Cole Swiger

Tic-Tac-Swap

OVERVIEW

Tic-Tac-Swap is a 2-D game built in Unity v2021.3.12f1. The game is based on the classic game of Tic-Tac-Toe with new shapes and an additional move. The current version of the game was published to Unity Play on March 7, 2023.

Links

1. Github: https://github.com/Cole-Swiger/Tic-Tac-Swap
2. Unity Play: https://play.unity.com/mg/other/v1-2-1-mh

Purpose

This project is my first full game built in Unity and was built while taking the Junior Programmer Pathway in Unity Learn. Since this is a beginner's course, the project is fairly straightforward. Although its main purpose was to be a learning experience, the game is fully functional and is available for anyone to play for free.

This document details the gameplay, design, and functionality of the game. First, it gives an overview of the game and the rules, followed by screenshots and flow diagrams of the two scenes that compose the game. After that, it details how the game state is calculated after every turn.

Game Summary

Tic-Tac-Swap keeps many of the same elements from the game that inspired it. It is a one-versus-one game where each player plays shapes, circles and triangles in this case, on a 3 by 3 grid. The goal is to get three of your shapes in a row. This can be done vertically, horizontally, or diagonally.

Players alternate taking turns placing their shape anywhere on the grid that isn't occupied. In the original game, this was the only option players had and the game ended when either player got three in a row or if all the spaces were filled. In Tic-Tac-Swap, players also have the option to

swap two occupied spaces instead of placing a new shape. Players cannot swap with an empty space, but they can swap two of the same shape.

This new mechanic also allows players to undo a three in a row after it happens. This means the game doesn't immediately end when someone gets a three in a row. Instead, the other player gets one turn to swap the three in a row. If a player makes a move that gives the other player three in a row, the other player immediately wins. Put simply, if a player has three in a row at the start of their turn, they win.

There is one exception to the rules stated above. If there is only one available move, meaning no move can be made after the current turn is finished, then the win conditions are a little different. If the player making the last move gives themself three in a row, they win, even if they give the other player three in a row as well. And just like in the original game, if neither player has three in a row at the end, it's a tie or a "cat."

Project Structure

The game uses 2 scenes, the Main Menu, and the Main Game.

