| Time Spent | Date | To do | Work done | Detail | Bugs |
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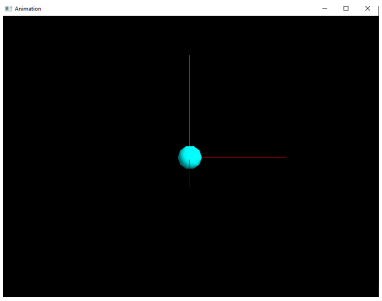
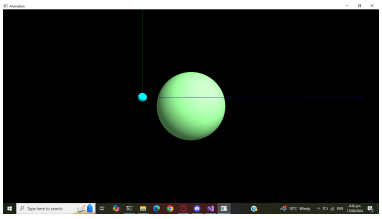
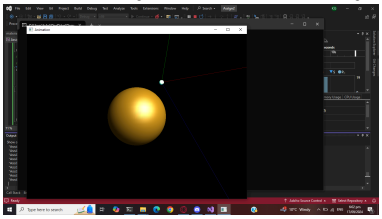
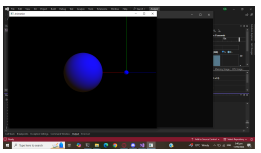
| 1hr | 19/08/2024<br>4pm-6pm | Start by creating a center point to show me x, y and z | Made a center point.<br><br>Made 3 directional controls. |  | |
| 2hrs | 20/08/2024<br>4pm-6pm | Implementing Camera controls | Setup key binds | I made keybinds, however I didn't manage to get the camera moving. I will need to do that next time. | |
| 2hrs | 17/09/2024<br>4-6pm | Creating a Sphere that will become my helicopter..<br><br>Changing it to work with materials. | Created Sphere's<br><br>Made materials work. | Started by creating a sphere. Then used the controls to make it move.<br>  <br><br>I then started working on setting up a material for the ball. However I found a bug with still having glcolor. Once it was solved the end result of my code for the day.<br>  | While trying to set up materials I didn't disable glColour so it resulted in my ball remaining the previous called color.<br><br>Once I had solved this. My axis were now all the small color of my ball. Which I also did not want. I thought I could enable and disable the color to get the desired results.<br><br>However that resulted in this:<br>  <br>Where my ball was partly both at once. |

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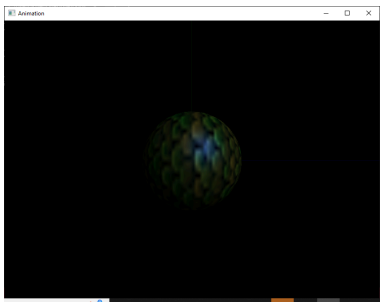
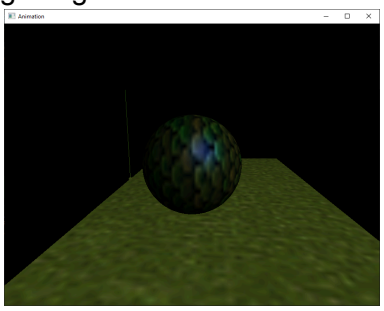
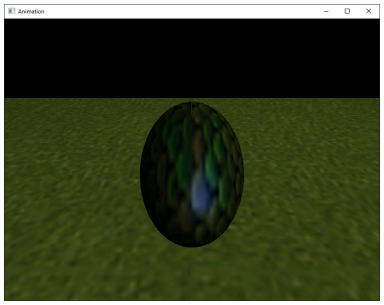
| 1hr | 23/09/2024<br>3pm-4pm | Working on getting textures | Gave my helicopter a feather texture as a start. |  <br>I did work along with the teacher getting this as the final result. | |
| 2hrs | 24/09/2024<br>4pm-6pm | Get the tiles working.<br><br>Making the bird helicopter shaped. | Placing tiles along the floor. | I started by following along with what the teacher had done in the previous day getting to this:<br>  <br>At this point was still hard coding each tile, which is not optimal as I'd rather it cover a large area with tiles.<br><br>I started by elongating my sphere.<br>  | |
| 4hrs | 11am-2pm<br>25/09/2024 | Create a tail.<br><br>Get a propeller inside.<br><br>Try to figure out textures for the | Created a tail,<br><br>Got a propeller inside a donut. | I started by adding a tail to the helicopter, then adding a small donut to the end of it. Ending in this: | Had a bug where my one rotor was being textured, however after using rotate it stopped working, so I decided to |

