Game Design

Neil Byrne - G00343624

October 2020

Contents

1 Introduction **3**
- 1.1 Main Concept . . . 4
  - 1.1.1 Endless Runner . . . 4
- 1.2 Inspiration . . . 4
  - 1.2.1 Alto's Adventure . . . 4
  - 1.2.2 Journey . . . 5

2 Front End **6**
- 2.1 Game Start . . . 7
- 2.2 Level Select . . . 7
- 2.3 Settings . . . 7

3 In-Game Menus **8**
- 3.1 Pause Menu . . . 9
- 3.2 Pause Menu Options . . . 9
- 3.3 Saving . . . 9
- 3.4 Game Over . . . 10

4 Control Mechanisms **11**
- 4.1 Controls . . . 12
- 4.2 Jumping . . . 12

5 The Game **13**
- 5.1 Gameplay . . . 14
- 5.2 Set and Settings . . . 14
- 5.3 Winning . . . 14
- 5.4 Dying . . . 14

6 Level Design **15**
- 6.1 Level Types . . . 16
  - 6.1.1 Snowy Mountain . . . 16
  - 6.1.2 Sandy Desert . . . 16
  - 6.1.3 Lava Volcano . . . 17
- 6.2 Objective . . . 17

7 Enemies / Targets **18**
7.1 Enemy Types 19

8 Collectables / Power ups **20**
8.1 Coins 21
8.1.1 Single Coin 21
8.1.2 Big Coin 21
8.1.3 Coin Magnet 21
8.1.4 Boost 21

9 Multiplayer Functionality **22**
9.1 Multiplayer 23
9.1.1 Dropping in 23
9.1.2 Coins / Collectables 23
9.2 Dying 23

10 Conclusion **24**
10.1 Conclusion 25
10.2 References 25

Chapter 1

Introduction

1.1 Main Concept

For this project I have designed a 3D Endless runner from a 2D perspective using the Unity engine. The objective of the game is to collect the most amount of coins in the three levels provided.

1.1.1 Endless Runner

The game has a fixed camera on the player and will follow the player as they progress through the level.

1.2 Inspiration

I researched several games as part of my investigation to find out what makes endless runners so fun and addictive. But ultimately came down to two as my main source of inspiration.

