Final Project Documentation

Brownie and Bullseye: A 2D Platformer

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Game Design Document

MainMenu

Our project contains multiple scenes; we will discuss each scene in the order in which they appear. Our first scene is the MainMenu scene. When the game is launched, it is the first thing the player sees. It has a label at the top that states the title of the game, "Bullseye and Brownie", and it includes three buttons: a 'Level Select' button, a 'How to Play' button, and a 'Quit' button. The 'Quit' button exits out of the game upon being pressed. The 'How to Play' button leads the player to a new scene called 'HowToPlay_Menu'. Inside this scene, there is a label that explains the list of controls needed to play the game, as well as the goal of the game. The 'Level Select' button calls the LevelSelectionMenu scene, where the player can choose which level they would like to play from levels 1 through 5.

HowToPlay_Menu

Brownie is controlled using WASD, and Bullseye is controlled using the arrow keys. The goal of the game is to reach the end of each level, indicated by two flags of different colors. There are also points for Brownie and Bullseye to collect: bones are points that can only be collected by Brownie, and fish are points that can only be collected by Bullseye. There are also certain liquids that Brownie and Bullseye must avoid, otherwise they will die before reaching the goal. Brownie can swim in water, but Bullseye will die if he touches the water. Bullseye can swim in gasoline, but Brownie will die if he touches the gasoline. Neither Brownie nor Bullseye can swim in nuclear waste or lava. These are the main obstacles created to make the game challenging. As the players progress through the game, they will encounter new mechanics that will contribute to the challenge, but they won't 'die' from them, they just won't be able to complete the level if not done correctly, and they will need to retry instead.

LevelSelectionMenu

From the MainMenu scene, the 'Level Select' button takes the player to a new scene called LevelSelectionMenu. There are 6 buttons total in this scene: buttons 1-5 will take the player to levels 1-5 respectively, and they are labeled as such. Button 6 is labeled 'Go Back', and will take the player back to the MainMenu scene.

Level1

When the player clicks the 'Level 1' button, they are taken to the Level1 scene. The player can now officially play the game, as Level 1 spawns in Bullseye and Brownie. The first level is meant to be the most basic level, to demonstrate the basic mechanics of the game. Brownie spawns on the left side of the map, next to a pool of gasoline. There is a bone right above it, indicating to the player that he or she must jump over the pool to collect the point and get to the other side. They must be careful though, because if they miss the jump, Brownie will die, and they will have to retry the level. Bullseye spawns symmetrically on the right side of the map. His issue is the exact same, except he must jump over a pool of water and collect the fish. After both players have made the jump, they can climb up a hill, and practice some platforming before reaching the goal at the top: the two flags that indicate both players have made it to the end successfully. They must be careful though, because in order to collect all the points, they need to get the points between the flags without accidentally ending the level early.

Scoreboard

When both players make it to their respective flags, the player is taken to a new scene called Scoreboard. There is a winning sound effect that plays once the Scoreboard appears, and a label that states that, "YOU WON!". There are also labels that indicate how long the player took to complete the level, as well as how many points were collected by Bullseye and Brownie respectively. From here, the player can click a 'Go Back' button, which will take them back to the LevelSelection_Menu.

Level2

From the LevelSelection_Menu, when the player clicks on the 'Level 2' button, they are taken to the Level2 scene. Level 2 is meant to demonstrate a few new mechanics that weren't found in Level 1. Brownie and Bullseye spawn on the same side of the map in the bottom left corner. There is a pool of water that is too large to jump over. Brownie must swim across and press the button on the other side. When the button is pressed, a platform appears above the water. Bullseye is now able to jump on the platform to get across the water. There is another pool next, but it is made of nuclear waste. Neither Brownie nor Bullseye can swim in nuclear waste, but there is a button on the island they are on that will make another platform appear. The two must decide who will stay behind to hold the button, and who will jump across the platform to reach the other side. Once this is done, the player who jumps across the platform will find another button that serves the same function, making it so the player that was left behind can now jump across, as long as the button is held. From here, some platforming is done, and

the players will find that there is a button that makes another platform appear, except it needs to stay pressed in order for both players to reach the end. One player must hold the button while the other goes to the higher platforms. From there, they will see a button, an unreachable platform, and a crate being held up by the unreachable platform. By pressing the new button, the platform will disappear, rather than appear like the previous ones. This makes it so the crate on top of it falls, due to gravity. The player is then able to push the crate off the cliff, next to the button that needs to be held down. The player is then able to push the crate on top of the button, and both players can then reach the end of the level.

Level3

After being taken to the Scoreboard scene, then back to the LevelSelection_Menu scene, the player can choose to click the 'Level 3' button, which takes them to the Level3 scene. Level 3 features the same mechanics as Level 2 but highlights them in different ways. Brownie spawns on the left side of the map, and Bullseye spawns on the right, but he is stuck inside a box. Brownie must press the button next to him to make the platform above Bullseye disappear. This allows him to jump out of the box. Bullseye will then need to find out which button releases the crate at the top of the map, similar to Level 2. Once the crate is dropped, they can push the crate onto the button that makes the vertical platform blocking the goal disappear. There is another crate that needs to be pushed down, but it requires one player to step on a button while the other pushes it down. Once the crate is pushed on the button that makes the appearing platform that allows them to move up, they can complete the level.

