Project Outline

High concept and Title

The high concept of my project is to show that I have implemented some basic and some complex features found in modern-day game engines. The user will be able to “fly” around the environment with a free moving camera. A free moving camera will be important so that the user can experience the realistic lighting effects that change depending on where you’re viewing from. The aesthetic will be an example of what a scene under development could be like. For example, the scene might have a grid, a skybox, textured meshes and light source.

The camera controls will be standard first-person movement controls, with the addition of the ability for going up and down.

The scene will showcase multiple different meshes loaded from obj and FBX files. The meshes will be both textured and untextured. In addition a skybox that will be textured using a cube map.

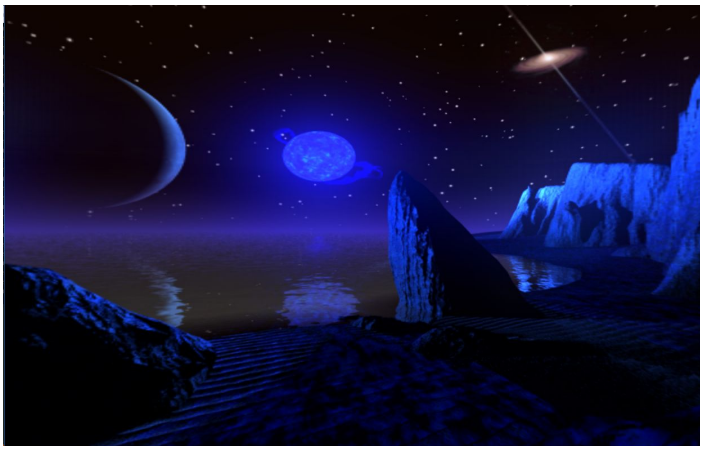
There will also be a light source creating realistic lighting for the objects in the scene.

The user will also be able to interact with the physics in the environment, such as changing gravity or applying an impulse.

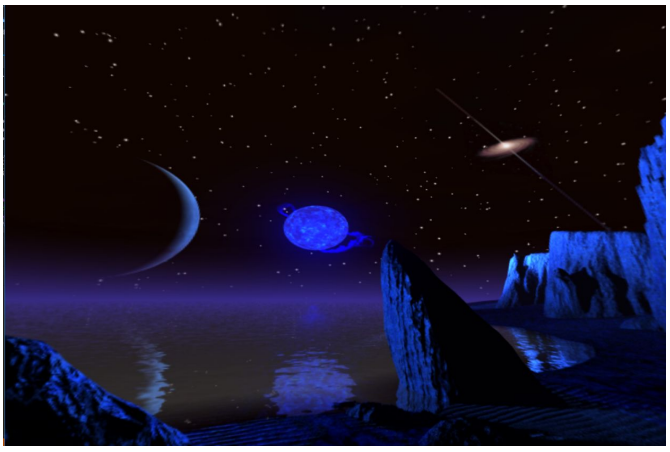
Graphical effect one BLOOM:

The first effect I will implement is a bloom effect. Bloom is where objects with high luminance become blurred, this is to simulate the bright light overwhelming the camera or eye. The addition of this effect to my scene will help reduce the contrast that objects with high luminance can have. The option to toggle the bloom in a scene will not only make the environment I create look better, it also will act as a demonstration of what Bloom does to an environment.

With Bloom



Without Bloom



Graphical effect two integration of a third-party physics engine:

For my second effect I will be implementing bulletphyscis https://github.com/bulletphysics/bullet3. Realistic physics is present in almost all game engines. I will create objects in the physics simulation. These objects will be of similar shape and size to that of the meshes rendered in the scene. This way the user can see how the lighting will affect objects that are falling and rotating. In addition, this will make my project more closely represent that of industry game engines. I will also create functionality that will allow the user to interact with the meshes in scene. Functionality such as applying an impulse to all objects in the scene, or changing the gravity will demonstrate the kind of physics possible in my game engine.

Scoping:

The aim of producing a fully functioning game engine is unrealistic given the time frame. My project aims to show a very small vertical slice of what a game engine might look like when a user is editing a particular scene. Without the ability to edit the scene just the ability to interact with it. This way, I believe, it will not prove too much given the time frame. I will spend a lot of my time making the code maintainable and structured instead of adding more features a game engine might have.