Project Documentation

Overview

This document outlines the key features, objectives, and challenges faced during the development of the programming test. The project was created in Unreal Engine 5, utilizing both C++ and Blueprint.

Project Features

1. Gravity Gun Mechanic

- **Description**: Replaced the projectile firing mechanic with a gravity gun that allows players to pick up and throw objects. The firing force and pickup radius are configurable in the editor.
- **Features Implemented**:
    - Object pickup and firing functions.
    - Exposed **Pickup Radius** and **Firing Force** as editable variables in the Unreal Editor.
    - **Functionality**: The gravity gun interacts with physics-enabled objects, simulating realistic handling and launching dynamics.

2. Ability System

- **Abilities Included**:
    - *Dash*: Moves the player character forward by a set distance.
    - **Smoke Grenade**: Currently spawns a grenade that can be launched, with functionality planned for a smoke effect and damage over time.
    - **Create Light (Toggle Light)**: An ability that toggles a light source on and off at the player's current location, improving visibility in dark areas.
- **Key Attributes**:
    - Each ability has a *cooldown* and a *damage* value (where applicable).
    - The cooldown system prevents abilities from being re-activated until their cooldown time has elapsed.
- **Additional Enhancements**:
    - Abilities are easily extensible, allowing additional abilities to be added with minimal adjustments to existing code.

3. Objectives Implemented:

- Arriving at a specified location.
- Interacting with a specified Actor.
- Collecting a defined number of items.

4. Optional and Bonus Features

- **Code Modularity and Clean Design**:
    - The project was structured to support future extensions and changes, specifically in the ability.

Areas for Improvement

1. **HUD Interface:**
    - **Future Plans:** Develop a HUD to display active abilities and cooldowns.
2. **Ability Enhancements:**
    - **Smoke Grenade Enhancements**: Implement a visual smoke effect and apply a damage-over-time effect within the affected area.
    - **Additional Abilities:** Incorporate more abilities for diverse gameplay options.
3. **Visual and Mesh Improvements:** Enhance asset quality to create a more immersive experience.
4. Intended to implement a tracking system for objectives to enhance gameplay experience.

Setup Instructions

To use the Smoke Grenade ability:

Ensure that the `BP_FirstPersonCharacter | Ability | SmokeGrenadeAbility | MySmokeGrenadeBP` is assigned in the editor at runtime.

Check the input actions: **FireObject**, **PickUpObject**, and **LightAction**, as they may need to be recreated for proper functionality.

Estimated Time Spent on Each Section

- **Gravity Gun Mechanic**: 8 hours
- **Ability System (Smoke Grenade, Dash, Create Light)**: 10 hours
- **Objectives Implementation**: 6 hours
- **Challenges & Debugging**: 8 hours
- **Documentation & Polish**: 2 hours

Total Estimated Time: **34 hours**

Conclusion

This project showcases my ability to understand requirements and implement functionalities in Unreal Engine 5. I am particularly proud of the gravity gun mechanic and the ability system. There is always room for improvement, and I recognize the potential for additional features and refinements in future iterations.