CMPSCI 383, Fall 2011
Homework 1
Due in class or in the main office of the Computer Science building by 4:00 PM,
September 29, 2011

Problem 1: Exercise 3.3 on page 113
Problem 2: Exercise 3.6, a and b only, on page 113
Problem 3: Exercise 3.14 on page 116
Problem 4: Exercise 3.18 on page 117
Problem 5: Exercise 3.32, as modified, below, on page 119
The book gave two simple heuristics for the 8-puzzle: Manhattan distance and misplaced tiles. Several heuristics in the literature purport to improve this—see, for example, Nilson (1971), Mostow and Prieditis (1989), and Hansson (1992). Implement A^* using the two simple heuristics, as well as one other heuristic from the literature. You may not use code from any other sources, other than the pseudo-code provided in the book. Run your program on the following three initial states:

7	5	0
2		4
3	1	6

2	7	
4	0	6
1	3	5

7	6	0
2	3	4
	1	5

You should submit:

- A print out of your source code, with comments.

- A brief description of each class and major function in your code.

- A description of the third heuristic, and where you found it.

- The solution for each of the three initial states (found using any of the heuristics). A solution consists of a series of boards going from the initial state to the goal state.

- The number of nodes expanded for each heuristic for each of the three initial states (9 numbers).

- A discussion of why you think each heuristic did better or worse (in terms of number of nodes expanded).