DOCUMENTATION

EXERCISE 1

You can find under the "AircraftJet" GameObject a component called "PlayerMovement". This script allows you to change:
 – The speed of the aircraft with the parameter "AircraftSpeed". It's the number of degrees per second you will rotate, so 60 will give you a full 360° rotation in 6 seconds
 – The angle of the roll with the parameter "RollAngle", in degree
 – The maximum angle of rotation available with the parameter "ClampAngle", in degree

You can find under the "Main Camera" GameOjbect a component called "CameraBehavior". This script allows you to configure:
 – The angle of the camera with the parameter "Camera Pitch" in degree
 – The distance of the camera from the player with the parameter "Camera Distance"

EXERCISE 2

By pressing the "fire" input, a bullet prefab will be fired from the end of each weapon. You don't have to smash the key in order to fire something, just keeping it pressed will fire automatically as soon as the cooldown is up. On the "AircraftJet" GameObject, you will find a "FireBullet" component. This component allows you to manipulate:
 – The fire rate with the parameter "FireRate", in seconds
 – The type of bullet the aircraft is launching with the parameter "Bullet"
 – The spots where the bullets are fired with the parameter "BulletSpawns"

The "Bullet" prefab must have a "Bullet" layer and a "Bullet" component. This script allows you to configure:
 – Its max lifetime with the parameter "MaxLifetime" in seconds
 – Its number of damage with the parameter "Damage"
 – Its velocity with the parameter "Velocity"

EXERCISE 3

You can modify any enemy in the "ScriptableObjects/Enemies" folder. If you want to create a new one, just right click -> Create -> Enemy.
This ScriptableObject allows you to change:
- Its maximum life with the parameter "MaxLife"
- Its velocity with the parameter "Velocity"
- Its damage to the player when it collides with it with the parameter "Damage"
- Its type with the parameter "Type". The different values of the enemy type can be found under the enum "EnemyType"
- Its probability of spawning with the parameter "ProbabilityOfSpawning", in percentage
- Its prefab with the parameter "Enemy", each prefab must have an "Enemy" layer and an "Enemy" script attached to it

In order to modify the spawner properties, you need to check the "Spawner" component under the "Spawner" GameObject. This script allows you to change:
- The spawn frequency, with the "SpawnFrequency" parameter, in seconds
- The distance the spawner will be from the player at the start, with the parameter "DistanceFromThePlayer"
- The list of possible enemies, with the parameter "EnemiesData". It's an array of ScriptableObject "Enemy"

EXERCISE 4

For the UI programmer:

The "UpgradeManager" is a singleton you can call anytime (like that `UpgradeManager.Instance`). It possesses 4 functions, only 2 are useful for the permanent upgrade feature:
- `AddFlatPermanentUpgrade(UpgradeStatType type, float value)` which can add a flat upgrade on a specific stat type with the formula x += value. Please note that it is positive by default, so for a downgrade you will have to send -value. This is the opposite for the COOLDOWN stat type, because the lesser a cooldown is, the better it gets.
- `AddPercentagePermanentUpgrade(UpgradeStatType type, float value)` which can add a percentage upgrade on a specific stat type with the formula x *= 1 – value / 100. Please not that it is a downgrade by default, so for an upgrade you will have to send -value. This is still the opposite for the COOLDOWN type.

"UpgradeStatType" is an enum with currently 3 values: COOLDOWN for the fire rate, SPEED for the velocity of a bullet and DAMAGE for the damage of a bullet.

For the content designer:

You can modify any pickup in the "ScriptableObjects/Pickups" folder. If you want to create a new one, just right click -> Create -> Pickup.
This ScriptableObject allows you to change:
  – Its probability of appearing with the parameter "ProbabilityOfSpawning", in percentage
  – Its lifetime with the parameter "Lifetime" in seconds
  – Its velocity with the parameter "Velocity"
  – The prefab of the pickup with the parameter "Pickup" (please note that a pickup prefab must have a "Pickup" script attached to it and have the "Pickup" layer)
  – An array of bonus with the parameter "BonusList". A bonus is :
    1. An upgrade type with the parameter "Type", its different values are under the " UpgradeType" enum.
    2. A stat type with the parameter "StatType", its different value are under the "UpgradeStatType" enum
    3. The value of the upgrade with the parameter "Value"

Please note that a flat value is positive by default, except for the cooldown, because the lesser a cooldown is, the better it gets (formula: x += value)
Please note that a percentage value is a downgrade by default, except for the cooldown (formula: x *= 1 – value / 100).
"UpgradeStatType" is an enum with currently 3 values: COOLDOWN for the fire rate, SPEED for the velocity of a bullet and DAMAGE for the damage of a bullet.
"UpgradeType" is an enum with currently 2 values: FLAT for a flat upgrade and PERCENTAGE for a percentage upgrade.

Design idea for the pickups spawner:

I have decided to spawn a pickup at the same spot as an enemy's one when it dies.
The probability of a pickup to be dropped is configurable by the parameter "ProbabilityOfPickupDrop" on each "Enemy" ScriptableObject. The harder the enemy is, the better the chances are to drop a pickup on death.
When a pickup can be spawned, its type depends on the parameter "ProbabilityOfSpawning" on each "Pickup" ScriptableObject.
When a pickup spawns, it aims at the player, like an enemy, and move straight towards him at a configurable velocity.
When a pickup reaches the player, it is destroyed, and a temporary upgrade is immediately launched with a configurable lifetime. At the end of the lifetime, the upgraded stat goes back to its state prior the upgrade.

NB: The game works perfectly fine under the game view of Unity, but when compiled and launched, the camera is slightly offset along the Y axis and I don't know yet how to fix this