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Kharghar, Navi Mumbai - 410 210.

PROJECT REPORT

ON

APPLICATION FOR PULSE UP FITNESS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
AWARD OF THE

DIPLOMA IN INFORMATON ENGINEERING

SUBMITTED BY

ADITYA KUMKAR (2009640063)

NIHAL MISHRA (2009640019)

PRATHAMESH PAWADE (2209640028)

GUIDED BY

MR. HARIDAS KHEDKAR

Information Technology Department

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

Academic Year **2024-25**

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INSTITUTE VISION:

"To excel in the field of technology by creating technocrats with value- based professionalism "

INSTITUTE MISSION

- To provide technical expertise to fulfill the needs of the industry.

- To impart ethical values & professional responsibilities.

- To achieve excellence in academics.

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DEPARTMENTAL VISION

"To Visualize the creation of skilled, proficient IT Professionals to meet current challenges."

DEPARTMENTAL MISSION

- To encourage young minds for training & entrepreneurship.

- To convey standard education with rapidly changing environment with ethical values.

- To provide an environment where students can continuously learn, apply & communicate knowledge.

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PROGRAM OUTCOME (POs)

- **PO 1. Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

- **PO 2. Problem analysis:** Identify and analyze well-defined engineering problems using codified standard methods.

- **PO 3. Design/ development of solutions:** Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

- **PO 4. Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

- **PO 5. Engineering practices for society, sustainability and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical Practices.

- **PO 6. Project Management:** Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well- defined engineering activities.

- **PO 7. Life-long learning:** Ability to analyze individual needs and engage in updating in the context of technological changes.

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Programme Educational Objectives (PEOs)

PEO1: Provide socially responsible, environment friendly solutions to Computer Engineering related broad-based problems adapting professional ethics.

PEO-2: Adapt state-of-the-art of Computer Engineering broad-based technologies to work in multi-disciplinary work environments.

PEO-3: Solve broad-based problems individually and as a team member communicating effectively in the world of work.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1. Modern Information Technology: Use latest technologies for operation and application of information.

PSO 2. Information Technology Process: Maintain the information process using modern information and communication technologies.

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DECLARATION

I hereby declare that the project entitled **"APPLICATION FOR PULSE UP FITNESS"** submitted for a diploma in Information Technology under MSBTE, is my original work and the project has not formed the basis for the award of any degree, association, fellowship or any other similar titles.

Signature of the Student:

Place: Siot, Kharghar, Navi Mumbai

Date:

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SARASWATI **Institute of Technology**

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Kharghar, Navi Mumbai - 410 210.

INFORMATION TECHNOLOGY DEPARTMENT

CERTIFICATE

This is to certify that the Project Report entitled **"APPLICATION FOR PULSE UP FITNESS"**

was duly submitted by the following students:

ADITYA KUMKAR

(2009640063)

NIHAL MISHRA

(2009640019)

PRATHAMESH PAWADE
(2209640028)

Has been successfully completed in a satisfactory manner as a part of the project in partial fulfillment of requirements for the award of **Diploma in Information Technology** conferred by the **MSBTE.**

Project Guide

Mr. Haridas Khedkar

Project Co-ordinator

Mrs. Samika Patil

HOD, Information Technology Dept

Mrs. Jyoti Shinde

Principal

Dr.D.R. Suroshe

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APPROVAL OF PROJECT

This report entitled **"APPLICATION FOR PULSE UP FITNESS"** by the following students–

1. **ADITYA KUMKAR** - **(2009640063)**

2. **NIHAL MISHRA** - **(2009640019)**

3. **PRATHAMESH PAWADE** - **(2209640028)**

Are approved for the Diploma of Information Technology.

Internal Examiner	**External Examiner**

Date: -   21 / 04 / 2024

Place:-   SIOT, Kharghar, Navi-Mumbai

ACKNOWLEDGEMENT

ABSTRACT

"APPLICATION FOR PULSE UP FITNESS" is a comprehensive mobile application developed to revolutionize personal health and wellness management. Designed specifically for fitness enthusiasts, the app integrates modern technology with expert guidance to provide an all-in-one fitness solution. Key features include a Meditation Space with themed music for mental relaxation, AI-powered Expert Crafted Routines with voice assistance, and an intelligent chatbot—Pulse Chat—for resolving fitness-related queries.

The app also offers a Unisex BMI Calculator, an Android-integrated Steps Counter, and detailed animated guides for both Home and Gym Workouts. Additionally, it includes a Yoga Asanas section, personalized Diet Plans for bulking and shredding, and a Maintenance Calorie Calculator. Interactive elements like user feedback and integrated social media links (Instagram and LinkedIn) enhance user engagement.

"Pulse Up" aims to promote a healthier lifestyle through accessible, guided, and user-friendly fitness support, making it a reliable digital companion for everyday wellness.

CONTENTS

Topic   **Page No**

LIST OF FIGURES

CHAPTER 1
Introduction to Android Studio

CHAPTER 1 - Introduction to Android Studio

1.1 What is Android Studio?

Android Studio is the official Integrated Development Environment (IDE) for Android app development, developed by Google. It is built on IntelliJ IDEA, which is an open-source IDE, and is specifically designed for building Android applications. Android Studio provides developers with a variety of tools to help create high-performance apps for smartphones, tablets, wearables, TV, and Android Auto. The IDE integrates the necessary tools for coding, testing, and debugging, allowing developers to focus on building high-quality applications rather than managing tools individually.

Fig 1.1 – Android Studio logo

1.2 Key Features of Android Studio

Android Studio is packed with a number of features that make it the ideal environment for Android app development:

1. Flexible Gradle-based Build System The Gradle-based build system offers automation and customization of build processes. It also makes it easier to work with different versions of Android and libraries.

2. Visual Layout Editor This allows developers to drag and drop UI components (like buttons, text views, images) to create a beautiful user interface. It also provides an instant preview of the layout, ensuring smooth design and efficiency.

3. APK Analyzer This tool helps you analyze the content of an APK (Android Application Package) file, providing you with insights into the app's size and enabling you to reduce it by optimizing resources and code.

4. Intelligent Code Editor The Android Studio code editor provides advanced features such as code completion, refactoring, and real-time syntax checking to improve productivity and minimize errors. The IDE also supports Java, Kotlin, and C++.

5. Emulator Support Android Studio comes with an Android Emulator that allows you to test your app on various virtual devices, ensuring compatibility across multiple screen sizes, resolutions, and API levels.

6. Real-time Profiling Tools You can use built-in profiling tools to monitor your app's performance in real-time. These tools provide information about CPU usage, memory usage, network requests, and other important metrics, helping you optimize your app's performance.

7. Firebase Integration Android Studio offers easy integration with Firebase, a backend-as-a-service platform. Firebase allows you to incorporate authentication, cloud storage, real-time database, and push notifications with just a few clicks.

8. Support for Android App Bundles Android Studio provides support for building App Bundles to optimize the distribution of your app. App Bundles are more efficient than APKs and help reduce the size of the app delivered to users.

1.3 Why Android Studio?

Android Studio is not just an IDE but an all-in-one development tool. Here's why it's the preferred choice for Android developers:

1. Official Support from Google Android Studio is officially supported by Google, ensuring that developers are always up-to-date with the latest Android features, APIs, and SDKs.

2. Regular Updates and Rich Community Support The tool is updated regularly with bug fixes, new features, and support for the latest Android versions. It also boasts a large and active community, offering solutions to problems, guides, and support.

3. Built-in Tools for Testing and Debugging Android Studio has automated testing tools to ensure your app is free from bugs. It also provides debugging tools that can help identify and fix issues quickly.

4. Cross-platform Performance Android Studio supports multiple operating systems (Windows, macOS, and Linux), making it easy for developers to work across different platforms. The IDE is optimized for performance, providing fast compilation and smoother debugging.

1.4 System Requirements for Android Studio

To run Android Studio efficiently, the following system requirements should be met:

Operating System:

Windows 7/8/10 (64-bit)

macOS 10.10 or later

Linux 64-bit Ubuntu or Fedora distribution

RAM:

8GB minimum (16GB recommended)

Hard Disk Space:

4GB for Android Studio IDE

8GB or more for Android SDK and emulator images

CPU:

A multi-core processor is recommended for faster performance.

Graphics:

Hardware acceleration is recommended for emulator usage, though it is optional for basic development.

Java Development Kit (JDK):

Android Studio comes bundled with the JDK, but you can also use your own version if necessary.

1.5 Android Studio in Pulse Up – Fitness App

Android Studio was the backbone for developing the Pulse Up – Fitness App. Using Android Studio, we were able to:

1. Design User Interfaces: Custom layouts were created for the app's various workout screens, using Android Studio's Visual Layout Editor to ensure a clean, user-friendly interface.

2. Integrate Firebase Services: The app uses Firebase Authentication to register and log in users, Fire store to store feedback, and Firebase Storage to upload media files like workout videos.

3. Create Dynamic Features: Android Studio enabled the implementation of dynamic features like the Step Counter (using Android sensors), BMI Calculator, and AI-Powered Chatbot.

4. Debugging & Testing: The Android Studio debugging tools helped in quickly identifying issues and fixing them, ensuring that the app ran smoothly across different devices.

1.6 Conclusion

Android Studio provides the tools necessary to build robust and scalable Android applications. Its flexibility, integrated features, and seamless experience make it an essential tool for developing apps like Pulse Up that require dynamic functionality, real-time updates, and smooth user interactions and fixing them, ensuring that the app ran smoothly across different devices.

CHAPTER 2
Introduction to Pulse Up - The Fitness App

CHAPTER 2 - Introduction to Pulse Up - The Fitness App

2.1 What is Pulse Up?

"Pulse Up" is a fitness app designed to help users of all levels to reach their fitness goals, whether at home or in the gym. The app offers workouts, diet plans, health trackers, and more, all designed to make fitness easier and more accessible. It combines AI features, guides, and interactive routines to keep users motivated and on track.

PULSE UP : THE FITNESS APP

Fig 2.1 - App Logo

2.2 Key Features of Pulse Up

Pulse Up is packed with features that make it unique in the fitness app space. Below are some of the standout features:

1. Meditation Space The meditation space offers a variety of relaxing themes and background music. It helps users unwind, meditate, and reduce stress.

2. Expert-Crafted Routines Pulse Up offers 3 pre-designed workout routines made by fitness experts. These routines are suited for all fitness levels, and users can follow along with AI voice notifications guiding them through each step.

3. Pulse Chat – AI Assistant The AI-powered Pulse Chat helps users with fitness-related questions. It answers workout-related queries, offers tips, and guides users on how to improve their fitness journey.

4. BMI Calculator Pulse Up has a simple BMI calculator that helps users check if their body mass index is in the healthy range. It takes height and weight as inputs and tells users whether they are underweight, normal,

overweight, or obese.

5. Steps Counter Pulse Up uses your phone's step counter to track how many steps you take each day. This feature is a great way to keep track of daily physical activity and push yourself to stay active.

6. Home Workout Guides Pulse Up includes a guide for home workouts. It provides animated previews and step-by-step instructions for each exercise, helping users to follow along easily. The app also includes helpful workout videos for better understanding.

7. Gym Workout Guides For those who prefer the gym, Pulse Up offers gym workout routines. These include step-by-step instructions, animated previews, and video demonstrations. It covers different goals such as strength training, muscle building, and fat loss.

8. Yoga Asanas Yoga lovers will find a section dedicated to Yoga Asanas. This section provides detailed guidance on performing various yoga poses, like Surya Namaskar and Padmasana, along with helpful videos.

9. Diet Plans and Nutrition Pulse Up provides diet plans for both bulking and shredding goals. It includes a maintenance calorie calculator to help users calculate their daily calorie needs based on activity levels. The app also offers video tutorials for healthy meal preparations.