1.2.1 Alto's Adventure

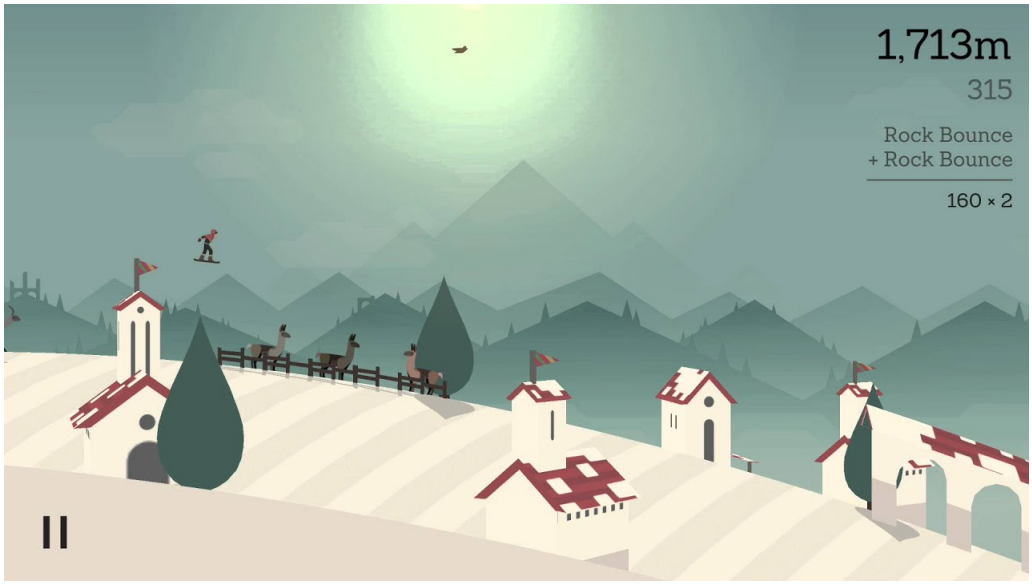

Figure 1.1: Alto's Adventure

- Single Player
- Endless Runner, Platformer
- IOS, Android, Windows

- 2D

Notes Alto's Adventure is a 2D endless runner platformer developed by Snowman. The player automatically moves to the right of the screen through procedurally generated landscapes. The player taps the screen to jump and perform tricks, and works towards goals, competitive high scores, and upgrades.

The fluidity of movement will be incorporated into this development, adapting the calm, relaxing tone of Alto's Adventure.

1.2.2 Journey

Figure 1.2: Journey

- Single Player, Multiplayer Co-op
- Adventure, Indie
- PS3, PS4, Windows
- 3D

Notes Journey is multi-platform indie, adventure game developed by thatgamecompany. Explore the ancient, mysterious world of Journey, discovering it's secrets along the way. Play alone or in the company of a fellow traveler and explore it's vast world together.

The passive "jump-in" style of Journey's co-op will be used in this development so a second player can join in with the same keyboard and work together.

Chapter 2

Front End

2.1 Game Start

Game opens on the title screen and will transition to next screen after 5 seconds. Start Menu is the Game Title, Level Select, Settings Button and a prompt to start the game.

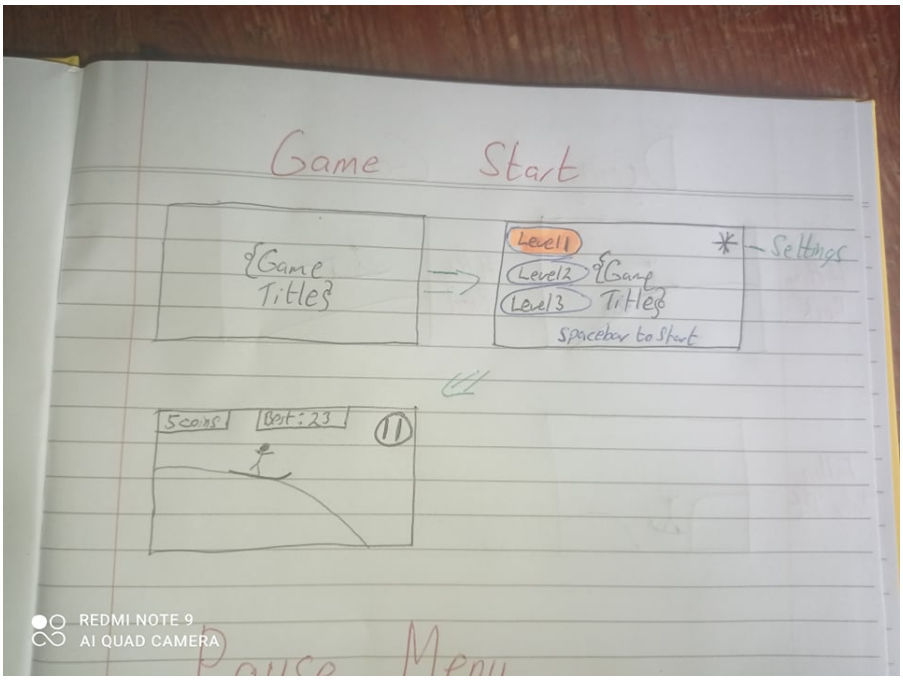

Figure 2.1: Initial Sketch of how to start a game.

2.2 Level Select

By default, "Level 1" is highlighted. Using the arrow, W,A,S,D keys or the mouse, the player can move up and down the highlighted selected level. Whichever level is highlighted when the spacebar is hit is the level the player will be put into.

2.3 Settings

To allow the player to change game and audio options.

