**Game Details**

**UX Improvements and UX Justifications are provided together as below:**

1. **Spawning the Character with the Gun by Default:**

Hodent's Principle: Accessibility and Usability

Justification: This improvement enhances accessibility and usability by eliminating the need for players to search for or acquire the gun, ensuring that they can immediately engage with the core gameplay mechanic without barriers or delays.

In file **BP\_FirstPersonCharacter** removing the default gun from viewport and attaching through creating a blueprint Rifle for new gun and using visual scripts to attach it to arms(commented)

1. **Changing the Default Gun:**

Hodent's Principle: Engagement and Flow

Justification: By offering a different default gun, we introduce variety and maintain player interest, thus contributing to sustained engagement and maintaining the flow of the gameplay experience.

In file **BP\_Rifle ,** introducing Ayakashi\_Sniper and attaching I to scope, using an Arrow component as reference for projectile direction.

1. **Changing the Projectile properties and behavior and using smaller Sphere and changing its Speed:**

Hodent's Principle: Feedback and Control

Justification: Modifying the projectile shape and speed enhances player feedback and control, making the shooting mechanics more intuitive and responsive, thereby improving the overall user experience.

In file **BP\_Bullet**

1. **Introducing Immersive Tracer Glow for Projectile:**

Hodent's Principle: Immersion and Presence

Justification: Adding a tracer glow to the projectile enhances immersion by making the projectile's trajectory more visible and believable, thus increasing the player's sense of presence within the game world.

In **BP\_Bullet**, adding emissive bullet mesh to materials to give a realistic and tracer effect

1. **Projectile Sparks on Hitting:**

Hodent's Principle: Feedback and Reward

Justification: Implementing projectile sparks upon hitting a target provides immediate feedback and reward to the player, reinforcing successful actions and increasing player satisfaction, which are crucial for maintaining engagement.

In BP\_Bullet, using Spawn System at Location blueprint and using P\_projectileSparks animation template

1. **Projectile Smoke Animation When Shot:**

Hodent's Principle: Immersion and Presence

Justification: Incorporating a smoke animation upon firing the projectile adds to the overall atmosphere of the game environment, enhancing immersion and making the gameplay experience more immersive and enjoyable for players.

In file BP\_Rifle, under spawn system attached, using the muzzle flash animation.

1. **Introducing Recoil Effect for Gun through Asset Animation:**

Hodent's Principle: Feedback and Control

Justification: Implementing a recoil effect provides tactile feedback to the player, enhancing the sense of control and realism in the shooting mechanics, thereby improving the overall user experience.

In BP\_Rifle, under Montage play blueprint, using the animation causes attached arrow to change location, giving a recoil effects to sniper.

1. **Creating Static Breakable Targets with Physics Enabled and Geometry Fracture Feature:**

Hodent's Principle: Engagement and Flow

Justification: Adding physics-enabled breakable targets enhances player engagement by providing dynamic challenges and opportunities for experimentation, thus maintaining the flow of the gameplay experience.

In BP\_Target, creation of fracture effects through Fracture mode in Unreal Engine and creating 3 layers of fracture then creating a geometry collection and using that as a materials mesh in target object.

1. **Added Score Mechanics Where Single Hit Counts as 1 Hit:**

Justification: Introducing score mechanics adds a layer of progression and achievement to the game, motivating players to improve their performance and engage with the gameplay loop, which aligns with the UX principle of motivation and reward

In WBP\_UI widget, using blueprints UpdateScore, through use of variables and using GM\_targetGame, setting max scores , and add scores blueprints.

1. **Made Sure Only Projectile Hit Counts:**

Hodent's Principle: Clarity and Usability

Justification: Ensuring that only projectile hits count towards the game's objectives maintains clarity and consistency in gameplay, preventing confusion and enhancing the overall user experience.

In BP\_Target, using on component hit, cast to BP\_Bullet, if statements(branches) ,and is hit? Variables to make sure only projectile hit/ collision counts.

1. **Made Sure the Targets Don't Fracture Until Hit by Enclosing in Box Mesh:**

Justification: Delaying the fracture of targets until they are hit adds anticipation and satisfaction to the gameplay, aligning with the UX principle of anticipation and reward.

Entrapping target objects in box(box collision) and setting collision presets.

