placement problem to optimize it. [24] Suggested optimizing the physical distance and signal strength between two nodes. [25] Advise us to use a routing algorithm that uses special parameters to reduce energy consumption by each node.
[26] Explained to use a combination of ACO based MAC and unequal clustering cross-layer protocol for cluster head selection. [27] Suggested using swarm intelligence based computational techniques to improve the overall WSN.

4. Solution Methodology

In our paper, a modified version of the ACO algorithm is implemented for the optimization of consumed energy in WSN. This technique has acquired attention due to its precision towards

the optimal results. In Ant Colony Optimization, several artificial ants build solutions are considered towards the optimization problem. These exchange data about the quality of these results via a communication media, "pheromone trail, which is reminiscent of the one adopted by real ants" [28].

The original ACO algorithm acknowledged as the Ant System was presented in [29]. A brief discussion on ACO is followed next.

An ant solves by repeatedly applying a state transition rule and further, the solution is enhanced by a local search algorithm. Then the ant adapts "...the amount of pheromone on the visited edges by applying a local pheromone updating rule" [28]. Once all ants have finished their operations, "the amount of pheromone is modified by applying a global updating rule" [28]. ACO activity may be realized with the following two equations Equation 1 and Equation 2.

$$\tau_{ij} = \begin{cases} (1-\rho).\tau_{ij} + \rho.\Delta\tau_{ij}, & \text{if(i,j)} \in \text{best solution} \\ \tau_{ij} & \text{otherwise} \end{cases} \quad (1)$$

The local pheromone updating rule is shown in Equation 2.

$$\tau_{ij} = \{\tau_{ij}.(1-\varphi) + \varphi.\tau_0 \quad (2)$$

Contribution: Modification in ACO algorithm: At first the ANT solution is updated using local update rule. Then the updated ANT solution is modified using global update rule and ultimately the ANT solution is compared with a previous feasible solution and has taken the following strategies:

a) If both (before modification by global update rule and after modification by global update rule) solution is feasible then choose the ANT solution for which the nearest value of global optimum is achieved.
b) If any solution is in-feasible then discard it and obtain the feasible ANT solution.
c) If both (before modification by global update rule and after modification by global update rule) solution is in-feasible then discard the ANT solution and find the next ANT solution.
d) In this paper, a modified meta-heuristic algorithm is used (i.e., modified ACO algorithm) that has been used, for selecting the cluster head of the efficient WSN to get the efficient network route.

Pseudo-code for modified ACO

Step 1: Initialize the parameters of the ACO algorithm, including the number of ants to be deployed, the maximum number of iterations, the tune-able parameters, and the initial level of pheromone.
Step 2: Randomly select a node within any cluster and select the other node from another cluster until all the clusters are covered and follow the ACO rule (ACO update rule).
Step 3: If all paths have been traversed by each ant, then continue; otherwise go to step 2.
Step 4: Evaluate the path using the update rule to achieve accuracy depending upon

verification.
Step 5: After evaporation of the pheromone, find the ant with the best path. Only permit those ants to deposit pheromone on its traversed paths. If the maximum number of iteration max has not reached go back to step 2; otherwise, go to the next step.
Step 6: Search for the globally best path which produces the highest accuracy among all local best solutions.
Step 7: End

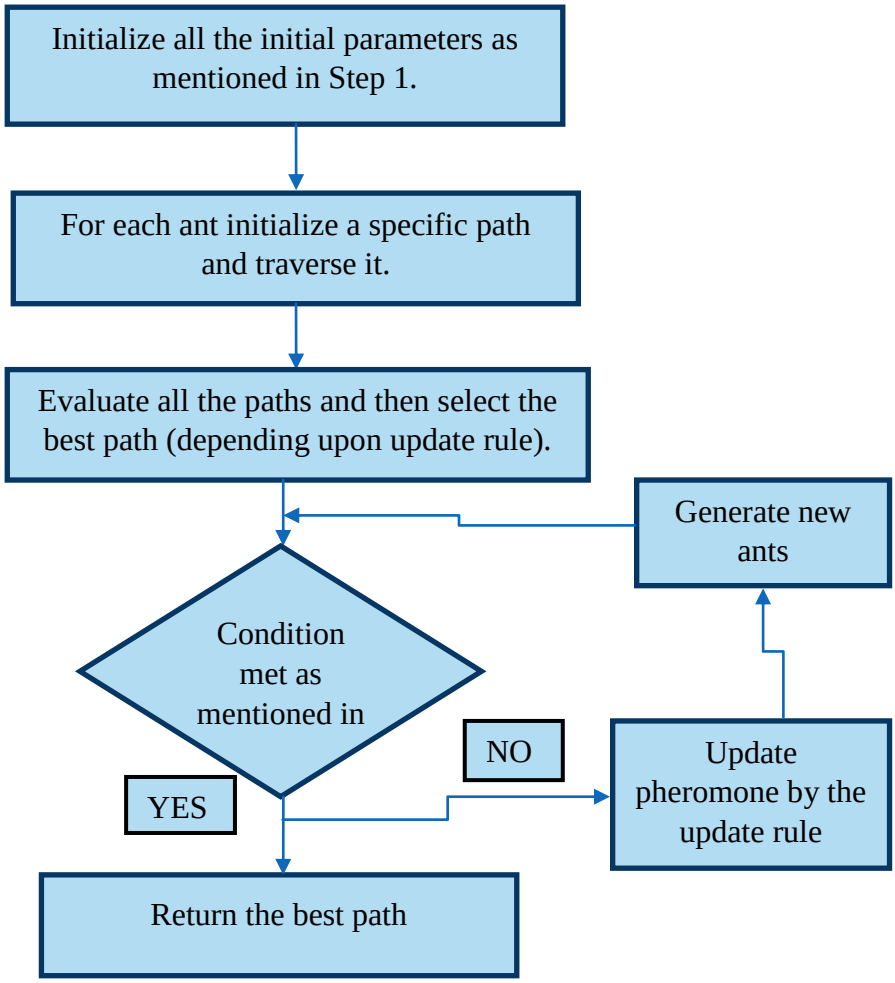

Figure 3: Flowchart of the modified ACO algorithm

In this paper, the entire process of network formation has been done through the following steps:

1. **Indexing for Sensor Nodes**: The sensor nodes to be deployed must be indexed virtually just to denote or keep track of each sensor nodes before and after the deployment. This indexing process will also help to form the network in an efficient manner. The indexing has been proposed by the help of row and column number of the cell (as depicted in figure 2.). It also helps us to get the matrix of row and column number of the target area. The indexing is generally a sequential number.

a. **Indexing before Deployment**: This is the indexing that is given to the sensor node before deployment. It will help us just to keep track of the total number of sensor nodes to be deployed and to maintain the serial of sensor nodes. (Figure 6, 7, 8, 10, 11, 12, 14, 15, 16).

b. **Indexing after Deployment:** This type of indexing much more important because this indexing is given to the sensor nodes after deployment. By this indexing, the sensor node will be denoted until the sensor node becomes fully exhausted. (Figure 9, 13, 17)

2. **Clustering:** Here clustering means separating target area into some uniform or equal chunks. The aim is to construct an efficient network. The structure of cluster cells has been chosen as a square. It can be proved (Katz 2008) that using square cluster-cell the target area can be covered properly. The energy consumption can be minimized. Here the term efficiently refers to the efficient and uniform coverage of the target area with no gap between the neighboring clusters.

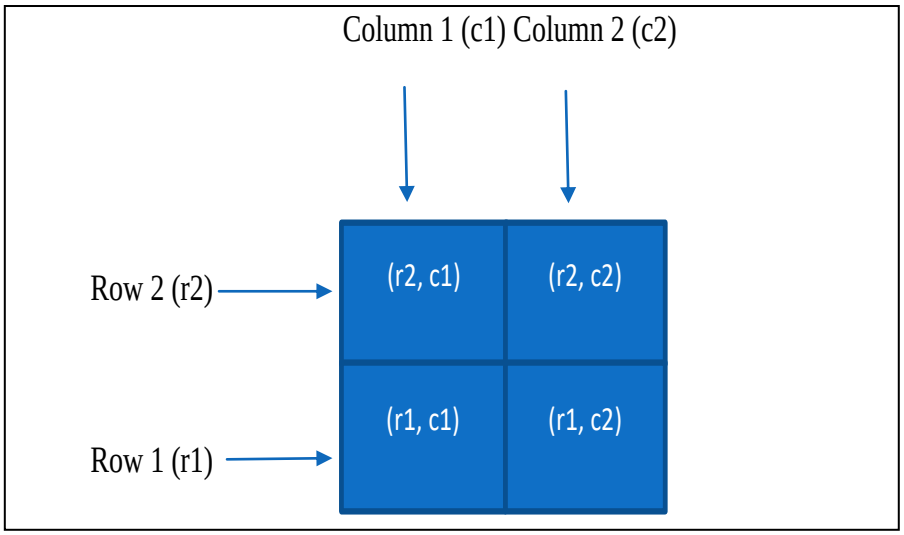

Figure 4. Structure of cluster cell and their representation

3. **Different strategies of the deployment of WSN nodes:**

A. **Random deployment of sensor nodes**: In case of random deployment the deployment is done randomly means the sensor nodes are deployed to the target area from a certain distance. The speed and is very difficult to predict the position of sensor node so this strategy is used by us. Certain numbers of nodes are deployed in the target area in a fixed amount of time and maintain a time interval but, without maintaining any fixed strategy. In the case of deployment of WSN nodes in some fields this type of deployment can be considered.

B. **S pattern deployment of sensor nodes**: In this type of deployment deployment-ship follow the S-pattern movement at the time of deployment of sensor nodes. A fixed amount of deployment time and maintaining a time interval and the path is followed. Here the starting time and ending time of deployment are fixed and the deployment is done in between this (see figure no 5 to 7).

C. **Spiral deployment of sensor nodes**: In this type of deployment deployment-ship follow the Spiral-pattern movement at the time of deployment of sensor nodes, other criteria are the same as previous deployment.

4. **Selection of a sensor node as cluster head**: The selection process has been done with the help of a meta-heuristic algorithm i.e., ACO algorithm. The selection of a sensor node as a cluster head (CH) is an important job towards the development of an efficient network configuration because with the help of the cluster head only the internal network is formed.
Here in this paper, the selection of the cluster head has been done by calculating the uniform distance between different nodes in a cluster maintaining the following conditions:
a) One cluster head has been selected from each cluster and the process has been done by the help of a meta-heuristic algorithm i.e., ACO algorithm.
b) After the full exhaustion of one cluster head, another sensor node is considered as an active cluster head and replaces the previous one.
c) The intermediate network will sustain for some time and thus it will give stability to the whole network to perform for a longer period and ultimately when all the sensor-nodes of a particular cluster will be exhausted the whole network will be down.

5. **WSN network configuration through modified ACO algorithm:**
Using the ACO algorithm choosing the optimized path for the minimization of energy consumption for transmitting the data as well as receiving data: ACO algorithm is used to choose the optimized path for the minimization of energy consumption for transmitting the data. The linear problem as described below:
The energy consumption during successful data transmission between cluster head (CH) to cluster head (CH) and cluster head (CH) to sink node (SN) has been calculated and minimized using the below-maintained equations:
The energy consumption during successful data transmission between cluster head (CH) to cluster head (CH) and cluster head (CH) to sink node (SN) has been calculated and minimized using the below-maintained equations [30]:

$$k(R,d) = \text{Minimize}\left(E^{\text{Total}}_{\text{communication}}(R,d)\right) \quad (1)$$

Subject to,
$d \leq d_o$, for free-space propagation model and $d > d_o$ for two- ray ground propagation model.
Where d_o is the threshold transmission distance.
Where,

$$E^{\text{Total}}_{\text{communication}}(R,d) = E^{\text{Total}}_{\text{receiving}}(R) + E^{\text{Total}}_{\text{transmission}}(R,d) \quad (2)$$

$$E^{\text{Total}}_{\text{receiving}}(R) = E^{\text{SN-CH}}_{\text{receiving}}(R) + E^{\text{CH-CH}}_{\text{receiving}}(R) \quad (3)$$

$$E^{\text{Total}}_{\text{transmission}}(R,d) = E^{\text{SN-CH}}_{\text{transmission}}(R,d) + E^{\text{CH-CH}}_{\text{transmission}}(R,d) \quad (4)$$

$$E^{\text{SN-CH}}_{\text{transmission}}(R,d) = E^{\text{SN-CH}}_{\text{charge}}(R) + E^{\text{SN-CH}}_{\text{resonator}}(R,d) \quad (5)$$

$$E^{\text{CH-CH}}_{\text{transmission}}(R,d) = E^{\text{CH-CH}}_{\text{charge}}(R) + E^{\text{CH-CH}}_{\text{resonator}}(R,d) \quad (6)$$

$$E^{\text{SN-CH}}_{\text{receiving}}(R) = E^{\text{SN-CH}}_{\text{charge}}(R) * (R) \quad (7)$$

$$E^{\text{CH-CH}}_{\text{receiving}}(k) = E^{\text{CH-CH}}_{\text{charge}}(R) * (R) \quad (8)$$

$$E^{\text{SN-CH}}_{\text{resonator}}(R,d) = E^{\text{SN-CH}}_{ts} * d^2 \quad (9)$$

$$E^{\text{CH-CH}}_{\text{resonator}}(R,d) = E^{\text{CH-CH}}_{ts} * d^2 \quad (10)$$

$E_{resonator}^{CH-CH}$ = energy required for the transmitting data packets between two adjacent cluster head for the amplifier to maintain an acceptable signal-to-noise ratio to transfer data messages reliably.
$E_{resonator}^{SN-CH}$ = energy required for the transmitting data packets between sink node and cluster head for the amplifier to maintain an acceptable signal-to-noise ratio to transfer data messages reliably.
E_{charge}^{CH-CH} =Electronic energy degenerated during the transmission between two adjacent cluster heads.
E_{charge}^{SN-CH} =Electronic energy degenerated during the transmission between the sink node and adjacent cluster head.
$E_{transmission}$ = amount of energy used by each node at the time of transmitting data packets.
$E_{receiving}$ = energy used for receiving data packets.
Measurement of distance between two cluster heads is done using the following formula

$$d_{xy}\sqrt{(x1-x2)^2+(y1-y2)^2}$$

E_{ts}= Amount of energy consumption by a single node for free-space propagation

Where (x1, y1) and (x2, y2) are coordinates of reference nodes and $d_{xy}$is the distance measured between two adjacent cluster heads and the notation d_{xy} and d are the same.

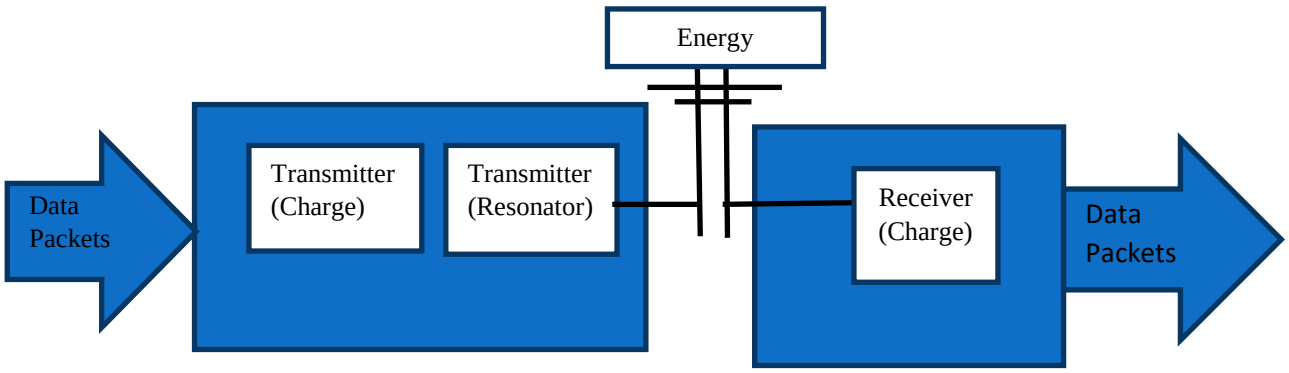

Figure 5: Block Diagram of WSN nodes with transmitter and receiver

Now in terms of minimizing the total energy transmission and using the proposed ACO algorithm, the optimized path has been established as shown in Figure 5.The data used from Table 1. After getting an efficient path through the meta-heuristic algorithm i.e., ACO total energy saved was determined in hours. In this paper, the tolerance percentage has been fixed to ±15% which is the most acceptable tolerance in the case of Wireless Sensor Network. The designed network is an efficient network concerning the minimization of energy consumption.

5. Numerical Data analysis

In this section, the energy minimization problem was solved using ACO. The proposed method was tested using the data of Table 1 using the ACO algorithm and obtained the optimized path for the network for minimizing energy consumption.
The following parameter values are used in the experiment for simulating the system. [31]

Table 1. Parameters for simulation.

Parameters	Values	Parameters	Values
Deployment Area	980 x 980 m^2	Data packet size (R)	4096 bits
Total number of Clusters	49	Max no. of nodes (in the network)	490
The initial energy of each node	1J	E_{charge}	50nJ/bit
E_{ts}	10pJ • bit−1 •m−2	Maximum Number of Rounds	6000

In Table 1, different units of the energy were used are for the Initial energy, and those units are Joule, Nano Joule, and Pico-Joule respectively. So for maintaining equivalency, all calculations have been done in Pico-Joule in Table 2, Table 3 and Table 4.In this paper the best path is plotted for shortest distances (see Figure 9, 13, 17) obtained from the ACO algorithm for different deployments by solving the equations 1 to 10 based on the data supplied in Table 1. As the energy consumption is directly proportional to the distance between nodes that's why we have calculated the maximum coverage area. Table 1 shows the communication between the sink node and the cluster head, whereas Table 2, 3, and 4 shows the communication between adjustment cluster heads. In the below diagram we are going to show the 4 phases of forming a network and finding the shortest path. The first process is the deployment were three strategies namely random, spiral, and s-pattern have been used. (See Figures 6, 10 and 14 respectively). The next step is the division of the nodes into clusters or clustering (See Figure 7, 11, 15). The third process consists of electing the Cluster Heads. (See Figure 8, 12, 16) and the fourth process includes connecting all the cluster heads among themselves using the ACO algorithm (See Figure 9, 13, 17).

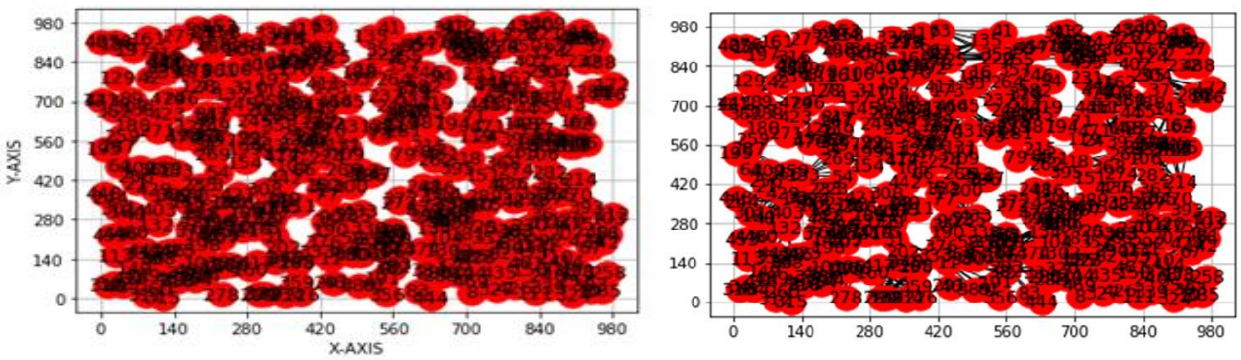

Figure 6: Random deployment-The above figure Shows the random deployment of the nodes in the area.

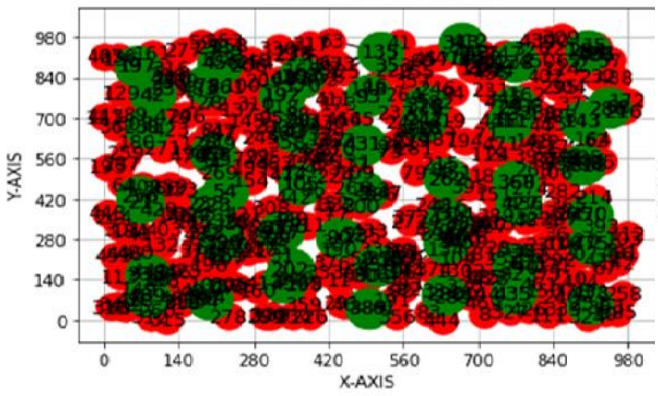

Figure 7: Random clustering-This figure shows how the nodes are grouped into clusters.

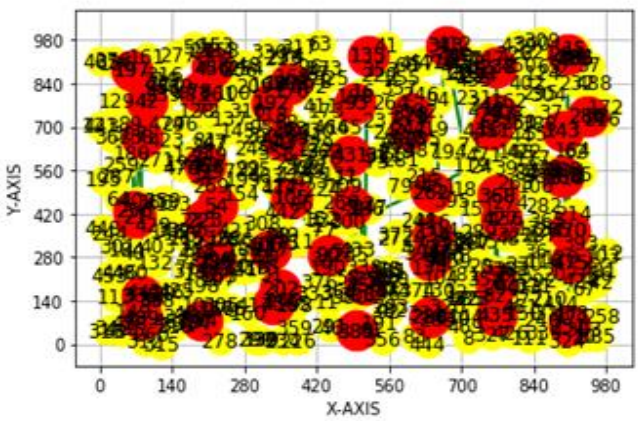

Figure 8: Leader Nodes or Head Nodes of the clusters-The The above figure shows the leader nodes of their respective clusters. The leader nodes are denoted by the green color.

Figure 9: Shortest path after applying ACO Algorithm denoted by green lines.

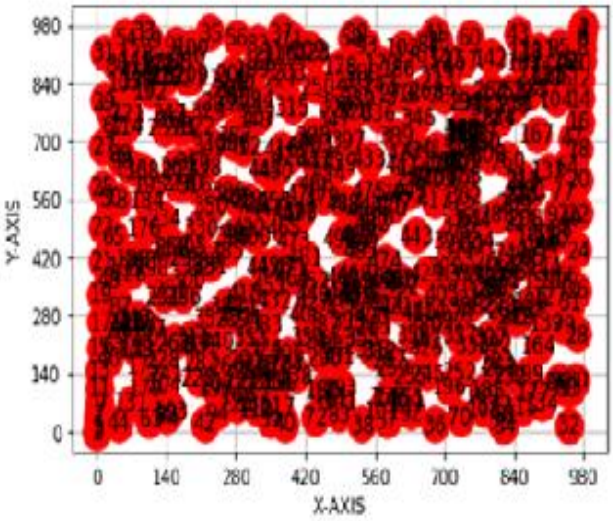

Figure 10: Spiral deployment-The above figure shows the deployment of nodes spirally starting from the upper left side and ending at the center.

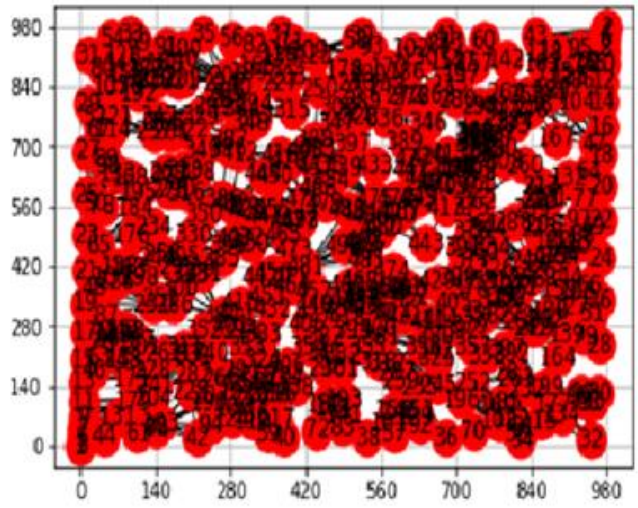

Figure 11: Spiral Clustering-This figure shows the clusters formed within the nodes and is connected through black lines.

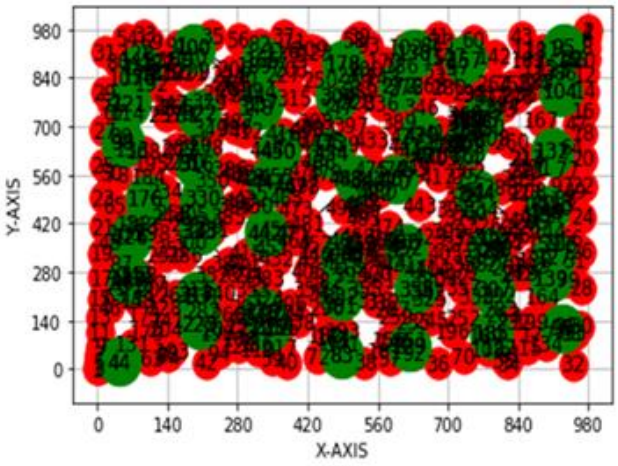

Figure 12: Leader nodes or head nodes of the clusters- The The green nodes indicate the leader nodes of the respective clusters.

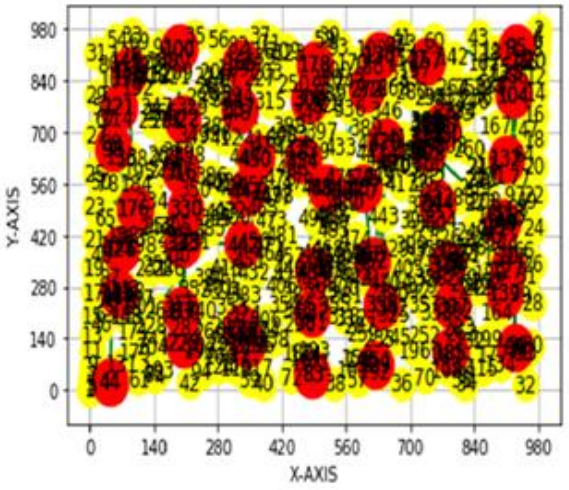

Figure 13: Shortest path obtained after applying ACO denoted by green lines.

