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GAD – 405: RADICAL CONVERSION: Find The Cat – Documentation

When planning my design, I had multiple different ideas and inspirations. I initially narrowed this down by choosing the 'space invaders' project to base my code off of. I at this point knew that I wanted to keep the shooting aspect as the visible core mechanism to feature in my game, but change the style and feel to something very different to a space shooter. Because I did not know where to start in terms of conceptualising the project, I thought back to some of my favourite 2D games I played as a child; one of the first to come to mind was Super Mario Bros[1]. This game made me decide that I wanted a map that is larger than the game camera displays. It also made me decide to have a camera that follows the player as they progress through the map. Because of this I decided to start the design process by making the map.

I started by sketching ideas in photoshop. After spending a substantial amount of time painting a backdrop, I decided that the goals I had set myself didn't fit the amount of time I had to produce the game. So instead I began experimenting with lines, until I had what I thought looked like trees. I decided to take this further, and make a forest landscape for the background. I went with darker colours and minimal detailing, because I decided that I wanted the character to stand out. I also designed the map with multiple layers, as I wanted the character to be able to walk in front of some trees, and behind others. I did this to give the image more depth and a sort of 3D illusion, in the hope of making it seem like a map, rather than just a background. Once the map was complete, I loaded it into the code for project 2, and used the existing asset for the player to check the movement through the map. However, I at this point discovered that converting the PSD file to a PNG had flattened the image, meaning that the player travelled in front of every tree. As I was unsure of how to make this work, I left the map as it was for a while.

Moving on to the character design, I took my inspiration for art style from Tim Burton, and the characters from the film "Coraline". I used Photoshop CC and a Wacom intuos tablet to make my design. I decided to take advantage of the large map by making a smaller, child like character. I thought this would be a different take on the usual shooter game. I kept within the black and grey theme, but painted the coat white. I did this so that the character stands out against the rest of the map. Also, the colour white can often be associated with innocence and purity – intentionally contradicting the theme of a shooter. Once I had determined how I wanted the character to look, I loaded it into the game. I did this so that I could check: the size of the character compared to the map, the movement throughout the world, and how it looked visually against the map. I then came up with an idea of how to make the original map idea work. I went into photoshop and took the layer of trees that I wanted to be in front of the player and moved it to it's own separate image. I then loaded this into the assets and played the "add()" function after the character ones, so that it woud be processed later. I tested this and it worked how I wanted it to – the player can run in front of and behind the trees. Once I was comfortable that everything looked how I wanted it to, I began working on the camera mechanisms. As I was unsure of how to do this, I read some of the code on the Phaser Learn Page and I watched some video tutorials.[2] After this, I added the necessary code to the Atom document. However, I encountered a problem where the camera stopped moving before the map finished. I tried changing the world bounds and the size of the map in attempt to fix this, but I was unable to do so.

Next, I started adding the enemies. I was unsure of what I wanted the enemies to be, but I knew that I already restrictions as the game was to be set in a forest. I wanted it to be something that could realistically be found in this setting, but exaggerate it in the way a child might see something they fear. I tried sketching out some monster type creatures, but found it difficult to design something different and imaginative that could also be taken seriously. I then resulted to asking my sister and cousins (all children) what they might see in a forest that would scare them, and they all concluded spiders. After that, I also I looked for inspiration in existing games. After browsing the steam store, I came across the game Limbo, which I recognised but had never played before. I thought that the design of the game was quite similar to mine, so I decided to buy it and play it to observe it more closely. After taking my

[1] Platform: Nintendo DS, Release Date: May 15, 2006, Category: Action, Publisher: Nintendo
[2] Brian Greig. (2017). *Phaser: How to Make Games for the Web: Interfaces and Camera.* Available: https://www.youtube.com/watch?v=6deUse0IQn4&t=429s

research into account, I decided to go with spiders. I sketched out some ideas, and once I had one I was happy with I put it into the assets folder and began the code for the enemies.

Originally, I was going to utilise some of the code from the 'space invaders' project to plot the enemies. However, I didn't plan on having a group of identical enemies, and I was unsure of how to change the mathematics to put them where I wanted them. Because of this, I decided to make each one a sprite and plot it in a specific position on the map. Concerning the design of each enemy, I planned on drawing different multiple different spiders. Instead, as I was running out of time and I knew that I still had a lot of coding to complete, I decided to use the same drawing but change the size and position each time. I then drew a spritesheet where the spider would move a few hundred pixels down in each frame. Originally I wanted to just have an image/ sprite that gradually moved on an axis defined in the code. I had hoped this would be possible as it is fairly common in 2D games for enemies to be "patrolling". Although upon looking for examples, I couldn't find any existing code in phaser to do this. Consequentially, I used a spritesheet. This worked ok in the end, however I did not have time detail each frame for a smooth movement, so the overall animation doesn't currently look how I want it to. Once I had put the three spiders in the right places, I added physics to the character, the enemies and the map.

Then, I added a hit function, where the player would die if it collided with an enemy. I added some code into the update function, that would tell it when to run the necessary hit function. I then loaded the server in attempt to try this out. However, the player walked straight through the enemy unharmed. This became a large problem in the development process, as I spent a lot of time trying to fix this issue. Looking on the Phaser Learn page, I found a lot of different examples of how to make the physics work, some outdated and some not beneficial in any way. Eventually, I had to change the position of the physics for the map in the code, and change the code for all of the physics for individual objects. I tested that it worked by adding a 'gameOver' state, using the image from the 'space invaders' project. I did this so that when the player collided with an enemy I would know because the game over screen would display and the game would start again. At this point I decided to take a break from coding, and design the screen that would display at this point. When making this, I decided to also make a game win screen, with the intention of adding this to the code later.

