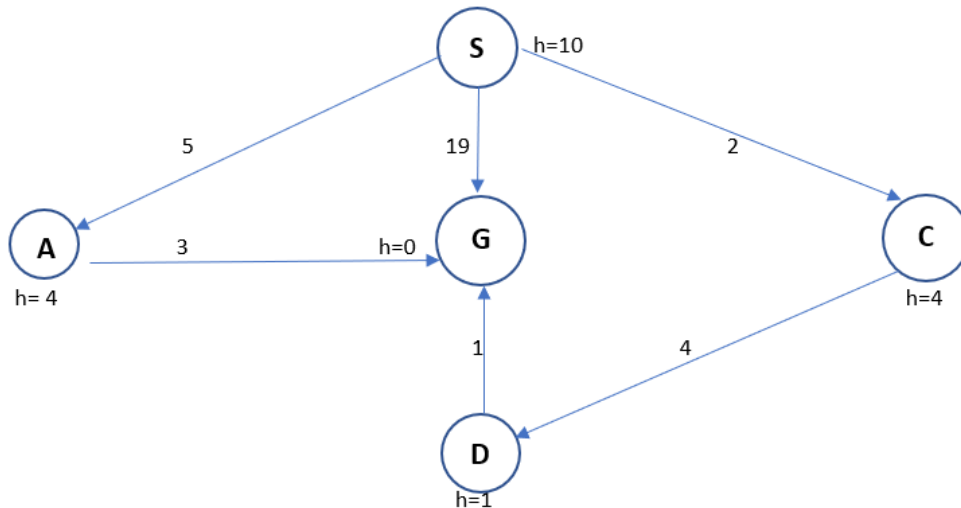


CS-271P, Intro to A.I., Winter Quarter, 2018—Quiz # 2—20 minutes

NAME: _____

YOUR ID: _____ ID TO RIGHT: _____ ROW NO.: _____ SEAT NO.: _____

1. (50 pts total, 25 pts each) HEURISTIC SEARCH. You will execute Tree Search through this graph (i.e., do not remember visited nodes). S is the start node and G is the goal node. Step costs are given next to each arc. Heuristic values are given next to each node (as $h=x$). The successors of each node are indicated by the arrows out of that node. Successors are returned in left-to-right order, i.e., successors of S are (A, G, C).



1.a (25 pts total) Show the order in which nodes are expanded in Greedy Best First search (to expand a node means its children are generated), ending with the goal node found, or indicate the repeating cycle if the search gets stuck in a loop. Show the path from start to goal, or write “None.” Give the cost of the path found, or write “None.”

(15 pts) Order of node expansion: _____ S (G) _____

(5 pts) Path found: _____ S G _____ (5 pts) Cost of path found: _____ 19 _____

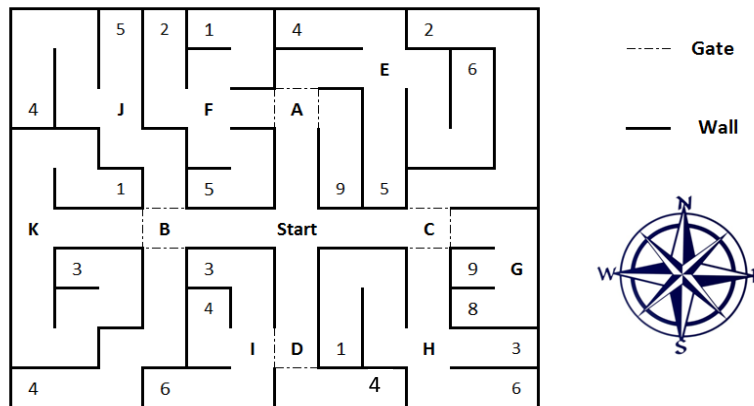
1.b (25 pts total) Show the order in which nodes are expanded in A* search (to expand a node means its children are generated), ending with the goal node found, or indicate the repeating cycle if the search gets stuck in a loop. Show the path from start to goal, or write “None.” Give the cost of the path found, or write “None.”

