

✔ Congratulations! You passed!

Grade
received 91.66%

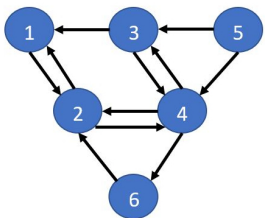
Latest Submission
Grade 91.67%

To pass 80% or
higher

Go to next item

1. Consider the graph shown below:

0.6666666666666666 / 1 point



Select all true facts about the strongly connected components of this graph.

☒ The set {1,2,3,4,5,6} is a maximal strongly connected component.

☒ This should not be selected
Incorrect since there is no path from 4 to 5.

☐ The set {1,3} is a strongly connected component.

☒ The set {1,2,3,4,6} is a maximal strongly connected component.

✔ Correct
Correct.

☐ The set {1, 2, 3, 4, 6} is a strongly connected component.

☒ The set {5} is by itself is a trivial maximal strongly connected component.

✔ Correct
Correct.

☐ The set {1,3,5} is a strongly connected component.

2. Select all true facts about the maximal strongly connected components (MSCCs) of any directed graph with at least two nodes.

1 / 1 point

☒ If a depth first search were started from any node of an MSCC, it would visit all the nodes in that MSCC.

✔ Correct
True

☒ It is possible to decompose the set of nodes of the graph into disjoint subsets which are each MSCCs.

✔ Correct
True

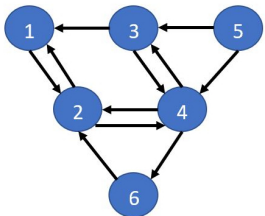
☐ If a depth first search were started from any node in an MSCC, then it would visit no node outside the MSCC.

☐ Two different MSCCs can have nodes in common.

☐ The set of all nodes in the graph is an MSCC.

3. Consider again the graph from Question 1.

1 / 1 point



Here is a table of start and finish times for a DFS visit on the nodes of the graph.

Node	Start	Finish
1	1	10
2	2	9
3	4	5
4	3	8
5	11	12
6	6	7

The list of nodes sorted in descending order of finish times is [5, 1, 2, 4, 6, 3]. Select all correct answers from list below.

☒ The reversed graph DFS visit starting from node 5 will not visit any node in the graph other than 5.

✔ Correct
Correct

☒ The reversed graph DFS visit starts from the node 5 since it has the latest finish time.

✔ Correct
Correct

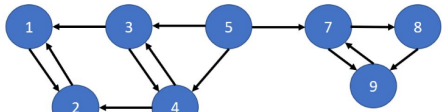
☒ The reversed graph DFS visit starting from node 1 will visit the nodes [1, 2, 3, 4, 6].

✔ Correct
Correct

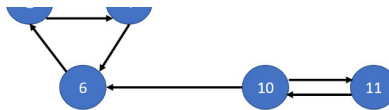
☒ The MSCC [1, 2, 3, 4, 6] remains an MSCC even when the edges of the graph are reversed.

✔ Correct
Correct

☐ When the edges of the graph are reversed, we have created the MSCC [1,2,3,4,5,6].



1 / 1 point



4. Consider the graph shown above with MSCC M1: {1,2,3,4,6}, M2: {5}, M3: {7,8,9} and M4: {10,11}

Select all the correct facts about the MSCC "super graph".

☒ The MSCC supergraph has an edge from M4 to M1 that is caused by the edge from 10 to 6 in the original graph.

☒ Correct
Correct

☒ The MSCC supergraph has an edge from M2 to M1 that is caused by the edges {5,3} or {5,4} in the original graph.

☒ Correct
Correct

☐ The MSCC supergraph can have cycles.

☐ The MSCC supergraph has an edge from M1 back to M4 caused by the edges back and forth between 10 and 11 in the original graph.