

## Assignment 2 (Individual)

### Amusement Park

**Deadline: Monday 20<sup>th</sup> of November @ 11:59 pm**

#### **Welcome to 3D modeling!**

After going through challenging midterm exams, it's time to take a break and treat yourself to some fun. For this assignment, you need to create a 3D amusement park game. The game environment includes various 3D objects and a character representing you as the player. Your objective is to design a goal, such as collecting items or reaching a specific destination, that the player needs to achieve within the game.

#### **Theme:**

You are tasked with creating a model of an amusement park. The scene should include the ground, boundary walls, and various objects commonly found in amusement parks, such as trees, lamp posts, cars, kiosks, a roller coaster, swings, a seesaw, a water fountain, gardens, benches, trash bins, an information desk, etc.

The total number of objects in the scene are **9+ types of objects** (**three** boundary walls, a ground, a character for the player, one (or more) as a goal, and **five** different objects of your choice from the aforementioned example or any other of your own).

#### **Modeling:**

- The player should be modeled as a human with head, body and limbs with minimum **six** primitives(unnecessary to be different).
- The fence surrounding the scene (three sides) has at least **two** primitives for each side.
- The ground has to be drawn with minimum **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 goal/collectible of your game 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.**

### **Collisions:**

- The player can move throughout the scene, which means the player can't move outside of the fence or the borders of the ground.
- The player collides with the goal(s) and it disappears when they are collected. 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.
- The player rotates towards the direction of motion using the mouse/keyboard.
- The player can not pass through the bounding walls.
- The player can only collide with the goal.
- The camera can move through the scene by the mouse or the keyboard.
- The camera views (top, side and front) are changed from one view to another using specified keyboard keys.
- For each scene object (**five**), there is an animation that starts on **one** key press and stops on another key press. You can use the same key or different keys. Object animation is translation, rotation or scaling.
- 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. 'GAME LOSE' screen appears 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 10 primitives each.
- 2- Sound for every action (background music, sound effect for animations, sound effect for collisions). The minimum number is three different sounds.

**Submission Guidelines:**

- The assignment should be implemented in OpenGL
- 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:**Monday 20<sup>th</sup> of November @ 11:59 pm**
- Files to be submitted:
  - A zip folder named after your ID (**P01 52-XXXX A2**) including:
    - The (\*.cpp, \*.h) files renamed as (**P01 52-XXXX A2**),
    - Audio files (if any)
  - NOT the whole project/solution
  - Use your **lab group** not **tutorial group** in case they are **different**.
  - **Not Following the naming conventions will lead to a DIRECT ZERO.**
- Submission forum: [\*\*HERE\*\*](#)