Assignment 2 (Individual)

Olympic Sports

Deadline: Saturday 16th of November @ 11:59 pm

Welcome to 3D modeling!

In this assignment, you are tasked with creating a 3D scene based on an Olympic sport of your choice. Your design should feature a game environment with various 3D objects and a character as the player. The game must also include an objective, such reaching a specific goal, which the player must complete within the given time to win. The game will be lost if the objective isn't accomplished before the time runs out.

Theme:

The game theme must be one of the Olympic sports games listed here (**except** football). The scene should include the ground(or floor), boundary walls, and objects commonly found in that sport's environment.

The total number of objects in the scene is **9+ types of objects;**

- Player
- Boundary walls (at **least** 3 walls in the scene)
- Ground (or floor)
- Goal object (one or more)
- Other objects in the scene (at least 5 **different** objects and different than the previously mentioned objects)

Modeling:

- The player should be modeled as a human with a head, body and limbs with a minimum of **six** primitives.
- The fence surrounding the scene (three sides) has at least **two** primitives for each side.
- The ground has to be drawn with a minimum of **one** primitive.
- The other scene objects:
    - **Two** major objects with at least **five** primitives each
    - The rest of the **three** objects with at least **three** primitives each
- The game's goal can be one or more objects of at least **three** primitives.

- Models must appear as realistic as possible (Not just a random arrangement of primitives).
- Every object must be colored.
- The primitives don't need to be different unless stated for a specific object.

Collisions:

- The player collides **only** with the game borders or walls and the goal(s).
- If the player collides with the goal(s), they must disappear.
- The goal(s) can be located in a fixed position(s) or random position(s).

Camera:

You are required to **move the camera freely** through the scene along the three axes **in addition to** three different views of the camera

1- Top View
2- Side View
3- Front View

Animations and Controls:

- The player can move in any direction using the keyboard keys.
- The player rotates towards the direction of motion using the mouse/keyboard.
- The camera can move through the scene by the mouse or the keyboard.
- The camera views (top, front and side) are changed from one view to another using specified keyboard keys. For example, one key is used to go to the top view, another for the side view and another for the front view of the game scene.
- For the **five** objects in the scene, there is an animation that starts on a **key press** and stops on a **key press** for each one. You can use the same key or different keys. You **must** use all types of animations; translate, scale, rotate and color change.
- The goal object(s) animates in its place throughout the game.
- The colors of the bounding walls keep on changing every interval of time.

How the game ends:

The game ends when the time is up. If the player collects the goal(s) within the specified time, a ‘GAME WIN’ screen appears to replace the game scene. A ‘GAME LOSE’ screen appears to replace the game scene otherwise if the goal is not collected/reached.

Code:

Use Lab 6 code or Lab 6 solution code as a starter code.

Bonus (any one of these):

1- Complex 3D models (very detailed models). The minimum number of complex models is three different models of at least 15 primitives each.
2- Sound for every action (background music, sound effect for animations, sound effect for collisions). The minimum number is three different sounds.

Note: Models are not accepted as bonus.

Submission Guidelines:

- The assignment should be implemented in OpenGL and cpp ONLY.
- This is an **INDIVIDUAL** assignment. Cheating cases will lead to a **ZERO**. Also, copying the code from the internet will lead to a **ZERO**.
- This assignment is worth 7.5%
- Deadline for the assignment: Saturday **16th of November @ 11:59 pm**
- Files to be submitted:
    - Do not submit the whole project files
    - Do not submit .sln/.xcodeproj
    - Use your **lab group** not **tutorial group** in case they are **different**.
    - You only need to submit your .cpp file(s).
    - If you are submitting a single .cpp file, named **PX_55_XXXXX_Firstname (without any spaces)** and submit it without zipping.
    - If you are submitting multiple files, zip them all in a file named **PX_55_XXXXX_Firstname (without any spaces) and all sub-files** should have a prefix of **PX_55_XXXXX_filename (without any spaces).**
    - Make sure to include the audio files if used.
    - Not Following the naming conventions will lead to a **DIRECT ZERO.**
- Submission forum link