

# Space Simulator Overview

---

## Introduction

The Space Simulator is an application that has been developed using the C++ language using the GLUT and OpenGL libraries. The application responds to some user input. The goal of the application was to simulate a universe (or a space if you will) and to display this with some simple graphics.

## Classes

The classes used in the project are as follows:

- Window
  - The class responsible for creating a window
- Draw
  - The class handling all drawing in the application
    - Has a window member to draw in
    - Has a space member to draw
- Space
  - Keeps lists of all objects in space
    - A list containing all objects
    - As well as different lists for different types of objects: Suns, Planets and Moons.
- SpaceObject
  - Creates an object in space that can be affected by gravity.
- Star
  - Inherits SpaceObject and is special because it emits light.
- Planet
  - Inherits SpaceObject and is just a planet.
- Moon
  - Inherits SpaceObject and is special because it orbits a planet.
- Coordinate
  - Handles coordinates in the application.

## User Input

The application responds to some user input as listed here:

- The '+' and '-' buttons zoom in and out, respectively.
- The 'n' button follows the next object in space (default is the sun)
- The 'q' button exits the application
- The delete button deletes the last object added into space.
- A left mouse click creates a planet at the pointers position with a speed relative to the press and release position difference.

More objects can be created within the main function. Follow the guidelines given there, first create an object and then add it to the space to be displayed in. Multiple stars can be created (to a maximum of 8) which all will emit light.

## **Dependencies**

The program is displaying graphics using GLUT and therefore the GLUT files are needed. These can be found in the 'dependencies' folder.