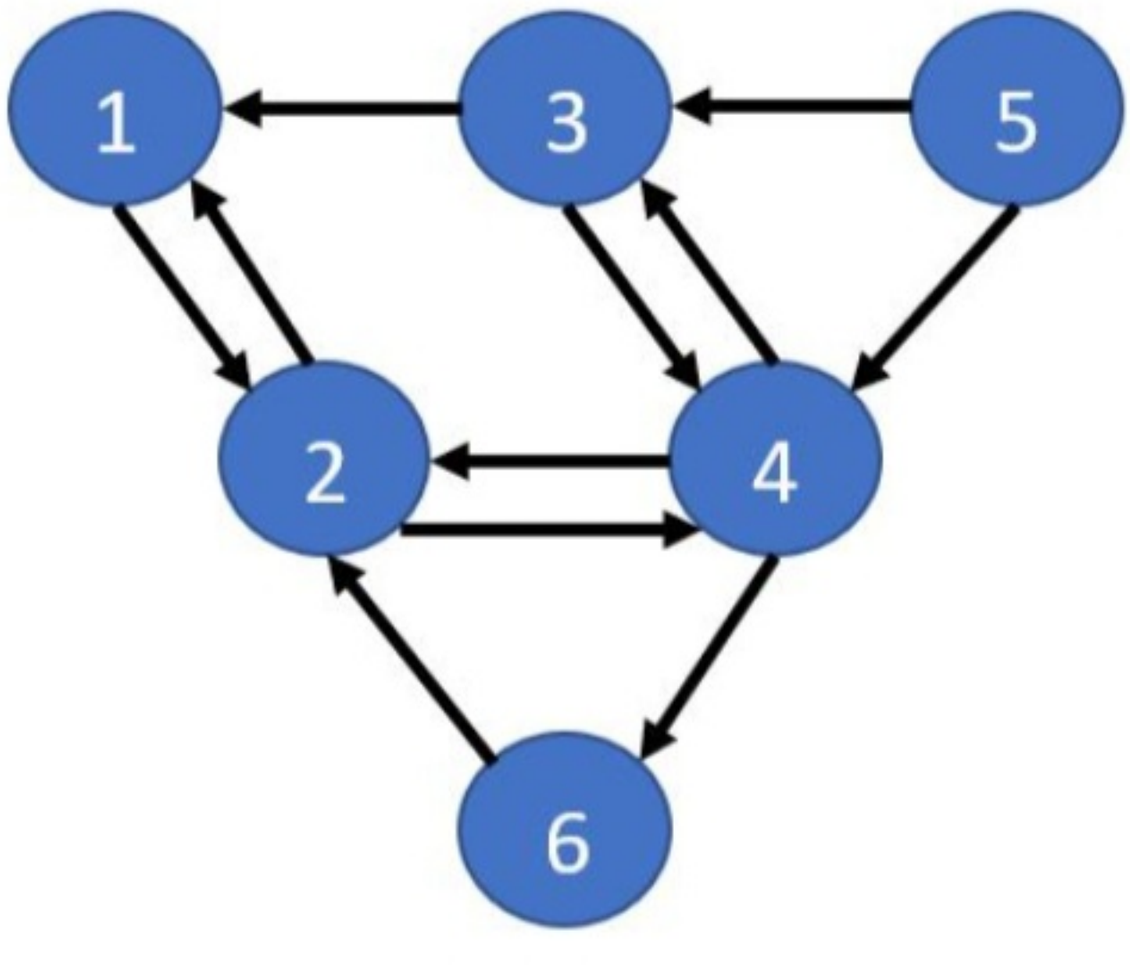
1. Consider the graph shown below:

1 / 1 point



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

- [x] The set {5} is by itself is a trivial maximal strongly connected component.

Correct
Correct.

- [x] The set {1,2,3,4,6} is a maximal strongly connected component.

Correct
Correct.

- [x] The set {1, 2, 3, 4, 6} is a strongly connected component.

Correct
It is correct.

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

- [ ] Two different MSCCs can have nodes in common.
- [x] If a depth first search were started from any node of an MSCC, it would visit all the nodes in that MSCC.

Correct
True

- [x] 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.
- [ ] The set of all nodes in the graph is an MSCC.

