COMP 282 Project 3: Nine Puzzle (30 points)

Due: December 1 at 23:55

Idea: As discussed in class: There is a children's game which has 8 sliding tiles numbered 1 through 8 in a 3 x 3 grid. The goal is to slide the tiles around to get them into order.

Requirements: Write a java program that reads the initial configuration of the tiles from a data file (for formatting see the sample data file below - zero indicates empty), determines using BFS whether there is a solution and the minimum number of moves to reach the solution, and uses A^* search to find the sequence of moves with least cost to find the solution where we we assume that sliding the tile with label n has cost n. Note that in the sample interaction below the least number of moves solution is the same as the least cost solution. This is not always (usually not) the case.

Your program must have at least one class called Driver3 from which I can run your program (there is very little interaction - see the sample output below).

You must also have a file called status.txt which contains your name and a short (2-10 sentence) description of the status of your program. This file should be an ascii file. Though you may create it with MS Word (or notepad/wordpad/jGrasp/etc), you should be certain that it is a text file.

Submission: Prior to the deadline upload your files (java and status.txt) to moodle (class files and data files are neither necessary nor wanted). I would suggest uploading long before the deadline and updating/replacing as you go (work on it today and upload, work on it tomorrow and replace, work on it the next day and replace, ...

Sample data.txt file:

```
1 0 3
5 2 6
4 7 8
```

Sample interaction

```
Welcome to the Nine Puzzle

Reading initial input:

There is a solution in 5 moves:
slide 2
slide 5
slide 4
slide 7
slide 8
The minimum cost solution has cost 26.
slide 2
slide 5
slide 4
slide 7
slide 8
```

Sample data.txt file:

```
1 2 3
4 5 6
8 7
```

Sample interaction

```
Welcome to the Nine Puzzle

Reading initial input:

There is no solution.
```