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APCS PD 1
Document

MinesweeperZ

Game Description

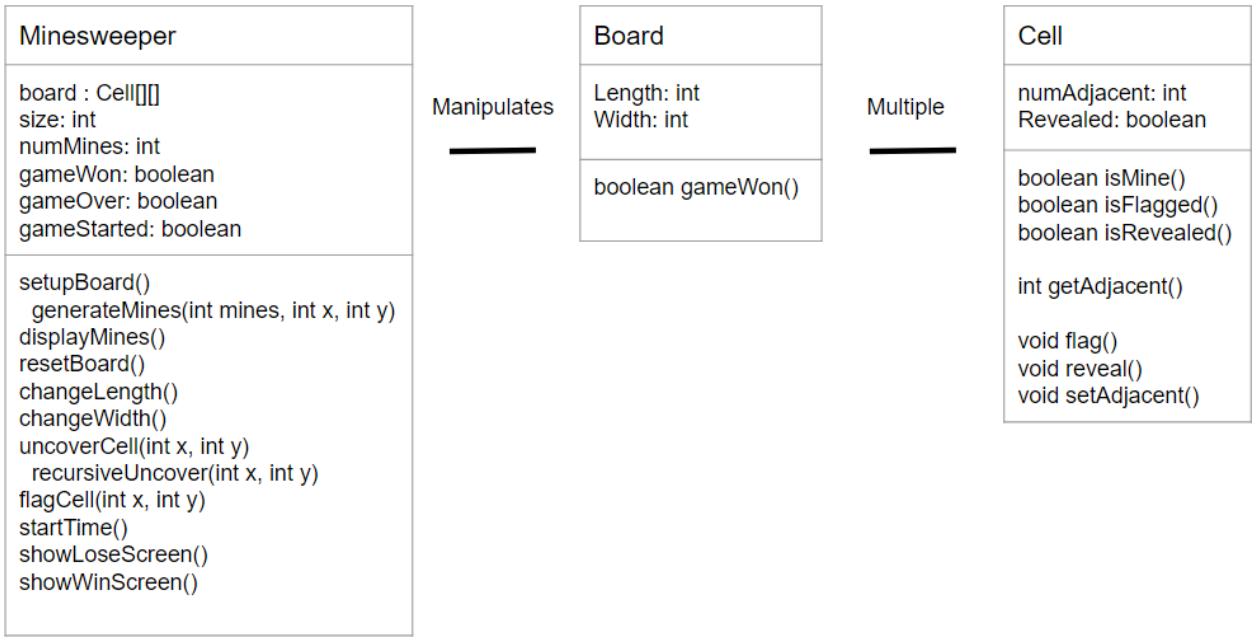
1. Grid Setup: The game begins with a square grid of cells in the form of a rectangular board. Each cell can either be empty or contain a hidden mine. Difficulty selector for size of board. The size of the board determines the number of mines.
2. Initial Cell Selection: The player starts by selecting a cell to uncover. This first selection is safe and will not contain a mine.
3. Numbered Cells: When a cell is uncovered, it will either be empty or reveal a number. The number indicates the count of mines in the adjacent cells (including diagonals).
4. Safe Cell Propagation: If an uncovered cell is empty, it will automatically uncover all the neighboring cells until it reaches cells with adjacent mines (numbered). This process of automatic propagation continues recursively until no more empty cells are left to uncover.
5. Flagging Mines: The player can mark cells they suspect to contain mines by right-clicking or using a flagging mechanism. This helps in keeping track of potential mine locations and strategizing.
6. Mine Detonation: If the player uncovers a cell that contains a mine, the game ends immediately, and the player loses. The location of the mines is revealed, and the player can choose to restart the game.
7. Game Completion: The player wins the game when all the safe cells are uncovered, and the only cells left are the ones containing mines. At this point show time for completion.

Functionalities:

- Create a board of specified length and specified width with each cell size 40.
- Associate board with int array that will contain mines.
- Randomly generate a specified number of mines on the array on the left first click. The first cell will always be an empty cell. The timer starts on the first click.
- Determine the number of adjacent mines in a cell and store it in the cell's array.
- Reveal text of numAdjacent if uncover a cell that is not a mine or empty.
- Reveal red mine if a mine is uncovered and reveal all mines.
- When uncovering an empty cell (0 adjacent), reveal all neighboring cells until you reveal a numbered cell. (recursive).
- Place flag art on the cell when right click and unflag when right click a flagged cell. There is a counter that tracks the number of flags left which corresponds with the number of mines.
- Change board size / mine count with arrow keys and update the number of mines automatically.
- You can't uncover flagged cells can't flag uncovered cells

- Determine when the game is won / lost and show the corresponding end screen with time.
- You cannot reveal or flag the board when the game has ended and must reset the board using the ‘r’ key.

UML



How to Play:

1) Start the game in Processing and use the arrow keys to set the size of the board (bigger = more difficult).
2) Left click a cell to start the game. The objective is to reveal every cell that does not contain a mine on the board. There is a timer on the right and you should try to complete the game as fast as possible. The yellow number indicates the number of flags left which corresponds to the number of mines.
3) The revealed number on the board represents the number of mines adjacent to the cell (both cardinal and ordinal). It is recommended you flag cells (right click) you believe to be mines as it helps keep track of how many mines remain.
4) Uncovering a mine will lose you the game, uncovering a number will reveal the number, and uncovering an empty cell (0 adjacent) will reveal all non-mine cells connected to the empty cell.
5) Once the game is over, click ‘r’ to reset the board.