

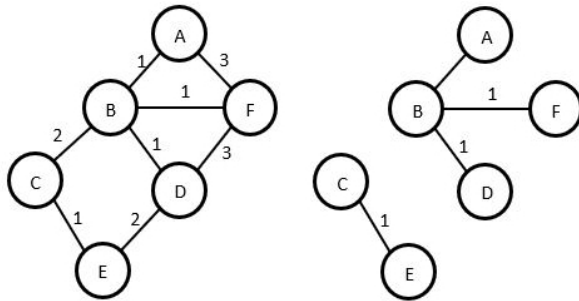
## Congratulations! You passed!

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Grade received 100% Latest Submission Grade 100% To pass 80% or higher

1. Consider the graph shown below and an intermediate stage of running Kruskal's algorithm on the graph.

1 / 1 point



The remaining edges to be processed in ascending order of weights are [C-B, E-D, A-F, D-F].

Select all correct answers from the list below.

- ☐ The edge C-B, when inserted, will connect two nodes that belong to the same tree in the forest.
- ☒ After the edge C-B is added, there is exactly one tree in the forest.

Correct  
 Correct.

- ☒ The edges E-D, A-F and D-F are not added to the spanning tree because their two nodes are part of the same tree in the forest.

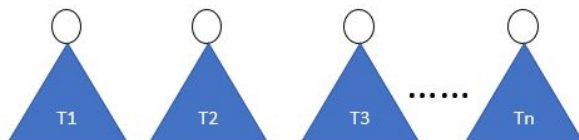
Correct  
 Correct. Because C-B is added first, there will only be one tree in the forest by the time E-D is considered.

- ☒ Given a forest of trees, finding if two nodes belong to the same tree can be achieved in time at most  $O(|V|)$ , where  $|V|$  is the total number of nodes.

Correct  
 Correct.

2. The schematic below represents a forest during an intermediate state of the Kruskal's algorithm. Each triangle is a tree.

1 / 1 point



Select all the correct facts about the operation of Kruskal's algorithm for minimum spanning tree referring to the figure above.

- ☒ Suppose we attempt to insert an edge  $(A, B)$  with weight  $W$ , wherein  $A$  and  $B$  belong to the same tree. Then every edge in the existing path from  $A$  to  $B$  must have weight less than or equal to  $W$ .

Correct  
 Correct. Otherwise, the edge A-B would have been added before the other path between A and B existed.

- ☒ Suppose we attempt to insert an edge  $(A, B)$  and  $A$  and  $B$  belong to two different trees in the forest. Then such an edge will be part of the final spanning tree output by Kruskal's algorithm.

✓ **Correct**  
Correct.

✓ If the edges are not inserted in ascending order of weights, the resulting spanning tree would not necessarily be minimal.

✓ **Correct**  
Correct.

✓ Kruskal's algorithm can be made faster if we have a way to rapidly check if two nodes in the forest are part of the same tree.

✓ **Correct**  
Correct.