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Graphics

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Creating a World

We set out to make an open world in the same styling as a video game. We chose the great outdoors for our theme because we felt that we would have the most success by combining and vastly improving on some of our previous projects. We saw the two textures in our field and sky project and wondered if we could make a large cube out of textures which the camera would sit inside of. Also, after we made mountains and a grassy field around the camera, we thought it would be a beneficial addition to add a variation of the movement found in the space exploration project. While we kept the same method to move forwards and backwards, we adjusted the movement so that instead of using left and right to rotate, using the mouse would enable the user to look around the world we created around them. We also added some small objects with specular properties near to the origin. The purpose of our project was first to focus on the requirements that were given to us, but also we wanted to understand the complexity it would take to make something similar to a first-person shooter video game which is why we placed such a heavy focus on the skybox looking complete and being able to move with intuitive controls.

We chose to make an environment using textures surrounding the camera in a way that would emulate the real world. Grass on the ground, clouds in the sky and mountains in the distance makes it feel like you're really there. Being able to easily control the movement of the camera to see causes the user to be immersed in this world we have created. We used the modern movement keys of W, A, S, and D used in many video games today to control the movement of the camera, and the mouse to control the rotation of the camera. Also in our project we have a cylinder representing a fire pit that reflects light from the sun, and a tent nearby. The fire pit is made up of a torus made from triangles and the tent is made from a cube sticking halfway out of the ground. We added these objects because we felt they worked well with our theme of the great outdoors and of the natural environment we created in our world.

Our project is comprehensive because we took many of the major and minor concepts learned in this class to make a complete program. The freedom for creativity in this project allowed for us to make something we had wanted to do all semester. We had heard previously that making a video game with a previously made game engine was relatively simple, so we wanted to gain an understanding of the complexity it takes to create a video game without an actual game engine. To do this, we used what we learned all semester, to first, make a skybox that would be everything that the user can see. Secondly, we used our understanding of the camera to move it around the skybox. Thirdly and finally, we created objects made up of triangles which make up everything in OpenGL. These things we did for this final project all culminated through the creation of objects and the education of how to structure these OpenGL programs properly and how to properly implement vertex array objet and vertex buffer objects.

This project we created is deserving of an A because we followed the requirements very closely. We followed our theme of the great outdoors closely for every object we created. The mountains and sky, the fire pit and tent all exemplified this theme and made it seem as if the user is in the great outdoors. Also, we built a skybox in the shape of a cube using triangles and implemented in header and class files. This skybox was very difficult to implement which made it so that when it finally worked it was all the more worth it to see what we had created. We added movement through the use of certain keys and implemented animation of the world through rotation of the camera by use of the mouse. We were able to at first directly pass through the current values of the location of the mouse to the movement of the camera, but we decided to change the way it worked so it felt a little more natural. We printed the correct keys to the console windows using cout in an easy to comprehend manner so any could use our program. We created a light source that reflects off the small fire pit located at the origin to give it the look as if there is actually fire in it. Also, we made an effort to document all functions and make all code easy and intuitive to read.

In conclusion, our project deserves an A, not because it is the best project, but because through this project, we got to be creative and really start and finish a project we wanted to do. We had multiple very late nights in the computer science lab and used what we learned in this class to troubleshoot our problems and use our imagination to do as much as we thought was possible. Also, we fulfilled all the requirements, while still making a project that we enjoyed working on and delivers a pleasing experience to the user.