DIJKSTRA'S ALGORITHM

```
import java.util.*;
public class DijkstraAlgorithm {
    static class Node {
        int id;
        int distance;
        Node(int id, int distance) {
            this.id = id;
            this.distance = distance;
        }
    }
    static int[][] graph = {
            {0, 4, 0, 0, 0, 0, 0, 8, 0},
            {4, 0, 8, 0, 0, 0, 0, 11, 0},
            {0, 8, 0, 7, 0, 4, 0, 0, 2},
            {0, 0, 7, 0, 9, 14, 0, 0, 0},
            {0, 0, 0, 9, 0, 10, 0, 0, 0},
            {0, 0, 4, 14, 10, 0, 2, 0, 0},
            {0, 0, 0, 0, 0, 2, 0, 1, 6},
            {8, 11, 0, 0, 0, 0, 1, 0, 7},
            {0, 0, 2, 0, 0, 0, 6, 7, 0}
    };
    static int V = graph.length;
    static void dijkstra(int source) {
```

```
        int[] dist = new int[V];
        boolean[] visited = new boolean[V];
        Arrays.fill(dist, Integer.MAX_VALUE);
        dist[source] = 0;
        for (int count = 0; count < V - 1; count++) {
            int u = minDistance(dist, visited);
            visited[u] = true;
            for (int v = 0; v < V; v++) {
                if (!visited[v] && graph[u][v] != 0 && dist[u] != Integer.MAX_VALUE
&& dist[u] + graph[u][v] < dist[v]) {
                    dist[v] = dist[u] + graph[u][v];
                }
            }
        }
        printSolution(dist);
    }
    static int minDistance(int[] dist, boolean[] visited) {
        int min = Integer.MAX_VALUE;
        int minIndex = -1;
        for (int v = 0; v < V; v++) {
            if (!visited[v] && dist[v] <= min) {
                min = dist[v];
                minIndex = v;
            }
        }
        return minIndex;
    }
```

```
    static void printSolution(int[] dist) {
        System.out.println("Vertex \t\t Distance from Source");
        for (int i = 0; i < V; i++) {
            System.out.println(i + " \t\t " + dist[i]);
        }
    }
    public static void main(String[] args) {
        dijkstra(0);
    }
}
```

OUTPUT:

```
Vertex          Distance from Source
0               0
1               4
2               12
3               19
4               21
5               11
6               9
7               8
8               14
PS C:\Users\HP\Desktop\LP2>
```