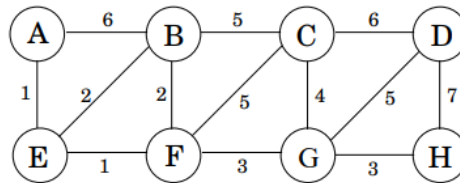


Tutorial title: Minimum Spanning Tree

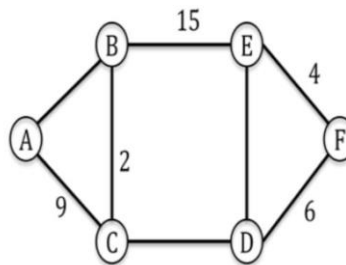
Q2. Given a connected, undirected graph. Give an algorithm to detect whether there is a cycle. Analyze the running time of your algorithm.

Q3. Consider the following weighted graph:

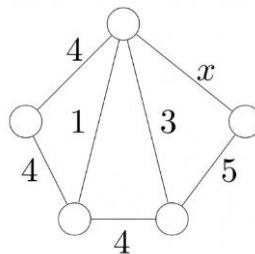


- What is the cost of the minimum weighted spanning tree?
- How many minimum spanning trees does it have?
- Suppose Kruskal's algorithm is run on this graph. In what order are the edges added to the MST?
- Suppose Prim's algorithm is run on this graph. In what order are the edges added to the MST?

Q4. The graph shown below has 8 edges with distinct integer edge weights. The minimum spanning tree (MST) is of weight 36 and contains the edges: $\{(A, C), (B, C), (B, E), (E, F), (D, F)\}$. The edge weights of only those edges which are in the MST are given in the figure shown below. Find the minimum possible sum of weights of all 8 edges of this graph.



Q5. Consider the following undirected graph G:



Choose a value for x that will maximize the number of minimum weight spanning trees (MWSTs) of G . The number of MWSTs of G for this value of x is ____.