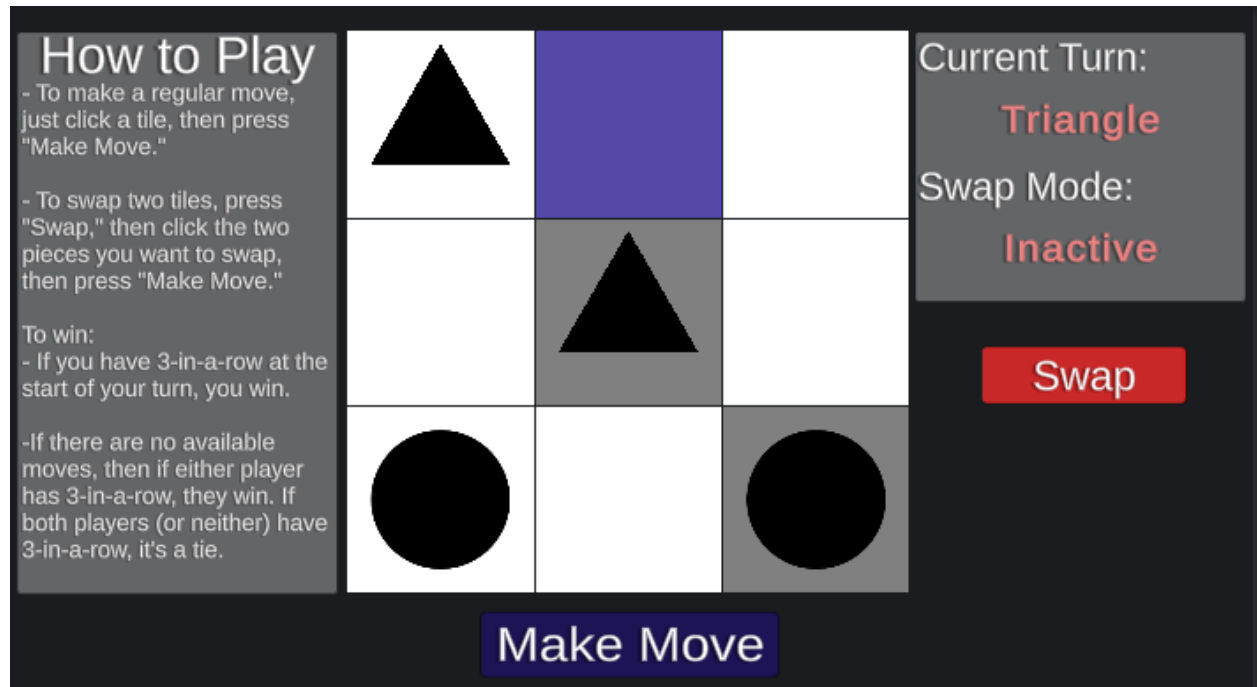### Main Menu

Buttons

- **Start**: Loads the Main Game scene
- **Rules**: Opens UI Rules Menu
- **Exit**: Quits the application

Flow Diagram
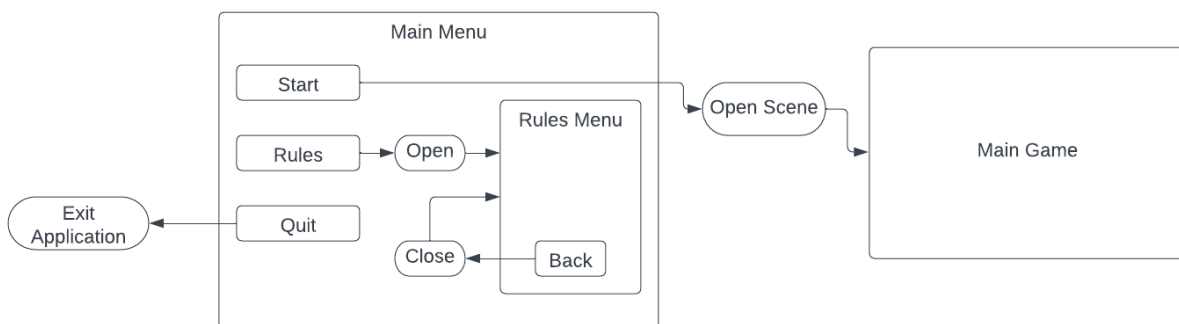
## Main Game

Buttons

Main Game

- **Make Move**:
    - If Swap Mode is active and 2 occupied tiles are selected, swap the contents of those tiles.

- ○ If Swap Mode isn't active and an unoccupied tile is selected, place the shape for the corresponding player in that tile.
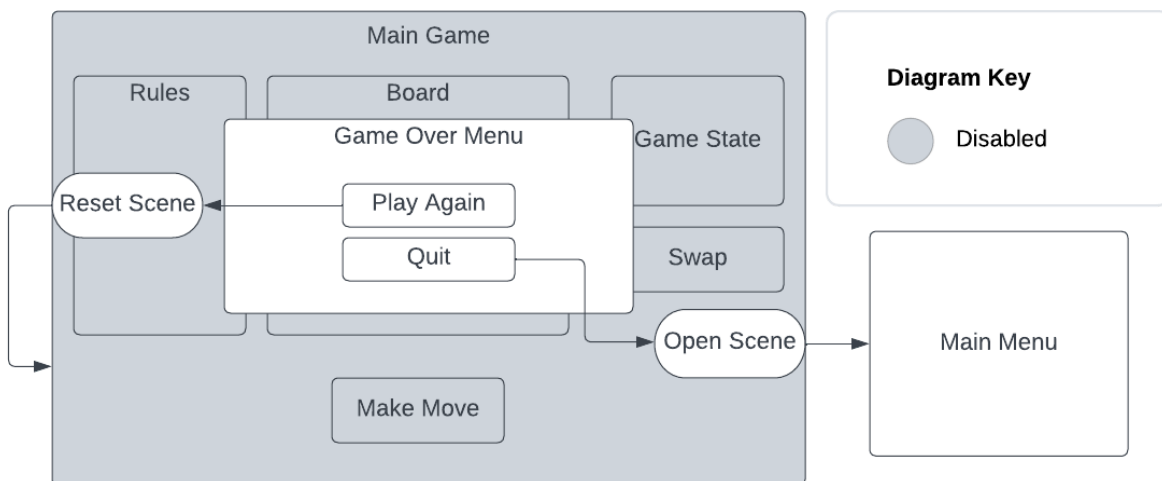- **Swap**: Toggles Swap Mode on and off.

