

WALK SPHERE

INTERDISCIPLINARY PROJECT

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Technology in Information Technology

by

CHANDRU K (41120046)



**DEPARTMENT OF INFORMATION TECHNOLOGY
SCHOOL OF COMPUTING**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

CATEGORY-1 UNIVERSITY BY UGC

Accredited "A++" by NAAC

12B Status by UGC |Approved by AICTE

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119

MAY 2024



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DEPARTMENT OF INFORMATION TECHNOLOGY

BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **CHANDRU K (41120046)** who carried out the project entitled "**WALK SPHERE**" under my supervision from **JANUARY 2024** to **MAY 2024**.

Internal Guide

Dr. L. MARY GLADENCE M.E., Ph.D.,

Head of the Department

Dr.R. SUBHASHINI, M.E., PH.D.,

Submitted for Viva voce Examination held on 08/05/24

Internal Examiner

External Examiner

DECLARATION

I CHANDRU K (41120046) hereby declare that the Project Report entitled "WALK SPHERE done by me under the guidance of

Dr. L. MARY GLADENCE M.E.,Ph.D., is submitted in partial fulfillment of the requirements for the award of Bachelor of Technology degree in Information Technology.

DATE: 08/05/2024

PLACE: Chennai



SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

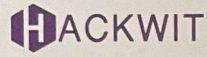
I am pleased to acknowledge my sincere thanks to **Board of Management of SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

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CERTIFICATE OF COMPLETION



HACKWIT TECHNOLOGIES PVT LTD
Redefine by Technologies

149, 1C, 2nd Floor, Mount Poonamallee Rd,
Ramapuram, Chennai - 600089.
admin@hackwittechnologies.com
www.hackwittechnologies.com

10.02.2024

CERTIFICATE FOR INTERNSHIP

TO WHOMSOEVER IT MAY CONCERN

This is to Certify that **Chandru K (Reg No: 41120046)** student of Sathyabama Institute of Science and Technology, B. Tech Information Technology, has successfully completed the Internship at Hackwit Technologies from 22nd January to 30th January 2024.

During the internship, **Chandru K** has closely worked as a part of the **Flutter** by carrying out the project entitled "**Walk Sphere**".

He demonstrated good developing and learning skill with self-motivated attitude to learn new things. His contribution to implement the Flutter was good. We wish him all the best for his future endeavors.

Best Regards,

Ravikumar S
CEO & Managing Director
Hackwit Technologies Pvt Ltd



CERTIFICATE OF COMPLETION



ABSTRACT

Walk Sphere is a cutting-edge shoe selling application meticulously crafted using the powerful Flutter framework. It redefines the online shopping experience, seamlessly blending user-friendly design with robust functionality. Flutter's versatility, Walk Sphere caters to the discerning needs of modern footwear enthusiasts, offering a diverse range of shoes at their fingertips. Focus on usability, performance, and aesthetic appeal, Walk Sphere delivers an immersive and intuitive platform for users to explore, select, and purchase their desired footwear with ease. Key features such as user authentication, immersive catalog browsing, search capabilities, and cart management underline its commitment to user satisfaction and convenience. The user interface, thoughtfully designed with Flutter's tools, strikes the perfect balance between functionality and visual allure, ensuring a captivating experience across devices and platforms. Rigorous evaluation through usability testing, performance benchmarking, and user feedback analysis confirms Walk Sphere's high levels of satisfaction and usability.

Keywords: Walk Sphere, Shoe selling app, Flutter framework, Ecommerce Mobile shopping, User experience, User interface design, Usability testing, Catalog browsing, Search capabilities, Cart management

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LIST OF ABBREVIATIONS

ABBREVIATION	EXPANSION
UI	- User Interface
UX	- User Experience
iOS	- iPhone Operating System
UAT	- User Acceptance Testing
IDE	- Integrated Development Environment

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION OF WALK SPHERE

Walk sphere presents the development process and outcomes of an ecommerce application focusing on shoe shopping, implemented using the Flutter framework. With the increasing popularity of online shopping, the demand for user-friendly and visually appealing mobile applications has surged. The objective of this project was to create a seamless and efficient platform for users to browse, purchase, and manage their shoe preferences conveniently.

Walk Sphere is a premier destination for stepping into the world of footwear fashion with style and sophistication. Powered by the innovative Flutter technology, Walk Sphere redefines the shoe shopping experience with its sleek design, intuitive interface, and unparalleled selection of footwear.

At Walk Sphere, we believe that shoes are more than just a necessity; they are an expression of individuality, personality, and lifestyle. Whether you're seeking the perfect pair of sneakers for your daily adventures, elegant heels for a special occasion, or rugged boots for your outdoor escapades, Walk Sphere offers a diverse range of styles curated to cater to every taste and preference.

With features like seamless browsing, detailed product descriptions, and secure checkout, Walk Sphere ensures that your shoe shopping journey is not only effortless but also enjoyable. From iconic classics to cutting-edge designs, Walk Sphere collaborates with leading brands and designers to bring you the latest trends and timeless favorites from around the globe.

But Walk Sphere is more than just a shopping platform; it's a community, a hub for shoe enthusiasts, trendsetters, and fashion aficionados to connect, share, and inspire. Immerse yourself in a world of style, creativity, and innovation as you explore our curated collections, discover exclusive releases, and stay updated on the latest industry news and trends.

Whether you're stepping out for a casual outing, striding into the office, or hitting the town for a night out, Walk Sphere is your trusted companion for all your footwear needs. So, lace up, step out, and make a statement with Walk Sphere – because every step you take tells a story, and every shoe you wear is a reflection of your unique journey.

1.2 FLUTTER

- ❖ Dart Programming: Understanding Dart, the primary language for Flutter, covering syntax, data types, and object-oriented concepts.
- ❖ Object-Oriented Programming (OOP): Proficiency in OOP principles like classes, inheritance, polymorphism, and encapsulation is crucial for building efficient Flutter apps.
- ❖ Mobile Development Basics: While not mandatory, prior knowledge of mobile app development concepts, frameworks, and UI/UX design principles can expedite learning.
- ❖ Widgets and UI Development: Familiarity with Flutter widgets, layout techniques, and UI design principles is essential for creating visually appealing and responsive apps.
- ❖ IDE Proficiency: Experience with IDEs like Android Studio or Visual Studio Code, along with relevant plugins for Flutter development.
- ❖ Version Control: Basic understanding of version control systems like Git for collaborative development and managing project versions.
- ❖ Asynchronous Programming: Knowledge of asynchronous programming concepts such as Futures, Streams, and async for handling tasks like network requests in Flutter apps.
- ❖ Package Management: Understanding how to manage dependencies using Dart's package manager, Pub, for integrating third-party libraries into Flutter projects.



Fig 1.1 BASIC FLUTTER OVERVIEW WITH LOGO

In the above figure 1.1 is an explanation of the basic Flutter overview with the logo for app development. Flutter, an open-source UI software development kit created by Google, empowers developers to build natively compiled applications for mobile, web, and desktop from a single codebase. With its reactive framework and extensive widget library, Flutter enables the creation of stunning, fast, and expressive user interfaces, ensuring a consistent experience across platforms. Its hot reload feature facilitates rapid iteration and debugging, while its comprehensive documentation and vibrant community support make it an ideal choice for developers seeking efficiency and innovation in their app development journey.

1.2.1 KEY ASPECTS OF FLUTTER FRAMEWORK

❖ **Single Codebase:**

- **Code Reusability:** Developers write code once and deploy it across iOS, Android, web, and desktop platforms, eliminating the need to rewrite code for each platform.
- **Time and Cost Efficiency:** A single codebase saves time and resources that would otherwise be spent on maintaining separate codebases for different platforms.
- **Consistency Across Platforms:** Utilizing a single codebase ensures consistency in user experience and app behavior across various devices and operating systems.

- Easier Maintenance: Managing and updating a single codebase is more straightforward and efficient than managing multiple codebases, leading to easier maintenance and troubleshooting.
- ❖ Hot Reload:
 - Real-time Feedback: Flutter's hot reload feature provides developers with instant feedback on code changes, allowing them to see the effects of their modifications immediately.
 - Increased Productivity: Developers can make iterative changes to their code without interrupting the app's state, leading to a more productive development workflow.
- ❖ Rich Set of Widgets:
 - Versatility: Flutter offers a diverse range of built-in widgets for various UI elements and functionalities, including buttons, text fields, lists, and animations.
 - Customizability: Widgets in Flutter are highly customizable, allowing developers to tailor their appearance and behavior to suit the specific requirements of their app.
 - Consistency Across Platforms: Flutter widgets are designed to provide a consistent look and feel across different platforms, ensuring a cohesive user experience.
- ❖ High Performance:
 - Native Performance: Flutter apps are compiled to native ARM code, allowing them to achieve near-native performance on both iOS and Android devices.
 - Smooth Animations: Flutter's rendering engine is optimized for smooth animations and transitions, ensuring a responsive and engaging user experience.
 - Efficient Resource Management: Flutter apps are designed to be lightweight and efficient, minimizing memory usage and battery.

1.2.2 APPLICATION OF FLUTTER:

- ❖ Cross-Platform Mobile Apps:
 - Allows developers to write code once and deploy it across multiple platforms, saving time and effort.
- ❖ Web Applications:
 - Flutter can be utilized to build web applications, enabling developers to create interactive and dynamic web experiences.
 - Provides a seamless transition from mobile to web development with a unified codebase.
- ❖ Desktop Applications:
 - Flutter is increasingly being used for building desktop applications for Windows, macOS, and Linux platforms.
 - Enables developers to create native-like desktop experiences with a single codebase.
- ❖ Financial Solutions:
 - Tailored for developing financial applications including banking apps, budgeting tools, and investment platforms.
 - Ensures secure transactions, financial planning assistance, and account management functionalities.
- ❖ Enterprise Applications:
 - Flutter is suitable for developing enterprise-grade applications such as CRM systems, inventory management tools, and internal communication platforms
 - Provides a consistent user experience across different devices and platforms.

