DECLARATION

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that We have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed. The plagiarism check report is attached at the end of this document.

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ABSTRACT

PlayVerse 3-in-1 is a gaming platform designed as a final-year project, featuring three distinct challenges: Endless Runner, Object Ninja, and Edge Dodger. Each game mode offers unique gameplay, from navigating dynamic environments to precise clicking and strategic ball control. The project focuses on smooth gameplay, intuitive controls, and appealing visuals, inspired by popular titles like Fruit Ninja, Extreme Balancer and Temple Run. This report outlines the conceptualization, development, and testing phases, demonstrating technical proficiency and creative game design. The game also features a login system, a chat feature, and a database for user management. Key features include:

- Singleplayer Functionality
- Multi-Game Integration
- Leaderboard
- Simple Controls
- Splash Screen & UI Enhancements
- Attractive Visuals and Sounds
- Database Implementation

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CHAPTER 1

INTRODUCTION

1.1 Overview

PlayVerse 3-in-1 is a fun and exciting gaming project that combines three different games into one. It offers players a mix of challenges that test their speed, precision, and defence skills, making it a versatile and engaging experience. The three game modes are:

1. Endless Runner: A fast-paced game where players must keep moving forward while avoiding obstacles. The goal is to survive as long as possible without slowing down or getting hit. It's all about quick reactions and nonstop action.

2. Object Ninja: A game that tests quick reactions and accuracy. Players need to slice objects that appear on the screen while carefully avoiding bombs. One wrong move can end the game, so it requires both speed and precision. The challenge increases as the game progresses, keeping players on their toes.

3. Edge Dodger: A game focused on staying safe while dodging various obstacles. The main aim is to survive as long as possible by avoiding anything that can cause the ball to crash. It challenges players to stay focused and make smart moves to outlast the threats.

4. The idea behind PlayVerse 3-in-1 stems from the popularity of casual games that require quick reflexes and hand-eye coordination. By merging three games with different gameplay styles, the project aims to enhance player retention and enjoyment. Each game within PlayVerse 3-in-1 follows a unique set of rules and objectives, which are clearly outlined in the game's instruction screens.

5. In addition to providing entertainment, the project also demonstrates technical proficiency in game development, leveraging the Unity engine's capabilities and C# programming to achieve optimized performance and interactive gameplay. This report outlines the core concepts, features, technologies, and future possibilities associated with the game.

With its combination of diverse game modes and exciting challenges, PlayVerse 3-in-1 stands out as a unique and captivating gaming experience that keeps players coming back for more.

1.2 Objectives

The primary objective of PlayVerse 3-in-1 is to develop an innovative and versatile gaming experience that appeals to casual gamers seeking dynamic and engaging sessions. By combining three distinct game modes within a single application, the project aims to maximize player engagement through varied gameplay mechanics and challenges. The primary focus is to create an entertaining and interactive environment that keeps players invested and motivated to improve their skills.

One of the key aspects of this project is to develop intuitive and visually appealing interfaces that ensure seamless navigation between game modes. Clear instructions and user-friendly controls are integral to enhancing the player experience, making it accessible for users of all skill levels. Additionally, the project prioritizes the use of efficient coding practices to maintain optimal performance, reducing lag and latency during gameplay.

To enhance player immersion, the game integrates smooth animations and responsive UI components that adapt to user interactions in real-time. The visual aesthetics are designed to be vibrant and attractive while maintaining a simplistic approach that aligns with casual gaming standards. Furthermore, the project emphasizes replay ability through score tracking and dynamic high-score boards, allowing players to challenge themselves and set new records.

The development process also demonstrates technical proficiency by leveraging Unity's powerful engine capabilities and C# programming to deliver a fluid and polished game. This combination of technical expertise and creative design aims to showcase the potential of game development in providing immersive and enjoyable gaming experiences.

