Assignment No. 11

Minimum Spanning Tree (MST)
Implementation of Prim's & Kruskal's algorithms

Aim
Represent any real world graph using adjacency list/adjacency matrix find minimum spanning tree using Prim's or Kruskal's algorithm.

Objective(s)	
1	Learn the concepts of graph as a data structure and their applications in everyday life.
2	Understand graph representation (adjacency matrix, adjacency list, adjacency multi list)

Theory
1. What is a graph? Explain in brief the basic terminologies used in graph. 2. State and explain different representations of graph. 3. Explain Prim's & Kruskal's Algorithm with suitable example.

Algorithm:

Prim's Algorithm

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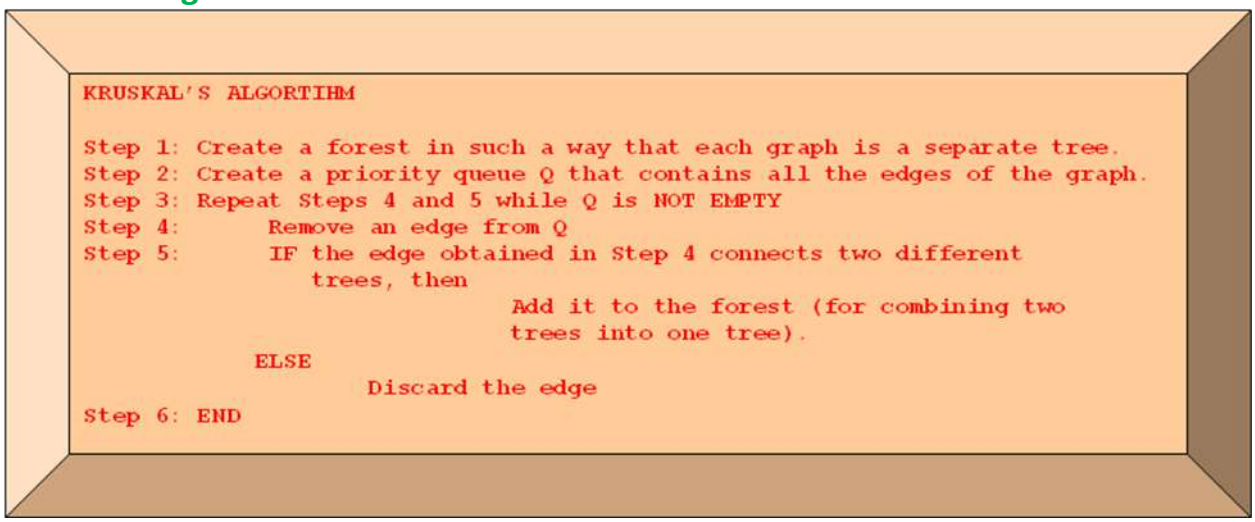
Prim Algorithm

Step 1: Select a starting vertex
Step 2: Repeat Steps 3 and 4 until there are fringe vertices
Step 3:   Select an edge e connecting the tree vertex and fringe vertex
          that has minimum weight
Step 4:   Add the selected edge and the vertex to the minimum spanning
          tree T
   [END OF LOOP]
 Step 5: EXIT
```

Kruskal's Algorithm



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KRUSKAL'S ALGORTIHM

Step 1: Create a forest in such a way that each graph is a separate tree.
Step 2: Create a priority queue Q that contains all the edges of the graph.
Step 3: Repeat Steps 4 and 5 while Q is NOT EMPTY
Step 4:       Remove an edge from Q
Step 5:       IF the edge obtained in Step 4 connects two different
                 trees, then
                                Add it to the forest (for combining two
                                trees into one tree).
              ELSE
                        Discard the edge
Step 6: END
```

Conclusion