Splash Screen, Login Page & Registration
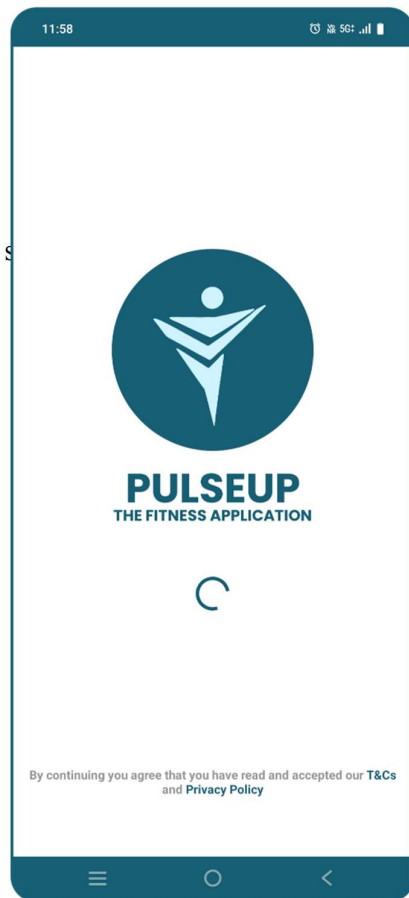
| Fig 2.2 - Splash Screen | Fig 2.3 - Login Page | Fig 2.4 - Registration |
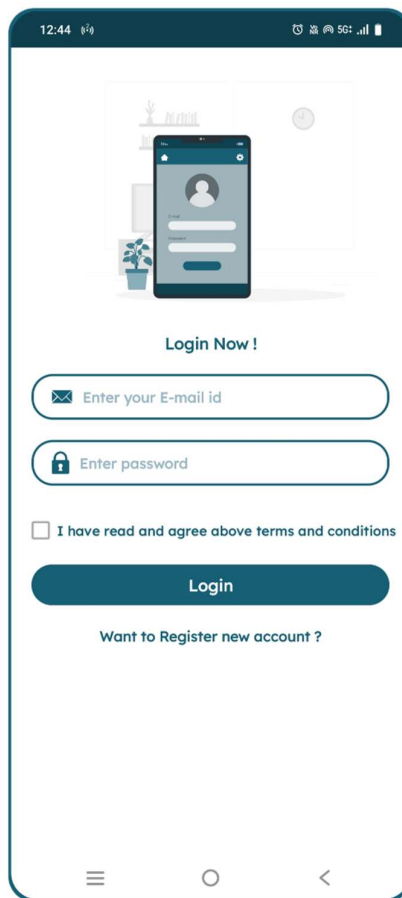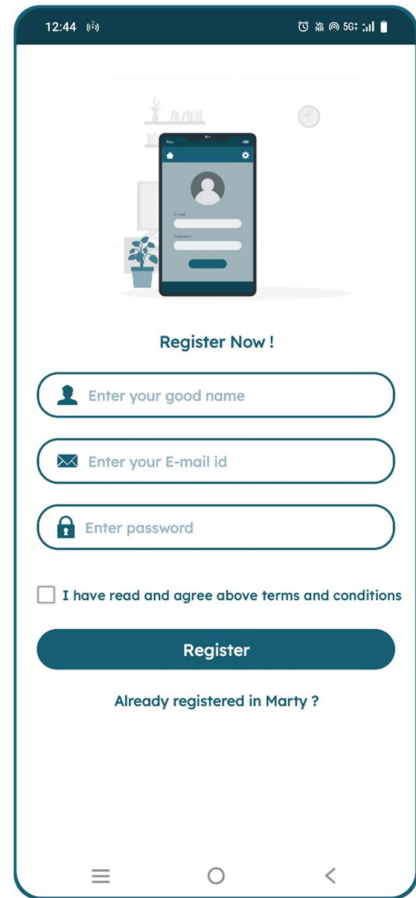
7

Pulse Up App – Architecture :
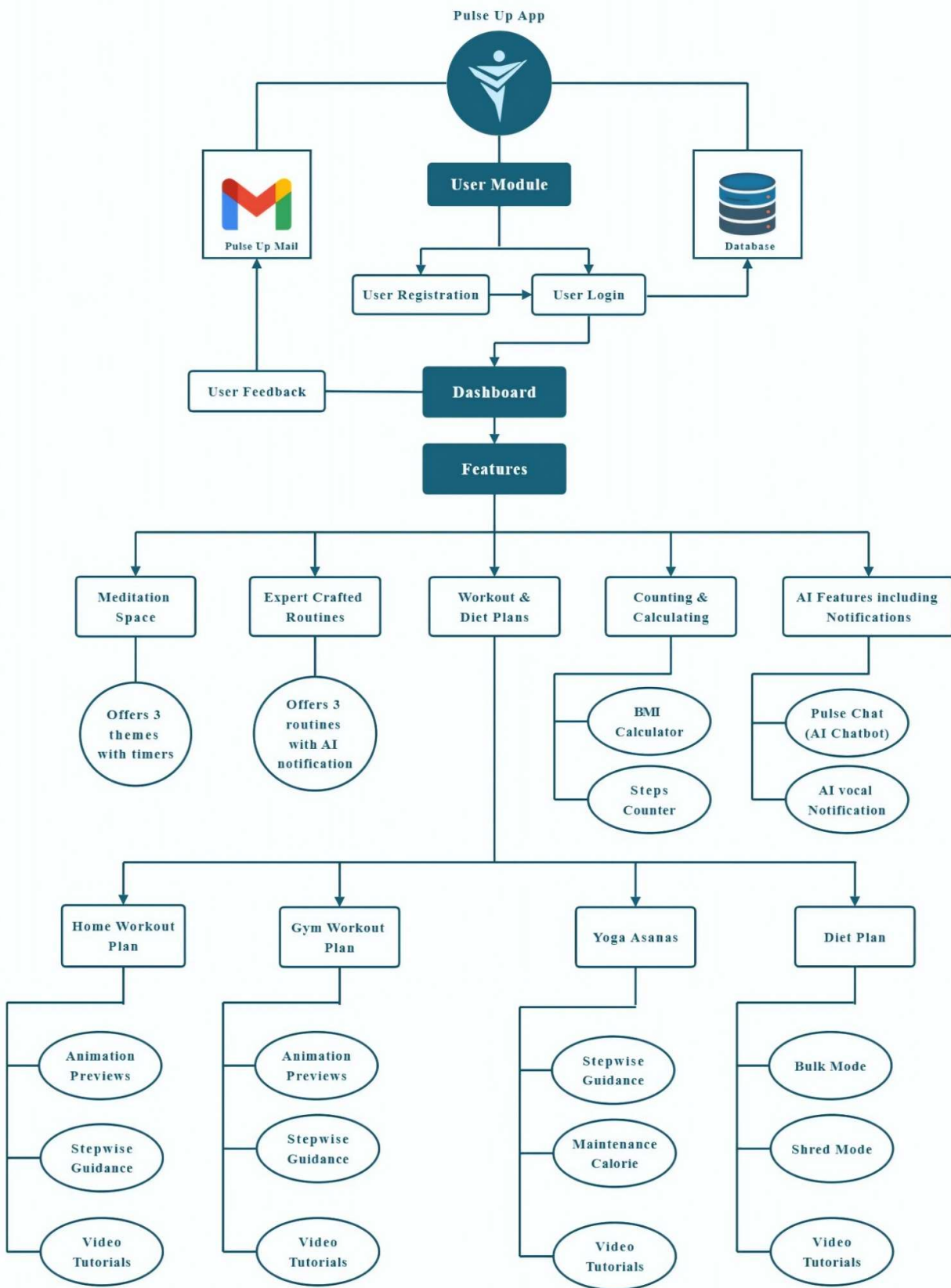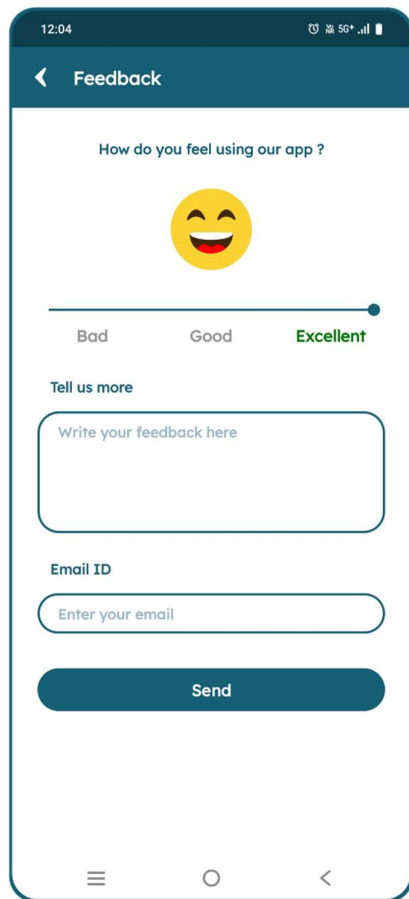
2.3 How Pulse Up Helps You Stay Fit?
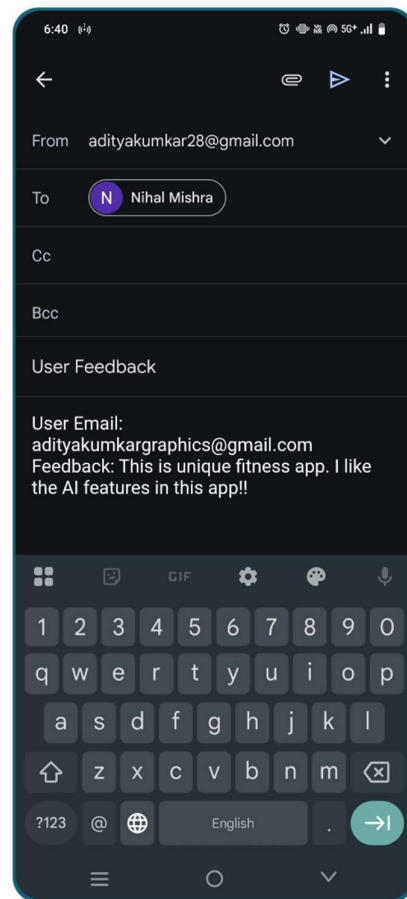
Pulse Up is designed to make fitness as simple and interactive as possible:

1. Personalized Dashboard: Once you log in, Pulse Up gives you a personalized dashboard that shows your progress, next workout, and daily goals.

2. Daily Tracking: The app lets you log your workouts and meals, helping you track your progress over time. This tracking helps the app suggest better workout routines and diets.

3. Interactive Feedback: Pulse Up includes a feedback system where users can rate their experience and provide suggestions. The app also offers daily motivational messages and fitness tips to keep users on track.

Feedback from users

Fig 2.5 - Feedback form ui

Fig 2.6 - Feedback via Gmail

2.4 Technology Used in Pulse Up

Pulse Up uses several modern technologies to create a smooth and user-friendly experience:

1. Android Studio Pulse Up is built using Android Studio, the official platform for Android app development. It provides all the tools needed to create a smooth, high-quality app.

2. Firebase Pulse Up integrates Firebase for user authentication, data storage, and real-time updates. Firebase helps in keeping data safe and syncing it across devices.

3. AI Features The app uses AI-powered features like the Pulse Chat assistant to answer fitness questions and guide users through their journey.

4. Sensors and Analytics The app tracks users' activity using Android sensors (for step counting and heart rate tracking), giving them real-time feedback on their fitness levels.

2.5 Why Choose Pulse Up?

Pulse Up is not just a fitness app; it's a fitness companion.

Whether you are trying to lose weight, build muscle, or improve your overall health, Pulse Up provides you with the tools, routines, and support to achieve your fitness goals.

With its easy-to-use design, personalized plans, and AI assistance, Pulse Up makes staying fit fun and effective.

Whether you're at home, at the gym, or on the go, Pulse Up has everything you need to stay active and healthy.

2.6 Conclusion

In conclusion, Pulse Up is designed to be a one-stop solution for all your fitness needs. It combines personalized workout routines, diet plans and AI-powered assistants into one app. Whether you want to meditate, work out at home, or go to the gym, Pulse Up is there to help you every step of the way.

CHAPTER 3
Features of Pulse Up

CHAPTER 3 - Features of Pulse Up

3.1 Overview of Pulse Up's Features

Pulse Up is a comprehensive fitness and wellness app that incorporates multiple features aimed at enhancing user experience and helping them reach their fitness goals.

With a combination of fitness tracking, personalized workouts, diet plans, and mental health support, Pulse Up stands out as an all-in-one solution for health and fitness.

The app's key features are designed to cater to a wide range of users, from beginners to fitness enthusiasts. Below, we dive deeper into the specific features of Pulse Up.

Pulse Up App Dashboard Page
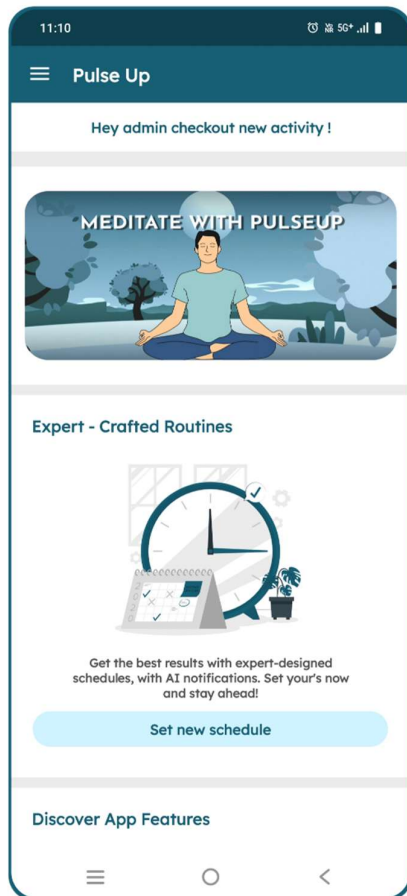
Fig 3.1 - Dashboard First half
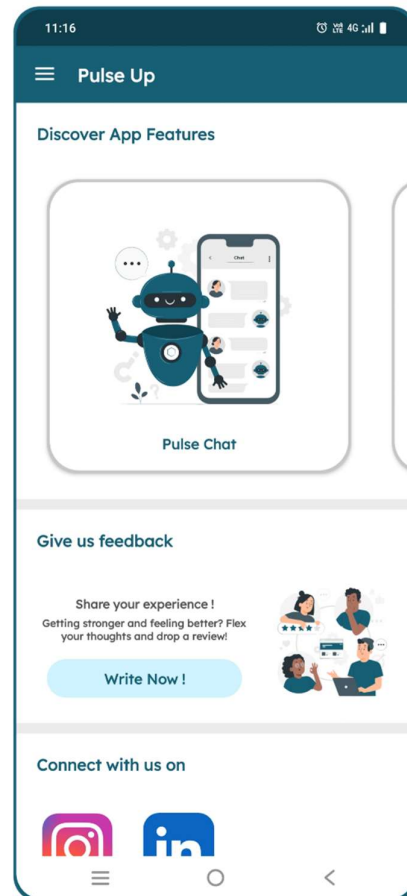
Fig 3.2 - Dashboard Second half

3.2 Meditation Space

The Meditation Space is one of the unique features of Pulse Up, focused on improving mental health alongside physical fitness. This section offers users the chance to unwind and de-stress, which is a crucial aspect of any healthy lifestyle.

