**Industrial Report on "Tom and Jerry" JavaScript Game Development**

**Project Title: *Tom and Jerry – A JavaScript Adventure Game***

**Bachelor of Technology**

**In**

**Computer Science & Engineering**

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**Certificate**

This is to certify that the project titled **"Tom and Jerry - A JavaScript Game"** submitted by **Nishtha** (Student ID: **10013202722**) of **CSE2** is a genuine work completed under my supervision as part of the course requirements.

The project report embodies original work and is submitted in partial fulfillment of the requirements for the completion of the course. To the best of my knowledge, the project does not infringe on the copyrights of any other work and has not been submitted previously.

I hereby approve this report as a significant contribution to the student’s practical learning in web development and game programming.

**PROJECT COORDINTOR HOD CSE DEPT.**

Ms. Amanpreet Kaur Dr. Aashish Bhardwaj (Assistant Professor) (Associate Professor)

**Acknowledgment**

I would like to express my sincere gratitude to everyone who supported me throughout the development of this project, **"Tom and Jerry - A JavaScript Game."**

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**Abstract**

This project, titled **"Tom and Jerry - A JavaScript Game,"** is a simple browser-based game inspired by the classic cartoon characters Tom and Jerry. The primary objective of this project is to create an engaging game using HTML, CSS, and JavaScript, allowing users to control Jerry as he avoids being caught by Tom. The game incorporates fundamental elements such as character movement, collision detection, and score tracking to create an interactive experience.

The game begins with Jerry positioned at the start, and the player can use keyboard controls to move Jerry and jump to avoid Tom. Collision detection logic is implemented to monitor the proximity between Tom and Jerry, ending the game if they collide. The score increments as the player continues to avoid Tom, and the game’s difficulty increases as Tom’s speed gradually accelerates.

Throughout the project, web development concepts such as DOM manipulation, event handling, and CSS animations were utilized. This project serves as a foundational exercise in game development, providing insight into essential game mechanics and user interaction within a web-based environment. Future improvements could include additional levels, power-ups, and mobile compatibility to enhance gameplay.

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*CHAPTER ONE*

**EXECUTIVE**

**SUMMARY**

1. ***Executive Summary***

The purpose of this project was to design a simple yet interactive browser-based game inspired by the classic cartoon "Tom and Jerry." The game allows users to control Jerry and avoid Tom, with the goal of surviving as long as possible while accumulating points. Developed using HTML, CSS, and JavaScript, this project focuses on essential game elements, including character control, collision detection, and score tracking.

Throughout the project, I implemented animations and key event handling to create a dynamic and engaging user experience. This report outlines the technical setup, challenges faced, and lessons learned during the game development process.

CHAPTER TWO

INTRODUCTION

***2. Introduction***

**2.1 Background**

"Tom and Jerry" is a timeless cartoon series enjoyed by many generations. This project is a tribute to the beloved characters, designed to recreate a playful chase scenario. By implementing fundamental game mechanics, I aimed to enhance my knowledge in web development.

**2.2 Objectives**

The primary objectives of this project are as follows:

* To develop an interactive game interface using HTML, CSS, and JavaScript.
* To enable character movement, collision detection, and score tracking.
* To provide a fun and engaging user experience by animating characters and increasing the game’s difficulty over time.

**2.3 Scope**

The project focuses on a single-level game where Jerry avoids Tom. Complex features such as advanced physics, multi-level gameplay, and mobile support are outside this scope but could be explored in future iterations.

CHAPTER THREE

TECHNICAL SPECIFICATION

***3. Technical Specifications***

**3.1 HTML Structure**

The HTML (index.html) defines the basic layout of the game interface:

* **Game Container**: Holds all game elements.
* **Score Counter and Game Over Message**: Displays the user’s score and indicates when the game ends.
* **Character Elements (Jerry and Tom)**: Represent the characters in the game.

Sample HTML code:

html

Copy code

<div class="gameContainer">

<div class="gameOver">Welcome to Tom and Jerry Adventure</div>

<div class="jerry"></div>

<div id="scoreCount">Your Score: 0</div>

<div class="tom tomAni"></div>

</div>

**3.2 CSS Styling**

The CSS (style.css) defines the layout, character images, and animations:

* **Background**: A full-screen background image to create an immersive setting.
* **Character Styling**: jerry and tom classes set the character dimensions, positions, and background images.
* **Animations**: @keyframes is used for jump (animatejerry) and movement (tomAni).

Sample CSS code:

css

Copy code

.jerry {

background-image: url(jerry.png);

width: 55px;

height: 65px;

position: absolute;

bottom: 0;

left: 52px;

}

.tomAni {

animation: tomAni 5s linear infinite;

}

**3.3 JavaScript Functionality**

The JavaScript (script.js) implements game mechanics:

* **Character Movement**: Arrow keys control Jerry’s movements.
* **Collision Detection**: Calculates distance between Jerry and Tom to detect collisions.
* **Score Tracking**: Increments the score as Jerry survives longer.

Sample JavaScript code:

javascript

Copy code

document.onkeydown = function (e) {

if (e.keyCode == 38) { /\* Jump \*/ }

if (e.keyCode == 39) { /\* Move Right \*/ }

if (e.keyCode == 37) { /\* Move Left \*/ }

}

setInterval(() => {

/\* Collision detection logic \*/

if (collisionDetected) {

document.querySelector('.gameOver').innerHTML = "Game Over";

}

}, 10);

***4. Implementation***

**Step-by-Step Development**

1. **Setting Up HTML Structure**: Designed the layout and added elements for characters and score display.
2. **CSS Styling**: Styled the game environment and added animations for characters.
3. **JavaScript Functionality**: Integrated event listeners for key presses, implemented collision detection, and added score updating.
4. **Testing and Debugging**: Tested game mechanics and optimized for smooth transitions and gameplay.

***5. Challenges and Solutions***

**Challenges Faced**

1. **Collision Detection**: Ensuring accurate detection between characters was difficult due to positioning.
2. **Animation Timing**: Fine-tuning animations for smooth transitions and adjusting Tom’s speed as the game progresses.

**Solutions**

1. **Collision Offset Calculations**: Adjusted offsetX and offsetY values to improve collision accuracy.
2. **Adaptive Animation Speed**: Reduced Tom’s animation-duration to increase difficulty dynamically.

***6.* *Conclusion and Future Scope***

**6.1 Conclusion**

This project successfully demonstrates the use of basic HTML, CSS, and JavaScript to create a simple, interactive game. The game highlights essential web development skills, such as DOM manipulation, animations, and event handling.

**6.2 Future Scope**

Future improvements could include:

* **Multiple Levels**: Adding levels with increasing difficulty.
* **Mobile Compatibility**: Optimizing the game for mobile devices.
* **Enhanced Graphics and Sounds**: Adding more characters and sound effects for an enriched experience.

***7. Appendices***

**7.1 Code Snippets**

**HTML Setup**

html

Copy code

<div class="gameContainer">

<div class="jerry"></div>

<div class="tom tomAni"></div>

</div>

**JavaScript for Score Update**

javascript

Copy code

function updateScore(score) {

document.getElementById('scoreCount').innerHTML = "Your Score: " + score;

}

**7.2 Screenshots**

1. **Game Start Screen**:
2. **During Gameplay**:
3. **Game Over Screen**:

**7.3 References**

* [JavaScript Event Listeners](https://developer.mozilla.org/en-US/docs/Web/API/EventListener)
* [CSS Animations](https://developer.mozilla.org/en-US/docs/Web/CSS/animation)
* Online tutorials and resources on JavaScript game development.