Game Over Menu

- **Play Again**: Resets the scene to a clean state so the game can be played again.
- **Quit**: Exit the game and open the Main Menu Scene

Main Game Flow
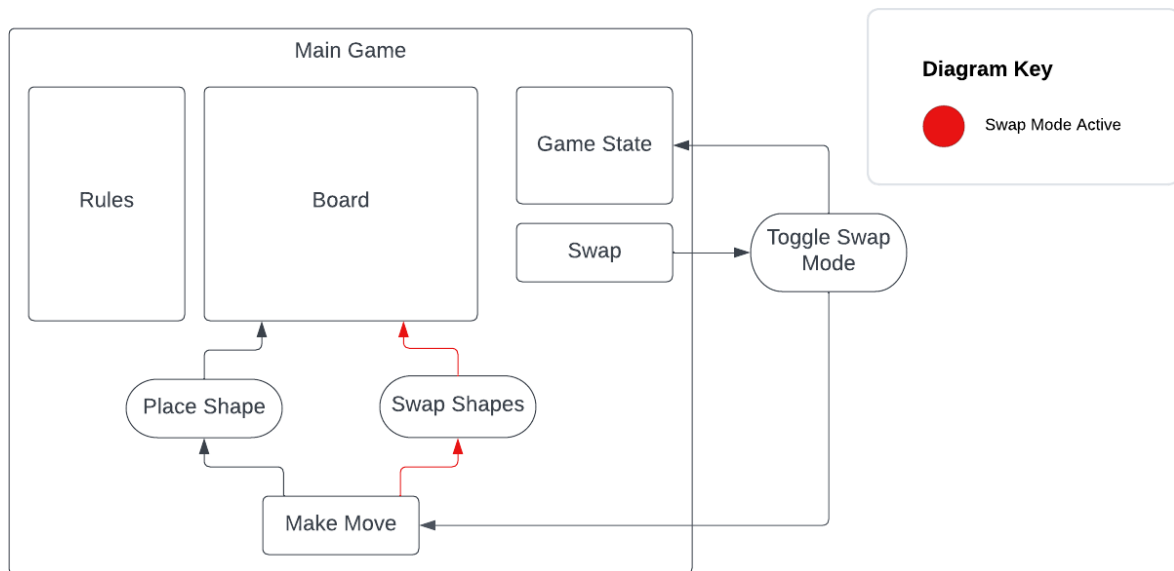
Game Over Flow Diagram

Board State Functionality

After each move, a method runs to check the current board state and see if either player has won. This is done using 8 invisible line objects that detect the collisions of the placed shapes. These collisions allow the script to determine if a player has three in a row and will end the game if the right conditions are met (These conditions are outlined in the Game Summary)