1.3 Existing Systems

1.3.1 Similar games as "Object Ninja"

Table 1.1: Similar games as Object Ninja

S.N.	Game Name	Description	Rating	Ref
1.	Fruit Ninja	Slice fruits quickly while avoiding bombs.	4.5	[1]
2.	Crazy Juicer	Blend fruits by slicing them into a juicer, avoiding hazards along the way.	4.5	[2]
3.	iSlash Heroes	Cut through the shapes without hitting enemies.	4.5	[3]
4.	Fruit Slash	Become a fruit-slashing expert while avoiding dangerous bombs and traps.	4.4	[4]
5.	Slice and Dice	Precision slicing game with challenging levels and smooth mechanics.	4.4	[5]
6.	Slice It: Fruit Edition	A spin on traditional slicing games with fun fruit challenges and obstacles.	4.4	[6]
7.	Fruit Samurai	Cut fruits and complete challenges while maintaining focus on avoiding bombs.	4.3	[7]
8.	Slash & Girl	A fast-paced runner game where you slash enemies with precision and style.	4.3	[8]
9.	Katana Fruits	Test your katana skills by slicing flying fruits with precision.	4.3	[9]
10.	Juicy Slice	Slice through juicy fruits with rapid swipes to achieve combos and high scores.	4.3	[10]
11.	Perfect Slices	Precision cutting game where you slice fruits and vegetables into perfect pieces.	4.2	[11]
12.	Slice It All	Slice objects into pieces while moving a knife through obstacles.	4.2	[12]
13.	Fruit Frenzy	Exciting fruit-cutting game with vibrant graphics and power-ups.	4.2	[13]

S.N.	Game Name	Description	Rating	Ref
14.	Fruit Cut Master	Cut fruits accurately while avoiding bombs; challenge yourself with new levels.	4.2	[14]
15.	Knife Hit	Throw knives at a rotating target without hitting existing knives.	4.1	[15]

1.3.2 Similar games as "Edge Dodger"

Table 1.2: Similar games as Edge Dodger

S.N.	Game Name	Description	Rating	Ref
1.	Red Ball 4	Navigate the red ball through tricky levels while avoiding enemies and traps.	4.6	[21]
2.	Roller Ball 6	Bounce and roll the ball to save the world while dodging enemies.	4.5	[22]
3.	GyroSphere Trials	Control a ball on twisty tracks with speed challenges.	4.4	[23]
4.	Bounce Ball 5	Navigate the ball through tricky paths and obstacles to solve puzzles.	4.4	[24]
5.	Extreme Balancer 3	Balance the ball on wooden bridges and escape traps to reach the boat.	4.4	[25]
6.	Going Balls	Roll a ball through obstacles and challenging tracks at high speed.	4.3	[26]
7.	Slope Run Game	Roll downhill at high speeds while avoiding falling off edges.	4.3	[27]
8.	Crazy Ball: The Survival Game	Navigate a ball through obstacles like circles and triangles as long as possible.	4.3	[28]

9.	Ball Resurrection	Navigate a ball through platforms and obstacles with precision and control.	4.2	[29]
10.	Balance Ball 3D	Navigate a 3D ball while avoiding obstacles and falling off the edges.	4.2	[30]
11.	Rolling Sky	Roll the ball on challenging tracks while dodging traps and obstacles.	4.2	[31]
12.	Survival Island: Avoid Falling Stack	Avoid falling balls and compete with online players.	4.1	[32]
13.	Ball World Adventure	Explore worlds with your ball and overcome obstacles through various levels.	4.1	[33]
14.	Jump Ball Adventure	Help the Angry Ball avoid obstacles, and enemies.	4.1	[34]
15.	Twisty Road	Guide a ball along a winding, narrow path filled with sharp turns and obstacles.	4.0	[35]

1.3.3 Similar games as "Endless Runner"

Table 1.3 Similar games as Endless Runner

S.N.	Game Name	Description	Rating	Ref
1	Subway Surfers	Dash through subway tracks, dodging trains and collecting coins.	4.6	[41]
2	Sonic Dash	Run as Sonic, dodging obstacles and defeating enemies.	4.6	[42]
3	Crossy Road	Help characters cross roads, rivers, and tracks.	4.6	[43]

