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CS 261 – Assignment 7

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

The graph is stored as a list of vertices and a matrix of edges that specify which nodes are connected.

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

Graph 1 : No connected

Graph 2: Connected

Graph 3: Connected

If every vertex is connected to each other vertex, then the graph is connected. This can be noted by the program output saying "DFS PATH, BFS PATH" vice "DFS NO PATH, BFS NO PATH"

3. 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?

No, the connected vertices should be the same, if you are navigating from destination to source or from source to destination. In the case of directed graphs, the path from source to destination may not be available from destination to source. Perhaps the destination vertex has only one input and zero outputs, therefore there is no path from destination to source.

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

Depth-first searches are better if the data has elements that nest well. A breadth-first search is better if the data is evenly distributed amongst vertices.

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

O(log n)