Next, I added the shooting mechanism. This was the code that I decided to keep from the 'space invaders' project. I drew a small bullet in photoshop, which I then converted to a PNG to use as an asset. I changed the velocity of the bullets, so that they went horizontally instead of vertically. I then added a function which would kill the enemies when they were hit by a bullet, and that would kill the bullet after it collided with the enemy. I then added some code into the update function that would call the code when the spacebar was pressed. I tried this out and discovered that the "bullet.kill()" part of the code meant that after killing one enemy, I was unable to shoot again. I could not work out why this was happening, so eventually I just decided not to immediately kill the bullet after it collided with an enemy, but speed up the movement of the bullet so it was less visible. However, this meant that after killing the first enemy, the bullet would continue through the map and kill every other enemy before the player even got to them. I resolved this by changing the velocity of the bullet so that it would shoot at such an angle that it wouldn't kill more than one spider at a time. In the future I would like to add a mechanism when the player can choose which direction they would like the shoot in, maybe by moving the mouse.

Once I had added all the code for the shooting function, I play tested the game and also asked a few friends to try it. Upon feedback, I found that a common issue was the hitbox on the enemies. I hadn't planned for this particular problem, however I had made sure the area around the spider was transparent, which I thought would avoid any issues. But I found out that as the spider moves up and down, a lot of people felt the best option was to try and run under it. This could be due to other games which have a more stealthy approach, or because the character is a child and a lot of people don't instantly expect to see a child shoot. I tried reducing the size of the space around the spider on the image, but this meant that some of the images on the sprite sheet were getting cut off. In the future I would like to attempt to solve this problem so that people can choose to run under the spiders or shoot them.

At this point, I felt like the code and design of the game was pretty much finished. But as I played it more, I felt as though a story needed to be more prominent. Due to the size and length of the game, I wanted the player to feel as

if they have a reason, or an objective. I felt that this would add more complexity to the game, and give the player a motivation and desire to complete it. This made me think about the reasons a small child might have to run through a forest and shoot huge scary spiders. I was thinking about this for days, until I had an idea that they might be looking for their pet. I began to sketch a cat in photoshop, and decided to paint it orange as opposed to grey. I did this so it that it would stand out and be obvious to the player straight away. I wanted the cat to be the focus of the game, and the reason they would play. I was also aware that having an accent of colour amongst white, grey and black can be an interesting way of drawing attention to something and provoke hidden messages and meanings e.g. the red coat in "Schindler's List". I then drew a sprite sheet that would be activated upon the initial start 'click', showing the cat running away. I added this so that it would be obvious to the player straight away that the cat had run off to the right of the screen, implying they should follow. I also used the first frame of the sprite sheet and added it at the end of the map, so that they player can run to the cat to finish the game. This also worked to hide the early finishing of the map, and stopped the player from running off screen.

I then took more feedback, and concluded that my game didn't resemble 'space invaders' as much as it maybe should. At this point I didn't want to change the game I had made, because I didn't want to risk errors occurring and also I liked the way that the game had turned out. So instead, I decided to use some of the 'space invaders' code to add a minigame within the game I had already made. I decided to write the code so that the minigame will be available upon a mouse click once the player reaches the cat at the end of the game. I thought this would be beneficial for the playability as it adds an element of exclusivity and reward. The player feels as if they have won something because they have found the cat.
I drew the assets for this in Photoshop. I made a map by painting a space background, which was slightly larger than the game window to make sure that it would fit. I kept the spiders from the original game as I wanted to keep it coherent and maybe make some implications of where the cat was and what it was doing before the child found it. I painted the spiders green and added some new colours give connotations of aliens and space. I then used the cat from before and painted a space suit and rocket on it, to fit the theme.

After that, I just had the sounds left to complete. I used the virtual instruments and recording facility on "www.soundtrap.com/studio/" to produce a song for the games. If I had more time and the correct facilities, I would use my existing musical knowledge to compose and record a guitar piece for the soundtrack. However due to different constraints, I used the synth pad to make a simple piece of music that could be looped in the game. I wanted to keep the space/ sci-fi genre prominent somewhere, so that the I could pay homage to 'Space Invaders'. I chose this instrument because synth sounds have been used in Sci-Fi films since 1956, giving people a forced perspective of what the future and space should sound like[3]. I also think that synth sounds can give feelings of uncertainty and due to the lack of musical familiarity, can sometimes cause discomfort. A good example of this is the soundtrack of one of my favourite films – "A Clockwork Orange" – By Stanley Kubrick.
I also used the synth pads in a different octave to make the sound for the shooting. I wanted to keep within the theme, and stay away from the sounds and connotations associated with normal guns. To add to this, I think that a lot of people are more comfortable seeing a child like character hold an electronic/ synth space gun than a normal one.

In conclusion, I am happy with the way my game turned out. I think that I achieved the "radical conversion" required for the brief, while still keeping an important core mechanism from 'Space Invaders" – (the shooting) . In the future I would like to make some minor changes, including design changes like the sprite sheet for the spider. I would also like to attempt to fix some bugs so that the playability of the game is smoother. One of these would be the hit box on the spider. Another would be the start screen, as the play can still play the game without clicking start, meaning they do not get to hear the music or see the initial cat animation. However altogether I am content with my game and will look into attempting to publish it, or at least take it further in the near future.

[3] Martin Fowler. (2016). *Sounds of the Future: A Historical Primer on Synths in Sci-Fi Movies.* Available: https://flypaper.soundfly.com/tips/sounds-future-history-primer-synths-sci-fi-movies/