Game Development **Homework Assignment#3**
Points: 25 **Due**: 09/20/2024 11:59 PM Jaden Brescia

1. Create a new Unity project named Homework_Three. **[1 pts] Note: This homework focuses on the detection of collisions and creating obstacles. The first part of this homework asks that you create a primitive object and terrain (such as a plane), add the cinemachine package, and create a virtual camera to track the primitive object. This is similar to the work you did for homework#2. If you have completed it, you can create a copy of that project and continue expanding upon your previous work. You can skip questions 2 and 3 if you're expanding upon homework#2. Else, work on them.**

2. Add the "cube" primitive object to your game and name it "Player". Create a new material and set its color to red (any shade of red is fine). Assign the material to the primitive object to ensure its color is the same as the color defined in the material. **[2 pts]**

3. a) Add the Cinemachine package to your game. **[1 pt]**
   b) Add a simple terrain to your game, such as a plane, and make sure that the primitive object is on the plane (and that no part of the object is underneath the plane). **[1 pt]**
   c) Create and add a Cinemachine virtual camera to the game. Set the virtual camera to follow the primitive object as it moves on the terrain. **[1 pts]**

4. a) Add boundaries to the terrain to confine the playing field of your player. Depending upon the shape of your terrain, make sure the player is confined in all directions. **[2 pts]**
   b) Make sure the player is unable to pass through the boundaries by adding the rigid body component to the player. **[2 pts]**
   c) Add constraints to the player by freezing position along the Y axis and freezing rotation along the X, Y, and Z axes. **[1 pt]**

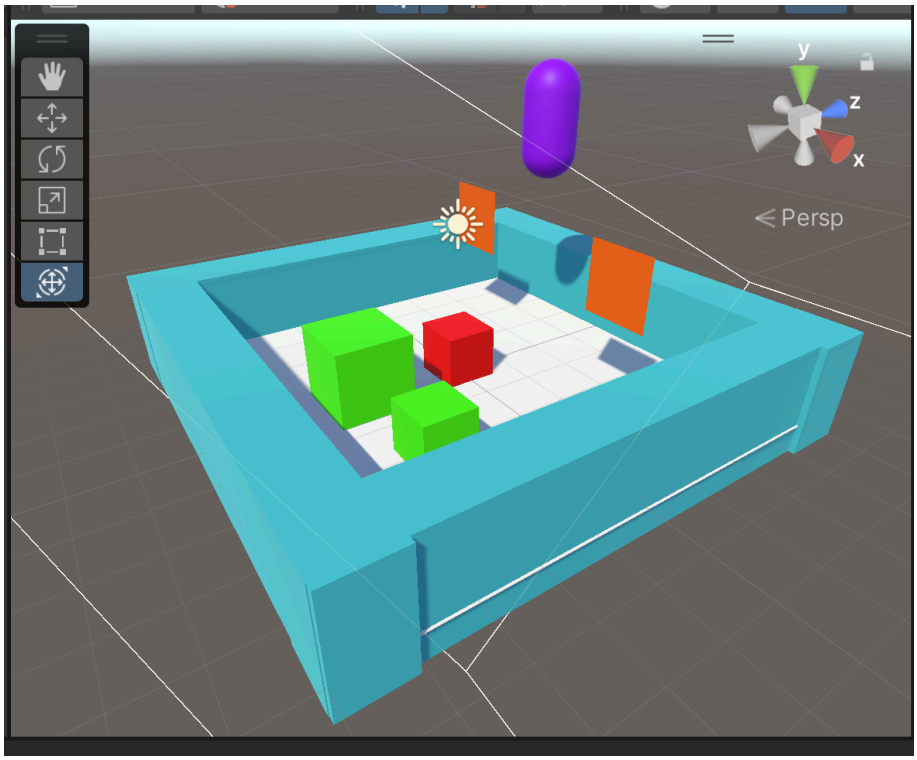
5. a) Explain the process of detecting collisions within Unity in a few sentences.
   a. To detect collisions, you need to use the box collider component which defines box shaped collision areas in a GameObject within Unity. To detect if a collision has occurred from one game object hitting another game object, you can use the OnCollisionEnter method which uses the Collision other parameter so that each time a GameObject with the component containing the script with this method can react on collision i.e. changing colors or counting the number of collisions.

   [2 pt] b) True or False: When the same C# script is added as a component to multiple game objects to detect collisions, each game object detects its own collisions without interfering with the collisions of the other game objects. Justify your answer.
   - True,I would believe that each game object detects its own collisions without interfering with the collision detection of other game objects. I would think that each game object has an instance of the script.

   [2 pts] c) Explain the use of the GetComponent method within Unity. **[1 pt]**
   - The GetComponent method is used to retrieve a reference to a component attached to a GameObject.
6. Add the following types of obstacles on your terrain:

a) a cube on the terrain that remains in its position even when the player collides with it. **[1 pt]**
b) a floating obstacle that remains invisible for five seconds, then makes itself visible and drops to the ground. **[2 pts]**
c) a spinning obstacle on the terrain. **[2 pts]** Note: Add any C# scripts necessary to make the obstacles behave as expected.

7. a) Create prefabs of the obstacles **[2 pts]**.
   b) Place two instances of each obstacle on the terrain **[2 pts]**.



Deliverables:

- The Homework_Three Unity project with the required specifications.
- For question#5, the answer needs to be written in a word (or similar) document.

Submission: Please upload the Unity project and word documents to a version control system of your choice, such as Git (or similar) and share the link on Blackboard.

Alternative Submission: If you are unfamiliar with version control systems or experience trouble, you may zip your deliverables, and upload directly to Blackboard.