4	Alto's Odyssey	Sandboard through vast desert landscapes.	4.6	[44]
5	Blades of Brim	Fight enemies and collect treasures in a vibrant fantasy world.	4.4	[45]
6	Minion Rush	Run as Minions.	4.4	[46]
7	Jetpack Joyride	Fly through obstacles with jetpacks and gadgets.	4.4	[47]
8	Talking Tom Gold Run	Chase robbers while collecting gold and dodging obstacles.	4.4	[48]
9	Rail Rush	Ride a minecart through caves while collecting gold.	4.4	[49]
10	Alto's Adventure	Snowboard down endless slopes and perform tricks.	4.4	[50]
11	Zombie Tsunami	Lead a horde of zombies, infect humans and avoid obstacles.	4.5	[51]
12	Temple Run 2	Navigate temples while dodging obstacles and collecting coins.	4.3	[52]
13	Mars Dash	Run through alien landscapes on Mars.	4.3	[53]
14	Monster Dash	Run and shoot through monster-filled environments.	4.3	[54]
15	Vector	Perform parkour moves through urban landscapes.	4.2	[55]

1.4 New Features

The PlayVerse 3-in-1 game introduces several new and advanced features to enrich the gameplay experience, optimize performance, and ensure player satisfaction. These features aim to set the game apart from conventional casual games by incorporating modern design practices and technical enhancements.

a. Multi-Game Integration within a Single Application

Unlike traditional casual games that focus on a single game mode, PlayVerse 3-in-1 seamlessly integrates three unique game modes into one cohesive application. This approach not only saves device storage but also offers a variety of gaming experiences without the need to switch between different apps.

b. Enhanced User Interface and Navigation

The game features a sleek and intuitive user interface, making it easy for players to navigate between different game modes. The UI components are designed with simplicity and clarity in mind, ensuring that players can switch modes effortlessly. Smooth transitions and visually appealing animations add a professional touch to the overall presentation.

c. Scoring

Each game mode within PlayVerse 3-in-1 has a dedicated scoring system that tracks player performance in real-time. The high-score boards encourage friendly competition among players by displaying personal best scores and motivating them to beat their previous records. This feature significantly boosts replay value and keeps players coming back for more.

d. Adaptive Difficulty Levels

The game intelligently adapts its difficulty based on player performance. This dynamic adjustment ensures that beginners can enjoy the game without feeling overwhelmed,

while experienced players continue to face new challenges as they progress. This balance makes the game appealing to a broad audience.

e. Smooth and Responsive Controls

PlayVerse 3-in-1 is designed with precision control mechanics to ensure a responsive and satisfying gameplay experience. Whether it's dodging obstacles in the Endless Runner or slicing through objects in Object Ninja, the controls feel fluid and intuitive, enhancing player satisfaction.

f. Visual and Sound Effects

To create an immersive environment, the game incorporates vibrant visual effects and dynamic soundscapes.

CHAPTER 2

TECHNOLOGY AND LIBRARY

2.1 Core Framework

The core framework of PlayVerse 3-in-1 revolves around the Unity game engine and the C# programming language. Unity's game object architecture allows for modular and reusable components, making the development process efficient and organized.

The project utilizes a layered architecture, including the following components:

- **Input Handling:** Captures player inputs and processes them in real-time for responsive control.

- **Game Logic:** Implements the core mechanics for each game mode using structured C# scripts.

- **UI Management:** Uses Unity's UI Toolkit to create interactive menus and instruction screens.

- **Animation System:** Employs Unity Animator and Animation Controllers to manage smooth transitions and character movements.

- **Physics Engine:** Utilizes Unity's built-in physics system for collision detection and realistic movements, especially in the Edge Dodger mode.

