Flip Side

Mini Project 1

Game Design Document

Deadline: 11:58pm Friday 13th of November

Guidelines

This mini project should be done **individually**. You can share ideas, consult the manual, and search online. However, all work done in this mini project must be done by your hands and your hands only.

The main aim of this mini project is to test your ability to develop the core mechanics of a videogame that can be deployed on a mobile platform.

You are not required to use any external assets. If you do, make sure that **any and all external assets used must be credited in the credits section of the Title Screen.**

Use Unity and C# to create this project. Once you are done, build the project into an **.exe (windows platform)** as well as an **.apk (Android platform)** files and compress them into a zip file (make sure to include the "***_Data**" folder as well as the "**UnityPlayer.dll**" file).
All three files, .exe .apk .zip, should be named in the following format "Tutorial_ID_Name" for example: "T01_40_1234_Adam.zip".

Use the following link to login and submit your **.zip** file, any other formats is not acceptable:

http://tiny.cc/submitMP1

The following links might be helpful to you during your implementation:
https://docs.unity3d.com/Manual/CreateDestroyObjects.html
https://unity3d.com/learn/tutorials/topics/mobile-touch/accelerometer-input
https://docs.unity3d.com/Manual/android-GettingStarted.html
https://learn.unity.com/tutorial/introduction-to-object-pooling#5cf1fc18edbc2a4c9daf6994

Game Design

Gameplay

In this project, you should implement a simple game called ***Flip-Side***. The game consists of two opposite platforms that are on top of each other. The platforms are parallel to each other and are arranged such that the bottom platform is facing up and the upper platform is facing down. Both platforms are infinite (in the forward direction) and include obstacles as well as collectibles. There are three types of obstacles and two types of collectibles. Collectibles can have different colors.
The player controls a sphere that is automatically moving forward on one of the two platforms. The sphere starts the game on the bottom platform. The player can switch platforms during the game as well as move the sphere left and right. The player starts with three health points and loses one point each time they hit an obstacle. The game is over whenever the player hits an obstacle while their health points are 0.
The sphere can have different colors and switches between them automatically. The game has two modes depending on the platform that the sphere is currently on; Normal mode and Flipped mode. In the normal mode, the player's score increases whenever they collect a collectible whose color matches the sphere's color and loses score whenever they collect one that doesn't. In the flipped mode, it's the exact opposite; the player's score decreases whenever they collect a collectible whose color matches the sphere's color and gains score points whenever they collect one that doesn't. The normal mode is active on the bottom platform while the flipped mode on the top platform.

Rules of Play

1. The sphere automatically (not controlled by the input) moves forward (think about the final effect and not just the literal meaning of the sentence).
2. Each one of the two platforms is divided into three lanes.
3. The player can steer the sphere left and right to change lanes. The sphere's movement can be either discrete or continuous.
4. Collectibles can have one of the following types:
    a. Score orbs that can have one of at least three different colors
    b. HP orbs that illuminate and have a unique color
5. In the **normal mode:**
    a. the player collects matching color score orbs that add 10 points to the score or hp orbs that add 1 point to the health (HP).
    b. the player should avoid non matching color score orbs as they remove 5 points from the score.
6. In the **flipped mode**:
    a. the player collects non matching color score orbs that add 10 points to their score or hp orbs that add 1 point to the health (HP).
    b. the player should avoid matching color score orbs as they remove 5 points from the score.
7. The sphere's material color is set to one of the different colors of the score orbs.
8. The sphere's material color randomly changes every 15 seconds to a different score orbs color.
9. The sphere's forward motion becomes faster every 50 points in the score.
10. Obstacles are divided into the following types:
    a. Obstacles that block only one lane.
    b. Obstacles that block two lanes.
    c. Obstacles that block all three lanes.
11. If the player fails to avoid one of the obstacles, they lose one of their HP.
12. The player loses when they hit an obstacle while they have no HP left (HP = 0).
13. The player starts with three health points (HP).
14. The health points can have a maximum value of 3 points.
15. The game becomes harder by the sphere's automatic forward motion being faster according to the player's score.
16. The player can pause the game.
17. The player can unpause (resume) the game.
18. The player can quit the game from the pause menu.
19. The player can restart the game from the pause menu.
20. The player can quit the game from the Game Over menu.
21. The player can restart the game from the Game Over menu.
22. The player can mute all sounds.
23. The player can unmute all sounds.

Technical

Mechanics

1. The obstacles are generated automatically and randomly throughout the entire game.
2. The obstacles are destroyed whenever the player hits them.
3. The space between the obstacles can be fixed or varying.
4. The collectibles are generated automatically and randomly throughout the entire game.
5. The color of each collectible is chosen randomly from the available colors.
6. The collectibles are destroyed whenever the player collects them.
7. HP orbs should be less common than score orbs.
8. All Game Objects are destroyed (or reused - kindly check the concept of object pooling) after they are no longer needed (i.e. they go past the player). This is done in order to maintain a tolerable memory usage. Otherwise, your memory usage will continue to grow indefinitely until the game crashes.

Screens

1. Title Screen
    a. Start Game
    b. Options
        i. Mute Sound
        ii. How to Play
        iii. Credits
    c. Quit
2. Gameplay HUD
    a. Score
    b. HP (Health Points)
3. Pause Screen
    a. Resume
    b. Restart
    c. Quit
4. Game Over Screen
    a. Restart
    b. Quit / Main Menu

Cameras

1. The player can view the game from the third-person perspective of the sphere.
2. The player can view the game from the side perspective of the environment (showing the two platforms).
3. The player can toggle between the different camera views.

Controls

- **Windows:**
    1. The player moves the sphere left and right using the left arrow and right arrow, **AND** A and D.
    2. The player should be able to switch platforms by pressing the “spacebar”.
    3. The player should be able to switch between cameras by pressing C.
    4. The player pauses and resumes by pressing the esc button.

- **Android:**
    1. The player moves the sphere right and left according to the x-axis of the accelerometer.
    2. The player should be able to switch platforms by pressing on a button on the bottom right/left of the screen.
    3. The player should be able to switch between cameras by pressing on a camera button on the bottom left/right of the screen.
    4. The player pauses by pressing on a pause button on the top left/right of the screen.

    Note: The buttons for the android controls do not have to be hidden in the windows version.

Graphics

Style Attributes

Minimalist design with only primitive shapes.

Graphics Needed

1. Platforms (Flat Cube/Plane/Quad)
2. Collectibles (Small sphere/capsule/cylinder)
3. Obstacles (Flat Cube/Plane/Quad)

Sounds/Music

Important Guideline

Make sure to credit all and any music used in the credits section of the main menu.

Sounds Needed

1. Effects
    a. When the game mode changes (i.e. sphere switches platforms)
    b. When the sphere’s color changes

2. Feedback
    a. When the sphere hits a correct score orb (according to the mode)
    b. When the sphere hits an HP orb
    c. When the sphere hits an obstacle or an incorrect score orb (according to the mode)

Music Needed

1. Slow-paced track for the main, pause and game over screens.
2. Exciting and/or upbeat track for the gameplay.

Cheats

Implementing cheat codes will help us to test individual aspects of your project, just in case we were not able to test it throughout the game. They only need to be available on the windows version

Cheats Needed

1. Change the sphere's color whenever the "R" key is pressed
2. Increase health points (HP) by 1 point whenever "E" key is pressed
3. Increase the score by 10 points whenever "Q" key is pressed