Different Themes: The Meditation Space offers several calming themes that allow users to choose the right environment based on their mood. Some themes focus on relaxation, while others might help with focus, clarity, or deep sleep.

Background Music: Each theme includes background music that complements the meditation experience. The music is carefully curated to help guide users into a state of mindfulness, aiding in relaxation and stress relief.

Mental Health Benefits: Meditation is proven to help reduce anxiety, improve focus, and enhance emotional well-being.

Pulse Up's Meditation Space encourages users to take breaks, meditate, and practice mindfulness for a balanced approach to fitness.
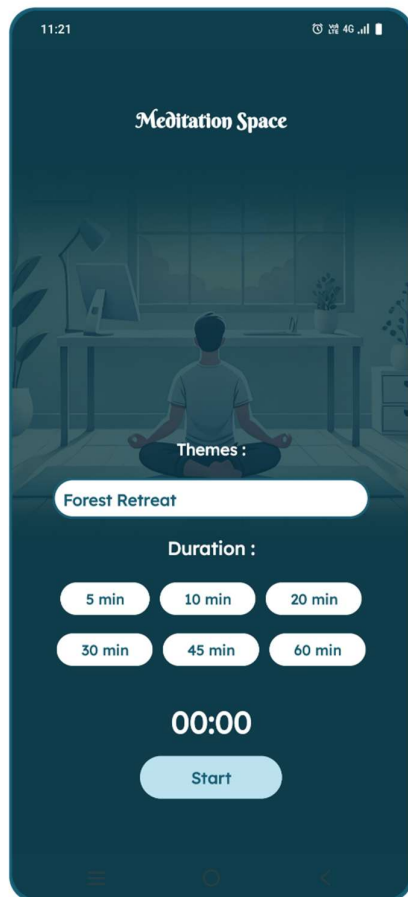
Fig 3.3 - Meditation space ui 1   *Fig 3.4 - Meditation space ui 2*
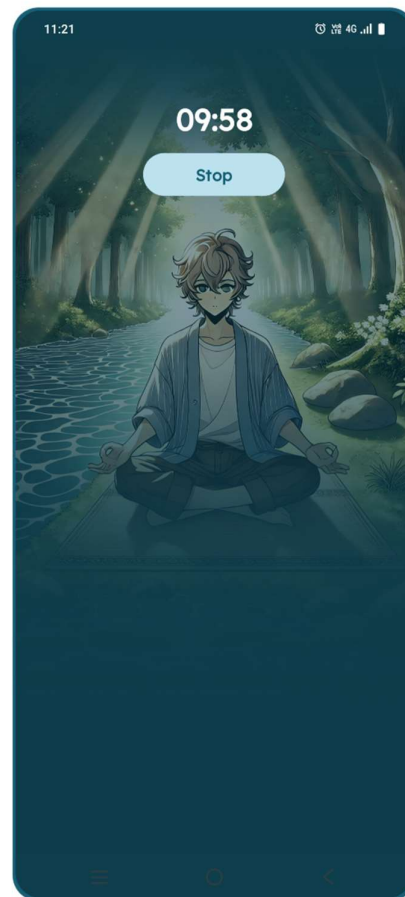
13

3.3 Expert-Crafted Routines

One of Pulse Up's standout features is the Expert-Crafted Routines. Fitness routines are created by certified fitness experts to ensure that users are following safe, effective, and structured workouts.

1. Three Pre-Designed Routines: Pulse Up offers 3 expert-created routines tailored for different fitness goals. Whether you want to lose weight, build muscle, or maintain fitness, there's a routine designed just for you.

2. AI Voice Notifications: Users can follow along with the routine while the app provides AI voice notifications to guide them through the workout. This hands-free feature ensures that users don't have to look at the screen while working out.

3. Personalization: Users can also adjust the routines based on their fitness level, whether they are beginners, intermediate, or advanced. The app suggests modifications to make the workouts more challenging or easier based on user progress.
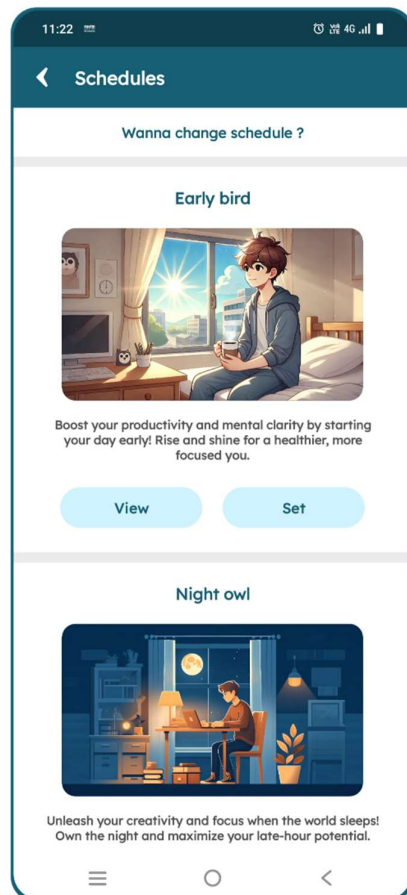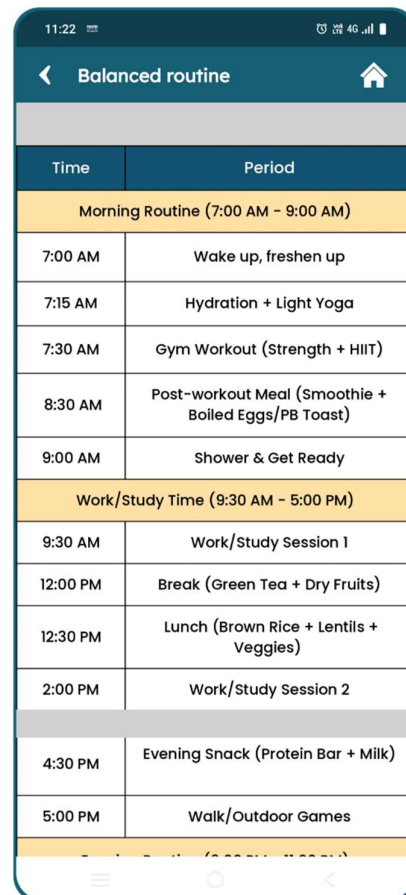
Fig 3.5 - Expert creafted routine ui 1   *Fig 3.6 - Expert creafted routine ui 2*

3.4 Pulse Chat – AI Fitness Assistant

The Pulse Chat feature is an AI-powered chatbot that serves as a fitness assistant within the app. It is designed to help users with any fitness-related queries they might have.

Instant Assistance: Pulse Chat provides instant replies to any fitness-related questions. Whether users need advice on a workout or tips on healthy eating, the chatbot is always available to offer assistance.

Interactive Features: Pulse Chat also provides users with tips and tricks to improve their workout techniques, diet plans, and overall health. It can even suggest modifications to the user's workout routine based on their goals and progress.

Health Education: The Pulse Chat feature also educates users on various fitness topics, from proper exercise form to the importance of hydration. It helps users make informed decisions about their fitness journey.
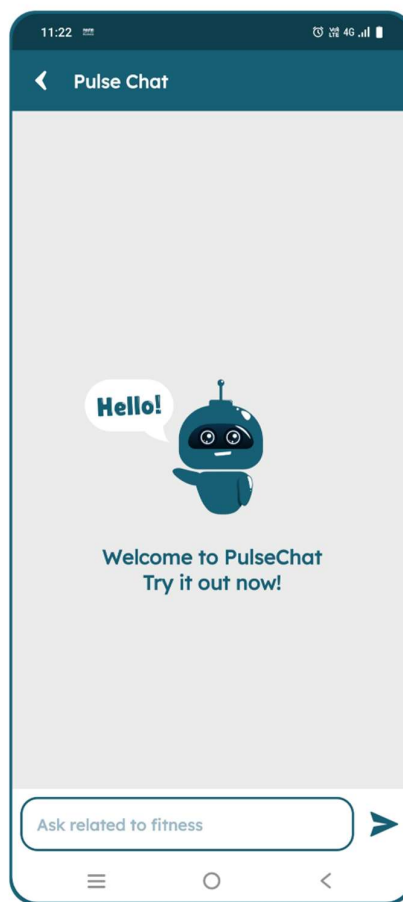
Fig 3.7 – Pulse Chat (AI chatbot)

3.5 BMI Calculator

The BMI Calculator is a simple yet essential feature of Pulse Up that helps users determine their body mass index (BMI). This index is a useful indicator of whether a person is in a healthy weight range.

Unisex Tool: The BMI calculator is designed to be unisex, meaning it can be used by anyone regardless of gender. It only requires basic inputs like height and weight.

Instant Results: After entering the required data, the app provides an instant calculation of the user's BMI. Based on the result, users will see if they are in the underweight, normal, overweight, or obese range.

Health Tips: Along with the BMI result, the app offers personalized tips for improving or maintaining health, depending on the user's BMI category. It suggests dietary modifications and fitness recommendations based on the user's result.
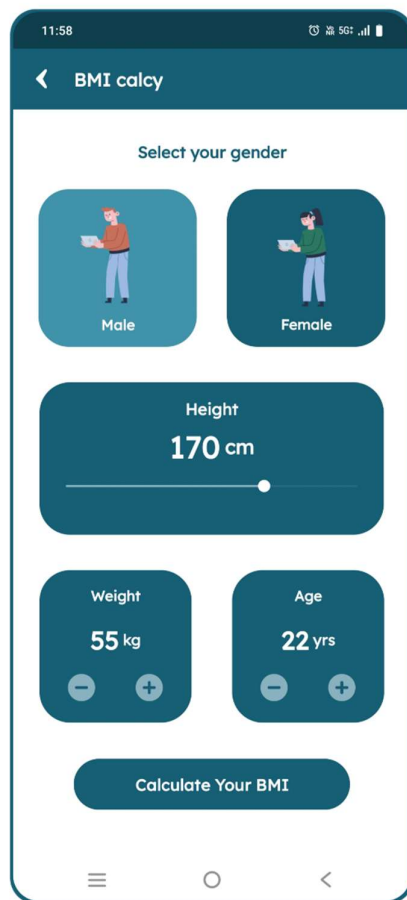
Fig 3.8 – BMI Calculator ui 1   *Fig 3.9 - BMI Calculator ui 2*
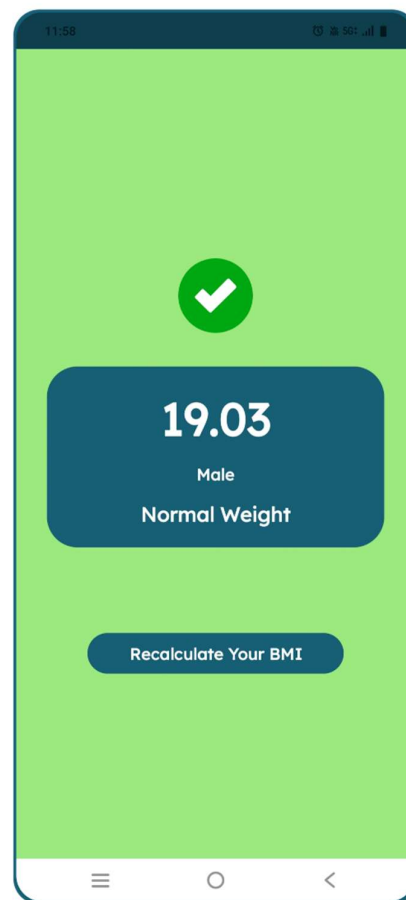
3.6 Steps Counter

The Steps Counter is an integrated feature in Pulse Up that tracks your daily physical activity. It uses the built-in step-counting technology in Android phones to help users keep track of their steps.

Track Physical Activity: The step counter records the number of steps taken throughout the day, encouraging users to stay active and meet their daily goals.

Motivation: Users can set daily step targets, and the app motivates them to stay active throughout the day. Achieving step goals is often a key indicator of how physically active someone is on a daily basis.