CHAPTER 3

METHODOLOGY

3.1 Objectives of the Project

The proposed project work for **PlayVerse 3-in-1** involves developing a dynamic and engaging PC game that brings together three unique casual gaming experiences within a single application. The primary focus of the project is to create an immersive and enjoyable game that caters to casual gamers seeking quick and challenging gameplay sessions.

This project leverages the Unity engine and C# programming language to deliver a well-optimized, visually appealing, and technically proficient gaming experience. The development process involves designing three distinct game modes:

Endless Runner, **Object Ninja**, and **Edge Dodger**, each offering a unique gameplay style while maintaining a consistent visual theme and user interface.

- The **Endless Runner** mode challenges players to navigate through obstacles and cover the maximum distance while collecting rewards.
- The **Object Ninja** mode requires precision and quick reflexes as players slice through objects while avoiding bombs.
- The **Edge Dodger** tests the player's ability to survive as long as possible while dodging incoming threats.

To ensure smooth gameplay and user satisfaction, the game incorporates features like **real-time score tracking**, **dynamic high-score boards**, and **responsive UI components**. Efficient coding practices are maintained throughout the development to optimize performance and reduce lag. Additionally, smooth animations and interactive UI elements are integrated to enhance the overall gaming experience. The project also aims to demonstrate technical expertise by showcasing the efficient use of Unity's engine

capabilities and C# programming skills. The modular structure of the game makes it easy to update and expand with additional game modes or new features in the future.

3.2 Technology Stack & Tools Used

The development of PlayVerse 3-in-1 involves a comprehensive technology stack and tools to ensure performance and scalability. The following technologies and tools were utilized:

- **Unity Game Engine:** The core platform for game development, offering comprehensive features for graphics, physics, and user interface management.

- **C# Programming:** The primary language used to script game logic and interactivity.

- **Visual Studio:** An integrated development environment (IDE) for writing and debugging code.

- **Unity Version Control (Git):** Tracks changes and enables collaboration among developers.

- **Cinemachine:** Manages dynamic camera movements for a more cinematic and immersive experience.

- **TextMesh Pro:** Enhances text clarity and customization within the game.

- **Unity UI Toolkit:** Enables the creation of responsive and visually appealing interfaces.

- **Audio Mixer:** Manages sound effects and background music to ensure consistent audio quality.

- **Unity Crash Handler 64:** Used to handle and report crashes, particularly when a game built with Unity encounters a native crash.

