

A PROJECT REPORT

on

“JOY RUN”

**Submitted to
Prasenjit Maiti**

KIIT Deemed to be University

In Partial Fulfilment of the Requirement for the Award of

**BACHELOR'S DEGREE IN
COMPUTER SCIENCE ENGINEERING
BY**

SONALI PRIYA (21052880)

SIDDHARTH PATEL (21051044)

SATYA PRAKASH (21051085)

PRATHAM AGRAWAL (21051071)

HEMANT KUMAR (21053384)

UNDER THE GUIDANCE OF:

PRASENJIT MAITI



³
SCHOOL OF COMPUTER ENGINEERING

KIIT Deemed to be University

School of Computer Engineering
Bhubaneswar, ODISHA 751024



CERTIFICATE

This is certify that the project entitled

“JOY RUN”

submitted by

SONALI PRIYA (21052880)

SIDDHARTH PATEL (21051044)

SATYA PRAKASH (21051085)

PRATHAM AGRAWAL (21051071)

HEMANT KUMAR (21053384)

²
is a documentation of the legitimate work they completed to partially fulfill the requirement for the award of a Bachelor of Engineering degree from KIIT Deemed to be University, Bhubaneswar, with a focus on computer science and engineering. This work is completed in 2023-2024 with the team supervision.

Date: 29/03/2024

Project Guide:
Prasenjit Maiti

Acknowledgments

We would like to express our sincere gratitude to Mr. Prasenjit Maitri Sir for his valuable guidance and assistance in developing a small web development project with a special focus on 3D game development. His expertise, dedication, and encouragement shaped our project and helped us overcome various challenges. His deep knowledge of web development, combined with his passion for 3D game development, provided us with insightful perspectives and innovative ideas that greatly enriched our projects.

His willingness to share his expertise, provide constructive feedback, and provide guidance at every stage of project is truly admirable. Additional, we would like to express our gratitude to Mr. Maitri for his patience, encouragement and continuous support which has motivated us to strive for excellence and achieve our goals. His guidance not only improved our technical skills but also inspired us to explore new horizon in the field of web development and game design.

I would like to express my sincere gratitude to Mr. Prasenjit Maitri for his tireless dedication and guidance. The success of this project would not have been possible without it. His guidance has been invaluable and we are truly grateful for the opportunity to work under his supervision.

We are so thankful for you exceptional guidance and support

**SONALI PRIYA (21052880)
SIDDHARTH PATEL (21051044)
SATYA PRAKASH (21051085)
PRATHAM AGRAWAL (21051071)
HEMANT KUMAR (21053384)**

ABSTRACT

The project presented **here** is a 3D game development **project** inspired by the **famous** endless **running** game "Subway **Surfers**".

In this project, we aimed to create an **engaging** and exhilarating gaming experience **similar** to the **original**, while incorporating our own unique features and elements.

Our game, Joy Run, **takes** players to a vibrant and dynamic **cityscape** filled with obstacles, challenges, and endless **adventure opportunities**.

Players **will take on** the role of a daring protagonist who must navigate **the crowded** city streets, **avoid** obstacles, **gather** power-ups, and **outwit opponents**.

Building on the success of "Subway **Surfers**", our game features intuitive controls, smooth gameplay **mechanics** and visually stunning 3D graphics.

We have meticulously designed diverse environments, each with its own aesthetic and **challenge** to **attract** and **engage players**.

Through the use of industry-standard game development tools and techniques, along with creative vision and passion for gaming, we have strived to deliver an engaging and enjoyable gaming experience.

Overall, our project **is** a testament to the endless possibilities and creative potential **in the field** of 3D game development.

