

CS-171, Intro to A.I., Fall Quarter, 2012 — Quiz # 1 — 20 minutes

1. NAME: _____

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

2. (16 pts total, 4 pts each) Your book defines a task environment as a set of four things, with the acronym PEAS. Fill in the blanks with the names of the PEAS components.

P _____ E _____ A _____ S _____

3. (24 pts total, 4 pts each) Label the following statements as True (T) or False (F).

3.a. ___ Local search algorithms generally operate only on one (or a few) current node(s).

3.b. ___ Local search algorithms generally are used to find the globally optimal solution.

3.c. ___ In tabu search recently visited states are temporarily excluded from being visited again.

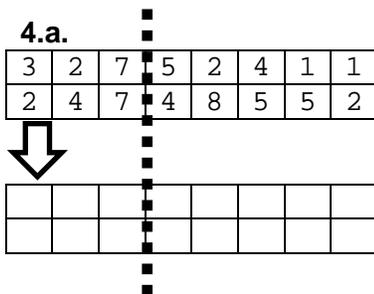
3.d. ___ Simulated annealing is more likely to accept a bad move late in the search than earlier.

3.e. ___ Local beam search retains the k best successors of the k states in the previous step.

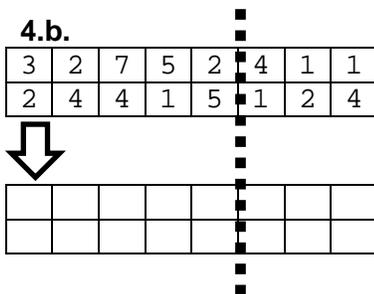
3.f. ___ Hill-climbing moves to the best successor of the current state.

4. (10 pts total, 5 pts each, -1 for each wrong answer, but not negative) You are performing genetic algorithm search for the 8-queens problem. Perform cross-over on these pairs of chromosomes at the indicated points.

4.a.



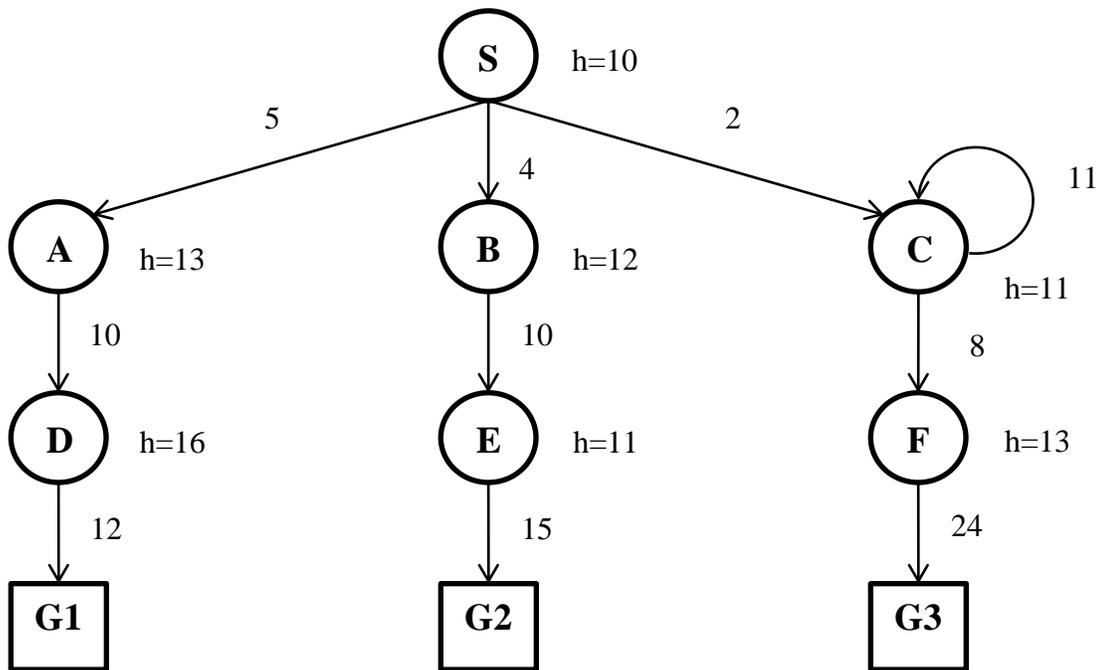
4.b.



5. (50 pts total, 10 pts each) Execute Tree Search through this graph (i.e., do not remember visited nodes, so repeated nodes are possible). It is not a tree, but pretend you don't know that. 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.

(Note: C is a successor of itself).

For each search strategy below, indicate the order in which nodes are expanded (i.e., to expand a node means that its children are generated), ending with the goal node that is found. The first one is done for you as an example.



5.a. DEPTH FIRST SEARCH.

S A D G1 _____

5.b. (10 pts, -3 for each wrong answer, but not negative) UNIFORM COST SEARCH.

S _____

5.c. (10 pts, -3 for each wrong answer, but not negative) GREEDY (BEST-FIRST) SEARCH.

S _____

5.d. (10 pts, -3 for each wrong answer, but not negative) ITERATED DEEPENING SEARCH.

S _____

5.e. (10 pts, -3 for each wrong answer, but not negative) A* SEARCH.

S _____

5.f. (10 pts, -3 for each wrong answer, but not negative) OPTIMALITY.

Did Uniform Cost Search find the optimal goal? _____ Why or why not? _____

Did A* Search find the optimal goal? _____ Why or why not? _____