EXPERIMENTAL RESULTS AND IMPLEMENTATION

Fig. 4.1 Starting Page

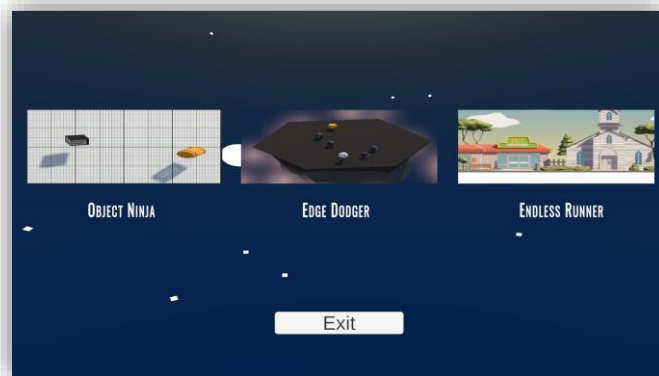Fig. 4.2 Login Page

Fig. 4.3 Data of Registered Accounts

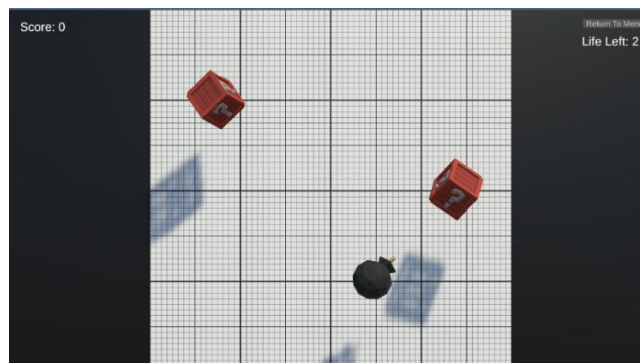Fig. 4.4 Lobby

4.2 GAME 1

Object Ninja

Fig. 4.2.1 The beginning
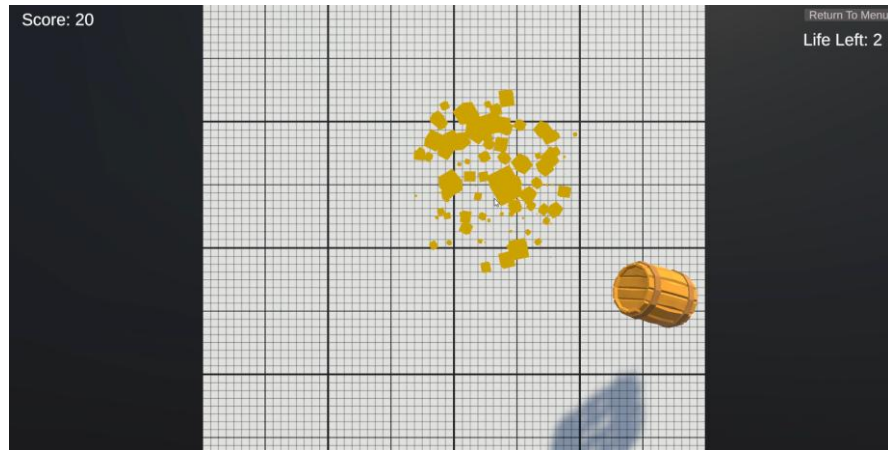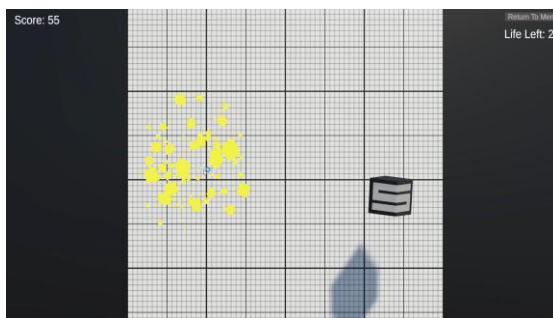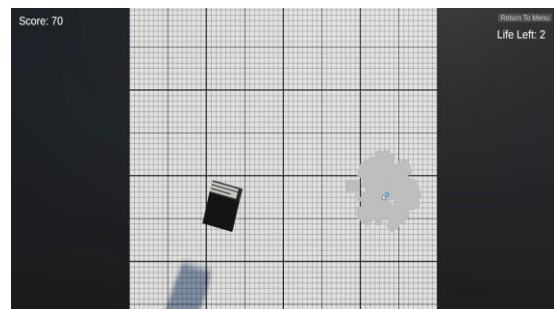
Fig. 4.2.2 Object collapses on hovering

a.   b.

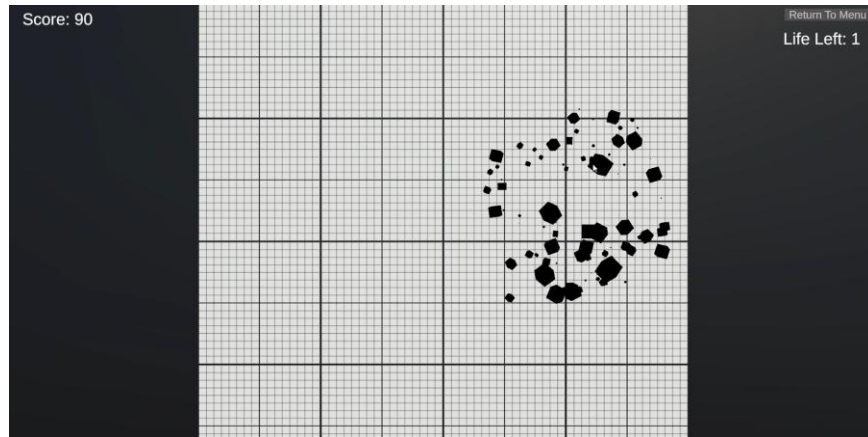Fig. 4.2.3 Score increases when the correct object gets collapsed