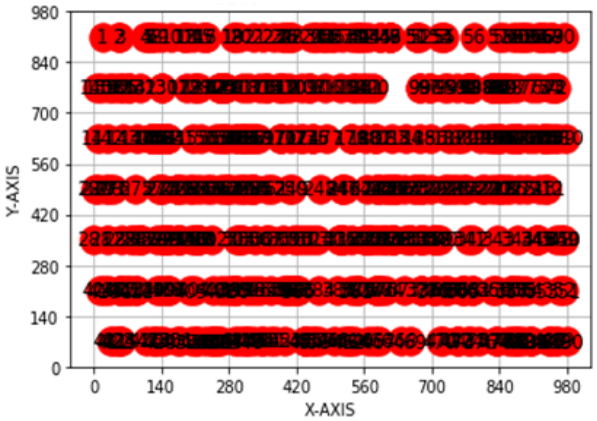

Figure 14: S-pattern Deployment-This above figure shows the deployment of the nodes in a s-pattern fashion.

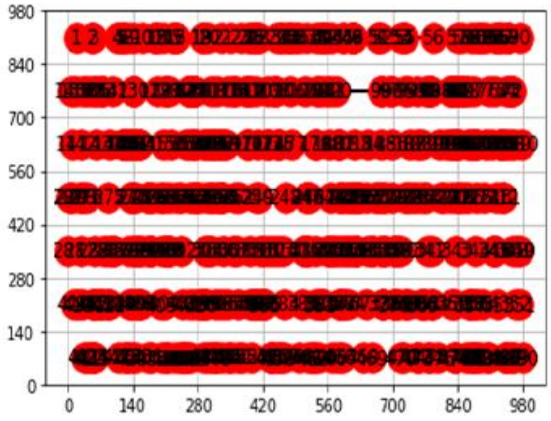

Figure 15: S-pattern Clustering-This figure shows the clustering of the nodes in a s-pattern manner.

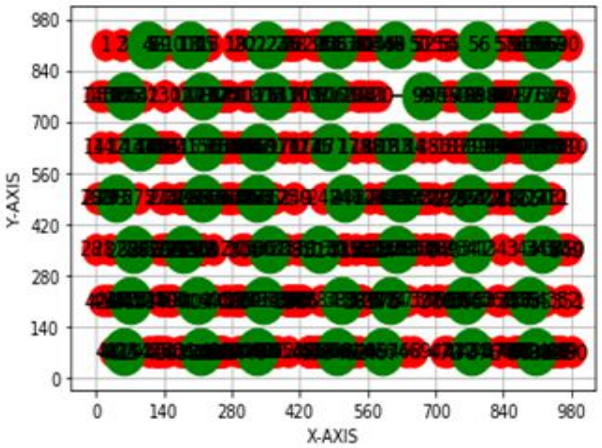

Figure 16: Leader nodes or head nodes of the clusters- The green nodes indicate the leader nodes of the respective clusters.

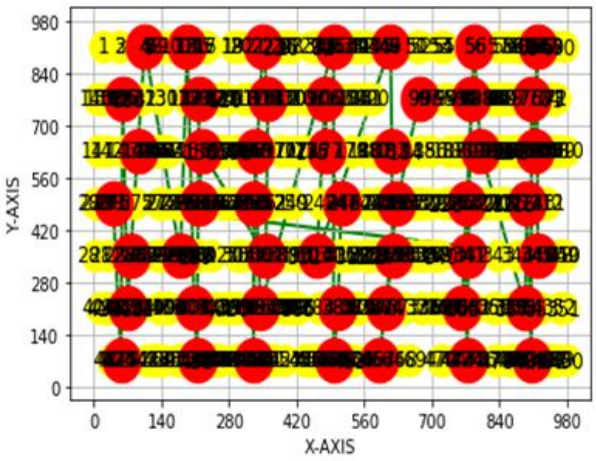

Figure 17: Shortest path after applying the ACO algorithm denoted by green lines.

6. Numerical Data representation

Now the numerical data is being represented with the help of tabular format depicted below. With the help of table 2, Energy Saving (E_s) calculations applying random deployment and area-wise clustering processes have been done. With the help of table 3, Energy Saving (E_s) calculations have been done applying spiral deployment and area-wise Clustering Process. With the help of table 4, Energy Saving (E_s) calculations applying s-pattern deployment and area-wise Clustering Process have been done.

We have used certain notations to calculate the energies. A brief description of them is given below. (This notation can be found in Tables 2,3 and 4)

1) E_tx0: This indicates the actual energy required to transform the data packets from one node to another (equation 5 and 6)
2) E_tx(min): This is E_tx0 but after applying minimum possible tolerance.
3) E_tx(max): This is also E_tx0 but after applying maximum possible tolerance.
4) total0: This the total energy required during the whole communication (transmitting and receiving) among the nodes.
5) totalxy(min): This is the total energy required but after applying minimum possible tolerance.
6) totalxy(max): This is the total energy required but after applying maximum possible tolerance.
7) maxEng: This is the difference between totalxy(max) and totalxy(min).
8) minEng: This is the difference between total0 and totalxy(min).
9) avgEng: This is the difference between totalxy(max) and total0.

Table 2: Energy saving (E_S) calculations applying Random Deployment Strategy and Area Wise Clustering Process

	dmin(d=42mm or 4.2cm)				dmax(d=42mm or 4.2cm)															
I no-cl no	(x1-d/2)	(y1-d/2)	(x2-d/2)	(y2-d/2)	(x1+d/2)	(y1+d/2)	(x2+d/2)	(y2+d/2)	dis(zero)	dxy(min)	dxy(max)	E_tx0	E_tx(min)	E_tx(max)	maxEng	minEng	avgEng	total0	totalxy(min)	totalxy(max)
1-1	-2.1	-2.1	71.89	118.45	2.1	2.1	76.09	122.65	141.4455	135.676	147.2285	204860966.8	204859368	204862636.2	3268.272	1598.856	1669.416	409660966.8	409659368	409662636.2
1-2	71.89	118.45	76.53	208.36	76.09	122.65	80.73	212.56	90.02965	85.71113	94.52427	204849065.3	204848306	204849894.8	1588.44	758.94	829.5	409649065.3	409648306	409649894.8
1-3	76.53	208.36	77.64	416.37	80.73	212.56	81.84	420.57	208.013	203.8334	212.2764	204884229.4	204882508	204886021.3	3513.216	1721.328	1791.888	409684229.4	409682508	409686021.3
1-4	77.64	416.37	75.59	526.39	81.84	420.57	79.79	530.59	110.0391	106.0044	114.2402	204853068.6	204852197	204854010.8	1813.896	871.668	942.228	409653068.6	409652197	409654010.8
1-5	75.59	526.39	67.68	631.04	79.79	530.59	71.88	635.24	104.9485	101.1773	108.9132	204851974.2	204851197	204852822.1	1625.232	777.336	847.896	409651974.2	409651197	409652822.1
1-6	67.68	631.04	32.53	766.83	71.88	635.24	36.73	771.03	140.2656	137.3476	143.3705	204860634.4	204859824	204861515.1	1690.752	810.096	880.656	409660634.4	409659824	409661515.1
1-7	32.53	766.83	79.83	930.3	36.73	771.03	84.03	934.5	170.1756	164.9986	175.4009	204869919.7	204868185	204871725.5	3540.936	1735.188	1805.748	409669919.7	409668185	409671725.5
1-8	79.83	930.3	238.7	24.61	84.03	934.5	242.9	28.81	919.5184	922.9424	916.1201	205686474.1	205692783	205680236	12546.58	6308.568	6238.008	410486474.1	410492783	410480236
1-9	238.7	24.61	204.01	172.48	242.9	28.81	208.21	176.68	151.8846	148.8405	155.0965	204864028.9	204863114	204865014.9	1901.424	915.432	985.992	409664028.9	409663114	409665014.9
1-10	204.01	172.48	197.15	393.11	208.21	176.68	201.35	397.31	220.7366	216.7124	224.8457	204889684.7	204887924	204891515.6	3591.336	1760.388	1830.948	409689684.7	409687924	409691515.6
1-11	197.15	393.11	191.8	444.07	201.35	397.31	196	448.27	51.24006	47.72526	55.17199	204843585.5	204843238	204844003.9	766.248	347.844	418.404	409643585.5	409643238	409644003.9
1-12	191.8	444.07	188.87	657.81	196	448.27	193.07	662.01	213.7601	209.6613	217.9437	204886653.4	204884918	204888459.5	3541.608	1735.524	1806.084	409686653.4	409684918	409688459.5
1-13	188.87	657.81	212.78	806.66	193.07	662.01	216.98	810.86	150.7581	145.9867	155.61	204863688	204862272	204865174.5	2902.368	1415.904	1486.464	409663688	409662272	409665174.5
1-14	212.78	806.66	221.61	964.72	216.98	810.86	225.81	968.92	158.3065	153.9296	162.7823	204866020.9	204864654	204867458.1	2803.752	1366.596	1437.156	409666020.9	409664654	409667458.1
1-15	221.61	964.72	345.44	83.7	225.81	968.92	349.64	87.9	889.6798	893.2669	886.1179	205632490.1	205638886	205626165	12720.79	6395.676	6325.116	410432490.1	410438886	410426165
1-16	345.44	83.7	350.68	211.53	349.64	87.9	354.88	215.73	127.9374	123.6344	132.367	204857328	204856245	204858481	2235.576	1082.508	1153.068	409657328	409656245	409658481
1-17	350.68	211.53	357.4	345.48	354.88	215.73	361.6	349.68	134.1185	129.7745	138.5809	204858947.8	204857801	204860164.7	2363.256	1146.348	1216.908	409658947.8	409657801	409660164.7
1-18	357.4	345.48	335.29	453.74	361.6	349.68	339.49	457.94	110.4947	107.3345	113.8772	204853169.1	204852481	204853928	1447.32	688.38	758.94	409653169.1	409652481	409653928
1-19	335.29	453.74	297.7	563	339.49	457.94	301.9	567.2	115.5455	113.0664	118.2711	204854310.8	204853744	204854948.1	1204.056	566.748	637.308	409654310.8	409653744	409654948.1
1-20	297.7	563	350.49	766.07	301.9	567.2	354.69	770.27	209.8195	204.72	214.9621	204884984.2	204882870	204887168.7	4298.448	2113.944	2184.504	409684984.2	409682870	409687168.7
1-21	350.49	766.07	341.78	856.14	354.69	770.27	345.98	860.34	90.49016	86.83504	94.37782	204849148.5	204848500	204849867.2	1366.848	648.144	718.704	409649148.5	409648500	409649867.2
1-22	341.78	856.14	495.23	84.74	345.98	860.34	499.43	88.94	786.5144	789.8297	783.2301	205459564.9	205464791	205454409.4	10381.56	5226.06	5155.5	410259564.9	410264791	410254409.4
1-23	495.23	84.74	499.97	262.51	499.43	88.94	504.17	266.71	177.8332	173.5708	182.1895	204872584.6	204871087	204874153	3066.168	1497.804	1568.364	409672584.6	409671087	409674153
1-24	499.97	262.51	496.84	383.71	504.17	266.71	501.04	387.91	121.2404	117.2294	125.4046	204855659.2	204854703	204856686.3	1983.576	956.508	1027.068	409655659.2	409654703	409656686.3
1-25	496.84	383.71	489.29	487.88	501.04	387.91	493.49	492.08	104.4432	100.6582	108.4218	204851868.4	204851092	204852715.3	1623.216	776.328	846.888	409651868.4	409651092	409652715.3
1-26	489.29	487.88	458.64	641.41	493.49	492.08	462.84	645.61	156.5595	153.3427	159.9323	204865470.9	204864474	204866538.4	2064.384	996.912	1067.472	409665470.9	409664474	409666538.4
1-27	458.64	641.41	501.75	760.8	462.84	645.61	505.95	765	126.9348	121.5842	132.3356	204857072.4	204855743	204858472.7	2730	1329.72	1400.28	409657072.4	409655743	409658472.7
1-28	501.75	760.8	483.24	971.52	505.95	765	487.44	975.72	211.5314	207.7649	215.3959	204885705.5	204884126	204887355.4	3229.128	1579.284	1649.844	409685705.5	409684126	409687355.4
1-29	483.24	971.52	604.33	68.74	487.44	975.72	608.53	72.94	910.8647	914.4813	907.2726	205670634.5	205677236	205664103.6	13132.39	6601.476	6530.916	410470634.5	410477236	410464103.6
1-30	604.33	68.74	666.47	170.31	608.53	72.94	670.67	174.51	119.0708	113.3047	124.8531	204855137.8	204853798	204856548.3	2750.328	1339.884	1410.444	409655137.8	409653798	409656548.3
1-31	666.47	170.31	640.25	294.99	670.67	174.51	644.45	299.19	127.4072	124.261	130.7476	204857192.6	204856401	204858054.9	1654.128	791.784	862.344	409657192.6	409656401	409658054.9
1-32	640.25	294.99	620.94	473.01	644.45	299.19	625.14	477.21	179.0642	175.4027	182.8454	204873024	204871726	204874392.4	2666.328	1297.884	1368.444	409673024	409671726	409674392.4
1-33	620.94	473.01	633.02	676.94	625.14	477.21	637.22	681.14	204.2875	199.8854	208.7657	204882693.4	204880914	204884543.1	3628.968	1779.204	1849.764	409682693.4	409680914	409684543.1
1-34	633.02	676.94	613.41	808.17	637.22	681.14	617.61	812.37	132.6871	129.2422	136.3039	204858565.9	204857664	204859538.8	1875.216	902.328	972.888	409658565.9	409657664	409659538.8
1-35	613.41	808.17	604.02	910.35	617.61	812.37	608.22	914.55	102.6105	98.91799	106.5065	204851488.9	204850745	204852303.6	1558.872	744.156	814.716	409651488.9	409650745	409652303.6
1-36	604.02	910.35	773.71	23.43	608.22	914.55	777.91	27.63	903.0071	906.3563	899.6846	205656381.8	205662442	205650392.3	12049.46	6060.012	5989.452	410456381.8	410462442	410450392.3
1-37	773.71	23.43	777.15	214.02	777.91	27.63	781.35	218.22	190.621	186.3915	194.9398	204877296.4	204875702	204878961.5	3259.704	1594.572	1665.132	409677296.4	409675702	409678961.5
1-38	777.15	214.02	755.78	388.7	781.35	218.22	759.98	392.9	175.9823	172.3869	179.7022	204871929.8	204870677	204873252.9	2575.608	1252.524	1323.084	409671929.8	409670677	409673252.9
1-39	755.78	388.7	764.62	538.37	759.98	392.9	768.82	542.57	149.9308	145.544	154.4216	204863439.3	204862143	204864806	2662.968	1296.204	1366.764	409663439.3	409662143	409664806
1-40	764.62	538.37	771.28	654.97	768.82	542.57	775.48	659.17	116.79	112.4269	121.2872	204854599.9	204853600	204855670.6	2070.768	1000.104	1070.664	409654599.9	409653600	409655670.6
1-41	771.28	654.97	776.94	804.74	775.48	659.17	781.14	808.94	149.8769	145.5773	154.2854	204863423.1	204862153	204864764	2611.224	1270.332	1340.892	409663423.1	409662153	409664764
1-42	776.94	804.74	749.45	917.79	781.14	808.94	753.65	921.99	116.3443	113.3692	119.5407	204854496	204853813	204855250	1437.408	683.424	753.984	409654496	409653813	409655250
1-43	749.45	917.79	888.9	70.34	753.65	921.99	893.1	74.54	858.8468	862.3226	855.3981	205578577.8	205584560	205572665.9	11894.4	5982.48	5911.92	410378577.8	410384560	410372665.9
1-44	888.9	70.34	922.17	226.63	893.1	74.54	926.37	230.83	159.7919	154.8433	164.8061	204866493.5	204864936	204868121	3184.608	1557.024	1627.584	409666493.5	409664936	409668121
1-45	922.17	226.63	909.56	291.66	926.37	230.83	913.76	295.86	66.24132	63.10994	69.73895	204845347.9	204844943	204845823.5	880.656	405.048	475.608	409645347.9	409644943	409645823.5
1-46	909.56	291.66	894.09	423.81	913.76	295.86	898.29	428.01	133.0524	129.4531	136.815	204858662.9	204857718	204859678.3	1960.224	944.832	1015.392	409658662.9	409657718	409659678.3
1-47	894.09	423.81	906.55	668.12	898.29	428.01	910.75	672.32	244.6275	240.252	249.0678	204900802.6	204898681	204902994.8	4313.736	2121.588	2192.148	409700802.6	409698681	409702994.8
1-48	906.55	668.12	916.71	747.11	910.75	672.32	920.91	751.31	79.64073	75.0271	84.42029	204847302.6	204846589	204848086.8	1497.72	713.58	784.14	409647302.6	409646589	409648086.8
1-49	916.71	747.11	915.41	941.7	920.91	751.31	919.61	945.9	194.5943	190.4694	198.8112	204878827	204877239	204880485.9	3247.272	1588.356	1658.916	409678827	409677239	409680485.9
2-1	-2.1	-2.1	44.99	8.72	2.1	2.1	49.19	12.92	48.31708	43.39789	53.44403	204843294.5	204842843	204843816.3	972.888	451.164	521.724	409643294.5	409642843	409643816.3
2-2	44.99	8.72	64.11	197.76	49.19	12.92	68.31	201.96	190.0045	185.4412	194.642	204877061.7	204875348	204878845.5	3497.088	1713.264	1783.824	409677061.7	409675348	409678845.5
2-3	64.11	197.76	67.25	286.72	68.31	201.96	71.45	290.92	89.0154	84.76663	93.44871	204848883.7	204848145	204849692.7	1547.28	738.36	808.92	409648883.7	409648145	409649692.7
2-4	67.25	286.72	63.77	458.8	71.45	290.92	67.97	463	172.1152	168.0556	176.2815	204870583.6	204869203	204872035.2	2832.48	1380.96	1451.52	409670583.6	409669203	409672035.2
2-5	63.77	458.8	79.4	672.93	67.97	463	83.6	677.13	214.6997	210.2409	219.2287	204887056	204885161	204889021.2	3859.968	1894.704	1965.264	409687056	409685161	409689021.2

2-6	79.4	672.93	29.04	710.68	83.6	677.13	33.24	714.88	62.938	64.04995	62.37426	204844921.2	204845062	204844850.5	211.848	141.204	70.644	409644921.2	409645062	409644850.5
2-7	29.04	710.68	76.85	931.86	33.24	714.88	81.05	936.06	226.2883	221.3191	231.3032	204892166.4	204889942	204894461.2	4519.032	2224.236	2294.796	409692166.4	409689942	409694461.2
2-8	76.85	931.86	240.44	0.13	81.05	936.06	244.64	4.33	945.9823	949.4051	942.5844	205735842.5	205742330	205729425.4	12904.75	6487.656	6417.096	410535842.5	410542330	410529425.4
2-9	240.44	0.13	254.27	145.83	244.64	4.33	258.47	150.03	146.3549	141.8273	150.9804	204862379.8	204861075	204863755.1	2680.104	1304.772	1375.332	409662379.8	409661075	409663755.1
2-10	254.27	145.83	192.82	327.73	258.47	150.03	197.02	331.93	191.9993	189.4392	194.7069	204877823.7	204876847	204878870.8	2023.56	976.5	1047.06	409677823.7	409676847	409678870.8
2-11	192.82	327.73	182.28	473.46	197.02	331.93	186.48	477.66	146.1107	142.2955	150.064	204862308.3	204861208	204863479.2	2271.192	1100.316	1170.876	409662308.3	409661208	409663479.2
2-12	182.28	473.46	238.82	645.79	186.48	477.66	243.02	649.99	181.3681	176.0885	186.6874	204873854.4	204871967	204875812.2	3845.016	1887.228	1957.788	409673854.4	409671967	409675812.2
2-13	238.82	645.79	216.08	819.48	243.02	649.99	220.28	823.68	175.1723	171.6177	178.8535	204871645.3	204870413	204872948.6	2535.96	1232.7	1303.26	409671645.3	409670413	409672948.6
2-14	216.08	819.48	201.71	885.46	220.28	823.68	205.91	889.66	67.52672	64.51057	70.91305	204845519.9	204845122	204845988.7	867.048	398.244	468.804	409645519.9	409645122	409645988.7
2-15	201.71	885.46	347.98	47.82	205.91	889.66	352.18	52.02	850.315	853.7438	846.9141	205563995.7	205569838	205558223.5	11615.02	5842.788	5772.228	410363995.7	410369838	410358223.5
2-16	347.98	47.82	355.59	164.86	352.18	52.02	359.79	169.06	117.2871	112.8915	121.8138	204854716.3	204853704	204855798.6	2094.12	1011.78	1082.34	409654716.3	409653704	409655798.6
2-17	355.59	164.86	361.37	405.92	359.79	169.06	365.57	410.12	241.1293	236.8653	245.463	204899103.3	204897065	204901212.1	4146.912	2038.176	2108.736	409699103.3	409697065	409701212.1
2-18	361.37	405.92	329.68	449.88	365.57	410.12	333.88	454.08	54.19168	53.56258	55.45346	204843896.7	204843829	204844035.1	206.136	67.788	138.348	409643896.7	409643829	409644035.1
2-19	329.68	449.88	347.23	586.62	333.88	454.08	351.43	590.82	137.8616	133.2106	142.6084	204859965.8	204858705	204861297.1	2592.072	1260.756	1331.316	409659965.8	409658705	409661297.1
2-20	347.23	586.62	343.5	789.78	351.43	590.82	347.7	793.98	203.1942	199.118	207.3605	204882247.9	204880608	204883958.4	3350.424	1639.932	1710.492	409682247.9	409680608	409683958.4
2-21	343.5	789.78	348.34	851.54	347.7	793.98	352.54	855.74	61.94936	57.56356	66.5766	204844797.7	204844274	204845392.4	1118.88	524.16	594.72	409644797.7	409644274	409645392.4
2-22	348.34	851.54	496.22	120.33	352.54	855.74	500.42	124.53	746.0138	749.3142	742.7462	205397496.6	205402432	205392631.9	9799.944	4935.252	4864.692	410197496.6	410202432	410192631.9
2-23	496.22	120.33	512.88	217.55	500.42	124.53	517.08	221.75	98.63713	93.8508	103.543	204850689.3	204849768	204851681.2	1913.184	921.312	991.872	409650689.3	409649768	409651681.2
2-24	512.88	217.55	486.86	357.86	517.08	221.75	491.06	362.06	142.7023	139.4245	146.148	204861323.9	204860399	204862319.3	1920.072	924.756	995.316	409661323.9	409660399	409662319.3
2-25	486.86	357.86	490.41	432.17	491.06	362.06	494.61	436.37	74.39475	70.11301	78.89159	204846494.6	204845876	204847183.9	1308.048	618.744	689.304	409646494.6	409645876	409647183.9
2-26	490.41	432.17	467.73	627	494.61	436.37	471.93	631.2	196.1456	192.5158	199.8861	204879433.1	204878022	204880914.5	2892.12	1410.78	1481.34	409679433.1	409678022	409680914.5
2-27	467.73	627	494.48	801.47	471.93	631.2	498.68	805.67	176.5088	171.7567	181.3308	204872115.3	204870460	204873840.9	3380.496	1654.968	1725.528	409672115.3	409670460	409673840.9
2-28	494.48	801.47	486.59	874.44	498.68	805.67	490.79	878.64	73.39532	69.82464	77.25817	204846346.9	204845835	204846928.8	1093.344	511.392	581.952	409646346.9	409645835	409646928.8
2-29	486.59	874.44	587.08	22.43	490.79	878.64	591.28	26.63	857.9157	861.6074	854.2493	205576979.3	205583327	205570701.8	12625.54	6348.048	6277.488	410376979.3	410383327	410370701.8
2-30	587.08	22.43	648.57	244.1	591.28	26.63	652.77	248.3	230.0405	224.8896	235.2285	204893878.6	204891535	204896292.4	4757.088	2343.264	2413.824	409693878.6	409691535	409696292.4
2-31	648.57	244.1	655.08	295.63	652.77	248.3	659.28	299.83	51.93959	47.38634	56.74978	204843657.7	204843205	204844180.5	975.072	452.256	522.816	409643657.7	409643205	409644180.5
2-32	655.08	295.63	624.53	523.4	659.28	299.83	628.73	527.6	229.8097	226.2545	233.4618	204893772.5	204892151	204895464.4	3313.296	1621.368	1691.928	409693772.5	409692151	409695464.4
2-33	624.53	523.4	643.4	664.05	628.73	527.6	647.6	668.25	141.9102	137.2363	146.6757	204861098.5	204859794	204862473.7	2679.936	1304.688	1375.248	409661098.5	409659794	409662473.7
2-34	643.4	664.05	579.72	711.88	647.6	668.25	583.92	716.08	79.64202	80.69245	79.02526	204847302.9	204847471	204847205	266.28	168.42	97.86	409647302.9	409647471	409647205
2-35	579.72	711.88	620.86	963.5	583.92	716.08	625.06	967.7	254.961	250.1624	259.8068	204905965.1	204903541	204908459.6	4918.368	2423.904	2494.464	409705965.1	409703541	409708459.6
2-36	620.86	963.5	783.44	65.4	625.06	967.7	787.64	69.6	912.697	916.0947	909.3255	205673975.9	205680190	205667832.8	12356.74	6213.648	6143.088	410473975.9	410480190	410467832.8
2-37	783.44	65.4	754.36	196.07	787.64	69.6	758.56	200.27	133.8667	130.7755	137.1457	204858880.3	204858062	204859768.9	1706.712	818.076	888.636	409658880.3	409658062	409659768.9
2-38	754.36	196.07	758.71	331.88	758.56	200.27	762.91	336.08	135.8796	131.6101	140.2708	204859423.3	204858281	204860635.9	2354.688	1142.064	1212.624	409659423.3	409658281	409660635.9
2-39	758.71	331.88	771.47	461.5	762.91	336.08	775.67	465.7	130.2465	125.7118	134.8905	204857924.2	204856763	204859155.4	2391.984	1160.712	1231.272	409657924.2	409656763	409659155.4
2-40	771.47	461.5	798.17	587.4	775.67	465.7	802.37	591.6	128.7	123.7624	133.7192	204857523.7	204856277	204858840.8	2563.68	1246.56	1317.12	409657523.7	409656277	409658840.8
2-41	798.17	587.4	791.16	829.15	802.37	591.6	795.36	833.35	241.8516	237.8144	245.9661	204899452.2	204897516	204901459.3	3943.632	1936.536	2007.096	409699452.2	409697516	409701459.3
2-42	791.16	829.15	793.79	872.09	795.36	833.35	797.99	876.29	43.02047	38.7718	47.63222	204842810.8	204842463	204843228.8	765.576	347.508	418.068	409642810.8	409642463	409643228.8
2-43	793.79	872.09	914.39	28.77	797.99	876.29	918.59	32.97	851.8996	855.476	848.3498	205566693	205572799	205560657.4	12141.7	6106.128	6035.568	410366693	410372799	410360657.4
2-44	914.39	28.77	941.15	143.81	918.59	32.97	945.35	148.01	118.1114	113.1126	123.1937	204854910.3	204853754	204856136.7	2382.24	1155.84	1226.4	409654910.3	409653754	409656136.7
2-45	941.15	143.81	923.84	371.99	945.35	148.01	928.04	376.19	228.8356	225.0105	232.7495	204893325.7	204891590	204895132.3	3542.616	1736.028	1806.588	409693325.7	409691590	409695132.3
2-46	923.84	371.99	895.11	556.02	928.04	376.19	899.31	560.22	186.2591	182.8202	189.8216	204875652.5	204874383	204876992.3	2609.04	1269.24	1339.8	409675652.5	409674383	409676992.3
2-47	895.11	556.02	890.1	642.87	899.31	560.22	894.3	647.07	86.99438	83.16157	91.0536	204848528	204847876	204849250.8	1374.912	652.176	722.736	409648528	409647876	409649250.8
2-48	890.1	642.87	918.26	710.57	894.3	647.07	922.46	714.77	73.32309	67.86996	78.84656	204846336.3	204845566	204847176.8	1610.448	769.944	840.504	409646336.3	409645566	409647176.8
2-49	918.26	710.57	899.61	936.57	922.46	714.77	903.81	940.77	226.7682	222.9739	230.6531	204892383.8	204890677	204894160.8	3483.48	1706.46	1777.02	409692383.8	409690677	409694160.8
3-1	-2.1	-2.1	87.7	13.79	2.1	2.1	91.9	17.99	91.19502	86.39454	96.12288	204849276.5	204848424	204850199.6	1775.592	852.516	923.076	409649276.5	409648424	409650199.6
3-2	87.7	13.79	59.89	148.14	91.9	17.99	64.09	152.34	137.1981	134.0286	140.5473	204859783.3	204858924	204860713.5	1789.872	859.656	930.216	409659783.3	409658924	409660713.5
3-3	59.89	148.14	65.75	283.75	64.09	152.34	69.95	287.95	135.7366	131.4205	140.1715	204859384.4	204858231	204860608	2376.696	1153.068	1223.628	409659384.4	409658231	409660608
3-4	65.75	283.75	77.28	553.06	69.95	287.95	81.48	557.26	269.5567	265.2113	273.962	204913620.8	204911297	204916015.2	4718.112	2323.776	2394.336	409713620.8	409711297	409716015.2
3-5	77.28	553.06	41.17	681	81.48	557.26	45.37	685.2	132.9382	130.1402	135.9383	204858632.6	204857896	204859439.2	1542.744	736.092	806.652	409658632.6	409657896	409659439.2
3-6	41.17	681	31.98	834.12	45.37	685.2	36.18	838.32	153.3955	149.5208	157.3991	204864490.2	204863316	204865734.5	2418.024	1173.732	1244.292	409664490.2	409663316	409665734.5
3-7	31.98	834.12	99.17	912.24	36.18	838.32	103.37	916.44	103.0399	97.118	108.9638	204851577.2	204850392	204852833.1	2441.208	1185.324	1255.884	409651577.2	409650392	409652833.1
3-8	99.17	912.24	213.76	44.73	103.37	916.44	217.96	48.93	875.0454	878.6719	871.4443	205606664.5	205613024	205600375.2	12649.06	6359.808	6289.248	410406664.5	410413024	410400375.2
3-9	213.76	44.73	157.11	163.16	217.96	48.93	161.31	167.36	131.2817	129.4265	133.3759	204858194.9	204857711	204858749.1	1037.904	483.672	554.232	409658194.9	409657711	409658749.1
3-10	157.11	163.16	187.94	359.08	161.31	167.36	192.14	363.28	198.3309	193.5606	203.1628	204880295.1	204878426	204882235.1	3809.4	1869.42	1939.98	409680295.1	409678426	409682235.1
3-11	187.94	359.08	221.61	422.18	192.14	363.28	225.81	426.38	71.52118	65.86115	77.22323	204846075.3	204845298	204846923.4	1625.736	777.588	848.148	409646075.3	409645298	409646923.4
3-12	221.61	422.18	173.34	625.53	225.81	426.38	177.54	629.73	209.0005	205.9462	212.1772	204884641.2	204883374	204885979.2	2605.344	1267.392	1337.952	409684641.2	409683374	409685979.2
3-13	173.34	625.53	220.14	828.82	177.54	629.73	224.34	833.02	208.6074	203.5966	213.6659	204884477.1	204882412	204886613.1	4201.512	2065.476	2136.036	409684477.1	409682412	409686613.1
3-14	220.14	828.82	199.95	923.48	224.34	833.02	204.15	927.68	96.78921	93.69036	100.1448	204850328.2	204849738	204850989	1251.096	590.268	660.828	409650328.2	409649738	409650989
3-15	199.95	923.48	339.43	57.76	204.15	927.68	343.63	61.96	876.8841	880.3758	873.4189	205609885.8	205616021	205603820.7	12200.83	6135.696	6065.136	410409885.8	410416021	410403820.7
3-16	339.43	57.76	350.82	146.08	343.63	61.96	355.02	150.28	89.05141	84.42672	93.8243	204848890.2	204848088	204849763	1675.128	802.284	872.844	409648890.2	409648088	409649763

