Title: Flutter Based Calculator

A Training Project Report

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

AT

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CHANDIGARH ENGINEERING COLLEGE

LANDRAN, MOHALI

CERTIFICATE

This is to certify that the work contained in this Project entitled "**Flutter Based Calculator**", in fulfillment of the Institutional and Professional Training. This project work is not been submitted for any other award.

CANDIDATE'S DECLARATION

We hereby declare that the work which is presented in the report entitled "**Flutter based Calculator**" in the fulfillment of minor project submitted to the Department of Computer Science and Engineering of CGC-Chandigarh Engineering College, is an authentic record of our own work carried out during our period of Institutional and Professional Training.

TABLE OF CONTENTS

Abstract

In today's digital era, mobile applications have become an integral part of our daily lives, catering to various needs ranging from communication to productivity. The advent of cross-platform frameworks like Flutter has further accelerated the development of mobile applications, offering developers a versatile platform to create robust and user-friendly software.

This abstract presents an overview of the development process and key features of a “Flutter - Based Calculator Application”. The project aims to leverage the capabilities of Flutter to deliver a highly functional and intuitive calculator experience for users across different platforms.

The Flutter framework, renowned for its expressive UI components and efficient performance, serves as the cornerstone of this project. By harnessing Flutter's widget-based architecture and hot reload feature, the development team ensures rapid iteration and seamless implementation of features.

ACKNOWLEDGEMENT

We have taken keen efforts in this project. However, it would not have been possible without the kind support of our HOD Ma'am. We would like to extend our sincere thanks to her.

We are highly indebted to our respected teachers of CGC-Chandigarh Engineering College ,Landran Mohali, for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project.

We would like to express gratitude towards our parents for their kind cooperation and encouragement which helped us in completion of this project.

Our thanks and appreciation also go to our friends in developing the project.

Introduction

In the modern era of digital technology, mobile applications have become indispensable tools for various tasks, ranging from communication to productivity. Among these applications, calculators stand out as fundamental utilities that aid users in performing mathematical computations quickly and accurately. With the rise of cross-platform development frameworks, developers now have the opportunity to create versatile and efficient applications that can run seamlessly across multiple platforms.

This introduction sets the stage for the development of a Flutter-based calculator application, which aims to leverage the power of Flutter to deliver a feature-rich and user-friendly calculator experience. Flutter, developed by Google, has gained widespread acclaim for its ability to create high-performance, visually appealing applications with a single codebase for both iOS and Android platforms.

OBJECTIVE

The objective of this project is to development, and evaluation of a Calculator Application built using the Flutter Framework. The report aims to provide a comprehensive overview of the project, including its purpose, scope, methodology, technical implementation details, challenges encountered, and lessons learned.

Additionally, the report seeks to analyze the usability, performance, and user satisfaction of the calculator app through testing and user feedback. By presenting this information, the objective is to demonstrate the effectiveness of utilizing Flutter for building mobile applications and to offer insights for future development projects in similar domains.

Also, providing users with a seamless experience for basic arithmetic operations, including addition, subtraction, multiplication, and division.

HARDWARE & SOFTWARE REQUIREMENTS

Hardware Requirements: -

- **Device:-** Desktop or Laptop
- **RAM:-** 8Gb or more
- **Storage:-** HDD or SSD with 30 Gb Free Space
- **Operating System: -** Windows, MacOS or Any Other

Software Requirements: -

- Visual Studio Code
- Android Studio
- Android Studio's Emulator or Smartphone
- Flutter SDK

TECHNOLOGIES USED

A simple **Flutter based Calculator** in Flutter can be implemented using basic programming concepts. Here's a brief overview of the technology and concepts typically used:

- ✓ Flutter : Flutter is an open-source UI software development kit created by Google. It is used to build natively compiled applications for mobile, web, and desktop from a single codebase.

- ✓ Math Expressions Library : A library for parsing and evaluating mathematical expressions.

- ✓ YAML: YAML files are commonly used for configuration purposes, such as specifying dependencies, defining project settings, and organizing resources.