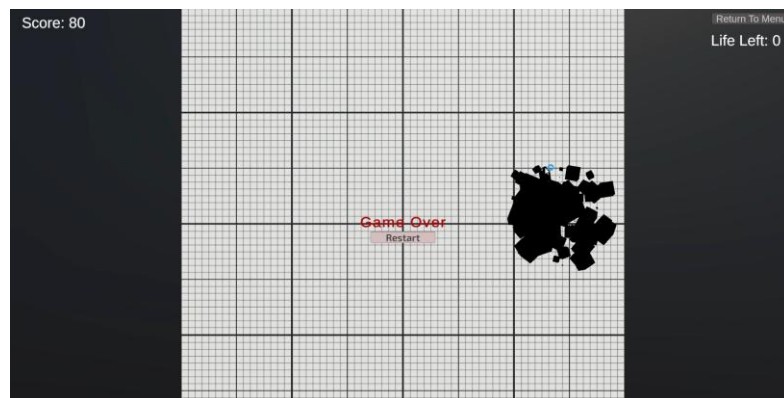Fig. 4.2.4 Score and number of lives decreases on hovering the wrong item

Fig. 4.2.5 Game gets over when you have 0 number of lives
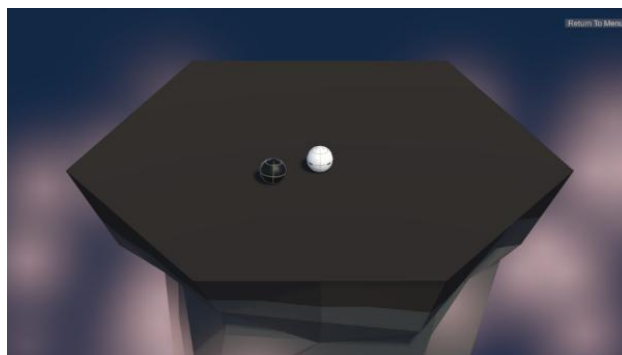
4.3 GAME 2

Edge Dodger

Fig. 4.3.1 The beginning

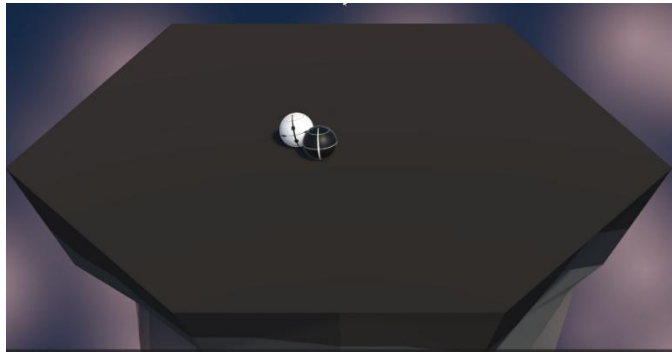a. White Ball; player's ball   b. Black Ball; enemy's ball

