Mobile Application Development 3 Project

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A Bayou-Space Odyssey

A 3D runner game made with Unity.

Introduction

This Developer Diary reports the development of the Game *'A Bayou-Space Odyssey'*. This Game was designed by another student and it is being developed by me. This Game's development will be over the first semester of fourth year. The Game's design document leaves the development to be very open. This means that a lot of changes can happen to the Game.

Game Implementations:

- Player Movement and Mechanics
- Level Development
- Enemy Movement and Mechanics
- Respawn Player
- Score System
- Power Ups
- Multiplayer
- Main Menu
- In Game Menus
- Options Menu - Resolution Options and Controls Mechanics

Meetings with the Designer

Meeting 1 - 21st of October 2020

I messaged the Designer on Microsoft Teams and asked for the design document. Shortly after he sent it and I had a look and I got the impression that the design of the Game is very open leaving me to actually further the design. Which meant that the design was up to me as long as it was an Endless 3D Runner. This gives me lots of freedom as a developer. After this meeting I did research on the Game and began to watch Unity tutorials to have a better idea of what to do and to plan ahead. I put together a Plan for the Game just to get to know what the world is going to look like and to get a feel how the Game would actually play. This Plan brings me to my next meeting with my Designer.

Meeting 2 - 23rd of October 2020

I messaged the Designer the Plan and he was very supportive of my ideas. This plan mainly consisted the level design. I named the Game *'A Bayou-Space Odyssey'* (inspired by the film *'2001: A Space Odyssey'*) and the

character Kal (inspired by the super computer *'The Hal 9000'* from the same film). Level 1 takes place in a desert with the obstacles are road blocks and cacti with one spider Enemy near the end. The Player has to jump or go from side to side (dodge) to avoid these obstacles. The Player also has to collect Bolts in order to get a score. Once the Player gets to the covered boat at the end of the Player have completed the level and can move onto Level 2. Level 2 now takes place in a swamp/bayou area. Level 2 is 3 times the size of Level 1. Similar to Level 1 the Player has to dodge logs and trees. There will be much more Enemies on this level, bears, crocodiles and frogs. The Player has to get through this level and find Kal's ship at the very end. This ship will bring the Player to the third level Mars. Level 3 is twice the size of Level 2. In Level 3 the Player will have to dodge space pods. The Enemies on this level are aliens and robots. There will be more than one type of alien. The Player has to get through this level and get to Kal's home at the very end. That is the level structure of the Game. The Designer agreed with this plan so I went forward from there.

Meeting 3 - 18th of November 2020

A few weeks passed and I had begun to develop the Game and with that I wanted to make a few of changes to its design so I messaged the Designer to discuss these changes. The first change is the controls. I have them set up for WASD and space to jump and I think it's actually better to allow the play to control the Player going forward as it isn't really an endless runner as it has different levels. The second change was the score system. I wanted to alter it from distance to the bolt pick-ups. I believe this would work better since the Game has different levels and each level has an ending point. The third change was to change the power up of Double Jump' to Double Bolts'. I thought that the Double Jump' didn't actually add an advantage to the Player so it was quite the pointless power up. The Designer agreed to these changes. I also sent some screenshots of the Game and he seemed to be impressed.

Meeting 4 - 4th of December 2020

The Game is almost finished but there was some late minute changes that I had to run by with my Designer. First was that I have allowed the Player to control the character with '1234', 'TFGH' and the arrow keys as well as 'WASD' and the 'space bar'. Second was since the Single Player's score system was changed to Bolts to have the Multiplayer the same. Whoever gets the highest amount of Bolts throughout all 3 levels wins. The Designer agrees and he said he was looking forward to the finish product.

Meeting 5 - 9th of December

I messaged the Designer to let him know that the Game is finished. He looks forward to seeing the Game in action at the presentation. We had a pleasure working together to make this Game.

The Development Process

13th of November 2020

I began making the Game by creating a new 3D Game project in Unity. I created a terrain and edited the textures to make it look like a desert. Next I got the 'Sleek Toon Bot' asset from the Unity Asset Store. I spent some time looking at different characters and this one seem perfect for the Game. The asset already had the animations of Idle, Walk, Run and Attack. I decided will be mainly using Idle and Run. The asset worked right out of the box but the Player controls did not suit the Game. I followed this tutorial to help me make a script for the Player movements. This tutorial also helped me with getting the camera to follow the Player which also needed a script for the camera. With these two function now in place I now have a Player that can run in all directions with the camera following closely behind. Next step was to get the Player to jump. We had covered this in a lab in the course so this was pretty easy to implement. Now that the Player movement has been fully implemented I could now design the level.

I created a track that has terrain heaps at either side. On this track I created two walls of hedges so Player cannot get off the track. With this in place I got some assets from the Unity Asset Store such as cacti and road blocks. I

place these throughout the level. With these obstacle now in place I decided to add Bolts which I also got from the Unity Asset Store. I placed Bolts throughout the level. These Bolts would need a script in order for the Player to actually pick them up. We also covered this in a lab so this was pretty straight forward. With these all in place I had the basic set up for Level 1.