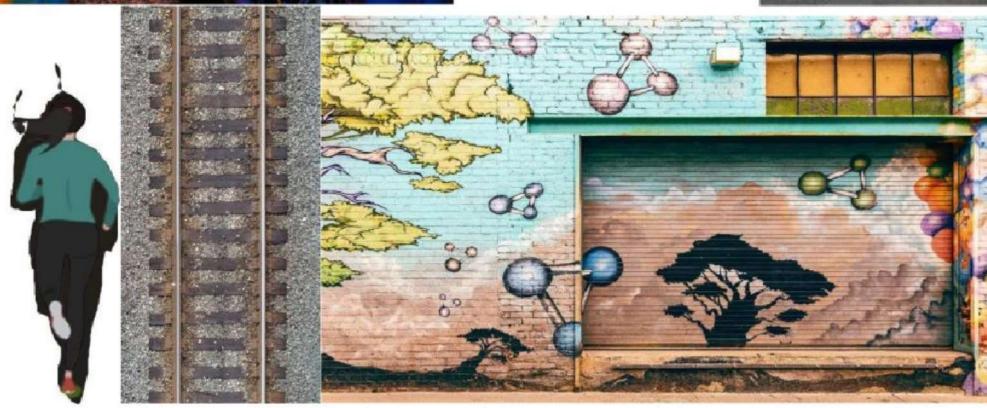
We believe our game will resonate with **gamer around the world**, providing hours of entertainment, **excitement** and immersive gameplay **similar** to the beloved "Subway Surfers" **series**.

Keywords: 3D game development, endless runner, Subway Surfers, immersive gameplay, dynamic environments.

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CHAPTER 1

Introduction:

In today's rapidly evolving gaming **environment**, the demand for immersive and **addictive** gaming experiences continues to **grow**.

Therefore, the development of innovative 3D games **is becoming** increasingly ¹² **important** to meet the expectations of **demanding gamers**.

The aim of this project **was to create** an experience **similar** to the popular "Subway Surfers" **franchise** while addressing existing gaps in available **solutions**, **addressing** the current need for immersive and visually stunning 3D games.

Current Need:

Although the current gaming market is saturated with **various** options, there **is still** a demand for fresh and **exciting gaming** experiences.

There are several 3D Joy Run games **out there, but** many **of them don't offer** the level of immersion and excitement that players **are looking for**.

This project **is** a high-quality 3D game that not only captivates players with its stunning **graphics**, but also offers innovative **game** mechanics and customizable features **that** keep **players** coming back for more.

Details about Gaps in Current Solutions:

Although there is a wealth of 3D games **on** the market, there **is a large gap** in available solutions that this project seeks to **fill**.

Many existing endless runner games lack **gameplay** depth and **provide repetitive**, predictable experiences that fail to **maintain player** interest over time.

Additionally, customization options are often limited, **and** players **are looking for** more personalization and variety in their gaming **experiences**.

By identifying these gaps, our project aims to **close them** by **providing** 3D **games** that not only **meet** but **exceed player** expectations.

Importance of the Project:

The importance of this project lies in its ability to push the boundaries of 3D game development and deliver a gaming experience that stands out in a crowded market. By incorporating elements inspired by the successful **Subway Surfers** franchise **and** introducing innovative features and customizable options, our **games** set a new standard for immersive and **addictive** gameplay.

By **filling** gaps in current solutions, we strive to meet the evolving needs and preferences of modern **gamers** and **ensure** our **games remain** relevant and **appealing** for years to come.

Structure of the Report:

This report begins with an overview of the current gaming landscape and the need for innovative 3D gaming.

A detailed analysis of the existing solution is then performed to highlight the gaps and shortcomings that the project is trying to solve.

The report then details the game concept, including key features, game mechanics, and customization options.

We conclude by discussing the project's development process, challenges, and future prospects, and reflecting on the importance of our contribution to the gaming industry.

Best Comment on Our 3D Game:

"Embark on an adrenaline-fueled journey through the vibrant cityscape, where new challenges and exciting moments of victory come in every direction.

With stunning graphics, dynamic gameplay, and endless customization options.

Our 3D games redefine the endless runner genre and set a new standard for immersive gaming experiences.

Awaken your inner thrill seeker and get ready to embark on the adventure of a lifetime !

