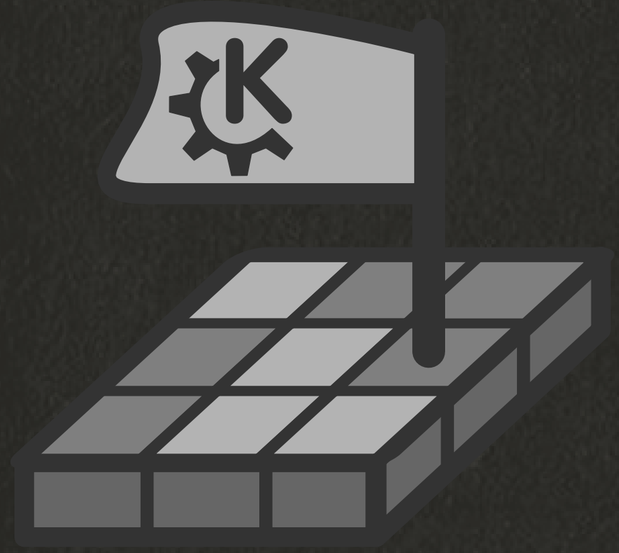
MINESWEEPER GAME IN C++ USING SFML



PRESENTATION

INTRODUCTION

Purpose of the project:

- Create a simple yet interactive Minesweeper game using C++ and SFML (Simple and Fast Multimedia Library).
- A fun project to practice game development and graphical programming.

Key Features:

- Dynamic grid sizes (Low, Medium, High difficulty levels).
- Bombs are placed randomly, with numbers showing the count of adjacent bombs.
- Game over state with the option to restart or quit.

Game Mechanics

Game Objective:

- Players need to uncover all the non-bomb cells without clicking on a bomb.
- Clicking on a bomb results in a "Game Over" screen.

Gameplay Mechanics:

- Left-click to reveal cells.
- Clicking a bomb causes a game over.
- Revealing a cell displays the number of bombs around it (0 for no bombs).
- Game is resettable with options to restart or quit.

Difficulty Levels:

- Low: 10x10 grid, 10 bombs.
- Medium: 20x20 grid, 40 bombs.
- High: 30x30 grid, 90 bombs.

How the Game Work

- Grid Creation:
- 2D Grid: The game grid is represented by a 2D vector in C++.
- Bomb Placement: Randomly placing bombs and updating adjacent cells with numbers.
- Game Over Condition:
- Clicking on a bomb triggers a game over.
- All cells are revealed to show the bomb positions.
- Revealing Cells:
- If a cell is empty (no adjacent bombs), adjacent cells are recursively revealed.

Code Overview

Class: Minesweeper

- Constructor:

  Initializes the grid, sets up bomb count, and loads the font for displaying numbers.

- Methods:
  - generateBombs(): Places bombs randomly and updates the grid with adjacent bomb counts.
  - handleClick(): Processes mouse clicks, triggers game over if bomb is clicked, or reveals the cell.
  - revealCell(): Recursively reveals empty cells (flood fill).
  - draw(): Draws the grid and displays the numbers.
  - reset(): Resets the game to its initial state with new difficulty

User Interface (UI)

Main Menu:
    - Show the buttons for Low, Medium, and High difficulty.
- Game Over Screen:
    - Display the restart and quit buttons.
- In-Game:
    - Show how cells are revealed and how numbers are displayed.
    - Highlight the colors: red for bombs, green for covered cells.

Conclusion

- Summary:
  - A simple but functional Minesweeper game made using C++ and SFML.
  - A great project to practice both algorithmic problem-solving and graphical programming.


Thank
you