FALLEN CITY

Game On Unity

BY

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INTRODUCTION

1.1. Introduction

Game development has evolved significantly over the years, with various platforms enabling developers to create immersive and interactive experiences. One such powerful and widely used platform is Unity 3D, known for its versatility and ability to build games across multiple platforms. This report provides an overview of Unity 3D and its functionalities, followed by a detailed discussion of the game *Fallen City*. The game consists of multiple scenes, interactive elements.

1.2. Overview of Unity 3D

Unity 3D is a leading game development engine that allows developers to create both 2D and 3D games. It provides an intuitive interface, a powerful scripting environment using C#, and a vast asset store that simplifies the game development process. Unity supports multiple platforms, including PC, mobile, and consoles, making it a popular choice for indie developers and large studios alike. With features such as physics simulation, animation, lighting effects, and real-time rendering, Unity helps developers bring their creative visions to life.

1.3. Purpose of the Report

The purpose of this report is to document the development and design of *Fallen City*, a game created using Unity 3D. This report outlines the game's structure, mechanics, and core functionalities, providing insights into its development process. Additionally, it highlights how different Unity features were utilized to create an engaging and interactive gameplay experience.

1.4. Brief Introduction to Fallen City

Fallen City is a Unity 3D game designed to provide an engaging and interactive experience where players navigate a city environment, collect coins, and avoid enemy characters. The core objective of the game is to collect as many coins as possible while evading enemies. If an enemy catches the player, the game ends.

The game consists of four primary scenes: Menu Scene, Options Scene, Main Game Scene, and Game Over Scene. Each scene plays a crucial role in enhancing the user experience by providing intuitive navigation, immersive gameplay, and interactive UI elements. The game integrates various Unity assets, external 3D models, animations, and physics-based interactions to create a visually appealing and engaging experience.

This report outlines the design choices, technical implementation, and improvements for Fallen City while providing insights into the development process and future enhancements.

2. Game Design & Development

2.1 Game Scenes and Navigation

The game consists of four distinct scenes, each with a specific purpose and interaction flow:

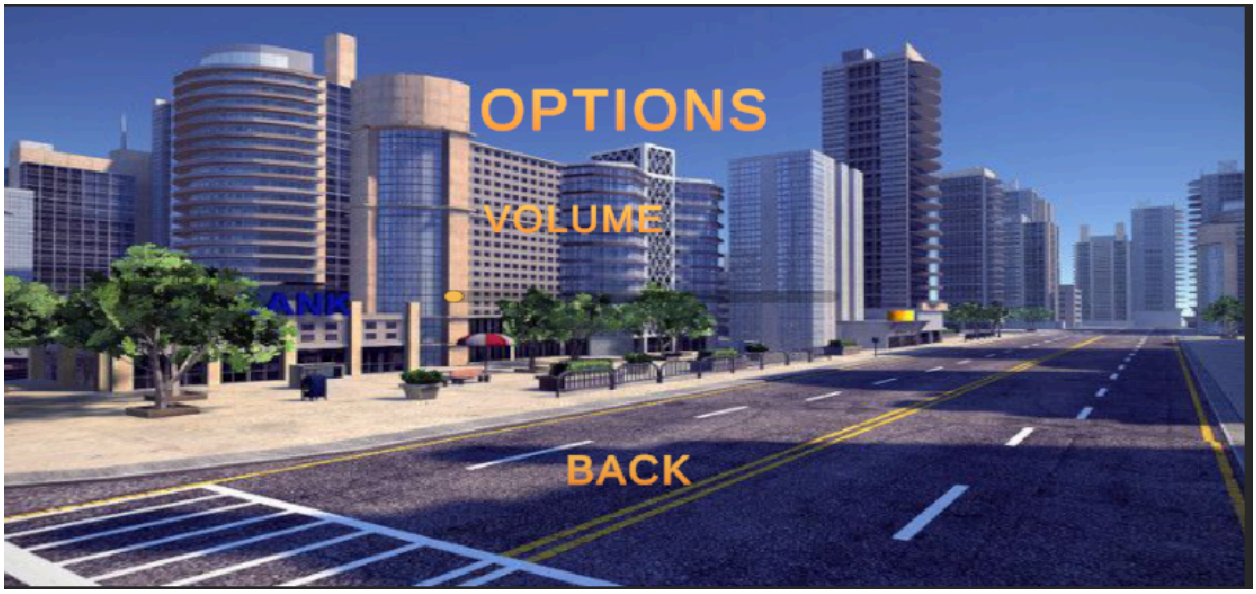
A. Menu Scene

- The **Menu Scene** is the first screen players see upon launching the game.
- It includes a **background image** with animations to enhance visual appeal.
- The interface contains:
    - **Game Title** – Displayed in a text box.
    - **Three interactive buttons:**
        - **Play:** Starts the game and navigates to the Main Game Scene.
        - **Options:** Takes the player to the Options Scene.
        - **Quit:** Directs the player to the Game Over Scene.

