Developer Diary
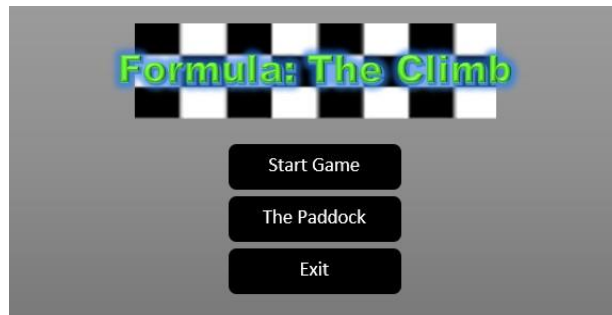
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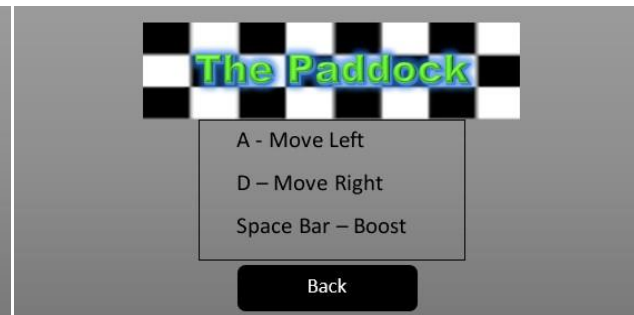
First Thoughts

I have been asked to develop a game called "Formula: The Climb", designed by the customer. After reading his design document I have an understanding what he is looking for in this game. There are some parts of his game that I feel he has not described in detail fully so I will have to get in contact with him so I can produce a game to the best of my abilities that he has planned.
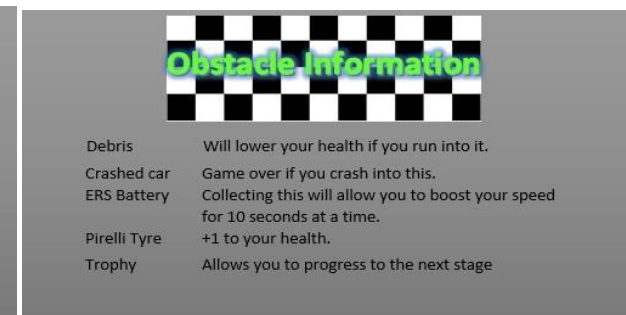
I started with doing up more graphical menu screens so I could picture clearer as to what the customer is looking for as they had only done up rough hand drawn sketches.

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Formula: The Climb Start Game The Paddock Exit	**The Paddock** A - Move Left D – Move Right Space Bar – Boost Back	**Obstacle Information** Debris — Will lower your health if you run into it. Crashed car — Game over if you crash into this. ERS Battery — Collecting this will allow you to boost your speed for 10 seconds at a time. Pirelli Tyre — +1 to your health. Trophy — Allows you to progress to the next stage
Menu Screen	The Paddock	Obstacle Information
Game Paused The Paddock Obstacle Info Exit Game	**Try Again Next Season !!** Score : _____ Race Again!	**World Champion** Score : _____ Race Again!
Pause Screen	Win Race Screen	Lose Race Screen

These are the screens I envision when reading the design document. The changes I feel that should be made are:

