

Python Code :-

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# Python program for Dijkstra's single
# source shortest path algorithm. The program is
# for adjacency matrix representation of the graph

# Library for INT_MAX
import sys

class Graph():

    def __init__(self, vertices):
        self.V = vertices
        self.graph = [[0 for column in range(vertices)]
                       for row in range(vertices)]

    def printSolution(self, dist):
        print("Vertex \tDistance from Source")
        for node in range(self.V):
            print(node, "\t", dist[node])

    # A utility function to find the vertex with
    # minimum distance value, from the set of vertices
    # not yet included in shortest path tree
    def minDistance(self, dist, sptSet):

        # Initialize minimum distance for next node
        min = sys.maxsize

        # Search not nearest vertex not in the
        # shortest path tree
        for u in range(self.V):
            if dist[u] < min and sptSet[u] == False:
                min = dist[u]
                min_index = u

        return min_index

    # Function that implements Dijkstra's single source
    # shortest path algorithm for a graph represented
    # using adjacency matrix representation
    def dijkstra(self, src):

        dist = [sys.maxsize] * self.V
        dist[src] = 0
        sptSet = [False] * self.V
```

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for cout in range(self.V):

    # Pick the minimum distance vertex from
    # the set of vertices not yet processed.
    # x is always equal to src in first iteration
    x = self.minDistance(dist, sptSet)

    # Put the minimum distance vertex in the
    # shortest path tree
    sptSet[x] = True

    # Update dist value of the adjacent vertices
    # of the picked vertex only if the current
    # distance is greater than new distance and
    # the vertex is not in the shortest path tree
    for y in range(self.V):
        if self.graph[x][y] > 0 and sptSet[y] == False and \
            dist[y] > dist[x] + self.graph[x][y]:
            dist[y] = dist[x] + self.graph[x][y]

    self.printSolution(dist)

# Driver program
g = Graph(9)
g.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]
            ];

g.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