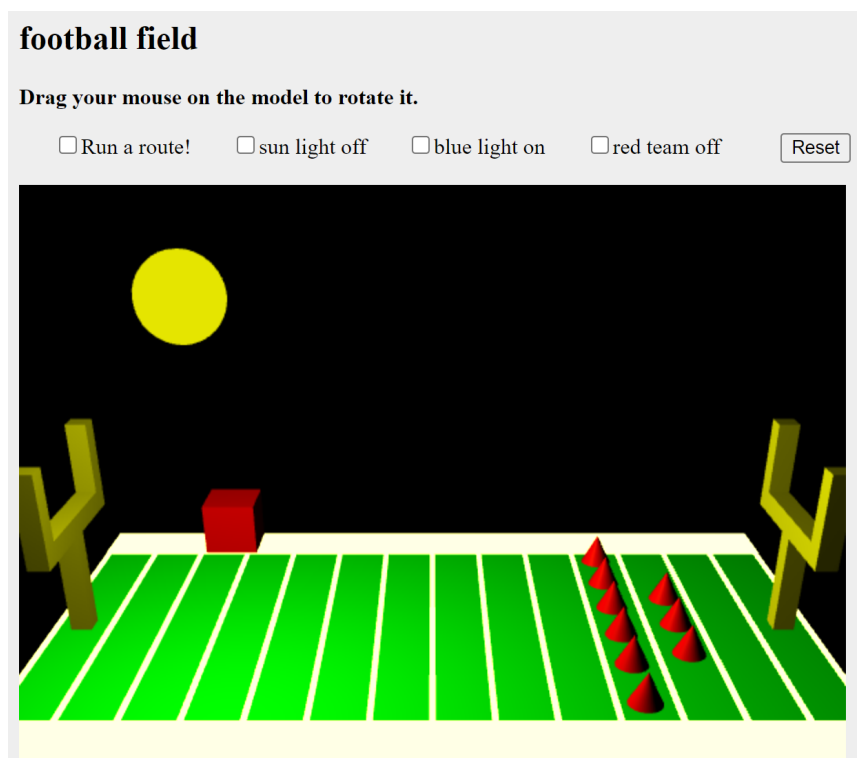**Project 4**
Alex Hong
CMSC 405
Sect # 7381
12/13/22

1. Overview

A web.gl project depicting a football field with a sun that can rotate above the field. There is the ability to turn on and off the animation of the sun's rotation as well as the route of a wide receiver getting open for a touchdown. Additionally there are 2 lighting effects, one from the rotating sun and a blue light that emanates from the viewer's point of view. The scene features 2 goal posts, a football field, markers for yardage increments across the field, cones which represent a team playing and a cube which represents the injury tent for injured players. The user can click and rotate around the field to view it from different angles and there is a check box option to turn the football team on and off. Finally, there is a reset button which will reset the viewing angle back to default.

This program made use of the soccer ball kicking template as well as the basic-object-models-IFS.js, gl-matrix-min.js, and trackball-rotator.js files. I used 3d shapes to create the field, team, sun, field markers, and injury tents. There is a total of 9 cones which make up the football team, 15 cubes which make up the field markers, 2 cubes which make up the sidelines, 1 sphere to represent the sun, 4 cubes which make up each goal post, and one big cube to make up the base field which the scene is based on.

2.   Execution

Frame 1: Animations are off. Sun light on. Blue light off. Red Team On.

football field

Drag your mouse on the model to rotate it.

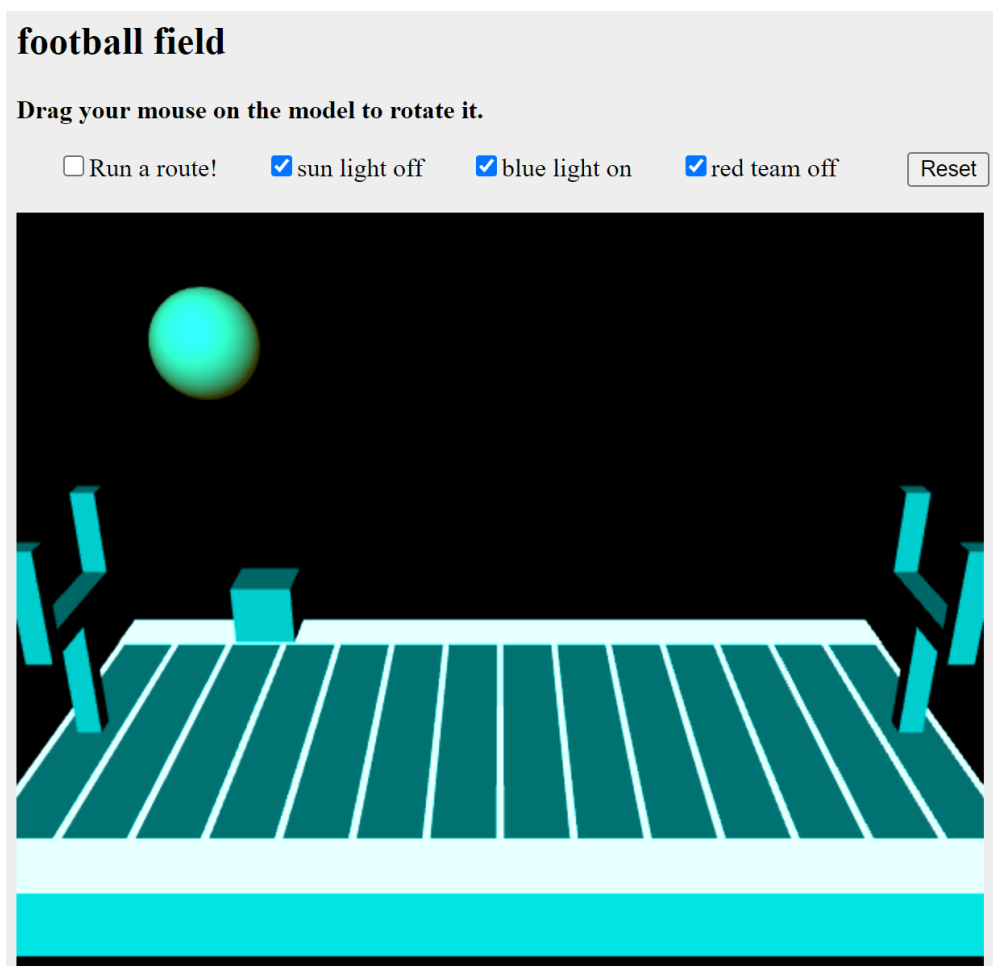☐ Run a route!   ☐ sun light off   ☐ blue light on   ☐ red team off   [Reset]