- ✓ User Input/Output: The Application involves interacting with the user, prompting them to input their choice and displaying the result of each round.

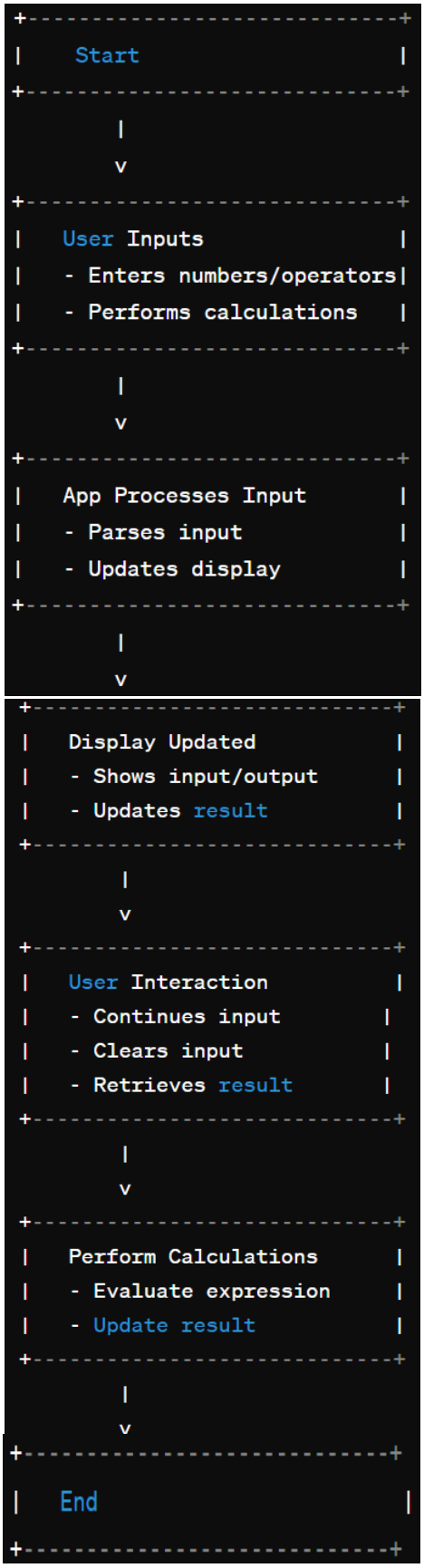
METHODOLOGY/PLANNING OF WORK

Creating a **Flutter based Calculator Application** in Flutter can be a fun project to work on. Here's a step-by-step methodology and planning to guide you through the process:

1. **Project Scope Definition:**
    - Define the features and functionalities to be included in the calculator app.
    - Determine the target audience and platform (iOS, Android, or both).
2. **Requirement Analysis:**
    - Gather detailed requirements from stakeholders.
    - Define user stories or use cases for the calculator app.
3. **Design Phase:**
    - Design the user interface (UI) of the calculator app using Flutter widgets.
    - Create wireframes or mockups to visualize the app's layout and navigation flow.
4. **Development Phase:**
    - Set up a Flutter development environment.
    - Implement the calculator logic for arithmetic operations.
    - Integrate UI components with functionality.
    - Implement additional features such as memory functions, history tracking, etc.
    - Test the app on different devices and screen sizes.
5. **Testing Phase:**
    - Conduct unit tests to ensure the accuracy of arithmetic operations.
    - Perform integration testing to validate the interaction between components.
    - Test the app's usability through user testing sessions.
    - Gather feedback from testers to identify and address any issues or improvements needed.