- Menu Screen: As this is the first screen, there is no need for an exit game button option. Instead I feel this option should lead to an Information Screen about the possible obstacles the player will encounter.
- The Paddock/Obstacle Info Screens: These screens are fine, but we will need a back button option to get us back to the main menu screen or pause game screen, depending on where they were accessed from.
- Win/Lose Screens: These Screens are fine, but I feel that the buttons should lead back to the main menu screen and the player can start the game from there. If not, then there should be an option to go back to the main screen as well as start game again, as the player might want to access the paddock or obstacle information.
- Pause Game Screen: In this screen there should be an option to Resume Game option as there is no way to get back to the game. In the design document, it says that this screen can be accessed by the "Esc" key on the keyboard. I think that there should be an on-screen option as well to pause the game, as keyboard keys can get jammed and some users may not be able to access their Esc button. Also there is nowhere that lets the user know that the "Esc" key will pause the game.
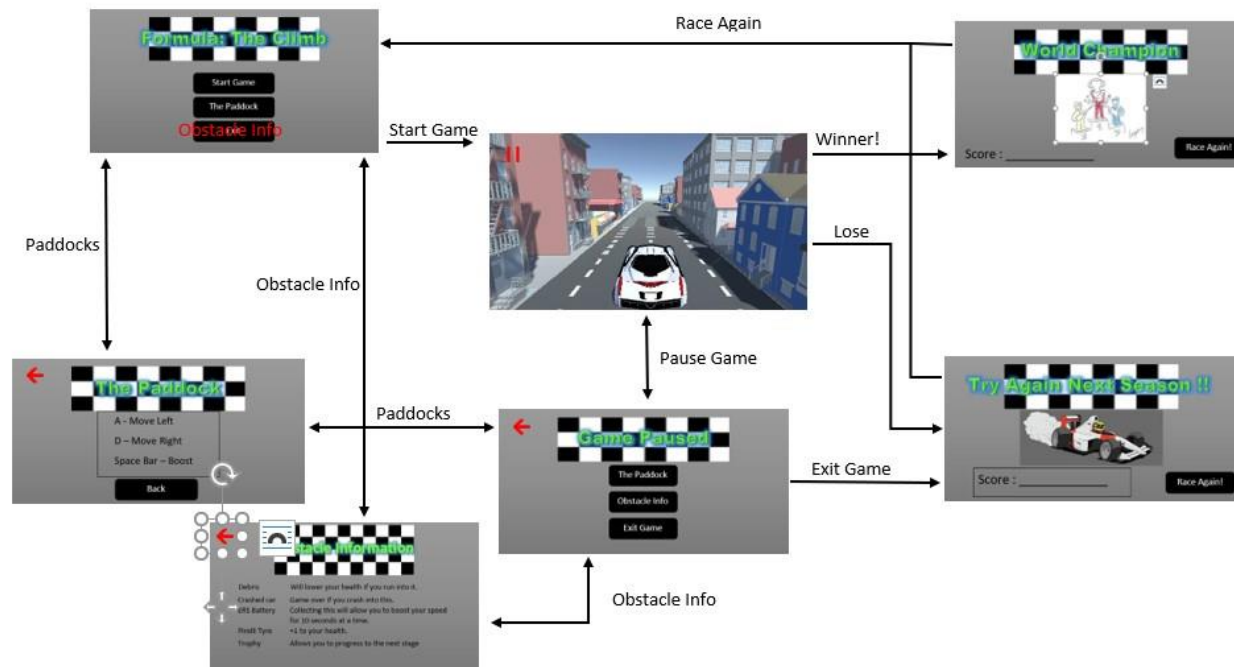
To get a feel for the movement through the screens I created a simple user interface

The red is the changes I would make.

Assets

In the Design Document the customer did not specify any assets from the unity store. After searching the store myself I decided on assets that I felt where most suited to the customers description and game theme. I was unable to find assets for car debris so instead I have used tyre stacks and barriers as these things are found in racing. I used the following assets to develop the game:

1. Player
   - https://assetstore.unity.com/packages/3d/vehicles/land/racing-cars-pack-1-2195
2. Obstacles
   - https://assetstore.unity.com/packages/3d/environments/roadways/cartoon-race-track-oval-175061
   - https://assetstore.unity.com/packages/3d/vehicles/land/racing-cars-pack-1-2195
3. Environment
   - https://assetstore.unity.com/packages/3d/environments/roadways/cartoon-race-track-oval-175061
   - https://assetstore.unity.com/packages/3d/environments/urban/simple-city-pack-plain-100348
4. Collectibles
   - https://assetstore.unity.com/packages/3d/high-detail-1970-s-supercar-wheel-92408
5. Audio
   - https://assetstore.unity.com/packages/audio/sound-fx/transportation/rotary-x8-free-engine-sound-pack-106119
   - https://assetstore.unity.com/packages/audio/sound-fx/shooting-sound-177096
   - https://assetstore.unity.com/packages/audio/music/track-day-racing-soundtrack-199016
   - https://assetstore.unity.com/packages/audio/sound-fx/transportation/i6-german-free-engine-sound-pack-106037