3-17	350.82	146.08	371.42	375.22	355.02	150.28	375.62	379.42	230.0641	225.5371	234.6542	204893889.5	204891827	204896022.6	4195.632	2062.536	2133.096	409693889.5	409691827	409696022.6
3-18	371.42	375.22	346.14	479.54	375.62	379.42	350.34	483.74	107.3394	104.3699	110.5484	204852481.7	204851853	204853181	1327.872	628.656	699.216	409652481.7	409651853	409653181
3-19	346.14	479.54	283.58	674.66	350.34	483.74	287.78	678.86	204.9038	202.2556	207.6881	204882945.6	204881867	204884094.4	2227.008	1078.224	1148.784	409682945.6	409681867	409684094.4
3-20	283.58	674.66	361.82	823.75	287.78	678.86	366.02	827.95	168.3726	162.7115	174.0522	204869309.3	204867435	204871254.2	3819.144	1874.292	1944.852	409669309.3	409667435	409671254.2
3-21	361.82	823.75	321.27	838.56	366.02	827.95	325.47	842.76	43.16988	45.99059	41.02076	204842823.6	204843075	204842642.7	432.432	251.496	180.936	409642823.6	409643075	409642642.7
3-22	321.27	838.56	499.66	9.16	325.47	842.76	503.86	13.36	848.3675	851.605	845.1592	205560687.4	205566191	205555254.1	10936.97	5503.764	5433.204	410360687.4	410366191	410355254.1
3-23	499.66	9.16	493.27	259.02	503.86	13.36	497.47	263.22	249.9417	245.8882	254.0694	204903430.9	204901421	204905511.3	4090.296	2009.868	2080.428	409703430.9	409701421	409705511.3
3-24	493.27	259.02	539.66	299.14	497.47	263.22	543.86	303.34	61.33226	55.40977	67.25779	204844721.6	204844030	204845483.6	1453.368	691.404	761.964	409644721.6	409644030	409645483.6
3-25	539.66	299.14	468.59	428.83	543.86	303.34	472.79	433.03	147.8866	146.3329	149.66	204862830.4	204862373	204863358.1	984.816	457.128	527.688	409662830.4	409662373	409663358.1
3-26	468.59	428.83	429.89	657.06	472.79	433.03	434.09	661.26	231.4878	228.1005	234.9765	204894546.6	204892990	204896174	3184.104	1556.772	1627.332	409694546.6	409692990	409696174
3-27	429.89	657.06	530.24	769.57	434.09	661.26	534.44	773.77	150.7601	144.8305	156.6905	204863688.6	204861936	204865511.9	3576.048	1752.744	1823.304	409663688.6	409661936	409665511.9
3-28	530.24	769.57	465.81	977.02	534.44	773.77	470.01	981.22	217.2251	214.5242	220.0531	204888146.7	204886981	204889383.4	2402.736	1166.088	1236.648	409688146.7	409686981	409689383.4
3-29	465.81	977.02	579.4	68.65	470.01	981.22	583.6	72.85	915.4446	919.1029	911.8102	205678998.7	205685710	205672357.9	13352.3	6711.432	6640.872	410478998.7	410485710	410472357.9
3-30	579.4	68.65	641.06	208.51	583.6	72.85	645.26	212.71	152.8489	147.3271	158.4008	204864322.8	204862665	204866050.8	3385.536	1657.488	1728.048	409664322.8	409662665	409666050.8
3-31	641.06	208.51	627.57	390.38	645.26	212.71	631.77	394.58	182.3696	178.5485	186.3018	204874218.7	204872840	204875668.3	2828.784	1379.112	1449.672	409674218.7	409672840	409675668.3
3-32	627.57	390.38	616	537.25	631.77	394.58	620.2	541.45	147.325	143.5389	151.2497	204862664.7	204861563	204863836.5	2273.04	1101.24	1171.8	409662664.7	409661563	409663836.5
3-33	616	537.25	610.41	595.78	620.2	541.45	614.61	599.98	58.79633	55.20501	62.7454	204844417	204844008	204844897	889.392	409.416	479.976	409644417	409644008	409644897
3-34	610.41	595.78	573	706.5	614.61	599.98	577.2	710.7	116.8693	114.3587	119.6224	204854618.4	204854038	204855269.5	1231.608	580.524	651.084	409654618.4	409654038	409655269.5
3-35	573	706.5	627.72	846.85	577.2	710.7	631.92	851.05	150.64	145.2208	156.097	204863652.4	204862049	204865326.3	3277.176	1603.308	1673.868	409663652.4	409662049	409665326.3
3-36	627.72	846.85	746.66	112.38	631.92	851.05	750.86	116.58	744.0382	747.5284	740.5793	205394552.9	205399759	205389417.7	10340.9	5205.732	5135.172	410194552.9	410199759	410189417.7
3-37	746.66	112.38	806.19	214.95	750.86	116.58	810.39	219.15	118.5935	112.863	124.3437	204855024.4	204853698	204856421.3	2723.28	1326.36	1396.92	409655024.4	409653698	409656421.3
3-38	806.19	214.95	772.62	401.86	810.39	219.15	776.82	406.06	189.9007	186.5731	193.3536	204877022.3	204875770	204878345.6	2576.112	1252.776	1323.336	409677022.3	409675770	409678345.6
3-39	772.62	401.86	743.07	515.81	776.82	406.06	747.27	520.01	117.7192	114.8221	120.8389	204854817.8	204854144	204855562	1417.92	673.68	744.24	409654817.8	409654144	409655562
3-40	743.07	515.81	800.48	579.68	747.27	520.01	804.68	583.88	85.87948	79.94881	91.81131	204848335.3	204847352	204849389.3	2037.504	983.472	1054.032	409648335.3	409647352	409649389.3
3-41	800.48	579.68	807.31	752.35	804.68	583.88	811.51	756.55	172.805	168.4905	177.2136	204870821.6	204869349	204872364.7	3015.6	1472.52	1543.08	409670821.6	409669349	409672364.7
3-42	807.31	752.35	797.73	892.13	811.51	756.55	801.93	896.33	140.1079	136.2785	144.0805	204860590.2	204859532	204861719.2	2187.36	1058.4	1128.96	409660590.2	409659532	409661719.2
3-43	797.73	892.13	852.56	54.96	801.93	896.33	856.76	59.16	838.9636	842.892	835.059	205544819.9	205551427	205538283.6	13143.31	6606.936	6536.376	410344819.9	410351427	410338283.6
3-44	852.56	54.96	899.68	257.61	856.76	59.16	903.88	261.81	208.056	203.0382	213.1212	204884247.3	204882185	204886380.7	4196.136	2062.788	2133.348	409684247.3	409682185	409686380.7
3-45	899.68	257.61	887.65	320.11	903.88	261.81	891.85	324.31	63.64724	60.51696	67.15801	204845011	204844622	204845470.2	847.896	388.668	459.228	409645011	409644622	409645470.2
3-46	887.65	320.11	884.82	427.44	891.85	324.31	889.02	431.64	107.3673	103.3693	111.5384	204852487.7	204851645	204853400.8	1755.6	842.52	913.08	409652487.7	409651645	409653400.8
3-47	884.82	427.44	919.19	577.49	889.02	431.64	923.39	581.69	153.936	148.9377	158.9991	204864656.3	204863142	204866240.7	3098.256	1513.848	1584.408	409664656.3	409663142	409666240.7
3-48	919.19	577.49	921.09	746.42	923.39	581.69	925.29	750.62	168.9407	164.7461	173.2374	204869501	204868101	204870971.2	2869.944	1399.692	1470.252	409669501	409668101	409670971.2
3-49	921.09	746.42	934.16	915.96	925.29	750.62	938.36	920.16	170.043	165.5778	174.5962	204869874.6	204868376	204871443.8	3067.848	1498.644	1569.204	409669874.6	409668376	409671443.8
4-1	-2.1	-2.1	97.3	6.91	2.1	2.1	101.5	11.11	99.80752	95.32144	104.4388	204850921.5	204850046	204851867.5	1821.288	875.364	945.924	409650921.5	409650046	409651867.5
4-2	97.3	6.91	88.21	157.5	101.5	11.11	92.41	161.7	150.8641	146.992	154.8672	204863720	204862567	204864943.9	2377.2	1153.32	1223.88	409663720	409662567	409664943.9
4-3	88.21	157.5	61.97	360.12	92.41	161.7	66.17	364.32	204.312	200.7414	207.991	204882703.4	204881257	204884220.3	2963.184	1446.312	1516.872	409682703.4	409681257	409684220.3
4-4	61.97	360.12	85.65	486.68	66.17	364.32	89.85	490.88	128.7563	123.9009	133.6992	204857538.2	204856311	204858835.5	2524.032	1226.736	1297.296	409657538.2	409656311	409658835.5
4-5	85.65	486.68	38.1	613.44	89.85	490.88	42.3	617.64	135.385	133.0376	137.9483	204859289.1	204858659	204859989.7	1330.728	630.084	700.644	409659289.1	409658659	409659989.7
4-6	38.1	613.44	13.69	698.73	42.3	617.64	17.89	702.93	88.71433	85.98907	91.74369	204848830.2	204848354	204849376.9	1022.784	476.112	546.672	409648830.2	409648354	409649376.9
4-7	13.69	698.73	100.64	968.54	17.89	702.93	104.84	972.74	283.4744	278.2018	288.7729	204921317.7	204918356	204924349.8	5993.568	2961.504	3032.064	409721317.7	409718356	409724349.8
4-8	100.64	968.54	198.76	57.23	104.84	972.74	202.96	61.43	916.577	920.3149	912.8625	205681073.5	205687940	205674277.9	13661.59	6866.076	6795.516	410481073.5	410487940	410474277.9
4-9	198.76	57.23	147.13	159.57	202.96	61.43	151.33	163.77	114.6261	112.909	116.6207	204854099.1	204853708	204854560.4	851.928	390.684	461.244	409654099.1	409653708	409654560.4
4-10	147.13	159.57	183.59	360.19	151.33	163.77	187.79	364.39	203.9061	199.0516	208.8168	204882537.7	204880582	204884564.5	3982.944	1956.192	2026.752	409682537.7	409680582	409684564.5
4-11	183.59	360.19	224.13	431.34	187.79	364.39	228.33	435.54	81.88904	76.17676	87.63156	204847665.8	204846763	204848639.3	1876.392	902.916	973.476	409647665.8	409646763	409648639.3
4-12	224.13	431.34	264.42	610.6	228.33	435.54	268.62	614.8	183.732	178.7414	188.7775	204874717.4	204872908	204876596.9	3688.44	1808.94	1879.5	409674717.4	409672908	409676596.9
4-13	264.42	610.6	223.94	715.87	268.62	614.8	228.14	720.07	112.7848	110.5054	115.3253	204853680.4	204853171	204854259.9	1088.472	508.956	579.516	409653680.4	409653171	409654259.9
4-14	223.94	715.87	196.61	884.49	228.14	720.07	200.81	888.69	170.8205	167.4159	174.361	204870139.6	204868988	204871361.7	2373.672	1151.556	1222.116	409670139.6	409668988	409671361.7
4-15	196.61	884.49	353.64	41.71	200.81	888.69	357.84	45.91	857.2844	860.658	853.9388	205575896.5	205581692	205570171.5	11520.6	5795.58	5725.02	410375896.5	410381692	410370171.5
4-16	353.64	41.71	365.11	168.45	357.84	45.91	369.31	172.65	127.258	122.7555	131.8743	204857154.6	204856029	204858350.8	2321.928	1125.684	1196.244	409657154.6	409656029	409658350.8
4-17	365.11	168.45	372.8	397.51	369.31	172.65	377	401.71	229.189	224.8871	233.5628	204893487.6	204891534	204895511.6	3977.4	1953.42	2023.98	409693487.6	409691534	409695511.6
4-18	372.8	397.51	319.77	495.27	377	401.71	323.97	499.47	111.2169	109.6756	113.0496	204853329.2	204852989	204853740.2	751.464	340.452	411.012	409653329.2	409652989	409653740.2
4-19	319.77	495.27	379.32	629.43	323.97	499.47	383.52	633.63	146.7825	141.2559	152.3403	204862505.1	204860913	204864167.6	3254.328	1591.884	1662.444	409662505.1	409660913	409664167.6
4-20	379.32	629.43	342.91	829.17	383.52	633.63	347.11	833.37	203.0314	199.7125	206.4679	204882181.8	204880845	204883589	2743.944	1336.692	1407.252	409682181.8	409680845	409683589
4-21	342.91	829.17	350.31	846.05	347.11	833.37	354.51	850.25	18.4308	13.07755	24.06089	204841299.7	204841131	204841538.9	407.904	168.672	239.232	409641299.7	409641131	409641538.9
4-22	350.31	846.05	501.12	117.69	354.51	850.25	505.32	121.89	743.8091	747.0868	740.5645	205394211.9	205399099	205389395.8	9702.84	4886.7	4816.14	410194211.9	410199099	410189395.8
4-23	501.12	117.69	520.43	270.31	505.32	121.89	524.63	274.51	153.8367	149.1872	158.5725	204864625.7	204863217	204866105.2	2888.424	1408.932	1479.492	409664625.7	409663217	409666105.2
4-24	520.43	270.31	542.21	351.46	524.63	274.51	546.41	355.66	84.02197	78.93262	89.21649	204848019.7	204847190	204848919.6	1729.224	829.332	899.892	409648019.7	409647190	409648919.6
4-25	542.21	351.46	467.04	500.74	546.41	355.66	471.24	504.94	167.1378	165.3717	169.0942	204868895	204868308	204869552.9	1245.048	587.244	657.804	409668895	409668308	409669552.9
4-26	467.04	500.74	510.14	573.81	471.24	504.94	514.34	578.01	84.83416	79.09669	90.5977	204848156.8	204847216	204849167.9	1951.656	940.548	1011.108	409648156.8	409647216	409649167.9
4-27	510.14	573.81	455.49	748.59	514.34	578.01	459.69	752.79	183.1247	180.4463	185.9544	204874494.7	204873521	204875539	2018.184	973.812	1044.372	409674494.7	409673521	409675539

