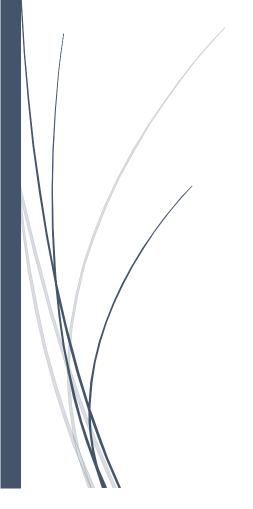
BSc in Software Development – Year 3 Mobile Applications Development 2 Project Part 1 – Design



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Introduction

I am required to research, design and develop a 2D shooter game for my Mobile Application Development module in 3rd Year. As part of the project I have to develop my game using Unity. I am required to develop the game from the bottom up without importing ready-made packages.

Research

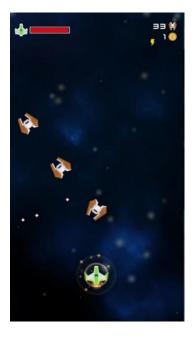
I am required to develop a 2D shooter for my 3rd year project but I wanted to research all different genres of games. This research will help me get a better understanding of all the different types of game available and it will help me design/develop my game. Below are some of the games that I have done research on.

Top-Down

Space Defender

Space Defender is a top-down shooter designed by MekGame Studios. It is set in outer space. In Space Defender, you are a pilot flying your aircraft upwards controlling the ships movement and weapons, trying to take down the alien attackers who are trying to invade planet earth. This type of game is very popular due to the fast-paced action and difficulty.





Sky Force Reloaded

Sky Force Reloaded is a top-down shooter designed by Infinite Dreams Studios. It is set in the future on planet earth. The story in Sky Force Reloaded is not great, you are just a pilot controlling your aircraft and shooting against enemies that attack from the sea, land, and sky to try and beat the evil leader. Apart from the story line, this game is the best top-down shooter game that I have played out of the games that I have researched.



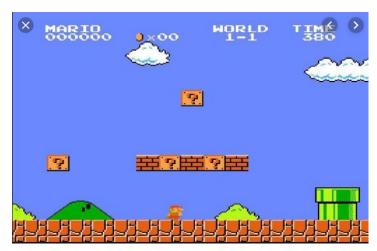


Classic

Super Mario Bros

This game is a side scrolling platformer for the Nintendo. The player controls a character called "Mario", and the aim of the game is to reach the end of the level, while collecting coins and destroying enemies on the way. Super Mario Bros is one of the most popular games ever and it has been around since the 1980's. Due to its popularity it has been remastered many times, so that it can be played on all of Nintendo's new consoles.





Sonic the Hedgehog (1991 Game)

Sonic is a platform game developed by Sonic Team and published by Sega. The game is about a hedgehog named Sonic in a quest to defeat Dr. Robotnik, a mad scientist who imprisoned animals in robots and who has stolen the powerful Chaos Emeralds. The gameplay involves Sonic collecting rings as a form of health, and the aim of the game is to reach the end of the level while collecting coins and destroying enemies on the way.





Vertical & Horizontal

Vertically Scrolling Video Games

A Vertically Scrolling Video Games or vertical scroller is a video game in which the player views the screen of play from a top-down perspective, while the background scrolls from top to bottom to create the illusion that the player character is moving.

A great example of a vertical scrolling game is Monaco GP which was released by Sega in 1979.



Looking at the games above, Space Defender and Sky Force Reloaded would also be vertically scrolling games.

Horizontal Scrolling Video Games

Horizontal scrolling video games or a side-scroller is a video game in which gameplay action is viewed from a side-view camera angle, and the onscreen character can generally move to the left or right.

A great example of a horizontal scrolling game is Defender which was released by Sega in 1979.



Looking at the games above, Super Mario Bros and Sonic the Hedgehog would also be horizontal scrolling games.

