

Python Code :-

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# A Python program for Prim's Minimum Spanning Tree (MST) algorithm.
# The program is for adjacency matrix representation of the graph

import sys # Library for INT_MAX

class Graph():

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

    # A utility function to print the constructed MST stored in parent[]
    def printMST(self, parent):
        print ("Edge \tWeight")
        for i in range(1, self.V):
            print (parent[i], "-", i, "\t", self.graph[i][parent[i]])

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

        # Initialize min value
        min = sys.maxsize

        for v in range(self.V):
            if key[v] < min and mstSet[v] == False:
                min = key[v]
                min_index = v

        return min_index

    # Function to construct and print MST for a graph
    # represented using adjacency matrix representation
    def primMST(self):

        # Key values used to pick minimum weight edge in cut
        key = [sys.maxsize] * self.V
        parent = [None] * self.V # Array to store constructed MST
        # Make key 0 so that this vertex is picked as first vertex
        key[0] = 0
        mstSet = [False] * self.V
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parent[0] = -1 # First node is always the root of

for cout in range(self.V):

    # Pick the minimum distance vertex from
    # the set of vertices not yet processed.
    # u is always equal to src in first iteration
    u = self.minKey(key, mstSet)

    # Put the minimum distance vertex in
    # the shortest path tree
    mstSet[u] = 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 v in range(self.V):

        # graph[u][v] is non zero only for adjacent vertices of u
        # mstSet[v] is false for vertices not yet included in MST
        # Update the key only if graph[u][v] is smaller than key[v]
        if self.graph[u][v] > 0 and mstSet[v] == False and key[v] >
self.graph[u][v]:
            key[v] = self.graph[u][v]
            parent[v] = u

self.printMST(parent)

g = Graph(5)
g.graph = [ [0, 2, 0, 6, 0],
            [2, 0, 3, 8, 5],
            [0, 3, 0, 0, 7],
            [6, 8, 0, 0, 9],
            [0, 5, 7, 9, 0]]

g.primMST();

```

Output:-

Edge	Weight
0 - 1	2
1 - 2	3
0 - 3	6
1 - 4	5