Activity Insights: Pulse Up provides users with weekly and monthly activity summaries, allowing them to track their progress over time. The app gives feedback on whether the user is meeting their activity goals or if improvements are needed.
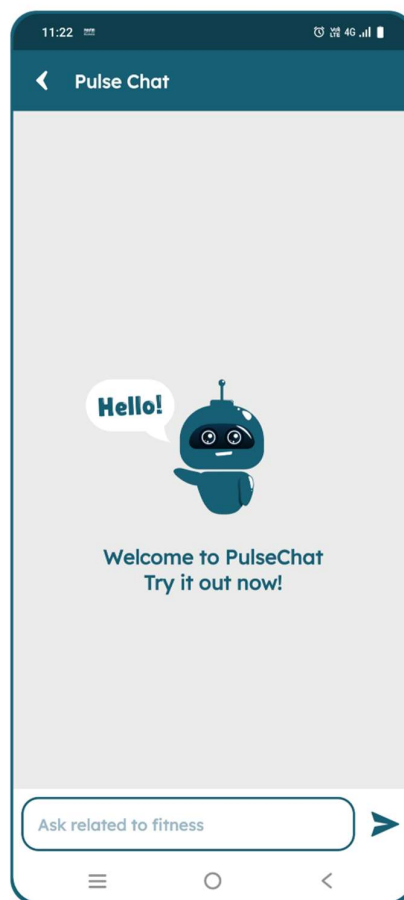
Fig 3.10 – Steps Counter

3.7 Home Workout Guides

Pulse Up provides a comprehensive guide for home workouts. These workouts are designed for users who prefer to work out at home without the need for gym equipment.

Step-by-Step Guidance: Each workout comes with clear, step-by-step instructions to ensure proper form and technique. Users can follow along with animated previews of each exercise.

Animated Previews: The app includes animations of each exercise to show users the correct way to perform movements, reducing the risk of injury.

Helpful Videos: In addition to animations, Pulse Up also provides video demonstrations for every exercise. This is particularly helpful for users who prefer to see the exercises performed in real-time.

Targeted Workouts: The home workouts are tailored to different fitness goals, such as strength training, muscle toning, or weight loss.
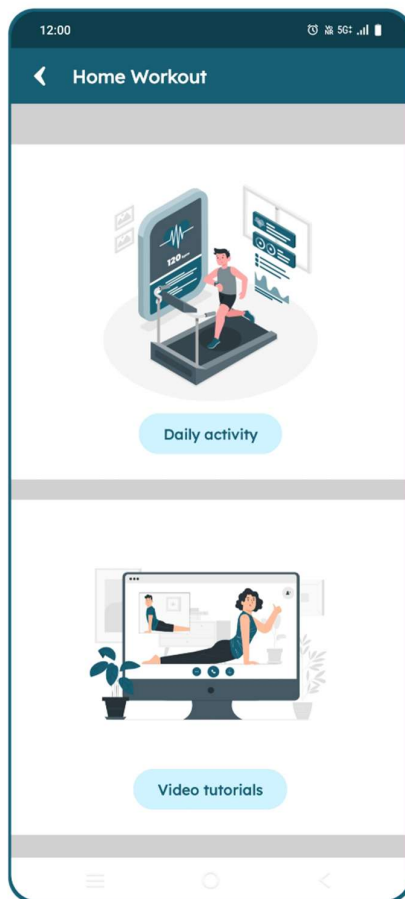
Fig 3.11 – Home workout ui 1   *Fig 3.12 - Home workout ui 2*   *Fig 3.13 - Home workout ui 3*
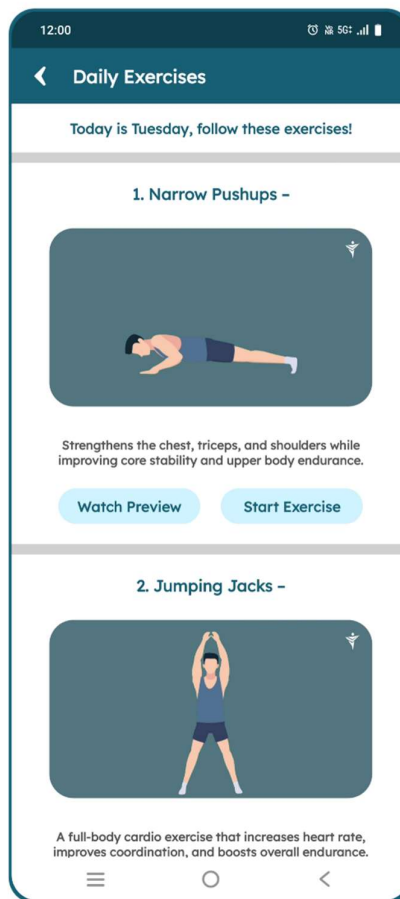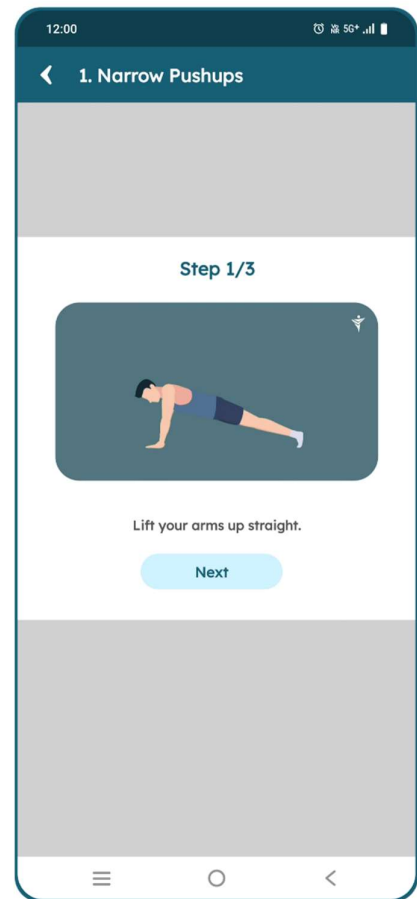
18

3.8 Gym Workout Guides

For users who prefer going to the gym, Pulse Up provides structured gym workout guides. These routines are focused on building strength, muscle mass, and improving overall fitness.

Gym-Specific Exercises: Pulse Up offers specific gym workouts that make use of common gym equipment like dumbbells, barbells, and machines. These exercises are aimed at maximizing results in the gym.

Animation and Video Demonstrations: Just like the home workout guides, gym workouts come with animated previews and step-by-step instructions.

Goal-Oriented Workouts: The gym workouts are tailored to users' specific fitness goals, whether they want to build muscle, lose fat, or increase strength.
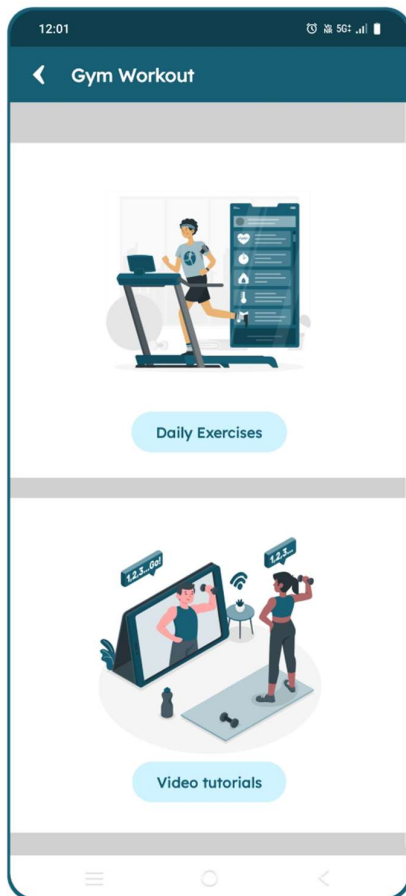
Fig 3.14 - Gym workout ui 1   Fig 3.15 - Gym workout ui 2   Fig 3.16 - Gym workout ui 3
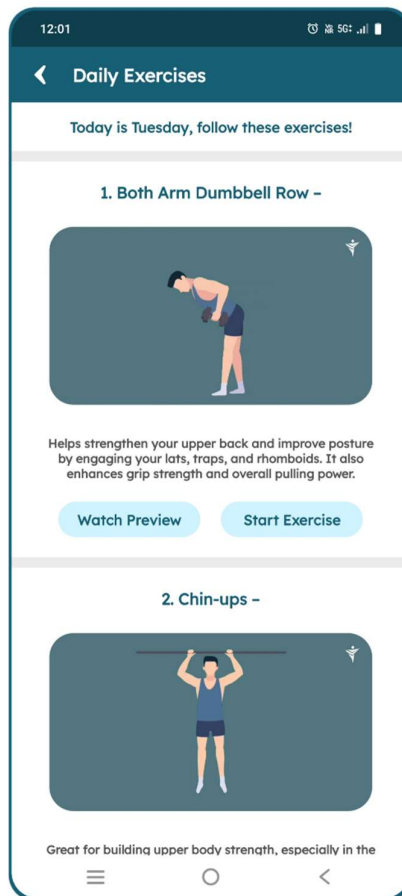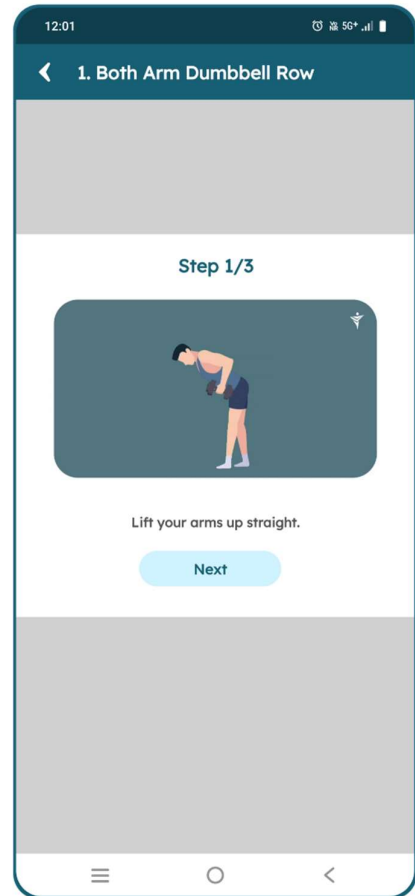
3.9 Yoga Asanas

Pulse Up also offers a dedicated section for Yoga Asanas. This feature helps users practice yoga at home, with step-by-step instructions and helpful resources.

Yoga Poses: Pulse Up covers a wide variety of yoga poses, including Sun Salutation (Surya Namaskar), Tree Pose (Vrikshasana), and Lotus Pose (Padmasana).

Step-by-Step Guidance: Each pose is explained in detail, with animation previews and step-by-step instructions to ensure users perform each asana correctly.

Video Resources: Pulse Up also provides yoga tutorial videos, making it easier for users to follow along and learn new poses.
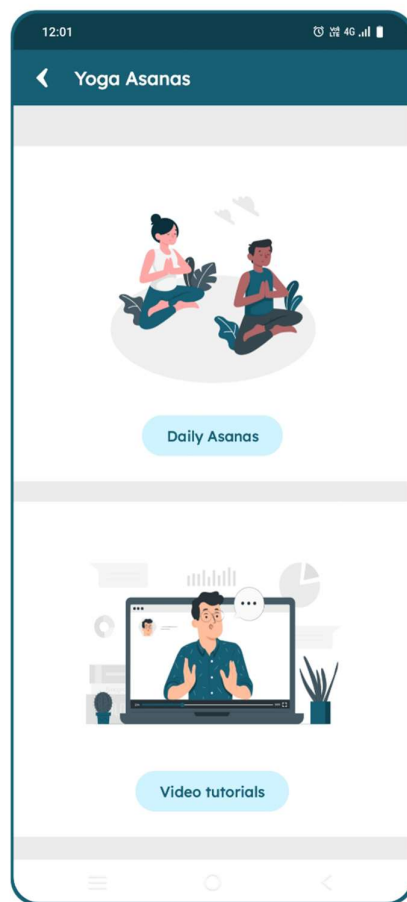
Fig 3.17 - Yoga asanas ui 1   *Fig 3.18 - Yoga asanas ui 2*
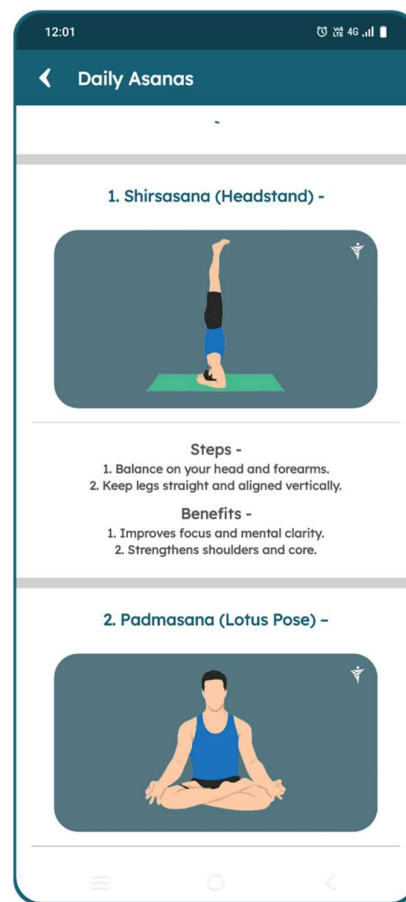
3.10 Diet Plans and Nutrition

Pulse Up includes comprehensive diet plans that help users achieve their fitness goals, whether it's bulking, shredding, or maintaining weight.

