

INTRODUCTION:

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Project Report: Calculator Application

1. INTRODUCTION

The Calculator application is a basic utility tool developed to perform arithmetic operations quickly and accurately. Designed with simplicity and efficiency in mind, this application provides users with a convenient tool for calculations, making it useful for both educational and day-to-day tasks. The application focuses on offering essential functionalities like addition, subtraction, multiplication, and division.

2. Objectives

The primary objectives of the Calculator project are:

- To develop a simple, reliable Calculator application that can perform essential arithmetic operations.
- To ensure that the interface is intuitive and userfriendly.
- To implement basic error handling for invalid operations (e.g., division by zero).

3. Scope of the Project

The scope of this project includes:

- Developing a **basic Calculator application** for general-purpose calculations.
- Supporting core arithmetic functions: **addition, subtraction, multiplication, and division**.
- Creating an intuitive user interface with large, easy-to-click buttons for each operation.

4. Methodology

The Calculator application was developed using an **Incremental approach** with the following stages:

1. **Requirements Gathering:** Defined the primary operations and identified user needs for an easy-to-use calculator.
2. **Design:** Planned the UI layout and implemented logic for basic arithmetic functions.
3. **Implementation:** Built and tested each function, ensuring accurate results.

4. **Testing and Debugging:** Conducted testing to ensure functionality and accuracy of the calculator.
5. **User Feedback:** Collected user feedback to enhance the UI and improve functionality.

5. Design & Implementation

- **Technology Stack:** The Calculator application was created using **Python** for a simple desktop interface, and **JavaScript, HTML, and CSS** for a web version.
- **Core Features:**
 - **Addition:** Adds two numbers and displays the result.
 - **Subtraction:** Subtracts the second number from the first.
 - **Multiplication:** Multiplies two numbers.

DIVISION: DIVIDES THE FIRST NUMBER BY THE SECOND, WITH ERROR HANDLING FOR DIVISION BY ZERO.

- **User Interface (UI):** The interface consists of a numeric keypad and operation buttons for basic arithmetic functions. Each button is clearly labelled , and results are displayed in a screen area at the top of the application.
- **Error Handling:** Implemented error handling to manage invalid inputs or operations, such as dividing by zero.

6. Testing

- **Unit Testing:** Each arithmetic function was tested individually to ensure accuracy (e.g., $2+2=4$, $5-3=2$, etc.).
- **Integration Testing:** Verified that the UI inputs correctly pass data to the calculation logic and return accurate results.
- **User Testing:** Conducted basic usability testing with users, leading to minor adjustments in button size and layout for improved usability.

7. Challenges Faced

- **Error Handling for Division by Zero:** Ensured that the application returns a user-friendly error message rather than crashing when attempting to divide by zero.
- **User Interface Layout:** Designing an intuitive layout that is easy to use on both desktop and web platforms.

8. Conclusion

The Calculator application successfully provides users with a simple, accurate, and reliable tool for performing basic arithmetic operations. This project was instrumental in understanding **UI design** and **basic error handling** in application development. Potential future features include support for more advanced functions, like **square roots, percentages, and exponentiation**.