(15 pts) Order of node expansion: _____ S C D (G) _____

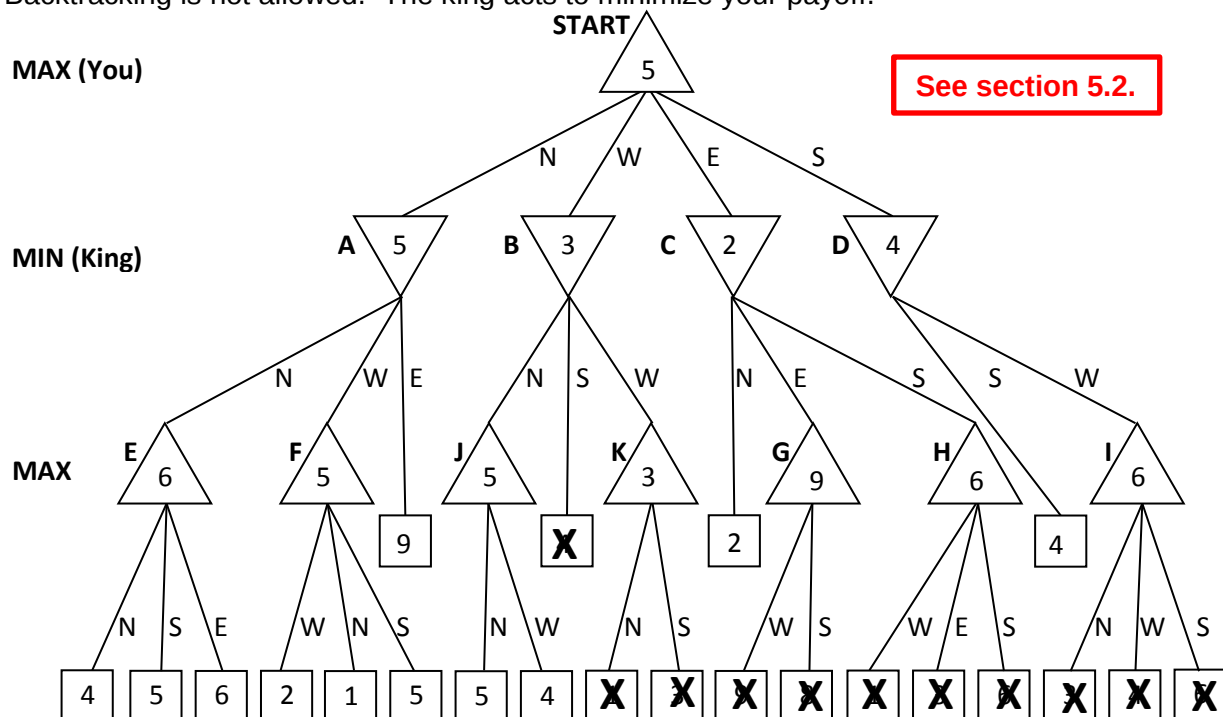
(5 pts) Path found: _____ S C D G _____ (5 pts) Cost of path found: _____ 7 _____

**** TURN PAGE OVER AND CONTINUE ON THE OTHER SIDE ****

2. (50 pts total, -5 pt each wrong answer, but not negative) MINIMAX WITH ALPHA-BETA PRUNING. While visiting Crete, you are challenged by a passing king to what he calls the “Labyrinth Challenge”. The rules are simple: you must make your way through a maze to find the largest prize for yourself. You are given the following map to plan your route:



You will start in the maze at the location labeled START and may travel North (N), South (S), East (E), or West (W). Your goal is to secure the largest, single prize for yourself, represented by the numbers spread across the maze. At four specific intersections (A, B, C, D), the king will be able to close off all but one pathway by closing gates around you, forcing you to take the path he gives you. Backtracking is not allowed. The king acts to minimize your payoff.



2.a. Fill in each blank triangle with its Mini-Max value. Process the game tree left-to-right.

2.b. Cross out each leaf node that will be pruned by Alpha-Beta pruning. Go left-to-right.

2.c. What is the best move for MAX? (write N, W, E, or S) N

See section 5.3.