Board
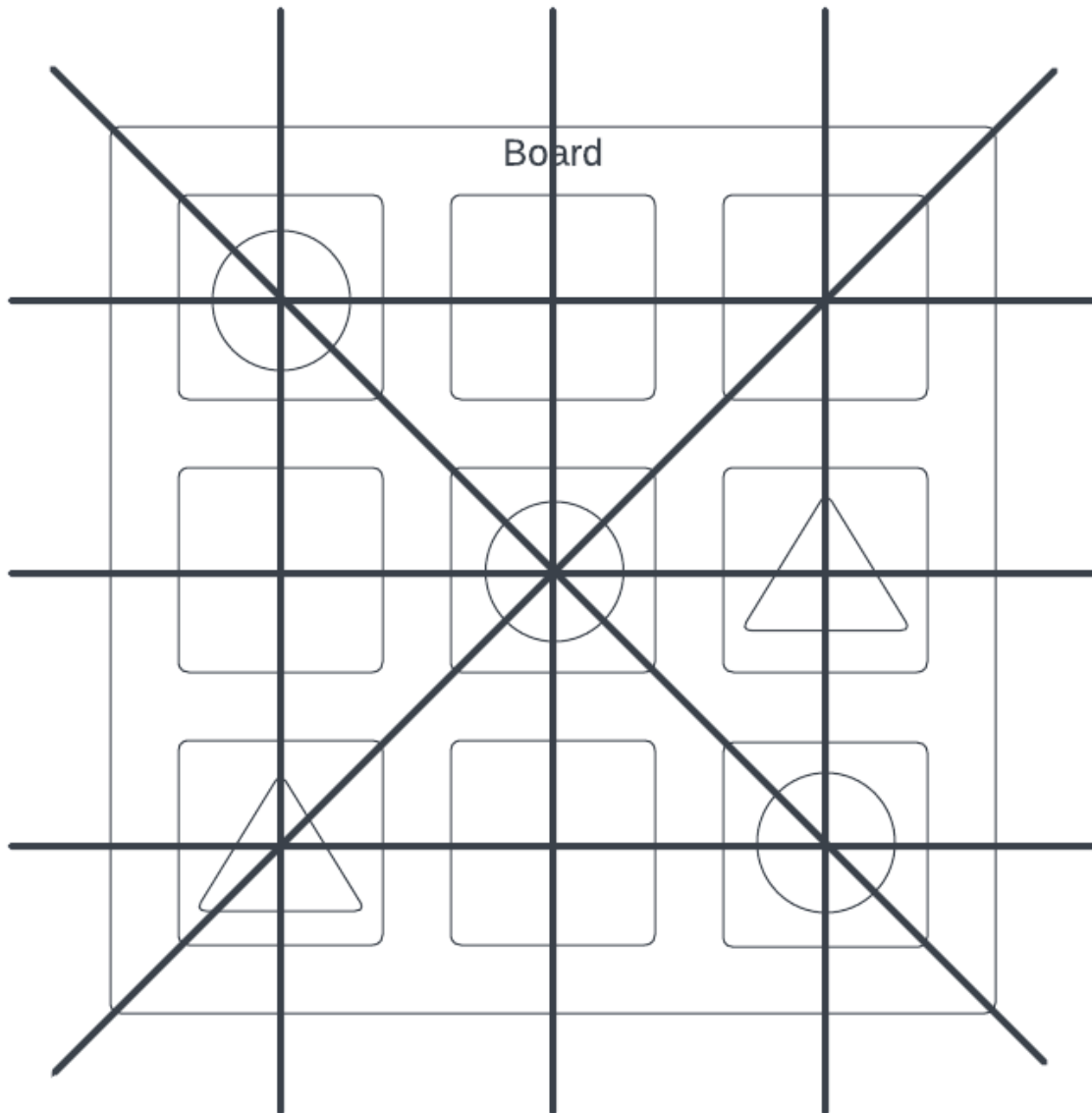
Assets Used

Music: The 8-bit Jukebox Lite - Cyberleaf Studio

SFX: [Casual Game Sounds](#) - DustyRoom