

NAME:

COLLABORATOR(S): *Please write down the names of your collaborators. If none, please write so. Otherwise, you'll be deducted 10 points.*

CS480 – HOMEWORK 1

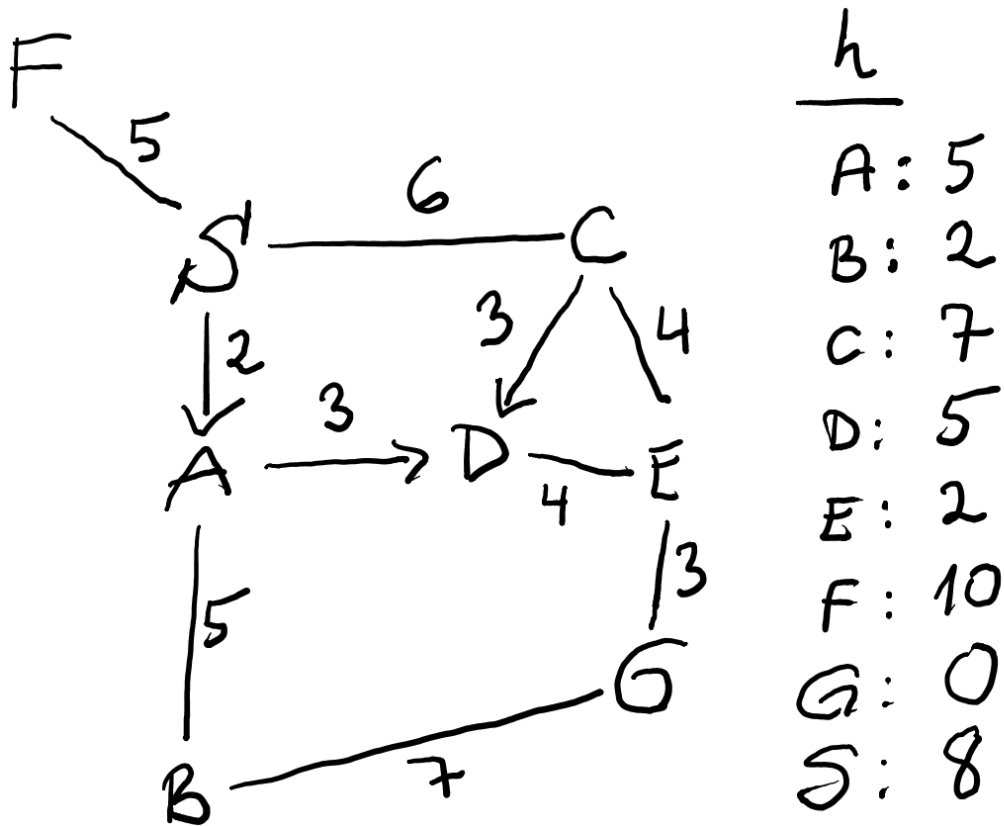
Assigned on: Wednesday, 9/17/2014

Due: Sunday, 9/28/2014, 11:59pm

There are 6 questions. Please submit your solutions through black board assignment page.

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 fill the left-most empty column. Order your actions from up to down for a given column. (This is a similar setup to the 4-queens problem we solved in class). Show the search tree.
2. Solve the 5-queens problem (place 5 queens on a 5x5 board so that none is attacked) using BFS-Tree Search. The initial state is an empty board. Available actions at each state is to fill the left-most empty column. Order your actions from up to down for a given column. (This is a similar setup to the 4-queens problem we solved in class). Show the search tree.

For the remaining questions, 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.



- Hand trace uniform-cost graph search. What is the solution path found and what is its cost? Show the search tree.
- Hand trace greedy best-first tree search. What is the solution path found and what is its cost? Show the search tree.
- Hand trace A* tree search. What is the solution path found and what is its cost? Show the search tree.
- 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 .