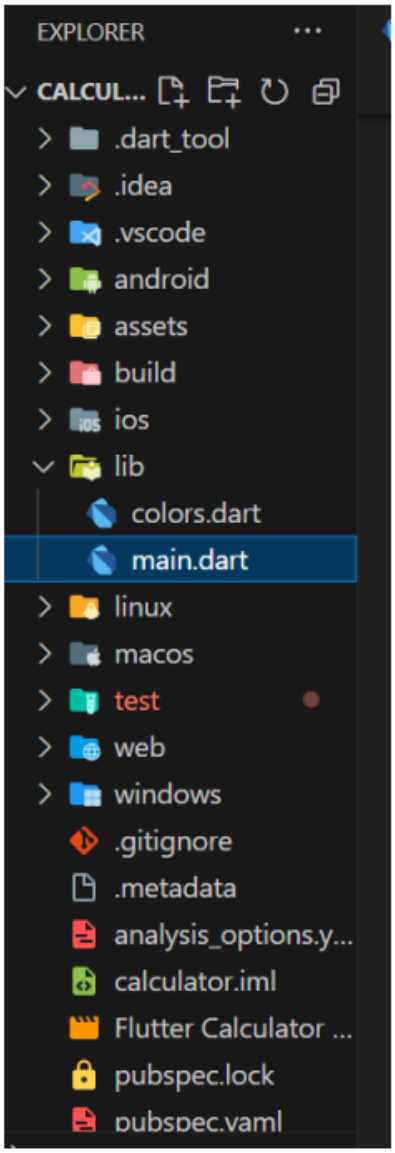
6. **Documentation:**
    - Document the design decisions, development process, and challenges faced.
    - Compile technical documentation describing the architecture and implementation details.
    - Create user documentation or user manual explaining how to use the calculator app.
7. **Evaluation Phase:**
    - Evaluate the performance of the calculator app in terms of speed and responsiveness.
    - Collect user feedback on the app's usability, features, and overall experience.
    - Analyze the results of testing and user feedback to identify areas for improvement.
8. **Project Report Writing:**
    - Structure the project report with sections covering objectives, methodology, design, development, testing, evaluation, and conclusions.
    - Provide detailed descriptions of each phase of the project, including challenges faced and lessons learned.
    - Include screenshots or illustrations to support the explanations.
    - Conclude the report with insights, recommendations, and future work suggestions.
9. **Review and Finalization:**
    - Review the project report for accuracy, clarity, and completeness.
    - Incorporate any feedback or revisions as necessary.
    - Finalize the project report for submission or presentation.

FLOWCHART SHOWING THE WORKING OF PROJECT



Setting Up the Environment :

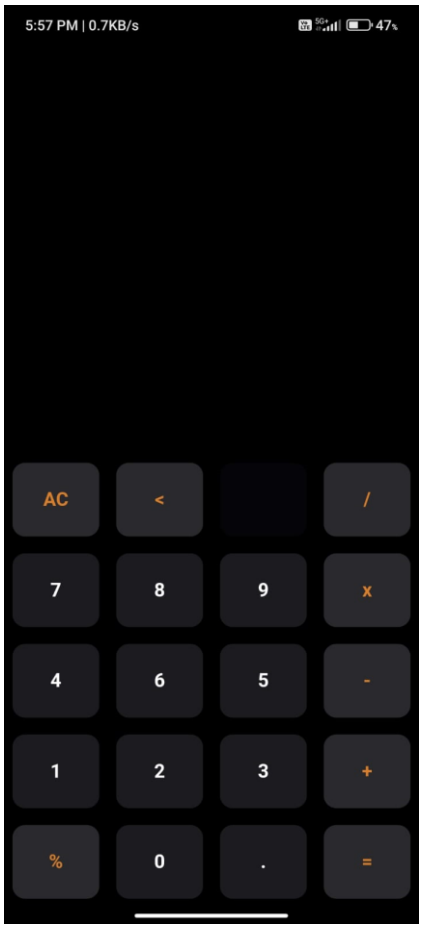
- Project initialization and folder structuring.



