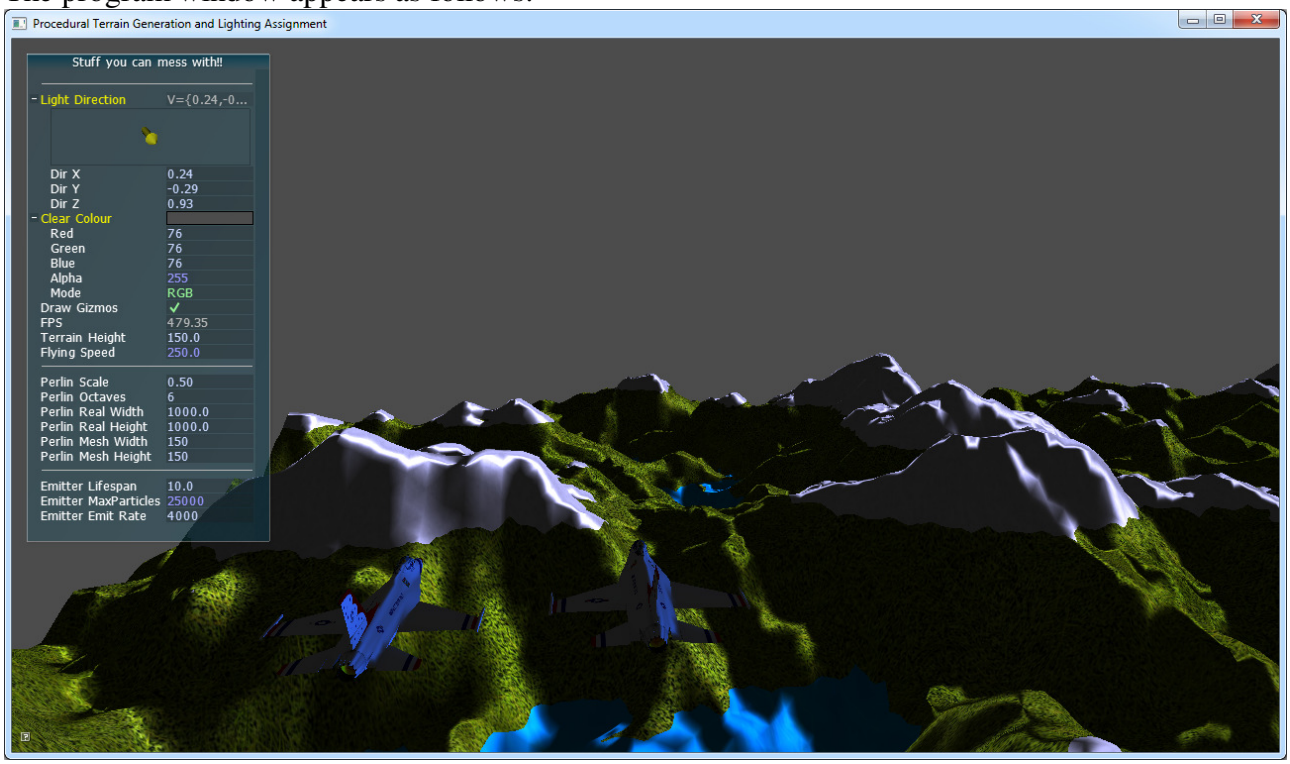
GUI Description: Procedural Terrain Generation and Lighting Assignment

The GUI for this assignment is fairly simple, comsisting of a set of program variables you can change, utilising AntTweakBar functionality. Navigation of the actual generated environment is by using the mouse and keyboard. Holding the **right mouse button** down and **dragging** allows you to rotate the current view, while the **WASD** keys allow you to go forward, backward, left and right, and the **Q and E** keys allow you to go up and down. T will display the highest and lowest current Perlin Noise samples before scaling. Holding down the **M** key will change the view to a wireframe, until the key is released.

The **R** key will reload all shaders when pressed, to use any changes made to them, used extensively for debugging shaders.

Hitting the **Space** bar will fire off one of four particle effects emitters, in sequence. There is also a minimum interval between firing of 1.0 second.

The program window appears as follows:



The AntTweakBar is on the left and shows the current frame rate, as well as allowing various program variables to be modified.

The displayed and modifiable variables are as follows:
Light Direction: This is the directional light for the terrain, and its values are relative to the terrain rather than the camera view, and also feeds into the model shaders.

Clear Colour: this is the background colour rendered in the absence of other geometry.

Draw Gizmos: simple tick box to turn the Gizmos drawing on and off. This is primarily just the original test grid

FPS: the current frame rate in Frames rendered Per Second. (display only)

Terrain Height: how much to scale the height of the terrain.

Flying Speed: how fast the camera moves. This also determines how fast the particle effects travel, as they use a percentage of the camera speed.

Terrain Generation and display options:
Perlin Scale: the Perlin Noise scale parameter for how much of the next octave will be added to the final sum.

Perlin Octaves: how many Perlin Noise Octaves to calculate.

Perlin Real Width: Width of the terrain in the world. (X-axis)

Perlin Real Height: Width of the other axis of the terrain in the world. (Z-axis)

Perlin Mesh Width: Width of the terrain mesh, and Perlin texture.

Perlin Mesh Height: Height of the terrain mesh, and Perlin texture.

Particle Emitter options:
Emitter Lifespan: How long the emitter will continue to emit particles for.

Emitter Max Particles: The maximum number of particles generated by the emitter.

Emitter Emit Rate: The rate at which the Emitter emits particles. (per second)