# COSC 363 Assignment 1 Report

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Scene Description

A group of aliens have decided to land in an unknown compound, somewhere in the snowy mountains. They have brought down their spacecraft and left it hovering in the corner of the compound next to an abandoned concrete building and a storage garage. One alien is patrolling the area in front of the abandoned building, and another one is waving its arms on the road in front of the garage. Opposite the garage, at the end of the road, the aliens have set up a portal to their homeworld, in which a supply cart is used to supply goods. The compound is lit up by 2 lamp posts on the wall corners near the abandoned building.

Scene Screenshots
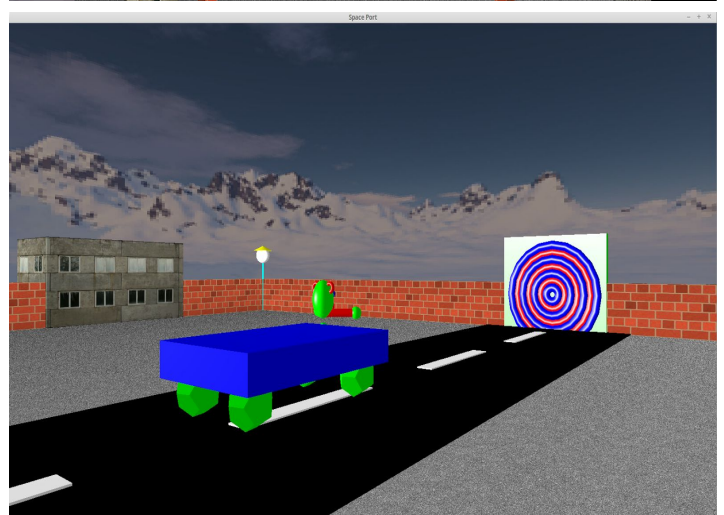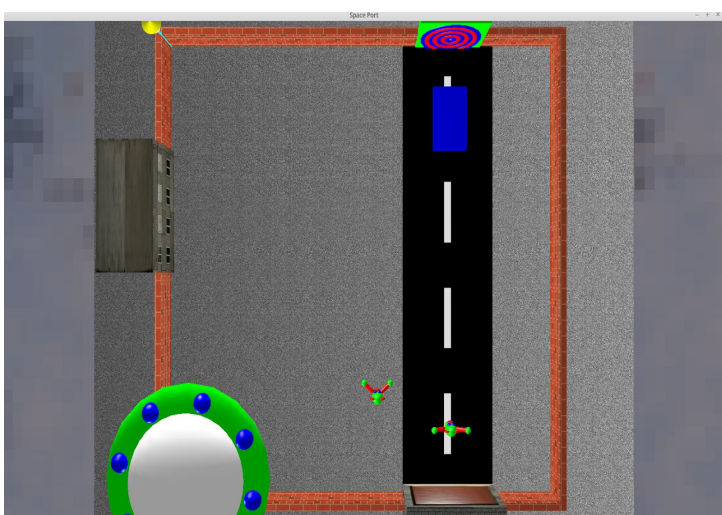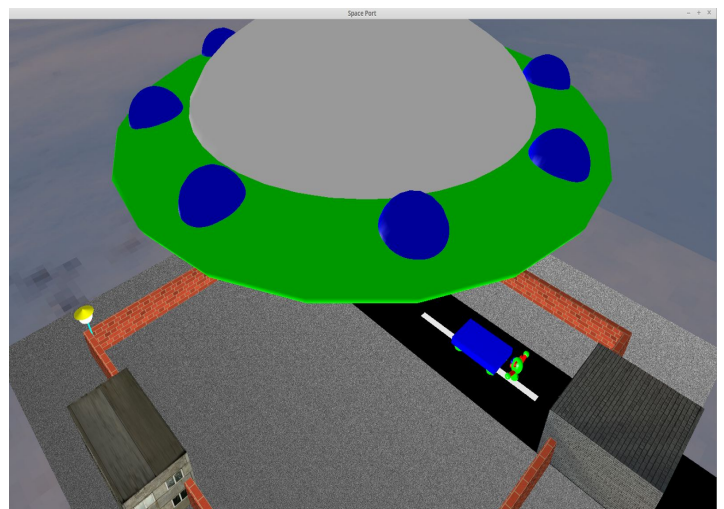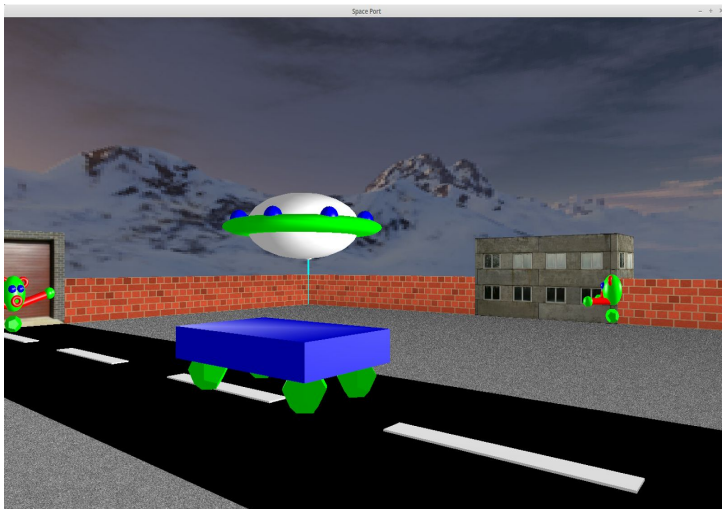
Scene Components