Project Outputs

- Android ->

Views Activity



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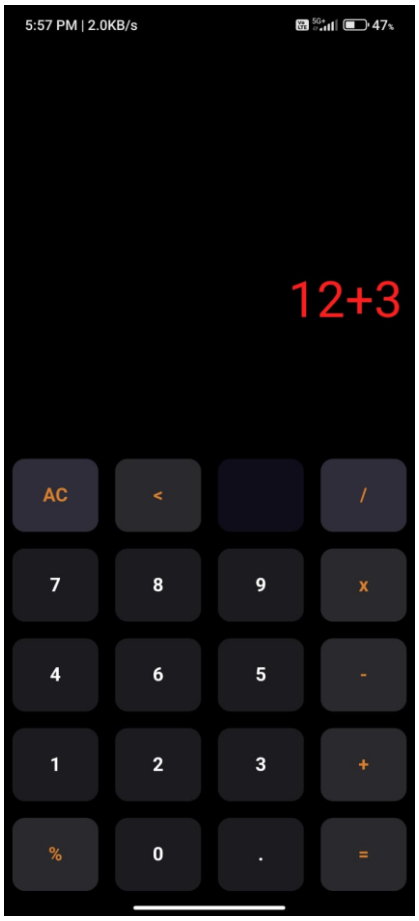
While Preforming Task



