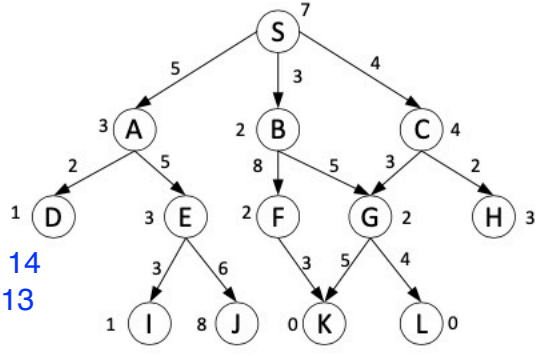
Total: 25/60

CSCI 538 Assignment 03
Search

1. (60 points, 10 points each for BFS, DFS, and IDS, 15 points each for BFS (f=h) and A* search)
Consider the search graph below. The h value of a node is given adjacent to that node. The actual cost of traversing an arc is given adjacent to the arc. Node S is the start/initial state. Nodes K and L are goals. Leaf states/nodes have no successors.



-1, BFS: …,J,K

-1, DFS: …,J,K

-15, BFS(f=h)
Node K, S->B->F->K, Cost: 14
Node L, S->B->F->L, Cost: 13

-15, A*
Node K, S->C->G->K, Cost: 12
Node L, S->C->G->L, Cost: 11

-3,IDS L3: S->A->D->E->I->J>-B->F->K (Found)

Give the order in which nodes are visited (i.e., checked for goalless) by each of the following strategies. In the case of two or more nodes with the same evaluation score, break the tie alphabetically, checking the nodes from left to right as the nodes appear in the graph above. Please note that in the graph, a state is visited only once. Show the detailed steps.

BFS: S, A, B, C, D, E, F, G, H, I, J
DFS: S, A, D, E, I, J
IDS: Depth 0: S, | Depth 1: S, A, B, C | Depth 2: S, A, D, E, B, F, C, G, H | Depth 3: S, A, D, E, I, J
BFS(f=h) with heuristic h shown on the graph S, C, H, G, B, F, J | Shortest path to J: S, B, F, J
A* search with the same heuristic S, A, B, E, F, J | Shortest Path to J: S, B, F, J

Note that for BFS(f=h) and A* search, list the shortest paths to reach the goal nodes beside the order of nodes visited.