Screenshot 1. Animations are off. Sun light on. Blue light off. Red Team On.

Frame 2: Animations are off. Sun light off. Blue light off. Red Team On.

football field

Drag your mouse on the model to rotate it.

☐ Run a route!   ☑ sun light off   ☐ blue light on   ☐ red team off   [Reset]

Screenshot 2. Animations are off. Sun light off. Blue light on. Red Team On.

Frame 3: Animations are off. Sun light off. Blue light on. Red Team Off.

Screenshot 3. Animations are off. Sun light off. Blue light on. Red Team Off.

Frame 4: Animations are on. Sun light on. Blue light off. Red Team On.

football field

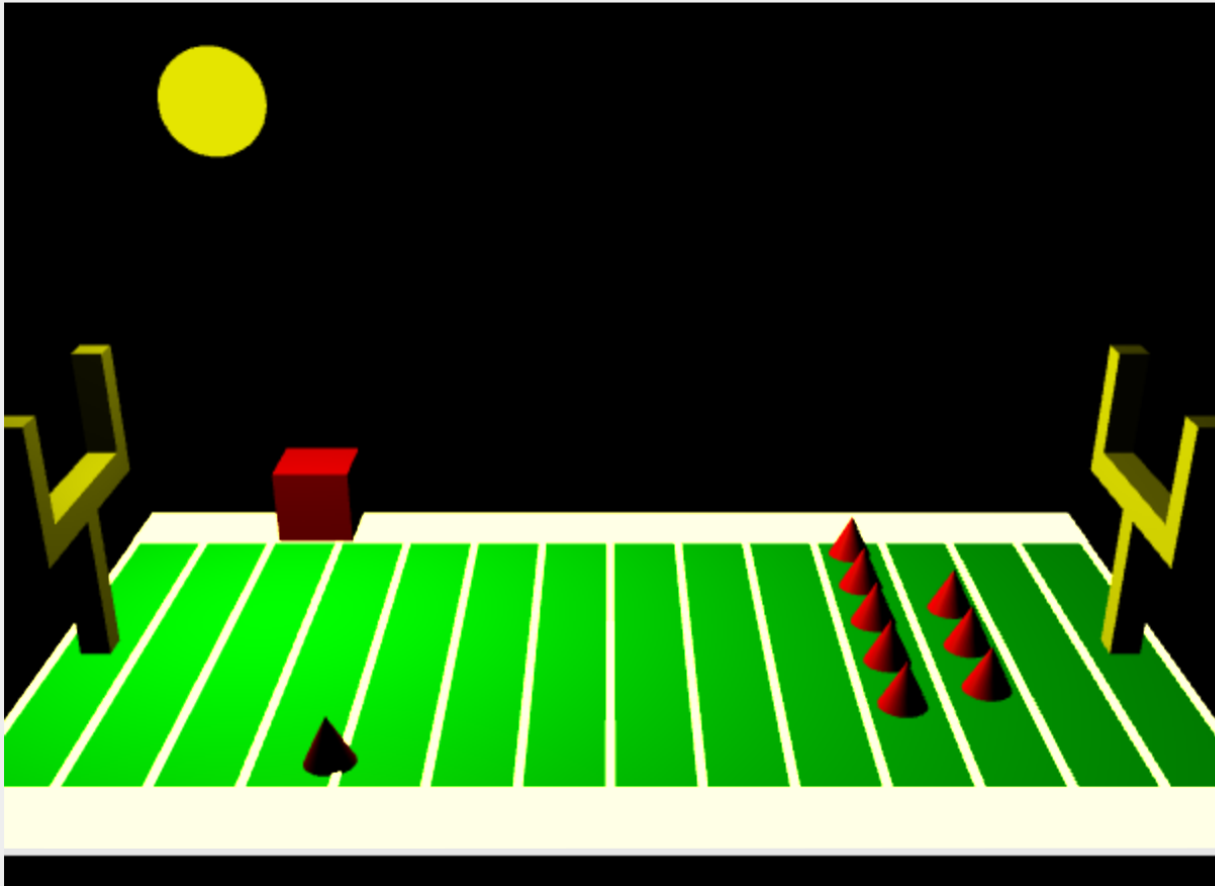**Drag your mouse on the model to rotate it.**