Chapter 3

In-Game Menus

3.1 Pause Menu

The Pause button is always present during gameplay. Hitting the 'P' key or clicking the pause button with the mouse will open the Pause Menu.

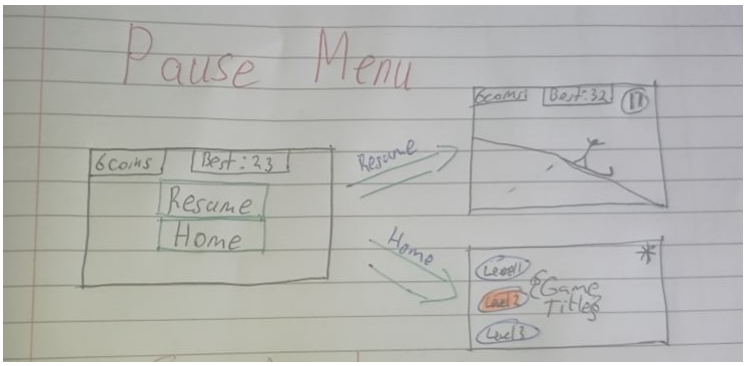

Figure 3.1: Menu Navigation

3.2 Pause Menu Options

The Pause Menu has two options. Resuming the game will simply bring the player back to their save state in game. Pressing home will bring the player back to the Main Menu where they can select a different level.

3.3 Saving

The current coin count and best score is still on display in the Pause Menu. If the player currently has the best score when pausing and returns to the Main Menu, the score will be saved.

3.4 Game Over

When a player dies they will be presented with a screen to either replay the level or go to the Main Menu to select a new level. The current coin count will be displayed along with the current best score.

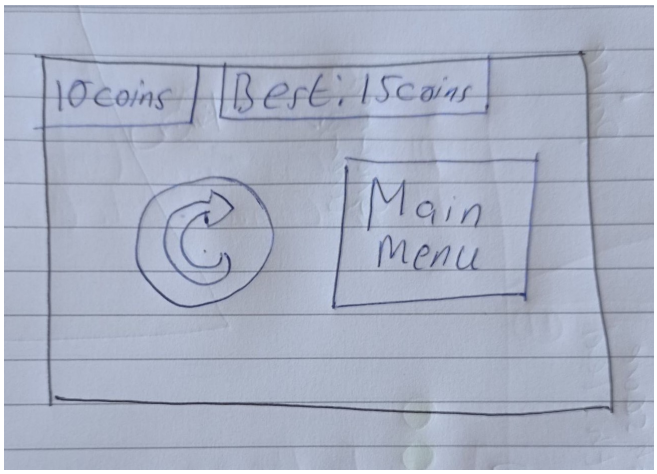

Figure 3.2: Game Over Screen

Chapter 4

Control Mechanisms

4.1 Controls

The Player controls with the arrow or W,A,S,D keys. Shifting weight either left or right will rotate the player. The space button is used for the player to jump. By default these are the keys players are most familiar with and are an obvious choice.

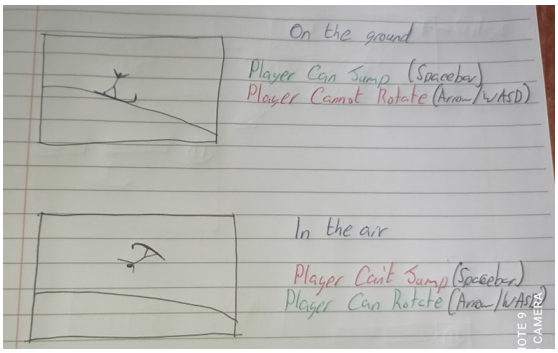

Figure 4.1: Player controls on ground and in air.

