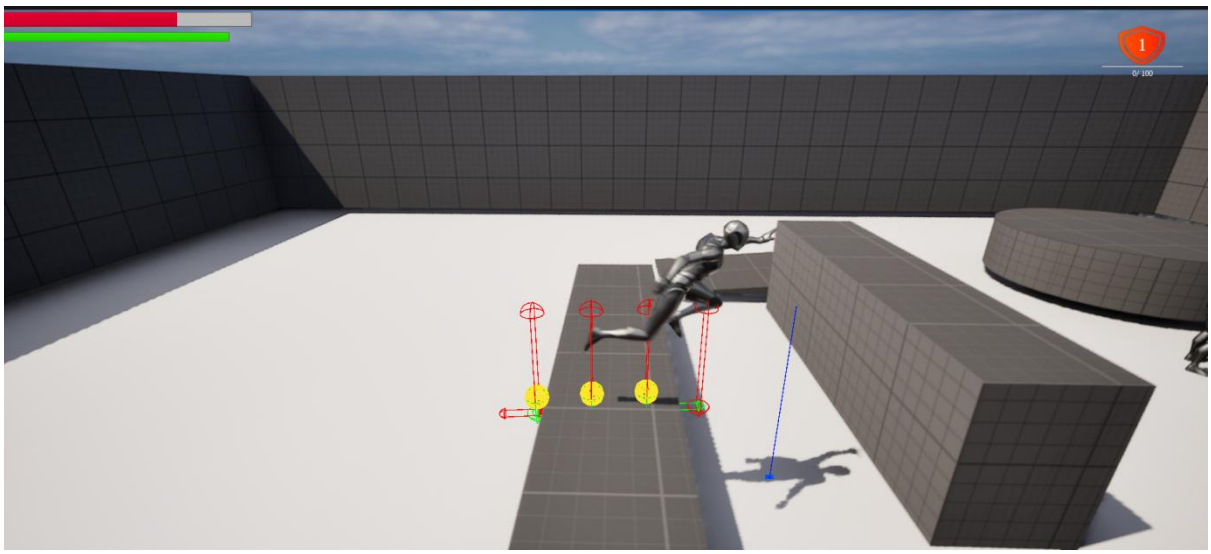
This is my brief explanation of how I have created the basic movements, vaulting, crouching along with UI elements and assassinations for my character in unreal engine 5 using blueprints and branches.

1. Vaulting Mechanic

Vaulting allows the character to climb over obstacles dynamically.



Steps to Implement Vaulting in UE5:

1. Line Trace for Vault Detection

- Use a **Line Trace (Single By Channel)** from the player's camera or chest level to detect an obstacle.
- If an obstacle is detected within a valid height range (e.g., 50-150cm), proceed to the next step.

2. Checking Ledge Space

- Perform a second **Line Trace** at the top of the obstacle to ensure there is enough space for the character to vault.
- Use **Capsule Trace** to check for obstructions above.

3. Vaulting Animation

- If the vault is possible, play a **vault animation montage** using **Play Anim Montage**.
- Use **Root Motion** for animation-driven movement.**4. Adjusting Player Position**

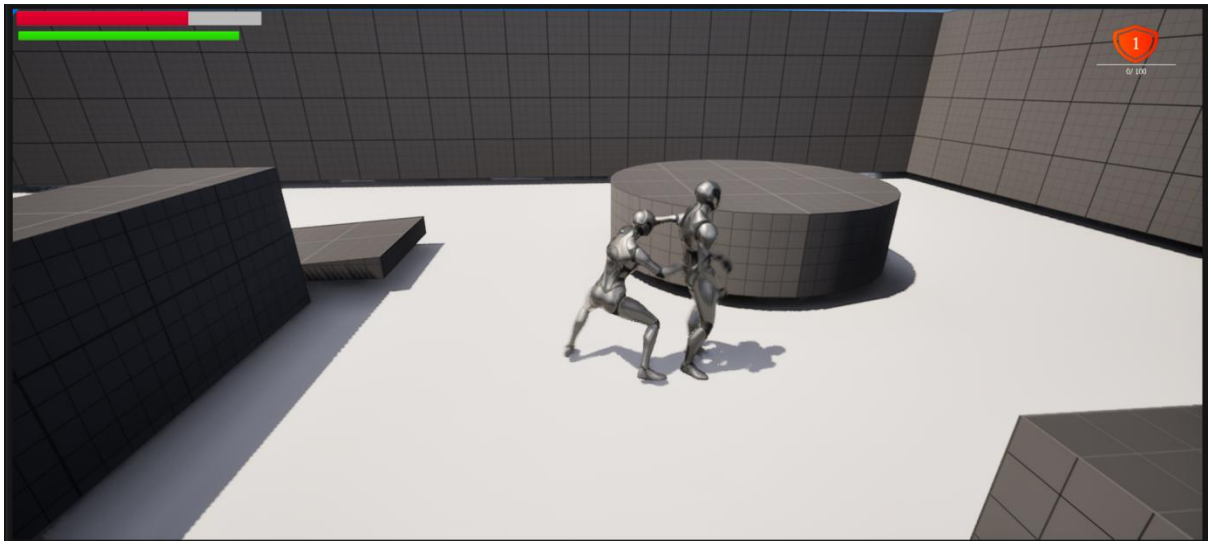
- When the animation is halfway, update the player's **location** using **Set Actor Location** to place them on the other side of the obstacle.
- Blend with animation to make movement smooth.