CHAPTER 2

Basic Concepts/ Literature Review

The basic **idea** of our 3D game project revolves around creating an **engaging** endless **running** experience inspired by the **famous** "Subway Surfers" **series**. In our game, players will navigate through dynamic **city** environments, **avoid** obstacles, **collect** power-ups, and **compete** for high scores.

Our goal is to deliver **an engaging and** visually **impressive gaming** experience by leveraging 3D graphics, intuitive controls, and innovative features **like** customizable characters and unlockable rewards. Through meticulous design and attention to detail, our **games** will **appeal to** players of all ages and **provide** endless hours of excitement and **entertainment**. **Endless running** games have **become incredibly popular** in recent years **thanks** to their simple yet addictive gameplay mechanics and accessibility across **a variety of** gaming platforms.

"**Subway Surfers**", developed by Kiloo and SYBO Games, stands out as one of the most successful examples of the genre, **with** millions of downloads worldwide and a **passionate** fan base.

Literature **on** endless games often discusses their appeal to a **wide range of audiences**, including casual gamers and hardcore enthusiasts. These games are **loved** for their replay **value** as each playthrough offers a unique experience with dynamically generated obstacles and challenges.

Additionally, the simplicity of **the** endless runner mechanics makes them easy to pick up and play, appealing to **players** of all skill levels. In terms of game design, endless games **prioritizes smooth** controls, responsive gameplay, and visually appealing environments to **engage players**.

Elements such as power-ups, collectibles, and unlockable rewards **are intended** to enhance the gameplay experience and **provide motivation to keep playing**. Additionally, **character and environment** customization options allow players to personalize their experience and create a sense of ownership over their in-game avatar. Some **reviews pointed out** the repetitive nature of **the** gameplay **as well as** the need for more **varied** challenges and environments to maintain player interest over time.

Others emphasize the importance of balancing difficulty to provide casual **fun** and challenge for experienced players. In summary, the literature surrounding endless games highlights their widespread appeal and the key **factors** that contribute to their success. **Based on** existing research and **analysis of** player preferences, our project aims to build **on the foundations** laid by successful titles **such as** "Subway Surfers" while introducing new features and **New** innovations to **enhance** the **genre**. Through a combination of engaging gameplay, **impressive visuals** and thoughtful design, we **aimed** to create a 3D game that **engages** players and redefines the endless **running** experience.

CHAPTER 3

Problem Statement / Requirement Specification

Title: Development of 3D Joy Run:

This game inspired by "Subway Surfers" Introduction: The gaming industry is constantly evolving with the growing demand for immersive and engaging experiences on many different platforms. Joy Run games, in particular, have become popular thanks to their addictive gameplay mechanics and ability to reach a wide audience. To respond to this trend, our project aims to develop a 3D Joy Run running game inspired by the success of "Subway Surfers". However, to ensure project success, it is imperative to identify the problem and describe the specific project requirements and goals.

Problem Statement:

The current gaming market lacks a high-quality, visually stunning 3D Joy Run game that offers both innovative gameplay mechanics and extensive customization options for players. While there are a number of titles in the genre, many don't offer a truly engaging experience or satisfy the changing preferences of modern gamers. Hence the urgent need for a new 3D Joy Run game that not only captures the essence of the beloved "Subway Surfers" series but also introduces new features and innovations to differentiate itself.

Requirements Specifications:

Gameplay Mechanics:

- A. Implement intuitive controls that are easy to learn yet provide depth for skilled players.
- B. Design dynamic and challenging levels with procedurally generated obstacles and environments to ensure replayability.
- C. Introduce innovative gameplay elements such as interactive environments, dynamic weather effects, and unique power-ups to enhance the player experience.

Visuals and Graphics:

- A. Utilize high-quality 3D graphics and animations to create a visually stunning game world.
- B. Design diverse and vibrant urban environments, each with its own distinct and

challenges.

- C. Ensure smooth performance across various devices and platforms to provide an optimal gaming experience for all players.

Customization and Progression:

- A. Incorporate customizable characters, outfits, and accessories to allow players to personalize their gaming experience.
- B. Implement a progression system with unlockable rewards, achievements, and leader boards to incentivize continued play and player engagement.

