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Assignment 7 – Written Portion

1. ***How is the graph stored in the provided code? Is it represented as an adjacency matrix or list?***

It appears to be stored as an edge list, as only the edges appear next to each vertex.

1. ***Which of the 3 graphs are connected? How can you tell?***

Graphs 2 and 3 are connected because all vertices are reachable, while in graph 1 not all vertices are reachable.

1. ***Imagine that we ran each depth-first and breadth-first searches in the other direction (from destination to source). Would the output change at all? Would the output change if the graphs were directed graphs?***

The output would not change if the graph is not directed. If the graphs were changed to directed, the output would change due to single direction edges.

1. ***What are some pros and cons of DFS vs BFS? When would you use one over the other?***

DFS Pros – Can potentially find the solution faster while using less memory

DFS Cons – Can potentially get stuck down infinite paths and never find a solution, and can also result in a lot of backtracking.

BFS Pros – Will always end up finding a solution since it searches multiple paths at once

BFS Cons – Not as memory efficient as DFS

***5. What is the Big O execution time to determine if a vertex is reachable from another vertex?***

O(E+V), where E is the number of edges and V is the number of vertices.