Q) Design and implement C/C++ Program to find shortest paths from a given vertex in a

weighted connected graph to other vertices using Dijkstra's algorithm.

#include<stdio.h>

#define INF 999

void dijkstra(int c[10][10],int n,int s,int d[10])

{

int v[10],min,u,i,j;

for(i=1;i<=n;i++)

{

d[i]=c[s][i];

v[i]=0;

}

v[s]=1;

for(i=1;i<=n;i++) {

min=INF;

for(j=1;j<=n;j++)

if(v[j]==0 && d[j]<min) {

min=d[j];

u=j;

}

v[u]=1;

for(j=1;j<=n;j++)

if(v[j]==0 && (d[u]+c[u][j])<d[j])

d[j]=d[u]+c[u][j];

}

}

int main() {

int c[10][10],d[10],i,j,s,sum,n;

printf("\nEnter n value:");

scanf("%d",&n);

printf("\nEnter the graph data:\n");

for(i=1;i<=n;i++)

for(j=1;j<=n;j++)

scanf("%d",&c[i][j]);

printf("\nEnter the souce node:");

scanf("%d",&s);

dijkstra(c,n,s,d);

for(i=1;i<=n;i++)

printf("\nShortest distance from %d to %d is %d",s,i,d[i]);

return 0;

}

OUTPUT:

Enter n value:6

Enter the graph data:

0 15 10 999 45 999

999 0 15 999 20 999

20 999 0 20 999 999

999 10 999 0 35 999

999 999 999 30 0 999

999 999 999 4 999 0

0 15 10 999 45 999

999 0 15 999 20 999

20 999 0 20 999 999

999 10 999 0 35 999

999 999 999 30 0 999

999 999 999 4 999 0

Enter the souce node:2

Shortest distance from 2 to 1 is 35

Shortest distance from 2 to 2 is 0

Shortest distance from 2 to 3 is 15

Shortest distance from 2 to 4 is 35

Shortest distance from 2 to 5 is 20

Shortest distance from 2 to 6 is 999