4-28	455.49	748.59	454.9	961.97	459.69	752.79	459.1	966.17	213.3808	209.2348	217.6099	204886491.4	204884739	204888314.1	3574.872	1752.156	1822.716	409686491.4	409684739	409688314.1
4-29	454.9	961.97	647.02	-1.52	459.1	966.17	651.22	2.68	982.4577	985.7677	979.1725	205806183.1	205812698	205799738.8	12959.02	6514.788	6444.228	410606183.1	410612698	410599738.8
4-30	647.02	-1.52	679.79	242.26	651.22	2.68	683.99	246.46	245.9727	241.2775	250.7207	204901462.6	204899175	204903820.9	4646.04	2287.74	2358.3	409701462.6	409699175	409703820.9
4-31	679.79	242.26	657.75	328.93	683.99	246.46	661.95	333.13	89.42847	86.54385	92.60466	204848957.5	204848450	204849535.6	1085.784	507.612	578.172	409648957.5	409648450	409649535.6
4-32	657.75	328.93	635.16	462.75	661.95	333.13	639.36	466.95	135.7133	132.3595	139.2398	204859378.1	204858479	204860347.7	1868.664	899.052	969.612	409659378.1	409658479	409660347.7
4-33	635.16	462.75	609.64	611.23	639.36	466.95	613.84	615.43	150.6572	147.3092	154.1614	204863657.6	204862660	204864725.7	2065.728	997.584	1068.144	409663657.6	409662660	409664725.7
4-34	609.64	611.23	571.51	759.49	613.84	615.43	575.71	763.69	153.0847	150.1503	156.1899	204864394.9	204863505	204865355.3	1850.184	889.812	960.372	409664394.9	409663505	409665355.3
4-35	571.51	759.49	590.91	844.07	575.71	763.69	595.11	848.27	86.77636	81.80455	91.8632	204848490.1	204847652	204849398.8	1746.864	838.152	908.712	409648490.1	409647652	409649398.8
4-36	590.91	844.07	736.55	24.59	595.11	848.27	740.75	28.79	832.3211	835.7356	828.9352	205533718.5	205539414	205528093.5	11320.51	5695.536	5624.976	410333718.5	410339414	410328093.5
4-37	736.55	24.59	746.72	169.48	740.75	28.79	750.92	173.68	145.2465	140.8166	149.7809	204862056.5	204860789	204863394.3	2605.008	1267.224	1337.784	409662056.5	409660789	409663394.3
4-38	746.72	169.48	713.48	360.05	750.92	173.68	717.68	364.25	193.4472	190.0935	196.923	204878381.8	204877096	204879738.7	2643.144	1286.292	1356.852	409678381.8	409677096	409679738.7
4-39	713.48	360.05	787.01	553.01	717.68	364.25	791.21	557.21	206.4951	201.0895	211.9293	204883600.2	204881397	204885874	4477.032	2203.236	2273.796	409683600.2	409681397	409685874
4-40	787.01	553.01	800.89	576.48	791.21	557.21	805.09	580.68	27.26711	21.56468	33.05322	204841703.5	204841425	204842052.5	627.48	278.46	349.02	409641703.5	409641425	409642052.5
4-41	800.89	576.48	739.06	705.44	805.09	580.68	743.26	709.64	143.0162	141.156	145.0958	204861413.6	204860885	204862012.8	1127.784	528.612	599.172	409661413.6	409660885	409662012.8
4-42	739.06	705.44	714.41	932.47	743.26	709.64	718.61	936.67	228.3643	224.6899	232.1325	204893110.2	204891446	204894845.5	3399.984	1664.712	1735.272	409693110.2	409691446	409694845.5
4-43	714.41	932.47	936.36	62.65	718.61	936.67	940.56	66.85	897.6907	900.7364	894.6741	205646808.6	205652286	205641401.8	10884.22	5477.388	5406.828	410446808.6	410452286	410441401.8
4-44	936.36	62.65	941.68	192.52	940.56	66.85	945.88	196.72	129.9789	125.675	134.4076	204857854.5	204856754	204859025.4	2271.192	1100.316	1170.876	409657854.5	409656754	409659025.4
4-45	941.68	192.52	963.27	412.72	945.88	196.72	967.47	416.92	221.2559	216.6989	225.8771	204889914.2	204887918	204891980.5	4062.072	1995.756	2066.316	409689914.2	409687918	409691980.5
4-46	963.27	412.72	876.05	530.98	967.47	416.92	880.25	535.18	146.9447	146.1756	147.9485	204862552.8	204862327	204862848.8	521.472	225.456	296.016	409662552.8	409662327	409662848.8
4-47	876.05	530.98	874.77	579.93	880.25	535.18	878.97	584.13	48.96673	45.08429	53.23015	204843357.7	204842993	204843793.4	800.856	365.148	435.708	409643357.7	409642993	409643793.4
4-48	874.77	579.93	922.59	730.2	878.97	584.13	926.79	734.4	157.6954	152.4439	162.9941	204865827.8	204864199	204867527.1	3327.912	1628.676	1699.236	409665827.8	409664199	409667527.1
4-49	922.59	730.2	937.96	970.05	926.79	734.4	942.16	974.25	240.342	235.9146	244.8334	204898724.3	204896616	204900903.4	4287.696	2108.568	2179.128	409698724.3	409696616	409700903.4
5-1	-2.1	-2.1	16.75	21.89	2.1	2.1	20.95	26.09	30.50971	24.62248	36.41399	204841890.8	204841566	204842286	719.712	324.576	395.136	409641890.8	409641566	409642286
5-2	16.75	21.89	56.75	150.89	20.95	26.09	60.95	155.09	135.0592	129.8333	140.342	204859201	204857817	204860655.9	2839.2	1384.32	1454.88	409659201	409657817	409660655.9
5-3	56.75	150.89	57.14	383.3	60.95	155.09	61.34	387.5	232.4103	228.2418	236.6545	204894974.6	204893054	204896965.4	3911.04	1920.24	1990.8	409694974.6	409693054	409696965.4
5-4	57.14	383.3	89.01	554.74	61.34	387.5	93.21	558.94	174.3771	169.5136	179.3055	204871367.4	204869695	204873110.5	3415.608	1672.524	1743.084	409671367.4	409669695	409673110.5
5-5	89.01	554.74	99.6	670.31	93.21	558.94	103.8	674.51	116.0542	111.5532	120.6797	204854428.6	204853404	204855523.6	2119.488	1024.464	1095.024	409654428.6	409653404	409655523.6
5-6	99.6	670.31	9.46	812.57	103.8	674.51	13.66	816.77	168.4136	167.2142	169.8123	204869323.1	204868921	204869796.2	875.616	402.528	473.088	409669323.1	409668921	409669796.2
5-7	9.46	812.57	104.87	921.94	13.66	816.77	109.07	926.14	145.1374	139.212	151.0639	204862024.9	204860340	204863780.3	3440.304	1684.872	1755.432	409662024.9	409660340	409663780.3
5-8	104.87	921.94	258.13	120.85	109.07	926.14	262.33	125.05	815.6187	818.9694	812.2976	205506193.8	205511671	205500787.3	10883.54	5477.052	5406.492	410306193.8	410311671	410300787.3
5-9	258.13	120.85	275.9	201.96	262.33	125.05	280.1	206.16	83.03376	78.09797	88.09357	204847854.6	204847059	204848720.5	1661.184	795.312	865.872	409647854.6	409647059	409648720.5
5-10	275.9	201.96	213.61	414.29	280.1	206.16	217.81	418.49	221.2783	218.4926	224.1867	204889924.1	204888699	204891219.7	2520.672	1225.056	1295.616	409689924.1	409688699	409691219.7
5-11	213.61	414.29	168.42	436.19	217.81	418.49	172.62	440.39	50.21699	52.46582	48.59414	204843481.7	204843713	204843321.4	391.272	230.916	160.356	409643481.7	409643713	409643321.4
5-12	168.42	436.19	166.67	695.29	172.62	440.39	170.87	699.49	259.1059	254.9694	263.3114	204908095.9	204905969	204910292.9	4323.48	2126.46	2197.02	409708095.9	409705969	409710292.9
5-13	166.67	695.29	176.34	783.3	170.87	699.49	180.54	787.5	88.53965	83.98831	93.24731	204848799.3	204848014	204849655.1	1641.024	785.232	855.792	409648799.3	409648014	409649655.1
5-14	176.34	783.3	187.71	878.73	180.54	787.5	191.91	882.93	96.10495	91.51132	100.8393	204850196.2	204849334	204851128.6	1794.24	861.84	932.4	409650196.2	409649334	409651128.6
5-15	187.71	878.73	337.02	116.48	191.91	882.93	341.22	120.68	776.7358	780.0657	773.4372	205444278.5	205449463	205439165.1	10297.39	5183.976	5113.416	410244278.5	410249463	410239165.1
5-16	337.02	116.48	337.03	243.82	341.22	120.68	341.23	248.02	127.34	123.2113	131.6074	204857175.5	204856141	204858280.5	2139.48	1034.46	1105.02	409657175.5	409656141	409658280.5
5-17	337.03	243.82	328.37	414.86	341.23	248.02	332.57	419.06	171.2591	167.3349	175.2967	204870289.7	204868961	204871688.9	2727.984	1328.712	1399.272	409670289.7	409668961	409671688.9
5-18	328.37	414.86	312.41	542.85	332.57	419.06	316.61	547.05	128.9812	125.4209	132.7121	204857596.2	204856690	204858572.5	1882.104	905.772	976.332	409657596.2	409656690	409658572.5
5-19	312.41	542.85	279.79	609.16	316.61	547.05	283.99	613.36	73.89912	72.20363	76.02208	204846421.1	204846173	204846739.4	565.992	247.716	318.276	409646421.1	409646173	409646739.4
5-20	279.79	609.16	363.1	816.2	283.99	613.36	367.3	820.4	223.1728	217.7211	228.6489	204890766.1	204888362	204893240.3	4877.88	2403.66	2474.22	409690766.1	409688362	409693240.3
5-21	363.1	816.2	314.02	861.71	367.3	820.4	318.22	865.91	66.93285	67.41865	66.97237	204845440	204845505	204845445.3	59.976	65.268	5.292	409645440	409645505	409645445.3
5-22	314.02	861.71	472.29	26.42	318.22	865.91	476.49	30.62	850.1522	853.511	846.8218	205563718.8	205569441	205558067.1	11373.94	5722.248	5651.688	410363718.8	410369441	410358067.1
5-23	472.29	26.42	480.04	185.67	476.49	30.62	484.24	189.87	159.4385	155.0906	163.8863	204866380.6	204865013	204867818.7	2805.6	1367.52	1438.08	409666380.6	409665013	409667818.7
5-24	480.04	185.67	548.4	361.71	484.24	189.87	552.6	365.91	188.847	183.4271	194.2972	204876623.2	204874605	204878711.4	4105.92	2017.68	2088.24	409676623.2	409674605	409678711.4
5-25	548.4	361.71	466.8	436.3	552.6	365.91	471	440.5	110.5542	110.9792	110.4474	204853182.2	204853276	204853158.6	117.768	94.164	23.604	409653182.2	409653276	409653158.6
5-26	466.8	436.3	419.57	654.85	471	440.5	423.77	659.05	223.5951	220.4336	226.8681	204890954.8	204889551	204892429.1	2878.176	1403.808	1474.368	409690954.8	409689551	409692429.1
5-27	419.57	654.85	539.49	717.74	423.77	659.05	543.69	721.94	135.4103	129.7522	141.0916	204859296	204857796	204860866.8	3071.208	1500.324	1570.884	409659296	409657796	409660866.8
5-28	539.49	717.74	512.9	881.68	543.69	721.94	517.1	885.88	166.0824	162.6803	169.6242	204868543.4	204867425	204869732.4	2307.48	1118.46	1189.02	409668543.4	409667425	409669732.4
5-29	512.9	881.68	652.74	91.66	517.1	885.88	656.94	95.86	802.301	805.7193	798.9121	205484646.8	205490144	205479220.6	10923.02	5496.792	5426.232	410284646.8	410290144	410279220.6
5-30	652.74	91.66	680.48	176.92	656.94	95.86	684.68	181.12	89.65922	84.40886	94.99082	204848998.8	204848085	204849983.3	1898.4	913.92	984.48	409648998.8	409648085	409649983.3
5-31	680.48	176.92	658.99	307.6	684.68	181.12	663.19	311.8	132.4352	129.0626	135.9837	204858499.1	204857617	204859451.6	1834.392	881.916	952.476	409658499.1	409657617	409659451.6
5-32	658.99	307.6	610.6	489.79	663.19	311.8	614.8	493.99	188.5067	185.5967	191.5567	204876494.8	204875406	204877654	2247.84	1088.64	1159.2	409676494.8	409675406	409677654
5-33	610.6	489.79	605.95	600.01	614.8	493.99	610.15	604.21	110.318	106.3887	114.4209	204853130.1	204852279	204854052.1	1773.576	851.508	922.068	409653130.1	409652279	409654052.1
5-34	605.95	600.01	645.1	768.51	610.15	604.21	649.3	772.71	172.9884	167.9762	178.0576	204870885	204869176	204872664.5	3488.52	1708.98	1779.54	409670885	409669176	409672664.5
5-35	645.1	768.51	574.85	939.42	649.3	772.71	579.05	943.62	184.7844	182.5788	187.1527	204875105.3	204874295	204875986.1	1691.088	810.264	880.824	409675105.3	409674295	409675986.1
5-36	574.85	939.42	820.59	121.24	579.05	943.62	824.79	125.44	854.2872	857.1175	851.489	205570766.7	205575610	205565993.4	9616.992	4843.776	4773.216	410370766.7	410375610	410365993.4
5-37	820.59	121.24	812.24	172.58	824.79	125.44	816.44	176.78	52.0146	48.78199	55.69483	204843665.5	204843340	204844061.9	722.232	325.836	396.396	409643665.5	409643340	409644061.9
5-38	812.24	172.58	809.31	324.37	816.44	176.78	813.51	328.57	151.8183	147.7621	155.9952	204864008.8	204862794	204865294.5	2500.848	1215.144	1285.704	409664008.8	409662794	409665294.5

5-39	809.31	324.37	788.5	492.25	813.51	328.57	792.7	496.45	169.1649	165.5797	172.8798	204869576.8	204868377	204870847.4	2470.776	1200.108	1270.668	409669576.8	409668377	409670847.4
5-40	788.5	492.25	742.42	613.81	792.7	496.45	746.62	618.01	130.0008	127.6771	132.55	204857860.2	204857261	204858529.5	1268.064	598.752	669.312	409657860.2	409657261	409658529.5
5-41	742.42	613.81	821.35	711.53	746.62	618.01	825.55	715.73	125.6151	119.7103	131.5229	204856739.1	204855291	204858258.3	2967.72	1448.58	1519.14	409656739.1	409655291	409658258.3
5-42	821.35	711.53	800.64	841.55	825.55	715.73	804.84	845.75	131.659	128.2622	135.2316	204858294.1	204857411	204859247.6	1836.408	882.924	953.484	409658294.1	409657411	409659247.6
5-43	800.64	841.55	843.93	41.82	804.84	845.75	848.13	46.02	800.9008	804.8798	796.9462	205482402.1	205488791	205476083.3	12708.19	6389.376	6318.816	410282402.1	410288791	410276083.3
5-44	843.93	41.82	948.16	160.22	848.13	46.02	952.36	164.42	157.7417	151.8145	163.6699	204865842.5	204864008	204867747.8	3740.184	1834.812	1905.372	409665842.5	409664008	409667747.8
5-45	948.16	160.22	864.43	386.38	952.36	164.42	868.63	390.58	241.1619	238.7424	243.7022	204899119.1	204897958	204900350.8	2392.824	1161.132	1231.692	409699119.1	409697958	409700350.8
5-46	864.43	386.38	873.8	452.88	868.63	390.58	878	457.08	67.15688	62.51415	71.99052	204845470	204844868	204846142.6	1274.616	602.028	672.588	409645470	409644868	409646142.6
5-47	873.8	452.88	870.59	668.41	878	457.08	874.79	672.61	215.5539	211.4599	219.7322	204887423.5	204885675	204889242.3	3566.976	1748.208	1818.768	409687423.5	409685675	409689242.3
5-48	870.59	668.41	883.02	727.58	874.79	672.61	887.22	731.78	60.46151	55.58268	65.51575	204844615.6	204844049	204845252.3	1202.88	566.16	636.72	409644615.6	409644049	409645252.3
5-49	883.02	727.58	946.43	901.17	887.22	731.78	950.63	905.37	184.8089	179.4402	190.2115	204875114.3	204873159	204877140.4	3981.6	1955.52	2026.08	409675114.3	409673159	409677140.4
															864823.7	**426308.4**	**438525.9**			

Table 3: Energy saving (E_S) calculations applying Spiral Deployment Strategy and Area Wise Clustering Process

	dmin(d=42mm or 4.2cm)				dmax(d=42mm or 4.2cm)															
i no-cl no	(x1-d/2)	(y1-d/2)	(x2-d/2)	(y2-d/2)	(x1+d/2)	(y1+d/2)	(x2+d/2)	(y2+d/2)	dis(zero)	dxy(min)	dxy(max)	E_tx0	E_tx(min)	E_tx(max)	max Eng	min Eng	AvgEng	total0	totalxy(min)	totalxy(max)
1-1	-2.1	-2.1	43.01	19.23	2.1	2.1	47.21	23.43	49.89871	44.35161	55.52708	204843450	204842927	204844043	1116.192	522.816	593.376	409643449.9	409642927.1	409644043.3
1-2	43.01	19.23	61.54	257.45	47.21	23.43	65.74	261.65	238.9396	234.4583	243.4833	204898052	204895931	204900244	4313.4	2121.42	2191.98	409698052.1	409695930.7	409700244.1
1-3	61.54	257.45	65.63	381.69	65.74	261.65	69.83	385.89	124.3073	120.0401	128.7073	204856412	204855370	204857526	2155.944	1042.692	1113.252	409656412.3	409655369.6	409657525.6
1-4	65.63	381.69	95.71	491.62	69.83	385.89	99.91	495.82	113.9711	108.8513	119.167	204853949	204852809	204855161	2352.168	1140.804	1211.364	409653949.4	409652808.6	409655160.8
1-5	95.71	491.62	49.15	652.98	99.91	495.82	53.35	657.18	167.9431	165.154	170.8932	204869165	204868236	204870164	1928.64	929.04	999.6	409669164.9	409668235.8	409670164.5
1-6	49.15	652.98	62.68	766.48	53.35	657.18	66.88	770.68	114.3036	109.6975	119.0279	204854025	204852994	204855128	2134.104	1031.772	1102.332	409654025.3	409652993.5	409655127.6
1-7	62.68	766.48	82.21	866.39	66.88	770.68	86.41	870.59	101.8009	96.92994	106.7802	204851323	204850355	204852362	2006.592	968.016	1038.576	409651323.4	409650355.4	409652362
1-8	82.21	866.39	202.63	126.14	86.41	870.59	206.83	130.34	749.9807	753.4672	746.5251	205403431	205408673	205398260	10413.14	5241.852	5171.292	410203431	410208672.9	410198259.7
1-9	202.63	126.14	196.89	212.17	206.83	130.34	201.09	216.37	86.22128	82.4315	90.24314	204848394	204847755	204849104	1348.872	639.156	709.716	409648394.1	409647755	409649103.8
1-10	196.89	212.17	201.54	397.12	201.09	216.37	205.74	401.32	185.0084	180.7506	189.3569	204875188	204873631	204876816	3185.28	1557.36	1627.92	409675188.1	409673630.8	409676816
1-11	201.54	397.12	207.03	491.55	205.74	401.32	211.23	495.75	94.58946	90.23922	99.10486	204849907	204849103	204850782	1678.656	804.048	874.608	409649907.2	409649103.1	409650781.8
1-12	207.03	491.55	195.66	591.65	211.23	495.75	199.86	595.85	100.7437	97.15572	104.5462	204851109	204850399	204851890	1490.664	710.052	780.612	409651109.3	409650399.2	409651889.9
1-13	195.66	591.65	200.28	736.26	199.86	595.85	204.48	740.46	144.6838	140.4106	149.0712	204861893	204860675	204863182	2507.064	1218.252	1288.812	409661893.4	409660675.1	409663182.2
1-14	200.28	736.26	191.54	925.14	204.48	740.46	195.74	929.34	189.0821	185.1328	193.1334	204876712	204875234	204878260	3026.352	1477.896	1548.456	409676712	409675234.1	409678260.5
1-15	191.54	925.14	342.66	121.93	195.74	929.34	346.86	126.13	817.3026	820.6683	813.9664	205508944	205514456	205503501	10955.11	5512.836	5442.276	410308943.6	410314456.4	410303501.3
1-16	342.66	121.93	328.06	164.44	346.86	126.13	332.26	168.64	44.9473	42.6743	47.85378	204842980	204842781	204843250	468.888	199.164	269.724	409642980.3	409642781.1	409643250
1-17	328.06	164.44	333.21	393.79	332.26	168.64	337.41	397.99	229.4078	225.152	233.7371	204893588	204891653	204895593	3939.6	1934.52	2005.08	409693587.9	409691653.4	409695593
1-18	333.21	393.79	341.27	537.08	337.41	397.99	345.47	541.28	143.5165	139.1436	147.9987	204861557	204860321	204862864	2542.68	1236.06	1306.62	409661557	409660320.9	409662863.6
1-19	341.27	537.08	359.18	629.54	345.47	541.28	363.38	633.74	94.17866	89.31848	99.15648	204849830	204848938	204850792	1854.216	891.828	962.388	409649829.6	409648937.8	409650792
1-20	359.18	629.54	324.13	762.22	363.38	633.74	328.33	766.42	137.2315	134.3416	140.3134	204859792	204859008	204860648	1640.184	784.812	855.372	409659792.5	409659007.7	409660647.9
1-21	324.13	762.22	329.07	887.81	328.33	766.42	333.27	892.01	125.6871	121.3923	130.1114	204856757	204855696	204857889	2192.904	1061.172	1131.732	409656757.3	409655696.1	409657889
1-22	329.07	887.81	483.97	40	333.27	892.01	488.17	44.2	861.8444	865.235	858.4816	205583736	205589592	205577951	11640.89	5855.724	5785.164	410383735.8	410389591.5	410377950.6
1-23	483.97	40	484.25	208.38	488.17	44.2	488.45	212.58	168.3802	164.2268	172.6381	204869312	204867930	204870764	2833.488	1381.464	1452.024	409669311.9	409667930.4	409670763.9
1-24	484.25	208.38	484.86	320.08	488.45	212.58	489.06	324.28	111.7017	107.5599	115.9998	204853437	204852529	204854416	1886.808	908.124	978.684	409653437.3	409652529.1	409654415.9
1-25	484.86	320.08	516.45	546.04	489.06	324.28	520.65	550.24	228.1575	223.4451	232.9261	204893016	204890888	204895215	4326.84	2128.14	2198.7	409693015.8	409690887.7	409695214.5
1-26	516.45	546.04	464.67	622.04	520.65	550.24	468.87	626.24	91.96286	91.04395	93.25179	204849417	204849249	204849656	406.896	168.168	238.728	409649417.2	409649249	409649655.9
1-27	464.67	622.04	476.79	786.32	468.87	626.24	480.99	790.52	164.7265	160.2758	169.2686	204868095	204866648	204869612	2963.52	1446.48	1517.04	409668094.8	409666648.3	409669611.9
1-28	476.79	786.32	489.29	879.11	480.99	790.52	493.49	883.31	93.62817	88.97796	98.41722	204849726	204848877	204850646	1768.872	849.156	919.716	409649726.2	409648877.1	409650646
1-29	489.29	879.11	622.03	66	493.49	883.31	626.23	70.2	823.8736	827.3561	820.4194	205519728	205525478	205514048	11430.22	5750.388	5679.828	410319727.8	410325478.2	410314048
1-30	622.03	66	634	230.1	626.23	70.2	638.2	234.3	164.536	160.0887	169.075	204868032	204866588	204869546	2957.976	1443.708	1514.268	409668032.1	409666588.4	409669546.4
1-31	634	230.1	613.23	349.06	638.2	234.3	617.43	353.26	120.7596	117.4451	124.2697	204855543	204854753	204856403	1649.592	789.516	860.076	409655542.9	409654753.4	409656403
1-32	613.23	349.06	596.64	546.34	617.43	353.26	600.84	550.54	197.9763	194.1961	201.8606	204880155	204878672	204881708	3035.592	1482.516	1553.076	409680154.6	409678672.1	409681707.7
1-33	596.64	546.34	644.58	674.32	600.84	550.54	648.78	678.52	136.6643	131.2809	142.092	204859637	204858195	204861150	2955.456	1442.448	1513.008	409659637.1	409658194.7	409661150.1
1-34	644.58	674.32	601.76	815.25	648.78	678.52	605.96	819.45	147.2916	144.589	150.1806	204862655	204861866	204863514	1648.248	788.844	859.404	409662654.8	409661866	409663514.2
1-35	601.76	815.25	630.5	908.4	605.96	819.45	634.7	912.6	97.48287	92.27304	102.7719	204850463	204849474	204851522	2047.752	988.596	1059.156	409650462.9	409649474.3	409651522.1
1-36	630.5	908.4	784.88	100.59	634.7	912.6	789.08	104.79	822.4294	825.781	819.1072	205517350	205522874	205511897	10977.62	5524.092	5453.532	410317350.2	410322874.3	410311896.6
1-37	784.88	100.59	788.82	226.87	789.08	104.79	793.02	231.07	126.3415	122.0803	130.7337	204856922	204855864	204858051	2187.696	1058.568	1129.128	409656922.2	409655863.6	409658051.3
1-38	788.82	226.87	778.18	336.72	793.02	231.07	782.38	340.92	110.3641	106.6872	114.2317	204853140	204852342	204854009	1666.728	798.084	868.644	409653140.2	409652342.1	409654008.9
1-39	778.18	336.72	756.38	506.01	782.38	340.92	760.58	510.21	170.6879	167.1248	174.3804	204870094	204868891	204871369	2477.832	1203.636	1274.196	409670094.3	409668890.7	409671368.5
1-40	756.38	506.01	737.8	654.97	760.58	510.21	742	659.17	150.1143	146.5414	153.8336	204863494	204862434	204864625	2190.384	1059.912	1130.472	409663494.3	409662434.4	409664624.8
1-41	737.8	654.97	763.95	714.51	742	659.17	768.15	718.71	65.02949	59.53418	70.59681	204845189	204844504	204845944	1439.592	684.516	755.076	409645188.8	409644504.3	409645943.9
1-42	763.95	714.51	734.58	892.29	768.15	718.71	738.78	896.49	180.1897	176.7964	183.7124	204873428	204872217	204874710	2493.288	1211.364	1281.924	409673428.3	409672217	409674710.2
1-43	734.58	892.29	926.04	116.64	738.78	896.49	930.24	120.84	798.9304	802.0177	795.8756	205479250	205484192	205474378	9814.392	4942.476	4871.916	410279249.9	410284192.3	410274377.9
1-44	926.04	116.64	903.54	261.52	930.24	120.84	907.74	265.72	146.6167	143.1913	150.199	204862456	204861464	204863520	2055.984	992.712	1063.272	409662456.5	409661463.8	409663519.7
1-45	903.54	261.52	910.33	324.6	907.74	265.72	914.53	328.8	63.44439	58.93694	68.17168	204844985	204844434	204845607	1173.816	551.628	622.188	409644985.2	409644433.6	409645607.4
1-46	910.33	324.6	897.51	455.24	914.53	328.8	901.71	459.44	131.2675	127.5804	135.1152	204858191	204857237	204859216	1979.376	954.408	1024.968	409658191.2	409657236.8	409659216.1
1-47	897.51	455.24	907.19	625.66	901.71	459.44	911.39	629.86	170.6947	166.3103	175.1708	204870097	204868619	204871645	3025.68	1477.56	1548.12	409670096.7	409668619.1	409671644.8
1-48	907.19	625.66	923.4	801.45	911.39	629.86	927.6	805.65	176.5358	172.0098	181.1435	204872125	204870547	204873773	3225.6	1577.52	1648.08	409672124.9	409670547.4	409673773
1-49	923.4	801.45	927.92	925.92	927.6	805.65	932.12	930.12	124.552	120.2704	128.9651	204856473	204855425	204857592	2167.032	1048.236	1118.796	409656473.2	409655425	409657592
2-1	-2.1	-2.1	68.07	68.44	2.1	2.1	72.27	72.64	99.49734	93.55766	105.437	204850860	204849713	204852077	2363.928	1146.684	1217.244	409650859.7	409649713	409652077
2-2	68.07	68.44	57.25	261.76	72.27	72.64	61.45	265.96	193.6226	189.7155	197.6309	204878450	204876952	204880018	3066	1497.72	1568.28	409678449.7	409676952	409680018
2-3	57.25	261.76	53.79	393.79	61.45	265.96	57.99	397.99	132.0753	128.0593	136.232	204858404	204857359	204859519	2159.976	1044.708	1115.268	409658403.9	409657359.2	409659519.2
2-4	53.79	393.79	100.33	556.6	57.99	397.99	104.53	560.8	169.3312	164.164	174.5477	204869633	204867910	204871427	3517.08	1723.26	1793.82	409669633.1	409667909.8	409671426.9
2-5	100.33	556.6	43.92	668.05	104.53	560.8	48.12	672.25	124.9127	123.1915	126.889	204856563	204856136	204857061	924.672	427.056	497.616	409656563.2	409656136.1	409657060.8

