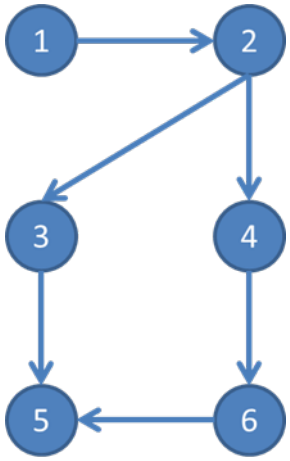
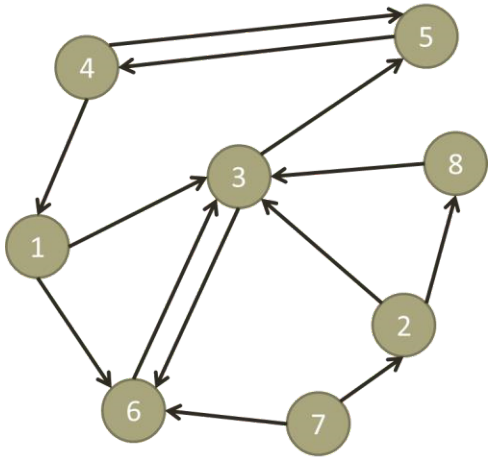
Practice Problems 3 Solutions



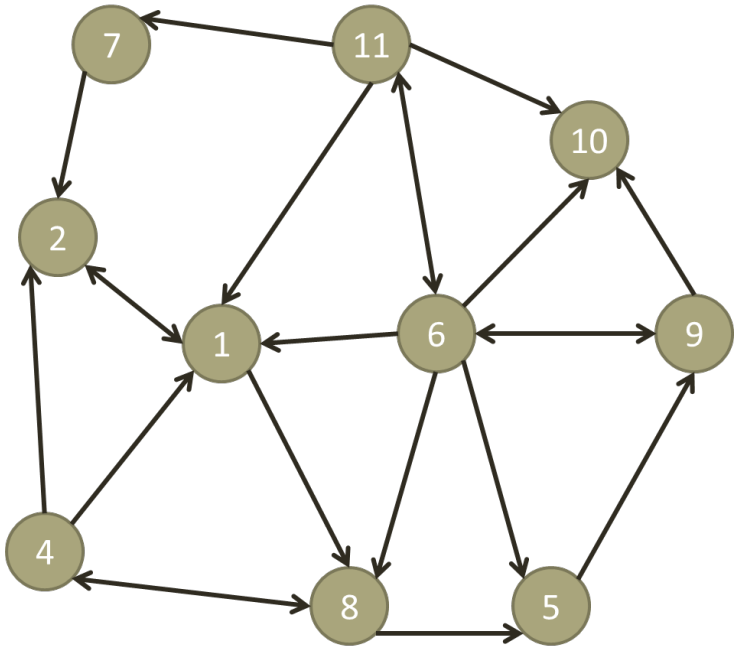
1. Given the above graph, provide an adjacency matrix and an adjacency list representing the graph.

1 -> 2
2 -> 3,4
3 -> 5
4 -> 6
5
6 -> 5

	1	2	3	4	5	6
1	0	1	0	0	0	0
2	0	0	1	1	0	0
3	0	0	0	0	1	0
4	0	0	0	0	0	1
5	0	0	0	0	0	0
6	0	0	0	0	1	0



8. Based on the above graph, identify a cycle of length 4 or greater. **(1,3,5,4,1)**



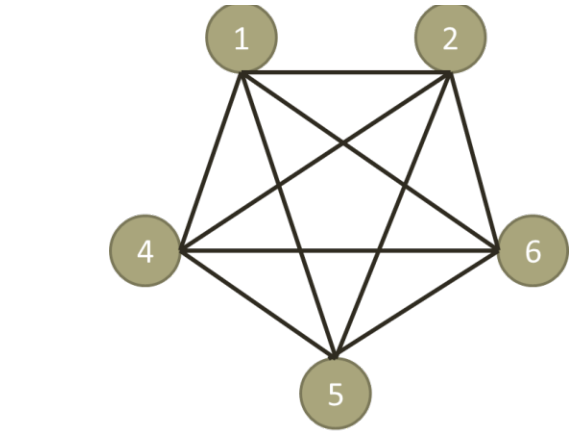
3. Provide the node traversal (the order in which nodes are explored) generated by a depth-first search of the given graph for the following scenarios.
   a. Starting at node 2, and attempting to reach node 7. Assume you always prefer a node with a smaller label value.
      (2,1,8,4,5,9,6,10,11,7)
   b. Starting at node 8, and attempting to reach node 1. Assume you always prefer a node with a smaller label value.
      (8,4,1)

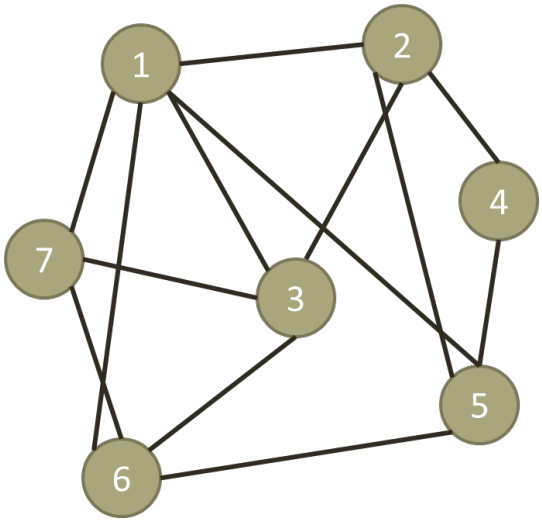
4. Provide the node traversal (the order in which nodes are explored) generated by a breadth-first search of the given graph for the following scenarios.
   a. Starting at node 2, and attempting to reach node 7. Assume you always prefer a node with a smaller label value.
      (2,1,8,4,5,9,6,10,11,7)

b. Starting at node 8, and attempting to reach node 1. Assume you always prefer a node with a smaller label value.

(8,4,5,1)

5. Construct a K_5 graph.





6. Given the above graph, determine if it has a possible planar representation, and construct that planar representation if possible.

Yes.