CS411 HW4

Sep. 16th, 2016

Exercises	Implement BFS for 15-puzzle problem
Due date	9:00 a.m., Sep. 23th, 2016.
Requirements	**1. Use Java to write your code.** **2. Submit your report in PDF.** **3. Email me .zip folder using your netID as the folder name.**
Points	**100**

In this homework, you need to implement BFS to solve 15-puzzle problem. The goal state is presented as follows (0 means the blank tile):

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	0

Your assignment is to implement BFS to search for the goal state starting from following three initial states:

Initial State #1:

1	2	3	4
5	6	7	8
9	0	10	11
13	14	15	12

Initial State #2:

1	2	3	4
5	6	7	8
0	9	10	15
13	14	12	11

Initial State #3:

1	2	3	4
5	0	12	10
9	8	7	11
13	14	15	6

You need to put your implemented code and the report in a folder and sumbit a .zip folder using your netID as the folder name. Requirements are as follows:

Code (40 points):

- **Comments and Readme file(10 points): Your need to add proper comments to your code to explain it clearly. You also need to provide a Readme file to instruct me how to run your program (like how to change the input).**
- **Code Quality (10 points): Your code can not have any grammar mistake. The code should be written in a well-organized way (for example, put all the content in just one single function is not well-organized).**

- **Correctness (20 points): Your code should correctly implement the BFS search: For the input, it should be given as follows where '0' represents the blank tile:**
  1 0 2 4 5 7 3 8 9 6 11 12 13 10 14 15
  For the output, your code should list the board configurations and steps taken by BFS. If there is a solution and BFS doesn't run out of memory, an example of the output can be:
  1 0 2 4 5 7 3 8 9 6 11 12 13 10 14 15
  1 2 0 4 5 7 3 8 9 6 11 12 13 10 14 15
  1 2 3 4 5 7 0 8 9 6 11 12 13 10 14 15
  ...
  ..
  ..
  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 0
  If BFS runs out of memory, just print "Cann't find solution-BFS ran out of memory".

Reports (60 points):

- **For each search case, you need to report both memory usage and running time of your program.**
- **20 points are rewarded for each case, thus the total score will be 60 points (BFS for 3 initial states).**