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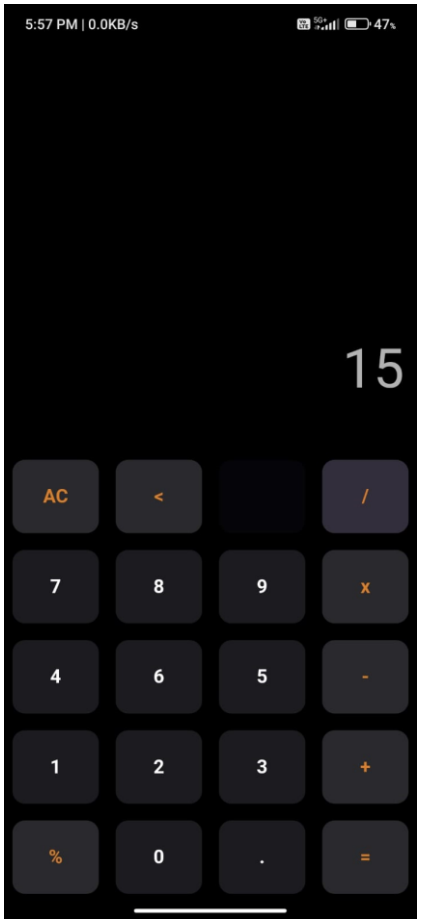
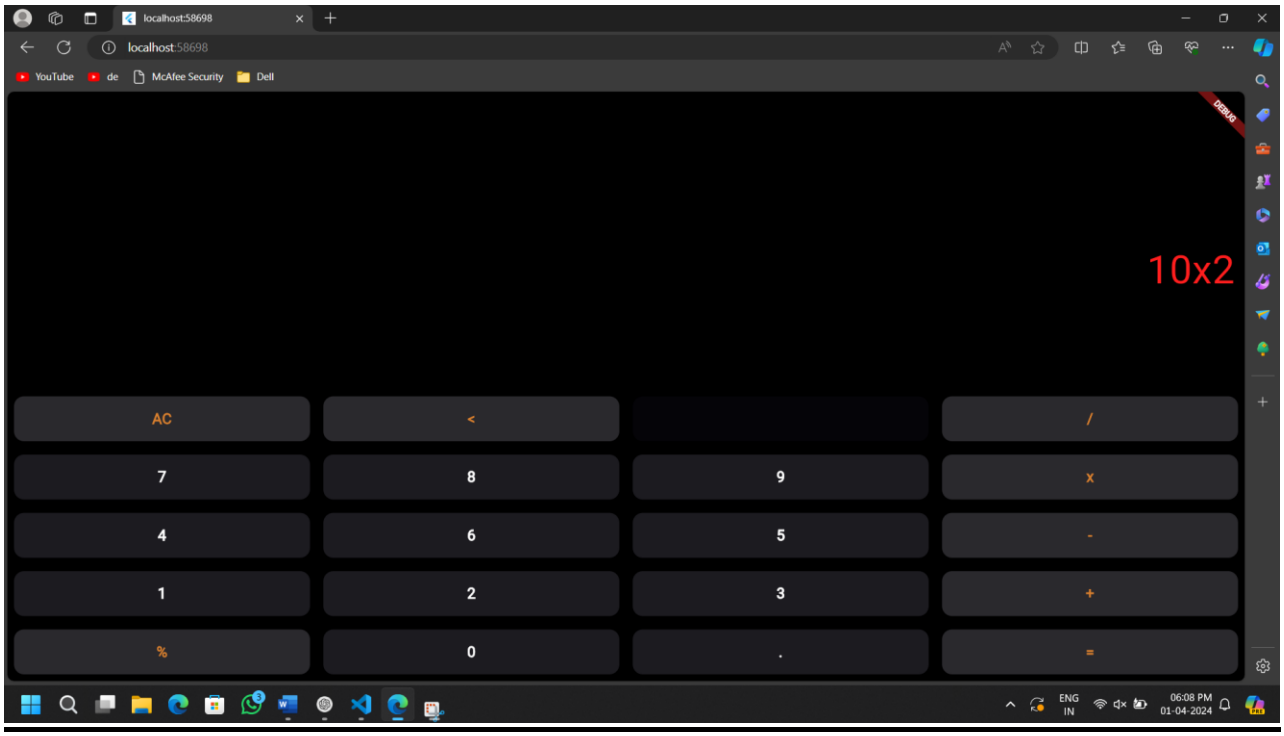
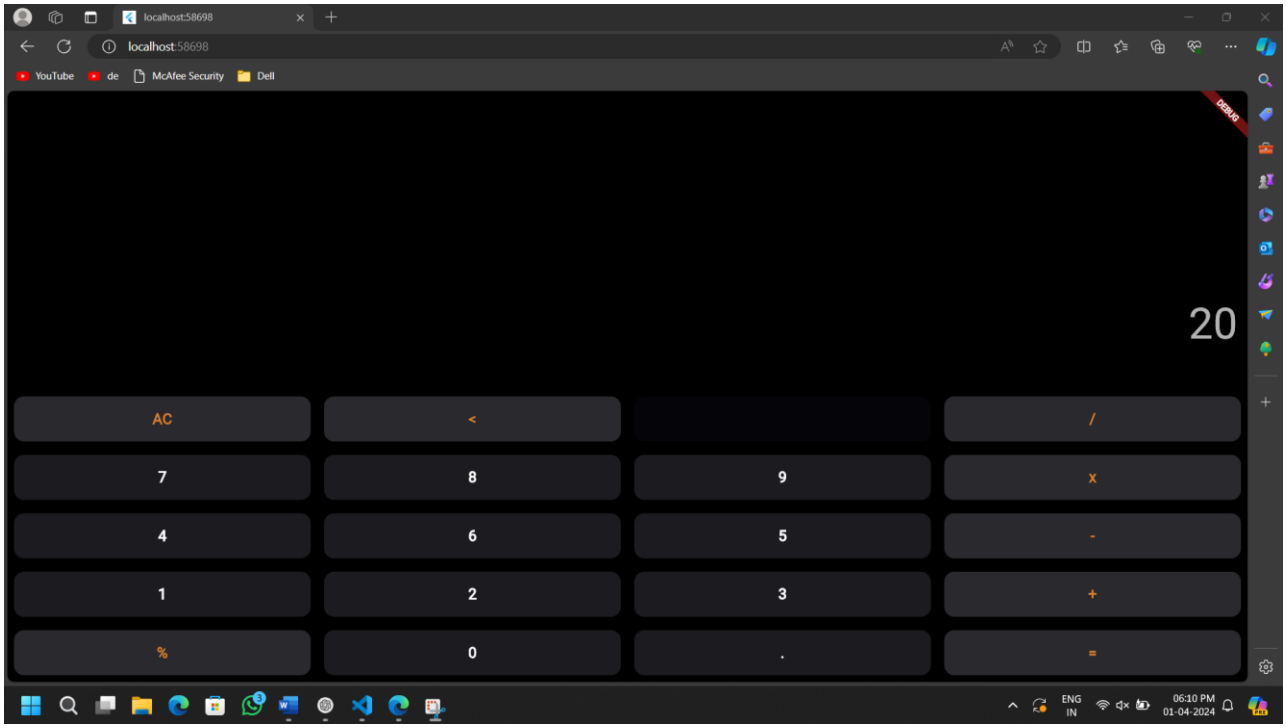