2-6	43.92	668.05	58.8	737.99	48.12	672.25	63	742.19	71.50537	66.60188	76.55577	204846073	204845396	204846821	1424.976	677.208	747.768	409646073	409645395.8	409646820.8
2-7	58.8	737.99	79.21	909.53	63	742.19	83.41	913.73	172.7499	168.1233	177.4548	204870803	204869225	204872450	3224.76	1577.1	1647.66	409670802.5	409669225.4	409672450.2
2-8	79.21	909.53	214.25	18.22	83.41	913.73	218.45	22.42	901.4817	905.0178	897.971	205653629	205660017	205647312	12705.34	6387.948	6317.388	410453629.3	410460017.3	410447311.9
2-9	214.25	18.22	208.49	208.18	218.45	22.42	212.69	212.38	190.0473	186.0268	194.1663	204877078	204875566	204878661	3094.56	1512	1582.56	409677078	409675566	409678660.5
2-10	208.49	208.18	215.83	411.47	212.69	212.38	220.03	415.67	203.4225	199.1148	207.8107	204882341	204880607	204884145	3538.584	1734.012	1804.572	409682340.7	409680606.7	409684145.3
2-11	215.83	411.47	186.07	442.4	220.03	415.67	190.27	446.6	42.92228	43.21776	43.44457	204842802	204842828	204842847	19.656	25.452	45.108	409642802.3	409642827.8	409642847.4
2-12	186.07	442.4	214.48	638.07	190.27	446.6	218.68	642.27	197.7217	192.9945	202.5128	204880054	204878207	204881971	3764.544	1846.992	1917.552	409680053.9	409678206.9	409681971.4
2-13	214.48	638.07	219.06	768.96	218.68	642.27	223.26	773.16	130.9701	126.6906	135.375	204858113	204857011	204859286	2275.896	1102.668	1173.228	409658113.2	409657010.5	409659286.4
2-14	219.06	768.96	189.42	859.44	223.26	773.16	193.62	863.64	95.21113	92.67893	98.03824	204850025	204849549	204850571	1022.112	475.776	546.336	409650025.2	409649549.4	409650571.5
2-15	189.42	859.44	347.06	27.05	193.62	863.64	351.26	31.25	847.1856	850.5449	843.8548	205558683	205564387	205553051	11335.8	5703.18	5632.62	410358683.5	410364386.7	410353050.9
2-16	347.06	27.05	337.34	201.89	351.26	31.25	341.54	206.09	175.11	171.2068	179.1251	204871624	204870272	204873046	2774.016	1351.728	1422.288	409671623.5	409670271.8	409673045.8
2-17	337.34	201.89	348.06	348.27	341.54	206.09	352.26	352.47	146.772	142.3294	151.3174	204862502	204861218	204863857	2639.28	1284.36	1354.92	409662502	409661217.7	409663856.9
2-18	348.06	348.27	355.45	551.53	352.26	352.47	359.65	555.73	203.3943	199.0856	207.7835	204882329	204880595	204884134	3538.92	1734.18	1804.74	409682329.2	409680595.1	409684134
2-19	355.45	551.53	336.26	632.52	359.65	555.73	340.46	636.72	83.23242	80.27326	86.49876	204847888	204847404	204848442	1038.24	483.84	554.4	409647887.6	409647403.8	409648442
2-20	336.26	632.52	320.76	798.08	340.46	636.72	324.96	802.28	166.284	162.5581	170.1357	204868610	204867385	204869906	2521.008	1225.224	1295.784	409668610.4	409667385.1	409669906.1
2-21	320.76	798.08	366.38	916	324.96	802.28	370.58	920.2	126.437	121.0283	131.8913	204856946	204855608	204858355	2747.472	1338.456	1409.016	409656946.3	409655607.9	409658355.3
2-22	366.38	916	469.58	92.9	370.58	920.2	473.78	97.1	829.5444	833.2024	825.9128	205529104	205535186	205523092	12094.32	6082.44	6011.88	410329103.9	410335186.3	410323092
2-23	469.58	92.9	482.1	182.87	473.78	97.1	486.3	187.07	90.83695	86.17259	95.64281	204849211	204848386	204850108	1721.832	825.636	896.196	409649211.4	409648385.7	409650107.5
2-24	482.1	182.87	494.77	370.02	486.3	187.07	498.97	374.22	187.5784	183.146	192.0922	204876146	204874502	204877859	3356.976	1643.208	1713.768	409676145.7	409674502.4	409677859.4
2-25	494.77	370.02	518.95	468.96	498.97	374.22	523.15	473.16	101.8518	96.8239	106.9733	204851334	204850335	204852403	2068.416	998.928	1069.488	409651333.8	409650334.9	409652403.3
2-26	518.95	468.96	455.02	653.87	523.15	473.16	459.22	658.07	195.6496	193.1264	198.3186	204879239	204878258	204880290	2032.464	980.952	1051.512	409679238.8	409678257.8	409680290.3
2-27	455.02	653.87	475.73	753.71	459.22	658.07	479.93	757.91	101.9653	97.05457	106.9805	204851357	204850380	204852405	2025.24	977.34	1047.9	409651356.9	409650379.6	409652404.8
2-28	475.73	753.71	510.6	948.85	479.93	757.91	514.8	953.05	198.231	193.3875	203.1327	204880256	204878359	204882223	3864.168	1896.804	1967.364	409680255.5	409678358.7	409682222.9
2-29	510.6	948.85	623.14	79.29	514.8	953.05	627.34	83.49	876.8123	880.4511	873.1988	205609760	205616154	205603436	12717.94	6394.248	6323.688	410409759.8	410416154.1	410403436.2
2-30	623.14	79.29	594.64	150.14	627.34	83.49	598.84	154.34	76.36735	74.23956	78.88595	204846792	204846472	204847183	711.48	320.46	391.02	409646792	409646471.5	409647183
2-31	594.64	150.14	608.71	364.51	598.84	154.34	612.91	368.71	214.8312	210.4016	219.3323	204887112	204885229	204889067	3837.792	1883.616	1954.176	409687112.5	409685228.8	409689066.6
2-32	608.71	364.51	641.55	471.63	612.91	368.71	645.75	475.83	112.0409	106.8306	117.3205	204853513	204852373	204854724	2351.328	1140.384	1210.944	409653513.2	409652372.8	409654724.1
2-33	641.55	471.63	636.65	626.08	645.75	475.83	640.85	630.28	154.5277	150.5253	158.6515	204864839	204863618	204866130	2512.44	1220.94	1291.5	409664838.8	409663617.9	409666130.3
2-34	636.65	626.08	614.84	812.76	640.85	630.28	619.04	816.96	187.9497	184.3244	191.6906	204876285	204874935	204877705	2769.816	1349.628	1420.188	409676285.1	409674935.5	409677705.3
2-35	614.84	812.76	664.07	934.67	619.04	816.96	668.27	938.87	131.4749	126.0291	136.9617	204858246	204856843	204859718	2875.152	1402.296	1472.856	409658245.6	409656843.3	409659718.5
2-36	664.07	934.67	778.89	54.51	668.27	938.87	783.09	58.71	887.6177	891.2516	884.0089	205628825	205635289	205622432	12857.71	6464.136	6393.576	410428825.3	410435289.4	410422431.7
2-37	778.89	54.51	753.42	209.04	783.09	58.71	757.62	213.24	156.6149	153.23	160.1488	204865488	204864439	204866608	2168.208	1048.824	1119.384	409665488.2	409664439.4	409666607.6
2-38	753.42	209.04	771.92	410.12	757.62	213.24	776.12	414.32	201.9292	197.3986	206.5313	204881735	204879926	204883615	3688.944	1809.192	1879.752	409681735.4	409679926.2	409683615.2
2-39	771.92	410.12	740.91	451.79	776.12	414.32	745.11	455.99	51.94236	51.41736	53.13034	204843658	204843604	204843783	179.088	54.264	124.824	409643658	409643603.7	409643782.8
2-40	740.91	451.79	738.39	615.91	745.11	455.99	742.59	620.11	164.1393	160.0611	168.3284	204867902	204866580	204869294	2714.88	1322.16	1392.72	409667901.7	409666579.6	409669294.4
2-41	738.39	615.91	761.38	791.76	742.59	620.11	765.58	795.96	177.3464	172.6754	182.0915	204872412	204870777	204874117	3340.512	1634.976	1705.536	409672411.8	409670776.8	409674117.3
2-42	761.38	791.76	749.67	947.55	765.58	795.96	753.87	951.75	156.2295	152.4226	160.1662	204865368	204864193	204866613	2420.544	1174.992	1245.552	409665367.6	409664192.7	409666613.2
2-43	749.67	947.55	931.32	121.43	753.87	951.75	935.52	125.63	845.8552	849.07	842.67	205556431	205561880	205551053	10827.1	5448.828	5378.268	410356431	410361879.8	410351052.7
2-44	931.32	121.43	888.62	206.69	935.52	125.63	892.82	210.89	95.3549	93.65006	97.39272	204850053	204849730	204850445	715.008	322.224	392.784	409650052.6	409649730.3	409650445.3
2-45	888.62	206.69	900.72	394.27	892.82	210.89	904.92	398.47	187.9699	183.5501	192.4714	204876293	204874651	204878005	3354.624	1642.032	1712.592	409676292.7	409674650.6	409678005.3
2-46	900.72	394.27	894.27	444.24	904.92	398.47	898.47	448.44	50.38456	46.99272	54.21671	204843499	204843168	204843899	731.136	330.288	400.848	409643498.6	409643168.3	409643899.5
2-47	894.27	444.24	871.82	581.11	898.47	448.44	876.02	585.31	138.699	135.3202	142.2456	204860197	204859272	204861194	1922.256	925.848	996.408	409660197.4	409659271.6	409661193.8
2-48	871.82	581.11	886	716.87	876.02	585.31	890.2	721.07	136.4985	131.938	141.1617	204859592	204858368	204860887	2518.992	1224.216	1294.776	409659591.9	409658367.6	409660886.6
2-49	886	716.87	933.85	850.96	890.2	721.07	938.05	855.16	142.3719	137.0282	147.761	204861230	204859737	204862793	3056.592	1493.016	1563.576	409661229.8	409659736.7	409662793.3
3-1	-2.1	-2.1	3.25	103.04	2.1	2.1	7.45	107.24	105.276	100.9466	109.7563	204852043	204851150	204853006	1856.232	892.836	963.396	409652043	409651150.2	409653006.4
3-2	3.25	103.04	48.69	248.35	7.45	107.24	52.89	252.55	152.2491	147.0128	157.5353	204864140	204862573	204865777	3204.6	1567.02	1637.58	409664139.8	409662572.8	409665777.4
3-3	48.69	248.35	72.04	415.98	52.89	252.55	76.24	420.18	169.2485	164.5481	174.0246	204869605	204868036	204871245	3208.464	1568.952	1639.512	409669605	409668036.1	409671244.6
3-4	72.04	415.98	31.73	467.77	76.24	420.18	35.93	471.97	65.6285	65.16094	66.62441	204845267	204845206	204845399	192.864	61.152	131.712	409645267.1	409645205.9	409645398.8
3-5	31.73	467.77	38.33	558.1	35.93	471.97	42.53	562.3	90.57079	86.16343	95.14495	204849163	204848384	204850013	1628.424	778.932	849.492	409649163.1	409648384.1	409650012.6
3-6	38.33	558.1	31.98	736.86	42.53	562.3	36.18	741.06	178.8727	174.8785	182.9726	204872955	204871542	204874439	2896.488	1412.964	1483.524	409672955.5	409671542.5	409674439
3-7	31.98	736.86	78.98	843.25	36.18	741.06	83.18	847.45	116.3092	110.791	121.8671	204854488	204853235	204855812	2576.952	1253.196	1323.756	409654487.8	409653234.6	409655811.6
3-8	78.98	843.25	238.54	114.21	83.18	847.45	242.74	118.41	746.2967	749.5183	743.1086	205397919	205402738	205393170	9567.264	4818.912	4748.352	410197918.7	410202737.6	410193170.4
3-9	238.54	114.21	207.45	166.92	242.74	118.41	211.65	171.12	61.19585	59.98837	62.94299	204844705	204844559	204844922	363.216	146.328	216.888	409644704.9	409644558.6	409644921.8
3-10	207.45	166.92	182.83	365.96	211.65	171.12	187.03	370.16	200.5569	196.9599	204.2632	204881183	204879753	204882683	2930.256	1429.848	1500.408	409681183.1	409679753.2	409682683.5
3-11	182.83	365.96	225.33	540.94	187.03	370.16	229.53	545.14	180.0673	175.022	185.1658	204873384	204871593	204875246	3653.664	1791.552	1862.112	409673384.3	409671592.7	409675246.4
3-12	225.33	540.94	190.11	646.76	229.53	545.14	194.31	650.96	111.5272	108.998	114.3094	204853398	204852841	204854027	1186.08	557.76	628.32	409653398.3	409652840.6	409654026.6
3-13	190.11	646.76	244.61	794.26	194.31	650.96	248.81	798.46	157.2466	151.8716	162.6609	204865687	204864025	204867419	3393.6	1661.52	1732.08	409665686.5	409664025	409667418.6
3-14	244.61	794.26	184.43	902.36	248.81	798.46	188.63	906.56	123.7224	122.2293	125.4793	204856267	204855900	204856705	805.056	367.248	437.808	409656267.2	409655900	409656705.1
3-15	184.43	902.36	319.59	55.45	188.63	906.56	323.79	59.65	857.6274	861.1264	854.1553	205576485	205582499	205570541	11957.4	6013.98	5943.42	410376484.8	410382498.8	410370541.4
3-16	319.59	55.45	337.68	257.49	323.79	59.65	341.88	261.69	202.8482	198.327	207.441	204882107	204880294	204883992	3698.184	1813.812	1884.372	409682107.4	409680293.6	409683991.8

3-17	337.68	257.49	357.08	401.31	341.88	261.69	361.28	405.51	145.1225	140.445	149.8896	204862021	204860685	204863427	2742.096	1335.768	1406.328	409662020.6	409660684.8	409663426.9
3-18	357.08	401.31	375.01	491.61	361.28	405.51	379.21	495.81	92.06289	87.18786	97.05662	204849436	204848562	204850380	1818.264	873.852	944.412	409649435.6	409648561.7	409650380
3-19	375.01	491.61	369.17	679.64	379.21	495.81	373.37	683.84	188.1207	184.104	192.237	204876349	204874854	204877915	3060.792	1495.116	1565.676	409676349.4	409674854.3	409677915.1
3-20	369.17	679.64	314.15	752.45	373.37	683.84	318.35	756.65	91.2606	90.633	92.26707	204849288	204849174	204849473	298.872	114.156	184.716	409649288.5	409649174.3	409649473.2
3-21	314.15	752.45	321.73	935.86	318.35	756.65	325.93	940.06	183.5666	179.2419	187.9795	204874657	204873088	204876296	3208.632	1569.036	1639.596	409674656.7	409673087.6	409676296.3
3-22	321.73	935.86	469.06	85.84	325.93	940.06	473.26	90.04	862.6935	866.1282	859.2862	205585200	205591138	205579333	11805.19	5937.876	5867.316	410385200.1	410391138	410379332.8
3-23	469.06	85.84	504.87	268.33	473.26	90.04	509.07	272.53	185.9703	181.0705	190.9292	204875545	204873747	204877414	3667.44	1798.44	1869	409675545	409673746.5	409677414
3-24	504.87	268.33	494.84	298.79	509.07	272.53	499.04	302.99	32.06887	29.86772	35.1469	204841988	204841852	204842195	343.224	136.332	206.892	409641988.4	409641852.1	409642195.3
3-25	494.84	298.79	496.38	550.75	499.04	302.99	500.58	554.95	251.9647	247.7743	256.2243	204904446	204902352	204906611	4258.8	2094.12	2164.68	409704446.2	409702352.1	409706610.9
3-26	496.38	550.75	488.99	646.99	500.58	554.95	493.19	651.19	96.52331	92.76686	100.4906	204850277	204849566	204851058	1492.68	711.06	781.62	409650276.7	409649565.7	409651058.4
3-27	488.99	646.99	504.1	702.36	493.19	651.19	508.3	706.56	57.39468	52.32014	62.62157	204844254	204843697	204844881	1184.064	556.752	627.312	409644254.1	409643697.4	409644881.5
3-28	504.1	702.36	511.6	845.18	508.3	706.56	515.8	849.38	143.0168	138.6593	147.4848	204861414	204860186	204862712	2525.376	1227.408	1297.968	409661413.8	409660186.4	409662711.8
3-29	511.6	845.18	592.64	76.25	515.8	849.38	596.84	80.45	773.1887	776.9391	769.4659	205438781	205444594	205433038	11556.55	5813.556	5742.996	410238780.8	410244594.4	410233037.8
3-30	592.64	76.25	657.29	217.42	596.84	80.45	661.49	221.62	155.2694	149.7163	160.8501	204865069	204863375	204866833	3457.776	1693.608	1764.168	409665068.6	409663375	409666832.8
3-31	657.29	217.42	602.59	366.63	661.49	221.62	606.79	370.83	158.9205	156.5155	161.5081	204866216	204865457	204867045	1587.768	758.604	829.164	409666215.7	409665457.1	409667044.9
3-32	602.59	366.63	589.81	539.41	606.79	370.83	594.01	543.61	173.252	169.433	177.1879	204870976	204869668	204872356	2688	1308.72	1379.28	409670976.3	409669667.5	409672355.5
3-33	589.81	539.41	659.01	609.75	594.01	543.61	663.21	613.95	98.67297	92.73349	104.6125	204850696	204849559	204851904	2344.272	1136.856	1207.416	409650696.4	409649559.5	409651903.8
3-34	659.01	609.75	601.11	711.01	663.21	613.95	605.31	715.21	116.6447	115.2261	118.3448	204854566	204854237	204854966	728.448	328.944	399.504	409654566	409654237.1	409654965.5
3-35	601.11	711.01	614.55	924.8	605.31	715.21	618.75	929	214.212	209.7936	218.7026	204886847	204884973	204888791	3817.464	1873.452	1944.012	409686846.8	409684973.3	409688790.8
3-36	614.55	924.8	774.74	90.9	618.75	929	778.94	95.1	849.1467	852.4931	845.8287	205562010	205567704	205556386	11318.33	5694.444	5623.884	410362010	410367704.5	410356386.2
3-37	774.74	90.9	800.46	214.04	778.94	95.1	804.66	218.24	125.7974	120.8711	130.8078	204856785	204855570	204858071	2500.848	1215.144	1285.704	409656785	409655569.8	409658070.7
3-38	800.46	214.04	783.04	381.35	804.66	218.24	787.24	385.55	168.2144	164.5366	172.0187	204869256	204868032	204870550	2518.152	1223.796	1294.356	409669256.1	409668032.3	409670550.4
3-39	783.04	381.35	765.18	459.67	787.24	385.55	769.38	463.87	80.33058	77.33316	83.64297	204847413	204846940	204847956	1015.728	472.584	543.144	409647413	409646940.4	409647956.1
3-40	765.18	459.67	755.41	689.12	769.38	463.87	759.61	693.32	229.6579	225.6828	233.7164	204893703	204891893	204895583	3690.624	1810.032	1880.592	409693702.8	409691892.7	409695583.3
3-41	755.41	689.12	771.64	721.49	759.61	693.32	775.84	725.69	36.21091	30.63119	41.88973	204842271	204841898	204842715	816.48	372.96	443.52	409642271.2	409641898.3	409642714.7
3-42	771.64	721.49	709.69	867.57	775.84	725.69	713.89	871.77	158.6732	156.5431	160.9942	204866137	204865466	204866879	1413.384	671.412	741.972	409666137.2	409665465.8	409666879.1
3-43	709.69	867.57	893.75	69	713.89	871.77	897.95	73.2	819.5072	822.672	816.3734	205512552	205517749	205507426	10323.77	5197.164	5126.604	410312552.1	410317749.3	410307425.5
3-44	893.75	69	937.41	255.66	897.95	73.2	941.61	259.86	191.6981	186.6782	196.7692	204877708	204875809	204879678	3869.376	1899.408	1969.968	409677708.2	409675808.7	409679678.1
3-45	937.41	255.66	922.26	360.53	941.61	259.86	926.46	364.73	105.9587	102.5128	109.6183	204852187	204851469	204852976	1507.296	718.368	788.928	409652187.2	409651468.9	409652976.2
3-46	922.26	360.53	914.8	464.42	926.46	364.73	919	468.62	104.1575	100.3696	108.1391	204851809	204851034	204852654	1620.024	774.732	845.292	409651808.8	409651034.1	409652654.1
3-47	914.8	464.42	938.77	576.37	919	468.62	942.97	580.57	114.4874	109.5487	119.5172	204854067	204852961	204855244	2283.456	1106.448	1177.008	409654067.4	409652960.9	409655244.4
3-48	938.77	576.37	876.14	826.24	942.97	580.57	880.34	830.44	257.5996	254.5977	260.7022	204907318	204905780	204908926	3145.632	1537.536	1608.096	409707317.5	409705780	409708925.6
3-49	876.14	826.24	939.64	889.69	880.34	830.44	943.84	893.89	89.76721	83.82752	95.70691	204849018	204847987	204850120	2132.76	1031.1	1101.66	409649018.2	409647987.1	409650119.8
4-1	-2.1	-2.1	97.63	101.48	2.1	2.1	101.83	105.68	143.7877	137.8491	149.7263	204861635	204859962	204863378	3415.608	1672.524	1743.084	409661634.9	409659962.4	409663378
4-2	97.63	101.48	75.68	271.17	101.83	105.68	79.88	275.37	171.1038	167.5433	174.7936	204870236	204869031	204871513	2482.032	1205.736	1276.296	409670236.5	409669030.8	409671512.8
4-3	75.68	271.17	42.98	303.18	79.88	275.37	47.18	307.38	45.75948	46.20613	46.08052	204843054	204843095	204843083	11.592	41.076	29.484	409643053.9	409643095	409643083.4
4-4	42.98	303.18	9.9	493.88	47.18	307.38	14.1	498.08	193.5479	190.1895	197.0281	204878421	204877132	204879780	2648.016	1288.728	1359.288	409678420.8	409677132	409679780.1
4-5	9.9	493.88	68.97	633.57	14.1	498.08	73.17	637.77	151.666	146.1789	157.186	204863963	204862328	204865667	3339.168	1634.304	1704.864	409663962.6	409662328.3	409665667.4
4-6	68.97	633.57	105.72	821.36	73.17	637.77	109.92	825.56	191.3522	186.4532	196.3086	204877576	204875725	204879497	3772.272	1850.856	1921.416	409677575.6	409675724.8	409679497.1
4-7	105.72	821.36	91.23	961.26	109.92	825.56	95.43	965.46	140.6484	136.981	144.4669	204860742	204859724	204861831	2106.888	1018.164	1088.724	409660742	409659723.8	409661830.7
4-8	91.23	961.26	147.42	51.11	95.43	965.46	151.62	55.31	911.8829	915.8269	907.9605	205672490	205679699	205665352	14346.53	7208.544	7137.984	410472490.3	410479698.9	410465352.4
4-9	147.42	51.11	191.77	227.03	151.62	55.31	195.97	231.23	181.4243	176.3513	186.5484	204873875	204872060	204875760	3700.536	1814.988	1885.548	409673874.8	409672059.8	409675760.3
4-10	191.77	227.03	226.47	402.34	195.97	231.23	230.67	406.54	178.7112	173.807	183.6765	204872898	204871169	204874697	3528.168	1728.804	1799.364	409672897.7	409671168.9	409674697.1
4-11	226.47	402.34	178.79	418	230.67	406.54	182.99	422.2	50.18583	53.13065	47.80094	204843479	204843783	204843245	537.936	304.248	233.688	409643478.6	409643782.9	409643244.9
4-12	178.79	418	224.75	688.67	182.99	422.2	228.95	692.87	274.5443	269.7224	279.4093	204916335	204913710	204919030	5319.384	2624.412	2694.972	409716334.6	409713710.2	409719029.5
4-13	224.75	688.67	167.87	731.88	228.95	692.87	172.07	736.08	71.43136	72.47445	70.87235	204846062	204846213	204845983	229.656	150.108	79.548	409646062.4	409646212.5	409645982.9
4-14	167.87	731.88	181.42	850.95	172.07	736.08	185.62	855.15	119.8385	115.2499	124.5414	204855321	204854243	204856471	2228.016	1078.728	1149.288	409655321.3	409654242.5	409656470.6
4-15	181.42	850.95	314.56	70.05	185.62	855.15	318.76	74.25	792.1686	795.6177	788.7491	205468491	205473968	205463085	10882.37	5476.464	5405.904	410268491.1	410273967.5	410263085.2
4-16	314.56	70.05	322.52	142.15	318.76	74.25	326.72	146.35	72.53807	68.00403	77.2629	204846222	204845585	204846930	1345.008	637.224	707.784	409646221.8	409645584.5	409646929.6
4-17	322.52	142.15	357.81	317.54	326.72	146.35	362.01	321.74	178.9051	173.9902	183.8805	204872967	204871233	204874772	3539.424	1734.432	1804.992	409672967	409671232.6	409674772
4-18	357.81	317.54	315.39	470.97	362.01	321.74	319.59	475.17	159.1861	156.3426	162.1974	204866300	204865403	204867268	1864.968	897.204	967.764	409666300.2	409665403	409667268
4-19	315.39	470.97	385.68	663.79	319.59	475.17	389.88	667.99	205.2322	199.8634	210.6315	204883080	204880905	204885326	4420.248	2174.844	2245.404	409683080.2	409680905.4	409685325.6
4-20	385.68	663.79	296.73	790.9	389.88	667.99	300.93	795.1	155.142	154.2199	156.2846	204865029	204864744	204865385	641.088	285.264	355.824	409665029.1	409664743.8	409665384.9
4-21	296.73	790.9	369.22	959.68	300.93	795.1	373.42	963.88	183.6886	178.1856	189.218	204874701	204872710	204876763	4053.336	1991.388	2061.948	409674701.5	409672710.1	409676763.4
4-22	369.22	959.68	489.31	73.65	373.42	963.88	493.51	77.85	894.1313	897.7416	890.546	205640431	205646900	205634032	12867.79	6469.176	6398.616	410440430.8	410446899.9	410434032.2
4-23	489.31	73.65	453.93	178.89	493.51	77.85	458.13	183.09	111.0279	108.5157	113.795	204853287	204852736	204853909	1173.648	551.544	622.104	409653287.2	409652735.7	409653909.3
4-24	453.93	178.89	497.44	337.72	458.13	183.09	501.64	341.92	164.6818	159.5485	169.8677	204868080	204866416	204869815	3399.312	1664.376	1734.936	409668080.1	409666415.7	409669815
4-25	497.44	337.72	526.74	476.53	501.64	341.92	530.94	480.73	141.8686	136.9301	146.8813	204861087	204859710	204862534	2824.248	1376.844	1447.404	409661086.7	409659709.9	409662534.1
4-26	526.74	476.53	454.41	564.33	530.94	480.73	458.61	568.53	113.7562	113.3393	114.4801	204853900	204853806	204854066	259.896	94.668	165.228	409653900.5	409653805.8	409654065.7
4-27	454.41	564.33	506.66	776.39	458.61	568.53	510.86	780.59	218.4022	213.3415	223.5061	204888660	204886475	204890915	4440.408	2184.924	2255.484	409688659.5	409686474.6	409690915