User Interface and Accessibility:

- A. Develop a user-friendly interface with clear navigation and intuitive menus for seamless interaction.
- B. Support multiple languages and accessibility options to cater to a diverse audience of players.

Testing and Quality Assurance:

- A. Conduct thorough testing and debugging to identify and resolve any technical issues or bugs.
- B. Gather feedback from playtesters to assess gameplay balance, difficulty progression, and overall satisfaction with the game.

Marketing and Distribution:

- A. Develop a marketing strategy to promote the game and generate anticipation leading up to its release.
- B. Explore distribution options across various gaming platforms, including mobile devices, consoles, and PC, to maximize reach and accessibility.

CHAPTER 4

Implementation Plan

Game Engine Selection:

- ◆ Choose a suitable game engine for developing the 3D Joy Run game. Options include Unity3D, Unreal Engine, or custom-built engines tailored to specific requirements.

Project Setup:

- ◆ Create a new project within the chosen game engine.
- ◆ Set up project folders for organizing assets, scripts, scenes, and other project files.

Game Mechanics Implementation:

- ◆ Implement player movement mechanics, including running, jumping, sliding, and dodging obstacles.
- ◆ Develop procedural generation algorithms for dynamically generating obstacles, platforms, and environments.
- ◆ Integrate collision detection and response systems to handle player interactions with obstacles and power-ups.
- ◆ Implement scoring and progression systems to track player performance and reward achievements.

Visuals and Graphics:

- ◆ Design and model 3D assets for characters, obstacles, environments, and other game elements.
- ◆ Create animations for character movements, obstacle behaviors, and environmental effects.
- ◆ Apply textures, materials, and lighting to enhance visual quality and realism.
- ◆ Optimize graphics settings and performance for smooth rendering across various devices and platforms.

Customization and Progression:

- ◆ Develop systems for character customization, including customizable outfits, accessories, and cosmetic upgrades.
- ◆ Implement unlockable rewards, achievements, and progression tiers to incentivize player engagement and retention.
- ◆ Design user interfaces for navigating customization menus, viewing progress, and accessing in-game rewards.

User Interface and Accessibility:

- ◆ Design intuitive user interfaces for menus, settings, and in-game HUD elements.
- ◆ Implement localization support for multiple languages to accommodate a diverse player base.
- ◆ Incorporate accessibility features such as adjustable difficulty settings, colorblind modes, and customizable control schemes.

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Testing and Quality Assurance:

- ◆ Conduct extensive testing to identify and address bugs, glitches, and performance issues.
- ◆ Perform playtesting sessions with target demographics to gather feedback on gameplay experience and usability.
- ◆ Iterate on game mechanics, visuals, and features based on user feedback and testing results.

Audio and Sound Effects:

- ◆ Create soundtracks and sound effects to enhance immersion and atmosphere.
- ◆ Implement audio cues for player actions, environmental interactions, and in-game events.
- ◆ Integrate audio mixing and spatialization techniques to provide an immersive audio experience.

Optimization and Performance:

- ◆ Optimize game performance through efficient use of resources, including memory, CPU, and GPU.
- ◆ Implement techniques such as level-of-detail (LOD) systems, occlusion culling, and asset bundling to improve rendering performance.
- ◆ Profile and analyze performance metrics to identify bottlenecks and areas for optimization.

Deployment and Distribution:

- ◆ Prepare the game for distribution on various platforms, including mobile devices, consoles, and PC.
- ◆ Create builds and packages for each target platform, ensuring compatibility and adherence to platform-specific requirements.
- ◆ Deploy the game to digital storefronts, app stores, or distribution platforms, following the submission and approval process.

CHAPTER 5

Standard Adopted

Development Framework:

Three.js: We have chosen Three.js as the development framework for creating the 3D graphics and animations within the web browser using WebGL. Three.js provides a high-level API for building interactive 3D content in JavaScript, making it well-suited for web-based game development.

