Individual Report

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# Project Plan

Every monday we will meet with our group to discuss phases of the project and our approach to implementing features.

# Weekly Activity Summaries

## Week 1:

Overall discussion of the project and its requirements. We outlined a broad idea and plan of how we are going to tackle each week of the project along with which features of the spec for each week .

Week one mostly consisted of research of the game “Highway Pursuit”.Figuring out how the game actually played, its rules , the objective and how the game could be remade in Unity.

## Week 2:

Discussed with group which asset packages could help that were discovered from research in week 1.

Imported a track editor and build a basic track and environment.

## Week 3:

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## Week 4:

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Imported a track editor and build a basic track and environment.

# Collaboration

## Action Items

|  |  |  |  |
| --- | --- | --- | --- |
| Action items | Owner(s) | Deadline | Status |
| Start programming game. | Aaron Curry,  Jack Dalton,  Jake Comiskey,  Sebastian Kruzel | 26th February | Completed |
| Import Assets | Jack Dalton,  Aaron Curry,  Sebastian Kruzel | 29 January | Complete |
| Recursive Track | Sebastian Kruzel,  Jack Dalton,  Aaron Curry,  Jake Comiskey | 26/02/2018 | Complete |
| AI car | Sebastian Kruzel,  Jack Dalton,  Aaron Curry,  Jake Comiskey | 26/02/2018 | Complete |
| Shooting | Jack Dalton,  Jake Comiskey | 26/02/2018 | Complete |
| Player Weapons | Jack Dalton,  Jake Comiskey | 26/02/2018 | Complete |
|  |  |  |  |
| Release Build | Sebastian Kruzel | 26/02/2018 | Complete |
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## Week 1:

The collaboration for week 1 mainly consisted of research of the game Highway Pursuit. I played the game with teammates watching and also playing it for themselves. As we played we recorded and discussed the games mechanics, features and rules of the game and how all these factors had an impact on the overall player experience. We then went on to research how we could implement the same mechanics and features in Unity by looking at the asset store for some ideas, importing and testing.

## Week 2:

The collaboration for week 2 consisted of sharing ideas as a result of week 1. Myself, Jack and Sebastian shared useful resources we discovered from week 1 like road builders, environment assets and building techniques, also player car and AI car mechanics that could be useful.

We then started on using these resources to start building a scene and realised we could use the track editor in conjunction with the environment editor to make a level similar to 2

“Highway Pursuit” if not better due to the better detail, lighting and texture quality.

## Week 3:

The collaboration for week 3 consisted of sharing ideas to do with making the track recursive and making the player respawn at a certain point to make it seem like the track is infinite long. Myself, Jack, Jake and Sebastian shared useful techniques we had thought of ourselves on how to achieve this and came to the conclusion that by repspawnig the AI and player cars at a certain point it will make it seem like the track never ends. We also started to implement the Ai and how pathfinding would work. We found useful resources online that utilises a set of waypoints for the ai to follow.

## Week 4:

The collaboration for week 4 consisted of sharing ideas to do with shooting, score and again AI . Myself, Jack, Jake and Sebastian shared ideas and solutions we had to each others problems. The main problems we had were how to reset the progress of the ai car when it is teleported back to the start. I discovered that you could call reset on the AI cars waypoint progress at any point to get it to follow the node at the start again. If we call Reset when the ai car is respawned then its waypoint progress will start from the beginning. We all agreed that shooting would be fairly simple and we discussed what would happen if a bullet hits a civilian or enemy car. Like highway pursuit you should be deducted points for shooting a car that isn’t an enemy one. We agreed that all cars should be destroyed and reset to the starting position when they get shot too. This allows us to use the same ai car instances instead of creating new ones all the time. We began to implement shooting, finished recursive track and added our improvements to how the ai respawned.

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## Week 5:

The collaboration for week 5 consisted of us sharing ideas on putting finishing touches on the game such as how the score system will actually work. Whats end game condition, the menu system and small touches such as how often should you be able to fire a bullet , when should bullets be deleted and whats their range. We also discussed about making a build of the game. Myself, Jack, Jake and Sebastian decided that the bullets should be deleted after a certain period of time. I suggested that we could use a collision box whose center is the middle of the player car. When the bullet leaves this box the bullet is then destroyed. The length of this box is just enough so you can shoot the distance that is seen within the camera. The fire rate is decided by each person, whatever feels best for each of our projects. We decided that the menu system should be simple enough. A main menu with play/controls buttons. When in game you should be able to select restart . When these improvements were implemented we started working on a final build of the game.