4-28	506.66	776.39	520.48	958.16	510.86	780.59	524.68	962.36	182.2946	177.8304	186.841	204874191	204872584	204875870	3285.912	1607.676	1678.236	409674191.3	409672583.6	409675869.6
4-29	520.48	958.16	628.9	44.97	524.68	962.36	633.1	49.17	919.6036	923.291	915.94	205686631	205693426	205679906	13520.14	6795.348	6724.788	410486630.9	410493426.2	410479906.1
4-30	628.9	44.97	587.88	171	633.1	49.17	592.08	175.2	132.5375	129.9515	135.335	204858526	204857847	204859276	1428.168	678.804	749.364	409658526.2	409657847.4	409659275.6
4-31	587.88	171	602.04	302.28	592.08	175.2	606.24	306.48	132.0414	127.4697	136.7184	204858395	204857209	204859652	2443.392	1186.416	1256.976	409658394.9	409657208.5	409659651.9
4-32	602.04	302.28	678.09	556.75	606.24	306.48	682.29	560.95	265.591	260.3795	270.8325	204911499	204908757	204914310	5552.736	2741.088	2811.648	409711498.6	409708757.5	409714310.2
4-33	678.09	556.75	631.67	581.16	682.29	560.95	635.87	585.36	52.44678	54.50531	51.00059	204843711	204843931	204843561	369.768	220.164	149.604	409643710.7	409643930.8	409643561.1
4-34	631.67	581.16	644.38	754.09	635.87	585.36	648.58	758.29	173.3965	168.9445	177.9353	204871026	204869502	204872621	3118.752	1524.096	1594.656	409671026.3	409669502.2	409672621
4-35	644.38	754.09	679.6	956.99	648.58	758.29	683.8	961.19	205.9341	201.1068	210.8183	204883369	204881404	204885404	4000.416	1964.928	2035.488	409683368.9	409681403.9	409685404.3
4-36	679.6	956.99	802.14	62.29	683.8	961.19	806.34	66.49	903.0527	906.6563	899.4739	205656464	205662986	205650013	12972.29	6521.424	6450.864	410456464.1	410462985.6	410450013.3
4-37	802.14	62.29	804.56	168.76	806.34	66.49	808.76	172.96	106.4975	102.2855	110.8678	204852302	204851422	204853252	1829.352	879.396	949.956	409652301.7	409651422.3	409653251.7
4-38	804.56	168.76	756.99	315.21	808.76	172.96	761.19	319.41	153.9822	151.3777	156.7686	204864671	204863875	204865536	1661.184	795.312	865.872	409664670.5	409663875.2	409665536.4
4-39	756.99	315.21	740.59	514.61	761.19	319.41	744.79	518.81	200.0733	196.284	203.9652	204880989	204879487	204882562	3074.4	1501.92	1572.48	409680989.3	409679487.4	409682561.8
4-40	740.59	514.61	739.76	569.52	744.79	518.81	743.96	573.72	54.91627	50.95886	59.20599	204843976	204843557	204844465	908.544	418.992	489.552	409643975.8	409643556.8	409644465.3
4-41	739.76	569.52	782.76	780.37	743.96	573.72	786.96	784.57	215.19	210.2609	220.1689	204887267	204885170	204889434	4264.68	2097.06	2167.62	409687266.7	409685169.7	409689434.3
4-42	782.76	780.37	790.96	901.02	786.96	784.57	795.16	905.22	120.9283	116.5187	125.4643	204855584	204854537	204856701	2164.68	1047.06	1117.62	409655583.7	409654536.6	409656701.3
4-43	790.96	901.02	943.54	101.24	795.16	905.22	947.74	105.44	814.2043	817.5576	810.8807	205503889	205509360	205498488	10872.96	5471.76	5401.2	410303888.7	410309360.5	410298487.5
4-44	943.54	101.24	964.02	234.85	947.74	105.44	968.22	239.05	135.1705	130.43	140.0025	204859231	204857972	204860561	2588.712	1259.076	1329.636	409659231.1	409657972	409660560.7
4-45	964.02	234.85	891.11	361.02	968.22	239.05	895.31	365.22	145.7214	144.3005	147.3682	204862195	204861783	204862677	894.768	412.104	482.664	409662194.7	409661782.6	409662677.4
4-46	891.11	361.02	918.77	476.24	895.31	365.22	922.97	480.44	118.4936	113.4716	123.5969	204855001	204853836	204856236	2400.384	1164.912	1235.472	409655000.7	409653835.8	409656236.2
4-47	918.77	476.24	857.99	576.79	922.97	480.44	862.19	580.99	117.4926	116.2141	119.054	204854765	204854466	204855134	668.136	298.788	369.348	409654764.5	409654465.7	409655133.9
4-48	857.99	576.79	954.52	703.92	862.19	580.99	958.72	708.12	159.6248	153.742	165.5116	204866440	204864597	204868354	3757.488	1843.464	1914.024	409666440.1	409664596.6	409668354.1
4-49	954.52	703.92	911.54	861.7	958.72	708.12	915.74	865.9	163.5292	160.6635	166.5575	204867702	204866773	204868701	1928.64	929.04	999.6	409667701.8	409666772.8	409668701.4
5-1	-2.1	-2.1	2.64	66.1	2.1	2.1	6.84	70.3	68.36452	64.00228	72.94987	204845634	204845056	204846282	1225.392	577.416	647.976	409645633.7	409645056.3	409646281.7
5-2	2.64	66.1	78.04	198.37	6.84	70.3	82.24	202.57	152.2515	146.5311	157.988	204864141	204862431	204865920	3488.856	1709.148	1779.708	409664140.5	409662431.4	409665920.2
5-3	78.04	198.37	86.93	411.36	82.24	202.57	91.13	415.56	213.1754	208.8427	217.5841	204886404	204884575	204888303	3727.584	1828.512	1899.072	409686403.8	409684575.3	409688302.8
5-4	86.93	411.36	133.27	513.44	91.13	415.56	137.47	517.64	112.1059	106.5658	117.6849	204853528	204852316	204854810	2493.456	1211.448	1282.008	409653527.7	409652316.3	409654809.7
5-5	133.27	513.44	23.43	563.67	137.47	517.64	27.63	567.87	120.7803	122.9792	118.8378	204855548	204856084	204855082	1001.448	536.004	465.444	409655547.9	409656083.9	409655082.4
5-6	23.43	563.67	24.87	767.94	27.63	567.87	29.07	772.14	204.2751	200.089	208.5463	204882688	204880996	204884452	3455.928	1692.684	1763.244	409682688.3	409680995.6	409684451.6
5-7	24.87	767.94	76.15	892.07	29.07	772.14	80.35	896.27	134.3052	128.8399	139.8092	204858998	204857560	204860507	2946.888	1438.164	1508.724	409658997.9	409657559.7	409660506.6
5-8	76.15	892.07	239.24	103.72	80.35	896.27	243.44	107.92	805.0429	808.3202	801.7962	205489054	205494342	205483837	10504.37	5287.464	5216.904	410289054.1	410294341.5	410283837.2
5-9	239.24	103.72	227.15	271.03	243.44	107.92	231.35	275.23	167.7462	163.9214	171.6914	204869099	204867830	204870438	2607.696	1268.568	1339.128	409669098.8	409667830.2	409670437.9
5-10	227.15	271.03	171.11	327.43	231.35	275.23	175.31	331.63	79.50749	79.71008	79.74801	204847281	204847314	204847320	6.048	32.256	38.304	409647281.4	409647313.7	409647319.7
5-11	171.11	327.43	260.5	436.83	175.31	331.63	264.7	441.03	141.2761	135.3676	147.1871	204860919	204859284	204862624	3339.672	1634.556	1705.116	409660918.9	409659284.4	409662624
5-12	260.5	436.83	174.65	598.01	264.7	441.03	178.85	602.21	182.6177	180.9744	184.4377	204874309	204873712	204874977	1265.544	597.492	668.052	409674309.2	409673711.7	409674977.3
5-13	174.65	598.01	155.27	751.65	178.85	602.21	159.47	755.85	154.8575	151.2889	158.5683	204864941	204863848	204866104	2255.568	1092.504	1163.064	409664940.8	409663848.3	409666103.9
5-14	155.27	751.65	226.02	960.59	159.47	755.85	230.22	964.79	220.5935	215.2844	225.934	204889621	204887307	204892006	4698.792	2314.116	2384.676	409689621.5	409687307.4	409692006.2
5-15	226.02	960.59	354.08	118.72	230.22	964.79	358.28	122.92	851.5541	855.0882	848.047	205566104	205572136	205560144	11992.01	6031.284	5960.724	410366104.5	410372135.7	410360143.7
5-16	354.08	118.72	353.93	158.83	358.28	122.92	358.13	163.03	40.11028	36.17251	44.4947	204842569	204842268	204842940	671.328	300.384	370.944	409642568.8	409642268.5	409642939.8
5-17	353.93	158.83	295.57	330.98	358.13	163.03	299.77	335.18	181.7732	179.2232	184.4793	204874002	204873081	204874993	1911.672	920.556	991.116	409674001.5	409673081	409674992.6
5-18	295.57	330.98	384.49	528.38	299.77	335.18	388.69	532.58	216.5029	210.959	222.0673	204887834	204885464	204890274	4810.176	2369.808	2440.368	409687833.5	409685463.7	409690273.9
5-19	384.49	528.38	294.5	684.61	388.69	532.58	298.7	688.81	180.2942	178.8432	181.9278	204873466	204872945	204874058	1112.832	521.136	591.696	409673466	409672944.9	409674057.7
5-20	294.5	684.61	391.2	781.31	298.7	688.81	395.4	785.51	136.7545	130.8148	142.6941	204859662	204858073	204861322	3249.12	1589.28	1659.84	409659661.8	409658072.5	409661321.6
5-21	391.2	781.31	314.75	872.46	395.4	785.51	318.95	876.66	118.9661	118.5948	119.6315	204855113	204855025	204855272	246.96	88.2	158.76	409655112.9	409655024.7	409655271.7
5-22	314.75	872.46	489.83	105.03	318.95	876.66	494.03	109.23	787.1479	790.3245	784.0034	205460562	205465573	205455621	9951.48	5011.02	4940.46	410260561.8	410265572.8	410255621.4
5-23	489.83	105.03	533.35	229.03	494.03	109.23	537.55	233.23	131.4153	126.0877	136.7934	204858230	204856858	204859672	2814.336	1371.888	1442.448	409658230	409656858.1	409659672.4
5-24	533.35	229.03	517.44	381.21	537.55	233.23	521.64	385.41	153.0094	149.3402	156.8178	204864372	204863262	204865552	2289.336	1109.388	1179.948	409664371.9	409663262.5	409665551.8
5-25	517.44	381.21	529.6	433.66	521.64	385.41	533.8	437.86	53.84114	48.90219	58.96501	204843859	204843351	204844437	1085.448	507.444	578.004	409643858.9	409643351.4	409644436.9
5-26	529.6	433.66	441.05	695.6	533.8	437.86	445.25	699.8	276.5026	273.9206	279.1871	204917414	204915992	204918905	2912.952	1421.196	1491.756	409717413.7	409715992.5	409718905.4
5-27	441.05	695.6	516.2	825.95	445.25	699.8	520.4	830.15	150.4614	144.7333	156.2054	204863599	204861908	204865360	3452.4	1690.92	1761.48	409663598.6	409661907.7	409665360.1
5-28	516.2	825.95	531.89	865.28	520.4	830.15	536.09	869.48	42.34413	36.96129	47.85889	204842753	204842326	204843250	924.336	426.888	497.448	409642753	409642326.1	409643250.5
5-29	531.89	865.28	629.01	133.16	536.09	869.48	633.21	137.36	738.5337	742.1599	734.9376	205386392	205391761	205381093	10668	5369.28	5298.72	410186392	410191761.3	410181093.3
5-30	629.01	133.16	658.51	254.04	633.21	137.36	662.71	258.24	124.4276	119.3914	129.5403	204856442	204855214	204857741	2526.384	1227.912	1298.472	409656442.2	409655214.3	409657740.7
5-31	658.51	254.04	644.65	288.58	662.71	258.24	648.85	292.78	37.21708	35.30834	39.92622	204842345	204842207	204842554	347.424	138.432	208.992	409642345.1	409642206.7	409642554.1
5-32	644.65	288.58	561.65	511.81	648.85	292.78	565.85	516.01	238.1609	235.7498	240.6945	204897681	204896538	204898894	2355.864	1142.652	1213.212	409697680.6	409696538	409698893.8
5-33	561.65	511.81	666.76	615.92	565.85	516.01	670.96	620.12	147.9426	142.0029	153.8822	204862847	204861125	204864640	3514.896	1722.168	1792.728	409662847	409661124.8	409664639.7
5-34	666.76	615.92	566.25	836	670.96	620.12	570.45	840.2	241.9452	239.9341	244.0843	204899497	204898528	204900537	2008.776	969.108	1039.668	409699497.5	409698528.4	409700537.1
5-35	566.25	836	681.87	895.86	570.45	840.2	686.07	900.06	130.1968	124.549	135.8695	204857911	204856472	204859421	2948.064	1438.752	1509.312	409657911.2	409656472.5	409659420.5
5-36	681.87	895.86	809.21	25.22	686.07	900.06	813.41	29.42	879.9031	883.4639	876.3681	205615189	205621468	205608981	12487.44	6279	6208.44	410415189.5	410421468.5	410408981
5-37	809.21	25.22	729.11	145.22	813.41	29.42	733.31	149.42	144.2775	143.2345	145.5557	204861776	204861476	204862146	670.32	299.88	370.44	409661776	409661476.1	409662146.5
5-38	729.11	145.22	792.1	350.48	733.31	149.42	796.3	354.68	214.7077	209.4788	219.9727	204887059	204884841	204889348	4506.6	2218.02	2288.58	409687059.4	409684841.4	409689348

5-39	792.1	350.48	726.81	556.67	796.3	354.68	731.01	560.87	216.2801	213.609	219.0798	204887737	204886589	204888956	2367.12	1148.28	1218.84	409687737.1	409686588.8	409688955.9
5-40	726.81	556.67	736.15	686.48	731.01	560.87	740.35	690.68	130.1456	125.7151	134.6923	204857898	204856764	204859102	2337.72	1133.58	1204.14	409657897.9	409656764.3	409659102
5-41	736.15	686.48	741.3	795.01	740.35	690.68	745.5	799.21	108.6521	104.3343	113.1171	204852765	204851846	204853755	1909.824	919.632	990.192	409652765.3	409651845.7	409653755.5
5-42	741.3	795.01	700.48	898.5	745.5	799.21	704.68	902.7	111.2495	109.0197	113.746	204853336	204852845	204853898	1052.856	491.148	561.708	409653336.5	409652845.3	409653898.2
5-43	700.48	898.5	879.15	95.29	704.68	902.7	883.35	99.49	822.8422	826.0452	819.6697	205518029	205523311	205512818	10492.27	5281.416	5210.856	410318029.3	410323310.7	410312818.4
5-44	879.15	95.29	846.29	275.98	883.35	99.49	850.49	280.18	183.6536	180.339	187.0981	204874689	204873482	204875966	2483.544	1206.492	1277.052	409674688.7	409673482.2	409675965.7
5-45	846.29	275.98	873.17	311.47	850.49	280.18	877.37	315.67	44.5205	38.64514	50.41094	204842942	204842453	204843501	1047.816	488.628	559.188	409642942.1	409642453.4	409643501.3
5-46	873.17	311.47	883.14	441.24	877.37	315.67	887.34	445.44	130.1524	125.7025	134.7173	204857900	204856761	204859109	2347.632	1138.536	1209.096	409657899.7	409656761.1	409659108.7
5-47	883.14	441.24	944.91	639.16	887.34	445.44	949.11	643.36	207.3351	202.0934	212.6136	204883948	204881802	204886165	4362.792	2146.116	2216.676	409683947.9	409681801.7	409686164.5
5-48	944.91	639.16	869.43	819.47	949.11	643.36	873.63	823.67	195.471	193.2968	197.7998	204879169	204878324	204880085	1761.144	845.292	915.852	409679168.9	409678323.6	409680084.8
5-49	869.43	819.47	946.09	896.26	873.63	823.67	950.29	900.46	108.5056	102.5659	114.4453	204852733	204851480	204854058	2577.96	1253.7	1324.26	409652733.5	409651479.8	409654057.7
															848969	**418425.9**	**430717.5**			

Table 4: Energy saving (E_S) calculations applying S-pattern Deployment Strategy and Area Wise Clustering Process

		dmin(d=42mm or 4.2cm)				dmax(d=42mm or 4.2cm)														
INO-CL NO.	(x1-d/2)	(y1-d/2)	(x2-d/2)	(y2-d/2)	(x1+d/2)	(y1+d/2)	(x2+d/2)	(y2+d/2)	dis(zero)	dxy(min)	dxy(max)	E_tx0	E_tx(min)	E_tx(max)	max Eng	min Eng	AvgEng	total0	totalxy(min)	totalxy(max)
1-1	-2.1	-2.1	65.28	68.03	2.1	2.1	69.48	72.23	97.2537	91.31526	103.1923	50418.28	49298.48	51608.65	2310.168	1119.804	1190.364	50418.28	49298.48	51608.65
1-2	65.28	68.03	68.28	208.3	69.48	72.23	72.48	212.5	140.3021	136.0753	144.6493	60644.67	59476.48	61883.42	2406.936	1168.188	1238.748	60644.67	59476.48	61883.42
1-3	68.28	208.3	73.42	348.04	72.48	212.5	77.62	352.24	139.8345	135.5433	144.2427	60513.69	59331.98	61765.96	2433.984	1181.712	1252.272	60513.69	59331.98	61765.96
1-4	73.42	348.04	96.92	488.73	77.62	352.24	101.12	492.93	142.6391	137.8478	147.5141	61305.93	59962.01	62720.4	2758.392	1343.916	1414.476	61305.93	59962.01	62720.4
1-5	96.92	488.73	89.81	628.26	101.12	492.93	94.01	632.46	139.711	135.8018	143.7595	60479.17	59402.13	61626.78	2224.656	1077.048	1147.608	60479.17	59402.13	61626.78
1-6	89.81	628.26	83.93	768.45	94.01	632.46	88.13	772.65	140.3133	136.3631	144.3998	60647.81	59554.89	61811.29	2256.408	1092.924	1163.484	60647.81	59554.89	61811.29
1-7	83.93	768.45	34.85	908.48	88.13	772.65	39.05	912.68	148.3821	145.906	151.0513	62977.25	62248.55	63776.51	1527.96	728.7	799.26	62977.25	62248.55	63776.51
1-8	34.85	908.48	215.44	68.65	39.05	912.68	219.64	72.85	859.0269	862.2645	855.8182	778887.2	784460.1	773384.8	11075.23	5572.896	5502.336	778887.2	784460.1	773384.8
1-9	215.44	68.65	188.95	208.48	219.64	72.85	193.15	212.68	142.3171	139.0589	145.7446	61214.15	60297.37	62201.49	1904.112	916.776	987.336	61214.15	60297.37	62201.49
1-10	188.95	208.48	190.93	348.65	193.15	212.68	195.13	352.85	140.184	135.9881	144.5022	60611.55	59452.77	61840.89	2388.12	1158.78	1229.34	60611.55	59452.77	61840.89
1-11	190.93	348.65	210.24	487.91	195.13	352.85	214.44	492.11	140.5924	135.9026	145.3736	60726.22	59429.52	62093.49	2663.976	1296.708	1367.268	60726.22	59429.52	62093.49
1-12	210.24	487.91	212.45	628.13	214.44	492.11	216.65	632.33	140.2374	136.0346	144.5622	60626.53	59465.4	61858.22	2392.824	1161.132	1231.692	60626.53	59465.4	61858.22
1-13	212.45	628.13	189.03	768.52	216.65	632.33	193.23	772.72	142.3301	138.9625	145.8618	61217.85	60270.58	62235.68	1965.096	947.268	1017.828	61217.85	60270.58	62235.68
1-14	189.03	768.52	175.03	908.36	193.23	772.72	179.23	912.56	140.5391	136.8556	144.373	60711.23	59689.45	61803.56	2114.112	1021.776	1092.336	60711.23	59689.45	61803.56
1-15	175.03	908.36	342.97	68.55	179.23	912.56	347.17	72.75	856.4372	859.7463	853.1566	774444.7	780123.7	768836.3	11287.42	5678.988	5608.428	774444.7	780123.7	768836.3
1-16	342.97	68.55	322.61	208.3	347.17	72.75	326.81	212.5	141.2253	137.757	144.8542	60904.59	59937	61942.75	2005.752	967.596	1038.156	60904.59	59937	61942.75
1-17	322.61	208.3	366.29	348.78	326.81	212.5	370.49	352.98	147.1141	141.8834	152.3968	62602.57	61090.91	64184.8	3093.888	1511.664	1582.224	62602.57	61090.91	64184.8
1-18	366.29	348.78	350.87	488.58	370.49	352.98	355.07	492.78	140.6478	137.0121	144.4365	60741.82	59732.3	61821.89	2089.584	1009.512	1080.072	60741.82	59732.3	61821.89
1-19	350.87	488.58	326.85	628.51	355.07	492.78	331.05	632.71	141.9766	138.6326	145.4864	61117.37	60179	62126.29	1947.288	938.364	1008.924	61117.37	60179	62126.29
1-20	326.85	628.51	324.74	768.58	331.05	632.71	328.94	772.78	140.0859	136.0164	144.2851	60584.06	59460.47	61778.2	2317.728	1123.584	1194.144	60584.06	59460.47	61778.2
1-21	324.74	768.58	297.27	907.99	328.94	772.78	301.47	912.19	142.0906	138.8695	145.4831	61149.75	60244.73	62125.33	1880.592	905.016	975.576	61149.75	60244.73	62125.33
1-22	297.27	907.99	499.05	68.71	301.47	912.19	503.25	72.91	863.1953	866.3119	860.1083	786066.1	791456.4	780746.4	10710	5390.28	5319.72	786066.1	791456.4	780746.4
1-23	499.05	68.71	486.83	208.24	503.25	72.91	491.03	212.44	140.0641	136.3225	143.9536	60577.95	59543.83	61682.63	2138.808	1034.124	1104.684	60577.95	59543.83	61682.63
1-24	486.83	208.24	483.81	348.56	491.03	212.44	488.01	352.76	140.3525	136.3113	144.5248	60658.82	59540.78	61847.42	2306.64	1118.04	1188.6	60658.82	59540.78	61847.42
1-25	483.81	348.56	511.25	488.31	488.01	352.76	515.45	492.51	142.4185	137.5278	147.3862	61243.02	59873.9	62682.69	2808.792	1369.116	1439.676	61243.02	59873.9	62682.69
1-26	511.25	488.31	460.9	628.36	515.45	492.51	465.1	632.56	148.8258	146.393	151.4526	63109.13	62390.93	63897.89	1506.96	718.2	788.76	63109.13	62390.93	63897.89
1-27	460.9	628.36	490.01	768.47	465.1	632.56	494.21	772.67	143.1021	138.1739	148.1045	61438.2	60052.04	62894.93	2842.896	1386.168	1456.728	61438.2	60052.04	62894.93
1-28	490.01	768.47	483.42	908.79	494.21	772.67	487.62	912.99	140.4747	136.547	144.5398	60693.13	59605.08	61851.74	2246.664	1088.052	1158.612	60693.13	59605.08	61851.74
1-29	483.42	908.79	636.31	67.96	487.62	912.99	640.51	72.16	854.6171	858.0119	851.2503	771330.4	777144.4	765587	11557.39	5813.976	5743.416	771330.4	777144.4	765587
1-30	636.31	67.96	648.55	208.78	640.51	72.16	652.75	212.98	141.3509	136.8564	145.9489	60940.09	59689.67	62261.07	2571.408	1250.424	1320.984	60940.09	59689.67	62261.07
1-31	648.55	208.78	639.6	348.39	652.75	212.98	643.8	352.59	139.8966	136.047	143.8884	60531.05	59468.79	61663.88	2195.088	1062.264	1132.824	60531.05	59468.79	61663.88
1-32	639.6	348.39	622.27	488.64	643.8	352.59	626.47	492.84	141.3166	137.743	145.0455	60930.39	59933.14	61998.2	2065.056	997.248	1067.808	60930.39	59933.14	61998.2
1-33	622.27	488.64	643.26	627.95	626.47	492.84	647.46	632.15	140.8824	136.1492	145.704	60807.86	59496.62	62189.66	2693.04	1311.24	1381.8	60807.86	59496.62	62189.66
1-34	643.26	627.95	668.26	768.21	647.46	632.15	672.46	772.41	142.4706	137.6407	147.3816	61257.87	59904.96	62681.33	2776.368	1352.904	1423.464	61257.87	59904.96	62681.33
1-35	668.26	768.21	627.62	907.92	672.46	772.41	631.82	912.12	145.5008	142.7361	148.4519	62130.49	61333.59	62997.96	1664.376	796.908	867.468	62130.49	61333.59	62997.96
1-36	627.62	907.92	786.64	68.37	631.82	912.12	790.84	72.57	854.4774	857.8364	851.1465	771091.6	776843.3	765410.4	11432.9	5751.732	5681.172	771091.6	776843.3	765410.4
1-37	786.64	68.37	754.28	208.44	790.84	72.57	758.48	212.64	143.7594	140.7028	146.9926	61626.77	60757.29	62566.82	1809.528	869.484	940.044	61626.77	60757.29	62566.82
1-38	754.28	208.44	762.36	348.65	758.48	212.64	766.56	352.85	140.4426	136.0653	144.9312	60684.13	59473.77	61965.05	2491.272	1210.356	1280.916	60684.13	59473.77	61965.05
1-39	762.36	348.65	744.58	488.02	766.56	352.85	748.78	492.22	140.4996	136.9454	144.2108	60700.13	59714.05	61756.76	2042.712	986.076	1056.636	60700.13	59714.05	61756.76
1-40	744.58	488.02	787.09	628.69	748.78	492.22	791.29	632.89	146.9529	141.7453	152.2141	62555.15	61051.72	64129.14	3077.424	1503.432	1573.992	62555.15	61051.72	64129.14
1-41	787.09	628.69	751.75	768.68	791.29	632.89	755.95	772.88	144.3818	141.4296	147.5143	61806.12	60962.34	62720.46	1758.12	843.78	914.34	61806.12	60962.34	62720.46
1-42	751.75	768.68	767.48	908.68	755.95	772.88	771.68	912.88	140.8809	136.2886	145.5708	60807.43	59534.58	62150.84	2616.264	1272.852	1343.412	60807.43	59534.58	62150.84
1-43	767.48	908.68	882.95	68.65	771.68	912.88	887.15	72.85	847.9291	851.5312	844.3534	759943.7	766065.3	753892.7	12172.61	6121.584	6051.024	759943.7	766065.3	753892.7
1-44	882.95	68.65	901.02	208.78	887.15	72.85	905.22	212.98	141.2903	136.6358	146.038	60922.94	59629.34	62287.1	2657.76	1293.6	1364.16	60922.94	59629.34	62287.1
1-45	901.02	208.78	886.16	348.71	905.22	212.98	890.36	352.91	140.7168	137.0617	144.5237	60761.22	59745.92	61847.09	2101.176	1015.308	1085.868	60761.22	59745.92	61847.09
1-46	886.16	348.71	899.04	488.08	890.36	352.91	903.24	492.28	139.9639	135.4484	144.5824	60549.89	59306.27	61864.07	2557.8	1243.62	1314.18	60549.89	59306.27	61864.07
1-47	899.04	488.08	897.17	628.34	903.24	492.28	901.37	632.54	140.2725	136.1953	144.4788	60636.36	59509.17	61834.12	2324.952	1127.196	1197.756	60636.36	59509.17	61834.12
1-48	897.17	628.34	895.15	768.77	901.37	632.54	899.35	772.97	140.4445	136.3719	144.6464	60684.67	59557.3	61882.59	2325.288	1127.364	1197.924	60684.67	59557.3	61882.59
1-49	895.15	768.77	900.24	908.06	899.35	772.97	904.44	912.26	139.383	135.0929	143.7904	60387.61	59210.1	61635.68	2425.584	1177.512	1248.072	60387.61	59210.1	61635.68
2-1	-2.1	-2.1	69.34	68.02	2.1	2.1	73.54	72.22	100.1024	94.16297	106.0418	50980.49	49826.66	52204.87	2378.208	1153.824	1224.384	50980.49	49826.66	52204.87
2-2	69.34	68.02	55.94	208.11	73.54	72.22	60.14	212.31	140.7294	137.025	144.583	60764.77	59735.85	61864.24	2128.392	1028.916	1099.476	60764.77	59735.85	61864.24
2-3	55.94	208.11	98.38	348.42	60.14	212.31	102.58	352.62	146.588	141.3797	151.85	62448.05	60948.23	64018.43	3070.2	1499.82	1570.38	62448.05	60948.23	64018.43
2-4	98.38	348.42	51.46	487.97	102.58	352.62	55.66	492.17	147.2267	144.682	149.9635	62635.69	61892.88	63449.06	1556.184	742.812	813.372	62635.69	61892.88	63449.06
2-5	51.46	487.97	86.01	628.02	55.66	492.17	90.21	632.22	144.2488	139.1989	149.3641	61767.71	60336.35	63269.63	2933.28	1431.36	1501.92	61767.71	60336.35	63269.63
2-6	86.01	628.02	84.71	768.89	90.21	632.22	88.91	773.09	140.876	136.7806	145.099	60806.05	59668.94	62013.71	2344.776	1137.108	1207.668	60806.05	59668.94	62013.71
2-7	84.71	768.89	31.14	908.27	88.91	773.09	35.34	912.47	149.3202	147.0068	151.8309	63256.53	62571.01	64012.61	1441.608	685.524	756.084	63256.53	62571.01	64012.61
2-8	31.14	908.27	213.69	68.5	35.34	912.47	217.89	72.7	859.3824	862.6089	856.185	779498.2	785054.1	774012.8	11041.3	5555.928	5485.368	779498.2	785054.1	774012.8
2-9	213.69	68.5	174.01	208.74	217.89	72.7	178.21	212.94	145.7455	142.9417	148.7338	62201.76	61392.34	63081.74	1689.408	809.424	879.984	62201.76	61392.34	63081.74
2-10	174.01	208.74	198.99	348.18	178.21	212.94	203.19	352.38	141.6599	136.8271	146.5739	61027.51	59681.67	62443.92	2762.256	1345.848	1416.408	61027.51	59681.67	62443.92