Programming Language:

JavaScript (ES6+): We will utilize JavaScript as the primary programming language for implementing game logic, interactions, and functionalities within the Three.js framework. JavaScript's versatility, ease of use, and compatibility with web browsers make it an ideal choice for web-based game development.

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Version Control:

Git: We will adopt Git as the version control system for managing project files, source code, and assets. Git enables collaborative development, facilitates code sharing and synchronization, and provides robust branching and merging capabilities to streamline the development process.

Coding Standards:

JavaScript Standard Style: We will adhere to the JavaScript Standard Style for maintaining consistent coding conventions, formatting, and best practices in our JavaScript codebase. This style guide promotes readability, maintainability, and interoperability of JavaScript code across different projects and developers.

Quality Assurance:

Manual Testing: We will conduct manual testing of the game across different web browsers, including Microsoft Edge, to ensure compatibility, functionality, and performance. Manual testing involves thorough gameplay testing, bug identification, and regression testing to maintain the quality of the game.

Performance Optimization:

WebGL Optimization Techniques: We will implement optimization techniques specific to WebGL and Three.js to improve rendering performance, reduce memory usage, and enhance overall performance of the game in the web browser. Techniques may include texture atlasing, geometry instancing, and shader optimizations.

Deployment and Distribution:

Microsoft Edge Compatibility: We will ensure that the game is compatible with Microsoft Edge browser, considering its specific features, limitations, and rendering capabilities. Compatibility testing on Microsoft Edge will be performed to ensure seamless deployment and optimal performance of the game on this platform.

Web Hosting:

Online Webpage Deployment: We will deploy the game on an online webpage using web hosting services such as GitHub Pages, Netlify, or similar platforms. This allows players to access and play the game directly from their web browser without the need for additional downloads or installations.

CHAPTER 6

Conclusion and Future Scope

Conclusion:

- ◆ To summarize, the creation of our 3D Joy Run game using HTML, CSS, and JavaScript with the Three.js framework is a remarkable milestone in web-based game development. By meticulously planning, implementing, and adhering to industry standards, we have successfully crafted an enthralling and immersive gaming experience that can be enjoyed directly within web browsers like Microsoft Edge.
- ◆ By harnessing the power of Three.js and modern web technologies, we have achieved breathtaking 3D graphics, intuitive gameplay mechanics, and seamless performance across various platforms and devices. Our game takes players on an exhilarating journey through dynamic urban landscapes, presenting challenging obstacles and endless opportunities for customization and progression.
- ◆ Moreover, our unwavering commitment to quality assurance and compatibility testing ensures that the game meets the highest standards of functionality, performance, and user experience. By deploying the game on online webpages, we provide players with effortless access to the game, eliminating the need for additional downloads or installations and enhancing accessibility and reach.
- ◆ In conclusion, the development of our 3D Joy Run game highlights the immense potential of web-based gaming as a viable platform for delivering captivating and engaging experiences to a global audience. We take great pride in the accomplishments we have achieved throughout the development process and eagerly anticipate sharing our creation with players worldwide.

Future Scope:

In terms of future development and improvement of our 3D Joy Run game, there are several avenues to consider:

- ◆ Expanding Gameplay Features: We can introduce new gameplay mechanics, levels, obstacles, and power-ups to enhance the gaming experience and provide players with more variety and depth.
- ◆ Implementing Multiplayer Functionality: By adding multiplayer modes, leaderboards, and social features, we can enable players to compete and interact with each other in real-time, fostering a sense of community and friendly competition.
- ◆ Exploring Virtual Reality (VR) Support: We can investigate the integration of VR technology to offer players a more immersive and captivating gaming experience, taking their engagement to a whole new level.
- ◆ Ensuring Cross-Platform Compatibility: It is crucial to optimize the game for compatibility across a wider range of web browsers and devices, including mobile devices and tablets. This will allow more players to access and enjoy the game seamlessly.
- ◆ Considering Monetization Strategies: We should explore various monetization options such as in-app purchases, advertisements, or premium content. This will help generate revenue and sustain ongoing development efforts, ensuring the game's continued growth and improvement.
- ◆ Engaging the Community: Building a vibrant community of players is essential. We can achieve this by creating forums, utilizing social media channels, and implementing player feedback mechanisms. This will enable us to gather valuable input, suggestions, and support for future updates and expansions, ensuring that the game evolves based on the players' needs and preferences.