B. Options Scene

- The **Options Scene** provides settings to adjust game preferences.
- It includes a **slider** to control the game's volume.

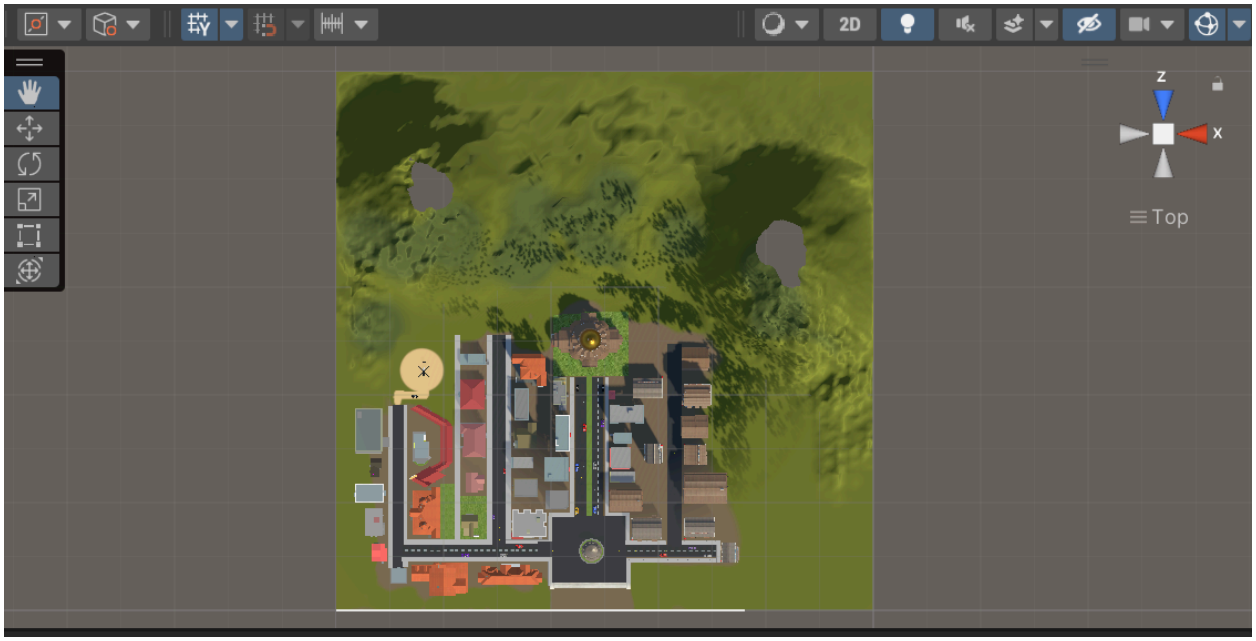
- A **Back button** allows players to return to the Menu Scene.



C. Main Game Scene

- The **Main Game Scene** is where the actual gameplay takes place.
- The environment consists of a **terrain** with roads, buildings, trees, mountains and vehicles.
- **Game Elements:**
    - **Player Character:** A 3D model obtained from **Mixamo**, equipped with walking animations.
    - **Enemies:** Code-controlled characters that move toward the player.
    - **Coins:** Placed across the map for collection.
    - **Camera System:** The camera follows the player from behind, ensuring a dynamic gaming experience.
    - **UI Elements:**
        - A counter that tracks the number of coins collected.
        - An X button to exit the game and navigate to the Game Over Scene.


Coin: 3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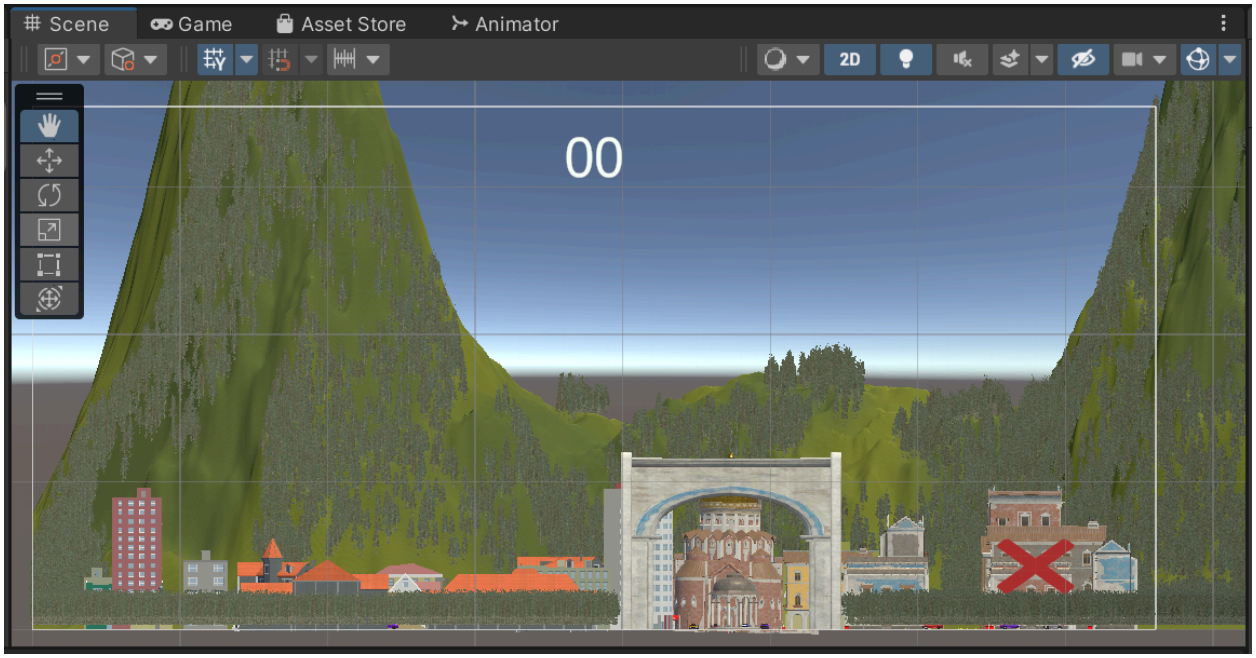

