Experiment No: 6

Name: Aniket Balendra Tiwari

Roll No: 21143285

Program:

```cpp
#include <iostream>
using namespace std;
#include <limits.h>
#define V 9
int minDistance(int dist[], bool sptSet[])
{
    int min = INT_MAX, min_index;
    for (int v = 0; v < V; v++)
        if (sptSet[v] == false && dist[v] <= min)
            min = dist[v], min_index = v;
    return min_index;
}
void printSolution(int dist[])
{
    cout << "\nVertex \t\t Distance from Source" << endl;
    for (int i = 0; i < V; i++)
        cout << i << " \t\t\t" << dist[i] << endl;
}
void dijkstra(int graph[V][V], int src)
{
    int dist[V];
    bool sptSet[V];
    for (int i = 0; i < V; i++)
        dist[i] = INT_MAX, sptSet[i] = false;
    dist[src] = 0;
    for (int count = 0; count < V - 1; count++) {
        int u = minDistance(dist, sptSet);
        sptSet[u] = true;
        for (int v = 0; v < V; v++)
            if (!sptSet[v] && graph[u][v]
                && dist[u] != INT_MAX
                && dist[u] + graph[u][v] < dist[v])
                dist[v] = dist[u] + graph[u][v];
    }
    printSolution(dist);
}

int main()
```

```
{
    cout << "Name : Aniket Tiwari\n";
    cout << "Roll No : 21143285\n";
    int graph[V][V] = { { 0, 4, 0, 0, 1, 0, 0, 8, 0 },
            { 4, 0, 8, 0, 0, 0, 0, 11, 0 },
            { 0, 9, 0, 7, 0, 8, 0, 0, 2 },
            { 0, 0, 7, 0, 9, 11, 0, 0, 0 },
            { 0, 2, 0, 9, 0, 10, 0, 0, 0 },
             { 0, 0, 6, 14, 10, 0, 2, 5, 0 },
            { 0, 0, 0, 5, 0, 3, 0, 1, 6 },
            { 8, 11, 0, 0, 0, 0, 1, 0, 7 },
            { 0, 0, 2, 0, 0, 0, 8, 7, 0 } };

    dijkstra(graph, 0);
    return 0;
}
```

Output:

```
Microsoft Windows [Version 10.0.22621.521]
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D:\Programming\College Experiments\TY 5 Sem\DAA Lab>cd
ras && "d:\Programming\College Experiments\TY 5 Sem\DAA
Name : Aniket Tiwari
Roll No : 21143285

Vertex              Distance from Source
0                        0
1                        3
2                        11
3                        10
4                        1
5                        11
6                        9
7                        8
8                        13
```