CS 4810/6810 sample Midterm Name: _____

You have 70 minutes

Please turn off all cellphones, pagers, etc.

You may ask questions about the problems, but not about your answers.

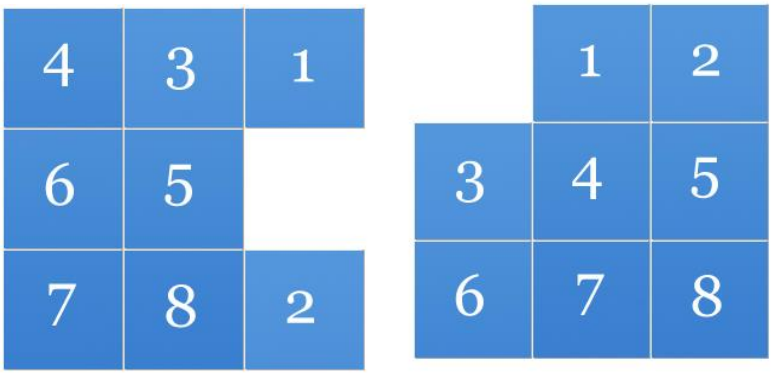
1. NetLogo:

Given the following NetLogo code, write:

- a NetLogo command *current* that takes a parameter *head*. If the current patch contains any boats, moves them 1 unit in the heading given.
- A NetLogo reporter *at_edge* for an individual boat and returns true if it is at the boundary of the world

breed [boats boat]

2. (A*) From the following 8-puzzle position on the left, show the status of the A* algorithm after each of the first 3 nodes is chosen for expansion: include the search tree and the ordering of the candidate nodes to be expanded, and the candidates to expand after the first 3 nodes. Use the Manhattan distance heuristic function of total distance of tiles from their final position. The desired end position is on the right.



For 6810 students, do all remaining questions. For 4810 students, you may pick 2 of the last 3 questions, or you can do all 3. If you only pick 2, each question is worth 25 points. If you do all 3, each question is worth 20 points.

3. (Agents) Describe how you might represent the states and possible actions for the following problem.

A news organization wants a program that will scan all public messages posted to a social media website (like Twitter) and will re-publish the messages in some way divided by keyword (hashtags, account, section of a webpage). The keywords chosen should be dynamically updated to reflect currently popular topics. Indicate any assumptions you are making (this problem description is quite incomplete).

4. (Constraint Satisfaction)

Step through 2 iterations of min-conflicts towards a solution of the following system of equations where the variables must have integer values – you don't have to actually complete a solution.

Starting values: x = 0, y = 0, z = 10

$x + z = 10$
$x - y - z = 5$
$x + 2y + z = 12$

5. (Iterative deepening)

For the following 8-puzzle, show the order of nodes being explored to a depth of 2