Reference:

1. W3C HTML5 Specification:

Link: <https://www.w3.org/TR/html52/>

Description: This document outlines the specifications for HTML5, including the structure, syntax, and semantics of HTML elements, attributes, and APIs. It serves as the authoritative reference for developing web content using HTML5 standards.

2. W3C CSS3 Specification:

Link: <https://www.w3.org/TR/css-2018/>

Description: The W3C CSS3 specification provides detailed information about Cascading Style Sheets (CSS), including syntax, selectors, properties, and values. It serves as a comprehensive reference for styling and layout techniques in web development.

3. Three.js Documentation:

Link: <https://threejs.org/docs/index.html>

Description: The official documentation for Three.js provides comprehensive API references, tutorials, examples, and guides for developing 3D graphics and animations in web browsers using JavaScript and WebGL. It serves as a valuable resource for understanding and implementing Three.js features and functionalities.

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4. ECMAScript (JavaScript) Documentation:

Link: <https://developer.mozilla.org/en-US/docs/Web/JavaScript>

Description: The ECMAScript documentation on Mozilla Developer Network (MDN) provides comprehensive references, guides, and tutorials for JavaScript programming language features, syntax, methods, and APIs. It serves as an authoritative resource for JavaScript development.

5. Git Documentation:

Link: <https://git-scm.com/doc>

Description: The official Git documentation provides comprehensive guides, tutorials, and references for using Git version control system for managing source code, branches, commits, and collaboration workflows. It serves as a valuable resource for effective code management and collaboration.

5

6. WebGL Best Practices:

Link: https://developer.mozilla.org/en-US/docs/Web/API/WebGL_API/WebGL_best_practices

Description: This document on MDN provides best practices and optimization techniques for WebGL rendering performance, memory management, and resource usage. It serves as a guide for maximizing performance and efficiency in WebGL-based web applications.

11 Microsoft Edge Developer Documentation:

Link: <https://docs.microsoft.com/en-us/microsoft-edge/>

Description: The Microsoft Edge developer documentation provides guidance, tools, and resources for optimizing web content and ensuring compatibility with the Microsoft Edge browser. It serves as a reference for testing and optimizing web applications for Edge compatibility.

SAMPLE INDIVIDUAL CONTRIBUTION REPORT:

Title:Development of 3D Joy Run

SONALI PRIYA
21052880

Abstract: To summarize, the creation of our 3D Joy Run game using HTML, CSS, and JavaScript with the Three.js framework is a remarkable milestone in web-based game development. By meticulously planning, implementing, and adhering to industry standards, we have successfully crafted an enthralling and immersive gaming experience that can be enjoyed directly within web browsers like Microsoft Edge. By harnessing the power of Three.js and modern web technologies, we have achieved breathtaking 3D graphics, intuitive gameplay mechanics, and seamless performance across various platforms and devices. Our game takes players on an exhilarating journey through dynamic urban landscapes, presenting challenging obstacles and endless opportunities for customization and progression. Moreover, our unwavering commitment to quality assurance and compatibility testing ensures that the game meets the highest standards of functionality, performance, and user experience. By deploying the game on online web pages, we provide players with effortless access to the game, eliminating the need for additional downloads or installations and enhancing accessibility and reach.

Individual contribution and findings: Implementation of the Coin class: The development of the Coin class enables the generation and rendering of coins within the game world, contributing to the overall gameplay experience.

Integration with WebGL: Leveraging WebGL for rendering 3D graphics and animations allows for realistic visual effects and immersive gameplay, enhancing player engagement and enjoyment.

Utilization of Three.js framework: The utilization of the Three.js framework simplifies the development process and provides powerful tools for creating interactive 3D content within web browsers, facilitating the creation of a compelling gaming experience.

