**Assignment No. 5**

* **Coded:**

#include<iostream>

using namespace std;

struct node{

    int dist[20];

    int from[20];

}route[10];

int main(){

    int dm[20][20], no;

    cout << "Enter no of nodes." << endl;

    cin >> no;

    cout << "Enter the distance matrix:" << endl;

    for (int i = 0; i < no; i++) {

        for (int j = 0; j < no; j++) {

            cin >> dm[i][j];

/\* Set distance from i to i as 0 \*/

            dm[i][i] = 0;

            route[i].dist[j] = dm[i][j];

            route[i].from[j] = j;

        }

    }

    int flag;

    do {

        flag = 0;

        for (int i = 0; i < no; i++){

            for (int j = 0; j < no; j++){

                for (int k = 0; k < no; k++){

                    if ((route[i].dist[j]) > (route[i].dist[k] + route[k].dist[j])){

                        route[i].dist[j] = route[i].dist[k] + route[k].dist[j];

                        route[i].from[j] = k;

                        flag = 1;

                    }

                }

            }

        }

    } while (flag);

    for (int i = 0; i < no; i++) {

        cout << "Router info for router: " << i + 1 << endl;

        cout << "Dest\tNext Hop\tDist" << endl;

        for (int j = 0; j < no; j++){

            printf("%d\t%d\t\t%d\n", j+1, route[i].from[j]+1, route[i].dist[j]);

        }

    }

    return 0;

}

* **Output:**

PS E:\TE\CNS\Practicals> cd 'e:\TE\CNS\Practicals\output'

PS E:\TE\CNS\Practicals\output> & .\'ex5.exe'

Enter no of nodes.

4

Enter the distance matrix:

5

6

7

2

3

4

5

6

7

8

9

45

65

67

87

44

Router info for router: 1

Dest Next Hop Dist

1 1 0

2 2 6

3 3 7

4 4 2

Router info for router: 2

Dest Next Hop Dist

1 1 3

2 2 0

3 3 5

4 1 5

Router info for router: 3

Dest Next Hop Dist

1 1 7

2 2 8

3 3 0

4 1 9

Router info for router: 4

Dest Next Hop Dist

1 1 65

2 2 67

3 1 72

4 4 0