# CS 330 Milestone One

For my final project, I am going to create a 3D scene of a section of a football field using OpenGL. The scene will include four main objects: a football, an orange sideline cone, a goalpost, and a section of the field with painted yard lines. By choosing these objects, I can explore different primitive shapes while keeping the project scope realistic and achievable. I will use photos of an actual football field taken from various angles as reference material. These images will help me capture the proportions accurately and ensure proper texture application, such as the grass on the field, the leather texture of the football, and the metallic look of the goalpost.

For this scene, the football will serve as the central focus. I will create it by combining a sphere and a tapered cylinder. The tapered cylinder will represent the football’s elongated, pointed ends, while the sphere will form the rounded body. Texture mapping will be crucial for this object, as the pigskin leather and white stitching are what make the football recognizable. This object is an excellent choice because it demonstrates how combining shapes and applying realistic textures can create an accurate representation in a sports setting.

Another simple yet effective object will be the sideline cone. I will model it using a cone placed on top of a short, thin box as its base. This approach will clearly display the cone shape and allow me to practice scale and positioning in relation to the field. The bright orange texture will make the cone stand out within the scene. Although the cone is straightforward in form, it provides strong visual contrast against the green field and highlights the use of different primitives in the overall composition.

The goalpost will be the tallest and most complex object in the scene. I will construct it using multiple cylinders to represent the pole, the crossbar, and the uprights. By assembling these components, I can show how different primitives come together to form a complete structure. Applying a metallic texture to the poles, along with maintaining realistic proportions, will make the goalpost instantly recognizable and a crucial part of the football field. Including this object also introduces a sense of depth and verticality within the scene.

The football field itself will be represented by a large plane as the ground object. I will apply a grass texture to this plane and add white lines to represent the yard markers. If additional context is needed, I could include a second, perpendicular plane as a stadium wall or scoreboard. This grounding element ensures that the objects are placed correctly and provides an opportunity to practice texture mapping for surface detail.

Overall, this football field scene meets the project requirements by incorporating a range of basic shapes, including a cone, cylinder, box, plane, sphere, and tapered cylinder. One object—the football—demonstrates the use of multiple shapes, while the field plane serves as the required grounding element. These selections balance simplicity with variety, allowing me to practice modeling, texturing, and lighting without making the project overly complex. The final result will be an engaging sports-themed scene that is achievable within the course timeline and well suited for exploration in OpenGL.