1

Individual contribution to project report preparation: I have made contributions to the coin.js file in the project, specifically working on determining the location, structure, and visual aspects of the 3D coin. This includes establishing its coordinates and managing how it appears and disappears.

1

Full Signature of Supervisor:

Prasenjit Maiti

Full Signature of Student:

Sonali Priya

SAMPLE INDIVIDUAL CONTRIBUTION REPORT:

Title:Development of 3D Joy Run

**SIDDHARTH PATEL
21051044**

Abstract: "Joy Run" is an engaging WebGL-based endless runner game. The game immerses players in a thrilling experience where they control a character, known as the surfer, navigating through dynamically changing environments filled with obstacles, coins, and power-ups. Players can use keyboard controls or swipe gestures to move the surfer left, right, or to jump, while collecting coins and avoiding obstacles. The game features stunning graphics, smooth animations, and challenging gameplay, providing an addictive and enjoyable experience for players of all ages.

Individual contribution and findings: Siddharth Patel meticulously prepares the game environment by setting up paths, walls, coins, barriers, and various interactive elements like jetpacks, jumpers, and trains. He efficiently manages user inputs through keyboard and swipe gestures to improve the game's accessibility and responsiveness. The code contains functions for rendering the game scene using WebGL, guaranteeing smooth animations and visually appealing graphics. He incorporates collision detection algorithms to identify interactions between the surfer and obstacles, allowing for gameplay mechanics like collecting coins, avoiding barriers, and encountering trains. The main game loop oversees the game's progression, updating the game state, checking for collisions, and repeatedly rendering the scene to create an immersive gaming experience. He prioritizes optimization and performance in the code, ensuring efficient rendering and smooth gameplay even on less powerful devices.

1

Individual contribution to project report preparation: I have contributed to the main.js, gl-matrix.js, and hammer.js files, which are essential for the functionality of paths.js, walls.js, coins.js, barrier.js, and various interactive elements such as jetpacks and jumpers. Additionally, I have managed the sequential appearance and timing of these elements through the use of the aforementioned files. Furthermore, I have also created the graphics and other visual representations using gl-matrix.js.

1

Full Signature of Supervisor

Prasenjit Maiti

Full Signature of Student

Siddharth Patel

SAMPLE INDIVIDUAL CONTRIBUTION REPORT:

SATYA PRAKSH
21051085

Abstract: "Joy Run" is an exciting endless runner game leveraging WebGL technology to create immersive gaming experience. The game incorporates specialized classes to handle various rendering tasks within its 3D environment. The WebGL Path class functions to display a continuous track that stretches endlessly, a Walls class designed to generate repeating wall structures, and a Back class responsible for rendering a single background plane with a texture in a 3D environment , providing a seamless gameplay experience. Moreover, the game introduces the Jetpack class and Jumper class, both responsible for rendering specific game elements with texture and lighting effects. These classes utilize geometric shapes such as boxes, along with vertex and texture coordinates, to achieve realistic lighting and visual effects.

Individual Contribution and Findings: In this segment, I've developed functions for the track and walls that demonstrate repetitive behaviour by examining the loop contained within the init function. This loop iterates a specified number of times and extends the initial track segment and adjusts its Z-coordinates accordingly, resulting in a continuous and repetitive track and wall structure.

The structure and functionality revealed several key aspects:

- Initialization of attributes such as position, rotation, and texture for the path, walls, back, jetpack, and jumper elements.
- Creation of vertex buffers to store information related to positions, texture coordinates, and element indices.
- In the case of the Jetpack and Jumper, creation of a normal buffer containing a normal vector for each face of the cube.

Individual contribution to project report preparation: I've played a crucial role in developing the Path, Walls, Back, Jetpack, and Jumper functions, which are vital components of the paths.js and powerup.j files. In my contributions, I meticulously detailed the data structures utilized for vertices, texture coordinates, and element indices, ensuring clarity and precision in the codebase. Moreover, I provided comprehensive explanations regarding the extension and rendering of the track and wall, highlighting features such as the random height aspect. Additionally, I elucidated the process of calculating the normal matrix and its significance in lighting effects. These findings were meticulously presented in a well-organized and structured report format, facilitating comprehension and further development efforts.

