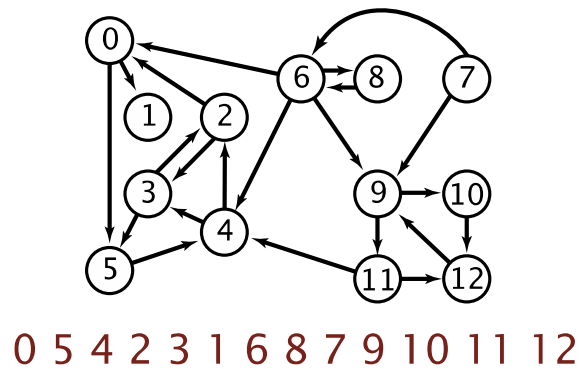


### Flipped Session Short Answer – Week 4

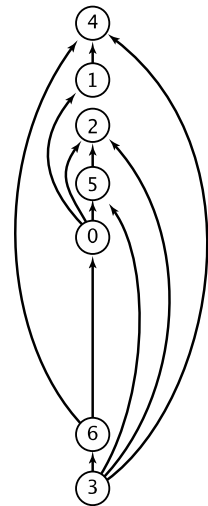
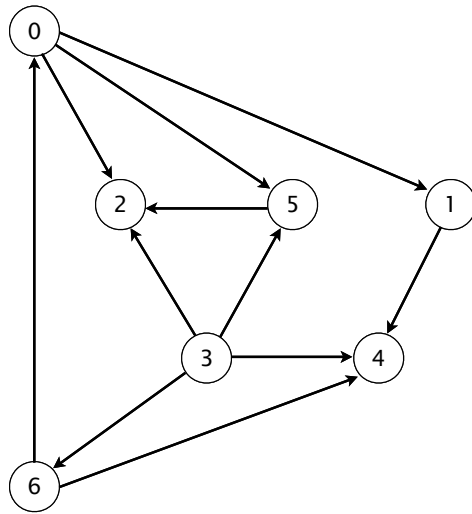
Instructions: Answer these solo or in groups.

1. A simple path is a sequence of vertices where no vertex is repeated twice. What is the worst case time to check the validity of a simple path  $P$  for a general graph with  $V$  vertices? Assume an adjacency list representation. For example, for the graph shown below, the path given is NOT valid since there is no vertex from 1 to 6.



- Worst case:
- |   |     |       |
|---|-----|-------|
| 1 | $V$ | $V^2$ |
|---|-----|-------|
2. What is the worst case if we use an adjacency matrix?
- |   |     |       |
|---|-----|-------|
| 1 | $V$ | $V^2$ |
|---|-----|-------|

3. Is the reverse postorder the only valid topological order for this graph?



topological order

4. How many strong components does a DAG on  $V$  vertices and  $E$  edges have?
5. Give an example of when you'd use DFS over BFS. Give an example of when you'd use BFS over DFS.
6. Suppose you have a choice between two algorithms, one described as having a runtime which is proportional to the sum of the degrees of the vertices, and the other described as having runtime proportional to the number of edges. Which would you choose? Why?