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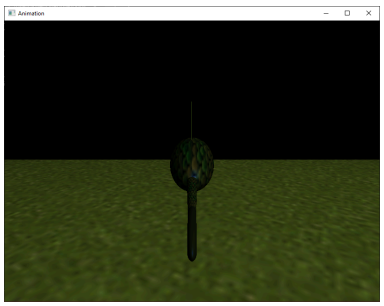
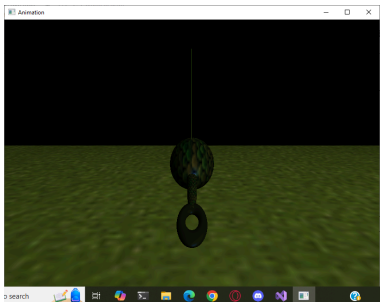
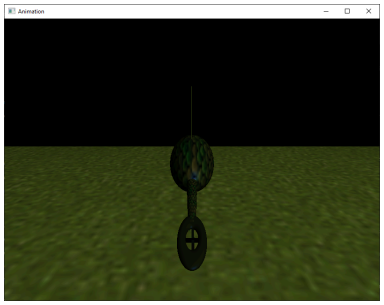
| | | rotors. | |  <br>I decided for testing purposes. I should keep the end donut turned to the side like this:<br>  <br>As this would allow me to know what is happening in that hole and if everything is being placed correctly.<br><br>I then got to work creating a propeller.<br>  | switch to cylinders anyway. |
| 2hrs | 2pm-4pm 30/09/2024 | Fix propellers.<br><br>Get more of the helicopter body built. | Fixed the propellers<br><br>Got more of the body built | I figured out how to get the textures working for the propellers however after confirming with the professors I could change to use a donut shape and go more along the lines of a drone. A lot of this went out the window and I forgot to take screenshots. | |

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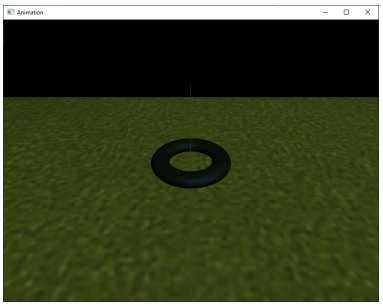
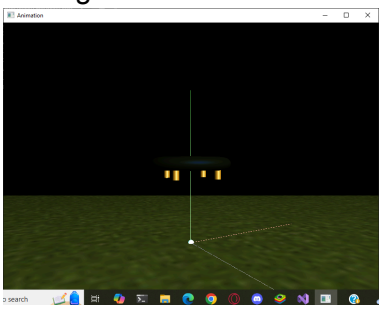
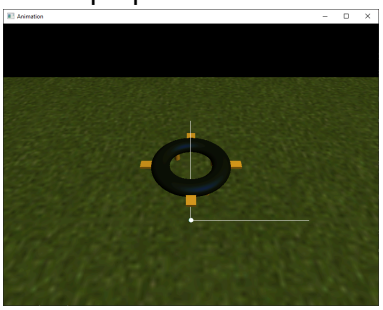
| 3hrs | 11am-2pm 1/10/2024 | Create Drone body<br><br>See how far into the drone shape we can get | I made a donut shaped body.<br><br>Made 4 “legs” for it to stand on.<br><br>Made 4 platforms around the body for the fans to stand on.<br><br>Made 4 fans on the platforms. | I started by deleting all my old helicopter building shape. Then began my drone building shape which resulted in<br>  <br>This so far. My next step was to create the 4 legs for it to stand on. Which ended up looking like:<br>  <br>I then made the base plates for the propellers.<br>  <br>I next added poles to the 4 corners | |