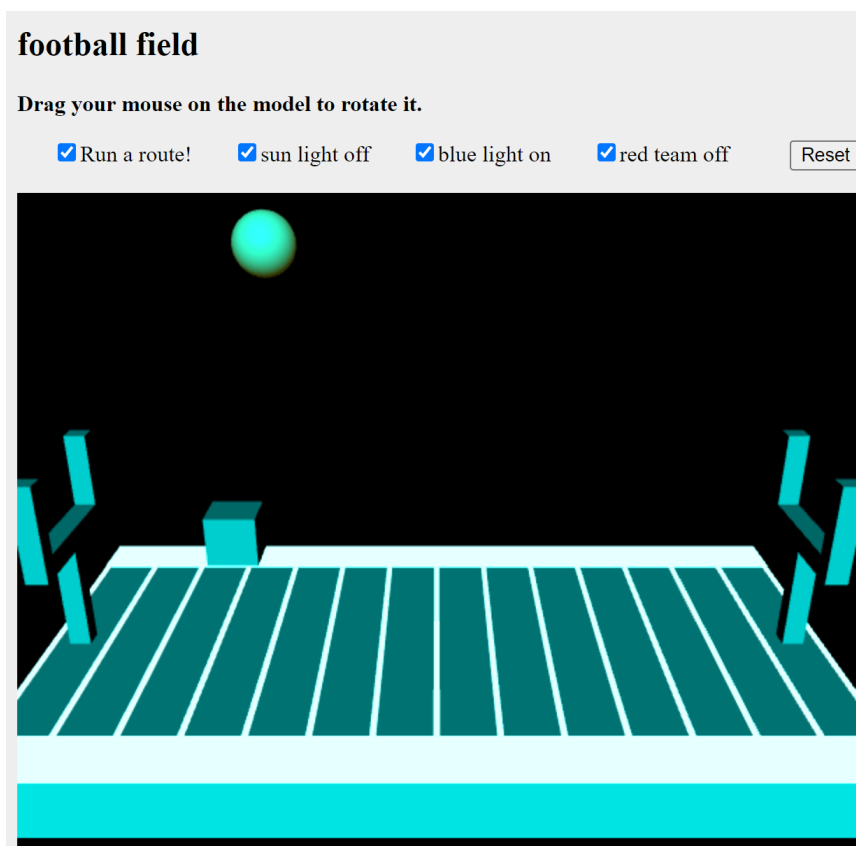☑ Run a route!   ☐ sun light off   ☐ blue light on   ☐ red team off   [Reset]

Screenshot 4. Animations are on. Sun light on. Blue light off. Red Team On.

Frame 5: Animations are on. Sun light off. Blue light on. Red Team Off.

Screenshot 5. Animations are on. Sun light off. Blue light on. Red Team On.

Frame 6: Animations are on. Sun light off. Blue light on. Red Team Off.

Screenshot 6. Animations are on. Sun light off. Blue light on. Red Team Off.

3. **Testing & Lessons learned**

When the program is opened, all animations are toggled to "off", the sun light is on, the blue light is off, and the red team is rendered. I began testing by turning off the sun light and turning on the blue light via the checkboxes and observed that they worked. I turned the animation on and toggled the sun and blue lights to make sure they worked while the animation was running. I then toggled the red team on and off while the animation was running to see if they would toggle on or off. I then turned both lights off and observed that the animation was still running. Finally, I clicked and dragged across the scene to rotate it and then clicked the reset button to see if my view was reset to default. All functions worked in my testing.

Test Case	Input	Expected Output	Actual Output	Result
turn sun off/on	click "sun light off" click "sun light on"	sun light off sun light on	sun light off sun light on	pass
turn blue light on/off	click "blue light on" click "blue light off"	blue light on blue light off	blue light on blue light off	pass
turn animation on	click "run a route!"	sun rotate starts wide receiver animation starts	sun rotate starts wide receiver animation starts	pass
toggle lights while animation is running	while animation is on click "sun light off" click "blue light on" click "blue light on"	sun light off blue light on no lights on	sun light off blue light on no lights on	pass
turn team off/on	click "red team off" click "red team off"	red team disappears red team reappears	red team disappears red team reappears	pass
turn off team while animation is running	click "red team off"	red team disappears	red team disappears	pass
change view angle and reset	click and drag anywhere on canvas click "reset" button	scene is rotated scene reverts back to original view angle	scene is rotated scene reverts back to original view angle	pass