**3D Graphics repeat-project**

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**Part 1: Game Design**

The game will fulfill the theme which is a “3D Racing Shooter Game”.

The Main Menu will pop up where a player can choose between 2 tracks where he wants to drive.

The Menu will also have an Options button for the volume inside of the game.

Once the game is loaded, a player can drive his car within the bounds of the track, if a player touches a barrier he will lose 20HP, if a players’ car reaches 0HP that will result in an animated explosion of the player’s car and the game stops then.

On the screen there will be a lot of UI elements. KM/H, Gears, Lap Time, Lap, Position, Health, Race Over screen, Best Lap Screen.

The player will be able to shoot in a straight direction 5 bullets at the time before the cooldown. Each bullet will probably do 10 damage to the enemy car who is cruising and racing around the track as well. If the player car destroys the enemy car, there will also be an explosion from the enemy car.

There will be pickups for the player to use, such as different types of weapons and a health pickup.

Once a player passes the Box collider which will be a start/finish line, a timer is started with the time elapsed at the top of the screen, health will also be displayed and will gradually go down, or up based on collision, or on a health pickup. Gears will change depending on the KM/H speed. Player’s position will also change if he passes the enemy car or if the player car gets passed by the enemy car.

Sounds will be used for the pickups, weapons and the player car.

When the player reaches the last lap, and crosses a finish line, The game will then display that the race is finished and will display its best lap out of 3 driven.

**Part 2: Project diary**

**WEEK 1:** On the first week of my project I have initialized the project and set up the GitHub repository. Then started to make the game, firstly I imported the “RoadArchitectSystem” which helped me in creating a road system with all of the nodes and the barriers easily.

After that I added the first scene which is called “Track\_1Scene”.

Following all these I have imported car assets to get everything started with the car.

Terrain is then being made, with mountains and trees around the track.

**WEEK 2:** On the second week of my project I was fixing the track system as I had some bugs with it.

After I fixed everything, I then created a first script which was a car controller script, to get the car going and handling.

**WEEK 3:** On the third week I added a bullet which is being shot from the player’s position from the front of the car. Also added trees around the track to get a better visual feeling.

A health bar was also added in the top left corner this week.

**WEEK 4:** This week was all about the UI on the game and how the UI will behave and interact with interactions such as: KM/H interacting with the players’ car accelerating and braking. I have also created a UI for a Lap Time Counter. Lap Progress, Speedometer, Gear System.

**WEEK 5:** This week started off easy with making a car go in reverse and the gear showing “R” meaning “Reverse”.

But then it got more complicated when I had to create an AI Car that follows the course of the track and also the Gouraud and Phong lighting models.

The AI Car follows the track in a way that is following the nodes on the track ad it calculates the closest distance from one to another, I tried to do the breaking and steering for the AI Car but Had to give up as it was taking too much time, and I was not going anywhere.

It also took me quite a while to understand the Gouraud and Phong lighting models.

**WEEK 6:** Health pickup is currently being made, I want to give it effect so that it spins and goes up and down a bit. Also I started working on a Flame Gun so that I can switch between the Flame Gun and the regular Bullet. Health pickup will restore 20HP of players’ Health.

**WEEK 7:** Creating a Health system for the enemy so that the enemy gets destroyed off the screen when its HP is less than or equal to 0.

Also creating the explosion animation for the enemy when the enemy dies, the car gets this explosion effect.

I have also started to work on the Main Menu with the track selection so that the player can choose between the “Track 1” and “Track 2”.

**WEEK 8:** Creating a healing and shooting sound effects.

Building a game and creating a better Main Menu with the Volume option.

Started to create a pause menu when in a game so that the player can stop the game by pressing esc and then either “Resume” to play the game or go back to the “Main Menu”.

**Part 3: Self-evaluation**

I was very happy when I first got the project briefing as I always wanted to make a racing game.

Throughout this journey I have learned a lot and improved in quite a few things regarding programming and how the game mechanics work.

For example: Creating an “AICar” that is running alone on the track and following the circuit and the course of the road.