

**CS 441/541**  
**Artificial Intelligence**  
**Fall, 2006**

**Homework 2: Search**

Due Tuesday, October 10

1. Textbook problem 3.8
  
2. Consider the 8-puzzle illustrated in Figure 3.4 in the textbook, and the state-space representation for this puzzle described in Section 3.2.
  - (a) Give two possible heuristic functions  $h(n)$  that could be used in this problem.
  - (b) Are your heuristic functions admissible?
  - (c) Choose one of your heuristic functions. Show the actions of the greedy-best-first algorithm on this problem with this heuristic function, to depth 3 (your illustration should be similar to Figure 4.2 in the textbook). At each level in the tree, give the value of  $h(n)$  on each node.
  - (d) For this problem, is greedy-best-first search equivalent to deterministic steepest-ascent hill-climbing using the same  $h(n)$ ? Explain why or why not.