1.3 ANDROID SOFTWARE DEVELOPMENT KIT (SDK)

The Android Software Development Kit (SDK) is a set of tools, libraries, and resources provided by Google for developers to create applications for the Android platform. It includes various components such as:

- ❖ SDK Tools: A set of command-line tools for compiling code, debugging, and other development tasks.
- ❖ Platform Tools: Additional tools for debugging and managing Android devices.
- ❖ Build Tools: Tools for compiling and packaging Android apps.
- ❖ Android Emulator: A virtual device emulator for testing Android apps on different device configurations.
- ❖ System Images: Pre-configured images of Android system versions for use with the emulator or physical devices.



FIG 1.2 OVERVIEW OF ANDROID STUDIO SETUP

In the above Figure 1.2 is an explanation detailing the setup process of Android Studio for app development. Android Studio, the official Integrated Development Environment (IDE) for Android application development, offers a comprehensive suite of tools and features tailored to streamline the development workflow. From project creation to code editing, debugging, and deployment, Android Studio provides developers with a robust platform to build high-quality Android applications efficiently.

1.4. FIREBASE

Firebase is a versatile platform by Google, offering a suite of tools for developing and managing mobile and web applications. It simplifies app development with features like real-time database, authentication, cloud storage, and analytics, enabling developers to create responsive, secure, and scalable apps with ease.

1.4.1 FIREBASE FEATURES:

- ❖ **Real-time Database:** Firebase Realtime Database allows for the synchronization of data across clients in real-time. This is crucial for an ecommerce application as it ensures that product listings, inventory, and user data are always up-to-date across all devices.
- ❖ **Firebase Authentication:** Secure user authentication is essential for any ecommerce application. Firebase Authentication provides a simple and secure way to authenticate users using email/password, phone number, or popular identity providers like Google, Facebook, and Twitter.
- ❖ **Cloud Firestore:** Firestore is Firebase's flexible, scalable database for mobile, web, and server development. It offers powerful querying capabilities and real-time updates, making it ideal for storing product data, user profiles, and order information.
- ❖ **Firebase Cloud Functions:** Cloud Functions allow you to run backend code in response to events triggered by Firebase features and HTTPS requests. This can be used for tasks such as processing payments, sending order confirmations, and updating inventory.
- ❖ **Firebase Hosting:** Firebase Hosting provides fast and secure hosting for web apps, with features like SSL encryption, CDN integration, and custom domain support. This ensures that your ecommerce website loads quickly and reliably for users worldwide.
- ❖ **Firebase Analytics:** Analytics is essential for understanding user behavior, tracking conversion rates, and optimizing your ecommerce app for better performance. Firebase Analytics provides valuable insights into user engagement, retention, and revenue metrics.
- ❖ **Firebase Cloud Messaging:** Cloud Messaging allows you to send targeted push notifications to users based on their interests, purchase history, and browsing behavior. This can help drive engagement, promote special offers, and re-engage inactive users.
- ❖ **Firebase Crashlytics:** Crashlytics provides real-time crash reporting for your app, allowing you to quickly identify and resolve bugs that may

impact the user experience. This helps maintain the reliability and stability of your ecommerce application, minimizing downtime and lost revenue.

1.5 VS CODE

To effectively utilize Visual Studio Code (VS Code):

- ❖ Basic Programming Understanding: grasp fundamental concepts like variables, control structures, and functions.
- ❖ Version Control Knowledge: Familiarize yourself with Git for efficient code management.
- ❖ Extension Awareness: Understand how to find, install, and manage extensions to tailor VS Code to your needs.
- ❖ Terminal Proficiency: Basic familiarity with using the terminal or command line interface enhances workflow efficiency.
- ❖ Project Structure Understanding: Navigate and organize project files effectively within VS Code.
- ❖ Debugging Skills: Learn to utilize VS Code's debugging capabilities for troubleshooting code efficiently.

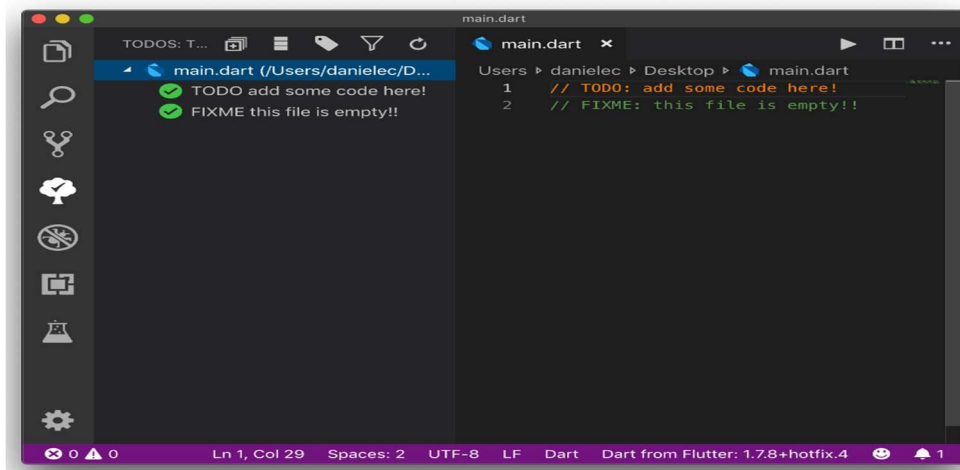


FIG 1.3 BASIC VS CODE SETUP FOR APP DEVELOPMENT

In the above figure 1.3 is an explanation of the basic VS Code setup for app development. Visual Studio Code (VS Code) stands as a versatile and widely used integrated development environment (IDE) for building various types of applications,

including mobile apps with Flutter. This setup encompasses essential configurations and extensions tailored to streamline the development process, ensuring efficiency and productivity for developers. With features like syntax highlighting, code completion, debugging capabilities, and seamless integration with version control systems, the basic VS Code setup serves as a solid foundation for crafting high-quality Flutter applications.

1.6 DART

Dart serves as the backbone of Flutter app development, offering a powerful and versatile programming language tailored for building high-performance applications. Designed by Google, Dart combines the best aspects of object-oriented and functional programming paradigms, providing developers with a robust toolkit for crafting scalable and efficient solutions. Dart, the programming language utilized in Flutter app development, offers several essential features crucial for crafting an online shoe selling application. Key features of dart for flutter are declarative syntax empowers developers to articulate complex logic clearly and concisely, expediting development cycles. Coupled with Flutter's hot reload feature, changes in code are instantly reflected in the UI, accelerating iteration cycles and enhancing developer productivity. Dart has a strong typing system aids in error detection at compile time, bolstering code reliability and minimizing runtime errors.

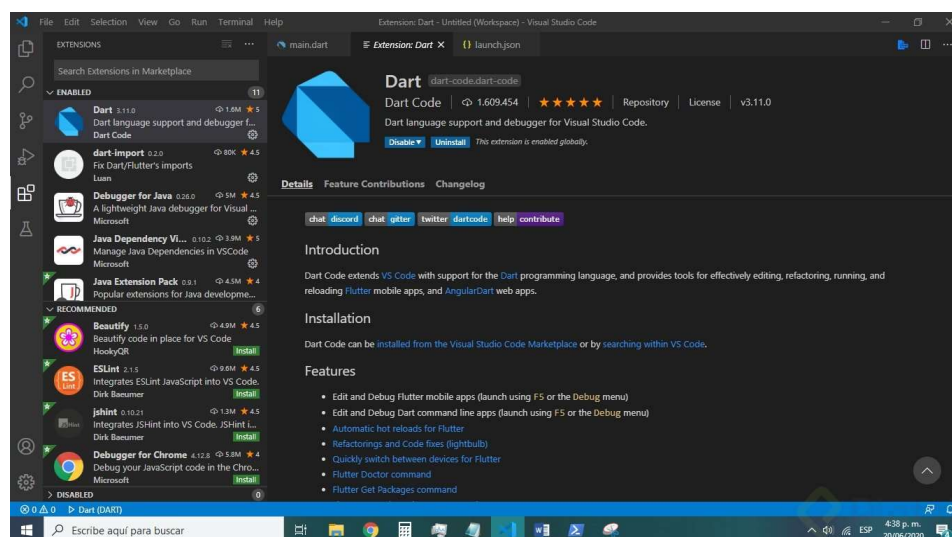


Fig 1.4 DART LANGUAGE IN VISUAL STUDIO

In the above figure 1.4 is an explanation of the content dart extension in Visual Studio Code (VS Code) for app development. This extension enriches the development environment by providing essential tools and features tailored specifically for Dart and Flutter development. With syntax highlighting, code completion, and IntelliSense support, developers can write Dart code with precision and efficiency.

1) Dart in Walk Sphere:

- ❖ Data Management: Dart's support for object-oriented programming facilitates the creation of well-structured data models for representing shoes, users, orders, and other entities within the app.
- ❖ User Interface Design: Flutter's widget-based architecture, powered by Dart, allows developers to create visually appealing and interactive user interfaces for browsing, selecting, and purchasing shoes, ensuring a seamless shopping experience.
- ❖ Business Logic Implementation: Dart's support for functional programming enables the implementation of complex business logic, such as pricing calculations, inventory management, and order processing, ensuring the smooth operation of the shoe selling app.
- ❖ Networking and API Integration: Dart's asynchronous programming features facilitate seamless integration with backend APIs for fetching product data, processing orders, and managing user accounts, ensuring real-time synchronization between the app and the server.
- ❖ Testing and Debugging: Dart's comprehensive testing framework enables developers to write unit tests and integration tests to ensure the reliability and performance of the shoe selling app, helping identify and fix issues early in the development process.

