The objects that I have selected to recreate from my scene were objects that I knew I would be able to complete by the end of the term. I also chose the hydrogen peroxide bottle, to provide myself some challenge and allow to better understanding of the concepts taught in this course. For my complex object, I choose to do a hydrogen peroxide bottle. I broke the bottle up into 3 parts the base, bottle neck, and cap. The base of the bottl was a cube. The section between the base and the cap, which was rendered using a four sided pyramid. The final piece was the cap that created from a cylinder. I changed the features of these shapes to make the meld to form one cohesive hydrogen peroxide bottle. Another shape I choose to portray from my scene was the table which I rendered using a plane. I also created a horizontal ace bandage which was done with a cylinder. The last piece I incorporated was the stack of two covid tests which I made using two cubes angled slightly. To create a cohesive texture on my objects, I created a plane of the face of each object I wished to texture. For the lighting of the scene, I used one white light and one warm fluorescent light color. I placed the white light directly in front of the object off to the left side, and the fluorescent light directly behind the object to the right side. All of these objects rendered together, create a program close to the picture I had taken of my kitchen counter on the first milestone.

For control of the camera you can use two different input devices. One of which, is the keyboard. The WASD keys control directional movement. W key goes forward, S key goes backward, A key goes left, and D key goes right. We also incorporated the Q & E keys to serve as the true up and down. The Q key will take the user up in the scene while E key will take the user below the scene. The final keyboard instructions are the of P and O keys. When P key is selected, the a perspective 3D scene is shown, but when O key is pressed an orthographic 2D scene is shown. The mouse is the second input device that I used. The mouse cursor moves the camera around 360 degrees from any fixed position the camera is already in. The scroll wheel affects the speed of the keyboard camera movement controls. When the wheel is scrolled back, the camera moves slower but when the wheel is scrolled forward, the camera moves faster.

I used multiple custom functions in my final project. The first function is to flip textured images vertically so they will render correctly. The next function is the initializing function in which the opengl window is initialized and opened. The process input function takes care of all the keyboard camera commands. The mouse position call back function, controls the mouse movement for camera control. The mouse scroll call back function take care of the scrolling camera functions. The resize window function resizes the window. The render function is where all the objects and light sources are created and passed to the shader programs. The create texture function creates a texture object for each texture loaded into the project. The create shader program compiles the shader program and throws error messages when it does not compile correctly. The destroy shader program and destroy texture programs will destroy all objects that are created once the project is completed. For a few of these individual functions to work, I had to use multiple source files and header files. All of my main code is found in the original source file. All the code to render each individual shade is found in a meshes file that was provided by our instructor. The three header files that I used are meshes which was again provided by my instructor. The other two are a camera file that was found in my textbook and modified to fit the requirements of my project. The last used was a is stb\_image which is a file that is necessary to generate textures.