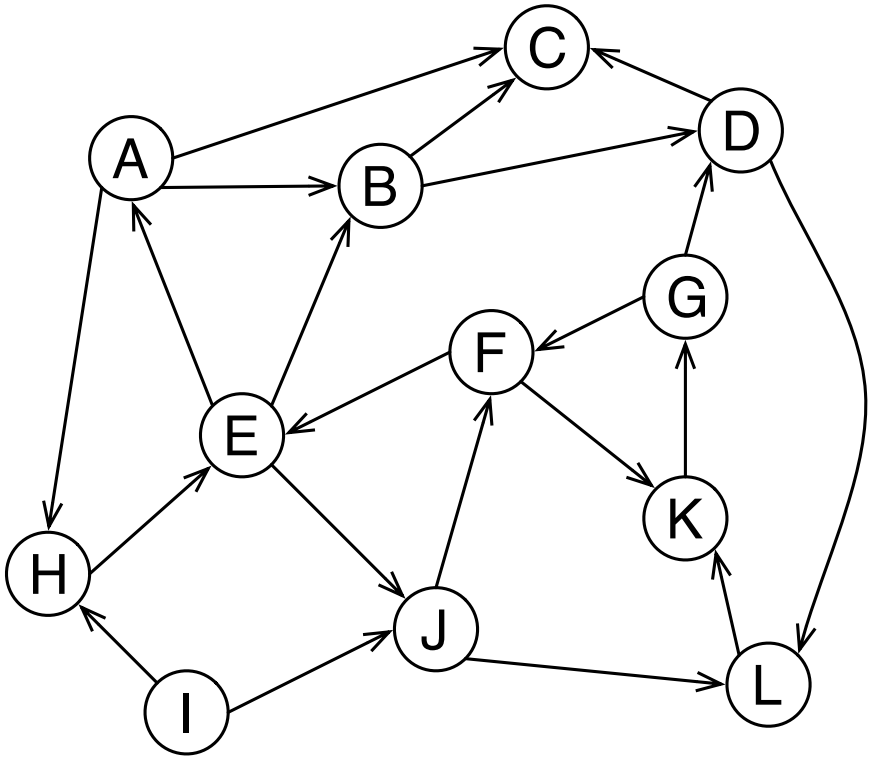
Executing Searches

- Trace an execution of `breadth_first_search()` on the following directed graph starting from vertex A.
- Highlight the search tree.
- Find a shortest path from vertex A to vertex G.



Concepts

Justify the true statements and give a counterexample for the false statements.

- If u can reach w and v can reach w in a directed graph, then either u can reach v or v can reach u.

- If there is a *walk* from a vertex u to a vertex v in a directed graph, then there is a *path* from u to v.

- A directed graph with n vertices and n edges must contain a cycle.

- An undirected and connected graph with n vertices must contain at least $n - 1$ edges.

- An undirected graph with n vertices and n edges must contain a cycle.