D. Game Over Scene

- This scene is displayed when the player loses (i.e., when an enemy catches the player).
- It includes a **Game Over** image along with two buttons:
    - **Re-Game Button:** Restarts the game from the beginning.
    - **Menu Button:** Returns the player to the main menu.

2.2 Assets and Features

To create a visually appealing and immersive gaming experience, several Unity assets and external resources were integrated into the game:

A. Unity Asset Store:

The following assets were utilized to construct the environment, UI elements, and animations:

- **8K Skybox Pack Free** – Enhances the background visuals.
- **ADG_Textures** – Provides high-quality texture packs for terrain and buildings.
- **ARCADE - FREE Racing Car** – Used to create vehicles in the city.
- **Conifers [BOTD]** – Tree models to add realism to the environment.
- **Grass And Flowers Pack 1** – Improves the natural elements in the city.
- **HousePack** – Includes 3D models of buildings.
- **Police Car & Helicopter** – Adds law enforcement vehicles for realism.
- **POLYGON City Pack** – Provides a low-poly city structure.
- **TextMesh Pro** – Used for UI text elements.

B. Character and Animation:

- The player and enemy characters were sourced from Mixamo, a platform that provides rigged 3D models with animations.
- The following animations were implemented:
    - Walking animation for the player and enemies.
    - Coin rotation animation to make them visually distinct.

C. Physics and Interactions:

- **Colliders** were applied to essential objects:
    - Coins – Disappear when collected.
    - Player – Registers interactions with coins and enemies.
    - Enemies – Trigger a **Game Over** when they catch the player.
- **Game logic:**
    - The coin counter updates dynamically as coins are collected.
    - The Game Over Scene is triggered when an enemy collides with the player.

3. Improvements & Future Enhancements

Several improvements can be made to enhance the gameplay experience:

- **Collisions:** Implement colliders to prevent the player from passing through buildings and vehicles.
- **Additional Characters:** Introduce human NPCs to make the game world more dynamic.
- **Graphics Enhancement:** Improve textures, lighting, and shadows for better realism.
- **Level Progression:** Add levels with increasing difficulty and different environments.
- **Speed Scaling:** Adjust player and enemy speed based on the number of collected coins.

4. Conclusion

Fallen City serves as an exciting introductory project in game design and development using Unity 3D. It successfully incorporates game physics, UI interactions, 3D animations, and asset management to create an interactive experience.

The structured development approach allowed for seamless scene navigation, user interaction, and game logic implementation. The use of Unity assets, physics-based mechanics, and Mixamo animations provided a strong foundation for creating a realistic and engaging city environment.

4.1. Key Takeaways:

1. **Game Structure & Navigation:** Implementing **four key scenes** (Menu, Options, Main Game, and Game Over) ensured a clear and engaging user flow.
2. **Character & Object Interaction:** The game utilizes colliders, animations, and physics-based object interactions to create an interactive environment.
3. **User Experience & Gameplay Mechanics:** The use of counters, enemy tracking, and UI transitions enhances the player's experience.
4. **Future Scalability:** The game has strong potential for further expansion, including AI improvements, new levels, and enhanced difficulty settings.

4.2. Overall Significance:

Developing Fallen City has provided valuable insights into the principles of game development, scene management, asset integration, and gameplay mechanics. By iterating on existing features and introducing new gameplay elements, the game can evolve into a more polished and professional project.

This project serves as a strong foundation for future game development endeavors, reinforcing key concepts such as game physics, AI behavior, animation control, and user interface design.With continued refinement, Fallen City can become an engaging, fast-paced game that provides an immersive player experience while demonstrating strong technical expertise in Unity 3D development.