Personalized Diet Plans: Pulse Up creates customized meal plans based on the user's fitness goals and caloric needs.

Calorie Calculator: The app includes a maintenance calorie calculator to help users determine how many calories they need to consume each day to maintain their current weight. The app also helps users track their daily calories, ensuring they are on track to meet their goals.

Dieting Tips and Recipes: Pulse Up also provides helpful dieting tips and healthy recipes to help users stick to their meal plans. Additionally, it features videos on healthy food preparation and meal planning.
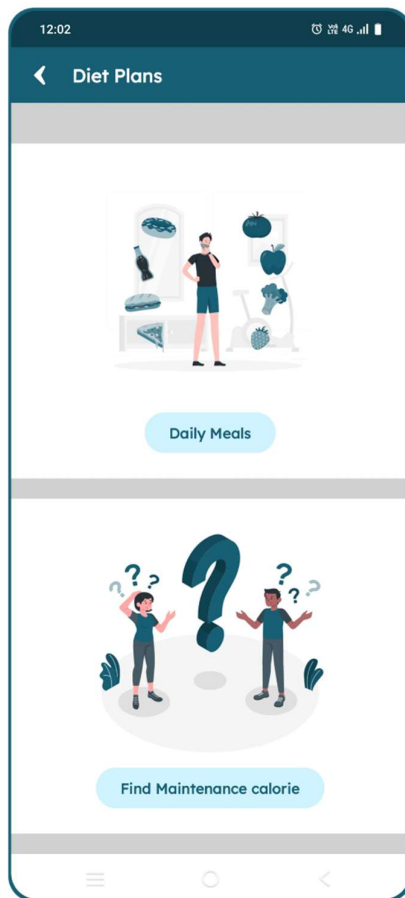
Fig 3.19 -Daily meals ui 1
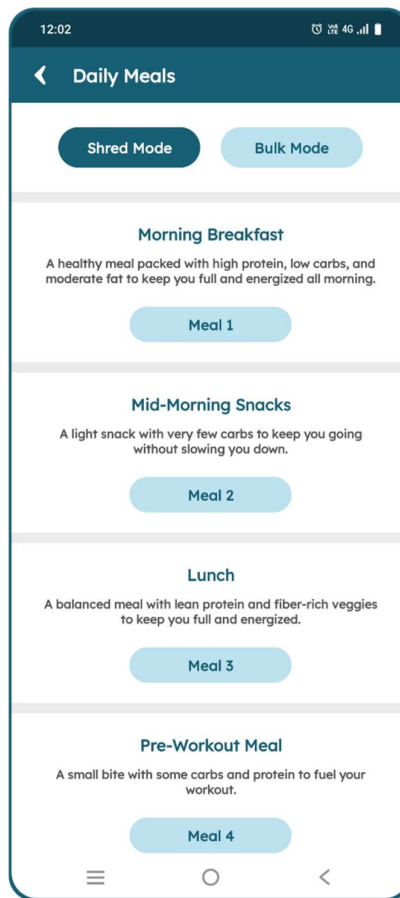
Fig 3.20 - Daily meals ui 2
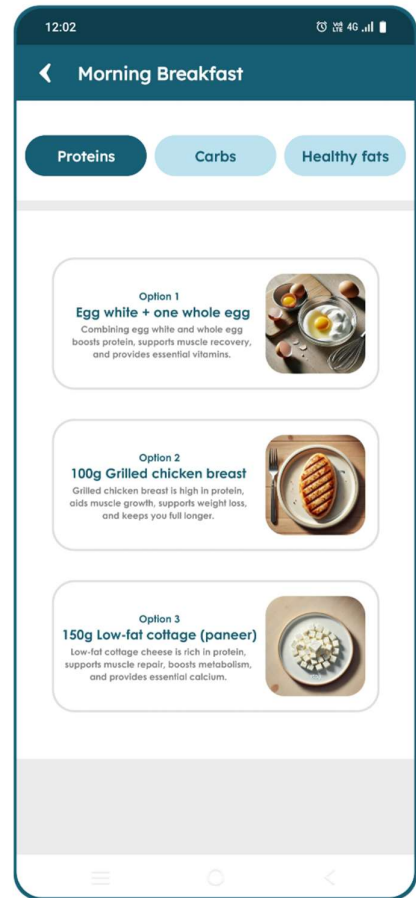
Fig 3.21 - Daily meals ui 3

21
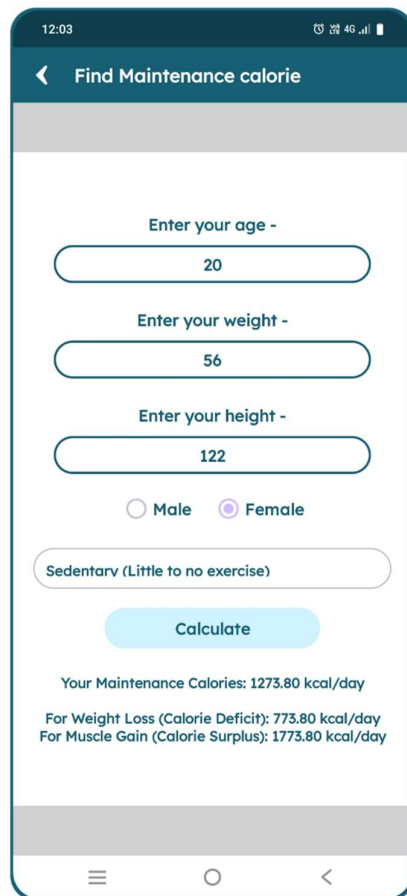
Fig 3.22 -Maintain calorie ui 1   *Fig 3.23 - Video tutorial ui 1*   *Fig 3.24 - Video tutorial ui 2*
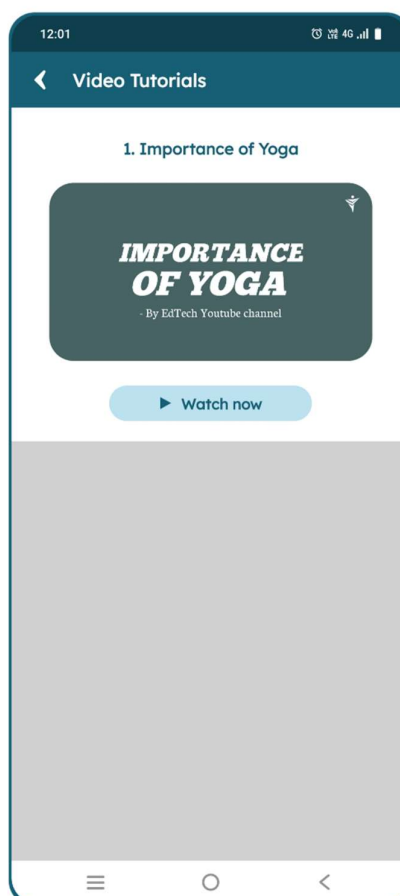
3.11 Conclusion

Pulse Up offers a wide array of features that combine to make it a complete fitness app.

Whether you want to improve your mental well-being with meditation, track your steps, follow expert-designed workouts, or get a personalized diet plan, Pulse Up has it all.

With its easy-to-use interface, interactive features, and helpful resources, Pulse Up ensures that users can work towards their fitness goals effectively and enjoyably.

CHAPTER 4
Login Page & Database Management

CHAPTER 4 - Login Page & Database Management

4.1 Introduction

The Login Page is one of the most essential features in any app, as it serves as the first point of interaction for users. It not only allows access to personalized content but also ensures data security and a seamless user experience. In this chapter, we will discuss how the Login Page is designed and how Database Management is implemented using Firebase to store user data securely.

4.2 Login Page Overview

The Login Page in Pulse Up is designed to be simple and user-friendly. It provides users with the option to either register if they are new or log in if they already have an account. The page contains the following key components:

Username / Email: The user needs to enter their registered email address or username. Password: A secure password field is provided where users can enter their password. This ensures that only authorized users can access their personal information.

Login Button: After entering the email and password, users can click on the Login button to access the app.

Register Option: For new users, there is an option to register by providing their email, name, and password.

Forgot Password Option: In case users forget their password, they can click on the "Forgot Password" option to reset it via email.

Already Registered Option: If users are already registered, they can simply enter their details and log in.

4.3 Registration Process

When a new user launches the app for the first time, they need to go through the registration process. The steps involved in registration are:

1. User Input: The user must provide their email, name, and password.

2. Email Verification: The app will verify the email format to ensure it's valid.

3. Password Requirements: The password should meet certain criteria (e.g., minimum length, inclusion of special characters, etc.) to ensure security.

4. Data Storage: Once the user enters the required details, the app sends this data to the Firebase database to create a new user record.

4.3 Firebase Integration

Firebase is a cloud-based platform provided by Google that offers real-time database management, user authentication, and other backend services. Firebase is used in Pulse Up to handle user authentication and data management. The main components of Firebase that Pulse Up integrates with include:

4.4.1 Firebase Authentication

Firebase Authentication is used to manage user login and registration processes. It supports a variety of authentication methods, but in Pulse Up, we use email/password authentication.

User Sign-In: When a user logs in, the app authenticates the email and password with Firebase. If the credentials are correct, the user is granted access to their personalized content.

Sign-Up: When users register for the app, their credentials are stored in Firebase's authentication system. This provides secure storage and ensures that the user's account details are properly managed.

Email Verification: After the user registers, they may receive an email to verify their account, ensuring that they own the provided email address.
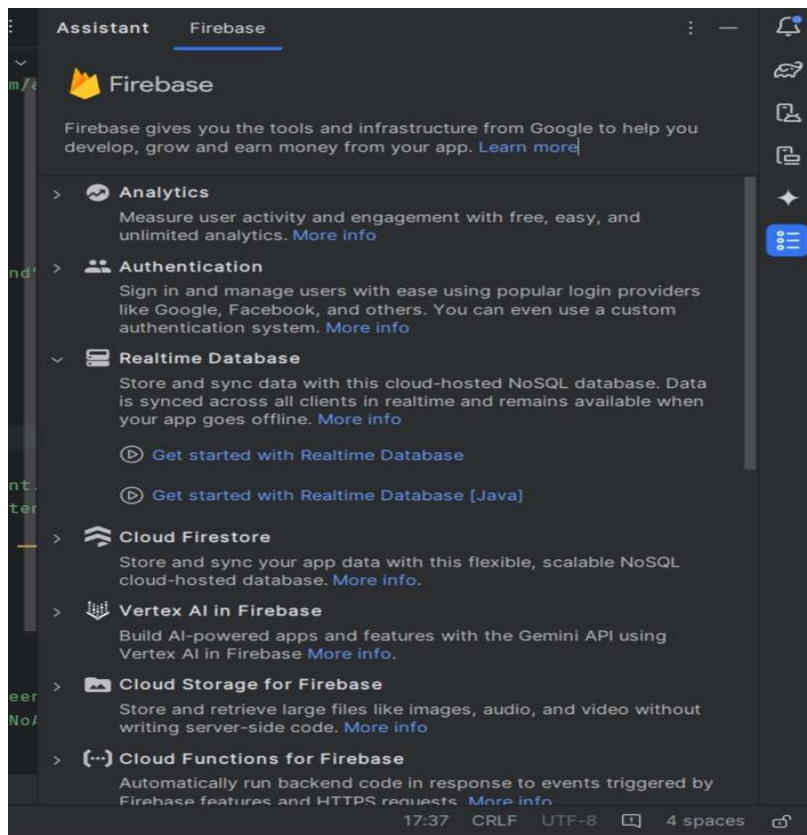
Fig 4.1 - Firebase Setup from Android studio

4.4.2 Firebase Firestore Database

Firebase Firestore is used to store and manage the data for Pulse Up. It is a cloud-based NoSQL database that stores data in a structured and scalable manner. Firestore is ideal for real-time updates and high-speed querying.

User Data: Once a user registers, their data, such as name, email, and password, is stored securely in the Firestore database.

Workout Plans: The personalized workout plans, steps counter data, and other user-generated content are stored in Firestore, ensuring that they are accessible across different devices in real-time.

User Profile: The user's profile, including their progress, fitness goals, and personal settings, is stored and managed in the Firestore database.

