COSC 363 Assignment One Report

Declaration

I declare that this assignment submission represents my own work (except for allowed material provided in the course), and that ideas or extracts from other sources are properly acknowledged in the report. I have not allowed anyone to copy my work with the intention of passing it off as their own work.

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Date: 28/03/2024

Figure 1: Front view of the scene

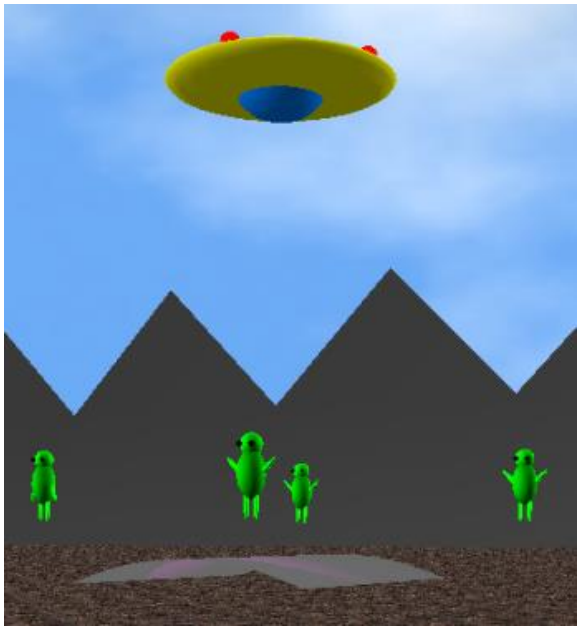


Figure 2: The UFO launching into the sky

In the scene when generated there is a UFO with four flashing lights directly in front of you, this UFO is sat atop of a launch pad. Four aliens surround the UFO and circle around guarding, when the UFO is launched they stop in their place and jump in celebration. The UFO has a purple spotlight underneath it which can be seen projected down onto the launch pad when the UFO is launched as seen in Figure 2. A sun can be seen moving across the sky in the background. The floor is made of a rock texture, suggesting it is come alien planet. The sky is blue with a slight amount of cloud, showing it is daytime. The scene is surrounded by rocky mountains.

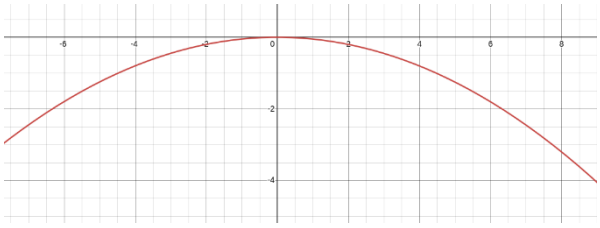
Instructions for Running the Program:

This program was developed in Linux Mint
Open the terminal to the directory the files are.
Type ' *g++ assignment.cpp -lglut -lGL -lGLU -o output* ' and press enter.
Now type ' *./output* ' and press enter.
Enjoy

Control Functions:

The up-arrow key moves the camera forward.
The back-arrow key moves the camera backwards.
The right-arrow key turns the camera to the right.
The left-arrow key turns the camera to the left.
The space bar launches the UFO.

Extra Features:



Firgure 3: Graph of y = -1/20x^2

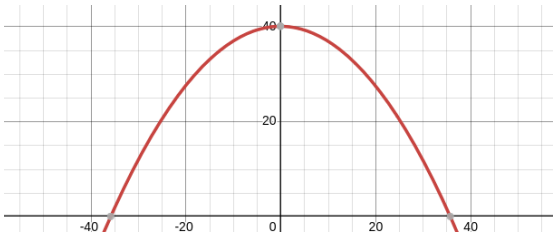


Figure 4: Graph of y = -1/32x^2 + 40

The UFO liftoffs by pressing the spacebar, when launched the aliens stop walking and jump up in celebration before resuming walking.
A sky dome surrounds the plane.
Border control is added to the camera movement, sending you back to the origin if you travel to the edges.
A purple spotlight is added underneath the UFO, this can be seen reflected on the white landing strip below.
A launchpad strip shape is generated by the equation y = -1/20x^2, the graph used show in Figure 3
A sun that path follows the parabola y = -1/32x^2 + 40, the graph used shown in Figure 4
Rocky Mountains generated by quads surround the edges of the scene.
The arm translation for the alien is worked out by armAngle = 25*sin (theta *0.4) and the leg translation is worked out by legAngle = 30*sin (theta *0.4) where the theta value is incremented from 0 to 360 continuously.
The circle movement of the aliens is worked out by the equations x = 5* (cos(angle*pi)/180) and z = 5* (sin(angle*pi)/180)-15, the x and z being used for their respective translations. The angle for those equations is given by theta+(i *(360/4)) where i represents the number alien which is being spawned (1st alien = 1, 2nd = 2 and so on.)

References:

sky1.tga- https://opengameart.org/content/seamless-sky-backgrounds-puffysky-blue04-512x512png
floor.tga - https://www.katsbits.com/download/textures/
sun.tga- https://www.textures4photoshop.com/tex/clouds-and-sky/sun-texture-seamless.aspx