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CS470
Homework 4
Due 11/15/2020

- Clear Description
 - You control a spaceship which has deliberately hard controls (pitch, yaw, roll, thrust mapped to three buttons each: left thrust, stabilize, and right thrust) who's sole purpose is to make it from planet to planet to refuel while flying through an asteroid field. The spaceship will have three hits on it. Hits and fuel will replenish when landing on the next planet. Crashing into a planet will punish the player by them starting with two hits instead of three. There will be a HUD overlay on the screen to relay fuel levels, hits left, and various thruster levels.
- Interface Implementation
 - I will be using Pygame for this and then passing the events to generic python event handlers depending on the type of event. Currently, I have a very configurable layout for the keys.
- Components
 - Ship
 - I am working on the ship's movement right now so the ship is a cube with a vector pointing out the top so you can tell which way is forward.
 - The ship will be modeled in blender most likely and imported using the .obj file
 - Asteroids
 - These will be procedurally generated by starting with a sphere and then modifying each instance's points based on Perlin noise.
 - If I can't get the perlin noise to work correctly, I will just model a few types of asteroids in Blender and then import them
 - Planets
 - Big ol' spheres
 - Planets will be able to be landed on by the spaceship where there are no trees
 - Trees
 - Cylinders with cones on the top which will be pointing colinear with the ray that comes from the center of the planet to the point where the tree is going to be.
 - The number of trees generated on the surface of planets will scale exponentially with the level counter
 - Ship Spotlights
 - Cylinders with lighting affects
 - Need to figure out lighting
- Problems
 - The main problem that I am having now is getting gluLookAt to work correctly. I think I am modifying the wrong matrix when drawing my objects. I think I have to put my objects in the world and then switch to the perspective matrix before I use gluLookAt. I will figure it out. I know all of the calculations I need, I just need to figure out where to put all my objects.
 - I need to model everything else. Ship movement and views have taken up most of my time
- Steps
 - Get views to work.
 - Model ship and get that imported
 - Procedurally generate asteroids
 - Model planets
 - Create landing logic
 - Create launch and entry animations
 - Deal with problems as they pop up
- On target statement
 - I did think that I would be ahead of where I am by now but I will say that I am ahead of the lectures for this course. The logic for the ship's movement didn't take too long but OpenGL finickiness certainly did. I think that I will be able to complete what I need to. The biggest thing is how to draw things in the world correctly. Once I get that, then I will be able to rule my crappy virtual game!