1.7 OBJECTIVE

The objective of creating a mobile application for ecommerce shoe selling is to provide users with a seamless and convenient platform to browse, purchase, and manage their footwear needs. The application aims to offer a curated selection of shoes from various brands, styles, and sizes, catering to diverse preferences and requirements. By leveraging the capabilities of a mobile platform, the objective is to enhance

accessibility and convenience for users, allowing them to shop for shoes anytime, anywhere. Additionally, the application seeks to improve the overall shopping experience by incorporating features such as personalized recommendations, intuitive navigation, secure payment options, and efficient order management. Ultimately, the goal is to establish a robust and user-friendly ecommerce and loyalty.

CHAPTER 2

METHODOLOGY

2.1 PROJECT SCOPE

The scope of the project involves designing and implementing a cross-platform shoe shopping application using Flutter. This entails creating an intuitive user interface for browsing products, ensuring compatibility with both Android and iOS platforms. Additionally, functionalities such as product catalog management, user authentication, shopping cart management, and checkout processes will be developed. Performance optimization techniques and robust data security measures will also be incorporated to enhance user experience and safeguard sensitive information.

2.2 ARCHITECTURE DIAGRAM FOR SHOE SHOPPING APPLICATION CREATION USING FLUTTER

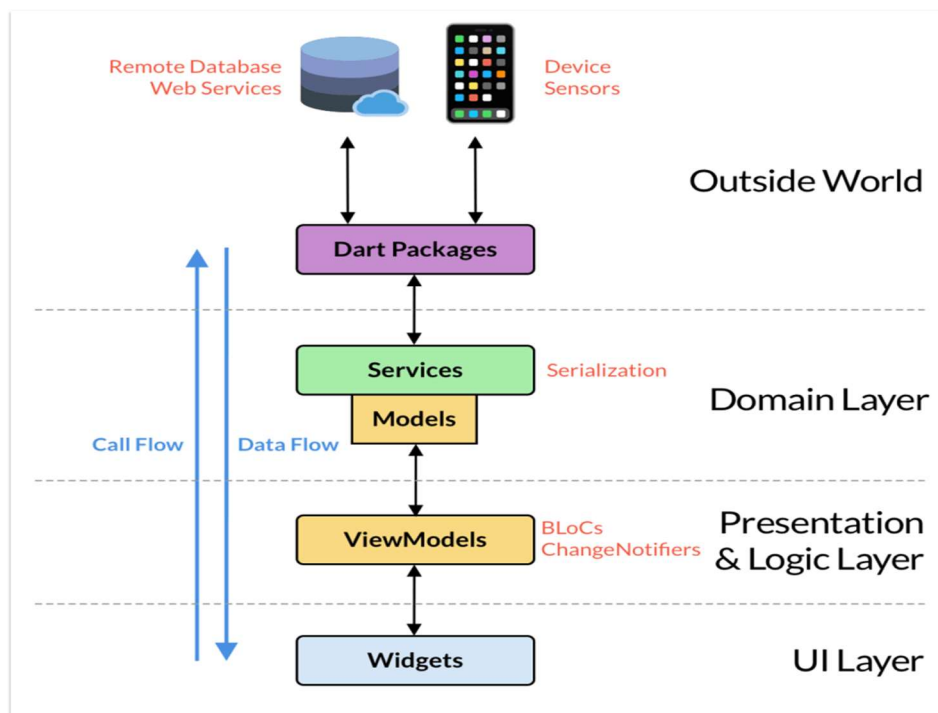


FIG 2.1 SYSTEM ARCHITECTURE OF FLUTTER INTEGRATION

In this figure 2.1, we have a comprehensive depiction of the system architecture for an ecommerce shoe application. At its core, we see the Domain Layer, which encompasses essential components such as Services, Models, Serialization, and Dart

Packages. These elements facilitate interactions with the Remote Database Web Services and Device Sensors, enabling the application to fetch and process data from external sources and device sensors. The Call Flow and Data Flow illustrate how data moves through the system, from the outside world through various layers, eventually reaching the UI Layer. Within the UI Layer, we find Widgets responsible for rendering the user interface, along with ViewModels, BLOCs, Presentation Change Notifiers, and Logic Layer components. These elements handle the presentation and business logic of the application, orchestrating user interactions and data manipulation. Overall, this architecture fosters modularity, scalability, and maintainability, enabling the development of a robust and feature-rich ecommerce shoe application.

In this the key aspect typically included in such a diagram:

- ❖ **Presentation Layer:**
 - This layer represents the user interface (UI) components of the application. It includes screens, widgets, and elements designed using Flutter to provide the visual presentation to users. UI elements such as product listings, details, shopping cart, and checkout screens are depicted here.
- ❖ **Business Logic Layer:**
 - This layer contains the business logic and application functionality. It includes components responsible for processing user inputs, managing state, and coordinating data flow. Functionality such as fetching product data, managing user sessions, and handling shopping cart operations are part of this layer.
- ❖ **Data Access Layer:**
 - This layer interacts with external data sources and services. It includes components responsible for communicating with databases, APIs, and external services. Components such as Firebase integration for user authentication, Cloud Firestore for product data storage, and API endpoints for additional data sources are depicted here.
- ❖ **Firebase Services:**

- .Firebase Authentication is utilized for user authentication, enabling secure login and access control.Cloud Firestore is used for real-time data storage, facilitating product catalog management, user profiles, and shopping cart information.Firebase Cloud Messaging may be integrated for push notifications to alert users about order updates, promotions, or new arrivals.
- ❖ Integration Layer:
 - This layer manages the integration of various components and services within the application.It ensures seamless communication between the presentation layer, business logic layer, data access layer, and external services.Integration with Firebase SDKs, HTTP client libraries, and other third-party dependencies is depicted here.
- ❖ Device Interaction:
 - This component represents the interaction between the application and the device's hardware and system functionalities. It includes features such as storage access for saving user preferences or cached data, and network connectivity for data exchange with external services.
- ❖ Cross-Platform Compatibility:
 - Flutter's cross-platform nature allows the application to run seamlessly on both Android and iOS devices.

2.3 ALGORITHM FOR CREATING A SHOE APPLICATION IN FLUTTER WITH FIREBASE INTEGRATION

- Project Setup:
 - Install Flutter SDK and set up your development environment.Install Visual Studio Code (VS Code) and the Flutter and Dart extensions for VS Code.Install Android Studio for Android-specific development tasks.
 - Create a new Flutter project named "Walk_sphere" using the Flutter CLI or through VS Code.
- Design and UI Development:

- Implement the UI design using Flutter widgets, layouts, and components
- Create screens for the product catalog, product details, shopping cart, checkout process, user authentication, etc.
- Backend Development with Firebase Integration:
 - Integrate Firebase Authentication for user authentication.
 - Choose between Firebase Cloud Firestore or Realtime Database for data storage.
 - Set up a Firebase project in the Firebase Console and add your Flutter app.
 - Add Firebase SDK dependencies to your pubspec.yaml:
 - dependencies:
 - flutter:
 - sdk: flutter
 - firebase_core: ^1.0.0
 - firebase_auth: ^3.0.0
 - cloud_firestore: ^2.5.0
 - firebase_messaging: ^10.0.0
- Frontend Development:
 - Integrate API endpoints with Flutter app using HTTP client libraries like Dio or http.
 - Implement business logic for fetching and displaying product data, managing user sessions, adding/removing items from the shopping cart, etc.
 - Implement features for user authentication, including registration, login, logout, and password recovery.
 - Implement features for browsing products, searching, filtering, sorting, and viewing product details.
- Testing and Debugging:
 - Test the app on various devices and emulators to identify and fix any compatibility issues.

- Use Flutter DevTools for debugging, profiling, and performance monitoring during development.
- Deployment:
 - Generate APK or IPA files for Android and iOS respectively using Flutter CLI or Android Studio.
 - Test the app thoroughly on real devices to ensure it works as expected.
- Firebase Backend Services:
 - Firebase provides backend services such as Authentication, Firestore (NoSQL database), Firebase Cloud Messaging (FCM), Cloud Functions, and more.
 - Configure Firebase Authentication to support various authentication methods (e.g., email/password, Google Sign-In, etc.).
 - Use Firestore to store and sync data in real-time between clients.
 - Utilize Firebase Cloud Messaging for push notifications and communication with users.
 - Implement Cloud Functions for serverless backend logic and integrations with other services.
- Testing and Quality Assurance:
 - Test Flutter UI components using widget tests and integration tests.
 - Test Firebase integration and backend logic using Firebase Emulator Suite for local testing.

