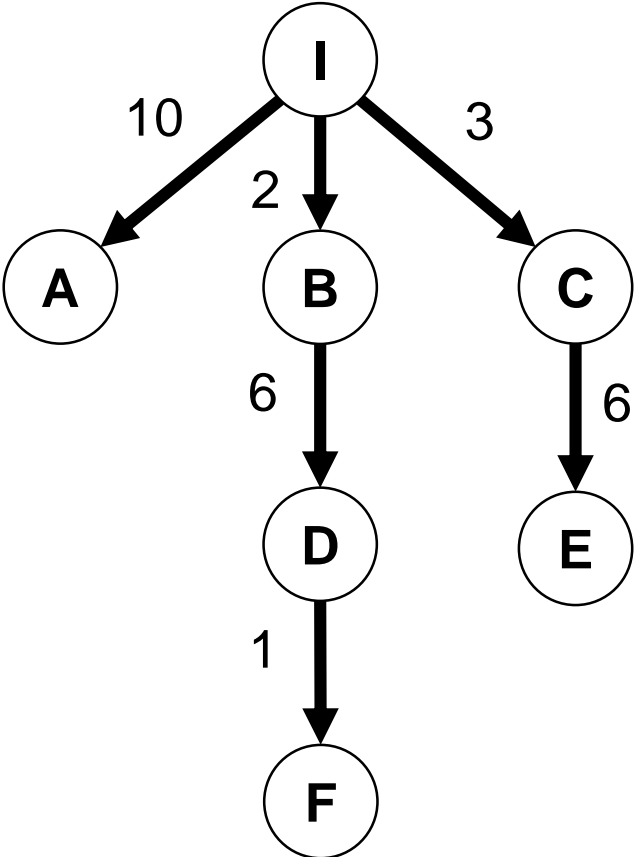


Q1-1: You are running BFS on a finite tree-structured state space graph that does not have a goal state. What is the behavior of BFS?

1. Visit all N nodes, then return one at random
2. Visit all N nodes, then return "failure"
3. Visit all N nodes, then return the node farthest from the initial state
4. Get stuck in an infinite loop



Q1-2: You are running UCS in the state space graph below. You just called the successor function on node **D**. What is the cost of node **F**?



