

1 Part I

1.1 Base

I first created a basic level, and dragged a large island to the center from the meshes given. Which is the main playground for me to implement and test on all the part 1 features.

1.2 Health System & Health Kit

It is relatively easy to adapt the health system from MP1, I created health variable for the player character, and imported the UI for displaying the health bar. I also imported the same mesh and blueprint of the health kit from MP1 which worked perfectly well after some modification.

1.3 Score System & Collectible

Similar to the health system, I imported the score system exactly the same way. And I added a collectible coin that could increase the player's score when it's hit.

1.4 Pursuer Enemy

This is something harder but the logic from the tutorial is also easy to follow. Worth noting that when I add more than one nav mesh, the chasing pursuer could damage my player even if it is at a distant island in another nav mesh. Later I found out that when the pursuer finishes "AI Move To" node, even if it is far from the player, it is also considered success if it reaches the end of nav mesh. I fixed this bug by adding a condition on the distance from the pursuer from the player.

2 Part II

2.1 Mortar Enemy

The design requirement is to create an unmoving enemy that fire projectiles around it. It is tricky because even mortar should be firing in a sector area in front of it. So I decided to make the mortar a spinning cannon, and created the mesh with meshy.com. It should spawn the bombs once in a while from the barrel.

To make sure it is realistic, I have to rotate the spawn position of the bombs with the mortar itself, so I created a socket on the barrel and retrieve its location then assign it to the spawn point.

I also created a blueprint for the bomb, where I got the mesh from sketchfab.com, which will be launched with a velocity at certain angle. It will be affected by gravity during flying and will explode, generating emitter and sound, then apply damage to the player in a certain range.

2.2 My Enemy - Rail Gun

Inspired by the mortar enemy, I created a much more powerful turret type enemy, a rail gun. I started by using a rail gun skeletal mesh for the mortar enemy, then found it much harder than a static mesh. And as the mortar enemy has a restriction that it must fire bomb at random location, it is not that powerful. So I designed this enemy to be the most dangerous enemy in my game, with the most fancy mechanism.

The rail gun is a skeletal mesh downloaded from sketchfab.com as well. It has several components, including a ground base, a gun base, and a head. Enabling it to rotate in any direction I want. So I designed it to aim at the player all the time, rotating the gun base for horizontal rotation and the head for vertical rotation. I also implemented a socket on that. It is extremely hard to calculate how to rotate the rail gun as well as the missile spawn point.

To reduce the difficulty a bit, the rail gun has a reduced firing rate, and the launching speed is random.

I also made the rail gun in two modes, one is aiming and the other is random, which behaves similar to the mortar.

2.3 Collision Behavior

This is done by adding collision capsule, one is around the enemy, and will trigger damage to the player if there's an overlap with this capsule. Another is above the enemy, will trigger the destruction of enemy.

3 Design

I have designed the complete level to guide the player step by step. The first four islands are easy level, aiming to guide player through and get familiar with the enemies.

3.1 Collectibles

Collectibles (coins) are scattered across the map, typically one island has 5 coins and 1 more between islands to guide the player to the end.

3.2 Easy Level

Spawning at the first island with only roaming enemies and collectible coins, there's relatively less danger as long as player don't run towards the enemy. Then the player could fly to the second island with a single mortar enemy, still simple, there are coins and health kit scattered on the island. The third island is a bit more difficult, where there are two rail gun enemies. But there's also more health kit to make sure the player could safely go through. And the fourth island has a pursuing enemy.

3.3 Medium Level

There are also four islands for medium level. They are composed by two types of enemies each. The first has two mortars and one rail gun, the second has two roaming and two chasing pursuer. The third has a rail gun and a roaming pursuer. The fourth has two mortars and a chasing pursuer. These are designed to be harder but still manageable by most of the players.

3.4 Hard Level

Here comes to the last part, where there are two hard level islands. The first one consists 6 mortars and 4 rail guns, which I call a battlefield level. This is quite difficult and even I may lose here sometimes. Another one has all four kinds of enemies and it is on a small island.

3.5 Winning Level

One last island has a flag on it, after hitting that, a winning screen will be displayed and player could see their final score and choose whether or not they want to replay.

3.6 Bonus Level

I have put a small island at a hidden spot, with golden texture, as a bonus component. There are 10 coins on the island, in 3 columns, with 4, 1, 5 coins in each column, corresponds to the course code.