Minimum Requirements

- The display contains a spaceship and two alien figures
- The scene contains three static figures. A road, a garage and an abandoned building
- Both aliens perform actions
- The spaceship displays animation. When the HOME key is pressed, the spaceship will accelerate upwards. If the key is pressed again, the spaceship will reset
- There are two light sources in the scene (the two lamps). The aliens hands and their rotating body balls have specular reflections. The blue balls on the spaceship also have specular reflections
- You can move the camera around the scene using the arrow keys. The pageup and pagedown keys will change the camera height.
- There are 5 different textures used. These include the abandoned building, the garage walls, the garage door, the brick walls and the ground.

Extra Features

- The patrolling alien casts a planer shadow
- There is an additional animated system in the scene. The portal is animated, and the vehicle that comes out of it both accelerates and decelerates, and has a small wait time between these accelerations and decelerations.
- There are 3 camera modes. The first mode is the view that can be moved around with the keys. The second mode is a camera positioned on the spaceship. When the spaceship takes off, the camera moves with it. The third is a bird's eye view mode. Modes can be cycled with the INSERT key.
- A skybox has been implemented
- The camera cannot be moved outside of the compound walls (collision detection)

Control Functions

The controls are as follows
- UP_DIRECTIONAL_KEY moves the camera forward
- DOWN_DIRECTIONAL_KEY moves the camera backward
- LEFT_DIRECTIONAL_KEY moves the camera left
- RIGHT_DIRECTIONAL_KEY moves the camera right
- PAGE_UP_KEY moves the camera up
- PAGE_DOWN_KEY moves the camera down
- INSERT_KEY cycles between the camera modes
- HOME_KEY Initiates and resets the spacecraft launch

Challenges and Resources

Some of the challenges i faced, included creating the skybox, animating the alien and using multiple textures. When animating the patrolling alien, i struggled with getting his path to follow the correct co-ordinates. In the end, i created a couple of booleans to indicate where his starting position should be after each turn and how far he should move. When using multiple textures on the garage, i had to end after the first quad, re-bind the new texture and continue with the rest of the quads. When creating the skybox, the edges where showing up. To fix this, i had to change the texture parameters from GL_LINEAR to GL_NEAREST, which solved the problem.

I did not use any code from the internet, all code and examples were sourced from the lecture slides and lab files. The rest of the code is all my work.