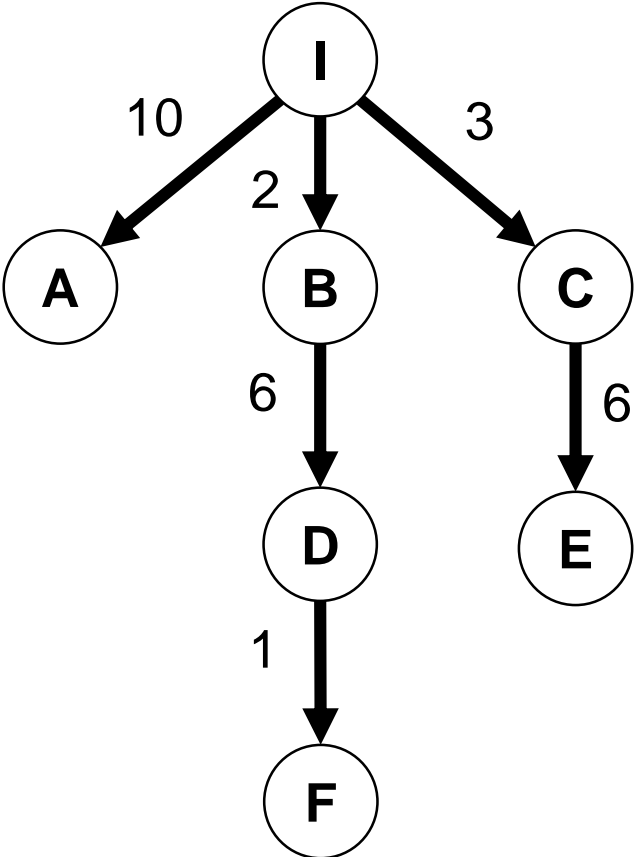
1. 2

2. 7

3. 8

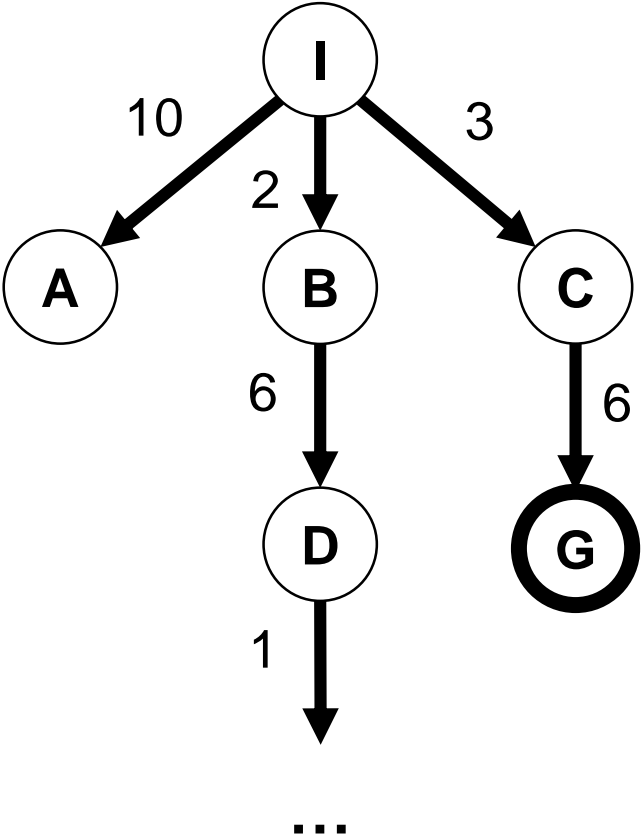
4. 9

Q1-3: You are running UCS in the state space graph below. You just expanded (visited) node **C**. What node will the search expand next?



- 1. A
- 2. D
- 3. E
- 4. F

Q2-1: You are running DFS in the state space graph below. DFS expands nodes left to right. **G** is the goal state. The state space graph is infinite (the path after **D** does not terminate). What is the behavior of DFS?



1. Get stuck in an infinite loop
2. Return A
3. Return G
4. Return "failure"

Q2-2: You need to search a randomly generated state space graph with one goal, uniform edges costs, $d=2$, and $m=100$. Considering worst case behavior, do you select BFS or DFS for your search?

1. BFS



2. DFS

Q2-3: You need to search a randomly generated state space graph with one goal, uniform edges costs, $d=25$, and $m=25$. Considering worst case behavior, do you select BFS or DFS for your search?

1. BFS

2. DFS



Q2-4: You need to search a randomly generated state space graph with many goals, uniform edges costs, $d=5$, and $m=10$. Considering worst case behavior, do you select BFS or DFS for your search?

1. BFS



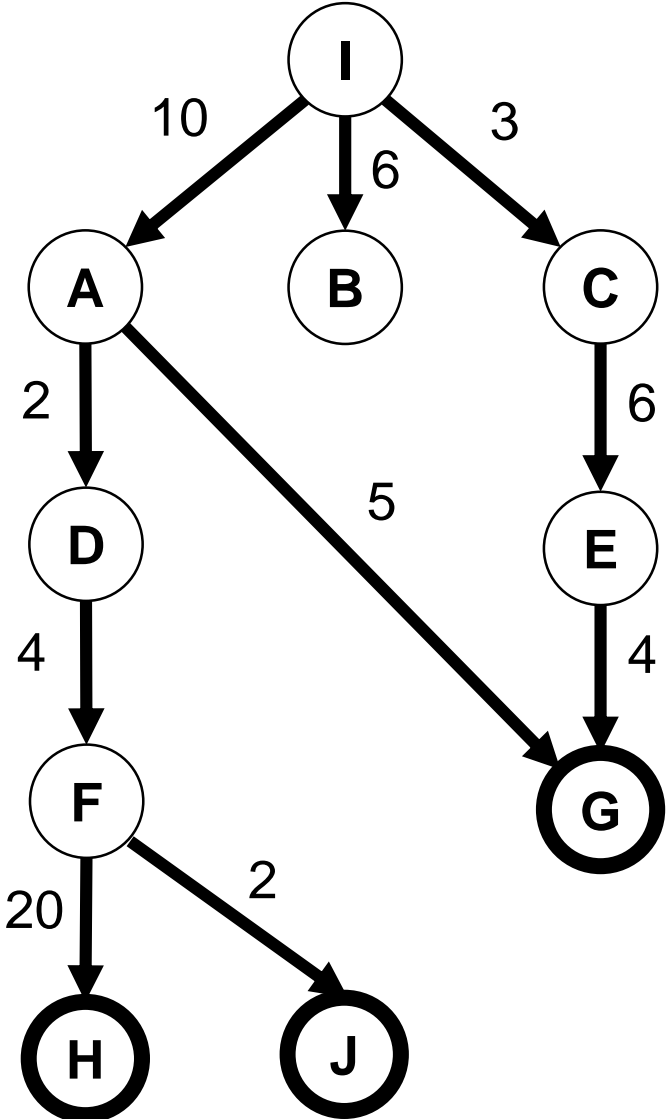
2. DFS

Q2-5: DFS uses a stack to maintain the fringe. You wish to implement DFS using the general state-space search algorithm that uses a min heap priority queue. What value should be stored in the queue for each node?