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

1 / 1 point

- [ ] Two different MSCCs can have nodes in common.
- [x] If a depth first search were started from any node of an MSCC, it would visit all the nodes in that MSCC.

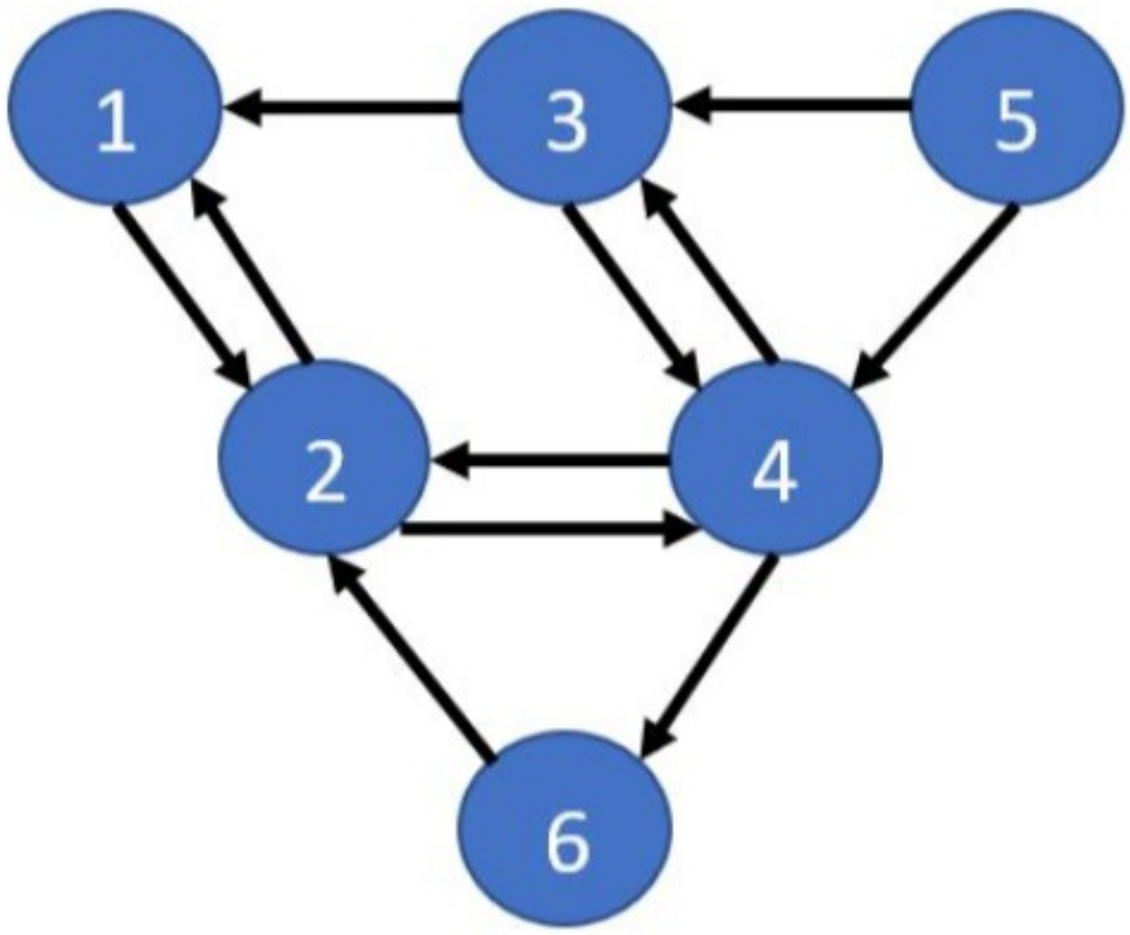
Correct
True

- [x] 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.
- [ ] 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.

- [x] The reversed graph DFS visit starts from the node 5 since it has the latest finish time.

Correct
Correct

- [x] The reversed graph DFS visit starting from node 5 will not visit any node in the graph other than 5.

Correct
Correct

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

Correct
Correct

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”.

- [x] 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 super graph has an edge from M1 back to M4 caused by the edges back and forth between 10 and 11 in the original graph.
- [ ] The MSCC supergraph can have cycles.
- [x] 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