Conclusion

I have been playing games for close to thirty years and some of my favourite childhood games are horizontally scrolling games like Super Mario Bros and Sonic the Hedgehog but after researching all the above formats I have decided that I am going to create a top-down game. The main reason for this is because I am playing Sky Force Reloaded on my Android phone and it is easily my favourite game at the moment. There is four games in the series and I have played two of them. Since I started playing this game series, I always wanted to see if I could recreate this game in my own vision. With this project, I now have that chance.

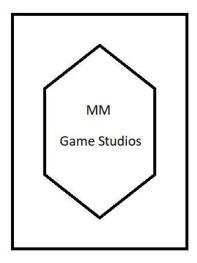
Game Design - Storyboard

The game is going to be called Alien Annihilation and it is going to be a fast-paced, top-down shooter game based in the deepest regions of outer space. The player must boldly go where no man has gone before in order to save planet earth from an alien species known as the Targarens.

- Master 3 stages with challenging missions to complete
- Battle countless alien invaders with intimidating bosses
- Unlock new difficulty modes
- Unlock and test three different aircrafts
- Track high score and try to better it with each turn score, number of kills
- Coins to buy upgrades for the aircraft

Splash Screen

The splash screen features the developer's logo, MM Game Studios. Music will be played until the game loads.



Menu

The main menu displays multiple options for the user to choose from.



- Play
 - o Play option will start a new game from the start
- Options
 - o Provides the player with an option to view the game controls
 - Displays the game controls
 - o Provides the player with an option to turn the game volume up or down/on

or off

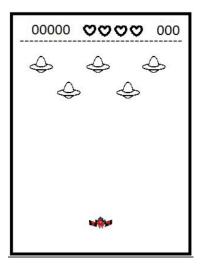




- High Score
 - Displays the players top scores including:
 - Total score
 - Enemies destroyed
- Upgrades
 - Collect coins and upgrade the players aircraft
 - o Upgrades include:
 - Faster aircraft
 - More powerful weapons
- Quit
 - o Provides the player with an option to quit and close the game

In Game Play

In play, the player will be able to see their score, number of kills and their health at the top of the screen. The enemy will be advancing from above, left and right side of the screen. All at different speeds and with different rates of fire. The player can move freely around the screen, trying to destroy all enemies in the players way.



Game Controls

The game controls are very simple to understand.

On the keyboard I am using the following key controls:

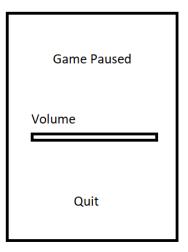
- W to move the player upwards
- A to move the player to the left
- S to move the player downwards
- D to move the player to the right
- Space bar to fire the players weapon
- Esc to pause and un-pause the game

Pause Menu

Press Esc to pause the game and press Esc again to resume.

The pause menu will provide the player with an option to:

- quit the game and return to the main menu
- resume game play where they left off
- settings with an option to turn the game volume up or down/on or off



Levels

The user will have to navigate through three daunting levels filled with terrifying aliens and dodge or take down asteroids. As the game is set in space, I am going to have image below set throughout the game, but have it look as if it is moving.



Player

The player will start off with the red spaceship and will unlock the green and orange ship through game play. Each ship will have the same health. The enemy will have to hit the player three times in order to kill the player. The players ships rate of fire and speed will also increase as the player advances through the game play.

SHIP COLOUR	HEALTH	RATE OF FIRE	SPEED
Red	3	3	5
Green	3	4	8
Orange	3	5	10







Enemy

The game will have four different types of enemy, denoted by different colours. Each enemy ship will all have different levels of health, rates of fire and speed. The ships will also have a different numerical value which will be added to the players score once the player destroys it. Each ship will also drop coins and power ups during the game once they get destroyed by the player.

SHIP COLOUR	HITS TO KILL	RATE OF FIRE	SPEED	POINTS WORTH
Red	3	3	5	150
Blue	2	2	4	100
Yellow	1	1	3	50
Green	1	1	3	50





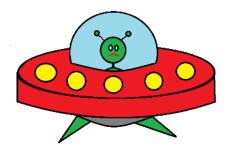




Enemy Bosses

At the end of each level the user will come face to face with an evil and terrifying alien in one of their many motherships.