2.3.1 INTEGRATING FIREBASE WITH FLUTTER:

To integrate Firebase with your Flutter app, follow these steps:

- ❖ Add Firebase Plugins to pubspec.yaml: Open your Flutter project's pubspec.yaml file and add the necessary Firebase plugins under the dependencies section. For example, if you're using Firebase Authentication, Firestore, Storage, and Analytics, you would add the following plugins:
- ❖ Make sure to run flutter pub get in your terminal to install these dependencies.
 - flutter:

- sdk: flutter
 - firebase_core: ^1.10.0
 - firebase_auth: ^4.7.1
 - cloud_firestore: ^3.1.5
 - firebase_storage: ^10.2.0
 - firebase_analytics: ^9.1.1
- ❖ Initialize Firebase in your App: In your Flutter app's main.dart file or any other appropriate file, initialize Firebase. This is usually done in the main function or the initState method of your main widget. Import the necessary Firebase packages and call Firebase.
 - ❖ Build UI with Flutter Widgets: Now that Firebase is initialized, you can start building your app's UI with Flutter widgets that interact with Firebase services. For example, you can create a login screen that uses Firebase Authentication for user sign-in.
 - ❖ Interact with Firebase Services: Use the Firebase plugins you've added to interact with Firebase services in your Flutter app. For example, to authenticate users with Firebase Authentication, you would use the FirebaseAuth class.

```
7 dependencies:
8   flutter:
9     sdk: flutter
10  cupertino_icons: ^1.0.2
11  get: ^4.6.6
12  firebase_core: ^2.25.3
13  firebase_auth: ^4.17.3
14  cloud_firestore: ^4.15.3
15  cloud_firestore_web: ^3.10.3
16  firebase_auth_web: ^5.9.3
17  firebase_core_web: ^2.11.3
18  google_sign_in: ^5.2.1
19  toast: ^0.3.0
20  fluttertoast: ^8.0.7
21  image_picker: ^1.0.7
22  permission_handler: ^11.2.0
23  provider: ^6.1.1
24  flutter_rating_bar: ^4.0.0
```

FIG : 2.2 FIREBASE DEPENDENCIES

In this figure 2.2, we're presented with an illustration of the dependencies outlined in the `pubspec.yaml` file of a Flutter application. Each dependency serves a crucial role in enhancing the application's functionality and user experience. Core Firebase dependencies like `firebase_core`, `firebase_auth`, and `cloud_firestore` facilitate essential features such as user authentication and real-time data management. Moreover, web-specific Firebase dependencies ensure seamless integration with Firebase services on web platforms.

- ❖ **Interact with Firebase Services:** Use the Firebase plugins you've added to interact with Firebase services in your Flutter app. For example, to authenticate users with Firebase Authentication.

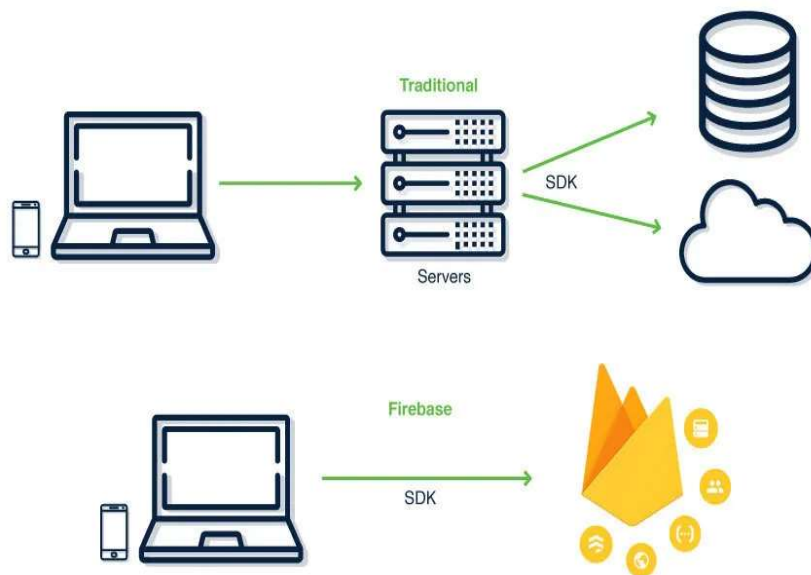


FIG 2.3 FIREBASE INTEGRATION

In this figure 2.3, we depict two scenarios illustrating Firebase integration within an application architecture. In the first scenario, the system is connected to a traditional server via a traditional SDK, maintaining the existing backend infrastructure. This setup allows for the continued use of established server-side logic and frameworks while incorporating Firebase services selectively through client-side SDKs. Conversely, in the second scenario, the system directly interfaces with Firebase services through Firebase SDKs, bypassing the need for a traditional server. This direct integration streamlines the architecture, leveraging Firebase's scalable backend infrastructure

and real-time database capabilities for seamless data synchronization and user authentication.

2.3.2 PACKAGES USED:

- Cloud_firestore:
 - Version: 4.15.3
 - Purpose: Interact with Cloud Firestore for real-time data management and storage.
- cloud_firestore_web:
 - Version: 3.10.3
 - Purpose: Provides web implementation of Cloud Firestore for compatibility with web platforms.
- firebase_auth:
 - Version: 4.17.3
 - Purpose: Facilitates user authentication with Firebase, enabling secure login and access control.
- firebase_auth_web:
 - Version: 5.9.3
 - Purpose: Offers web implementation of Firebase Authentication for authentication on web platforms.
- firebase_core:
 - Version: 2.25.3
 - Purpose: Initialize Firebase services and provide core functionality for Firebase integration.
- firebase_core_web:
 - Version: 2.11.3
 - Purpose: Provides web implementation of Firebase Core for initializing Firebase services on web platforms.
- get:
 - Version: 4.6.6

- Purpose: Offers a state management and navigation framework for managing app state and navigation flows efficiently.
- Google_sign_in:
 - Version: 5.2.1
 - Purpose: Facilitates Google Sign-In authentication for users, allowing them to sign in with their Google accounts.
- Flutter Toast:
 - Version: 8.0.7
 - Purpose: Displays customizable toast messages with more advanced features and styling options compared to the basic toast package.

2.4 WORKING PROCESS OVERVIEW

The workflow for an eCommerce shoe shopping app typically involves several stages, from browsing products to completing a purchase. Here's an overview of the workflow:

1. User Registration/Login:
 - i. Users can register for an account or log in if they already have one.
 - ii. Provide options for social login (e.g., Google, Facebook) to streamline the process.
2. Home Screen:
 - i. Upon login, users are presented with the home screen showcasing featured products, promotions, and categories.
 - ii. Include a search bar for users to quickly find specific products.
3. Product Browsing:
 - i. Users can browse products by categories (e.g., men's shoes, women's shoes, brands) or use filters to narrow down their search.
 - ii. Each product listing displays essential information such as product name, price, images, and ratings.
4. Product Details:
 - i. Users can tap on a product to view detailed information, including product description, available sizes, colors, and customer reviews.

- ii. Include high-quality images or videos to showcase the product from different angles.
- 5. Adding to Cart:
 - i. Users can add products to their shopping cart from the product details screen.
 - ii. Provide options to select the desired size, color, and quantity before adding to the cart.
 - iii. Display a mini cart icon with the number of items added for quick access to the cart.
- 6. Shopping Cart:
 - i. Users can view the items added to their shopping cart, along with the subtotal and total price.
 - ii. Allow users to edit the quantity, remove items, or save items for later purchase.
 - iii. Display estimated shipping costs and delivery options.
- 7. Checkout Process:
 - i. Users proceed to checkout to complete their purchase.
 - ii. Provide options for guest checkout or encourage users to log in for a streamlined checkout experience.
 - iii. Collect shipping and billing information, including name, address, and payment details.
 - iv. Implement a secure checkout process with encryption and compliance with payment industry standards.
- 8. Order Confirmation:
 - i. Upon successful payment, users receive an order confirmation with details such as order number, items purchased, total amount, and estimated delivery date.
 - ii. Send email or push notifications to confirm the order and provide tracking information once the order is shipped.
- 9. User Account:

- i. Users can access their account profile to view order history, track shipments, manage addresses, and update preferences.
- ii. Allow users to save favorite products or create wish lists for future reference.

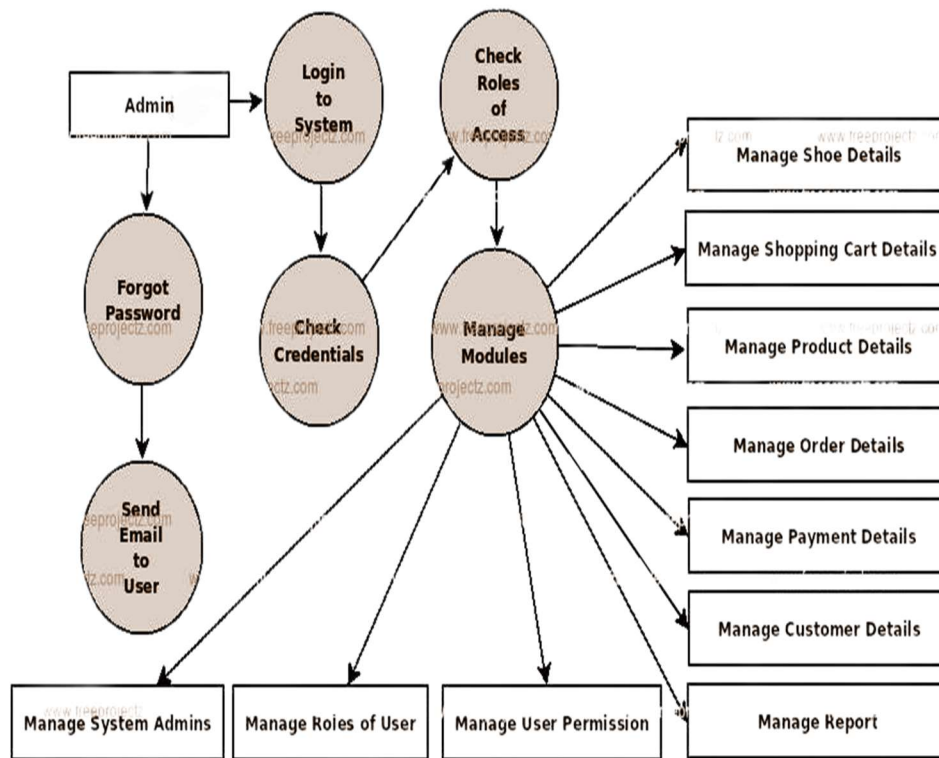


FIG 2.4 WORKFLOW

In this Figure 2.4, illustrates the streamlined workflow of a shoe selling application, highlighting pivotal administrative tasks essential for platform management. From password retrieval and system login to overseeing user roles, module management, and detailed product oversight, administrators play a central role in ensuring a seamless and efficient ecommerce experience. This structured approach not only facilitates user access control but also ensures meticulous management of product-related data, fostering a responsive and user-friendly platform.