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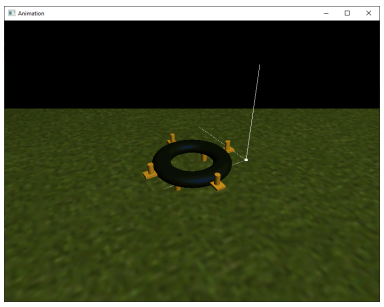
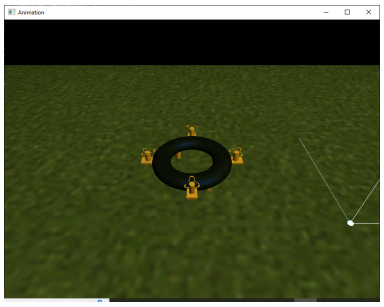
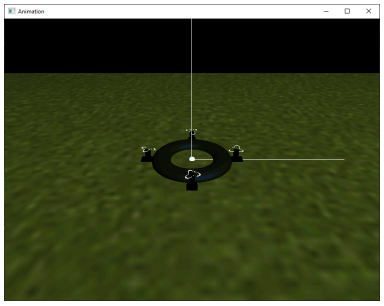
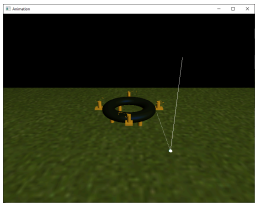
| | | | |  <br>I then added the fan blades to it, I decided to go a bit fancy and made circle fanblades.<br>  | |
| 2hrs | 4pm-6pm<br>1/10/2024 | Get props to rotate.<br><br>Make a framework version of my items. | Made adjustments to speed and movement. Needs more work. | I started by adjusting the speed required for takeoff, so now my helicopter can only liftoff at a high enough speed. I also changed the color of certain things to make them more standout.<br>  <br>With this I can't go up until it's at the right speed.<br><br>I also stopped being able to drop below 0. I now just need to trial and error to find the offset. |  <br>It's hard to see with these smaller props however my bug was rotating the prop on the wrong point resulting in a strange pattern. Not a massive bug but entertaining. |
| 2hrs | 7/10/2024<br>2pm-4pm | Getting all art to make a mesh when I pressed | Made the ground and drone itself a mesh. | After finding all moments where I had used glut, I then adjusted it to allow for mesh. | |

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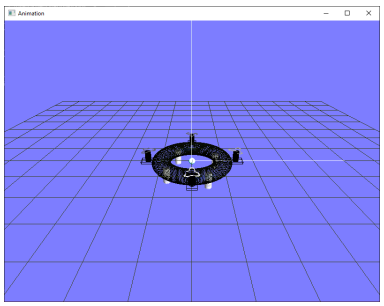
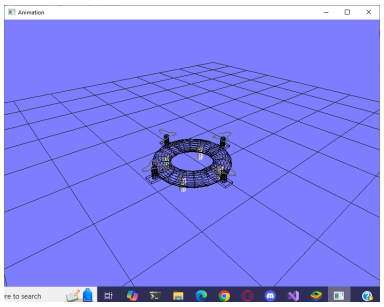
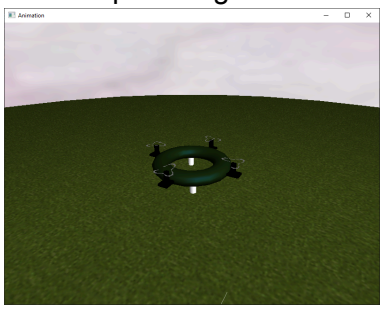
| | | | |  <br>This was the start of getting it to work. I'd then have to get it to move based on how many squares rather than just the entire size. | |
| 3hrs | 8/10/2024<br>11am-2pm | Fix old code.<br><br>Try getting fog working. | Fixed old code.<br><br>Made a skybox and fog. | I started by fixing some of the tech debt from yesterday, and adjusting things to be more the way I'd like.<br>  <br>This was the result, the grid is now the same size as the ground was before.<br><br>I then worked on setting up fog, to do this, I would need to create the skybox which landed up looking like:<br>  <br>And if I were to go outside the skybox it would look like this: | While trying to get the skybox to move with the player so that the player wouldn't "escape" the sky. I found because I was using rotate to make the skybox look "correct" it would mean as a adjust my position it didn't corrospond x to x and so on. To debug this and find which position matched which of the "elements" of body. I shrunk my skybox down making this:<br>  <br>Which would give me an easy overview of what was happening. Once solved, I could increase my skybox again. |

