Exercise 2 - Shooty Gun:

Welcome to Exercise 2! In this Exercise, You'll be making your first 2D Shooter Game! In order to do so, You'll be learning the basic Philosophy of Unity Development, that being Script Oriented Programming. You'll be learning how to create nested Objects with well-defined behaviors, how to define and plan Component interaction between Objects within a Hierarchy, how to learn about and employ new Components on your own, and You'll create your first interactive Program in Unity!

For Week 2 (Submission 17/NOV/2024):

Chapter 1 - Runny Guy/Gal Part 1 - Set the Stage:

a. We'll start with a new Scene in Unity. Choose six different PNGs (from any source, say, online; feel free to make your own!) for each of the following:

1) Guy/Gal
2) Gun
3) Floor
4) Background
5) Bullet
6) Enemy

(You can choose whatever style You want.)

b. Import these PNGs into Unity's Asset Folder and drag them into your Scene to create six SpriteRenderers.

c. Adjust the PPU (Pixels Per Unit) of the six Sprites in the Import Settings (in the inspector when the PNG is selected in the Asset Folder) until all the Sprites are "normal sized" relative to each other.

d. Finally, in Additional Settings, adjust the Order in Layer Parameter to be 0 for the background, 1 for the Guy/Gal, the Enemy and the Floor and 2 for the Gun and Bullet. You should end up with a normal-sized Guy/Gal with a normal sized Gun, normal sized Bullet and normal sized Enemy in a normal sized World.

Chapter 2 - Runny Guy/Gal Part 2 - Let's Run!:

a. Add a Collider2D Component to the Floor and to the Guy/Gal, and add a Rigidbody2D to the Guy/Gal.

b. Write a PlayerControlScript and MovementScript. The PlayerControlScript checks Input.GetKey(KeyCode.A) (for movement to the left) and Input.GetKey(KeyCode.D) (for movement to the right), and sets, in the MovementScript, the x component of the Rigidbody2D's Velocity to be moving left or right appropriately.

c. In addition, use (in the MovementScript) OnCollisionEnter2D and OnCollisionExit2D to determine a boolean value to check (or alternatively, use GetComponent<Collider2D>().GetContacts() to determine) whether or not the Guy/Gal is touching the floor (using an appropriate tag check as described in class).

d. In the PlayerControlScript, measure Input.GetKey(KeyCode.W) to determine a jump, and make it (in the MovementScript) so that when They are touching the floor, using Rigidbody2D.AddForce with ForceMode2D.Impulse to make the Guy/Gal jump!

Note: Remember to have any functionality related to the movement itself taken care of by MovementScript and any functionality related to Player control taken care of by the PlayerControlScript. Furthermore, use SerializeField on any of the Parameters You used in determining movement speed and Player Controls.

Now press Play... Can You control your Character? Good! We're ready to move on to the next part.

Chapter 3 - Gunny Guy/Gal Part 1 - Lock:

a. Make sure the Gun is a child of the Guy/Gal.

b. Add a GunAimScript to the Gun, which sets the transform.rotation of the Gun to Quaternion.Euler(0, 0, rot), calculating rot according to the angle between the Input.mousePosition and the Gun.

Note: Input.mousePosition returns the position in Screen Space. Remember to use Camera.current.ScreenToWorldPoint to convert to World Space!

Chapter 4 - Gunny Guy/Gal Part 2 - Load:

a. Add a Collider2D and a Rigidbody2D Component to the Bullet Object.

b. Connect the Bullet as a child to the Gun.

c. Position the bullet right at the Gun's Barrel, and point it out of the gun's barrel.

d. Set the Bullet Object's Active status to false.

e. Now, add a ShootyGunScript to the Gun, which will check Input.GetMouseButtonUp(0) every frame to call a shoot() function, which will instantiate the Bullet object, set the Velocity of the instantiated version to some starting value and set the GameObject to active.

Try it out! Is the gun shooty? Good!

Note: If not, what might You need to change about the implementation to make it work? Once You figure out how to get the implementation right, You have completed the exercise.

Good Luck!!!