

CS161 – KleeSweeper (Minesweeper Project)

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GENERAL FEATURES

- The GUI of this program is drawn using [Raylib](#).
- Every clickable button will change to darker color when user places mouse onto it for easier usage.

Main Menu

- “NEW GAME” button allows user to start a new game with new board configurations (number of rows, columns and mines)
- If there is a saved game, “LOAD SAVED GAME” button will appear for user to continue their saved game with saved properties.

Difficulty Screen

- The program offer three default board configurations Easy (9 x 9, 10 mines), Medium (16 x 16, 40 mines) and Hard (16 x 30, 99 mines).
- Besides, this program allows user to customize board configuration by clicking “backward arrow” and “forward arrow” buttons. The number of mines will be automatically updated to smaller value if it reaches the number that larger than Current Rows times Current Columns minus 1.

Gameplay Screen

- User can open a cell by left-click, place a flag by right-click (a cell contains flag can not be opened by left-click)
 - Once user open the first cell, the game begins and timer starts to count.
 - The mines are not placed until the player opens the first cell. When opened, the mechanism guarantees the first cell is safe and will try to avoid mining on the first cell’s neighbors so the player could have a smooth start.

- Keep track of time spent on the current game and the number of flags remaining.
 - The time spent on completing this game is used as the score.
 - The player cannot flag cells if the number of flags used reaches the number of mines on the board.
- “Pause” button contains 4 features: Reset (Play again with unchanged board configurations), Resume (Return back to game from Pause screen), Save (Save current game into the file “savegame.txt” in build folder), Quit (Return to Main Menu)
- When the game is over, a game over screen is displayed and informs the player how much time they spent on playing the game and the fastest time spent on winning a game with the same configuration.
- All records will be stored in “highscore.txt” in build folder for future playing sessions.

UNFINISHED FEATURES

- This program cannot be run directly from .exe file, user must use terminal (which is inconvenient for user who is not used to working with terminal, but I hope the instructions I give below will be useful). That is because I cannot figure out how to link my resources (including images) to the direct executable file.
- This program can only be run on MacOS (because I build it on XCode, and Visual Studio does not support C++ on MacOS)

GRAPHICS AND STORY

- This program is a Genshin Impact fangame based on the famous game “Minesweeper”. All the graphics in this program were drawn by the author - Thanh Hieu. The main character in KleeSweeper is called Klee - a character in Genshin who is an explosives expert.
- Klee in the original game’s story is well known for the danger she presents because of the bombs she put around Mondstadt (a region in Genshin’s world). Therefore, I think that her story is suitable for the Minesweeper remade game. User have to find all Klee’s bombs in the field, if you win, Kaeya from The Knights of Favonius will send you a thank-you letter, otherwise, he will tell you how hard The Knights of Favonius clearing the mess that caused from the unfigured bombs.

PROJECT STRUCTURE

The project contains `main.cpp` and `KleeSweeperbuild` file.

The include folder contains header files, the build folder (for the executable and data files generated in-game), the lib folder (contains a Raylib library file) and the resource folder (for media files).

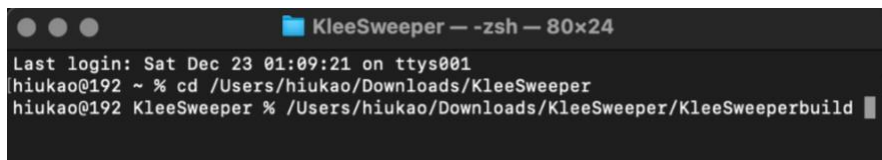
HOW TO INSTALL

Due to strict security of MacOS, you must do these following steps to allow open executable file on your laptop/PC:

1. Open the folder KleeSweeper, right-click on the “KleeSweeperbuild” file, choose “Open”.
2. The system may create a window called ***“macOS cannot verify the developer of “KleeSweeper”. Are you sure you want to open it?”***, choose Open.
3. After choosing Open, a program with nothing will be run, you must turn it off and continue to the second step.

Due to unfinished features I have mentioned before, you must do these following steps to run the program:

1. Open Terminal (by Press Command + Space Bar or F4 on your Mac keyboard)
2. Type “cd”, then drag and drop the whole folder KleeSweeper into the Terminal window. This action can change your current directory to the program’s directory. Press “return” on your Mac keyboard.
3. Open the folder KleeSweeper, drag and drop the file “KleeSweeperbuild” into the Terminal window. Your terminal may look like this



```
KleeSweeper - zsh - 80x24
Last login: Sat Dec 23 01:09:21 on ttys001
hiukao@192 ~ % cd /Users/hiukao/Downloads/KleeSweeper
hiukao@192 KleeSweeper % /Users/hiukao/Downloads/KleeSweeper/KleeSweeperbuild
```

4. Press “return” on your Mac keyboard and the program should be run successfully.

HOW TO PLAY

Video Demonstration

Link: <https://youtu.be/fcC4k5uw0iw>

Instruction

- Click on “NEW GAME” to begin a new game.
- If there is a save file of a previous game on your computer, the “LOAD SAVED GAME” button will appear. Click on that button to continue that game.