Developing Process

- I started by making a simple environment and getting basic player movement working, to do this I created the PlayerMove script. I added forward movement but also, I added left and right movement.
- For the left and right movement I created the LevelBoundary script. The player can only move left and right by 3. This will be the width of the playable platform. The left and right movement can be controlled by both the A and D key and the left and right.
- I have added the car asset to the player object. I adjusted the box collider around the player car. I made sure the movement looked right before moving on.
- I started to design a simple environment using different assets. Once I had one of these environments designed, I duplicated it twice and changed them both slightly. I added obstacles to these sections, although they do nothing yet.
- I created the GenerateLevel script so it will randomly place these sections to form a continuous platform. In this script it contains a GameObject array. It randomly picks one of the three sections and then adds it to the array placing them every 50 positions. Each section is a length of 50 positions.
- I started adding the collectible items, these are the Pirelli tyres. I made these triggerable. I created the CollectableControl script. I added a canvas to the game scene, I added a raw image for the border and a text box, this displays the amount of health collected
- Since the customer wants a max collectable amount of 3, I needed to make sure any health collected over the 3 would not affect the value. For this I created the HealthCollect script, in this there is a simple if statement. I also added sound effects to this script.
- To start the game I want it to look like a 3, 2, 1 countdown, I created the Starter script and I added texts to the canvas and added an animator to each. I have a 3, 2, 1 and a go text. All have a different animation to them which rotates them on the x axis, so they fade out. I also added a fade in animation, so the screen goes from pitch black to visible. I also added in sound effects, so it sounds like a race countdown. Until this is over the player cannot move left or right.
- I created the BigObstacle script. I decided to get the bigger obstacles working first and then I can use this script later to develop the script for smaller obstacles. I created different sizes of obstacles and added the assets to them, so they look like cars, barriers and tyre stacks. I added the BigObstacle script to all the obstacles, set the is Trigger on. If I can get obstacles working under the BigObstacle script, then it should not be too hard to change them to small obstacle scripts later. In this script once the obstacle and player collide, the player stops moving.
- I added the main camera to the player object so is follows the car during the game. When the player crashes, I want to have an animation that will play to let the player know they have crashed. For this, the animation I made the z position of the camera move so it bounces forward a bit and changed the z rotation so that is wabbles from side to side. When the player crashes this animation, and a crash sound is played.
- Like the start-up animation of the game I wanted a sequence of events to be played when the player had run into an obstacle. For this I created the EndRunSequence script. Initially I was just going to display a Game Over and then fade out but reading back over the customers design document I

decided to add two different screens. I will need to create a distance count to decided between what screen is displayed at the end. I will display the win screen if the player beats the high score.

- I implement a distance script called <u>LevelDistance.</u> For this I used a coroutine. In this it just adds one to distance after one second wait period, it displays the distance to the game canvas.
- With the distance now implemented I went back to the end-run sequence. I added an if statement. This just plays different coroutines depending on if the player beats the current high score or not.
- I tested the game out and tweaked different aspects like speed, so it looked good in the game. I now want to add a difference between big and small obstacles. I copied the contents of the big obstacle script into <u>SmallObstacles</u>. This uses the health count to indicate whether it will minus one from the health count or if the count is 0 it will end the game.
- After implementing the small obstacles. I tested the game more. This is when I realised, I needed a way to implement levels. For this I decided that I would have subgroups within each section called "F3", "F2" and "F1". F3 had little obstacles but more health collectables, F2 increased the number of obstacles but decreased the health collectables. F1 had the most obstacles but little health collectables. Using a new script called <u>ActiveObjects</u>, I used this, and the player move script to decide which subsections are activated at different times. To do this I used the distance ran number. F3 is used between 0-100, then the next section, F2 starts between 100-250 and then from 250 onwards it will show the F1 subgroup.
- I decided to add more sections to the game, I now have 8 sections that will create the platform.
- After testing the workings of the game I then just needed get a main menu scene, a pause scene and to get the end scenes and win scene buttons working. The main menu and end scenes where simple to get going but when I tried to get a pause scene going, I found it hard to then resume the game, so instead of going to a completely new game I decided to just show the pause options in the game scene. This meant then to pause the game all I had to do was put the time scale to 0. To resume I then just put it back to 1.
- To get buttons working and movement through my game I had to create the <u>MainMenu</u> script. This just allows exit game, play game, quit application and a lot more functions work.
- I did some final tweaking to my game and tidying up. I ran a set of tests that all passed. I built and ran the game some more to make sure it was all working fine.