Data Sync: With Firestore's real-time capabilities, the app ensures that any changes made to the user's profile, workout routine, or progress are synced across devices instantly.
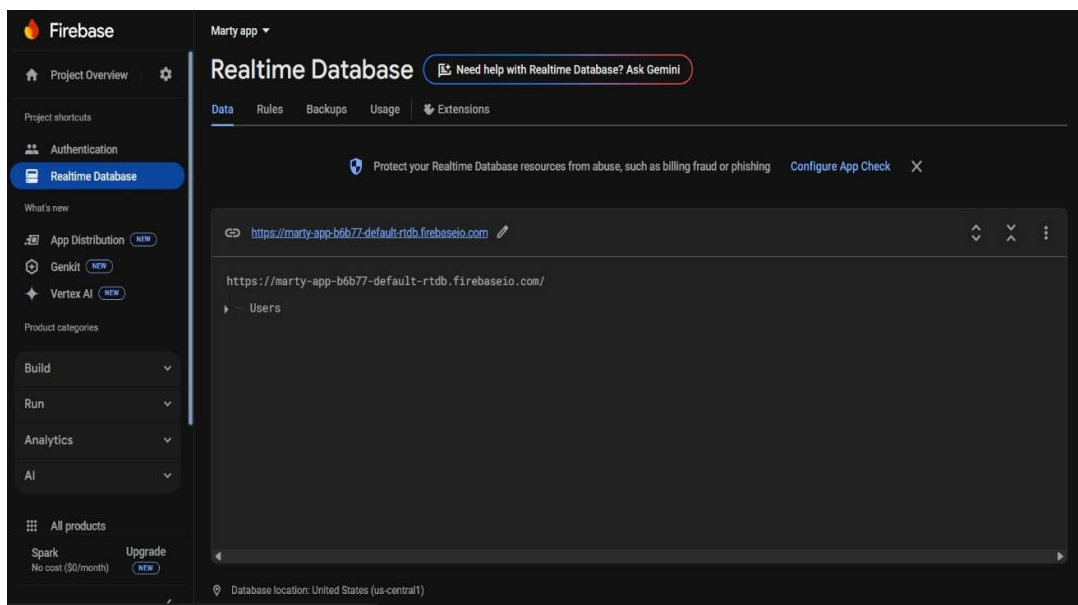
Fig 4.2 – Realtime database

4.4.3 Firebase Security Rules

Firebase provides robust security rules to ensure that user data is not only stored securely but also accessed only by authorized users. These rules are designed to protect the user's sensitive information, such as their email, password, and fitness progress.

Authentication Rules: Firebase uses user-specific authentication rules to ensure that only the user who is logged in can access their own data. This prevents unauthorized access to other users' data.
Data Validation: Firebase's security rules also include data validation features that ensure the integrity of the data entered into the system.
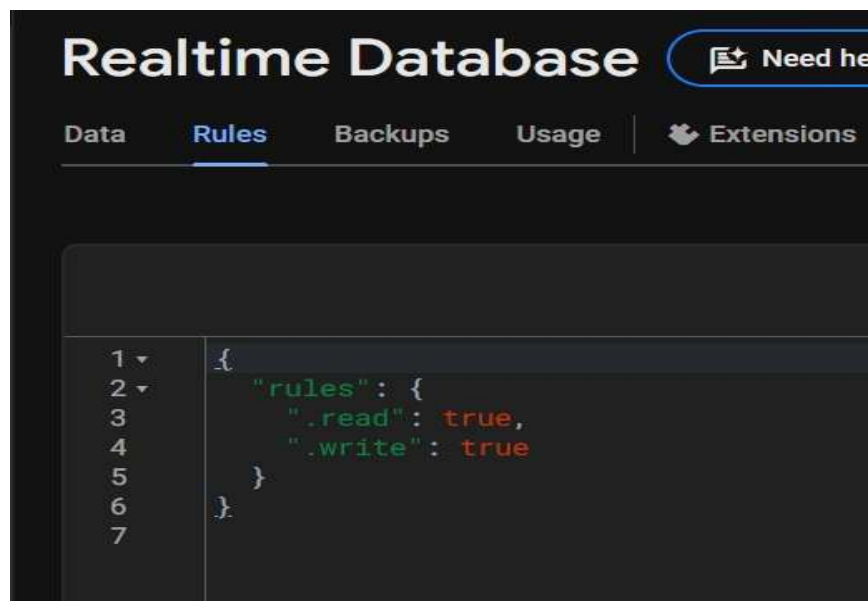
Fig 4.3 – Firebase rules

4.5 Login Flow

The login flow in Pulse Up follows these steps:

1. Launch Screen: When the user opens the app, the login screen is displayed. If they are already logged in, they are directly taken to the app's home screen.

2. Enter Credentials: The user enters their email and password.

3. Authentication: The app verifies the entered credentials with Firebase's authentication system. If successful, the user is granted access to their profile.

27

4. Error Handling: If the credentials are incorrect, an error message is displayed, prompting the user to try again. Additionally, the "Forgot Password" link is provided for users to reset their password if necessary.

5. User Session: Once the user logs in, the app creates a session for the user. This session is maintained throughout their use of the app until they log out or the session expires.

4.6 Session Management

Pulse Up implements session management to ensure that users do not need to log in repeatedly every time they open the app. Firebase handles session management by using user tokens.

Session Token: Once a user logs in successfully, Firebase generates a session token. This token is stored in the app and used to authenticate the user in subsequent sessions.

Session Expiry: Sessions typically expire after a set period of inactivity. After expiry, users will be required to log in again to continue using the app.

4.7 Logout Process

When a user wants to logout, the app ensures that their session is securely terminated. The Logout button triggers the following process:

1. Session Termination: The user's session is terminated, and the app clears any locally stored authentication tokens.

2. User Redirect: After logging out, the user is redirected to the login page to ensure that no unauthorized user can access the account.

3. Confirmation: A confirmation message or screen is displayed, ensuring that the user successfully logged out.

4.8 Error Handling and User Feedback

Proper error handling is essential in ensuring that the app functions smoothly and provides useful feedback to users. For example:

Invalid Login Attempt: If a user enters an invalid email or password, the app provides clear error messages, such as "Invalid credentials. Please try again."

Empty Fields: If the user attempts to log in or register without entering required fields (email or password),

28

the app prompts the user to fill in the missing information.

Registration Errors: If there are issues during registration, such as the email already being in use, the app displays a helpful error message: "Email already registered. Please try a different one."

Login page and Database handling – code logic (java) :

```java
registerButton.setVisibility(View.INVISIBLE);
pb_register.setVisibility(View.VISIBLE);


mAuth.createUserWithEmailAndPassword(email, password)
    .addOnCompleteListener(this, task -> {
        if (task.isSuccessful()) {
            FirebaseUser user = mAuth.getCurrentUser();
            if (user != null) {
                String userId = user.getUid();

                // Store user data in Firebase Database
                HashMap<String, String> userData = new HashMap<>();
                userData.put("userId", userId);
                userData.put("name", name);
                userData.put("email", email);

                databaseReference.child(userId).setValue(userData)
                    .addOnCompleteListener(task1 -> {
                        if (task1.isSuccessful()) {
                            Toast.makeText(MainActivity.this, "User Registered Successfully!",
Toast.LENGTH_SHORT).show();
                            Intent intent = new Intent(MainActivity.this, dashboard.class);
                            startActivity(intent);
                            finish();
                        } else {
                            Toast.makeText(MainActivity.this, "Database Error: " +
task1.getException().getMessage(), Toast.LENGTH_SHORT).show();
                        }
                        registerButton.setVisibility(View.VISIBLE);
```

29

```
                    pb_register.setVisibility(View.GONE);

            });

        }

    } else {

        Toast.makeText(MainActivity.this, "Registration failed: " + task.getException().getMessage(),
Toast.LENGTH_SHORT).show();

        registerButton.setVisibility(View.VISIBLE);

        pb_register.setVisibility(View.GONE);

    }

});
```

4.9 Conclusion

The Login Page and Database Management system are crucial components of the Pulse Up app. By using Firebase Authentication and Firestore Database, Pulse Up ensures that users have a secure and seamless experience.

The app's login flow is intuitive, allowing users to easily register, log in, and access their personalized content.

Additionally, Firebase's real-time database and security rules ensure that user data is protected and accessible whenever needed.

CHAPTER 5
Introduction to the AI Feature

CHAPTER 5 - Introduction to the AI Feature

5.1 Overview

Artificial Intelligence (AI) is an essential part of many modern apps, and Pulse Up is no exception. In this chapter, we will explore how AI is integrated into the app to enhance the user experience. Specifically, we'll focus on the AI-powered fitness assistant and other AI-driven features such as AI Chatbot and Voice Notifications that help users achieve their fitness goals in a more interactive and personalized manner.

5.2 The Role of AI in Pulse Up

In Pulse Up, AI is used to assist users in their fitness journey by providing them with tailored workouts, step-by-step instructions, and real-time feedback. The core AI features in Pulse Up are:

1. AI Chatbot: This feature assists users by answering fitness-related queries and providing recommendations based on user input.

2. AI Voice Notifications: AI-driven voice notifications guide users through their workouts, offering step-by-step assistance and motivational messages.

3. Personalized Workout Plans: AI algorithms can suggest personalized workout routines based on user preferences, goals, and current fitness levels.

4. Fitness Tracker and Analysis: AI tracks user progress and gives insights into their performance. This includes tracking steps, calories burned, and offering suggestions for improvement.

5.3 AI Chatbot for Fitness

The Pulse Chat feature in the app is powered by AI. The chatbot serves as a fitness assistant, answering user queries related to fitness, nutrition, and general wellness. The AI chatbot is trained to understand and respond to a wide range of fitness-related questions, providing users with useful information, workout tips, and advice.

5.3.1 Features of the AI Chatbot

Fitness Queries: Users can ask the AI chatbot about workout routines, exercises, and health tips. Personalized Recommendations: Based on the user's fitness level and goals, the AI chatbot suggests personalized workout routines or diet plans.

Motivational Messages: The AI chatbot encourages users by sending motivational messages, helping them stay focused on their fitness journey.

5.3.2 Working of the AI Chatbot

Natural Language Processing (NLP): The AI chatbot uses NLP algorithms to understand user inputs. It can recognize different phrases and words to deliver meaningful responses.

Machine Learning: The chatbot improves over time by learning from user interactions. It can provide better responses based on the data it collects.

5.4 AI-Powered Voice Notifications

AI Voice Notifications guide users during their workouts, providing real-time assistance and instructions. These notifications ensure that users perform exercises correctly and stay motivated throughout their session.

5.4.1 Key Features of AI Voice Notifications

Step-by-Step Instructions: The AI voice provides clear, real-time instructions on how to perform each exercise correctly.

Workout Progress Updates: It keeps the user informed about their progress, such as how many sets or reps are left.

Motivational Feedback: The AI voice encourages the user with motivational comments such as "Great job! Keep going!" or "You're almost there!"

5.4.2 Working of AI Voice Notifications

User Input: The user selects a workout routine or exercise, and the AI voice starts providing instructions.

Speech Synthesis: Pulse Up uses speech synthesis technology to generate voice instructions in a clear, natural tone.

Customization: Users can customize the voice notifications, such as choosing between different voices (male or female) and adjusting the frequency of the feedback.

5.5 Personalized Fitness Plans Using AI

Pulse Up uses AI to create personalized fitness plans that cater to each user's unique needs. These plans are generated based on factors like age, gender, fitness level, and specific fitness goals (e.g., weight loss, muscle gain, etc.).

5.5 Personalized Fitness Plans Using AI

User Profile: Users enter their personal details such as age, weight, height, fitness goals, and current fitness level. This information helps the AI understand the user's needs.

AI Analysis: The AI analyzes the user's data and creates a custom workout plan that aligns with their fitness goals.

Adjustments: Based on the user's progress and feedback, the AI can modify the workout plan over time to ensure continued progress.

5.6 Fitness Tracking and Analysis

AI also plays a role in tracking and analyzing the user's fitness data. Pulse Up uses machine learning algorithms to analyze data such as step count, calories burned, and workout duration.

5.6.1 Features of Fitness Tracking

Steps Counter: The AI tracks the user's daily steps and provides insights into their activity level.

Calories Burned: The AI estimates the number of calories burned during workouts and daily activities, helping users maintain or achieve their desired fitness goals.

Progress Tracking: Users can view their progress over time, including improvements in endurance, strength, and flexibility.

5.6.2 AI Insights and Recommendations

Goal Setting: Based on the data collected, the AI provides suggestions for setting realistic fitness goals.

Performance Improvement: The AI analyzes past workouts and suggests ways to improve performance, whether by increasing workout intensity or trying new exercises.

5.7 Benefits of Using AI in Pulse Up

Integrating AI into Pulse Up offers several benefits for users:

Personalized Experience: AI ensures that users receive fitness advice, routines, and recommendations that are tailored to their needs and goals.

Real-Time Assistance: With AI-powered voice notifications and chat support, users receive guidance and motivation in real-time during their workouts.

34

Continuous Improvement: AI learns from user behavior and provides continuous improvements in workout plans, ensuring that users always have an optimized fitness regimen.

Data-Driven Insights: Users receive valuable insights into their fitness progress

5.8 Challenges and Future Scope of AI in Fitness Apps

While AI brings a lot of advantages, there are some challenges and areas for improvement:

5.8.1 Challenges

Data Privacy: The collection of personal data such as weight, height, and health information may raise privacy concerns. Pulse Up ensures that all user data is securely stored and processed.

Accuracy: The accuracy of AI predictions and recommendations depends on the quality of the data it receives. It is important to ensure that AI algorithms are well-trained and updated.

