

ABSTRACT

This project aims to develop a 2D action game titled "**ALL AS PLANNED**" using the RayLib library in C. The game is inspired by the popular anime *Bleach* and features a protagonist, Ichigo, who must defeat enemies and a final boss, Aizen, to complete the game. The game incorporates various mechanics such as player movement, projectile attacks, enemy spawning, and boss battles. The project focuses on creating an engaging and interactive gaming experience while ensuring smooth gameplay, efficient resource management, and a user-friendly interface.

The game is designed to be a side-scrolling action game where the player controls Ichigo, who can move left and right, jump, and attack using a projectile called **Getsuga Tensho**. The game also includes a **Flash Step** ability, which allows the player to move faster for a limited time. The enemies spawn at regular intervals, and the game features two boss battles with increasing difficulty. The project emphasizes the use of object-oriented programming principles, efficient collision detection, and sound effects to enhance the gaming experience.

This project was possible due to the cooperation of the entire team members which managed different aspects of this projects like handling the files and managing it, programming the certain features and abilities of the character, cool new designs and cool new effects which enhanced the game, Even though the game is near its completion, few bugs are to be expected because this project is made by junior developers and students who have very less experience.

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1. INTRODUCTION

1.1. Background Introduction

In recent years, the gaming industry has seen exponential growth, with 2D games remaining a popular choice due to their simplicity and nostalgic appeal. The development of 2D games involves various aspects such as game design, physics, collision detection, and user interaction. This project focuses on creating a 2D action game using the **Raylib** library, which provides a simple and efficient framework for game development in C.

The game, "**ALL AS PLANNED**", is inspired by the anime *Bleach* and features the protagonist, Ichigo, who must defeat enemies and a final boss, Aizen. The protagonist have their own sets of skills and moves, as for now there is only two moves that Ichigo can perform, they are Flash step and Getsuga Tensho, the enemy spawns from time to time, from a random side, if Ichigo is touched by the enemy then he will get damaged and if he kills the enemy with his moves then the score will increase, and once certain score is reached then the boss Aizen will be spawned, This is the first Aizen Boss , which has large Hit Point and if Aizen touches Ichigo than Ichigo lives is subtracted from his main health. Aizen main attack freezes the target on touch, preventing player from moving for certain time. Ichigo has total of 10 lives and if he loses all of it, then Game is over.

The programming Language used in making this game was C. With the help of RayLib library it was possible to make this game visually more entertaining and more interactable, RayLib helps to make the Game have UI, Controls, Logics, And much more.

1.2. Motivation

The motivation behind this project is to explore the field of game development and understand the intricacies involved in creating a functional and entertaining game. The project also aims to apply programming concepts such as collision detection, and resource management in a practical scenario. By developing a game inspired by a popular anime, the project also seeks to engage fans of the series and provide them with an interactive experience.

As people who were exposed to video games and anime at a very young age, we were inspired by them to make one for ourselves by combining the two things we love. We aim to combine video games with our favourite characters from the anime *Bleach*.

We as the students of 081BCT worked on this project not only for the project completion but also for the development of our knowledge on working with projects which is a vital skill in the field of Technology.

1.3. Problem Definition

The project aims to develop a 2D action game with the following features:

- Player movement (left, right, jump)
- Projectile attacks (Getsuga Tensho)
- Enemy spawning and AI
- Boss battles with increasing difficulty
- Sound effects and background music
- Efficient collision detection and resource management

1.4. Project Objectives

The specific objectives of the project are:

- To study and understand the concepts of game development using Raylib.
- To implement player movement, projectile attacks, and enemy AI.
- To design and implement boss battles with increasing difficulty.
- To incorporate sound effects and background music to enhance the gaming experience.
- To ensure efficient collision detection and resource management.

1.5. Project Applications

The proposed game can be used for:

- Entertainment and leisure.
- Educational purposes to teach game development concepts.
- Showcasing the capabilities of the Raylib library in game development.

1.6. Scope of the Project

The scope of the project includes the development of a 2D action game with the aforementioned features. The game will be developed using the Raylib library in C, and the focus will be on creating a smooth and engaging gaming experience. The project will also include testing and debugging to ensure the game runs efficiently on various platforms.

2. LITERATURE REVIEW

Game development has evolved significantly over the years, with 2D games remaining a popular choice due to their simplicity and nostalgic appeal. The use of libraries such as Raylib has made game development more accessible, allowing developers to focus on game design and mechanics rather than low-level programming.

Raylib is a simple and easy-to-use library for game development in C. It provides functions for rendering graphics, handling input, and playing audio, making it an ideal choice for developing 2D games. The library is lightweight and cross-platform, making it suitable for developing games that can run on various platforms.

The game "**ALL AS PLANNED**" draws inspiration from the popular anime *Bleach*, which has a large fan base worldwide. By incorporating elements from the anime, the game aims to engage fans and provide them with an interactive experience.

3. METHODOLOGY

3.1. Game Development Lifecycle

The game development lifecycle involves several stages, including planning, design, implementation, testing, and deployment. The project will follow an iterative development process, where each stage is revisited and refined based on feedback and testing results.

3.2. Tools and Technologies

The following tools and technologies will be used in the development of the game:

- **Raylib:** A simple and easy-to-use library for game development in C.
- **C Programming Language:** The primary language used for game development.
- **Visual Studio Code:** A source code editor used for writing and debugging the game code.
- **GitHub:** A version control system used for collaboration and code management.

3.3. Game Mechanics

The game mechanics include:

- **Player Movement:** The player can move left and right using the keyboard and jump using the spacebar.
- **Projectile Attacks:** The player can shoot projectiles (Getsuga Tensho) using the mouse.
- **Enemy AI:** Enemies spawn at regular intervals and move towards the player.
- **Boss Battles:** The game features two boss battles with increasing difficulty.
- **Sound Effects:** Sound effects are used to enhance the gaming experience.

3.4. Implementation Details

The game is implemented using the Raylib library in C. The game loop handles player input, updates the game state, and renders the game objects. Collision detection is implemented using bounding boxes, and sound effects are played using Raylib's audio functions.

4. TIME ESTIMATION

The project timeline is as follows:

Activity	Start Date	End Date
Research and Planning	2 nd Feb	5 th Feb
Game Design	5 th Feb	6 th Feb
Implementation	6 th Feb	11 th Feb
Testing and Debugging	11 th Feb	11 th Feb
Documentation	12 th Feb	

5. EXPECTED OUTCOME

The expected outcomes of the project are:

- A fully functional 2D action game with player movement, projectile attacks, enemy AI, and boss battles.
- Efficient collision detection and resource management.
- Sound effects and background music to enhance the gaming experience.
- A user-friendly interface and smooth gameplay.

REFERENCES

Raylib Documentation: <https://www.raylib.com/>

Bleach Anime: <https://www.crunchyroll.com/bleach>

Game Development Concepts: <https://www.gamedev.net/>

Error Debugging: <https://chatgpt.com/>

Game Development Techniques:
https://www.youtube.com/watch?v=wVYKG_ch4yM&list=PLwR6ZGPvjVOSRywn9VCQ3yrRVruxzzuo9&ab_channel=ProgrammingWithNick