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Assignment 7 Answers
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1. How is the graph stored in the provided code -- adjacency matrix or edge list?

    An edge list, it is collections of each vertexes connections, not a 2d array of size n x n

2. Which of the graphs are connected? How can you tell?

    Only number 3 is not connected because it is the only one that has unreachable nodes from one or more of its nodes
    for a graph to be connected all nodes must be reachable by all others

3. Imagine that we ran each search in the other direction (from destination to source, instead of source to destination) -- would the output change at all? What if the graphs were directed graphs?

    The output would not change for undirected graphs.
    If the graphs were directed however this could make a difference on the reachablility.
    In a directed graph it is very possible for a path to exist from U to V but not from V to U

4. What are a few pros and cons of DFS vs. BFS?

A depth first search can get caught on a very long trail away from the destination when the destination may have been only a few steps from the origin, which BFS would find in a few steps. It is also theoretically possible for a DFS to continue down an infinite path forever, never returning to another branch to discover the destination. (non-termination)

While a BFS can find the destination quicker if it has a relative proximity to the source it can also exhaust a lot of time slowly creeping across a graph or tree if instead the destination is down a long not well connected path

Breadth first search is an optimal algorithm in that it will always find the shortest path to the destination. Whereas Depth first search is not, it can find return a path that is not the shortest path to the destination.

5. What's the Big O execution time to determine if a node is reachable from another node?

    For a graph with V vertexes and E edges it is O(V + E)