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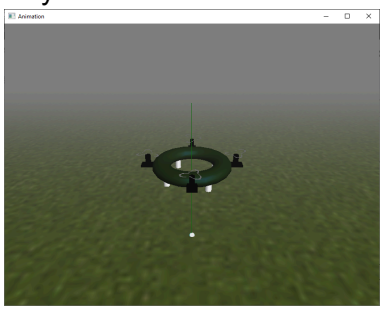
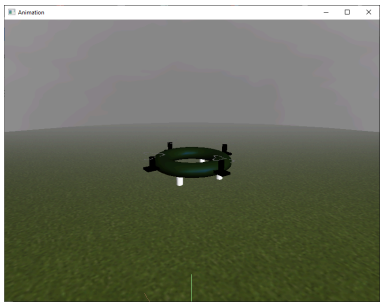
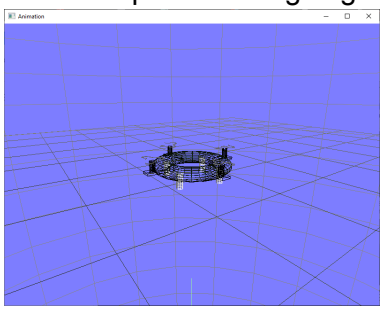
| | | | |  <br>I then added fog. Which was very thick at first.<br>  <br>After reducing the figures a bit I could see a lot further.<br>  <br>I also made sure the skybox would keep the mesh going.<br>  <br>I then did 2 small changes that I couldn't capture in photos, but I made it so when the player flies the skybox follows and also the ground's size increases and decreases. | |

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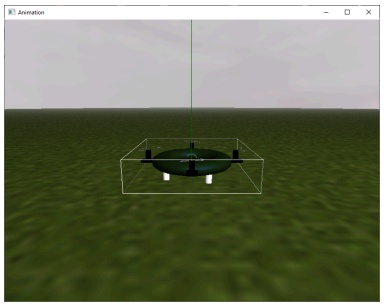
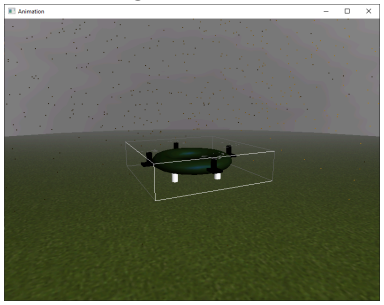
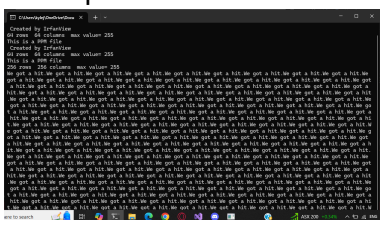
| 2hrs | 4pm-6pm<br>8/10/2024 | Make an offset.<br><br>Start getting hitbox working. | Built a square around the drone as a “hitbox” for later. | I got offset working and then made a small square box around the drone.<br>  | |
| 2hrs | 4pm-6pm<br>15/10/2024 | Made ash fall from the sky. | I got ash in the sky and got it falling | I made ash, however it was quite hard to see in a screenshot. It will last for a couple seconds, some won’t reach the ground.<br>  <br>I also made it so they reset as the player moves out of range of them basically meaning the player “loses” the particles, this means the amount of particles are around always. | |
| 4hrs | 12pm-4pm<br>25/10/2024 | Making the player collide with an object. | Collision is happening | I started by creating a function to check if the player could get in a similar position as the box. If it did it would print out:<br>  <br>I then made it so it would reset our position. Back to where we hit so: | |

