**Project Report**

TASK 1:

**READINGS :-**

|  |  |  |  |
| --- | --- | --- | --- |
|  | GraphC | Graph A | Graph B |
| Node 1 | 1 | 3 | 4 |
| Node 2 | 2 | 6 | 7 |
| Node 3 | 2 | 9 | 10 |
| Node 4 | 3 | 11 | 13 |
| Node 5 | 3 | 13 | 15 |
| Node 6 | 3 | 15 | 17 |
| Node 7 | 4 | 20 | 20 |
| Node 8 | 4 | 23 | 21 |
| Node 9 | 4 | 29 | 25 |
| Node 10 | 5 | 33 | 28 |
| Node 11 |  | 40 | 30 |
| Node 12 |  | 47 | 34 |
| Node 13 |  | 77 | 44 |
| Node 14 |  | 78 | 60 |
| Node 15 |  | 79 | 61 |
| Node 16 |  | 79 | 61 |
| Node 17 |  | 80 | 62 |
| Node 18 |  | 80 | 62 |
| Node 19 |  | 81 | 63 |
| Node 20 |  | 81 | 64 |
| Node 21 |  | 81 | 65 |
| Node 22 |  | 82 | 65 |
| Node 23 |  | 82 | 65 |
| Node 24 |  | 83 | 66 |
| Node 25 |  | 83 | 66 |
| Node 26 |  | 83 | 67 |
| Node 27 |  | 84 | 67 |
| Node 28 |  | 84 | 67 |
| Node 29 |  | 84 | 68 |
| Node 30 |  | 84 | 68 |
| Node 31 |  | 85 | 68 |
| Node 32 |  | 85 | 69 |

**GRAPH PLOT:-**

**The results are as expected because time required for every node to calculate minimum distance to all other nodes depends on all its previous node calculations. Thus subsequently the time for each nodes goes on increasing. Also here in GRAPH A, we had different costs between the nodes of the graphs which led to more variation and more delay as the distance calculation would change more often with all other nodes. But in GRAPH B, all the costs of graph are 1, which led to less time as the change in the cost between the edges would be less often. Also for GRAPH C, only 10 nodes are there with distance of one which led to less time in calculating the cost between the edges. These costs would vary a lot when this algorithm would run on the network which would include then the connection delay and the calculation timings.**

Task 2:

1. For small-net.txt

|  |  |
| --- | --- |
| **Initial Node** | **Max number of Iterations** |
| 1 | 2 |
| 2 | 2 |
| 3 | 2 |
| 4 | 2 |
| 5 | 3 |
| 6 | 3 |
| 7 | 3 |
| 8 | 2 |
| 9 | 3 |
| 10 | 2 |

1. For large-net-a.txt

|  |  |
| --- | --- |
| **Initial Node** | **Max number of Iterations** |
| 1 | 2 |
| 2 | 2 |
| 3 | 2 |
| 4 | 3 |
| 5 | 3 |
| 6 | 3 |
| 7 | 3 |
| 8 | 3 |
| 9 | 2 |
| 10 | 2 |
| 11 | 2 |
| 12 | 3 |
| 13 | 3 |
| 14 | 3 |
| 15 | 4 |
| 16 | 3 |
| 17 | 4 |
| 18 | 3 |
| 19 | 3 |
| 20 | 4 |
| 21 | 4 |
| 22 | 5 |
| 23 | 5 |
| 24 | 4 |
| 25 | 5 |
| 26 | 4 |
| 27 | 5 |
| 28 | 5 |
| 29 | 5 |
| 30 | 5 |
| 31 | 4 |
| 32 | 5 |

1. Large-net-b.txt

|  |  |
| --- | --- |
| **Initial Node** | **Max number of Iterations** |
| 1 | 3 |
| 2 | 3 |
| 3 | 3 |
| 4 | 3 |
| 5 | 3 |
| 6 | 3 |
| 7 | 3 |
| 8 | 3 |
| 9 | 3 |
| 10 | 3 |
| 11 | 3 |
| 12 | 3 |
| 13 | 3 |
| 14 | 3 |
| 15 | 4 |
| 16 | 3 |
| 17 | 4 |
| 18 | 3 |
| 19 | 3 |
| 20 | 4 |
| 21 | 4 |
| 22 | 5 |
| 23 | 5 |
| 24 | 4 |
| 25 | 5 |
| 26 | 4 |
| 27 | 5 |
| 28 | 5 |
| 29 | 5 |
| 30 | 5 |
| 31 | 4 |
| 32 | 5 |

Findings:

From the three readings and curves, we can see that the time taken to converge increases slowly as the number of nodes in the network goes on increases. This is not a linear increase and thus it is very scalable. Also, the number of iterations taken to converge depends on the intial node.