

The goal of this project was to create a 3D representation of a golf driving range scene. In this final stage, I brought together elements from earlier milestones, refining the 3D objects, textures, lighting, and camera navigation to create a polished, interactive experience. The primary objects in the scene are the golf club, golf balls, the grass hitting mat, and a bucket of balls. Each object was created using basic 3D shapes, such as spheres, cylinders, and tapered cylinders. The golf club consists of three parts: the grip, a small thin cylinder, the shaft, modeled as a long, thin cylinder, and the head, which is a tapered cylinder designed to resemble a driver. Similarly, the bucket is modeled using a tapered cylinder for the outer structure and spheres to represent the balls inside. The golf balls are modeled as spheres and placed strategically within the scene, while the grass mat is created using a large box with a high quality grass texture applied to it. The plane is sized to match the proportions of the grass mat in the reference image, ensuring it fits appropriately within the scene.

Textures were applied to enhance the realism of the objects. I used royalty free images found with a few advanced google image searches. The grass mat is textured with a realistic grass image, while the bucket uses a grid pattern to simulate the appearance of a basket. The golf club and golf balls are textured to reflect the real world materials, metal for the club and rubber with dimples for the balls. These textures were mapped to the objects in a way that complements their geometry, allowing the scene to maintain a natural, visually appealing aesthetic. The process of texturing was crucial for maintaining the balance between performance and visual quality, as I ensured that the textures fit the polygonal models without overcomplicating the geometry.

Lighting was a critical aspect of the scene's development. I incorporated light sources to ensure the entire scene was well lit and to add depth and dimension. My intention was to

simulate the outdoor scene with a light source that mimicked the sun and its effects. Using ambient, diffuse and specular methods, the scenes lighting was very close to representing an outdoor lit environment.

The camera system was designed to allow users to navigate freely through the 3D world. I implemented controls using the WASD and QE keys for forward, backward, left, right, upward, and downward movement. This ensures that users can move around the scene smoothly. The mouse cursor was used to control the orientation of the camera, allowing users to look around the scene by moving the mouse. The mouse scroll wheel adjusts the speed of the camera, giving users better control over how quickly they explore the environment. This intuitive camera system allows users to fully engage with the scene and examine each object from various angles.

The development of this 3D scene was a process of careful planning and lots of refinement. The objects were designed to accurately replicate the real world components of the golf driving range, while the textures, lighting, and camera system were adjusted to create an immersive, interactive environment. The use of modular functions ensured that the code remained organized and maintainable, making it easier to update or expand the scene as needed. The final result is a realistic and engaging 3D representation of a golf range, complete with well placed objects, realistic lighting, and intuitive navigation.