2-11	198.99	348.18	243.29	488.66	203.19	352.38	247.49	492.86	147.2994	142.0572	152.5928	62657.12	61140.25	64244.55	3104.304	1516.872	1587.432	62657.12	61140.25	64244.55
2-12	243.29	488.66	182.53	628.67	247.49	492.86	186.73	632.87	152.6256	150.5462	154.905	64254.58	63624.16	64955.56	1331.4	630.42	700.98	64254.58	63624.16	64955.56
2-13	182.53	628.67	171.48	768.12	186.73	632.87	175.68	772.32	139.8871	136.107	143.8132	60528.41	59485.13	61642.25	2157.12	1043.28	1113.84	60528.41	59485.13	61642.25
2-14	171.48	768.12	174.42	908.54	175.68	772.32	178.62	912.74	140.4508	136.2258	144.7961	60686.42	59517.48	61925.92	2408.448	1168.944	1239.504	60686.42	59517.48	61925.92
2-15	174.42	908.54	317.74	68.09	178.62	912.74	321.94	72.29	852.5824	856.0304	849.1621	767856.8	773748	762036.2	11711.78	5891.172	5820.612	767856.8	773748	762036.2
2-16	317.74	68.09	319.57	208.02	321.94	72.29	323.77	212.22	139.942	135.7507	144.2561	60543.75	59388.25	61769.82	2381.568	1155.504	1226.064	60543.75	59388.25	61769.82
2-17	319.57	208.02	371.63	348	323.77	212.22	375.83	352.2	149.3474	143.968	154.7678	63264.64	61686.79	64913.06	3226.272	1577.856	1648.416	63264.64	61686.79	64913.06
2-18	371.63	348	347.91	488.66	375.83	352.2	352.11	492.86	142.646	139.287	146.1693	61307.87	60360.86	62325.45	1964.592	947.016	1017.576	61307.87	60360.86	62325.45
2-19	347.91	488.66	353.28	628.47	352.11	492.86	357.48	632.67	139.9131	135.615	144.3276	60535.67	59351.44	61790.47	2439.024	1184.232	1254.792	60535.67	59351.44	61790.47
2-20	353.28	628.47	324.68	768.55	357.48	632.67	328.88	772.75	142.9698	139.7827	146.3287	61400.37	60499.21	62372.08	1872.864	901.152	971.712	61400.37	60499.21	62372.08
2-21	324.68	768.55	292.36	908.62	328.88	772.75	296.56	912.82	143.7504	140.6925	146.9849	61624.19	60754.37	62564.57	1810.2	869.82	940.38	61624.19	60754.37	62564.57
2-22	292.36	908.62	505.33	68.41	296.56	912.82	509.53	72.61	866.7809	869.8351	863.7566	792269.1	797573.2	787035.5	10537.63	5304.096	5233.536	792269.1	797573.2	787035.5
2-23	505.33	68.41	496.47	208.2	509.53	72.61	500.67	212.4	140.0705	136.2175	144.0654	60579.74	59515.21	61714.84	2199.624	1064.532	1135.092	60579.74	59515.21	61714.84
2-24	496.47	208.2	494.96	348.56	500.67	212.4	499.16	352.76	140.3681	136.2797	144.585	60663.21	59532.15	61864.83	2332.68	1131.06	1201.62	60663.21	59532.15	61864.83
2-25	494.96	348.56	477.66	488.56	499.16	352.76	481.86	492.76	141.0648	137.4914	144.7938	60859.29	59863.89	61925.25	2061.36	995.4	1065.96	60859.29	59863.89	61925.25
2-26	477.66	488.56	498.41	628.86	481.86	492.76	502.61	633.06	141.8261	137.1026	146.6382	61074.65	59757.11	62462.75	2705.64	1317.54	1388.1	61074.65	59757.11	62462.75
2-27	498.41	628.86	477.24	768.04	502.61	633.06	481.44	772.24	140.7808	137.3435	144.3808	60779.24	59823.24	61805.81	1982.568	956.004	1026.564	60779.24	59823.24	61805.81
2-28	477.24	768.04	496.46	908.08	481.44	772.24	500.66	912.28	141.3528	136.6679	146.129	60940.61	59638.11	62313.67	2675.568	1302.504	1373.064	60940.61	59638.11	62313.67
2-29	496.46	908.08	647.58	68.89	500.66	912.28	651.78	73.09	852.6882	856.0912	849.313	768037.1	773852.2	762292.6	11559.58	5815.068	5744.508	768037.1	773852.2	762292.6
2-30	647.58	68.89	677.69	208.46	651.78	73.09	681.89	212.66	142.7809	137.8273	147.8073	61346.4	59956.37	62806.99	2850.624	1390.032	1460.592	61346.4	59956.37	62806.99
2-31	677.69	208.46	644.94	348.17	681.89	212.66	649.14	352.37	143.4972	140.4573	146.7147	61551.45	60688.26	62485.19	1796.928	863.184	933.744	61551.45	60688.26	62485.19
2-32	644.94	348.17	646.18	488.81	649.14	352.37	650.38	493.01	140.6455	136.4721	144.9421	60741.15	59584.64	61968.22	2383.584	1156.512	1227.072	60741.15	59584.64	61968.22
2-33	646.18	488.81	685.68	628.77	650.38	493.01	689.88	632.97	145.4271	140.2743	150.638	62109.05	60636.87	63651.8	3014.928	1472.184	1542.744	62109.05	60636.87	63651.8
2-34	685.68	628.77	673.84	768.22	689.88	632.97	678.04	772.42	139.9517	136.1978	143.853	60546.49	59509.84	61653.69	2143.848	1036.644	1107.204	60546.49	59509.84	61653.69
2-35	673.84	768.22	628.52	908.01	678.04	772.42	632.72	912.21	146.9529	144.3498	149.7464	62555.15	61796.88	63383.97	1587.096	758.268	828.828	62555.15	61796.88	63383.97
2-36	628.52	908.01	790.49	68.78	632.72	912.21	794.69	72.98	854.7171	858.0592	851.4033	771501.3	777225.5	765847.6	11377.97	5724.264	5653.704	771501.3	777225.5	765847.6
2-37	790.49	68.78	782.43	208.61	794.69	72.98	786.63	212.81	140.0621	136.183	144.0817	60577.39	59505.8	61719.54	2213.736	1071.588	1142.148	60577.39	59505.8	61719.54
2-38	782.43	208.61	744.1	348.8	786.63	212.81	748.3	353	145.3356	142.4854	148.3689	62082.43	61262.08	62973.33	1711.248	820.344	890.904	62082.43	61262.08	62973.33
2-39	744.1	348.8	804.78	488.12	748.3	353	808.98	492.32	151.9609	146.4493	157.5037	64052.12	62407.4	65767.4	3360	1644.72	1715.28	64052.12	62407.4	65767.4
2-40	804.78	488.12	780.18	628.22	808.98	492.32	784.38	632.42	142.2433	138.9181	145.7349	61193.17	60258.25	62198.65	1940.4	934.92	1005.48	61193.17	60258.25	62198.65
2-41	780.18	628.22	751.2	768.67	784.38	632.42	755.4	772.87	143.4087	140.2319	146.7572	61526.04	60624.97	62497.67	1872.696	901.068	971.628	61526.04	60624.97	62497.67
2-42	751.2	768.67	799.8	908.09	755.4	772.87	804	912.29	147.6479	142.3229	153.0181	62759.9	61215.81	64374.54	3158.736	1544.088	1614.648	62759.9	61215.81	64374.54
2-43	799.8	908.09	881.7	68.39	804	912.29	885.9	72.59	843.6846	847.4695	839.9247	752763.7	759164.5	746433.5	12731.04	6400.8	6330.24	752763.7	759164.5	746433.5
2-44	881.7	68.39	908.58	208.45	885.9	72.59	912.78	212.65	142.6161	137.7401	147.57	61299.34	59932.32	62736.91	2804.592	1367.016	1437.576	61299.34	59932.32	62736.91
2-45	908.58	208.45	938.78	348.35	912.78	212.65	942.98	352.55	143.1225	138.1683	148.1491	61444.05	60050.49	62908.17	2857.68	1393.56	1464.12	61444.05	60050.49	62908.17
2-46	938.78	348.35	891.03	488.12	942.98	352.55	895.23	492.32	147.7014	145.1827	150.4126	62775.72	62038.03	63583.96	1545.936	737.688	808.248	62775.72	62038.03	63583.96
2-47	891.03	488.12	894.28	628.51	895.23	492.32	898.48	632.71	140.4276	136.1933	144.7818	60679.91	59508.62	61921.77	2413.152	1171.296	1241.856	60679.91	59508.62	61921.77
2-48	894.28	628.51	892.76	767.92	898.48	632.71	896.96	772.12	139.4183	135.3309	143.635	60397.46	59274.46	61591.01	2316.552	1122.996	1193.556	60397.46	59274.46	61591.01
2-49	892.76	767.92	909.63	908.12	896.96	772.12	913.83	912.32	141.2113	136.5889	145.9291	60900.64	59616.53	62255.3	2638.776	1284.108	1354.668	60900.64	59616.53	62255.3
3-1	-2.1	-2.1	73.84	68.23	2.1	2.1	78.04	72.43	103.5046	97.56949	109.4401	51673.19	50479.8	52937.14	2457.336	1193.388	1263.948	51673.19	50479.8	52937.14
3-2	73.84	68.23	54.66	208.35	78.04	72.43	58.86	212.55	141.4266	137.9162	145.0954	60961.49	59980.87	62012.66	2031.792	980.616	1051.176	60961.49	59980.87	62012.66
3-3	54.66	208.35	102.51	348.87	58.86	212.55	106.71	353.07	148.4436	143.1379	153.7956	62995.49	61448.46	64613.08	3164.616	1547.028	1617.588	62995.49	61448.46	64613.08
3-4	102.51	348.87	50.45	488.05	106.71	353.07	54.65	492.25	148.5978	146.2354	151.1569	63041.32	62344.79	63808.4	1463.616	696.528	767.088	63041.32	62344.79	63808.4
3-5	50.45	488.05	105.56	628.72	54.65	492.25	109.76	632.92	151.08	145.6568	156.5407	63785.16	62175.89	65464.99	3289.104	1609.272	1679.832	63785.16	62175.89	65464.99
3-6	105.56	628.72	93.09	768.08	109.76	632.92	97.29	772.28	139.9168	136.1841	143.798	60536.71	59506.11	61637.87	2131.752	1030.596	1101.156	60536.71	59506.11	61637.87
3-7	93.09	768.08	30.07	908.38	97.29	772.28	34.27	912.58	153.8038	151.7951	156.013	64615.61	64001.74	65300.04	1298.304	613.872	684.432	64615.61	64001.74	65300.04
3-8	30.07	908.38	242.13	68.18	34.27	912.58	246.33	72.38	866.548	869.6075	863.5186	791865.5	797177.1	786624.4	10552.75	5311.656	5241.096	791865.5	797177.1	786624.4
3-9	242.13	68.18	196.58	208.78	246.33	72.38	200.78	212.98	147.7943	145.1896	150.5884	62803.16	62040.02	63636.86	1596.84	763.14	833.7	62803.16	62040.02	63636.86
3-10	196.58	208.78	202.9	348.73	200.78	212.98	207.1	352.93	140.0926	135.7666	144.5334	60585.94	59392.56	61849.89	2457.336	1193.388	1263.948	60585.94	59392.56	61849.89
3-11	202.9	348.73	246.56	488.18	207.1	352.93	250.76	492.38	146.1249	140.8888	151.413	62312.5	60809.65	63885.9	3076.248	1502.844	1573.404	62312.5	60809.65	63885.9
3-12	246.56	488.18	247.76	628.07	250.76	492.38	251.96	632.27	139.8951	135.7232	144.1912	60530.65	59380.78	61751.09	2370.312	1149.876	1220.436	60530.65	59380.78	61751.09
3-13	247.76	628.07	200.58	768.43	251.96	632.27	204.78	772.63	148.0773	145.5316	150.814	62886.88	62139.45	63704.87	1565.424	747.432	817.992	62886.88	62139.45	63704.87
3-14	200.58	768.43	173.32	908.74	204.78	772.63	177.52	912.94	142.9336	139.6985	146.3383	61390	60475.66	62374.9	1899.24	914.34	984.9	61390	60475.66	62374.9
3-15	173.32	908.74	383.45	68.04	177.52	912.94	387.65	72.24	866.5628	869.6339	863.5216	791891.1	797223.2	786629.6	10593.58	5332.068	5261.508	791891.1	797223.2	786629.6
3-16	383.45	68.04	307.45	207.93	387.65	72.24	311.65	212.13	159.2018	157.6192	160.9881	66305.21	65803.82	66877.17	1073.352	501.396	571.956	66305.21	65803.82	66877.17
3-17	307.45	207.93	342.51	348.57	311.65	212.13	346.71	352.77	144.9442	139.8864	150.0666	61968.81	60528.21	63479.97	2951.76	1440.6	1511.16	61968.81	60528.21	63479.97
3-18	342.51	348.57	357.25	488.11	346.71	352.77	361.45	492.31	140.3164	135.7498	144.9825	60648.68	59388.01	61979.91	2591.904	1260.672	1331.232	60648.68	59388.01	61979.91
3-19	357.25	488.11	325.23	627.94	361.45	492.31	329.43	632.14	143.4493	140.383	146.6922	61537.71	60667.39	62478.59	1811.208	870.324	940.884	61537.71	60667.39	62478.59
3-20	325.23	627.94	320.72	768.72	329.43	632.14	324.92	772.92	140.8522	136.8574	144.9803	60799.35	59689.96	61979.3	2289.336	1109.388	1179.948	60799.35	59689.96	61979.3
3-21	320.72	768.72	323.34	908.79	324.92	772.92	327.54	912.99	140.0945	135.8792	144.4311	60586.47	59423.15	61820.35	2397.192	1163.316	1233.876	60586.47	59423.15	61820.35
3-22	323.34	908.79	487.01	68.39	327.54	912.99	491.21	72.59	856.1892	859.523	852.8838	774020	779739.8	768370.8	11369.06	5719.812	5649.252	774020	779739.8	768370.8
3-23	487.01	68.39	472.57	208.41	491.21	72.59	476.77	212.61	140.7626	137.0931	144.5831	60774.11	59754.52	61864.27	2109.744	1019.592	1090.152	60774.11	59754.52	61864.27
3-24	472.57	208.41	519.71	348.62	476.77	212.61	523.91	352.82	147.9224	142.6274	153.2646	62841.02	61302.56	64450.04	3147.48	1538.46	1609.02	62841.02	61302.56	64450.04
3-25	519.71	348.62	516.49	488.29	523.91	352.82	520.69	492.49	139.7071	135.6731	143.8733	60478.08	59367.18	61659.54	2292.36	1110.9	1181.46	60478.08	59367.18	61659.54
3-26	516.49	488.29	433.55	628.74	520.69	492.49	437.75	632.94	163.1111	161.7326	164.6925	67565.25	67117.44	68083.61	966.168	447.804	518.364	67565.25	67117.44	68083.61
3-27	433.55	628.74	473.75	768.29	437.75	632.94	477.95	772.49	145.2248	140.0558	150.4507	62050.24	60575.62	63595.42	3019.8	1474.62	1545.18	62050.24	60575.62	63595.42
3-28	473.75	768.29	497.77	908.84	477.95	772.49	501.97	913.04	142.5877	137.783	147.4752	61291.26	59944.15	62708.93	2764.776	1347.108	1417.668	61291.26	59944.15	62708.93