Testing Plan

Requirement ID	Sprint	Test Case R	Test Case Name	Descriptions	Search Parameters/Instructions	Checks	Expected Result	Actual Result	Results Pass/	Comments
1.00	1	TC.001	Start Game	Game functionality	• Start the Game	The Game loads	• Main Menu is loaded. • All buttons are clickable • Audio is playing	• Main Menu is loaded. • All buttons are clickable • Audio is playing	Pass	
2.00	1	TC.002	Main Menu Buttons	UI Buttons	• Click Start Game Button • Click 'The Paddocks' Button • Click Quit Game Button	All the buttons in the main menu work	• Start Game Button loads up game • The Paddocks button loads up the paddock description page • The Quit button stops the application from running	• Start Game Button loads up game • The Paddocks button loads up the paddock description page • The Quit button stops the application from running	Pass	UI does not all stretch with different applications
3.00	1	TC.003	The Paddock Page	UI button and functionality	• Click Back Button • Text	Button works and text is legible	• The text is legable and has correct grammer • The back button takes you back to the main men	• The text is legable and has correct grammer • The back button takes you back to the main men	Pass	
4.00	1	TC.004	Game Audio	Game Audio functions through the entire game	• Load main menu to test Main Menu music • Play through game to test Level audios • Collect health to test sounds • Collide with small obstacles to test audios • Collide with big obstacles to test audios • Load up end screens to test End Scene music	The Audio	• Main Menu Music play and continue throughout all the Menus • Audio changes for different levels • Different audios played for health collection, depending on if player contains contains 3 health • Different audios played when colliding with small obstacles, depending on if the game ends or just minus 1 health • Audio plays when player collides with big • Lose and Win End Scene music plays when	• Main Menu Music play and continue throughout all the Menus • Audio changes for different levels • Different audios played for health collection, depending on if player contains contains 3 health • Different audios played when colliding with small obstacles, depending on if the game ends or just minus 1 health • Audio plays when player collides with big • Lose and Win End Scene music plays when	Pass	Audio choices suit the theme of the game
5.00	1	TC.005	Game Animations	Game Animation functions through the entire game	• Play through game to test animations • Collide with obstacles to test end game an • Beat high score to load Lose Scene to test text animation text animation	The Animation function	• Start up game plays "3, 2, 1, Go" animation • Collide with obstacles, main camera animation plays • Fade Out animation plays after main camera • Flash text animation plays on load up of both Win and Lose Scene	• Start up game plays "3, 2, 1, Go" animation • Collide with obstacles, main camera animation plays • Fade Out animation plays after main camera • Flash text animation plays on load up of both Win and Lose Scene	Pass	Animations adds a realistic effect to game
6.00	1	TC.006	Game Levels	Level loading functionality	• Play game through and test if levels load	Level loading	• Game and level one load up when start game option in main menu is selected. F3 obstalces are displayed • F2 obstacles displayed once distance gets to 100. Player speed increases and audio changes • F3 obstacles displayed once distance gets to 250. Player speed increases and audio changes	• Game and level one load up when start game option in main menu is selected. F3 obstalces are displayed • F2 obstacles displayed once distance gets to 100. Player speed increases and audio changes • F3 obstacles displayed once distance gets to 250. Player speed increases and audio changes	Pass	
7.00	1	TC.007	In-Game Pause Menu	Pause Menu UI functionality	• Click Pause Button to load pause menu • Click Resume Button • Click The Paddock Button • Click the Exit Button	Pause Menu UI	• Pause Button loads the pause menu and pauses the gameplay • Resume Button resumes the gameplay • The Paddock Button loads the Paddock screen • Exit Button exists game to the main menu	• Pause Button loads the pause menu and pauses the gameplay • Resume Button resumes the gameplay • The Paddock Button loads the Paddock screen • Exit Button exists game to the main menu	Pass	Good UI

8.00	1	TC.008	Player Movement	Player Movement functionality	• Play through game to test the movements of the player • Press A or ← to move left • Press D or → to move right	Player Movement	• Player automatically moves forward on start up • A and ← move player left • D and → move player right • Left and right movement is disabled until after player crosses the start line	• Player automatically moves forward on start up • A and ← move player left • D and → move player right • Left and right movement is disabled until after player crosses the start line	Pass	Basic player movement
9.00	1	TC.009	Obstacles	Obstacle functionality	• Collide with obstacles of different types.	Obstacles Box Colliders	• When the player collides with small obstacles with a health count above 0, obstacle disapears, audio plays and health count minuses 1 • When the player collides with small obstacles with a health count equal to 0, player movement is disabled, end run animations play, distance • When the player collides with big obstacles, player movement is disabled, end run animations play, distance count stops and game ends	• When the player collides with small obstacles with a health count above 0, obstacle disapears, audio plays and health count minuses 1 • When the player collides with small obstacles with a health count equal to 0, player movement is disabled, end run animations play, distance • When the player collides with big obstacles, player movement is disabled, end run animations play, distance count stops and game ends	Pass	
10.00	1	TC.010	Collectables	Collectable functionality	• Collect pirelli tyres	Player can collect health	• When the player collides with Pirelli tyres, it will destroy the object from the game	• When the player collides with Pirelli tyres, it will destroy the object from the game	Pass	
11.00	1	TC.011	Health Count	Health Counter functionality	• Collect pirelli tyres	Pirelli tyre updates the player health	• Health count is displayed in the Win scene, lose scene and in the Game during all levels, • When the player collides with pirelli tyres, it will update the Health counter with the new Health amount • Health amount saves through levels • The health count is reset when the Game is started from the main menu, win scene and lose	• Health count is displayed in the Win scene, lose scene and in the Game during all levels, • When the player collides with pirelli tyres, it will update the Health counter with the new Health amount • Health amount saves through levels • The health count is reset when the Game is started from the main menu, win scene and lose	Pass	Good UI
12.00	1	TC.012	Distance Display	Distance functionality	• Play the game	Distance is added and updated throughout game	• Distance will start being kept after start up animations finish • Distance added 1 every second played	• Distance will start being kept after start up animations finish • Distance added 1 every second played	Pass	