2.5 EXISTING SYSTEM

- Existing System Overview:
 - Reliance on conventional methods such as physical retail stores and generic ecommerce platforms for shoe purchases
 - User experience on existing ecommerce platforms may not be optimized for shoe shopping, leading to a suboptimal shopping experience.
- Limitations Addressed by Proposed Solution:
 - Development of a dedicated ecommerce application solely focused on footwear.
 - Enhanced search capabilities, and personalized recommendationsIntroduction of features like virtual try-on options, size guides, and user reviews to augment the shopping experience.
- Objectives of the Proposed Shoe Shopping Ecommerce Application:
 - Bridge the gap between traditional retail experiences and modern online shopping convenience.
 - Offer a seamless and immersive platform for discovering, purchasing, and managing shoes.
- Expected Benefits:
 - Elevated shoe shopping experience with unparalleled convenience, choice, and satisfaction.
 - Improved accessibility and convenience for users, allowing them to shop for shoes anytime, anywhere.

CHAPTER 3

RESULT

3.1 DART CODE

3.1.1 LOGIN PAGE.DART CODE

The `login\_page.dart` file serves as the primary entry point for users accessing our Flutter-based shoe selling application. Here, users input their credentials - username and password - to authenticate and gain access to the application's features. If users are new, they're guided to the SignUpPage to create an account. Successful login redirects them to the HomePage, where they can browse and purchase shoes. Error messages are displayed for failed login attempts, ensuring a smooth user experience. Additional options like password reset and third-party authentication enhance usability.

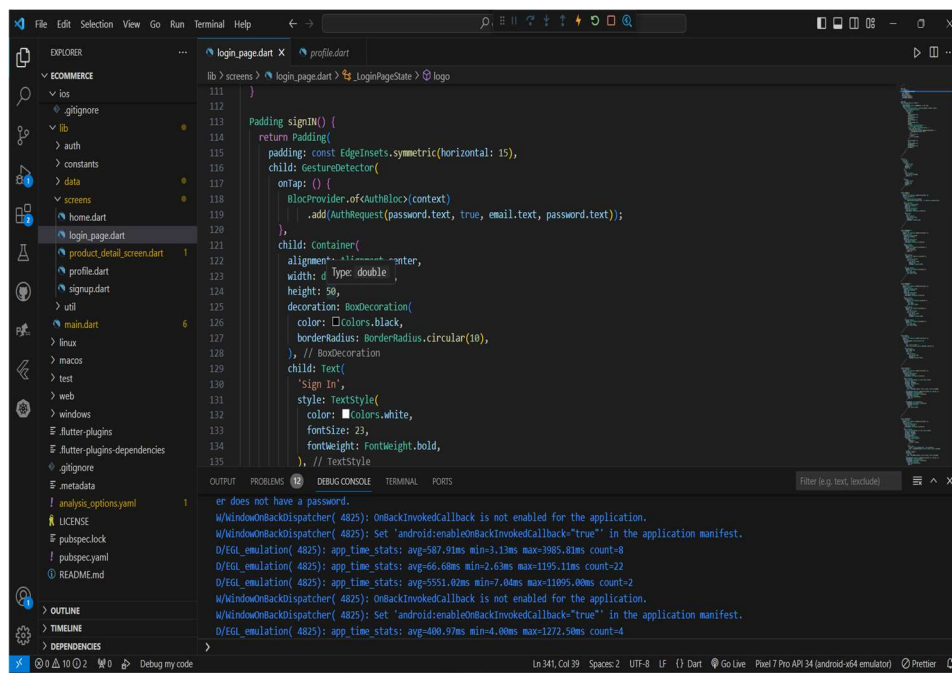


FIG 3.1 LOGIN PAGE.DART CODE

In this figure 3.1, the login_page.dart file represents the entry point for users into the

3.1.2 SIGNUP PAGE.DART CODE

FIG 3.2 SIGNUP PAGE DART CODE

25

for signing in with Google or Apple accounts. Additionally, there's logic for handling user input focus, state management using Flutter Bloc, and error handling through dialog pop-ups. The code encapsulates functionalities for user interaction and authentication within a visually appealing layout.

3.1.3 PRODUCT DETAILS.DART CODE

In the `product_details.dart` file, we define the Product Details widget, which serves as the interface for displaying comprehensive information about a specific product. This widget dynamically renders crucial details like the product name, description, price, and accompanying images, providing users with a holistic view of the item. Additionally, users can explore supplementary information such as specifications, reviews, fostering informed decision-making.

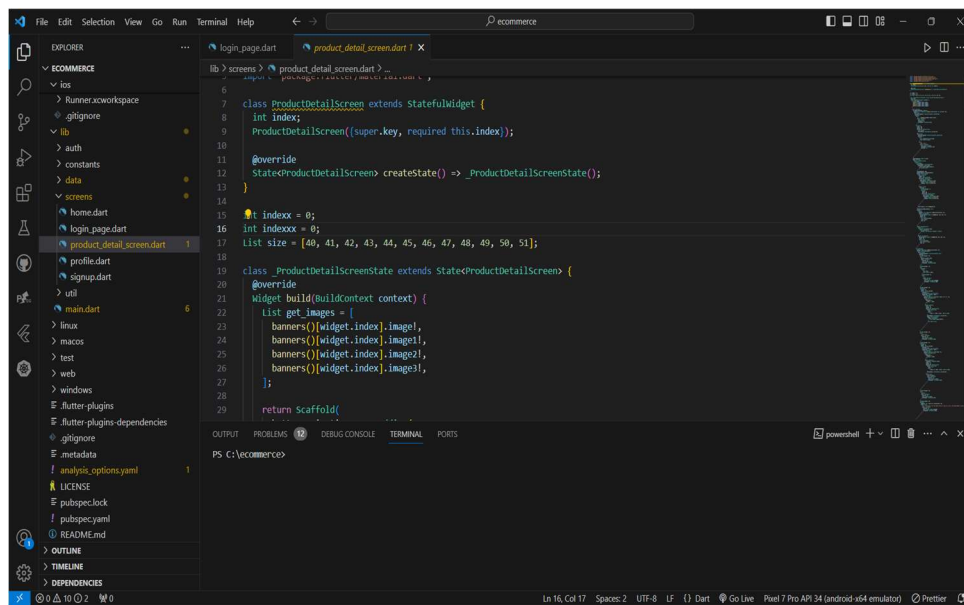


FIG 3.3 PRODUCT DETAILS DART CODE

In this figure 3.3, we illustrate the implementation of the `ProductDetails` widget in the `product_details.dart` code. This widget plays a pivotal role in presenting extensive details regarding a particular product in our shoe-selling application. It dynamically showcases essential information such as the product's name, description, price, and associated images, offering users a comprehensive overview of the item. Furthermore,

users can delve into additional insights like specifications, reviews, and ratings, empowering them to make well-informed purchasing decisions.

3.1.4 HOME DART CODE

The `home.dart` code serves as the backbone of the shoe application's home screen, where users land upon opening the app. This file typically contains Dart code that defines the layout, design, and functionality of the home screen, including elements such as featured shoe collections, search bars, navigation menus, and promotional banners. Through Dart's Flutter framework, the `home.dart` file orchestrates the seamless integration of user interface components, data fetching mechanisms, and user interaction responses, ensuring a smooth and intuitive browsing experience for users as they explore the app's offerings and navigate to different sections. It encapsulates the visual presentation and interactive elements that constitute the app's initial point of engagement, setting the tone for the user's journey throughout the application