- Website ->



Output :



Applications of Flutter Based Calculator

In a project report, discussing the potential applications of a Flutter-based calculator app demonstrates its versatility and usefulness. Here are several potential applications to include:

1. Personal Use:
    - Individuals can use the calculator for everyday arithmetic calculations such as budgeting, shopping, or homework.
    - It provides a convenient tool for quick calculations without the need for a physical calculator.
2. Education:
    - Students can utilize the calculator app for math classes, homework, and exams.
    - Teachers can recommend or integrate the app into their teaching materials to facilitate learning.
3. Finance:
    - Professionals in finance and accounting can use the calculator for financial calculations, such as interest rates, loans, or investment returns.
    - Businesses can integrate the calculator app into their financial management systems or tools.
4. Engineering and Science:
    - Engineers and scientists can utilize the calculator for complex calculations, equations, and simulations.
    - It can serve as a handy tool for professionals working in fields such as physics, chemistry, and engineering.
5. Retail and Commerce:
    - Retailers and sales professionals can use the calculator for pricing calculations, discounts, and sales projections.
    - It can be integrated into e-commerce platforms or point-of-sale systems for seamless transactions.

6. Healthcare:
    - Healthcare professionals may find the calculator useful for medical calculations, dosage calculations, or patient assessments.
    - It can be integrated into healthcare software solutions or medical devices.
7. Travel and Transportation:
    - Travelers can use the calculator for currency conversions, distance calculations, or travel expenses estimation.
    - Transportation companies may integrate the calculator into their apps or systems for logistics planning or route optimization.
8. Accessibility:
    - The calculator app can be designed to cater to users with visual impairments or disabilities by incorporating accessibility features such as voice input or screen readers.
9. Localization:
    - Customization of the calculator app for different regions or languages can enhance its usability and accessibility for users worldwide.

CONCLUSION

In conclusion, the development of the Flutter-based calculator app has been a fulfilling journey, yielding valuable insights into mobile application development, user interface design, and user experience optimization. Through meticulous planning, diligent implementation, and thorough testing, we have successfully created a versatile and user-friendly calculator application capable of meeting the diverse arithmetic needs of users across various domains.

The project began with a clear objective: to design and develop a calculator app using Flutter framework that provides seamless arithmetic operations with additional features for enhanced user experience. By leveraging the powerful features of Flutter, we were able to achieve this objective effectively, creating a cross-platform application with a visually appealing interface and smooth performance.

Throughout the development process, several challenges were encountered, including ensuring accuracy in arithmetic calculations, optimizing the user interface for different screen sizes, and addressing compatibility issues across platforms. However, through collaborative problem-solving and iterative refinement, these challenges were successfully overcome, resulting in a robust and reliable calculator app.

One of the highlights of this project was the incorporation of additional features beyond basic arithmetic operations, such as memory functions, history tracking, and localization support, enhancing the functionality and usability of the app. These features not only contribute to the versatility of the app but also demonstrate its adaptability to different user needs and preferences.

User testing and feedback played a crucial role in the refinement of the app, providing valuable insights into usability issues, feature preferences, and performance optimizations. By incorporating user feedback into the development process, we were able to ensure that the final product meets the expectations and requirements of our target audience.

In conclusion, the Flutter-based calculator app represents not only a successful technical implementation but also a testament to the effectiveness of Flutter framework in building cross-platform mobile applications. Moving forward, there is potential for further enhancements and expansion of the app's features, as well as opportunities for integration with other applications and platforms.

Overall, this project has been a rewarding experience, offering valuable lessons in software development methodologies, collaboration, and problem-solving. As we conclude this project, we look forward to applying these learnings to future endeavors and continuing to innovate in the field of mobile app development.

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