# Self-Evaluation

## Achievement and Progress

***Recursive track:***

The recursive track was easy to implement after finally deciding on a technique to do it. The technique I decided on was to respawn the player and ai cars to the start of the road when they reached a certain distance down the road. This gives the illusion of a constant flow of traffic and it seems to the player that they are traveling along a never ending road. This illusuion is helped by the fact the camera is tiled towards the road at an angle so they cant see too far ahead of them and also the track itself along with terrain is a lot longer than what the player actually travels so when the player is respawned they cant see the end of the track / terrain. It seems seemless.

***Player car***

The player car was relatively simple to implement. I made to add a collision box to it as a trigger for future use in the project. Also added a script to reset its Z position when it reaches 1000 in the z direction. Gives the illusuion that the track is never ending.

***Ai Cars***

To achieve the look of constant traffic and to make the ai stick to a path. I first split the ai into two parts. A prefab of cars that would be on the left side of the road and a prefab of the cars that would be on the right side of the road. Each car was spaced around 100 ahead on the z direction from the previous. The right side was offset slightly so there wasn’t too much of a gap between cars. The ai car follows a set of waypoints that I had defined. Along the way the ai will go side to side as it follows the path. I also made a respawn script for the left and right prefab that would reset the cars to the start of the left side/ rightside of the road depending on the prefab.

***Bullet***

To create the bullet I defined a bullet prefab that has vfx. I also added a empty game object that is a child of the player that the bullet will be fired from. When the shoot button is pressed it gets the position info frim this empty game object getting its rotation. The bullet also has a collider on it. When the bullet collides with an AI car it will respawn the AI car and destroy the bullet object. The bullet object will also be deleted when it leaves the boundry collision box which is set to the position of the player and its size is that which is visible by the camera.

***Collision***

Added code to the ai car script that detects what the tag is of the object that intersects with. If the ai car is of type enemy and the other tag is player, then the AI car is respawned and the player is destroyed. If the ai car is type normal and the other tag is player than the ai car is respawned and the player isn’t destroyed.

***Sound***

There is a backing track that will play constantly on loop as the game is played. When the bullet is shot a sound is played. If the ai car is destroyed, be it by bullet or the player car an explosion sound is played along with a particle effect. The car has an engine noise along with car tyre sound when the car breaks. When the car breaks a smoke particle effect is also triggered.

***Score***

The score system I implemented is simple. The plays is deducted points if they destroy a friendly ai car and the player gains points if they destroy an enemy car. However if you collide with an enemy AI car the player is destroyed and the end game screen is triggered where you can play again.

***Menu***

The menu system has simple navigation. From the main menu screen you can go to the controls or play the game. When the game ends in the end game screen you can replay the game or quit which then brings you to the main menu screen.

***Multiple cameras and replay***

From the play screen I implemented a hud which utilises buttons. You can click the camera button which switches between the 3 camera views. Follow cam, free look cam which you can look around using the mouse and also a cinematic camera. The cinematic camera is positioned above the center of the track. It is stationary put is pointing towards the player car. From the in game hud you can also replay the level by clicking the replay button.

## Areas of Improvement

***Time management***

An area I could definitely improve on is time management. I spent too much time on some features that could have been distributed to other features making them better or even add new features to the game.

***Score system***

I definitely could have improved the score system. If I spent more time on the score system I could have figured out a way to make a highscore table or even just to save the highest score so far to a file where it can read and write from.

***Terrain/level design***

I could have improved on my level design. In some areas the foliage does encroach on the track. This was mainly due to my system I was working on at home. It isn’t powerful enough to debug the terrain in real time. I had to debug and test the game without the terrain and then add in the terrain I made in the lab and try sync the track up to the terrain extremely slowly due to my laptops hardware. If I could have stayed in the lab more I would have been able to put much more time and detail into the design and execution of my terrain and level design.

***Ai***

As of right now I only have 1 type of AI which is a path finding AI. This could have been improved by adding another type of Ai that followed the player car itself. I tried to do this initially by tying a waypoint to the player car but it made the game far too hard as the car would always collide with you within seconds. If I spent more time on this feature I could have fine tuned the linear speed and turning speed of the ai car so the game would have a chance to get away from the car and also at the same time give the ai car a good chance to catch up with you so its not too easy to get away from.

***Weapons***

A variant could have been added to my weapon. So at a certain score your fire rate increases. This would have been a very easy thing to add however I only thought about it after I made the build of the game for submission

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