**CSCI 438 – ADVANCED GAME DEVELOPMENT**

**FINAL PROJECT**

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**Game Overview:**

The game is inspired by the mobile arcade action game by Habby, “Archero”. Our hero faces different number of enemies every level, and he must destroy them to go to the next level and to finally face the boss enemy.

**Game Flow Summary:**

The game starts with a title screen. After the user progresses past this screen the first level loads to start the battle.

The user progresses through the levels by collecting the coin which appears in a random location after every enemy is defeated.

**Gameplay and Mechanics:**

The user controls their character’s movement with the arrow keys to dodge the bullets from its enemies. The character can only fire back when he is not on the move. Whenever he stops, the closest enemy is targeted and shooting starts. Thus, the user act strategically and choose wisely when to stop since this is the only way to change the course of the fight. The health bars on top of the hero and the enemies help to see their current HP(health point).

**Game Implementation:**

The game is implemented in Godot game engine with the help of Blender.

The hero is a kinematic body with manually applied gravity as a downwards force vector. The movement is based on the camera angle (*Figure 1*). The function “findClosestEnemy” (*Figure 2*) as anyone can imagine, locates the closest enemy. Then, the “aim” function *(Figure 3)* comes into play to point the hero to the closest enemy by using quaternions. When the aiming is done, “shoot” function (*Figure 4*) instances a bullet from a preloaded HeroBullet scene and sets its location to the gunContainer’s global location which is of type Position3D. This chain of events occurs at the signal “timer\_time\_out” which happens every one second when the character is not moving (*Figure 5*).

The enemy is also a kinematic body with manually applied gravity as a downwards force vector. They use the same aiming technique as the hero to shoot at the hero. However, its timer is triggered every two seconds instead of one.

Hero bullets and enemy bullets are both of type Area and they use signals to check if they hit something. Then they trigger the hit body to change its health and according to that their health bars.

Health bars are of type Sprite3D with a viewport containing a TextureProgress HealthBar2D. HealthBar2D contains the implementation of the health bar visuals (*Figure 6*). We activated the billboard mode to have the bar always angled towards the camera.

**Figure 1**

A screenshot of a cell phone

Description automatically generated

**Figure 2**

A screenshot of a cell phone

Description automatically generated

**Figure 3**

A screenshot of a cell phone

Description automatically generated

**Figure 4**

A picture containing bird

Description automatically generated

**Figure 5**

A screenshot of a cell phone

Description automatically generated

**Figure 6**

A screenshot of a social media post

Description automatically generated