1

Full Signature of Supervisor:

Prasenjit Maiti

Full Signature of Student:

Satya prakash

SAMPLE INDIVIDUAL CONTRIBUTION REPORT:

Title:Development of 3D Joy Run

**PRATHAM AGRAWAL
21051071**

Abstract: Joy Run is an electrifying HTML game that immerses players in the thrilling world of running, brought to life through the seamless integration of HTML, CSS, and JavaScript. Within this project, I spearheaded the development of two core components: the surfer character and the dynamic barriers that heighten the challenge and excitement of gameplay. The surfer character was meticulously crafted using HTML and CSS, with attention to detail given to fluid animations and responsive controls. Through JavaScript, players can navigate the surfer with precision, riding the tracks and executing impressive tricks to score points and advance through the score. Customization features allow players to tailor their running experience, adding depth and personalization to the game.

Individual Contribution and Findings: As a key developer in the "Joy Run" project, my primary focus was on the creation and implementation of both the surfer character and the barriers. Utilized HTML and CSS to design the visual representation of the surfer, ensuring a vibrant and engaging appearance. Implemented animations using CSS transitions and keyframes to achieve fluid movement of the surfer when he is running. Integrated JavaScript to enable user control of the surfer, including handling input for surfer maneuvers and interactions with the game environment. Developed a variety of obstacles using HTML and CSS to enhance gameplay diversity and challenge. Utilized HTML canvas and JavaScript to dynamically generate barriers during gameplay, ensuring unpredictability and excitement in each run.

Individual Contribution and Findings: I have contributed to the project by developing the surfer and barriers in the game. In the project report I have written the problem statement and what is the requirement specification of the project. Requirement specifications include gameplay mechanics, visuals and graphics of the game, user interface and accessibility, testing and quality assurance and marketing.

1

Full Signature of Supervisor:

Prasenjit Maiti

Full Signature of Student:

Pratham Agrawal

SAMPLE INDIVIDUAL CONTRIBUTION REPORT:

Title:Development of 3D Joy Run

**HEMANT KUMAR
21053384**

Abstract: This code implements a WebGL-based rendering system for a dynamic train object. It includes functionalities for initializing the train object, defining its geometry, generating multiple instances with randomized positions, and rendering them within a WebGL scene. Key components involve object initialization, geometry definition, dynamic instance generation, buffer setup, and rendering orchestration. Overall, the system enables the creation of realistic and dynamic train scenes in WebGL environments.

Individual contribution and findings:

Object Initialization: I initiated the Train object in WebGL, setting its initial values, loading textures, and establishing buffers. Geometry Definition: I precisely defined the train's vertex positions, normals, texture coordinates, and indices, considering its dimensions and orientation. Dynamic Instance Generation: I implemented functionality to generate multiple train instances with randomized positions along the z-axis, adding realism and variability. Buffer Setup: I handled the initialization of buffers for efficient rendering and data management. Rendering Orchestration: I orchestrated the rendering process, ensuring accurate transformation, attribute setup, texture binding, and drawing calls.

Findings: The dynamic instance generation enhanced realism, while proper buffer setup and rendering orchestration ensured smooth performance. Overall, this demonstrates WebGL's effectiveness for immersive 3D graphics, applicable in gaming, visualization, and virtual environments.

Individual contribution to project report preparation: My individual contributions to the project report preparation encompassed content creation, writing, data analysis, graphics, editing, references, collaboration, presentation preparation, and review. These efforts were essential for producing a comprehensive and high-quality report that effectively communicated the project's objectives, methodologies, findings, and implications.

1

Full Signature of Supervisor:

Prasenjit Maiti

Full Signature of Student:

Hemant Kumar

“JOY RUN”

ORIGINALITY REPORT



PRIMARY SOURCES

1	www.worldleadershipacademy.live Internet Source	2%
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