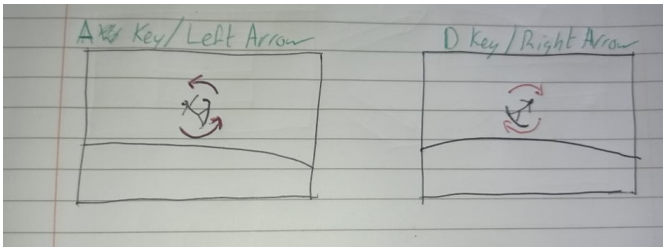

Figure 4.2: Rotation in the air.

4.2 Jumping

The player can only rotate while in the air (after a spacebar jump or off a ledge) and can only jump when on the ground (no double jump).

Chapter 5

The Game

5.1 Gameplay

The game is infinite. The level only ends when the player dies or quits. The camera is fixed onto the player and continues to scroll with the player as the level out of view is being rendered.

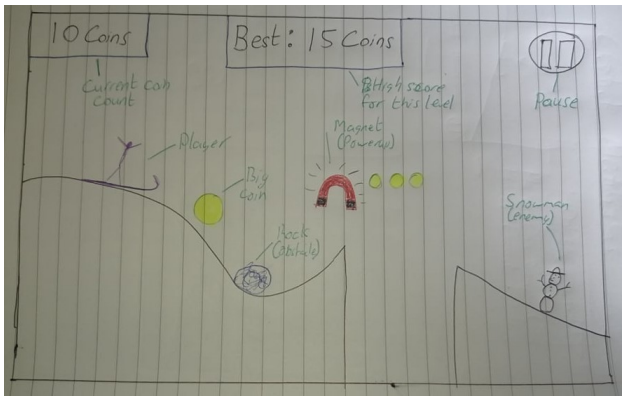

Figure 5.1: Initial Sketch of gameplay.

5.2 Set and Settings

There are three levels with three different types, each increasing with difficulty from increased speed and respawn rate of enemies and obstacles.

5.3 Winning

There is no win state, this an endless runner where the objective is to collect the most coins.

5.4 Dying

The player dies and therefore loses if they hit an enemy/obstacle, fall on their head or fall into a pit.

Chapter 6

Level Design

6.1 Level Types

There are three levels each with a different theme; Snowy Mountain, Sandy Desert, Lava Volcano. Each level increases in difficulty by scaling up the respawn rates of enemies/obstacles and pits

6.1.1 Snowy Mountain

Figure 6.1: Example of Snow Level

6.1.2 Sandy Desert

Figure 6.2: Example of Sand Level

6.1.3 Lava Volcano

Figure 6.3: Example of Lava Level

6.2 Objective

Functionally each level plays the same. Skate down a mountain, avoid obstacles, collect coins. Each level has it's own coin high score.

Chapter 7

Enemies / Targets

Level	Enemy	Obstacle
Snow Mountain	Snowman	Rock
Sandy Desert	Mummy	Cactus
Lava Volcano	Skeleton	Lava pit

Table 7.1: Table of enemies/obstacles

7.1 Enemy Types

Each level has its own associated enemies which functionally do the same. Enemies are passive, they do not try and kill the player they function as a moving obstacle. Hitting any enemy or obstacle is game over.

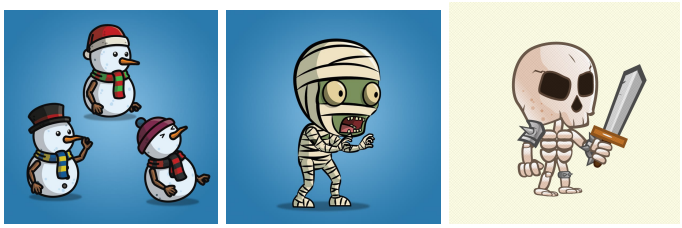

Figure 7.1: Potential enemy sprites

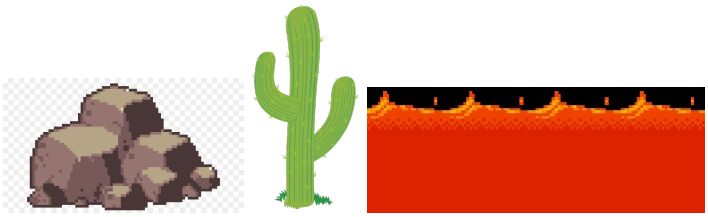

Figure 7.2: Potential obstacle sprites

Chapter 8

Collectables / Power ups

8.1 Coins

The main objective in this game is to collect the most amount of coins in the level without dying