3-29	497.77	908.84	653.74	68.72	501.97	913.04	657.94	72.92	854.4754	857.8522	851.1267	771088.3	776870.4	765376.7	11493.72	5782.14	5711.58	771088.3	776870.4	765376.7
3-30	653.74	68.72	608.33	208.42	657.94	72.92	612.53	212.62	146.8951	144.2962	149.6846	62538.16	61781.4	63365.47	1584.072	756.756	827.316	62538.16	61781.4	63365.47
3-31	608.33	208.42	646.94	348.34	612.53	212.62	651.14	352.54	145.1494	140.0142	150.3438	62028.34	60563.97	63563.27	2999.304	1464.372	1534.932	62028.34	60563.97	63563.27
3-32	646.94	348.34	648.62	488.04	651.14	352.54	652.82	492.24	139.7101	135.5234	144.0201	60478.91	59326.6	61701.78	2375.184	1152.312	1222.872	60478.91	59326.6	61701.78
3-33	648.62	488.04	634.36	628.02	652.82	492.24	638.56	632.22	140.7045	137.0291	144.5305	60757.75	59736.98	61849.08	2112.096	1020.768	1091.328	60757.75	59736.98	61849.08
3-34	634.36	628.02	683.18	767.95	638.56	632.22	687.38	772.15	148.2019	142.8761	153.5727	62923.8	61373.58	64544.58	3171	1550.22	1620.78	62923.8	61373.58	64544.58
3-35	683.18	767.95	629.93	908.42	687.38	772.15	634.13	912.62	150.2244	147.8851	152.759	63527.38	62830.02	64295.31	1465.296	697.368	767.928	63527.38	62830.02	64295.31
3-36	629.93	908.42	773.18	68.79	634.13	912.62	777.38	72.99	851.7623	855.2099	848.3424	766459.1	772344	760644.8	11699.18	5884.872	5814.312	766459.1	772344	760644.8
3-37	773.18	68.79	738.23	208.12	777.38	72.99	742.43	212.32	143.6466	140.687	146.787	61594.35	60752.84	62506.42	1753.584	841.512	912.072	61594.35	60752.84	62506.42
3-38	738.23	208.12	727.71	348.52	742.43	212.32	731.91	352.72	140.7936	136.9931	144.738	60782.83	59727.12	61909.1	2181.984	1055.712	1126.272	60782.83	59727.12	61909.1
3-39	727.71	348.52	739.83	488.03	731.91	352.72	744.03	492.23	140.0355	135.5416	144.6337	60569.93	59331.52	61878.91	2547.384	1238.412	1308.972	60569.93	59331.52	61878.91
3-40	739.83	488.03	801.77	628.65	744.03	492.23	805.97	632.85	153.6572	148.1362	159.2085	64570.55	62904.32	66307.33	3403.008	1666.224	1736.784	64570.55	62904.32	66307.33
3-41	801.77	628.65	743.48	768.17	805.97	632.85	747.68	772.37	151.207	149.052	153.5616	63823.55	63176.5	64541.17	1364.664	647.052	717.612	63823.55	63176.5	64541.17
3-42	743.48	768.17	752.08	908.86	747.68	772.37	756.28	913.06	140.9526	136.5609	145.4543	60827.64	59608.88	62116.95	2508.072	1218.756	1289.316	60827.64	59608.88	62116.95
3-43	752.08	908.86	864.04	68.63	756.28	913.06	868.24	72.83	847.6565	851.278	844.0612	759481.5	765634.2	753399.3	12234.94	6152.748	6082.188	759481.5	765634.2	753399.3
3-44	864.04	68.63	896.96	208.44	868.24	72.83	901.16	212.64	143.6334	138.6179	148.7171	61590.56	60174.91	63076.77	2901.864	1415.652	1486.212	61590.56	60174.91	63076.77
3-45	896.96	208.44	950.79	348.81	901.16	212.64	954.99	353.01	150.3376	144.9324	155.7818	63561.41	61965.41	65227.97	3262.56	1596	1666.56	63561.41	61965.41	65227.97
3-46	950.79	348.81	916.88	488.21	954.99	353.01	921.08	492.41	143.4651	140.4685	146.6412	61542.25	60691.41	62463.64	1772.232	850.836	921.396	61542.25	60691.41	62463.64
3-47	916.88	488.21	892.85	628.44	921.08	492.41	897.05	632.64	142.274	138.9284	145.785	61201.89	60261.09	62213.25	1952.16	940.8	1011.36	61201.89	60261.09	62213.25
3-48	892.85	628.44	901.89	768.68	897.05	632.64	906.09	772.88	140.5311	136.1261	145.0455	60708.98	59490.31	61998.21	2507.904	1218.672	1289.232	60708.98	59490.31	61998.21
3-49	901.89	768.68	917.32	907.97	906.09	772.88	921.52	912.17	140.142	135.556	144.8265	60599.79	59335.42	61934.72	2599.296	1264.368	1334.928	60599.79	59335.42	61934.72
4-1	-2.1	-2.1	95.37	68.02	2.1	2.1	99.57	72.22	120.0717	114.2136	125.9375	55377.22	54004.74	56820.25	2815.512	1372.476	1443.036	55377.22	54004.74	56820.25
4-2	95.37	68.02	84.3	208.18	99.57	72.22	88.5	212.38	140.5965	136.8148	144.5234	60727.37	59678.29	61847.01	2168.712	1049.076	1119.636	60727.37	59678.29	61847.01
4-3	84.3	208.18	63.99	348.69	88.5	212.38	68.19	352.89	141.9703	138.4961	145.604	61115.56	60141.16	62160.52	2019.36	974.4	1044.96	61115.56	60141.16	62160.52
4-4	63.99	348.69	101.22	488.57	68.19	352.89	105.42	492.77	144.7497	139.6426	149.9183	61912.49	60460.04	63435.49	2975.448	1452.444	1523.004	61912.49	60460.04	63435.49
4-5	101.22	488.57	110.64	628.59	105.42	492.77	114.84	632.79	140.3365	135.9203	144.8617	60654.34	59434.32	61944.91	2510.592	1220.016	1290.576	60654.34	59434.32	61944.91
4-6	110.64	628.59	63.11	768.25	114.84	632.79	67.31	772.45	147.5263	145.0014	150.2438	62724.02	61985.4	63533.19	1547.784	738.612	809.172	62724.02	61985.4	63533.19
4-7	63.11	768.25	66.85	908.2	67.31	772.45	71.05	912.4	140	135.7508	144.3685	60559.99	59388.27	61802.27	2413.992	1171.716	1242.276	60559.99	59388.27	61802.27
4-8	66.85	908.2	194.35	68.04	71.05	912.4	198.55	72.24	849.7794	853.3151	846.2706	763085.1	769106.7	757134	11972.69	6021.624	5951.064	763085.1	769106.7	757134
4-9	194.35	68.04	203.29	208.21	198.55	72.24	207.49	212.41	140.4548	136.0526	144.9667	60687.55	59470.31	61975.36	2505.048	1217.244	1287.804	60687.55	59470.31	61975.36
4-10	203.29	208.21	165.27	348.31	207.49	212.41	169.47	352.51	145.1672	142.3072	148.2103	62033.53	61211.34	62926.28	1714.944	822.192	892.752	62033.53	61211.34	62926.28
4-11	165.27	348.31	177.93	488.81	169.47	352.51	182.13	493.01	141.0692	136.5623	145.6789	60860.53	59609.26	62182.35	2573.088	1251.264	1321.824	60860.53	59609.26	62182.35
4-12	177.93	488.81	168.91	628.48	182.13	493.01	173.11	632.68	139.961	136.1135	143.9507	60549.07	59486.89	61681.81	2194.92	1062.18	1132.74	60549.07	59486.89	61681.81
4-13	168.91	628.48	163.09	767.98	173.11	632.68	167.29	772.18	139.6214	135.6705	143.7091	60454.12	59366.49	61612.31	2245.824	1087.632	1158.192	60454.12	59366.49	61612.31
4-14	163.09	767.98	164	908.62	167.29	772.18	168.2	912.82	140.6429	136.4797	144.9301	60740.44	59586.7	61964.74	2378.04	1153.74	1224.3	60740.44	59586.7	61964.74
4-15	164	908.62	315.59	68	168.2	912.82	319.79	72.2	854.1789	857.5807	850.8049	770581.5	776404.6	764828.9	11575.7	5823.132	5752.572	770581.5	776404.6	764828.9
4-16	315.59	68	368.45	208.32	319.79	72.2	372.65	212.52	149.9463	144.556	155.3766	63443.88	61856.45	65101.87	3245.424	1587.432	1657.992	63443.88	61856.45	65101.87
4-17	368.45	208.32	373.25	348.53	372.65	212.52	377.45	352.73	140.2921	136.0113	144.6902	60641.88	59459.08	61895.25	2436.168	1182.804	1253.364	60641.88	59459.08	61895.25
4-18	373.25	348.53	359.79	488.47	377.45	352.73	363.99	492.67	140.5858	136.884	144.4371	60724.38	59697.22	61822.09	2124.864	1027.152	1097.712	60724.38	59697.22	61822.09
4-19	359.79	488.47	365.7	628.56	363.99	492.67	369.9	632.76	140.2146	135.9008	144.6438	60620.14	59429.02	61881.82	2452.8	1191.12	1261.68	60620.14	59429.02	61881.82
4-20	365.7	628.56	318.11	768.28	369.9	632.76	322.31	772.48	147.6025	145.0789	150.3185	62746.49	62007.87	63555.66	1547.784	738.612	809.172	62746.49	62007.87	63555.66
4-21	318.11	768.28	278.32	907.99	322.31	772.48	282.52	912.19	145.2657	142.4713	148.2455	62062.13	61258.08	62936.74	1678.656	804.048	874.608	62062.13	61258.08	62936.74
4-22	278.32	907.99	512.59	68.49	282.52	912.19	516.79	72.69	871.5748	874.5067	868.6737	800602.7	805721.9	795554	10167.86	5119.212	5048.652	800602.7	805721.9	795554
4-23	512.59	68.49	508.3	208.29	516.79	72.69	512.5	212.49	139.8658	135.8655	144	60522.44	59419.44	61696.01	2276.568	1103.004	1173.564	60522.44	59419.44	61696.01
4-24	508.3	208.29	457.91	348.89	512.5	212.49	462.11	353.09	149.357	146.9184	151.9887	63267.51	62545.03	64060.56	1515.528	722.484	793.044	63267.51	62545.03	64060.56
4-25	457.91	348.89	471.27	488.79	462.11	353.09	475.47	492.99	140.5365	136.0088	145.166	60710.5	59458.4	62033.16	2574.768	1252.104	1322.664	60710.5	59458.4	62033.16
4-26	471.27	488.79	513.59	628.25	475.47	492.99	517.79	632.45	145.7397	140.529	151.0043	62200.07	60708.4	63762.31	3053.904	1491.672	1562.232	62200.07	60708.4	63762.31
4-27	513.59	628.25	516.8	768.1	517.79	632.45	521	772.3	139.8868	135.6536	144.2405	60528.33	59361.9	61765.31	2403.408	1166.424	1236.984	60528.33	59361.9	61765.31
4-28	516.8	768.1	431.95	907.93	521	772.3	436.15	912.13	163.5602	162.251	165.0729	67711.95	67285.4	68209.06	923.664	426.552	497.112	67711.95	67285.4	68209.06
4-29	431.95	907.93	618.8	68.69	436.15	912.13	623	72.89	859.7888	862.9902	856.6165	780196.7	785712.1	774751.9	10960.15	5515.356	5444.796	780196.7	785712.1	774751.9
4-30	618.8	68.69	682.38	208.58	623	72.89	686.58	212.78	153.6608	148.114	159.2359	64571.63	62897.76	66316.06	3418.296	1673.868	1744.428	64571.63	62897.76	66316.06
4-31	682.38	208.58	652.76	348.06	686.58	212.78	656.96	352.26	142.5904	139.4434	145.9113	61292.01	60404.47	62250.12	1845.648	887.544	958.104	61292.01	60404.47	62250.12
4-32	652.76	348.06	655.22	487.94	656.96	352.26	659.42	492.14	139.9016	135.6912	144.2338	60532.47	59372.09	61763.4	2391.312	1160.376	1230.936	60532.47	59372.09	61763.4
4-33	655.22	487.94	633.38	628.86	659.42	492.14	637.58	633.06	142.6024	139.1777	146.1882	61295.43	60330.44	62330.98	2000.544	964.992	1035.552	61295.43	60330.44	62330.98
4-34	633.38	628.86	686.66	768	637.58	633.06	690.86	772.2	148.9923	143.5885	154.4354	63158.7	61577.65	64810.31	3232.656	1581.048	1651.608	63158.7	61577.65	64810.31
4-35	686.66	768	609.82	908.85	690.86	772.2	614.02	913.05	160.4466	158.8732	162.2223	66703.11	66200.7	67276.07	1075.368	502.404	572.964	66703.11	66200.7	67276.07
4-36	609.82	908.85	792.12	68.57	614.02	913.05	796.32	72.77	859.8278	863.0562	856.6283	780263.8	785826.1	774772	11054.06	5562.312	5491.752	780263.8	785826.1	774772
4-37	792.12	68.57	785.54	208.09	796.32	72.77	789.74	212.29	139.6751	135.7487	143.7397	60469.13	59387.71	61621.1	2233.392	1081.416	1151.976	60469.13	59387.71	61621.1
4-38	785.54	208.09	719.38	348.78	789.74	212.29	723.58	352.98	155.4697	153.558	157.5822	65130.82	64540.05	65792.15	1252.104	590.772	661.332	65130.82	64540.05	65792.15
4-39	719.38	348.78	818.14	488.9	723.58	352.98	822.34	493.1	171.4268	165.5773	177.2823	70347.15	68375.84	72389.02	4013.184	1971.312	2041.872	70347.15	68375.84	72389.02
4-40	818.14	488.9	808.13	628.82	822.34	493.1	812.33	633.02	140.2776	136.4619	144.2371	60637.81	59581.84	61764.33	2182.488	1055.964	1126.524	60637.81	59581.84	61764.33
4-41	808.13	628.82	737.9	768.84	812.33	633.02	742.1	773.04	156.6456	154.877	158.6171	65497.85	64946.9	66119.37	1172.472	550.956	621.516	65497.85	64946.9	66119.37
4-42	737.9	768.84	804.59	908.86	742.1	773.04	808.79	913.06	155.0908	149.5061	160.701	65013.16	63312.07	66784.8	3472.728	1701.084	1771.644	65013.16	63312.07	66784.8
4-43	804.59	908.86	857.21	68.61	808.79	913.06	861.41	72.81	841.896	845.837	837.9786	749748.9	756400.3	743168.1	13232.18	6651.372	6580.812	749748.9	756400.3	743168.1
4-44	857.21	68.61	886.53	208.26	861.41	72.81	890.73	212.46	142.6947	137.7596	147.7038	61321.78	59937.72	62776.41	2838.696	1384.068	1454.628	61321.78	59937.72	62776.41
4-45	886.53	208.26	864.61	348.78	890.73	212.46	868.81	352.98	142.2194	138.7998	145.8008	61186.36	60225.4	62217.88	1992.48	960.96	1031.52	61186.36	60225.4	62217.88
4-46	864.61	348.78	875.9	487.97	868.81	352.98	880.1	492.17	139.6471	135.1761	144.2242	60461.32	59232.57	61760.63	2528.064	1228.752	1299.312	60461.32	59232.57	61760.63

4-47	875.9	487.97	889.77	628.58	880.1	492.17	893.97	632.78	141.2924	136.7523	145.9331	60923.55	59661.2	62256.46	2595.264	1262.352	1332.912	60923.55	59661.2	62256.46
4-48	889.77	628.58	883.32	768.79	893.97	632.78	887.52	772.99	140.3583	136.4263	144.4275	60660.45	59572.14	61819.31	2247.168	1088.304	1158.864	60660.45	59572.14	61819.31
4-49	883.32	768.79	878.58	908.65	887.52	772.99	882.78	912.85	139.9403	135.9543	144.061	60543.29	59443.56	61713.58	2270.016	1099.728	1170.288	60543.29	59443.56	61713.58
5-1	-2.1	-2.1	20.86	67.97	2.1	2.1	25.06	72.17	73.73579	68.48938	79.08033	46396.97	45650.79	47213.7	1562.904	746.172	816.732	46396.97	45650.79	47213.7
5-2	20.86	67.97	27.45	208.45	25.06	72.17	31.65	212.65	140.6345	136.301	145.0818	60738.06	59537.95	62008.73	2470.776	1200.108	1270.668	60738.06	59537.95	62008.73
5-3	27.45	208.45	111.77	348.7	31.65	212.65	115.97	352.9	163.6457	157.8886	169.4154	67739.92	65888.82	69661.59	3772.776	1851.108	1921.668	67739.92	65888.82	69661.59
5-4	111.77	348.7	102.62	488.63	115.97	352.9	106.82	492.83	140.2288	136.385	144.215	60624.13	59560.86	61757.96	2197.104	1063.272	1133.832	60624.13	59560.86	61757.96
5-5	102.62	488.63	75.49	628.8	106.82	492.83	79.69	633	142.7714	139.5328	146.1796	61343.67	60429.41	62328.48	1899.072	914.256	984.816	61343.67	60429.41	62328.48
5-6	75.49	628.8	97.22	768.43	79.69	633	101.42	772.63	141.3108	136.5598	146.1487	60928.73	59608.59	62319.43	2710.848	1320.144	1390.704	60928.73	59608.59	62319.43
5-7	97.22	768.43	25.39	908.81	101.42	772.63	29.59	913.01	157.6899	155.9665	159.6158	65826.09	65285.55	66437.19	1151.64	540.54	611.1	65826.09	65285.55	66437.19
5-8	25.39	908.81	165.05	67.98	29.59	913.01	169.25	72.18	852.3497	855.8184	848.9084	767460	773385.1	761605.5	11779.66	5925.108	5854.548	767460	773385.1	761605.5
5-9	165.05	67.98	155.74	208.24	169.25	72.18	159.94	212.44	140.5686	136.7291	144.5504	60719.54	59654.84	61854.8	2199.96	1064.7	1135.26	60719.54	59654.84	61854.8
5-10	155.74	208.24	210.57	348.83	159.94	212.44	214.77	353.03	150.9035	145.4841	156.3608	63731.88	62125.63	65408.69	3283.056	1606.248	1676.808	63731.88	62125.63	65408.69
5-11	210.57	348.83	255.97	488.38	214.77	353.03	260.17	492.58	146.7493	141.4817	152.0665	62495.36	60977.06	64084.22	3107.16	1518.3	1588.86	62495.36	60977.06	64084.22
5-12	255.97	488.38	156.86	627.97	260.17	492.58	161.06	632.17	171.1963	170.3039	172.2889	70268.16	69963.41	70643.47	680.064	304.752	375.312	70268.16	69963.41	70643.47
5-13	156.86	627.97	225.32	768.51	161.06	632.17	229.52	772.71	156.3274	150.7247	161.9541	65398.26	63677.94	67189.14	3511.2	1720.32	1790.88	65398.26	63677.94	67189.14
5-14	225.32	768.51	161.29	908.71	229.52	772.71	165.49	912.91	154.1294	152.1556	156.3042	64715.88	64111.33	65390.99	1279.656	604.548	675.108	64715.88	64111.33	65390.99
5-15	161.29	908.71	315.17	68.44	165.49	912.91	319.37	72.64	854.244	857.6326	850.8833	770692.7	776493.7	764962.3	11531.35	5800.956	5730.396	770692.7	776493.7	764962.3
5-16	315.17	68.44	305.13	208.14	319.37	72.64	309.33	212.34	140.0603	136.2462	144.0185	60576.89	59523.03	61701.32	2178.288	1053.864	1124.424	60576.89	59523.03	61701.32
5-17	305.13	208.14	376.28	348.69	309.33	212.34	380.48	352.89	157.5329	151.9	163.1876	65776.63	64033.63	67590.19	3556.56	1743	1813.56	65776.63	64033.63	67590.19
5-18	376.28	348.69	333.47	487.97	380.48	352.89	337.67	492.17	145.7107	143.0264	148.5841	62191.61	61416.55	63037.24	1620.696	775.068	845.628	62191.61	61416.55	63037.24
5-19	333.47	487.97	308.2	628.01	337.67	492.17	312.4	632.21	142.3017	139	145.7708	61209.77	60280.99	62209.12	1928.136	928.788	999.348	61209.77	60280.99	62209.12
5-20	308.2	628.01	360.32	768.86	312.4	632.21	364.52	773.06	150.1839	144.8087	155.6003	63515.22	61929.55	65171.44	3241.896	1585.668	1656.228	63515.22	61929.55	65171.44
5-21	360.32	768.86	327.49	908.61	364.52	773.06	331.69	912.81	143.5544	140.517	146.7695	61567.87	60705.02	62501.28	1796.256	862.848	933.408	61567.87	60705.02	62501.28
5-22	327.49	908.61	516.14	68.89	331.69	912.81	520.34	73.09	860.65	863.8419	857.4875	781678.5	787182.8	776244.8	10937.98	5504.268	5433.708	781678.5	787182.8	776244.8
5-23	516.14	68.89	457.4	208.74	520.34	73.09	461.6	212.94	151.6852	149.5405	154.0293	63968.41	63322.37	64685.01	1362.648	646.044	716.604	63968.41	63322.37	64685.01
5-24	457.4	208.74	456.76	348.24	461.6	212.94	460.96	352.44	139.5015	135.3865	143.7441	60420.66	59289.52	61622.36	2332.848	1131.144	1201.704	60420.66	59289.52	61622.36
5-25	456.76	348.24	467.65	488.54	460.96	352.44	471.85	492.74	140.722	136.2643	145.2858	60762.68	59527.97	62067.96	2539.992	1234.716	1305.276	60762.68	59527.97	62067.96
5-26	467.65	488.54	423.05	628.15	471.85	492.74	427.25	632.35	146.561	143.9351	149.377	62440.11	61677.31	63273.48	1596.168	762.804	833.364	62440.11	61677.31	63273.48
5-27	423.05	628.15	468.36	767.99	427.25	632.35	472.56	772.19	146.9974	141.733	152.3114	62568.22	61048.24	64158.76	3110.52	1519.98	1590.54	62568.22	61048.24	64158.76
5-28	468.36	767.99	542.07	908.72	472.56	772.19	546.27	912.92	158.865	153.206	164.5438	66198.1	64432.08	68034.67	3602.592	1766.016	1836.576	66198.1	64432.08	68034.67
5-29	542.07	908.72	666.44	68.37	546.27	912.92	670.64	72.57	849.5034	853.0566	845.977	762616	768665.5	756637.1	12028.46	6049.512	5978.952	762616	768665.5	756637.1
5-30	666.44	68.37	581.73	208.87	670.64	72.57	585.93	213.07	164.0611	162.735	165.5897	67876.03	67442.68	68379.95	937.272	433.356	503.916	67876.03	67442.68	68379.95
5-31	581.73	208.87	652.76	348.52	585.93	213.07	656.96	352.72	156.676	151.0396	162.3341	65507.38	63772.95	67312.38	3539.424	1734.432	1804.992	65507.38	63772.95	67312.38
5-32	652.76	348.52	583.94	488.84	656.96	352.72	588.14	493.04	156.2879	154.4687	158.3091	65385.89	64820.57	66021.77	1201.2	565.32	635.88	65385.89	64820.57	66021.77
5-33	583.94	488.84	692.05	628.06	588.14	493.04	696.25	632.26	176.2668	170.3751	182.1616	72029.98	69987.69	74142.83	4155.144	2042.292	2112.852	72029.98	69987.69	74142.83
5-34	692.05	628.06	578.51	768.52	696.25	632.26	582.71	772.72	180.611	180.0819	181.3333	73580.34	73389.5	73841.75	452.256	190.848	261.408	73580.34	73389.5	73841.75
5-35	578.51	768.52	604.39	908.05	582.71	772.72	608.59	912.25	141.9098	137.0556	146.8439	61098.4	59744.23	62523.12	2778.888	1354.164	1424.724	61098.4	59744.23	62523.12
5-36	604.39	908.05	767.42	68.29	608.59	912.25	771.62	72.49	855.4389	858.7756	852.1305	772735.6	778455.5	767086.4	11369.06	5719.812	5649.252	772735.6	778455.5	767086.4
5-37	767.42	68.29	734.4	208.09	771.62	72.49	738.6	212.29	143.6467	140.6154	146.8557	61594.36	60732.69	62526.59	1793.904	861.672	932.232	61594.36	60732.69	62526.59
5-38	734.4	208.09	827.9	348.56	738.6	212.29	832.1	352.76	168.7426	162.9233	174.57	69434.07	67504	71434.7	3930.696	1930.068	2000.628	69434.07	67504	71434.7
5-39	827.9	348.56	825.93	488.56	832.1	352.76	830.13	492.76	140.0139	135.9401	144.2172	60563.88	59439.71	61758.61	2318.904	1124.172	1194.732	60563.88	59439.71	61758.61
5-40	825.93	488.56	750.27	628.84	830.13	492.76	754.47	633.04	159.3829	157.7827	161.1862	66362.91	65855.39	66941	1085.616	507.528	578.088	66362.91	65855.39	66941
5-41	750.27	628.84	733.51	768.46	754.47	633.04	737.71	772.66	140.6223	137.0325	144.3674	60734.64	59737.9	61801.95	2064.048	996.744	1067.304	60734.64	59737.9	61801.95
5-42	733.51	768.46	744.5	908	737.71	772.66	748.7	912.2	139.9721	135.5102	144.5404	60552.19	59323.02	61851.92	2528.904	1229.172	1299.732	60552.19	59323.02	61851.92
5-43	744.5	908	925.89	68.02	748.7	912.2	930.09	72.22	859.342	862.5753	856.1378	779428.7	784996.2	773931.9	11064.31	5567.436	5496.876	779428.7	784996.2	773931.9
5-44	925.89	68.02	933.58	208.63	930.09	72.22	937.78	212.83	140.8201	136.4546	145.2973	60790.31	59579.87	62071.31	2491.44	1210.44	1281	60790.31	59579.87	62071.31
5-45	933.58	208.63	861.26	347.99	937.78	212.83	865.46	352.19	157.0076	155.3175	158.9019	65611.39	65083.54	66209.81	1126.272	527.856	598.416	65611.39	65083.54	66209.81
5-46	861.26	347.99	922.7	488.72	865.46	352.19	926.9	492.92	153.5572	148.0434	159.1016	64539.81	62876.86	66273.31	3396.456	1662.948	1733.508	64539.81	62876.86	66273.31
5-47	922.7	488.72	903.86	628.42	926.9	492.92	908.06	632.62	140.9647	137.4449	144.6428	60831.04	59851.09	61881.54	2030.448	979.944	1050.504	60831.04	59851.09	61881.54
5-48	903.86	628.42	883.29	768.76	908.06	632.62	887.49	772.96	141.8395	138.375	145.464	61078.44	60107.65	62119.79	2012.136	970.788	1041.348	61078.44	60107.65	62119.79
5-49	883.29	768.76	937.41	908.83	887.49	772.96	941.61	913.03	150.1618	144.7503	155.6119	63508.58	61912.66	65175.06	3262.392	1595.916	1666.476	63508.58	61912.66	65175.06
															838600.7	**412773.6**	**425827.2**			

The value of R, E_charge, E_ts, and E_{rx} have b een considered 4096 bits, 50000 Pico-Joules, 10 Pico-Joules, and 204800000 Pico-Joules respectively.

7. Result Analysis

We have used the data from Table1 for experimental purpose. There are so many variables that has been used in our experiment. The various data of different variables have been taken from existing Literature [30]. Applying our strategies (deployment strategies and clustering process) we have obtained a large set of results as depicted in Tables 2, 3, and 4.

Applying Random Deployment Strategy and area wise Clustering Process

The calculations of the energy saved are shown in table 2. There are five iterations and the energy saved has been calculated for every node which sums up to 864823.7 Pico-Joules in case of maximum energy saving. Considering the initial energy of nodes as 1 Joule and not taking duty cycle into account we have calculated the number of days by using the formula

$$days = \frac{1\times10^{12}\ \text{Joules}}{86400\times E_S} \quad (11)$$

Where E_s=Energy saved and 1day=86400 seconds.
Putting the value of E_S as 864823.7 we get 13 days and 3 hours or 315 hours.
So this network can be saved up to 267.75 hours to 362.25 hours or 11.15 days to 15.09 days.

Applying Spiral Deployment Strategy and area wise Clustering Process

The calculations of the energy saved are shown in table 3. There are five iterations and energy saved that have been calculated for every node which sums up to 848969.0 Pico-Joules in case of maximum energy saving. Considering the initial energy of nodes as 1 Joule and not taking duty cycle into account we have calculated the number of days by using the formula

$$days = \frac{1\times10^{12}\ \text{Joules}}{86400\times E_S} \quad (12)$$

Where E_s=Energy saved and 1day=86400 seconds.
Putting the value of E_S as 864823.7 we get 13 days and 6 hours or 318 hours.
So this network can be saved up to 270.3 hours to 365.7 hours or 11.25 days to 15.23 days.

Applying S-pattern Deployment Strategy and area wise Clustering Process

The calculations of the energy saved are shown in table 2. There are five iterations and energy saved that have been calculated for every node which sums up to 838600.7 Pico-Joules in case of maximum energy saving. Considering the initial energy of nodes as 1 Joule and not taking duty cycle into account we have calculated the number of days by using the formula

$$days = \frac{1\times10^{12}\ \text{Joules}}{86400\times E_S} \quad (13)$$

Where E_s=Energy saved and 1day=86400 seconds.

Putting the value of E_S as 864823.7 we get 13 days and 8 hours or 320 hours. So it can be concluded that the concept can save up to 272 hours to 368 hours or 11.33 days to 15.33 days

of a lifetime of WSN. Therefore, from the above calculations, we can say that the s-pattern deployment is performing better than the other two deployments as the network will remain active for a longer time in the case of s-pattern deployment. In this research work, the obtained result (the lifetime of WSN) has been compared with the paper of [30] by scaling up the external environmental parameters like covered area size, several nodes deployed, several rounds have also been compared and it has been seen that the lifesaving can be done 10 to 11 days by applying their method which can be increased 1 to 5 days in case of random deployment strategies using modified ACO. Lifetime saving can be increased.

We have compared our work with other literature [30] to prove that our experiments have yielded better results than other papers.

Table 5. Comparison of results obtained by our proposed algorithm and existing literature [30]

Parameters / Algorithms	totalxy(max)	totalxy(min)	Energy Saved	Days
ACO(Random)	100389425972.31	100389269395.97	864823.68	13.38
ACO(Spiral)	100388152202.95	100387999246.18	848969.016	13.63
ACO(S-pattern)	36589595.82	36436618.21	838600.728	13.8
DE-QPSO	17214960557260.80	17215930368000.00	969810739.2	**7**

In this table, we have compared our work to another literature [30] and found out that our experiment has performed better than the literature[30]. We have obtained a value of about 13 days which is 6 days more than the value obtained by applying the DE-QPSO algorithm. In our experiment, we have covered a large area (1sq km) than the existing literature [30]. Other than that we have also deployed more nodes and have more clusters as well.

8. Conclusion

In this research, the lifetime of WSN has been increased to a significant margin theoretically. To choose the best result set among all the obtained results some parameters such as equivalent distribution, number of iterations, maximum energy has been set to a permissible range. To decide which type of deployment should be applied to get the maximum amount of energy and increasing the lifetime of the overall network we can use the fuzzy set in future work. IN practical life the margin may not match with the theoretical result due to physical dependencies like some external environmental factors. In this research work, we have also considered some physical dependencies like different environmental hazards as well as physical hazards. To implement those hazards in our experiment we have used an allowable tolerance percentage in this experiment. It is expected that the result may reach up to some significant level if some fuzzy logic is going to be developed to incorporate the uncertainty into the experimental result to make the situation more realistic. In the future, the fuzzy

number system can be implemented in this type of research work to adapt to the uncertainty in the experimental environment.

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