Unified Mentor Internship Program

INTERNSHIP REPORT

On

Web Development

Project Name : Basic Calculator

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Company: Unified Mentor

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Domain: Full Stack Web Development

Acknowledgement

I would like to express my sincere gratitude to Unified Mentor for providing me with the opportunity to intern and work on a meaningful project. A special thanks to my mentor for their constant guidance, support, and motivation during the internship. This project has been a significant step in my learning journey.

Unified Mentor is a tech-focused organization that provides mentorship and hands-on experience through real-world projects. Their mission is to bridge the gap between theoretical knowledge and practical industry requirements by guiding students through internships and live projects.

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1. Introduction

The Basic Calculator is a lightweight, user-friendly web application developed using HTML, CSS, and JavaScript. Its primary function is to perform basic arithmetic operations such as addition, subtraction, multiplication, division, and percentage calculations. This project provides a responsive and modern user interface that mimics the functionality of a physical calculator, complete with number input, decimal handling, operator control, and real-time result display.

The calculator also includes support for keyboard input and error handling features through a custom-styled message box, enhancing the overall user experience. This project not only demonstrates the use of JavaScript for arithmetic logic but also highlights the use of HTML for structure and CSS for professional and responsive styling.

The project aims to combine simplicity with efficiency, allowing users to perform operations with ease while offering a polished and visually appealing layout.

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2. Objective

The main objectives of this project are:

- To create a basic calculator that performs essential arithmetic operations.
- To design a clean and interactive user interface using HTML and CSS.
- To implement calculation logic using vanilla JavaScript.
- To handle user input through both mouse clicks and keyboard events.

- To practice front-end development skills including responsive layout, DOM manipulation, and event handling.

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3. Tools and Technologies Used

Tool/Technology	Purpose
HTML5	Structure of the calculator layout
CSS3	Styling and responsive design
JavaScript (ES6)	Logic for calculations, DOM handling, user input
VS Code	Code editor
Browser (Chrome/Firefox)	Testing and previewing the calculator

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4. Project Description

This calculator application consists of three main components:

- **Display Panel**: Shows the current expression or the result.
- **Buttons Grid**: Includes numbers, decimal point, operators (+, −, ×, ÷, %), and functional buttons like DEL, AC, and =.
- **Message Box**: Displays user-friendly alerts for invalid operations (e.g., division by zero).

All buttons trigger JavaScript functions that either modify the expression or evaluate it. The calculator logic uses safe handling of input, prevents invalid decimal use, handles operator chaining, and ensures errors are caught and communicated clearly.

5. Features Implemented

- ✅ Perform basic arithmetic operations
- ✅ Clear display (AC) and delete last character (DEL)
- ✅ Decimal point handling
- ✅ Percentage calculation
- ✅ Keyboard input support
- ✅ Error detection (e.g., divide by zero)
- ✅ Responsive design with hover/active states
- ✅ Custom message box for errors

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6. User Interface Design

The UI is dark-themed with orange highlights for interactive buttons, creating a sleek and modern calculator look. The layout is built using CSS Grid for the button section and Flexbox for the main container alignment. The display is styled to resemble LED panels with bold fonts and a soft inner glow effect. Button states (hover, active) provide immediate feedback to user actions.

7. Challenges Faced

- Ensuring the expression is valid before passing it to eval() safely.
- Preventing multiple decimal points in the same number.
- Handling operator chaining (e.g., 5 + * 6) and correcting logic flow.
- Making the layout responsive across different screen sizes.
- Creating a smooth and intuitive user experience with keyboard support.

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8. Learning Outcomes

- Gained a strong understanding of JavaScript functions, event handling, and conditional logic.
- Learned how to manage and validate user input in real-time.
- Practiced designing responsive and attractive UI using CSS Grid and Flexbox.
- Understood how to handle exceptions and errors gracefully in a web interface.
- Improved overall front-end development confidence and practical coding workflow.

9. Conclusion

The Basic Calculator project successfully demonstrates how foundational web technologies can be used to create an interactive and fully functional application. It blends functionality with design, and helps in strengthening front-end programming concepts. The project lays the groundwork for more advanced calculator features such as scientific operations, history tracking, or theming options in the future.

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10. Future Enhancements

- Implement scientific calculator functions (e.g., square root, trigonometric operations).
- Add memory storage buttons (M+, M−, MR).
- Save previous calculations (history view).
- Allow users to switch themes (dark/light).
- Add animations and sound effects for better interactivity.