User Trust: Some users may be skeptical about using AI-driven features. It's important to build trust by ensuring that the AI features are transparent and explainable.

```
dependencies {
    implementation libs.appcompat
    implementation libs.material
    implementation libs.activity
    implementation libs.constraintlayout
    implementation libs.firebase.database
    implementation libs.firebase.auth
    testImplementation libs.junit
    androidTestImplementation libs.ext.junit
    androidTestImplementation libs.espresso.core

    // Retrofit and Gson dependencies
    implementation 'com.google.android.material:material:1.9.0'
    implementation 'com.squareup.retrofit2:retrofit:2.9.0'
    implementation 'com.squareup.retrofit2:converter-gson:2.9.0'
    implementation 'com.squareup.okhttp3:logging-interceptor:4.9.3'
    implementation 'com.squareup.okhttp3:okhttp:4.9.3'
    implementation 'com.airbnb.android:lottie:6.1.0'
}
```

Fig 5.1 – Required implements in build.gradle (app)

5.8.2 Future Scope

Improved AI Algorithms: As AI continues to evolve, Pulse Up can implement more advanced algorithms for even more accurate and personalized fitness plans.

Integration with Wearable Devices: Pulse Up can integrate with wearable fitness trackers to gather more precise data on user activity, enhancing the AI's ability to provide real-time feedback.

Virtual Personal Trainer: In the future, Pulse Up could implement an AI-driven virtual personal trainer, providing users with personalized coaching and workout modifications.

AI chatbot – code logic (java) :

```java
Retrofit retrofit = new Retrofit.Builder()
    .baseUrl("https://your-api.com/") // Replace with your actual API URL
    .client(getSecureOkHttpClient())
    .addConverterFactory(GsonConverterFactory.create())
    .build();

ChatApi chatApi = retrofit.create(ChatApi.class);

sendButton.setOnClickListener(v -> {
    String message = messageEditText.getText().toString().trim();
    if (!message.isEmpty()) {
        if (chatList.isEmpty()) {
            welcomeTextView.setVisibility(View.GONE);
        }

        chatList.add(new Message(message, true));
        chatAdapter.notifyItemInserted(chatList.size() - 1);
        recyclerView.scrollToPosition(chatList.size() - 1);
        messageEditText.setText("");

        sendMessageToApi(chatApi, message);
    }
});
```

Chat Api – code logic (java) :

```java
import retrofit2.Call;
import retrofit2.http.Body;
import retrofit2.http.POST;

public interface ChatApi {
    @POST("send-message") // Replace with correct API endpoint
    Call<ApiResponse> sendMessage(@Body ApiRequest request);
}
```

5.9 Conclusion

The integration of AI in Pulse Up significantly enhances the user experience by providing personalized fitness plans, real-time workout guidance, and valuable data-driven insights.

From the AI Chatbot to the AI-powered Voice Notifications and Personalized Fitness Plans, AI enables users to engage with the app in a more interactive and motivational way.

As AI technology continues to advance, the potential for future improvements in fitness apps like Pulse Up is immense.

CHAPTER 6
Counting & Calculating Feature

CHAPTER 6 - Counting & Calculating Feature

6.1 Overview

In this chapter, we will explore the Counting & Calculating Features of the Pulse Up fitness app. These features are designed to provide users with valuable data related to their fitness progress. By counting and calculating important metrics such as steps taken, calories burned, and BMI, Pulse Up ensures that users stay on track with their fitness goals and get real-time feedback on their performance. These features are especially useful for users who want to track their physical activity and make data-driven decisions to improve their health.

6.2 Key Features of the Counting & Calculating System

Pulse Up offers several important counting and calculating features, each designed to measure specific aspects of fitness. These include:

1. Step Counter: Tracks the number of steps taken by the user throughout the day.

2. Calories Burned Tracker: Calculates the number of calories burned during various activities, including workouts and everyday tasks.

3. BMI Calculator: Helps users determine their Body Mass Index (BMI) to understand their weight status and assess whether they need to make changes to their diet or exercise routine.

4. Calories Intake vs. Burn: Tracks the balance between the user's calorie intake (from diet) and the calories burned (through physical activity), helping to optimize weight management.

6.3 Step Counter

The Step Counter is one of the most fundamental features of Pulse Up. It tracks the number of steps a user takes throughout the day and provides valuable insight into their physical activity.

6.3.1 How the Step Counter Works?

The Step Counter feature in Pulse Up is designed to work on Android devices. It uses the phone's built-in sensors, such as the accelerometer, to detect motion and accurately count steps. The app automatically records each step taken by the user and displays it in a simple and easy-to-read format

6.3.2 Benefits of the Step Counter

Track Physical Activity: The Step Counter helps users track their daily activity and measure how much they are moving each day.

Stay Motivated: Users can set daily step goals and track their progress, providing motivation to stay active and achieve their fitness targets.

Health Insights: By keeping track of steps, Pulse Up helps users understand their activity level and make adjustments to their daily routine as needed.

6.3.3 Data and Insights Provided by the Step Counter

Total Steps: Users can see the total number of steps they've taken in a day.

Daily Targets: Users can set daily step targets and compare their progress.

 Historical Data: Pulse Up tracks steps over time, allowing users to see their weekly, monthly, or yearly activity levels.

6.4 Calories Burned Tracker

Another important feature of Pulse Up is the Calories Burned Tracker, which helps users understand how many calories they've burned during workouts and throughout their day.

6.4.1 How Calories Burned are Calculated

Pulse Up calculates calories burned based on various factors, including the type of activity, intensity, and duration. The app uses the user's personal details, such as weight and age, to estimate the number of calories burned during specific activities.

Resting Calories: Even when the user is not active, they burn calories at a resting rate, which Pulse Up takes into account.

Active Calories: The calories burned during physical activities like walking, running, or exercising are calculated separately.

6.4.2 Benefits of Tracking Calories Burned

Weight Management: By tracking the calories burned, users can assess their energy expenditure and adjust their diet and exercise routines accordingly.

Progress Monitoring: Users can track the number of calories burned over time to measure improvements in fitness and activity levels.

Motivation: Seeing how many calories they've burned can motivate users to push harder during their workouts.

6.5 BMI Calculator

The Body Mass Index (BMI) Calculator is another essential feature of Pulse Up. It helps users determine whether they are underweight, normal weight, overweight, or obese based on their weight and height. BMI is an important metric for understanding overall health and can help users make informed decisions about their fitness goals.

6.5.1 How the BMI Calculator Works?

To calculate BMI, Pulse Up requires users to enter their weight and height.
The app then uses the following formula:

$$BMI = \frac{\text{Weight (kg)}}{\text{Height (m)}^2}$$

BMI Ranges: Pulse Up provides feedback based on BMI categories:
Underweight: BMI less than 18.5 Normal weight: BMI between 18.5 and 24.9
Overweight: BMI between 25 and 29.9
Obese: BMI over 30

6.5.2 Benefits of the BMI Calculator

Health Assessment: BMI helps users understand their weight status and determine whether they need to lose, gain, or maintain weight.

Personalized Recommendations: Pulse Up can provide personalized workout plans or diet suggestions based on the user's BMI to help them achieve their desired weight.

41

6.6 Calories Intake vs. Burn

Pulse Up also tracks the balance between calories consumed (from food) and calories burned (through activity). This feature helps users optimize their diet and workout routine for weight management.

6.6.1 How the Feature Works?

Calories Intake: Users input their daily food intake into the app, and Pulse Up calculates the calories consumed.

Calories Burned: The app also tracks calories burned through physical activity.

Balance: The app compares the calories burned with the calories consumed and provides insights into whether the user is in a caloric surplus, deficit, or maintenance mode.

Step counting – code logic (java) :

```java
sensorManager=(SensorManager)
getSystemService(Context.SENSOR_SERVICE);
if (getPackageManager().hasSystemFeature(PackageManager.FEATURE_SENSOR_STEP_COUNTER)) {
    stepSensor =    sensorManager.getDefaultSensor(Sensor.TYPE_STEP_COUNTER);
}
else
{
    tvSteps.setText("Step    Sensor Not    Available!");
    return;
}

//Register listener for    step    counter
sensorManager.registerListener(this,    stepSensor,    SensorManager.SENSOR_DELAY_UI);

// Toggle Stop/Resume    functionality
btnStopResume.setOnClickListener(v ->
{
    if (isCounting)          {
        // Stopcounting      steps
        sensorManager.unregisterListener(stepcounting.this,      stepSensor);
```

```java
        btnStopResume.setText("Resume");
    } else
{
    // Resume    countingsteps
    sensorManager.registerListener(stepcounting.this,stepSensor,
SensorManager.SENSOR_DELAY_UI);
    btnStopResume.setText("Stop");


  isCounting=!isCounting;//Togglestate
});
```

Maintenance Calorie finder – code logic (java) :

```java
int age = Integer.parseInt(ageStr);
float weight = Float.parseFloat(weightStr);
float height = Float.parseFloat(heightStr);
int selectedGender = rgGender.getCheckedRadioButtonId();
double bmr;

if (selectedGender == R.id.rbMale) {
   bmr = 10 * weight + 6.25 * height - 5 * age + 5;
} else {
   bmr = 10 * weight + 6.25 * height - 5 * age - 161;
}

double activityFactor;
switch (spActivityLevel.getSelectedItemPosition()) {
   case 0:
      activityFactor = 1.2;
      break;
   case 1:
      activityFactor = 1.375;
      break;
   case 2:
      activityFactor = 1.55;
```
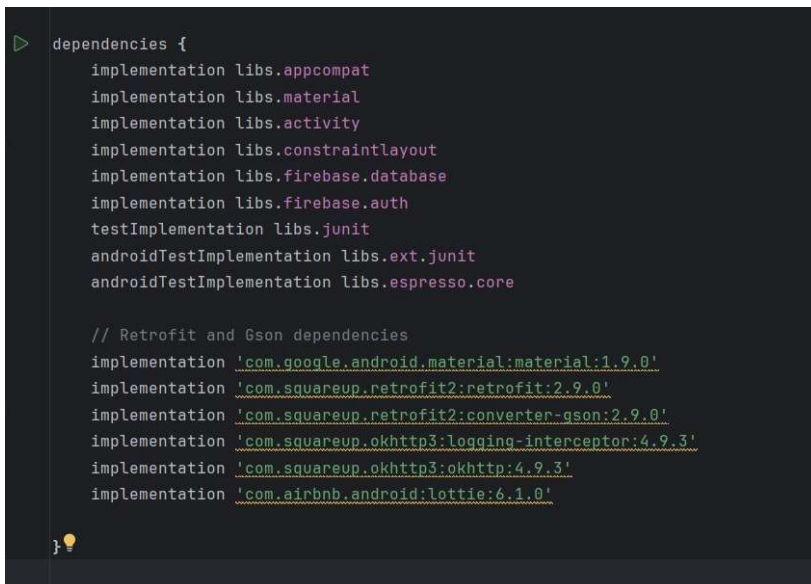
```
      break;
   case 3:
      activityFactor = 1.725;
      break;
   default:
      activityFactor = 1.2;
      break;
}


double maintenanceCalories = bmr * activityFactor;
double calorieDeficit = maintenanceCalories - 500;
double calorieSurplus = maintenanceCalories + 500;
tvResult.setText(
   "Your Maintenance Calories: " + String.format("%.2f", maintenanceCalories) + " kcal/day\n\n" +
      "For Weight Loss (Calorie Deficit): " + String.format("%.2f", calorieDeficit) + " kcal/day\n" +
      "For Muscle Gain (Calorie Surplus): " + String.format("%.2f", calorieSurplus) + " kcal/day"
);
```

```
dependencies {
    implementation libs.appcompat
    implementation libs.material
    implementation libs.activity
    implementation libs.constraintlayout
    implementation libs.firebase.database
    implementation libs.firebase.auth
    testImplementation libs.junit
    androidTestImplementation libs.ext.junit
    androidTestImplementation libs.espresso.core

    // Retrofit and Gson dependencies
    implementation 'com.google.android.material:material:1.9.0'
    implementation 'com.squareup.retrofit2:retrofit:2.9.0'
    implementation 'com.squareup.retrofit2:converter-gson:2.9.0'
    implementation 'com.squareup.okhttp3:logging-interceptor:4.9.3'
    implementation 'com.squareup.okhttp3:okhttp:4.9.3'
    implementation 'com.airbnb.android:lottie:6.1.0'

}
```

Fig 6.1 – Required permissions in manifest.xml

6.6.2 Benefits of the Calories Intake vs. Burn Feature

Weight Loss or Gain: This feature helps users manage their weight by maintaining a caloric deficit (for weight loss) or surplus (for weight gain).

Nutritional Awareness: Users become more aware of the calories they are consuming and can make healthier food choices.

Goal Optimization: Pulse Up helps users optimize their fitness goals, whether they're looking to lose fat, build muscle, or maintain their current weight.

6.7 Conclusion

The Counting & Calculating Features of Pulse Up provide users with essential data and insights into their fitness journey.

From tracking steps and calories burned to calculating BMI and balancing calorie intake with energy expenditure, Pulse Up ensures that users have all the tools they need to monitor their progress and make informed decisions.

These features not only enhance the user experience but also keep users motivated to reach their fitness goals.

CHAPTER 7
Workout & Diet Plan

CHAPTER 7 - Workout & Diet Plan

7.1 Overview

The Workout & Diet Plan is one of the most essential features of the Pulse Up fitness app. This chapter focuses on the comprehensive workout guides and diet plans available for users who want to improve their fitness and reach their desired goals. The app provides both home workout and gym workout routines, each designed with animations and step-by-step guidance to help users perform exercises correctly. Along with workouts, Pulse Up also offers personalized diet plans to suit different fitness goals, such as bulking, shredding, and maintaining weight.