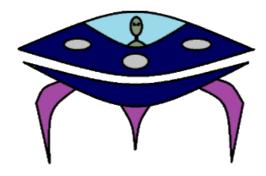
Boss 1 – at the end of level one the user will face the daunting task of defeating Gaktod. Do not let his sad looking face fool you. Armed with Lazers, Gaktod is a human killing machine and he takes no prisoners.



Boss 2 – at the end of level two the user will face the frightening task of defeating Grux. Look at the face on Grux. He is not here just for the crack. After hearing about the death of his cousin Gaktod, Grux who is armed with lazers and missiles he is out for revenge and to cause havoc on planet earth.



Boss 3 – at the end of level three (the final level) the user will face the formidable task of defeating Asnar. Asnar, who funnily enough looks a lot like Grux, is the leader of the Targarens and is not happy at all after hearing about the death of his two generals. He is armed with more powerful lazers and missiles and is out to annihilate the human civilisation.



General

Sounds - I will have sound playing throughout the game and special sound effects for the player and enemy ships when they fire their weapons. When a ship is destroyed, I will implement an explosion sound. I will also implement a sound when the player collects each coin.

Weapons/Bullets – the enemy ships will have the same weapons/bullets throughout the game. Each of the three player aircrafts will its own weapons and each having different types and strengths of firepower.

- Bullets • • •
- Lazer -
- Missile + + + + +

Coins – coins will be collected to allow the user to upgrade the player aircraft. Each coin will be worth a value of ten.



Asteroid – as well as taking on the mighty Targarens, the user must dodge or shoot down apocalyptic sized asteroids (as well as some smaller ones). Some of these asteroids may or may not hold a small reward (coins or upgrades) and the user will also gain points for destroying them.



End Screen

I will implement an end screen at the end of each level using a cut-scene. The cut-scene will inform the user of hints and tips about the game. If the user makes it out alive by completing the game, they will be shown a message of congratulations which will be accompanied with victory music.

Cut-Scene - Level 1



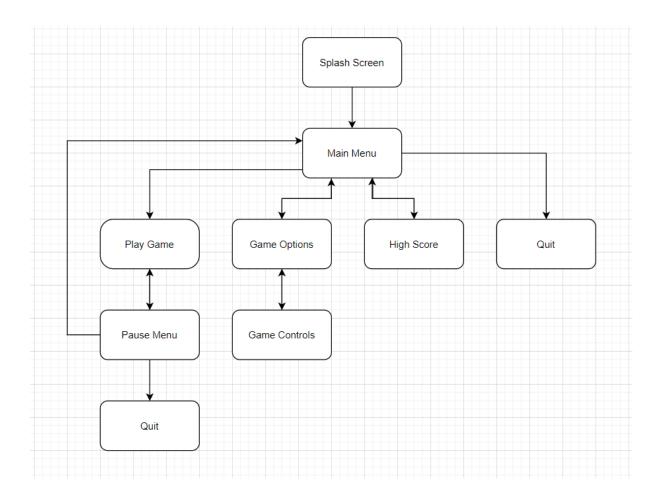
Cut-Scene – Level 2



Cut-Scene when the game is completed



UML Diagram



References

Unity Splash Screen

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Unity Main Menu

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Sky Defender

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Sky Force Reloaded

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Sonic the Hedgehog

https://en.wikipedia.org/wiki/Sonic the Hedgehog (1991 video game)

Vertically Scrolling Video Games

https://en.wikipedia.org/wiki/Vertically scrolling video game

Monaco GP

https://en.wikipedia.org/wiki/Monaco_GP_(video_game)

Horizontal Scrolling Video Games

https://en.wikipedia.org/wiki/Side-scrolling video game

Defender

https://en.wikipedia.org/wiki/Defender (1981 video game)