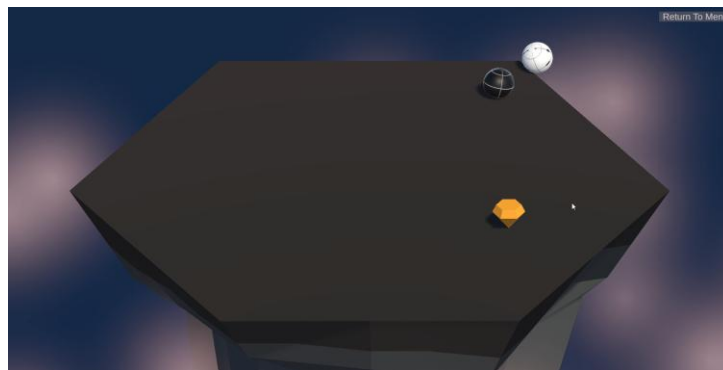Fig. 4.3.2 Enemy's ball push the player's ball to the edges

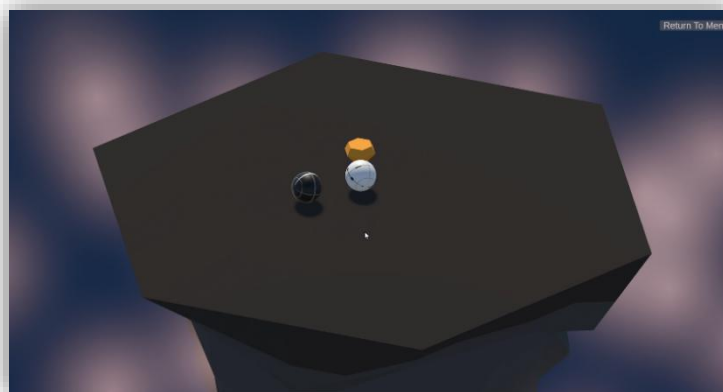Fig. 4.3.3 The player needs to dodge and avoid getting off the edge

Fig. 4.3.4 Player needs to collect diamonds

Fig. 4.3.5 If the player's ball is off the rhombus table; game gets over
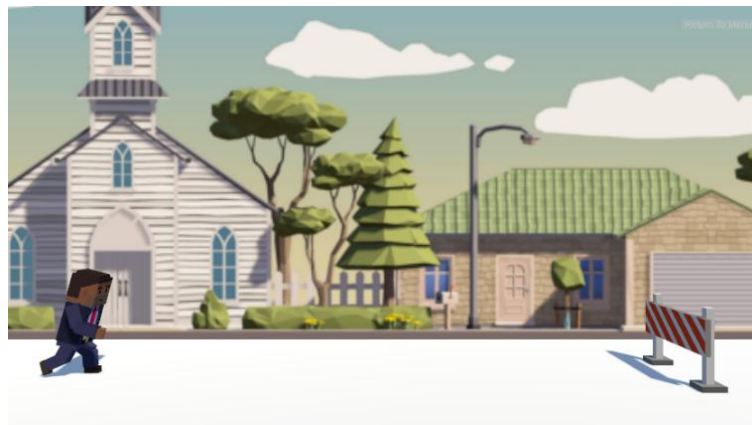
4.4 GAME 3

Endless Runner

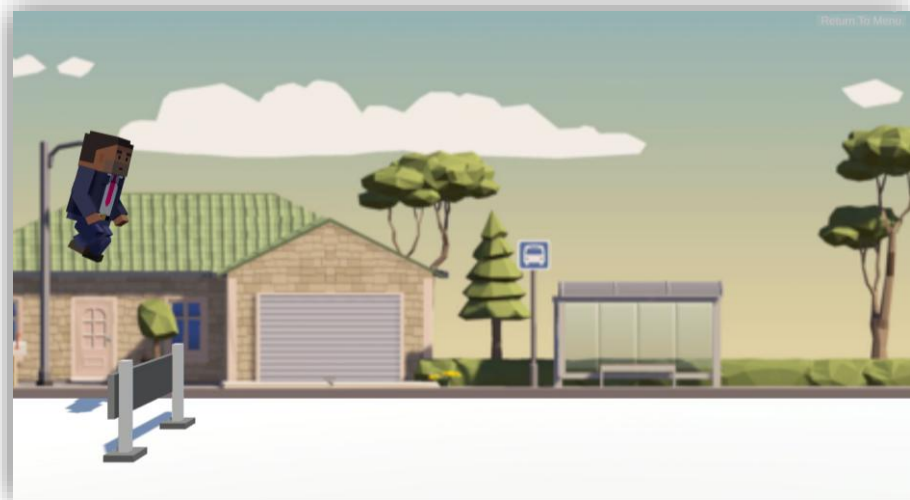Fig. 4.4.1. The player will be moving endlessly

