The 2-dimensional scene provided by the client for 3-dimensional rendering is a cute Halloween themed decorative scene. The client requested a simple approximation using basic shapes as the scene will be 3D printed to be utilized as a preliminary concept for their business. To meet these requirements, I created the scene using the small library of approximately 10 basic shapes to create the objects in the scene. An elongated box was used to create the straw bale with a straw texture applied to improve the visual affect. Spheres and tapered cylinders were used to create the pumpkins with stems with textures being applied to these as well. A cauldron was created using a metal texture applied to tapered cylinders for the legs, two half spheres for the bowl shape and its contents, and a torus for the rim. The witch’s hat was created with a flattened cylinder and a cone with a black shiny texture applied. The bat is the most complex with spheres used for the head and body, many prisms used for the wings, half spheres for the ears and tapered cylinders for the legs these all a texture applied to mimic bat skin as well. To simplify the complex shape of the bat the facial features are rendered as a texture applied to the head sphere instead of created with individual objects. The combinations of materials and textures add visual interest and realism to the scene. The overall effect is a relatively simply 3-diminsional rendering of the scene without negatively impacting the fun visual experience of the viewer. To complete the scene the lighting selected was a purple ambient hue with green glow coming from the area of the cauldron, this provides a nice ambiance for the Halloween scene.

To navigate the scene, the viewers use the following keys and mouse functions. Pressing the W key moves the camera forward, the S key moves the camera backward. Pressing the A key pans the camera to the left and the D key pans the camera to the right. Similarly pressing the Q key pans up and pressing the E key pans down. For more nuanced camera control viewers can use their mouse to adjust the camera’s view and the mouse scroll will adjust the speed of the camera’s movement.

The code was organized to use reusable functions to load and apply the textures and materials. It was modularized for better organization allowing for developers to easily find the object then the piece of each object to allow for easy modification in the future as needed or requested by the client. It features reusable draw shape mesh functions that are called after the location and size vectors are passed in and shader variables are set. The application has one function for each object in the scene and clear commenting to delineate which part of the object that section of code is creating. The render scene function calls the functions for each object and this allows for reusability as new frames are refreshed and the camera angles change. This clear and concise organization will ensure future modifications are easy to apply.

Below is the provided 2D image.

