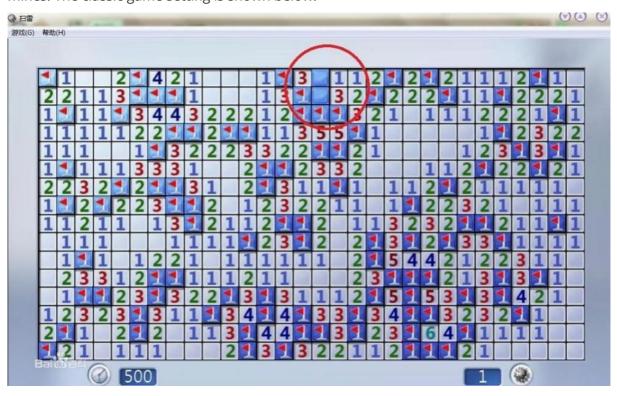# CS102A PROJECT——Minesweeper Game

This project requires you to implement a two-player turn-based minesweeper game.

1. Basic rules of the game (80 points):

1. some foundational elements of the game are included: minefields, mine counters (located in the top left corner, recording the number of remaining mines), a certain number of mines randomly arranged in a rectangular minefield of a certain size(10 mines in 9*9 squares for the primary level, 40 mines in 16*16 squares for the mediate level, 99 mines in 16*30 squares for the advanced level, and user defined level where the size of the minefield and the account of mines can be set by players themselves but the size cannot exceed 24*30, and the number of mines cannot surpass half of the total number of squares). The players need to find all the squares that are not mines in the minefield, and avoid stepping on the mines. The classic game setting is shown below.

2. Basic operations of the game include Left Click and Right Click. The left click is used to open the safe grid and advance the game progress while the right click is used to mark the mines to get points. Action rules:

   - **Left Click**: when you consider that a certain grid is nota mine, click the left button to open a grid. If you unfortunately hit a mine, 1 point will be deducted.
   - **Right-click**: right-click on the square is used to judge the existence of mine and mark it simultaneously. If the mark is correctly, a small red flag will be displayed and 1 point will de added to the player; if it is marked wrong,, then the player has to add the number of mistakes once.

3. Other requirements for details of the distribution of mines.

- **Avoid extremely dense arrangement**: for example, a 3*3 square full of mines (nine mines), is not reasonable. the nine dense mines can be redistributed or the minefield can be regenerated.
- **Avoid the first step of hitting a mine**: The first click on the minefield should not be a mine. If the first player hits a mine on the first click, the mines should be redistributed immediately before revealing all mines , or the minefield should be regenerated so that the player's first click is not a mine. Of course, it is also allowable to start the game without generating mines and then arrange mines based on the location of the first click.
- **Perspective mine setting**: to meet the demands of testing the game functions, the game needs a specific tool that can show the mine location in advance. It can be a "cheat mode" switch or a legal game tool to see the position of a small number of mines.

4. Two-player turn-based game: The game is played with at least two players with the turn-based rule. In each turn, a player can perform n left-clicks or right-clicks.(n can be set between 1 and 5.)

   Winning conditions: Each round requires to compare the scores of both players.

   - If the score difference between two players is greater than the number of unrevealed mines in the game zone, the superior wins directly.
   - If the scores are still the equal when all mines are revealed, the side with a less number of mistakes (mistakes include missed and marking errors) wins.
   - If the number of mistakes is still the same, the game is a tie.

5. principles of scoring: if all the basic requirements are completed, and the game interface basically meets the effect of traditional minesweeper game, then you can get 80 points, other wise points will be deducted as appropriate.

   - **Start the game (10%)**: including the area for starting the initial game and all its necessary elements, restarting the game for several times when running once project, showing the running real-time state, and avoiding intensive mines, etc.
   - **Load and store games (15%)**: including loading pre-stored games successfully, checking the consistency of loaded and stored games and saving in-progress games in text files.
   - **Play the game (35%)**: successfully play the game according to the rules, including ending the game correctly.
   - **User Interface (20%)**: design the user interface using Java Swing or FX.

2. Additional points for the game (20 points, including but not limited to):

1. The game interface is vivid and interesting, with a strong sense of experience.
2. Add game animation effects, such as visualizing the player and having corresponding actions when sweeping mines, etc.
3. Add background music and sound effects.
4. Add multiplayers (more than two people) mode.
5. Add man-machine mode.

6. Enrich the game themes and designs the game plot.
7. Support LAN online match mode.
8. Add items, characters, skills and other rules to enhance the playability
9. Add a timer to limit the player's action time per turn.
10. More.