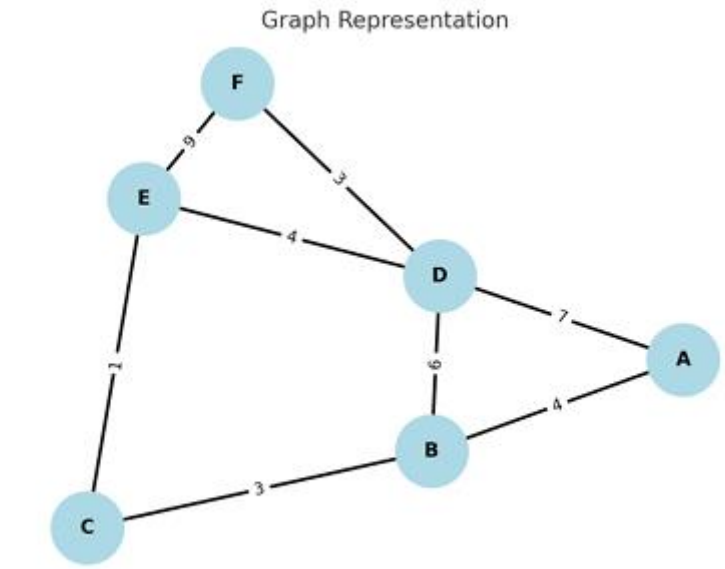

Figure 1: Reference Graph

1. Minimum Spreading Tree (MST)

A minimum spanning tree (MST) is a tree that connects all nodes in a graph, minimizing the sum of edge weights. The Kruskal algorithm and the Prim algorithm are the most widely used MST algorithms.

Kruskal Algorithm:

1. We sort all the edges according to the increasing weights.
2. Select the smallest weighted edge and add this edge to the tree. If the tree does not form a loop, we can use this edge.

3. We repeat this step until all the edges are processed.

2. Whether MST Is Unique or Not

Whether an MST is unique or not depends on the weights of the edges in the graph. If there are multiple edges with the same weight, the MST can be created in more than one different way. However, if the weights of all edges are different, the MST is unique.

3. Dijkstra Algorithm

1. The Dijkstra algorithm is used to find the shortest paths from one source to all other nodes. Steps:
2. 2.We can assign zero distance to the starting node, we can assign infinite distance to other nodes.

3. Let's update the distances of neighboring nodes.
4. Let's select the node with the shortest distance and update the distances for its unvisited neighbors.

5.Let's repeat the steps for each node.

4. Critical Edge

An edge is defined as a "critical edge" in the graph, if this edge is removed, connections to all nodes in the graph are broken or the connection in the graph is lost.

Critical Edge Detection: If the commitment in the chart disappears when an edge is removed, that edge is critical. For this, we can check the loyalty of the graph when the edge is removed.

5. Joint Point

An Articulation Point is a node in the graph that disappears when this node is removed, the connection in the graph disappears. If a node can be considered a bridge, then that node is also a joint point.

Joint Point Detection: If the attachment is lost when a node is removed, that node is the joint point.

6. A New Road Situation

If we have found the path A-B-C-E in the Dijkstra algorithm and C is no longer available, we need to analyze the graph to see if there is an alternative path. In this case, we may need to check again whether a path is valid.

7. Graphic Robustness

The robustness of a graph can be determined by the number of critical edges and joint points on the graph. If the graph has a large number of critical edges or joint points, the robustness level of the graph decreases. Graph robustness is related to whether the graph will still remain connected despite the removal of an edge or node.