5. Enable/Disable Player Control

- Disable player input during the animation using **Disable Input**.
- Re-enable input after the animation using **Enable Input**.

2. Assassination Mechanic

An assassination move allows a player to eliminate an enemy with a special takedown animation when behind them.



Steps to Implement Assassination in UE5:

1. Enemy Detection

- Use a **Sphere Trace (By Channel)** from the player's position to check if an enemy is within range.
- Use **Dot Product** to ensure the player is behind the enemy (Dot Product > 0.5 means facing the back).

2. Trigger Assassination Animation

- When the player presses the assassination button (e.g., **E key** or **Gamepad Button X**), play the assassination animation using **Play Anim Montage**.

- Use an **Anim Notify** event to execute damage.

3. Disable Enemy AI

- Temporarily disable the enemy AI using **Set AI Movement Enabled (false)**.
- Use **Set Collision Enabled (No Collision)** to prevent unwanted interactions during animation.

4. Attach Player to Enemy

- Use **Attach Actor to Actor** to sync the player with the enemy animation.
- Blend in camera effects (like zoom or slow motion).

5. Execute Damage & Destroy Enemy

- When the assassination animation reaches the impact frame, apply **Damage** using **Apply Damage** node.
- *Optionally, destroy the enemy actor after death.*

3. Crouching Mechanic

Crouching lets a player move silently and avoid detection.

Steps to Implement Crouching in UE5:

1. Modify Character Movement

- In the character **Blueprint**, enable **Crouch** under **Character Movement** settings.
- Bind the crouch function to an input key (e.g., **CTRL key** or **Gamepad B button**).

2. Crouch Logic in Blueprints

- On **Crouch Key Pressed**, call **Crouch** node.
- On **Crouch Key Released**, call **UnCrouch** node.

3. Adjust Speed & Collision

- Modify **Character Movement Component** settings:
  - Reduce **Max Walk Speed** when crouched (e.g., from 600 to 200).
  - Adjust **Capsule Half Height** when crouching to avoid collision issues.

4. AI Stealth Integration

- If using AI perception, lower noise levels while crouched using **Modify AI Noise Emission**.
- Reduce AI detection range when crouching.

4. Leveling Up Using XP (Skill Experience Points)

Leveling up allows a character to gain experience and unlock new abilities.

Steps to Implement Leveling System in UE5:

1. Create XP Variables

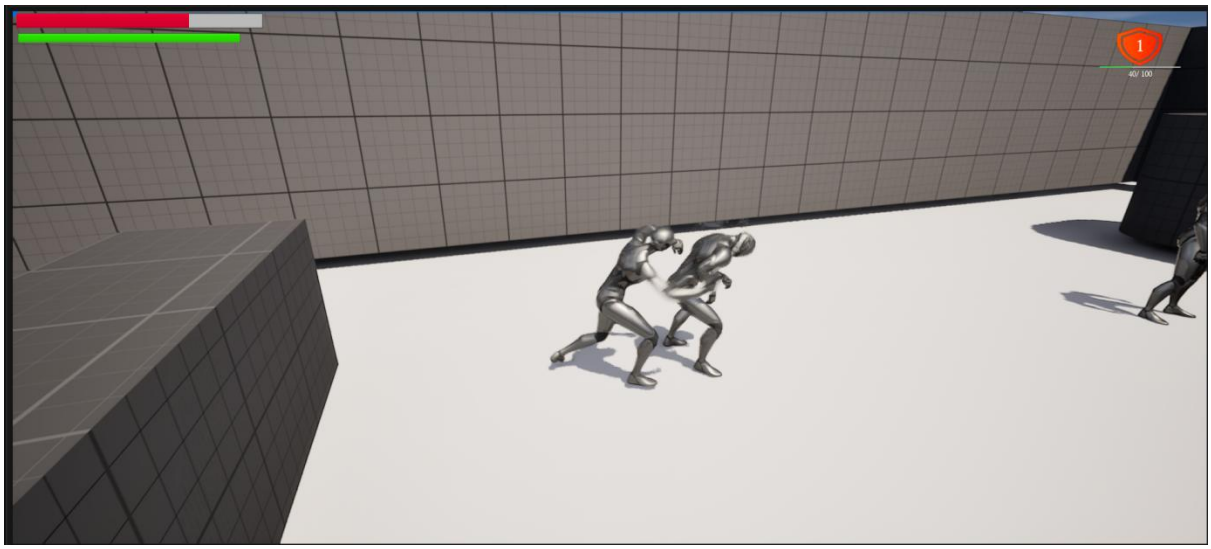
- In the **Character Blueprint**, create variables:
  - **Current XP (Float)**
  - **XP Needed for Next Level (Float)**
  - **Current Level (Integer)**

2. Gain XP on Event

- Call **Add XP** function when the player kills an enemy or completes an objective.
- Check if **Current XP >= XP Needed for Next Level**.
- If true, call **Level Up Function**.

3. Level Up Logic

- Increase **Current Level**.
- Reset **Current XP** and increase **XP Needed for Next Level** (e.g., scale by 1.2x).
- Grant skill points or unlock new abilities.



4. Update UI

- Update XP Bar using **Progress Bar Widget** in **UMG**.
- Play a **Level-Up Animation** or Sound Effect

I have provided a brief video in which my character will demonstrate everything that was given above in brief manner: Video