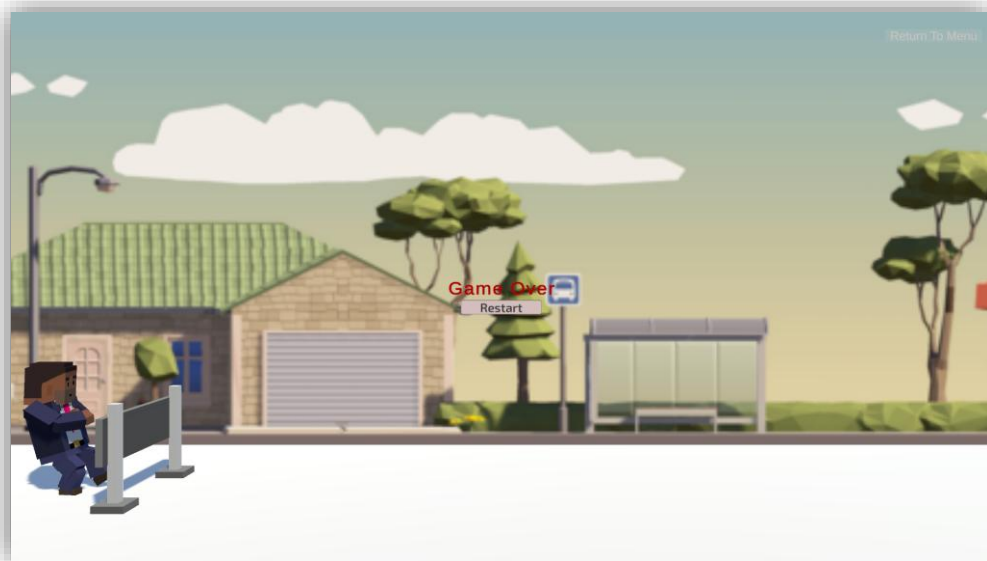Fig. 4.4.2. The player has to avoid obstacles coming on the way

Fig. 4.4.3. If the player hits the obstacle; game gets over

CHAPTER 5

CONCLUSION AND FUTURE SCOPE

PlayVerse 3-in-1 is an innovative casual gaming experience that successfully combines three distinct game modes into one cohesive application. By leveraging the Unity engine and C# programming, the project has achieved a robust and optimized performance, delivering smooth gameplay and visually appealing graphics.

One of the key accomplishments of PlayVerse 3-in-1 is its ability to provide variety and replay ability within a single package. The inclusion of Endless Runner, Object Ninja, and Edge Dodger ensures that players can switch between different challenges without the need for separate installations. This not only saves device storage but also keeps players engaged for longer periods.

The project also showcases technical proficiency by incorporating Unity's core functionalities, including the animation system, UI Toolkit, and physics engine. The use of popular libraries like Cinemachine and TextMesh Pro has enhanced the overall quality and user experience. Furthermore, the dynamic leaderboard system motivates players to compete and strive for higher scores.

The simplicity of controls, progressive difficulty, and rewarding gameplay make PlayVerse 3-in-1 suitable for casual gamers of all ages. The game's design philosophy revolves around creating a fun, intuitive, and captivating experience while maintaining efficiency and performance.

The success of this project not only demonstrates our skills in game development but also reflects our ability to conceptualize and implement multifaceted ideas. The lessons learned from this project will undoubtedly influence future endeavours, allowing for more refined and advanced game development practices. The future work aims to incorporate online or local multiplayer options to increase player interaction and competitiveness.

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