14th of November 2020

Now that I had the basis of Level 1 done I got aspider Enemy from the Unity Asset store. This spider was not suiting the Game so I went back to the store and had another look. I found one and this spider suited the desert theme of the level. This spider was pretty easy to implement as we had covered making Enemies in a lab. After this was complete I added some audio to the obstacles, Bolts, Player and the spider. I got these sounds from here. I have it so I the Player hits the spider they will just respawn a few meters back.

15th of November 2020

Level 1 is now almost complete. I thought the level looked a bit lifeless so I decided to have the Bolts rotate by following this tutorial. After this was added I thought a golden Bolt would be fitting to have at the end of the level. This Bolts is worth 10 regular Bolts. The next implementation was to add a portal to the next level again we covered this in a lab so I found it straight forward and I got it working on aboat I found on the Unity Asset Store. Since I had the next level portal working I decided to make a Start Menu but this was only basic with no UI so this had to be worked on more.

16th of November 2020

Now that the next level portals were working I decided to add an actual portal level. I created a level with thiswater I got from the Unity Asset Store. Next I added the boat and added a fixed joint component to connect it with the Player. I first tried to make a timeline to have this like a cut scene. This really wasn't working well so I added the Player script to this new Player so I could control the Player and the boat. I added a level portal but I was thinking how is the Player going to know that they have to make the Player and boat go forward in order to get to the next level. I decided to add another Bolt right at the portal and coloured the texture to make it purple. For the time being I duplicated Level 1 for Level 2 and 3. This was just so I could get the flow of the Game working.

From here I wanted to put more work into my Start Menu (now Main Menu) and add a UI to the Game. Thistutorial helped me greatly as it was easy to follow and suited the purpose for the Game. Next I decided to make the Pause Menu. The same youtuber also had a tutorial on this which I was extremely glad of. Since I got these added I set up an Options Menu which was a pretty similar set up to the Main Menu. With these Menus now in place I had a nice UI implemented into the Game.

17th of November 2020

The Game needed a Bolt Counter so I managed to get it working with thistutorial. Now the Bolts collected by the Player are displayed on a basic UI on the top of the screen. This needed to improved. I updated the Bolt Counter with a nicer font and made it much bigger as it was hard to see. This tutorial helped me here. All I had to do was get the Bolts to save over the levels. This was by far the hardest thing to implement in the Game yet. After watching many tutorials and googling for hours I finally got it to work by putting multiple solution together. Add first I tried to have the Bolt Counter to be set to DontDestoryOnLoad but this ended up just not destroying the Player which made for a very buggy Game. I decided to take a break from this and to work on the 2nd Portal. This worked very similar to the first. It was set in space and the Player can control a Space-ship to get the Purple Bolt and go on to the next level. This ship asset had some nice textures so I added one to Kal to make him more unique for the Game.

After my short break a I came across the PlayerPrefs. This was just the thing I need to do to get my Bolt Counter working but I could only get this working because of what I learned from failing to do it by using DontDestoryOnLoad. Now that the Bolts saves across the level I added a line of code to delete them once the Player starts the Game from the Main Menu.

18th of November 2020

When I thought I had met the hardest thing to implement in the Game another one comes along and proves to be much harder! First I wanted to actually give the Game Options. So I first tried to set up a volume level and then I realized that wasn't very necessary since this can be controls by the device the is being played on. I decided to allow the Player to choose was resolution would they like to play in. This tutorial helped me set up a UI and the options of having the Game to be in Low (1152x646), Medium (1280x1010), HD (1920x1080) and Default which is HD. This would only work in an actual build of the Game so I will have to test to see if this actually works.

Now comes the hard part. Changing the control mechanisms in Game. I followed thisfour part tutorial series and this helped me set up a UI for the Player change the controls. The Player can change the controls from WASD and Space to whatever they wanted (except for the shift keys and mouse). This is saved by the PlayerPrefs which I used earlier to make the Bolts save but this did not work like the Bolts. When the Player starts the Game after changing the controls the Game automatically resets them to WASD and Space. I began to think something was wrong with my code but I went back to the Control Option and my edited controls were still there. I messaged the youtuber and asked if this only works in an actual build of the Game like the Resolution Controls but no he said it should also work in the Unity Editor. I decided to call it a day as I had already got a lot done.

I also met with the Designer on this day and we discussed some changes that I would later implement into the Game.

19th of November 2020

I wanted to update the UI as it was a bit clunky and did not resize. I updated the UI on all the Menus with a green and navy colour scheme. I tried once again to get the Control Options working but I again failed to do so. I will have to look into this more.

