Project 02C

FPS Game Mechanics

# Homework Description

For this project you will start with your previously created FPS Player Controller. If you don’t have one, you may need to find one from an online resource. Once you have your player, you will need to create a “Shooting” ability using Raycasting. Finally, you will create an enemy for the player to fight that can fire projectiles towards the player.

# Required Resources

Player Raycast Shooting in Unity (13:23)

For this one, work off of your previously created FPS Controller. Your GameObject will look different than mine.

<https://youtu.be/PptpfD8cu2U>

Retrieving GameObject Name from Raycast in Unity (5:23)

<https://youtu.be/D5lgqV_2Hh8>

Using Impact Point From Raycast in Unity (6:41)

<https://youtu.be/rozSJYowJKg>

Find Component Through Raycast Example in Unity (9:02)

<https://youtu.be/x4vDcBkeq7s>

Raycast Filtering Example in Unity (8:17)  
<https://youtu.be/wAhGmdsyfaE>

# Requirements

Complete the following Requirements:

1. **Continue off of your FPS Controller.** Your Player Controller must do the following:
   1. W,S – Move local forward/back
   2. A,D – Strafe left/right
   3. Mouse – Rotate camera
   4. Spacebar – Jump
   5. Shift (hold) – Sprint while holding
2. **View the Concepts material** (if available) to understand the concepts covered in this homework assignment.
3. **View the Required Resources material** (if available) to understand the specific requirements associated with the assignment
4. **Primary Player Ability** - Create your Primary Ability
   1. **Left Mouse Click -** must trigger primary Ability
   2. **Primary Ability must fire a Raycast** in the camera direction and **detect the enemy**. Do something interesting to the enemy on a successful hit.
      1. What it does to the enemy is up to you!
      2. Examples: Damage enemy, stun enemy, knock-back, grapple/pull, slow, “convert to ally”, etc.
   3. **Create a visual representation of your weapon** that moves with your camera
   4. **Make it interesting** – can you do something more compelling than applying damage?
5. **Enemy** - Create an enemy for the player to confront.
   1. **Enemy must periodically fire** a projectile toward the player
      1. HINT: look into the transform.LookAt() function
   2. **Enemy projectiles must be instantiated**, giving player a chance to evade (see above)
   3. NOTE: Your enemy is not required to have health, unless your player abilities are intended to apply damaged.
6. **Enemy Projectile** - Create a projectile for an enemy to fire at the player
   1. **Must have travel time**, but how it moves is up to you!
      1. Either forces or direct control is fine
      2. Example: lobbing in arc (physics), straight line (missile), homing, etc.
   2. **Player MUST be able to dodge** the projectile – look into the transform.LookAt() function to help your code for “Aiming”
   3. **Projectile must Destroy when colliding** with a Player or Level Object
   4. **Projectiles must damage** the player
   5. NOTE: Enemy projectile does not have to apply damage to player… yet
7. **Enemy Awareness** - Give spatial awareness to your Enemy
   1. **Enemies should detect if player is in range**, and if so start firing at player
   2. HINT: You have several options for detecting Player distance from Enemy… look into OverlapSpheres, Vector3.distance, or trigger volume detection.
8. **Feedback** – Add audio/visual feedback to all of your key game systems so far. Make sure to account for at least the following:
   1. **Primary Ability**
      1. OnPrimaryAbilityActivate()
      2. OnRaycastImpactPoint()
   2. **Enemy**
      1. OnFireProjectile()
      2. OnHitByPlayerRaycast()
   3. **Enemy Projectile**
      1. OnSpawn()
      2. OnImpact()
   4. **PlayerHealth Feedback**
      1. OnDamage
      2. OnDeath

# Deliverables

No Turn-in.