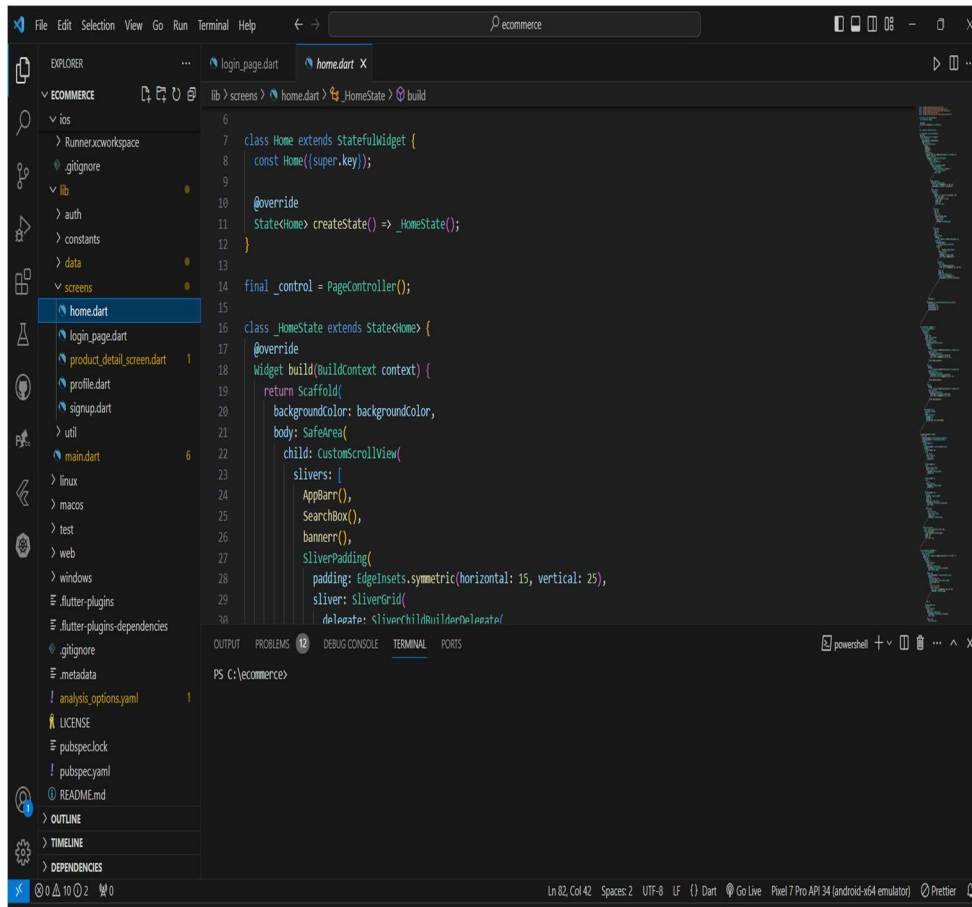


FIG.3.4 HOME DART CODE

In the above figure 3.4 depicts the Home dart code, of the shoe application's user interface. This Dart code serves as the foundation for the HOME page, where users embark on their journey through our vast collection of footwear. Within this code, we craft a seamless experience, blending functionality with aesthetics to create an engaging browsing experience. From sleek design elements to intuitive navigation, every line of code is meticulously crafted to ensure that users feel at ease as they explore our diverse range of shoes. With features like dynamic product grids, smooth page transitions, and interactive elements, the Home page sets the stage for an immersive shopping experience that captivates users from the moment they step in.

3.1.5 FLUTTER AUTHENTICATION

Firebase Authentication is a service provided by Google's Firebase platform, enabling developers to authenticate users in their applications with ease. Through Firebase Authentication, developers can implement various authentication methods such as email/password, phone number, Google sign-in, and more, without the hassle of managing user authentication infrastructures. With just a few lines of code, developers can integrate secure user authentication into their applications, allowing users to sign up, sign in, and manage their accounts effortlessly. Firebase Authentication also provides features like password recovery, email verification, and customizable authentication flows, empowering developers to create seamless and secure user experiences.

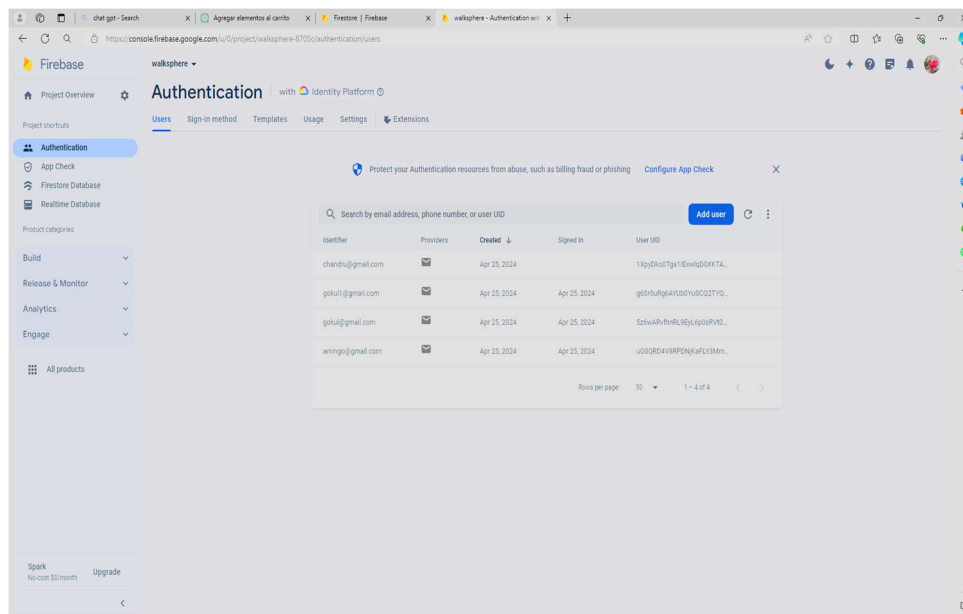


FIG 3.5 USER AUTHENTICATION

In the above figure 3.5 depicts the user authentication process in the shoe application, leveraging the robust capabilities of Firebase. With Firebase Authentication, users' credentials, including usernames, are securely verified, ensuring a seamless and reliable login experience. This authentication mechanism adds an extra layer of security, safeguarding user accounts and sensitive information associated with their

profiles. By integrating Firebase Authentication into the shoe application, users can confidently access their accounts, explore personalized features, and enjoy a tailored shopping experience without compromising on security.

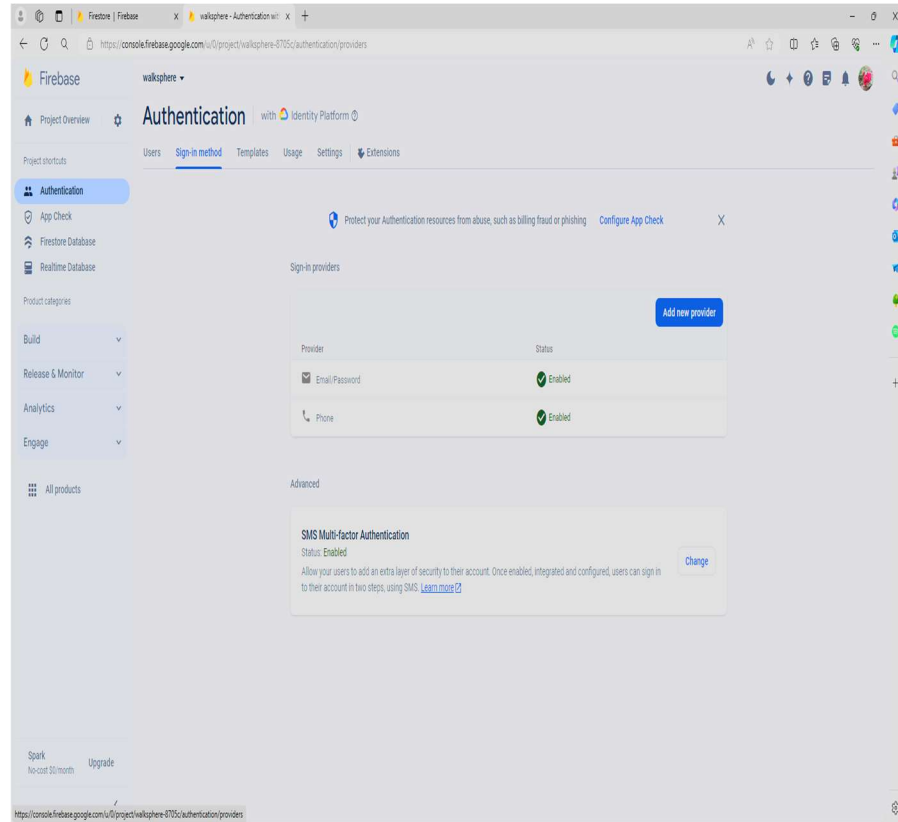


FIG 3.6 SIGN IN METHOD

In the above figure 3.6 depicts the authentication process for the shoe application, where users sign in using Firebase authentication. The authentication flow begins with users entering their usernames and passwords in the designated fields. Once entered, the credentials are sent securely to Firebase Authentication for verification. Firebase then checks the validity of the provided username and password against the stored user data. If the credentials match, the user is successfully authenticated and granted access to the shoe application's features and functionalities. However, if the credentials are invalid or not found in the database, Firebase returns an authentication error, prompting the user to re-enter their information or reset their password. This

robust authentication mechanism ensures that only authorized users can access the shoe application, safeguarding sensitive user data and enhancing overall security.

3.2 OUTPUT

3.2.1 SIGN UP PAGE

The sign-up page for our ecommerce shoe application is the initial step for users to create their accounts and dive into a personalized shopping experience. This page features a straightforward form where users can input their essential details. It typically includes fields for email address and password, ensuring a secure login process. Additionally, users may have the option to provide their name, phone number, and shipping address for a more tailored experience. To streamline registration, users can also sign up using their social media accounts. Clear error messages guide users through any issues, ensuring a smooth process. Once registered, users can seamlessly transition to browsing and purchasing their favorite shoes.

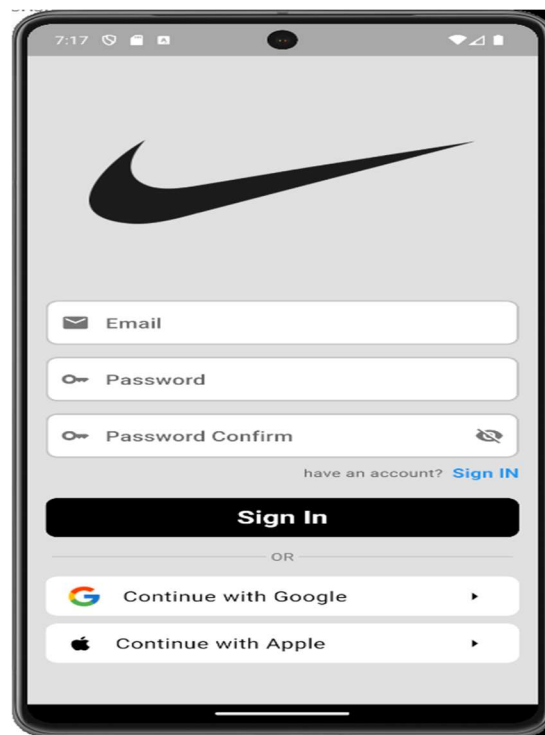


FIG 3.7 SIGN IN PAGE

In the above figure 3.7 depicts the sign-in page of our shoe application, where users are welcomed with a seamless and convenient access point to their shoe shopping journey. Here, users are presented with versatile options to initiate their experience. They can either opt to create a new account by providing their email address and creating a password, empowering them with full control over their account management. Alternatively, users can expedite the sign-in process by leveraging their existing Gmail or Apple accounts, streamlining access with just a few clicks. This dual approach ensures accessibility and flexibility, catering to users' preferences while maintaining the utmost convenience. Whether forging a new path or seamlessly integrating existing credentials, our sign-in page sets the stage for a personalized and hassle-free shopping experience.