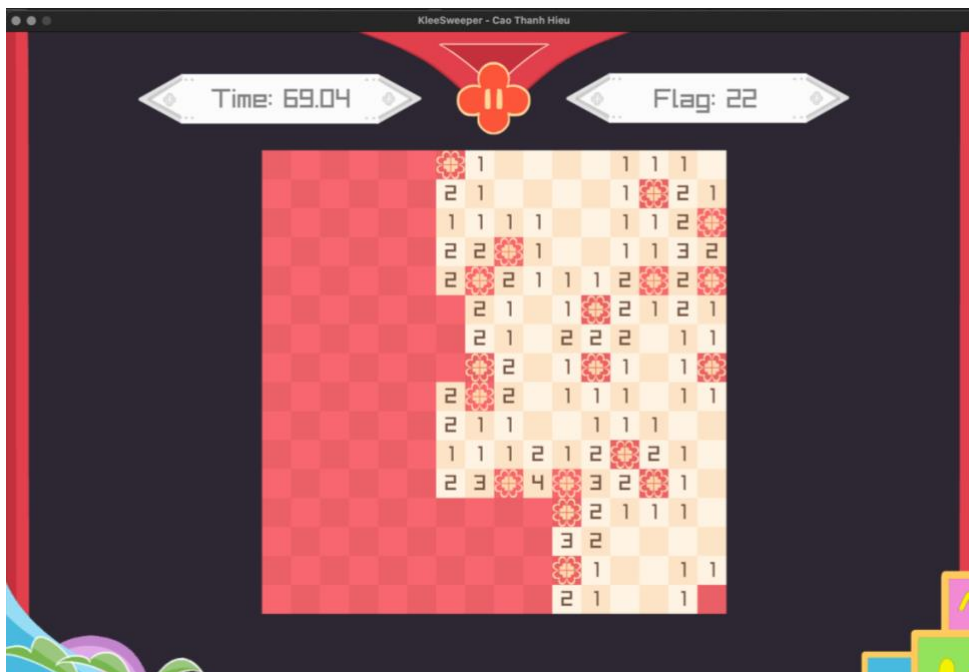


If you choose “NEW GAME”, the Difficulty screen should appear.

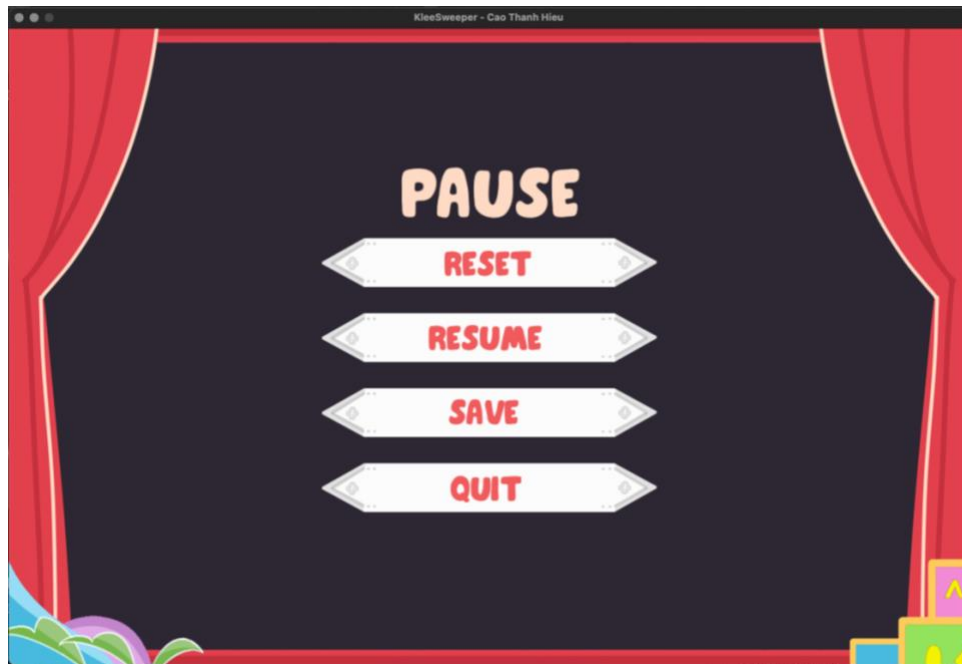
- Click on one of the three modes (Easy, Medium, Hard) to set the configuration.
- You can also set the configuration on your own by decreasing or increasing the number of rows, columns and mines. Press “Start” to start a new game with your custom configuration.
- Press “Main Menu” to return to the main menu.



- Click on a cell to begin the game.
- Left-click on a cell to open it, right-click on a cell to flag it.
- With opened cells, if you put flags on exact unopened bombs, you can right-click on them to open unopened no-bomb cells. If the flags do not match the positions of bombs, you will lose immediately.



- You can press the “||” button on the button that placed between the Timer and Flag Counter to pause the game.
 - Press “RESET” to start a new game with the same configuration.
 - Press “RESUME” to resume the game.
 - Press “SAVE” to save current game state.
 - Press “QUIT” to return to main menu.



- The game ends when you click on a mine or open all safe cells. The time you spent on this game and the fastest time will be displayed.
 - Click on the “MAIN MENU” button to return to the main menu.
 - Click on the “PLAY AGAIN” button to start a new game with the same configuration.
- 2 images below are the Lose screen and Win screen respectively.