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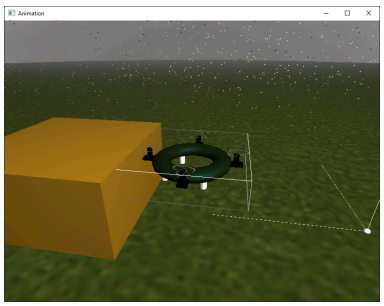
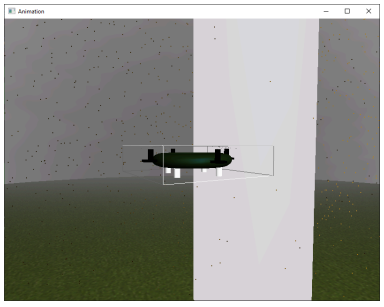
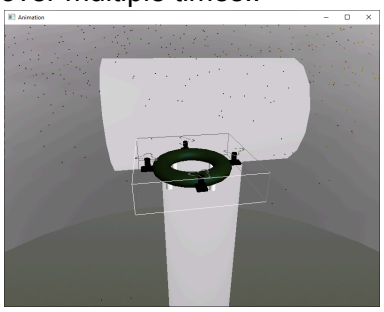
| | | | |  <br>I also did some changes to make it so collision will be easier to do for particles and other objects for later.<br><br>I then made an object struct to store the locations and sizes of all the objects I'll be making | |
| 2hrs | 11am-1pm<br>26/10/2024 | Creating a pole.<br><br>Updating hitboxes to work on any object I build rather than just the single box. | Created a pole.<br><br>Created hitboxes to work on any objects. | I created an object made it white, since it's going to become a wind turbine:<br>  <br>And then got a collision of it working, seeing that the process is simple now that I've got everything setup. | |
| 8hrs | 11am-7pm<br>27/10/2024 | Finishing up the turbine.<br><br>Create lights. | Created a turbine.<br><br>Put lights on the drone. | Started by making the top<br>The next step was to make the blades, then copy that over multiple times..<br>  | |

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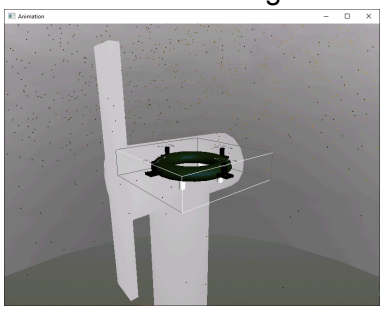
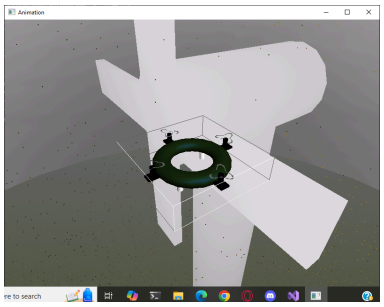
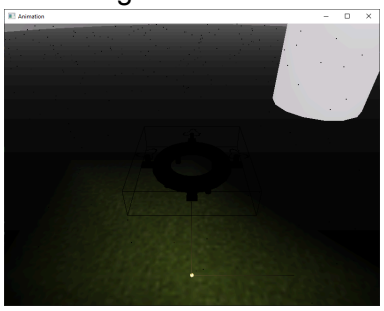
| | | | | I then built the first wing, it was quite a lot easier to then build the second wing.<br>  <br>  <br>I then got to work making the lights of my drone look better.<br><br>I started by adding one to the bottom of my drone, I set the global light to 0 so it would be easier to see my drone's light<br>  <br><br>This made the top of my drone a bit darker | |

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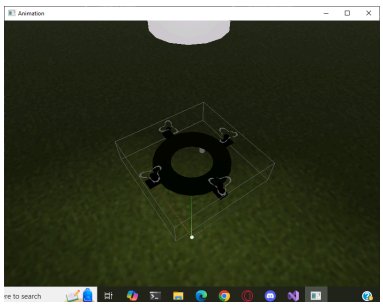
| | | | |  <br>However overall fit quite well. | |
| Final Notes | What went right:<br>I think getting collisions working went very right. The code is quite simple to understand and pretty compact compared to how I thought it would be.<br><br>I also like my particles and how they “follow” you in height.<br><br>What went wrong:<br>Small minor thing, having to redo a lot of my code into solid and wire as I didn’t know that requirement until I was halfway done and had to alter a lot of my code.<br><br>Another thing that went wrong was figuring out scales for things, as I landed up on 2 slightly different systems for where things needed to be drawn.<br><br>Final thing that went wrong, how long it took, I should have managed my time better with this project to get it done sooner.<br><br>Overview:<br>The project went quite well, helping a lot with my understanding of 3d. The scale I decided on was the turbine is 25m tall so the drone would be less than a meter tall.<br><br>I also decided the scene would be a few turbines along the scene and were no longer spinning due to a nearby volcano having erupted. They turned the turbines off to stop it jamming the bearings. | | | | |
| Total: | 48hrs | | | | |