1. **Created a Crosshair Using BP\_First-Person HUD:**

Justification: Providing a crosshair enhances player aiming accuracy and feedback, improving the overall shooting experience and aligning with the UX principle of feedback and control.

1. . **Changed Projectile Speed to Improve Bullet Drop over Distance:**

Hodent's Principle: Feedback and Control

Justification: Adjusting the projectile speed to simulate bullet drop improves player feedback and control, requiring players to adapt their aiming strategies based on distance, thus enhancing the overall user experience.

1. **Added Restart Game Mechanics After Game Won:**

Justification: Allowing players to restart the game after winning maintains engagement and encourages replayability, ensuring a continuous flow of gameplay experience without interruptions, which aligns with the UX principle of flow and engagement.

Using buttons and anchors in WBP\_EndScreen to display restart and on clicked🡪 open level Blueprint to give it functionality.

1. **Added Game Lost Mechanics Through Use of a Timer to Make Game Engaging:**

Justification: Incorporating a timer adds a sense of urgency and challenge to the game, motivating players to act quickly and strategically, enhancing the gameplay experience and aligning with the UX principle of challenge and engagement.

1. **Corrected Bugs Where Player Movement Wouldn't Stop After Game Ended:**

Justification: Resolving bugs related to player movement ensures a smooth and consistent gameplay experience, preventing frustration and maintaining immersion, which aligns with the UX principle of usability and consistency.

1. **Solved Bugs Where Game Won and Game Lost Displayed at Same Time:**

Justification: Fixing bugs related to game state display ensures clarity and coherence in the user interface, preventing confusion and enhancing the overall user experience, which aligns with the UX principle of clarity and feedback.

1. **Added a Blur on End Screen Widget to Properly Display Endgame Texts and Buttons:**

Justification: Incorporating visual effects such as blur improves the readability and aesthetics of the end screen, ensuring that important information is easily discernible to the player, which aligns with the UX principle of aesthetics and readability.

1. **Created Modularity in GameMode\_TargetGame Using the ShowEndScreen Function:**

Justification: Implementing modularity improves the maintainability and scalability of the game codebase, allowing for easier updates and expansions in the future, which aligns with the UX principle of efficiency and scalability.

1. **Introduction of Unreal's Force-Field Engine Module to Break the Targets:**

Justification: Integrating Unreal's force-field engine module adds visual flair and interactivity to the game environment, enhancing the overall immersion and engagement for the player, which aligns with the UX principle of immersion and interactivity.

**Along with many other minor Changes and bug fixes.**

**Sources:**

1. Assets :Unreal Sensei youtuber
2. Used the tutorial and assets by unreal sensei youtuber to fix bugs, basically, developed the project myself and took help from tutorial only after exhausting other means to fix bugs
3. Use ChatGPT to understand key concepts, and to provide a list of options as to where the bugs might be, often times ChatGPT was incorrect but helped me learn many core concepts and principles.
4. Google, and UE5 Documentation.

**UX Testing:**

Had a friend “Fawaz Ahmad” play the game at different stages of completion, some key bugs found were:

1. Lack of crosshair
2. Default projectile was boring, no effects, low speed and huge bullet drop
3. Player hitting target registered as hit.
4. If game won last second then Game Won and Game Lost overlapped.
5. Suggestion of blurring the background
6. Targets auto fractured upon simulation, lead to the solution of wrapping them in collision boxes and not simulating hit/fracture physics until hit by bullets
7. Lack of environment, boring environment lead to downloading a 60gb free sample environment from epic, not used in the submitted project. ONLY used in video Submissions.

**Code Appendix:**

Photos and videos attached separately. Some examples are given below.

Blueprint files made and modified by me are: 1.) BP\_Bullet

A screenshot of a computer

Description automatically generated

2.) BP\_FirstPersonCharacter

3.) BP\_FirstPersonProjectile

4.) BP\_Rifle

A screenshot of a computer

Description automatically generated

5.) BP\_Target

A screenshot of a computer

Description automatically generated

6.) BP\_FirstPersonHUD

1. GM\_TargetGame

A screenshot of a computer

Description automatically generated

1. WBP\_UI

A screenshot of a computer

Description automatically generated

10.) WBP\_EndScreen

A screenshot of a computer

Description automatically generated

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