23rd of November 2020

I wanted to work on the Game levels more that the Controls Options to get an actual Game working. So I am now designing Level 2. I bought an Animal Assets pack from the store as these best suited my needs. I put the bears, crocodiles and frogs throughout the level and added the Enemy script to them. They work much the same as the spider on Level 1. Since there is more Enemies there are more respawn points for the Player

25th of November

I've been working on Level 2 a lot, it is almost completed. The level is 3 times the size of level 1. To make it a bit harder than the previous level there are far more Enemies to get past and Kal is a bit slower as he is running through mud. I think I've done well with creating the bayou atmosphere. I got some really nice trees and materials for the level. The fallen tree barriers do take a bit long to render but they still work great. At the end of the level Kal's ship is found buried in the mud. This ship is the same ship from the Level 2 Portal I mentioned earlier.

30th of November

I decided to create an actual build of the Game to see if the Resolution Options worked. Med, HD and Default worked. Low did nothing so I picked a different resolution, 640x480 and that worked. I then went on to finish designing Level 2. Level 2 is now complete with it being much longer than Level 1. There are more Enemies, more Bolts, more obstacles and Kal's ship is at the very end!

3rd of December

I have been working on Level 3. As it is twice the size of Level 2 Kal can run faster and jump higher. This actually suits the level as it is on Mars. The Player has to jump over Space Pods. There are many Enemies on Level 3 that are much harder to dodge compared to the last two level. (robots, aliens and alien Insects). The respawn point are less frequent so it really encourages the Player not to hit an Enemy. There is also more Golden Bolts to be

collected. This Level is challenging to get through so I thought it would be good to give the Player some extra rewards. Kal's home can be found at the very end and that is the very last point of the Game. The next scene will be almost like a podium for the Player and it will display their score form their playthrough.

5th of December

Level 3 is now complete. I have added a finishing screen that shows Kal has made it home. This screen displays the Bolts the Player has collected throughout the 3 Levels and a button to return to the Main Menu. I have added in the power ups, '¡Double Bolts!' and '¡Invincible!' to all the levels (Level 1 has no invincibility). I also discovered you can change the controls in the Input Manager. So I've set up: '1234' and 'TFGH' for character controls. This will suffice for my attempt at the key bind changing script. With these new controls I have updated the Controls Options Menu to show a layout of all the controls for the Game.

I have implemented a Multiplayer Menu where 2 Players can select which character wants to play as. Player 1 plays as 'Kal' and Player 2 plays as 'Cronk' (Inspired by 'Cronk' from the Racket and Clank Games). Their Bolts score is displayed on the screen. First Player 1 runs through all 3 Levels and tries to get the highest amount of Bolts as they can. Then Player 2 runs through the levels and tries to get the highest amount of Bolts they can. Whoever collects the highest amount of Bolts wins! (Any Player can go first.) When the Players have run through the levels they are both displayed on a finish screen at Kal's home. This screen displays both Player's Bolts score. The Game is almost finished now. I just need to fix some small things and update the Single Player with some things I learn will implementing the Multiplayer. First of all is the fix the second '¡Invincible!'. After this power up is over some of the Enemies can still be passed through. Second is to update the Bolt Counter as it is quite hard to see at times so I will be adding in a background to have it like the way it is in the Multiplayer mode.

I have updated the UI on the Bolt Counter in Single Player. It is much easier to see now. I've also redesigned the pause button as that also was hard to see. I have fixed the '¡Invincible!' power up problem on Level 3. The Player can no longer pass through Enemies if they respawn. The Game is pretty much finished now. I just need to finish the audio.

6th of December

I have fixed the In-Game over lapping UI (Pause Menu + Bolt Counter). I have also added 'LAST GAME BOLTS: 000' to the Main Menu to display how many Bolts the Player collected in their last playthrough. I updated the Controls Menu to have a different colour scheme for each control layout just to make the different controls look more separated and unique.

9th of December

I have been adding the last few touches to the Game. Now when the Player hits an Enemies the Game will slow down for about a second before they respawn. I have made it so the audio in the Main Menu plays throughout all the Menus. This tutorial helped me achieve that. I have updated the audio on all the scenes. I found some 8 Bit versions of some of my favorite themes from other Games and films to add to the Game. All music used in the Game are credited in the new Music Credits Menu. I have updated the Splash Screens in the Single Player to show the level of difficulty for the levels. I have added in a 'Not Invincible' Power Up just to let the Player know that the 'Invincible' Power Up is used up. The Scripts needed some cleaning up so I added the necessary comments and they are all formatted appropriately. I discovered some bugs while testing a playthrough. Some of the Enemies did not have sounds so if a Player hit one they would just pass through. This has been fixed on all Levels. When a Player used up the 'Invincible' Power Up if they respawned close to where the Power Up use to be they could still pass through the Enemies and Obstacles. This has also been fixed. I believe that is all the bugs fixed. I can't find any more so hopefully that is all of them.

The Game is finally finished!

Conclusion

Now that the Game is complete the Designer and I are very pleased with the final product. I believe I have met all the requirements for the Game. I had some nice changes for the Game that the Designer agreed with. I believe these changes makes the user experience better, more interactive and enjoyable. Working with Éoghan was a pleasure. He was very open to the changes and he always seemed to be interested to see the progression of the Game. With this project I have discovered that I love Game Development and I hope to do a lot more of it in the future.

END OF DEVELOPER DIARY