1. Node's path cost from initial state
2. $-1 * (\text{node's path cost from initial state})$
3. Node's depth from initial state
4. $-1 * (\text{node's depth from initial state})$

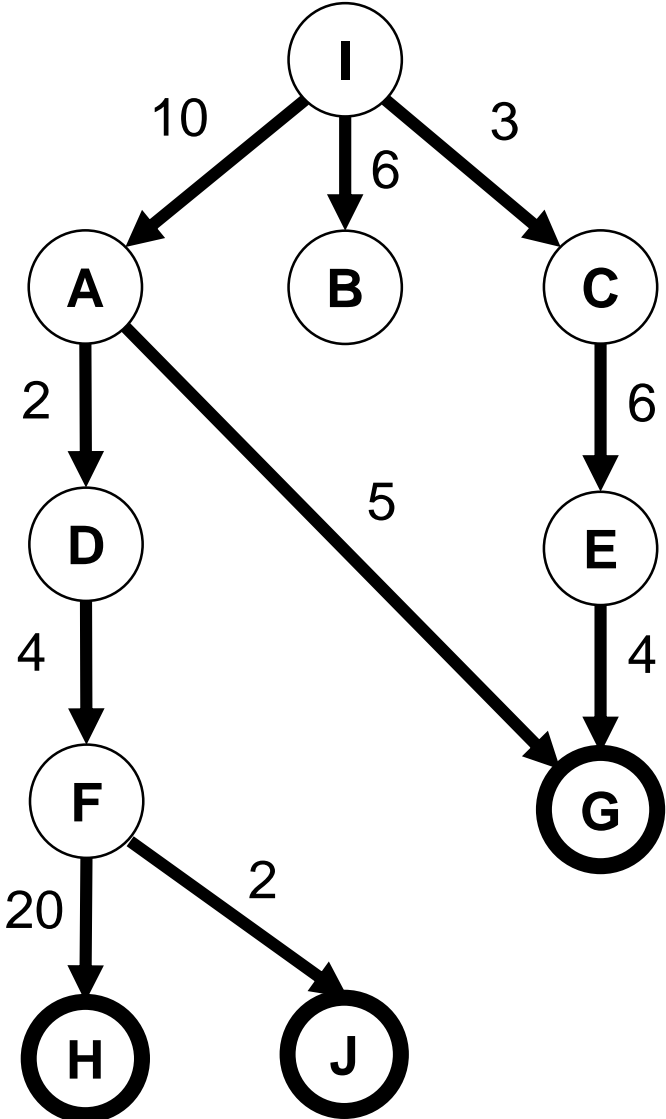


Q3-1: Consider the state space graph below. Goal states have **bold** borders. Nodes are expanded left to right when there are ties. What solution path is returned by BFS?