7.2 Home Workout Plan

7.2.1 What is the Home Workout Plan?

The Home Workout Plan in Pulse Up is designed for users who prefer exercising in the comfort of their home.

It contains a variety of bodyweight exercises that do not require any equipment, making it accessible for anyone, regardless of their location or budget.

These exercises are aimed at improving strength, flexibility, endurance, and overall fitness.

7.2.2 Features of the Home Workout Plan

Step-by-Step Guidance: Each exercise comes with detailed instructions on how to perform it, ensuring proper form and preventing injury.

Animation Preview: Animated visuals demonstrate the exercise movements, making it easy for users to follow along.

Exercise Categories: Exercises are divided into categories such as core, upper body, lower body, and full-body workouts.

Varied Intensity: The workouts range from beginner to advanced levels, so users can progress at their own pace.

7.2.3 Benefits of the Home Workout Plan

Convenience: No need to go to a gym or purchase equipment. Users can work out at home anytime. Cost-effective: It's free and doesn't require any special equipment or membership fees.

Flexibility: Users can tailor their workout plans based on their time and fitness level.

Full-body Strengthening: The exercises are designed to target all major muscle groups, ensuring a balanced workout.

7.3 Gym Workout Plan

7.3.1 What is the Gym Workout Plan?

The Gym Workout Plan is designed for users who have access to a gym and want to focus on building strength, muscle mass, or improving their cardiovascular health.

The plan includes exercises that require gym equipment like weights, machines, and resistance bands. These exercises are more advanced and aim to push users toward achieving their fitness goals with a higher intensity.

7.3.2 Features of the Gym Workout Plan

Exercise Split: The gym workout plan is typically divided into muscle group splits, such as chest and back, arms, legs, and shoulders. This split ensures that users can target specific muscle groups for optimal growth and recovery.

Step-by-Step Instructions: Each exercise is accompanied by detailed instructions, including the number of sets, repetitions, and rest periods.

Animation Preview: Animated demonstrations provide a visual guide to ensure proper form during exercises.

Targeted Goals: Gym workouts are designed to help users with specific fitness goals, such as strength building, muscle toning, or fat loss.

7.3.3 Benefits of the Gym Workout Plan

Muscle Building: Using weights and machines helps users build muscle mass and strength more efficiently.

Variety: A variety of exercises targeting different muscle groups prevents workout monotony and ensures balanced growth.

Advanced Training: The gym plan is perfect for individuals looking to take their fitness to the next level, with more challenging exercises.

7.4 Yoga Asanas Plan

7.4.1 What is the Yoga Asanas Plan?

In addition to home and gym workouts, Pulse Up also includes a Yoga Asanas Plan. Yoga is known for improving flexibility, balance, and mental clarity. Pulse Up provides users with a variety of yoga poses (asanas), along with step-by-step guidance and animations, to help users practice yoga at home.

7.4.2 Features of the Yoga Asanas Plan

Step-by-Step Guidance: Detailed instructions help users understand how to perform each yoga pose correctly.

Animation Preview: Visual aids show how to correctly execute the asanas, ensuring proper alignment and breathing techniques.

Different Levels: The yoga plan caters to beginners, intermediate, and advanced practitioners.

Mental Wellness: In addition to physical benefits, yoga can help with relaxation and stress relief.

7.4.3 Benefits of the Yoga Asanas Plan

Improved Flexibility: Regular yoga practice increases flexibility and reduces the risk of injury.

Stress Relief: Yoga helps users calm their minds, reduce stress, and promote mental well-being.

Posture Correction: Yoga enhances posture and promotes better spinal alignment.

7.5 Diet Plan

7.5.1 What is the Diet Plan?

Pulse Up offers personalized diet plans for users based on their fitness goals. Whether users are looking to lose fat (shredding), gain muscle (bulking), or maintain their current weight, Pulse Up provides tailored meal suggestions and calorie recommendations.

7.5.2 Features of the Diet Plan

Customized Plans: The diet plans are customized based on the user's weight, height, age, and fitness goals.

Meal Recommendations: The app suggests different meals for breakfast, lunch, dinner, and snacks that fit within the user's calorie and macronutrient goals.

Calorie Maintenance Calculator: Pulse Up includes a calorie maintenance calculator that helps users

determine their daily calorie needs based on their activity level.

Helpful Videos: The diet plan also includes videos on healthy cooking and meal preparation to guide users in making nutritious meals

7.5.3 Benefits of the Diet Plan

Nutritional Balance: The diet plans ensure users get the right amount of protein, carbs, and fats to support their fitness goals.

Weight Management: Whether users want to lose weight, gain muscle, or maintain their current weight, the diet plans help them reach their goals.

Healthy Eating: Pulse Up encourages healthy eating habits by suggesting nutrient-dense meals and snacks.

7.6 Conclusion

Nutritional Balance: The diet plans ensure users get the right amount of protein, carbs, and fats to support their fitness goals.

Weight Management: Whether users want to lose weight, gain muscle, or maintain their current weight, the diet plans help them reach their goals.

Healthy Eating: Pulse Up encourages healthy eating habits by suggesting nutrient-dense meals and snacks.

CHAPTER 8 - Reference

8.1 Overview

This chapter provides the reference materials used in the development and creation of the Pulse Up fitness app. These references include key resources such as books, articles, websites, and research papers that contributed to the understanding of fitness, app development, and the technologies utilized in building Pulse Up. It also includes information about the libraries and tools used during the development process.

8.2 Reference Materials for Fitness and Nutrition

In developing the Workout Plans and Diet Plans for Pulse Up, a variety of fitness and nutrition-related resources were referenced to ensure that the app's content was scientifically sound and beneficial to users. These resources include books, articles, and reputable fitness websites, providing evidence-based information for creating effective workout and diet strategies.

1. Books on Fitness and Nutrition: "Strength Training Anatomy" by Frederic Delavier "The Science and Fine Art of Food and Nutrition" by Arnold Ehret "The New Encyclopedia of Modern Bodybuilding" by Arnold Schwarzenegger

2. Websites and Online Articles: Healthline (www.healthline.com) – A trusted source for nutrition and fitness tips. Mayo Clinic (www.mayoclinic.org) – Providing health information related to exercise, nutrition, and wellness. Bodybuilding.com (www.bodybuilding.com) – A comprehensive resource for workout routines, nutritional plans, and fitness articles.

3. Research Papers:

"Physical Activity Guidelines for Americans" by the U.S. Department of Health and Human Services. "Dietary Guidelines for Americans" by the U.S. Department of Agriculture and U.S. Department of Health and Human Services.

8.3 Reference Materials for App Development

The development of Pulse Up involved the integration of several technologies and tools. These references helped ensure that the app's architecture, performance, and user interface were optimized.

1. Official Android Documentation: The Android official documentation (https://developer.android.com/docs) was a critical reference for understanding Android Studio, creating user interfaces, and managing app components like activities and services.

2. Firebase Documentation: Firebase was used for backend services like authentication, real-time database, and storage. The official Firebase documentation (https://firebase.google.com/docs) provided the necessary

guidelines for setting up and integrating Firebase services.

3. Books on Android App Development: "Android Programming: The Big Nerd Ranch Guide" by Bill Phillips, Chris Stewart, and Kristin Marsicano. "Android Development for Beginners" by Google Developers.

4. Online Courses and Tutorials: Udemy (www.udemy.com) – Various Android development courses and Firebase tutorials helped in implementing the app's features. Coursera (www.coursera.org) – Online courses on mobile app development and machine learning that were useful for integrating AI features.

5. GitHub Repositories: Many open-source repositories on GitHub were referenced for code examples and solutions to common app development challenges.

These repositories helped in speeding up development and improving the quality of the app.

8.4 Libraries and Tools Used

To enhance the app's functionality, several libraries and tools were used. These tools allowed for more efficient coding, better user experience, and smoother app performance.

1. **Android Libraries:**

    Retrofit: For handling HTTP requests and working with APIs.

    Glide: For image loading and caching.

    Room Database: For local storage and database management.

    View Model and Live Data: For managing UI-related data in a lifecycle-conscious way.

2. **Firebase Libraries:**

    Firebase Authentication: For managing user login and registration.

    Firebase Firestore: For real-time database services.

    Firebase Storage: For storing images and videos Research Journal of Engineering and Technology, 2017.

3. **AI Libraries:**
    Dialog flow: For integrating AI chatbot functionality.
    TensorFlow Lite: For adding machine learning capabilities to the app, such as recognizing workout poses.

4. **Design Tools:**
    Figma: For creating the app's UI/UX design.
    Adobe Photoshop: For editing images used within the app.
    Canva: For creating promotional materials and in-app graphics.

8.5 Citation Format

Here is the standard citation format for some of the key references used:

Delavier, Frederic. Strength Training Anatomy. 3rd Edition, Human Kinetics, 2010.

Ehret, Arnold. The Science and Fine Art of Food and Nutrition. 4th Edition, Health Science, 1922.

Schwarzenegger, Arnold.

The New Encyclopedia of Modern Bodybuilding. 2nd Edition, Rebo Publishing, 1998.

U.S. Department of Health and Human Services. "Physical Activity Guidelines for Americans". 2nd Edition, 2018. Firebase Documentation. "Firebase for Android". Firebase, Google Inc., https://firebase.google.com/docs.

8.6 Conclusion

The Reference section highlights the essential sources and tools used in developing the Pulse Up fitness app. These references ensured the app's content was scientifically valid and that its development adhered to best practices in mobile app creation. With these resources, the app delivers an effective, user-friendly, and data-driven experience for individuals seeking to improve their fitness and overall well-being.

Future Scope

A. In-App Updates

To enrich the user journey and bring more life to the app, we plan to introduce a seamless navigation bar with meaningful additions:

1. **Home:** A comforting dashboard where users can track their daily progress and stay motivated.

2. **Experts**: A live connection with real mentors — fitness influencers who are ready to guide, inspire, and listen. Because sometimes, all it takes is a little push from the right person.

3. **Shop:** A space where fitness becomes affordable — offering quality products without burdening the pocket.

4. **Ebook:** A library of powerful knowledge — guides, stories, and magazines that don't just inform but inspire.

5. **Profile:** A window to the self — where users can see their growth, reflect, and personalize their fitness journey.

B. IEEE Paper

This app is not just functional, it's meaningful. In the near future, we plan to document its journey and innovations by preparing a comprehensive IEEE research paper — highlighting the blend of technology, wellness, and social value.

C. Publishing

Our ultimate goal is to bring Pulse Up to the Google Play Store, reaching out to people who need motivation, structure, and support in their fitness journey. We believe this app can become a digital companion — not just an assistant, but a silent partner in transformation.

Appendix-Assessment sheet

PROGRESSIVE ASSESSMENT (PA) OF CAPSTONE PROJECT EXECUTION & REPORT WRITING

Name of Student: Aditya Kumkar, Nihal Mishra, Prathamesh Pawade

Enrollment No: 2209640063, 2209640019, 2209640028

Name of Program: Information Technology

Semester: IF6I

Course Title and Code: Capstone Project Execution & Report writing (22058)

Title of the Capstone Project: "APPLICATION FOR PULSE UP FITNESS"

A.   POs addressed by the Capstone Project

a)   Basic and Discipline specific knowledge.

b)   Problem Analysis

c)   Design / development of solution

d)   Engineering Tools, Experimentation and Testing

e)   Engineering practices of society, sustainability and environment.

f)   Project Management

g)   Life-long learning

B.   COs addressed by the Capstone Project

a)   Write the problem/task specification in existing system related to the occupation

b)   Select, collect and use required information/knowledge to solve the problem / complete the task.

c)   Logically choose relevant possible solution.

d)   Consider the ethical issues related to the project (if there are any)

e)   Prepare a project proposal with a clear action plan and timeline before starting the project

f)   Communicate effectively and confidently as a member & leader of team.

55

C.   Other Learning Outcomes Achieved Through This Project

1.   Unit Outcomes (Cognitive Domain)

a)   Explain process of using multiple forms for the given problems

b)   Describe modules using multiple forms for the given modules

c)   Create stored procedures using Google firebase to solve given problems

2.   Practical Outcomes (in Psychomotor Domain) Developed the software requirements analysis where the information domain, functions, behaviour, constraints and validation criteria for software are established.

3.   Affective Domain Outcomes:

a)   Identified our own strength and develop the area of growth.

b)   Developed Coordination among the team.

c)   Developed various strategies to tackle problems.

d)   Ability to work in discipline as a team.

e)   Developed a good and friendly relation with guide.

Enrollment No	Student Name	Problem Identification/ project Title	Punctuality and overall contribution	Project Diary	Execution of Plan During Sixth Semester	Project report including documentation	Presentation	P.A Marks According to T. E. Scheme (50)
		10 Marks			20 Marks	15 Marks	5 Marks	50 Marks
2209640063	Aditya Kumkar							
2209640019	Nihal Mishra							
2209640028	Prathamesh Pawade							

Project Guide:

Mr. Haridas Khedkar   **Signature**