8.1.1 Single Coin

Collecting a coin will add 1 coin to the total - common

8.1.2 Big Coin

Collecting a Big Coin will add 3 coins to the total. The sprite for the Big Coin is the same as single coin but 50 percent bigger - rare

8.1.3 Coin Magnet

For 10 seconds, the hit box around the coins is increased. Any coin within the radius is collected -rare

8.1.4 Boost

For 5 seconds the player's speed is increased 50 percent - very rare

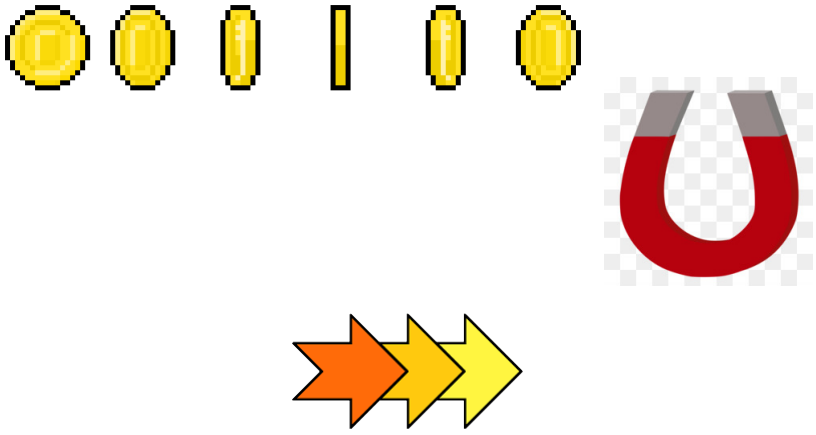

Figure 8.1: Potential Collectable Sprites

Chapter 9

Multiplayer Functionality

9.1 Multiplayer

Multiplayer is passive, the two players work together and cannot interact with each other, only the environment and collectables.

9.1.1 Dropping in

A second player can drop in at anytime by pressing the "Enter" button. Player one will be bound to the W,A,S,D keys while Player two will use the arrow keys.

9.1.2 Coins / Collectables

Each player will add to the pool coin count. If one player collects an item such as a magnet, the other player will not benefit from it's effects.

9.2 Dying

If one player dies then it is game over for both and you will be presented the game over screen as normal.

Chapter 10

Conclusion

10.1 Conclusion

The main objective of this game development is to create an addictive and exciting side scrolling adventure with emphasis on relaxation and passive play. From my research in this game type I was immediately drawn to the more laid back, enjoy the scenery type gameplay. It's because of this interest that I am taking inspirations from Alto's Adventure and Journey. Two games which do not rush the player but offer a comfortable time to enjoy yourself boarding down a hill.

10.2 References

http://altosadventure.com/
https://store.steampowered.com/app/638230/Journey/
https://thatgamecompany.com/journey/
https://tokegameart.net/item/snowman-character-pack/
https://tokegameart.net/item/mummy/
https://www.chupamobile.com/ui-graphic-assets-full-applications/skeleton-2d-game-character-sprites-03-9165
https://www.cleanpng.com/png-pixel-art-sprite-rocks-734519/
https://www.freepnglogos.com/pics/cactus
http://www.cashadvance6online.com/lava-wallpapers/4091987544.html
https://webstockreview.net/explore/coin-clipart-sprite/
https://www.cleanpng.com/free/horseshoe-magnet.html
https://wreckageuk.wordpress.com/author/wreckageuk/