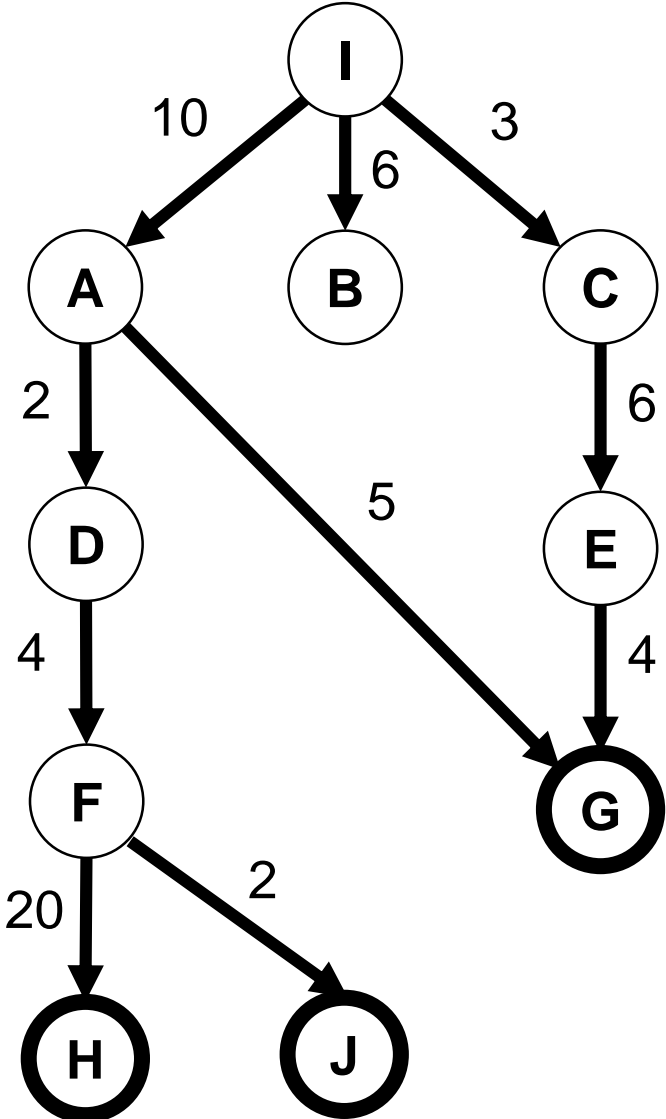
- 1. IADFH
- 2. IADFJ
- 3. IAG
- 4. ICEG

Q3-2: Consider the state space graph below. Goal states have **bold** borders. Nodes are expanded left to right when there are ties. What solution path is returned by UCS?



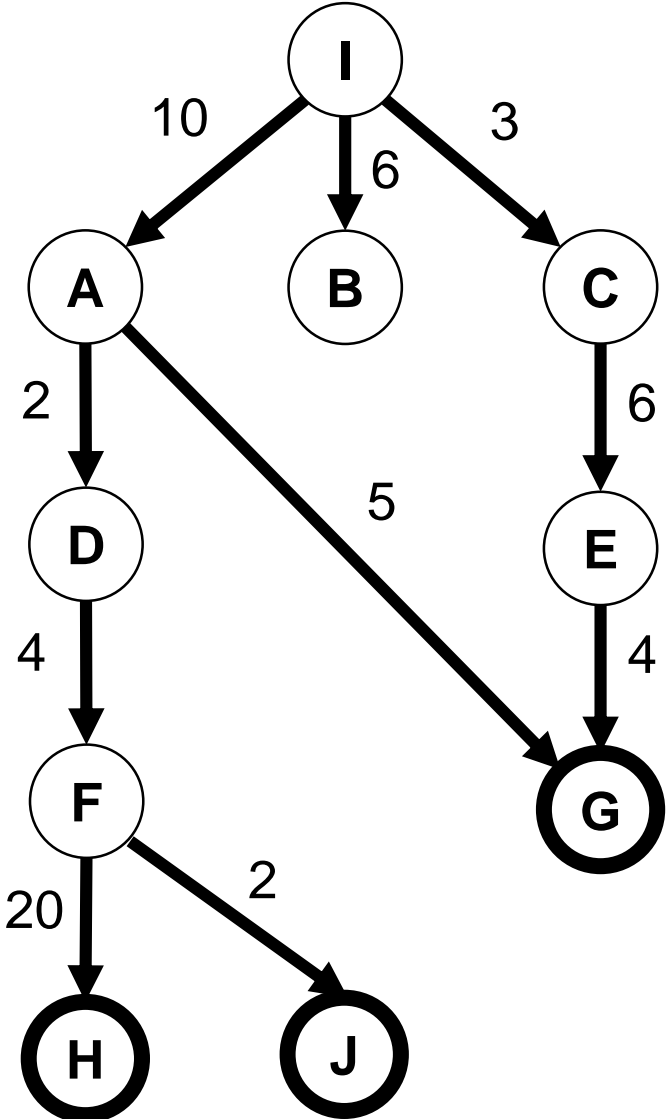
- 1. IADFH
- 2. IADFJ
- 3. IAG
- 4. ICEG

Q3-3: Consider the state space graph below. Goal states have **bold** borders. Nodes are expanded left to right when there are ties. What solution path is returned by DFS?



- 1. IADFH
- 2. IADFJ
- 3. IAG
- 4. ICEG

Q3-4: Consider the state space graph below. Goal states have **bold** borders. Nodes are expanded left to right when there are ties. What solution path is returned by IDS?



- 1. IADFH
- 2. IADFJ
- 3. IAG
- 4. ICEG