

Assignment 5: Final Project Proposal

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The main idea for my final project is to create a procedurally generated natural-looking landscape scene.

The plan for the procedural terrain will be to randomly generate a height map to render a terrain. The procedural terrain will be generated by Perlin Noise. The terrain may be set up as mountains, green grass covered hills, dirt patches, or bottom of the water. Thus, we will need to generate different color and texture based on how high or low the terrain is. **(35 points)**

We will also generate a water plane that clips in at a certain height in the lower parts of the terrain. This water plane will have its own light blue color, its own texturing, lighting, and transparency to the bottom. Additionally, it will have ripples created through vertex shaders and fragment shaders using sine waves and based on time so the water waves move up and down. **(35 points)**

Environment mapping will need to be implemented to generate a sky box. Once implemented, the user will be able to load and move the camera around using WASD and the direction keys. WS will move the user camera back and forth on the plane, while AD will rotate the camera. Up and down will move the camera higher or lower. **(15 points)**

Trees/grass/bushes will need to be placed on top of the generated terrain vertices in the appropriate heights. These will be simple grass patches of 2-3 billboard planes intersecting from top down, so we can generate a large quantity of grass blades poking out of the terrain. As a result, grass/trees/bushes will be randomly generated 2D elements in this 3D procedurally terrain world **(15 points)**

If there's time, I'd also like to apply additional effects to have the sun cause hills to generate shadows with shadow mapping and to apply depth-based fog to make objects and hills fade in seamlessly as the camera moves around. **(15 bonus points)**

An example of my vision can be seen below, though my implementation will look more simplified given the timeline, different features, rendering style, and additions such as adding water and mountains.

