PROGRAM:

```
#define INFINITY 9999
#define MAX 10
void dijkstra(int G[MAX][MAX],int n,int startnode)
{
	int cost[MAX][MAX],distance[MAX],pred[MAX];
	int visited[MAX],count,mindistance,nextnode,i,j;
	for(i=1;i<=n;i++)
		for(j=1;j<=n;j++)
			if(G[i][j]==0)
				cost[i][j]=INFINITY;
			else
				cost[i][j]=G[i][j];
	for(i=1;i<=n;i++)
	{
		distance[i]=cost[startnode][i];
		pred[i]=startnode;
		visited[i]=0;
	}
	distance[startnode]=0;
	visited[startnode]=1;
	count=1;
	while(count<n)
	{
		mindistance=INFINITY;
		for(i=1;i<=n;i++)
			if(distance[i]<mindistance&&!visited[i])
			{
				mindistance=distance[i];
				nextnode=i;
			}
		visited[nextnode]=1;
		for(i=1;i<=n;i++)
			if(!visited[i])
```

#include<stdio.h>

```
                        if(mindistance+cost[nextnode]
[i]<distance[i])
                        {
                                distance[i]=mindistance+cost[nextnode]
[i];
                                pred[i]=nextnode;
                        }
                count++;
        }
        for(i=1;i<=n;i++)
                if(i!=startnode)
                {
                        printf("\nDistance of node %d =
%d",i,distance[i]);
                        printf("\nPath = %d ",i);
                        j=i;
                        do
                        {
                                j=pred[j];
                                printf("-> %d ",j);
                        }while(j!=startnode);
                }
}
int main()
{
        int G[MAX][MAX],i,j,n,u,ch=1;
        while(ch!=0)
        {
                printf("\nEnter no. of vertices:");
                scanf("%d",&n);
                printf("\nEnter the adjacency matrix :\n");
                for(i=1;i<=n;i++)
                        for(j=1;j<=n;j++)
                                scanf("%d",&G[i][j]);
                printf("\nEnter the starting node : ");
                scanf("%d",&u);
                dijkstra(G,n,u);
                printf("\nEnter 1 to continue and 0 to exit : ");
                scanf("%d",&ch);
        }
        return 0;
}
```

OUTPUT:

```
(base) MSMLs-iMac:DS msml$ gcc dijkstra.c -o dijkstra
(base) MSMLs-iMac:DS msml$ ./dijkstra

Enter no. of vertices:7
```

```
Enter the adjacency matrix :
0     2     0     1     0     0     0
0     0     0     3     10    0     0
4     0     0     0     0     5     0
0     0     2     0     2     8     4
0     0     0     0     0     0     6
0     0     0     0     0     0     0
0     0     0     0     0     1     0

Enter the starting node : 1

Distance of node 2 = 2
Path = 2 -> 1
Distance of node 3 = 3
Path = 3 -> 4 -> 1
Distance of node 4 = 1
Path = 4 -> 1
Distance of node 5 = 3
Path = 5 -> 4 -> 1
Distance of node 6 = 6
Path = 6 -> 7 -> 4 -> 1
Distance of node 7 = 5
Path = 7 -> 4 -> 1
Enter 1 to continue and 0 to exit : 1

Enter no. of vertices:6

Enter the adjacency matrix :
0     5     0     6     10    0
5     0     1     0     2     7
0     1     0     0     0     8
6     0     0     0     3     0
10    2     0     3     0     4
7     0     8     0     5     0

Enter the starting node : 1

Distance of node 2 = 5
Path = 2 -> 1
Distance of node 3 = 6
Path = 3 -> 2 -> 1
Distance of node 4 = 6
Path = 4 -> 1
Distance of node 5 = 7
Path = 5 -> 2 -> 1
Distance of node 6 = 11
Path = 6 -> 5 -> 2 -> 1
Enter 1 to continue and 0 to exit : 0
```