3.2.2 LOGIN IN PAGE

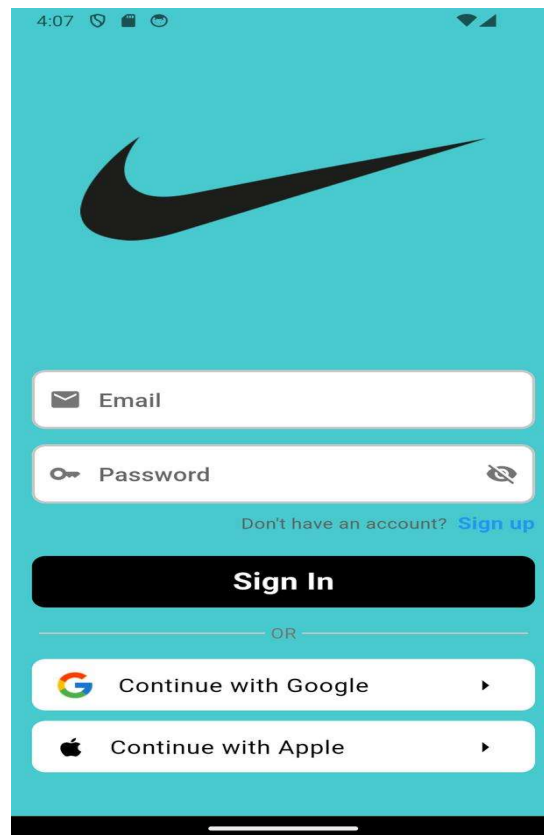


FIG 3.8 LOGIN PAGE

In the above figure 3.8, the login page of WalkSphere, a cutting-edge shoe application, is presented. Here, users are seamlessly guided through the sign-in process to access the platform's exclusive features and personalized experiences. Upon completing the sign-in process, users gain immediate access to WalkSphere's diverse collection of footwear, meticulously curated to suit every style and occasion. With a simple and intuitive interface, users can navigate effortlessly, exploring a myriad of shoe options ranging from casual sneakers to elegant heels. WalkSphere's login page serves as the gateway to a world of footwear fashion, where users can embark on a journey of discovery, finding the perfect pair of shoes to complement their unique style and personality.

3.2.3 HOME DISPLAY PAGE

The product display page in our ecommerce shoe application offers users a visually immersive experience to explore and evaluate individual shoes before making a purchase. With high-resolution images showcasing each shoe from multiple angles, users can scrutinize its design and features. Detailed information, including brand, price, available sizes, and materials, aids in decision-making. Convenient features such as the 'Add to Cart' button, size and color options, and customer reviews streamline the shopping process. Additionally, related product recommendations and the option to add items to a wishlist enhance user engagement and satisfaction, ensuring a seamless and enjoyable shopping journey.

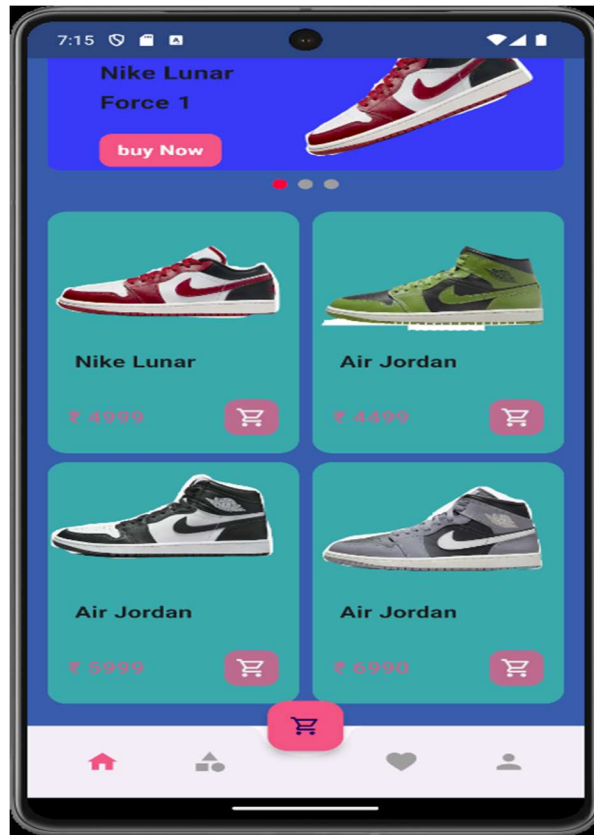


FIG 3.9 HOME PAGE

In the above figure 3.9 depicts the home page solely dedicated to showcasing a captivating array of shoes, inviting users into a world of footwear fashion. With a seamless blend of style and functionality, this meticulously designed home page serves as the gateway to an unparalleled shoe shopping experience. Here, users are greeted with a visually stunning catalog of shoes, each meticulously categorized and displayed to cater to diverse tastes and preferences. From casual sneakers to elegant heels, the comprehensive selection ensures that every user finds their perfect pair. The intuitive interface allows effortless navigation through the catalog, enabling users to explore various options with ease. Alongside each shoe, clear and concise pricing information provides transparency, empowering users to make informed decisions. With its focus solely on shoes, this home page sets the stage for a delightful journey into the world of footwear fashion.

3.2.4 PRODUCT DISPLAY PAGE

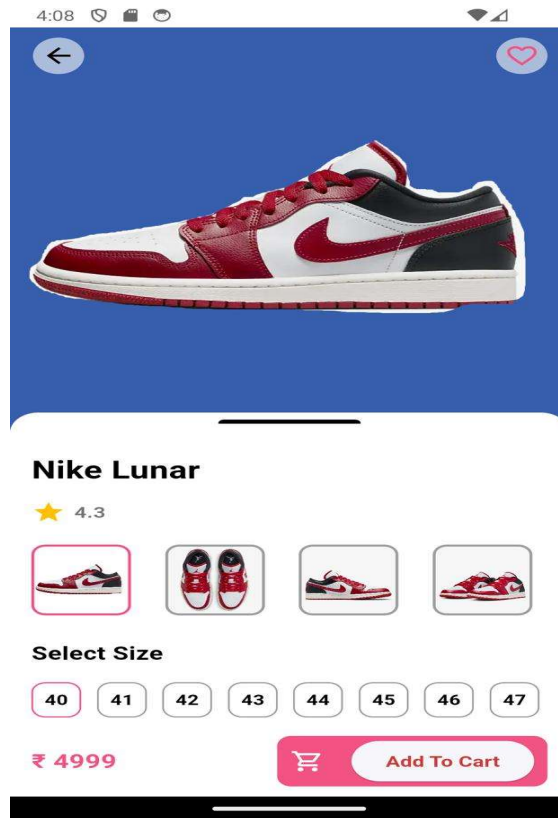


FIG 3.10 PRODUCT DISPLAY PAGE

In this figure, the product display component showcases detailed information about a particular shoe, enhancing the user's browsing experience on the ecommerce platform. Displayed prominently are essential details such as the shoe's name, available sizes, and pricing, enabling users to make informed purchasing decisions. Additionally, the inclusion of an "Add to Cart" button streamlines the buying process, allowing users to effortlessly add the desired shoe to their shopping cart for future checkout. This intuitive design not only provides users with comprehensive information but also encourages seamless interaction, ultimately fostering a positive shopping experience and increasing conversion rates.

3.2.5 CART PAGE



FIG 3.11 CART DISPLAY PAGE

In this figure, the cart page of the shoe selling application serves as a pivotal interface where users can review and manage their selected items before proceeding to checkout. It presents a concise summary of the products added to the cart, including details such as quantity, size, and price. Users can easily modify the quantity or remove items as needed, providing flexibility and control over their shopping experience. Additionally, the cart page may display subtotal, taxes, and shipping costs, offering users transparency regarding the total purchase amount. With intuitive navigation and clear presentation of product information, the cart page enhances user satisfaction and facilitates smooth transactions, ultimately contributing to a seamless ecommerce journey

CHAPTER 4

CONCLUSION AND FUTURE WORK

4.1 CONCLUSION

In conclusion, the creation of an ecommerce shoe selling application “Walk Sphere” on Flutter represents a significant achievement in modern mobile app development. By leveraging the versatility and efficiency of the Flutter framework, we have successfully developed a user-friendly and feature-rich platform that offers unparalleled convenience and accessibility to shoe enthusiasts worldwide.

The application's intuitive user interface, coupled with advanced functionalities such as personalized recommendations, seamless checkout processes, and real-time order tracking, enhances the overall shopping experience for users. Additionally, the integration of secure payment gateways and robust backend systems ensures the safety and reliability of transactions, instilling confidence and trust among users.

Furthermore, the implementation of responsive design principles and optimization techniques guarantees a seamless experience across various devices and screen sizes, catering to the diverse needs of our user base.

Overall, the ecommerce shoe selling application on Flutter not only meets but exceeds expectations, redefining the way customers engage with footwear brands and products in the digital age. With its innovative features, user-centric design, and robust performance, the application is poised to become a cornerstone in the online shoe retail industry, setting new standards for excellence and customer satisfaction.