Level4

After being taken to the Scoreboard scene again, then back to the LevelSelection_Menu scene, the player can choose to click the 'Level 4' button, which takes them to the Level4 scene. Level 4 is a simple level, but it demonstrates a new mechanic: moving platforms. Brownie and Bullseye spawn at the bottom left side of the map, next to a large pool of lava. There is a moving platform above the lava, that slowly moves to the left and right side of the lava pool. The players have to time their jump, and walk along the platform as it moves. Once they reach the other side of the lava, they can click a button that reveals a platform. One player holds the button down while the other jumps across. The player that jumps across must then hold the button on the other side so that the other player can make it across as well. Both players have to make it across a moving platform again, except this time it's a smaller

distance, and the platform is moving from right to left. Once they make it across, they can reach the goal and complete the level.

Level5

After being taken to the Scoreboard scene again, then back to the LevelSelection_Menu scene, the player can choose to click the 'Level 5' button, which takes them to the Level5 scene. This is the final level and is meant to be more challenging. Both Brownie and Bullseye spawn in the bottom left corner of the map. There is a crate next to them, and a button inside a pit. The crate can be pushed into the pit and onto the button, which will cause a disappearing platform to disappear. This platform is holding up a crate, so when it disappears, the crate falls. The players must be careful when timing this, because the crate will fall into a pool of nuclear waste if they don't time it correctly with the moving platform that moves above the pool. The player will need to push this second crate off the moving platform and onto the other side of the pool quickly, otherwise the momentum might cause the crate to fall off the platform, even if it originally landed correctly. Once it is pushed off the edge, it will land in another pit with a button, which will activate another disappearing platform that was functioning as a gate. Once both players make it across the moving platform and have both buttons successfully pressed using crates, they can see a suspiciously easy path to the end. There is a button along this path, and when it is pressed, it causes a disappearing platform to disappear with a crate on top of it, causing the crate to fall and press a button below it, causing an appearing platform to appear in the player's way, cutting off their easy path to the goal. There is another button above it that does the exact same thing and is meant to just be a funny deterrent. The players must take the long way around, unless they run across the button quick enough as to not let the crate fall in time.

game_over

After being taken to the Scoreboard scene again, then back to the LevelSelection_Menu scene, there are no more new levels to complete. However, if Brownie or Bullseye die on any of the levels, the player will be taken to the game_over scene. The scene has three buttons: a 'Retry' button, a 'Level Select' button, and a 'Quit' button. The 'Quit' button will close out the game, using the same script as the 'Quit' button in the MainMenu scene. The 'Level Select' button will take the player to the LevelSelect_Menu scene, also like the MainMenu scene. Lastly, the 'Retry' button will allow the player to replay the level they just died on.

Buttons

The buttons have a reference to a platform. They can toggle the state of the platform if a sprite enters the button's body. The body can either be a player or a moveable box. Multiple buttons can toggle the same platform.

Appearing and Disappearing Platforms

The button sends a signal to the platform, which will toggle its collision and visibility, depending on if it is an appearing or disappearing platform. Appearing platforms start off with visibility and the ability to collide with sprites, while disappearing platforms start off invisible and with no collision. The button toggles the state of the platform depending on whether it is pressed or not.

Moveable Boxes

Moveable boxes are rigid bodies that are affected by gravity. They can have impulse if the player collides with them.

Liquids

If a player collides with a liquid, it changes the scene to Retry. However, some liquids are safe for Brownie and dangerous for Bullseye, and vice versa. We used collision layers and masks to make sure the correct bodies are colliding with certain liquids, while ignoring others. For example, the water collision layer is only on layer 2, which is Bullseye's layer, thus it will kill Bullseye and ignore Brownie, whose collision layer is 3.

Sprites

As discussed previously, Brownie and Bullseye have different interactions with different liquids. Brownie can swim in water but Bullseye cannot, and Bullseye can swim in gasoline but Brownie cannot. Neither of them can swim in nuclear waste or lava. Brownie and Bullseye can move through each other, which is intended, and they can both interact with the same mechanisms, like boxes and buttons. Both characters have animations for walking left, walking right, and being idle. These animations are related to the sprites state; while the player is holding down the button that moves them left, it triggers the walk_left animation; else if the player is holding down the button that moves them right, it will trigger the walk_right animation. Else, the player is idle. When either of them dies, it signals that the scene needs to be changed to the game_over scene.

