File: PR3.pdf

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Part A

The first step is to understand the provided code. In your PR3.pdf file, Answer the following questions:

1. **Which method is called when the user clicks on one of the cells in the grid?**

   Public void mouseReleased(MouseEvent e)

2. **What are the two central classes used to implement Minesweeper? Roughly, what does each do?**

   [Outer] class MineSweeperGUI

   The class sets up the overall structure of the game and makes a lot of use of the inner class to help it with the board functionality. Its capabilities include but not limited to create a cell panel and mine the cells, count the mined neighbors in a row/column, expose cell under different circumstances, etc.

   [Inner] class MineCell

   The class contains some methods and instances that keep track of the row and the column in the game. Its functionality includes but not limited to get column/row in the board, clear the cell, set the cell, update label and check if a cell is mined/visited/exposed, etc.

3. **What class implements the necessary MouseListener methods that are attached to each of the cells in the board?**

   Inner class MineCell implements the MouseListener method

4. **What does the exposeSlowly method do? How do you control the animation speed?**

   The method sets off a series of exposes where each expose is delayed for [DELAY] milliseconds. In the provided code, DELAY = 150. I.e. 150 milliseconds.

   The animation speed is controlled by making use of the created instance variable Timer exposeTimer, which controls how fast the cells are exposed by passing in parameters.

5. **What is the purpose of the actionPerformed method implemented in the MineSweeperGUI class?**

   This method exposes one cell from the toExpose queue and stops the timer when toExpose is empty. When the cell finishes exposing, this method also checks if the game is already won.

These questions are a minimum starting point. If you don't understand what's happening in the code, talk about it with your classmates (this is allowed) or go see a tutor, TA or professor.

Part B

Finally, explore the difference between the two algorithms. Play the game with each algorithm, and notice how the animation changes. Describe the difference you see between how the cells are exposed when you use depth first search vs. breadth first search.

DEPTH first search

When the cells start to be exposed one after another, DFS algorithm demonstrates the animation that starts at a single node (the original [0] cell) and then visits its neighbor with a chain and goes as deep as possible. When reach the end of chain, it goes level up and descend again until no more cell can be exposed.

BREADTH first search

When the cells start to be exposed one after another, DFS algorithm demonstrates the animation that also starts at a single node (the original [0] cell), and then expand as widely as it can at each level (exposing inner layer, then outer layer, then more outer ones), such that a breadth-first traversal can be seen.