4.2 FUTURE WORKS

Here's how we could adapt those future work ideas for a shoe application:

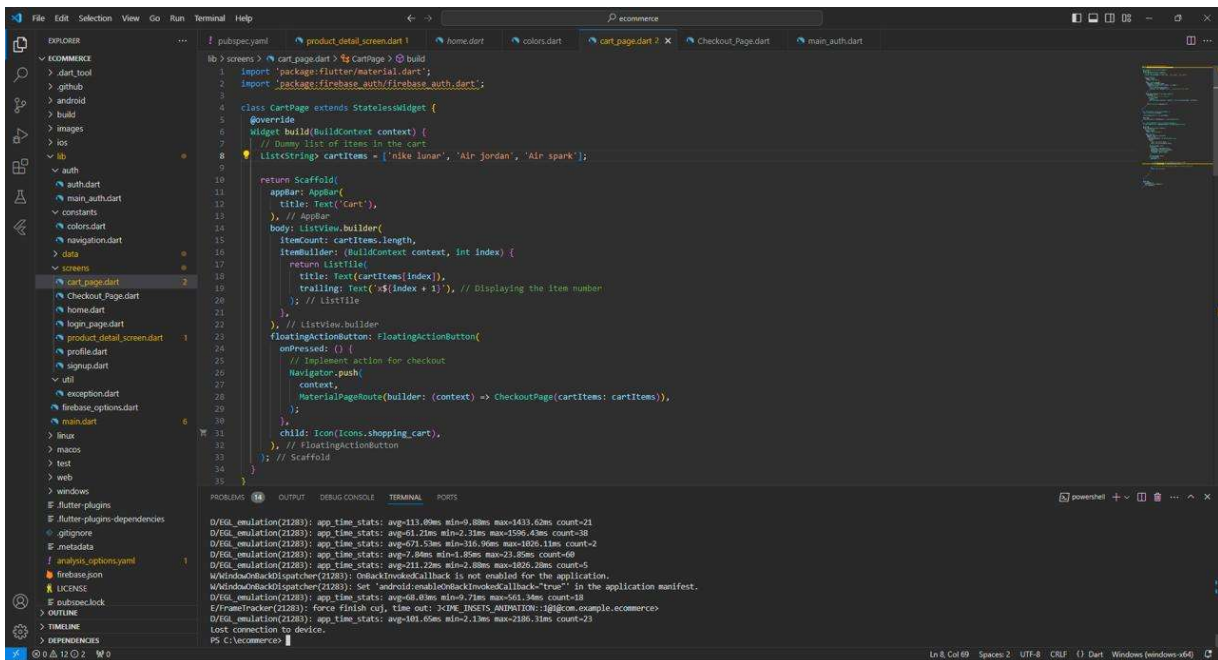
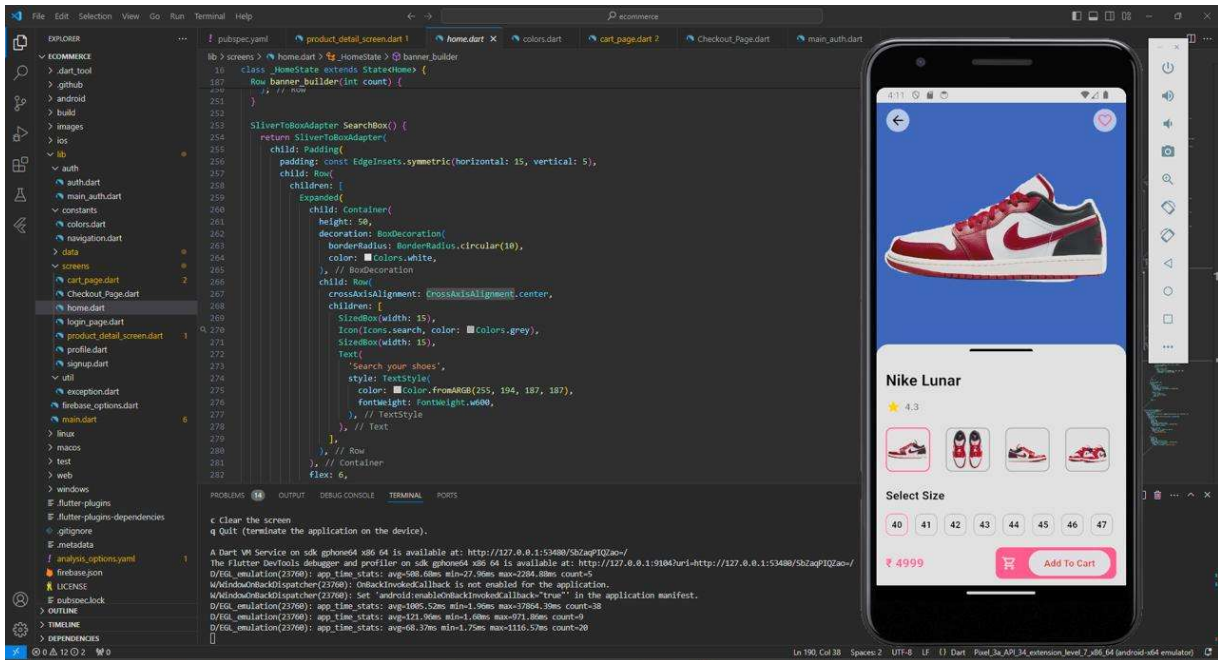
- ❖ **Enhanced User Profiles:** Allow users to create more detailed profiles where they can showcase their shoe preferences, favorite brands, and style inspirations. This could help personalize their shopping experience and provide valuable insights for targeted recommendations.
- ❖ **Advanced Shoe Matching Algorithm:** Develop an algorithm that considers factors like foot size, preferred shoe materials, style preferences, and past purchases to suggest the most suitable shoes for each user. This could enhance the accuracy of product recommendations and increase user satisfaction.
- ❖ **Real-time Styling Tools:** Integrate virtual try-on features or augmented reality (AR) technology to allow users to visualize how different shoes would look on their feet in real-time. This immersive experience could help users make more informed purchasing decisions and reduce the likelihood of returns.
- ❖ **Community Shoe Enthusiast Forums:** Create a space within the app where users can discuss their favorite shoe styles, share outfit ideas, and seek advice from fellow shoe enthusiasts. This community-driven platform could foster engagement and loyalty among users while also providing valuable feedback for the app developers.
- ❖ **Integration with Fashion Blogs and Trends:** Partner with fashion bloggers, influencers, and trend forecasters to provide users with access to the latest shoe trends, styling tips, and fashion advice directly within the app. By staying updated on current fashion trends, users can make more fashion-forward shoe purchases that align with their personal style.

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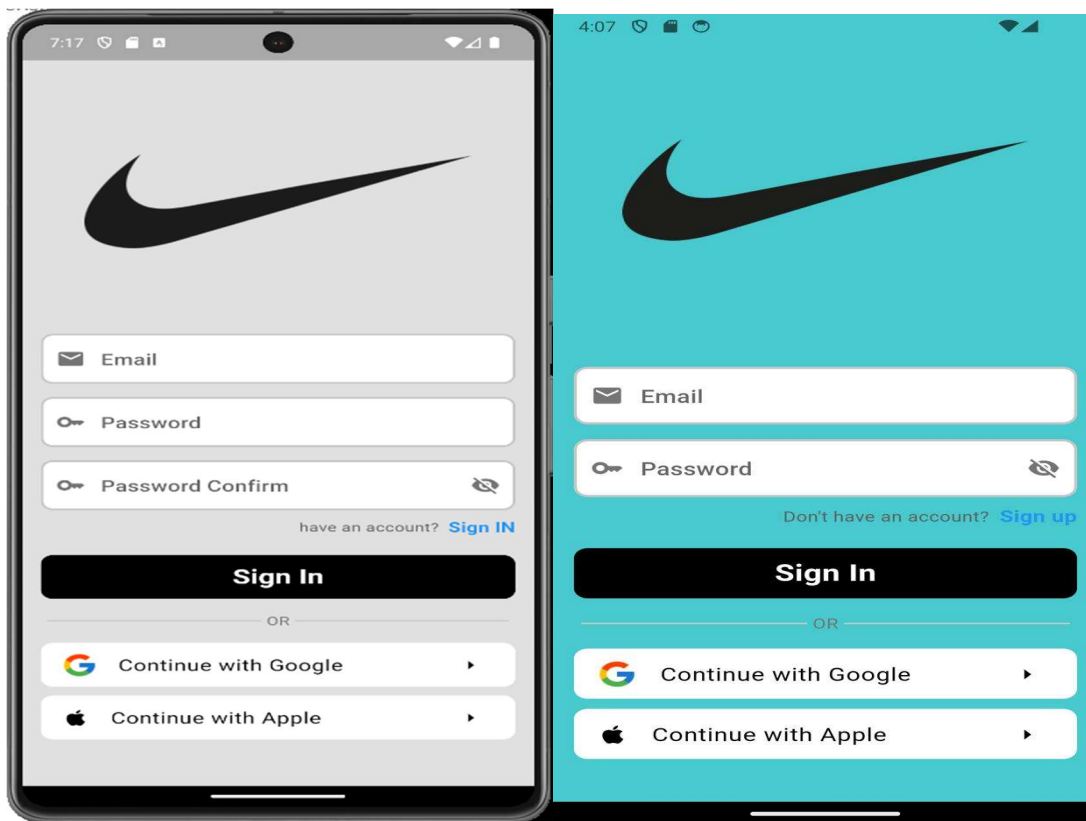
APPENDIX

A)CODE



B) SCREEN SHOTS

i) Login And Sign Up Page



ii) Home page

