

CS480 – HOMEWORK 1

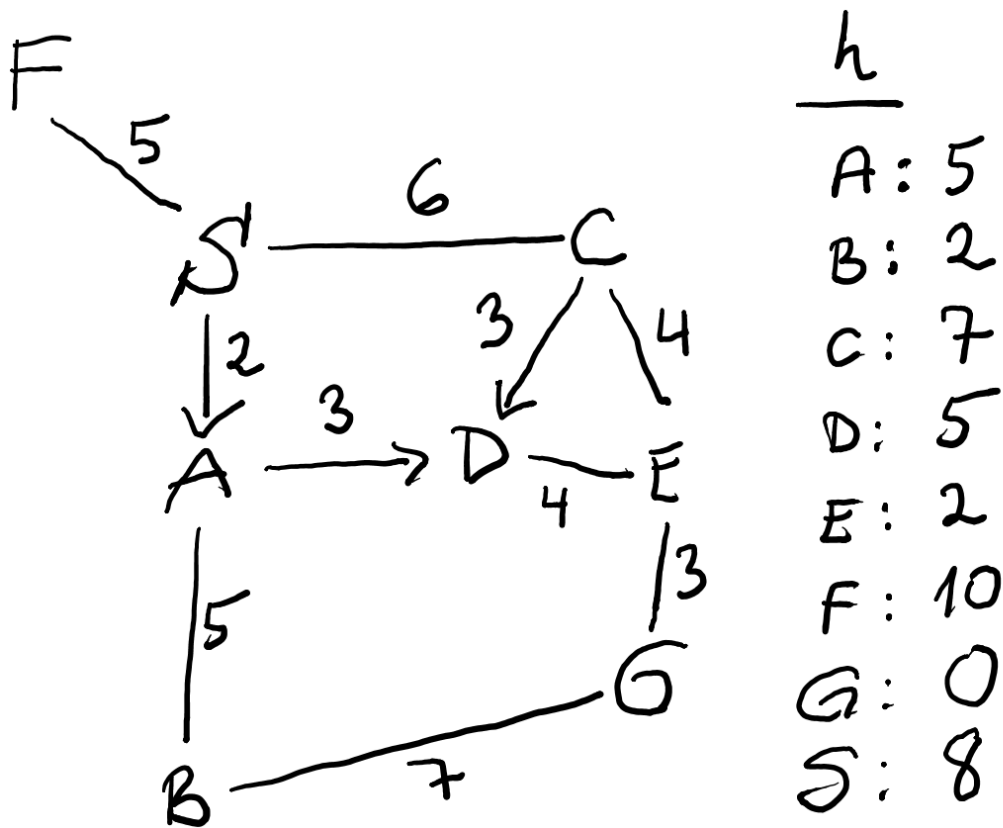
Assigned: Saturday, 9/7/2019

Due: Sunday, 9/15/2019, 9:59pm (CST)

There are 6 questions. Please submit your solutions through blackboard.

1. Solve the 5-queens problem (place 5 queens on a 5x5 board so that none is attacked) using DFS-tree search. The initial state is an empty board. Available actions at each state is to put a queen at the left-most empty column (use only legal actions). (This is a similar setup to the 4-queens problem we solved in class). Show the search tree.

For questions 2, 3, 4, 5, and 6, please use the following figure. We want to travel from S to G, where some of the roads allow only one-way traffic. The distances between two locations are given on the figure. The estimates, h , from a location to G are given on the side.



2. Hand-trace breadth-first tree search. What is the solution path found and what is its cost? Show your work.
3. Hand trace uniform-cost graph search. What is the solution path found and what is its cost? Show your work.
4. Hand trace greedy best-first tree search, where best is defined as the node that has the smallest $h(n)$. What is the solution path found and what is its cost? Show your work.

5. Hand trace A* tree search. What is the solution path found and what is its cost? Show your work.
6. Come up with an admissible heuristic function h^* that dominates every possible admissible heuristic for this map; specify $h^*(n)$ for all n . Remember the definition of dominates: h_1 dominates h_2 if $h_1(n) \geq h_2(n)$ for all n .