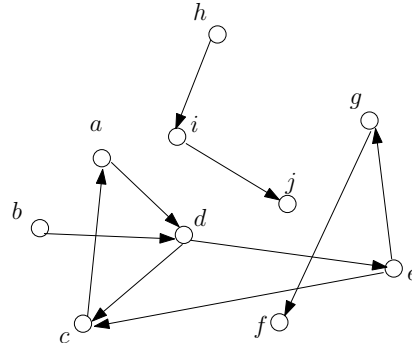


CSCI2100: Special Exercise Set 12

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Problem 1. Consider the following directed graph.



Show a BFS-tree that can possibly produced by running the BFS algorithm starting from a .

Problem 2. Consider the graph in Problem 3. Is the following a possible order of the vertices visited (i.e., discovered) by any BFS execution?

d, e, c, g, f, a

Problem 3. Consider that we run BFS on the graph in Problem 1, starting from vertex a . Show the content of the queue at the moment right after node g enters the queue.

Problem 4. Let $G = (V, E)$ be a directed graph, given in the adjacency list format. Define a directed graph $G' = (V, E')$ where an edge $(u, v) \in E'$ if and only if $(v, u) \in E$ (namely, G' reverses the direction of each edge in G). Describe an algorithm to obtain an adjacency list representation of G' in $O(|V| + |E|)$ time.