Software Engineering Plan

Team Structure

Overall, the work was divided evenly. It became difficult to work together on the project at times, simply because it is difficult to combine our versions of the game when we work on them at the same time. We were able to work around this issue by assigning ourselves to certain days, or certain times of the day. After finishing for the day, we would send the other person the updated version of the game, as well as a list of what has been changed. Ultimately, the work was divided into the following:

Equal Responsibilities

- o Creating Basic Sprites with Basic Movement (watched Andy's tutorial together and worked alongside him)
- o Creating Brownie and Bullseye's Basic Functionalities
- o Creating a Point System (Using 'Bones' and 'Fish')

Brandon's Responsibilities

- o Adding MainMenu Scene
- o Adding Sound Effects
- o Programming Liquids (water, gasoline, lava, and nuclear waste)
- o Creating 'Doors' to the end (represented as flags)
- o Adding Buttons
- o Adding Disappearing and Appearing Platforms
- o Adding Movable Boxes

Jessica's Responsibilities

- o Adding LevelSelection_Menu Scene
- o Adding game_over Scene
- o Adding Scoreboard Scene
- o Primary Level Designer
- o Creating Pixel Art for the Bones and Fish
- o Creating Moving Platforms
- o Creating Walking and Idle Animations for both Brownie and Bullseye

State Transition Diagram

Figure 1
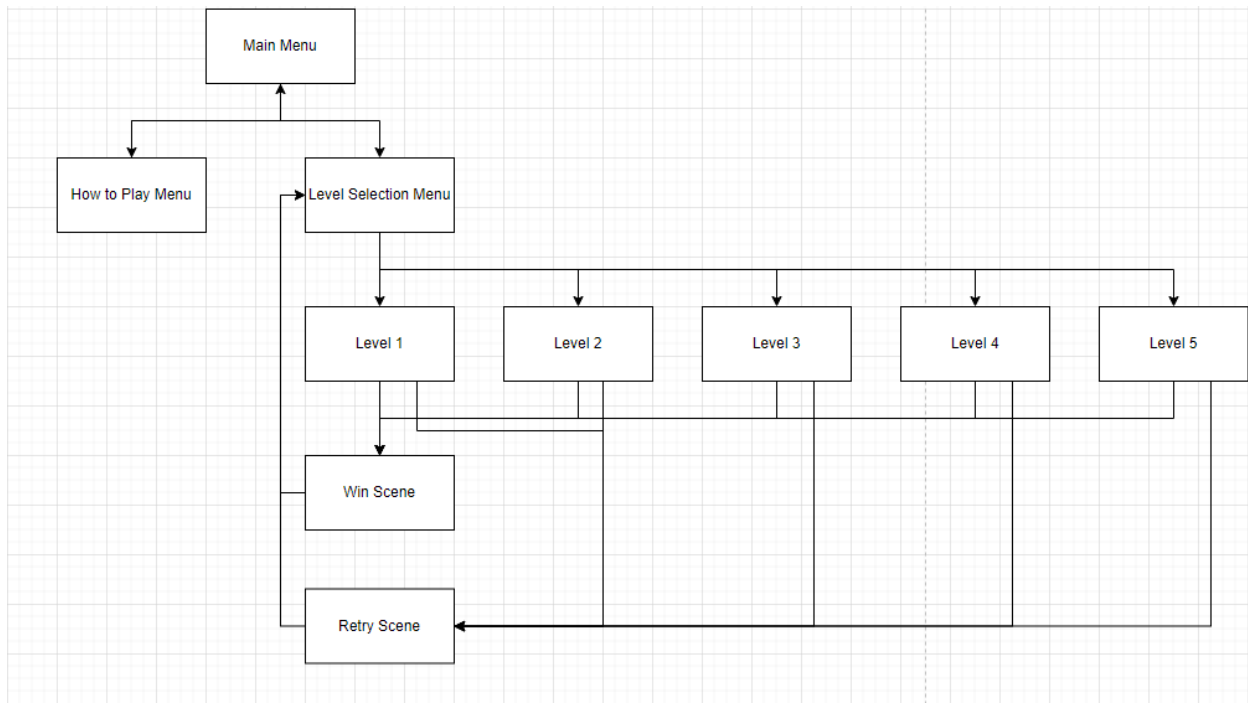
State Transitions

The Main Menu's state transitions to the How To Play Menu and Level Selection Menu are signaled through a user onclick(). This is also true for the Level Selection Menu's transitions to Levels 1 through 5. Levels 1 through 5 transition to the win scene upon level completion: when both Brownie and Bullseye make it to the end of the level, next to their respective flags. The Win Scene transitions to the Level Selection Menu upon user onclick(). Levels 1 through 5 can also transition to the retry scene when either Brownie or Bullseye die on the level. The Retry scene transitions to the Level Selection Menu scene upon user onclick().

User Instructions

The game can be played online using the following link:

https://jct6.itch.io/bullseye-and-brownie

References

Kenney.nl

- o Tilemap
- o Button Sprite

Opengameart.org – CatnDog by: pzUH

- o Brownie Sprites (Dog)
- o Bullseye Sprites (Cat)

Sfxr.me

- o All Sound Effects

Special Thanks

To the pets that inspired this game: Brownie and Bullseye.

Brownie:

Bullseye: