VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI-590018

Mobile Application Development - Mini Project Report

on

Fitness App

Submitted in partial fulfillment of the requirements for the VI semester

Bachelor of Engineering in Computer Science

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CERTIFICATE

Certified that the mini project work entitled **"Fitness App"** has been successfully carried out by **Arun S** bearing USN **1RN20CS025** and **Asutosh C Urs** bearing USN **1RN20CS026**, bonafide students of **"RNS Institute of Technology"** in partial fulfillment of the requirements for the 6th Semester of **"Bachelor of Engineering in Computer Science and Engineering of Visvesvaraya Technological University"**, Belagavi, during academic year 2022-2023. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the Mobile Application Development Laboratory requirements.

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1.

2.

Acknowledgement

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Abstract

By giving users a platform to track and advance their fitness activities, this project, a fitness app called Fitness App, hopes to upend the fitness industry. The app has features that let users keep track of their workouts, and get tailored advice.

XML is used for the front end of the Fitness App app, and Java is used for the back end. It stores user information, fitness activities, and other pertinent information in a FIREBASE database. To inform users of their progress and any changes in the fitness community, the app also includes notifications and updates.

The Fitness App app's updated core features and capabilities are listed below:

Fitness tracking: Users are able to keep track of their workouts and activities, including the exercises they perform and the weights they lift. Users of the app can record a variety of workouts, including cardio, strength training, yoga, and more.

Users can set specific fitness goals, such as weight loss, muscle growth, or an improvement in overall fitness. Based on user goals, the app offers recommendations and guidance.

Fitness Reports: Based on the activities entered into the database, administrators have the ability to produce weekly fitness reports. These reports can give users and trainers information about their achievements, trends, and progress, assisting in performance analysis.

Personalised Recommendations: The app uses user data to generate personalised workout, diet, and fitness tip recommendations that are catered to users' preferences and goals.

By offering users a comprehensive and user-friendly platform to track their fitness journeys and receive individualised guidance, Fitness App seeks to revolutionise the fitness industry. Fitness App aims to empower people in achieving their fitness goals and leading healthier lifestyles with its data-driven approach.

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Chapter 1

Introduction

1.1 About the Project

Fitness App's goal is to give users a platform to keep track of and manage their fitness activities. Users can keep track of their workouts, set fitness objectives, and get tailored advice. Users can access the app directly without logging in, and there is no need to register in order to use it. Fitness App makes use of dependable technology to provide users with a seamless experience as soon as they launch the app. The emphasis is on giving users the knowledge they require to follow their fitness journey and accomplish their objectives. Users of the app can record a variety of workouts, such as cardio, strength training, yoga, and more. Users can set specific fitness objectives, such as weight loss, muscle growth, or general fitness improvement, and Fitness App offers tailored advice to assist users in achieving their objectives.

Fitness App does not integrate payments because it is only intended for tracking and advising fitness. There isn't a shopping feature on the app.

Fitness App's mission is to give users the tools they need to take charge of their fitness by giving them a simple and effective platform for monitoring their workouts, setting goals, and getting tailored advice. The emphasis is on assisting users in leading healthier lifestyles and supporting them on their fitness journey.

1.1.1 Android Studio

Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems or as a subscription-based service in 2020. It is a replacement for the Eclipse Android Development

Tools (E-ADT) as the primary IDE for native Android application development.

Android Studio supports all the same programming languages of IntelliJ (and CLion) e.g. Java, C++, and more with extensions, such as Go; and Android Studio 3.0 or later supports Kotlin and "all Java 7 language features and a subset of Java 8 language features that vary by platform version." External projects backport some Java 9 features. While IntelliJ states that Android Studio supports all released Java versions, and Java 12, it's not clear to what level Android Studio supports Java versions up to Java 12 (the documentation mentions partial Java 8 support). At least some new language features up to Java 12 are usable in Android.

1.1.2 Android SDK

The Android SDK is a software development kit that includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and tutorials. Currently supported development platforms include computers running Linux (any modern desktop Linux distribution), Mac OS X 10.5.8 or later, and Windows 7 or later. As of March 2015, the SDK is not available on Android itself, but software development is possible by using specialized Android applications.

Until around the end of 2014, the officially-supported integrated development environment (IDE) was Eclipse using the Android Development Tools (ADT) Plugin.As of 2015, Android Studio, is the official IDE; however, developers are free to use others, but Google made it clear that ADT was officially deprecated since the end of 2015 to focus on Android Studio as the official Android IDE. Additionally, developers may use any text editor to edit Java and XML files, then use command line tools (Java Development Kit and Apache Ant are required) to create, build and debug Android applications as well as control attached Android devices (e.g., triggering a reboot, installing software package(s) remotely).

1.1.3 Emulator

The Android Emulator simulates Android devices on your computer so that you can test your application on a variety of devices and Android API levels without needing to have each physical device.

The emulator provides almost all of the capabilities of a real Android device. You can simulate incoming phone calls and text messages, specify the location of the device, simulate different network speeds, simulate rotation and other hardware sensors, access the Google Play Store, and much more.

Testing your app on the emulator is in some ways faster and easier than doing so on a physical

device. For example, you can transfer data faster to the emulator than to a device connected over USB.

The emulator comes with predefined configurations for various Android phone, tablet, Wear OS, and Android TV devices.

1.1.4 Firebase

Firebase is a product of Google which helps developers to build, manage, and grow their apps easily. It helps developers to build their apps faster and in a more secure way. No programming is required on the firebase side which makes it easy to use its features more efficiently. It provides services to android, ios, web, and unity. It provides cloud storage. It uses NoSQL for the database for the storage of data. In this architecture, Firebase sits between the server and clients. Your servers can connect to Firebase and interact with the data just like any other client would. In other words, your server communicates with clients by manipulating data in Firebase. Our Security and Firebase Rules language lets you assign full access to your data to your server. Your server code can then listen for any changes to data made by clients, and respond appropriately. In this configuration, even though you're still running a server, Firebase is handling all of the heavy lifting of scale and real-time updates. Firebase initially was an online chat service provider to various websites through API and ran with the name Envolve. It got popular as developers used it to exchange application data like a game state in real time across their users more than the chats. This resulted in the separation of the Envolve architecture and it's chat system. The Envolve architecture was further evolved by it's founders James Tamplin and Andrew Lee,to what modern day Firebase is in the year 2012. In this architecture, Firebase sits between the server and clients. Your servers can connect to Firebase and interact with the data just like any other client would. In other words, your server communicates with clients by manipulating data in Firebase. Our Security and Firebase Rules language lets you assign full access to your data to your server. Your server code can then listen for any changes to data made by clients, and respond appropriately. In this configuration, even though you're still running a server, Firebase is handling all of the heavy lifting of scale and real-time updates.

1.1.5 Java

Java is a programming language independent of all platforms and can be used for multiple operating systems.Keeping security in mind, all other programming languages are developed, including the interpreter, compiler, and run-time environment. A lot of concentration is put on testing to ensure potential early errors are caught.Java is the first choice of android app developers because of ease of

use, robustness, security features, and cross-platform development capabilities.

1.1.6 XML

Extensible Markup Language (XML) is a markup language and file format for storing, transmitting, and reconstructing arbitrary data. It defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. The World Wide Web Consortium's XML 1.0 Specification of 1998 and several other related specifications—all of them free open standards—define XML.

The design goals of XML emphasize simplicity, generality, and usability across the Internet. It is a textual data format with strong support via Unicode for different human languages. Although the design of XML focuses on documents, the language is widely used for the representation of arbitrary data structures such as those used in web services.

Several schema systems exist to aid in the definition of XML-based languages, while programmers have developed many application programming interfaces (APIs) to aid the processing of XML data.

1.2 Existing System

Since technology is advancing, a lot of fitness apps are switching to this practical method where they don't need to complete any registration, and the hassle for the fitness enthusiasts also decreases because all they need is their phone with a google account signed in, and the app uses O-Auth technology to sign into the app. The existing data is more susceptible to data leaks and we aim to fix that in the future.

1.2.1 Limitation of Existing System

Furthermore, the Fitness App app can address challenges related to logistics and instant deliveries by incorporating features that efficiently assign workout routines or fitness challenges to users based on their preferences and available resources. This could involve smart scheduling algorithms that consider factors such as workout availability, trainer availability, and user preferences to optimize the allocation of workout routines or challenges.

By implementing these improvements, Fitness App can provide users with a more personalized and engaging fitness experience, allowing them to track their progress, set goals, and customize their workout routines according to their preferences and aspirations

Some of the major limitations that persons with fitness app are:

Modification of Workouts or Plans: In some cases, users may want to modify or update their selected workouts or fitness plans after they have been confirmed. Fitness App can offer an option for users to modify or update their workouts within a specific time frame, allowing flexibility and accommodating changes based on the user's evolving fitness needs and preferences.

1.3 Problem Statement

In today's fast-paced life, people often face inconvenience when it comes to visiting multiple gyms or fitness centers to find suitable workout options. Having a Fitness App app can greatly simplify the fitness journey by allowing users to access and manage their fitness activities online, anytime and anywhere.

The Fitness App app aims to provide a comprehensive fitness solution, eliminating the need for users to physically visit different fitness centers. Users can easily explore various workout options and receive recommendations through the convenience of their mobile devices.

Chapter 2

Requirement Analysis

2.1 Hardware Requirements

The hardware requirements are very minimal and the program can be run on most of the machines

Processor : Qualcomm Snapdragon processor

Processor Speed : 1.4 GHz

RAM : 4 GB

Storage Space : 50 MB to 100MB

Display Resolution : Any sized phone screen

I/O Elements : Speaker

Network : 5 Mbps (Works without internet also)

2.2 Software Requirement

Operating System : Android (Base version should be 4.4 and anything above)

Chapter 3

System Design

3.1 System Architecture

The project consists of the following parts as shown in figure 3.1

The figure shown above (Figure 3.1) represents the system design of the Fitness App application. It illustrates the flow of the app and the different functionalities available to users.

Users of the Fitness App app can view their customised fitness dashboard by logging in with their credentials. After logging in, customers can explore a range of workout options and fitness activities divided into various disciplines like cardio, strength training, yoga, and more.

Administrators have the power to amend or eliminate any exercise programme. Through the incorporation of Firebase, they can also notify users via alerts of upgrades or new workout additions. With the Fitness App app, users can find appropriate solutions for their fitness journey by focusing on offering a seamless user experience and a wide variety of routines. by utilising intuitive user interfaces and strong back-end management systems.

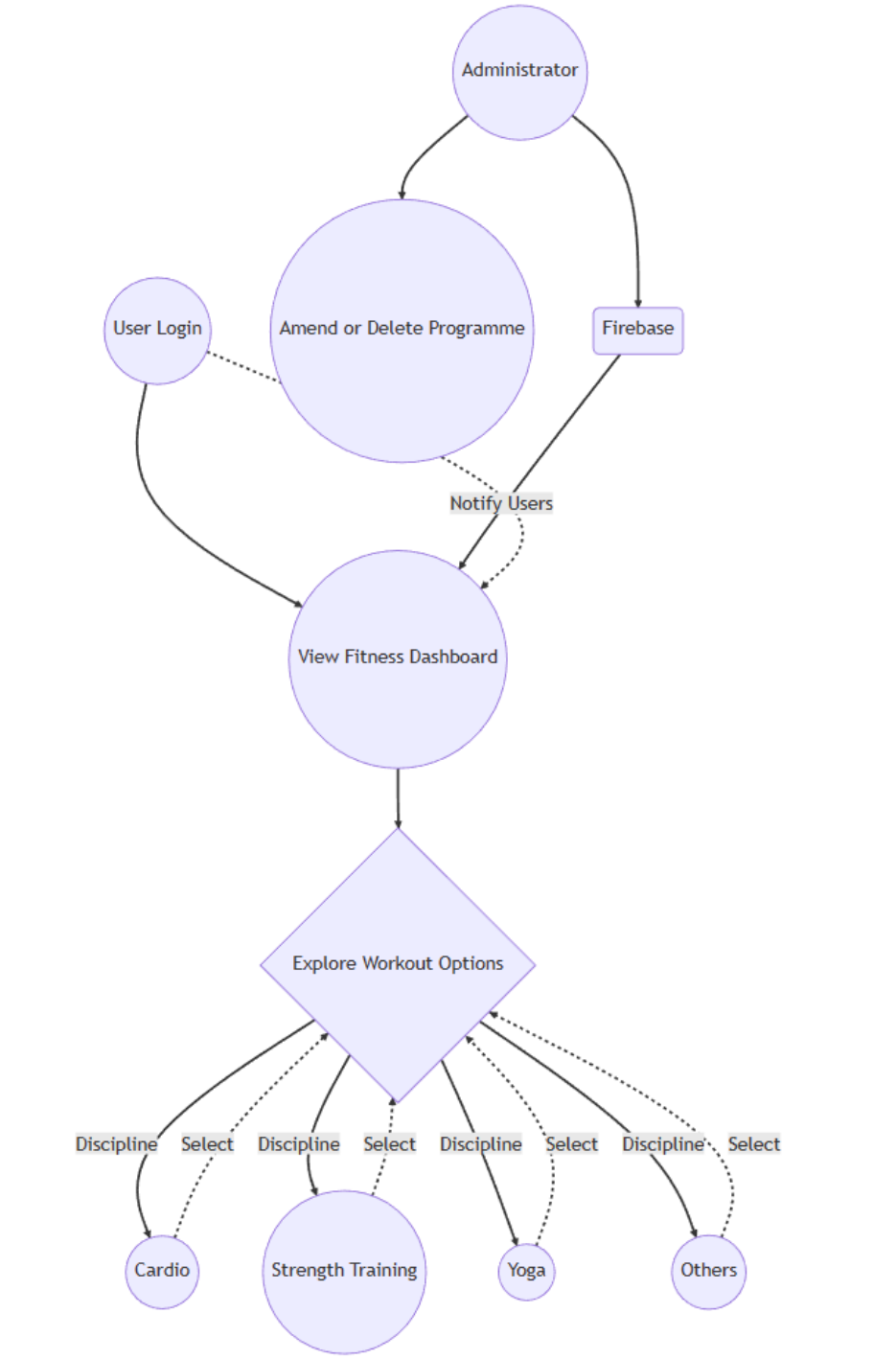


Figure 3.1: Flowchart of the application

Chapter 4

Implementation

4.1 Creating a User Registration

```
FireBaseAuth mAuth;
String mail,passwd;
mail = String.valueOf(email.getText());
passwd = String.valueOf(pass.getText());
mAuth.createUserWithEmailAndPassword(mail, passwd);
```

The code snippet initializes a FirebaseAuth object (mAuth) for Firebase Authentication. It retrieves email and password values from input fields and creates a new user account using createUserWithEmailAndPassword() method.

4.2 User login

```
FirebaseAuth mAuth;
String mail,passwd;
mail = String.valueOf(email.getText());
passwd = String.valueOf(pass.getText());
mAuth.signInWithEmailAndPassword(mail, passwd);
```

The given code snippet initializes a `FirebaseAuth` object (`mAuth`)

for Firebase Authentication. It retrieves the email and password values from input fields, and then uses the 'signInWithEmailAndPassword()' method to sign in the user with the provided email and password credentials.

4.3 Check whether user has already logged in

```
public void onStart()
{
super.onStart();
// Check if user is signed in (non-null) and update UI accordingly.
FirebaseUser currentUser = mAuth.getCurrentUser();
if(currentUser != null)
{
Intent i = new Intent(getApplicationContext(), Splashscreen.class);
startActivity(i);
//finish();
}
}
```

onStart() method checks if a user is signed in, and if so, it starts the Splashscreen activity, which presumably represents the next screen after successful authentication.

4.4 Displays exercise.

```
public void beforeage18(View view)
{
Intent intent=new Intent(MainActivity.this,SecondActivity.class);
startActivity(intent);
}
  public void afterage18(View view)
{
Intent intent=new Intent(MainActivity.this,SecondActivity2.class);
```

```
startActivity(intent);
}
   public void food(View view)
{
Intent intent=new Intent(MainActivity.this,FoodActivity.class);
startActivity(intent);
}
```

The three methods handle button clicks in
the MainActivity and start different activities
(SecondActivity, SecondActivity2, or FoodActivity)
based on the specific button clicked,
thereby navigating to different screens
within the application

4.5 Displays the exercise page with timer

```
Intent intent=getIntent();
buttonvalue=intent.getStringExtra("value");

   int intvalue=Integer.valueOf(buttonvalue);

   switch(intvalue)
{
   case 1:  setContentView(R.layout.activitybow); break;
case 2:  setContentView(R.layout.activitybridge);
   break;
case 3:  setContentView(R.layout.activitychair); break;
case 4:  setContentView(R.layout.activitychild); break;
case 5:  setContentView(R.layout.activitycobbler); break;
case 6:  setContentView(R.layout.activitycow); break;
case 7:  setContentView(R.layout.activityplayji); break;
case 8:  setContentView(R.layout.activitypauseji); break;

}
```

4.6 Logout

```
if(id==R.id.logout)
{
FirebaseUser currentUser = auth.getCurrentUser();
if(currentUser != null)
{
Intent i = new Intent(getApplicationContext(), Login.class);
startActivity(i);
FirebaseAuth.getInstance().signOut();
finish();
}
}
```

The code snippet checks if the logout button is clicked, signs out the currently signed-in user if any, navigates to the login screen, and finishes the current activity or fragment.

Chapter 5

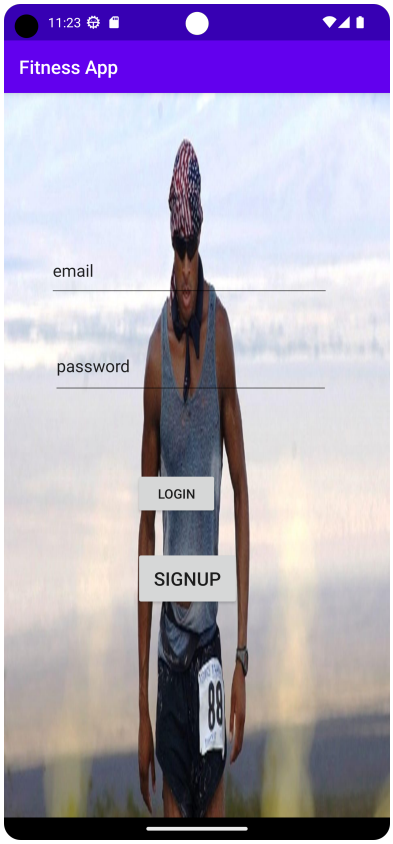
Result Analysis

5.1 Testing

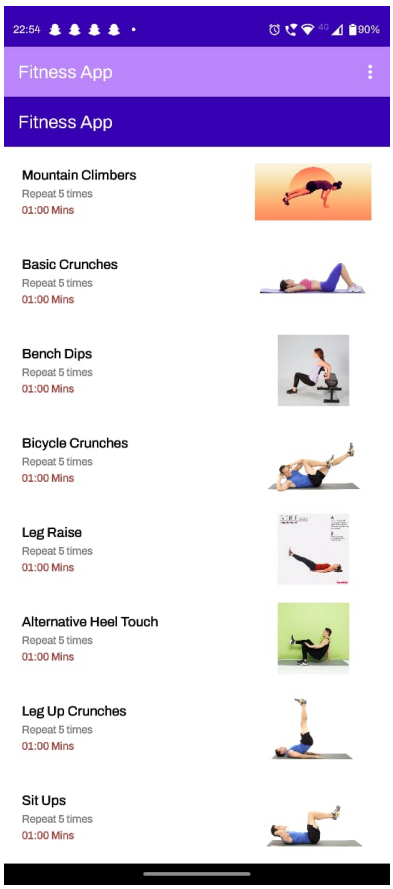
Table 5.1 gives details of validation.

Table 5.1: Test Case Validation

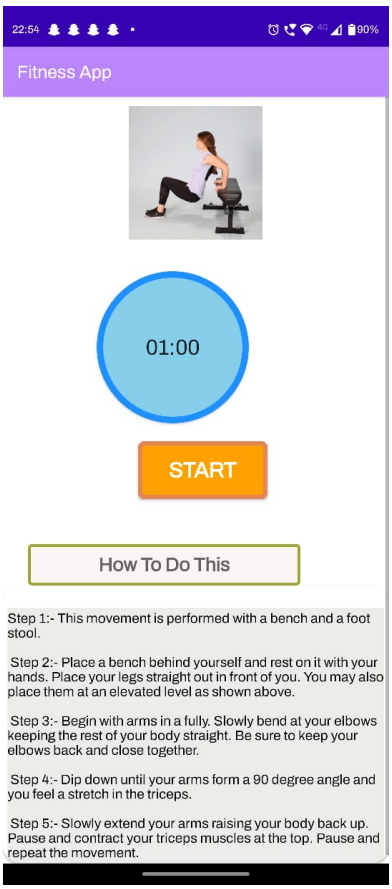
Test Case No.	**Input**	**Expected Output**	**Actual Output**
1	User enters email address and password	User gets verified and app outputs screen to home page	User gets access to the app only if email id and password matches with the one stored in system
2	User gives an invalid email	The app outputs login failed	The app outputs invalid command and redirects user to login page
3	User gives a valid command	The app performs desired functionality	The app performs desired function as per user's request
4	User receives exercise notification	The app performs the desired functionality	User receives notification



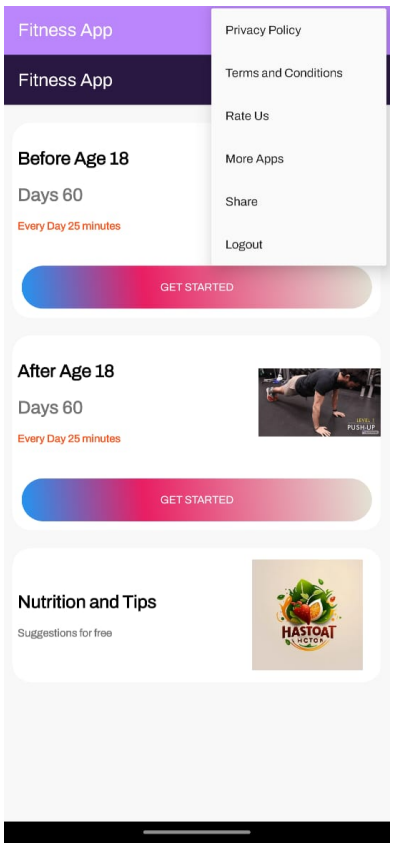
(a) Allows User To Login



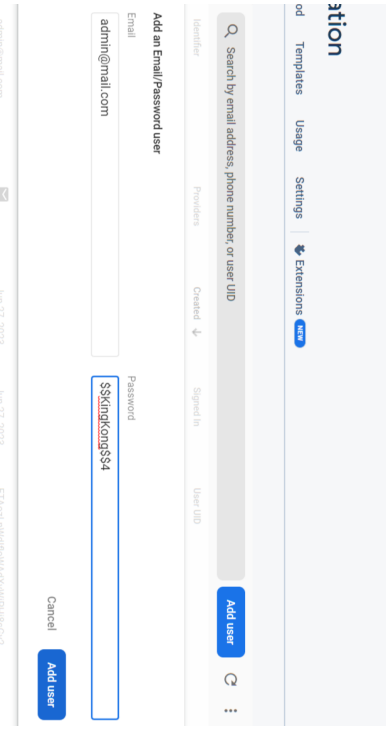
(b) Exercises in Category wise



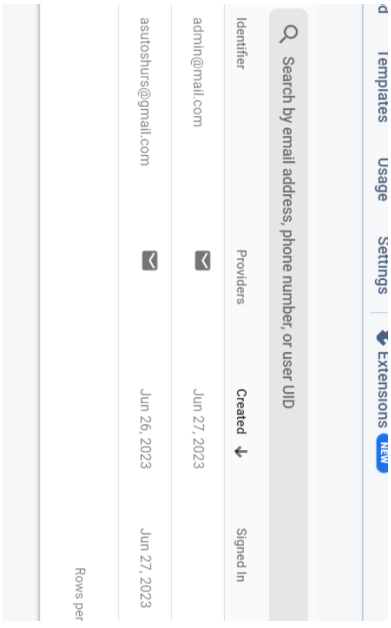
(c) Exercise



(d) Home page



(e) Admin Adding Accounts



(f) Account Details on Firebase

Figure 5.1: Output for test cases of Fitness App.

(a) Login Page: Figure (a) represents the login page of the application. This page serves as the initial point of access for users to log in to the game. It typically includes fields for users to enter their credentials, such as a username and password, allowing them to securely access their personalized accounts and game progress. The login page may also feature additional options like a ”Remember Me” checkbox or a ”Forgot Password” link to provide users with a convenient and secure login experience.

(b) Exercises in Category View: Figure (b) displays the category view of exercises within the game. This view presents a collection of exercises organized into different categories, such as ”Strength Training,” ”Cardiovascular Workouts,” or ”Yoga and Stretching.” Users can browse through these categories to explore the available exercise options and select the ones they wish to perform. This view allows users to easily navigate and discover exercises based on their preferences or fitness goals.

(c) Exercise: Figure (c) showcases an individual exercise within the game. It typically includes details such as the exercise name, instructions, and any associated visuals or diagrams to guide users on how to perform the exercise correctly. This page provides users with step-by-step instructions, ensuring they have the proper form and technique while performing the exercise. It may also include additional information such as the targeted muscle groups, variations, or difficulty level of the exercise.

(d) Home Page: Figure (d) represents the home page of the game. This page serves as the central hub or dashboard where users land after logging in. The home page typically provides an overview of the user’s progress, including their recent activity, achievements, and any personalized recommendations or reminders. It may also display other relevant information, such as upcoming challenges, leaderboard rankings, or news and updates related to the game.

(e) Admin Adding Account: Figure (e) illustrates the process of an admin adding an account within the game. This image represents the backend or administrative interface where authorized personnel can manage user accounts. The admin typically has privileges to create new accounts, assign roles or permissions, and perform other administrative tasks. Adding an account involves filling in necessary user details, such as username, email address, password, and any additional information required for user profiles.

(f) Account Details on Firebase: Figure (f) demonstrates the storage of account details on Firebase. Firebase is a popular cloud-based platform that provides various backend services, including user authentication and real-time data storage. In this context, Firebase is utilized to securely store and manage user account information, ensuring confidentiality and data integrity. The image showcases the account details stored in Firebase, which may include user IDs, usernames, email addresses,

profile pictures, and any other relevant data associated with the user accounts.

Overall, these figures represent various aspects of the game, including the login process, exercise organization, individual exercises, the home page, administrative functionalities, and the backend storage of account details.

Chapter 6

Conclusion

The purpose of the Fitness App app is to provide a platform for users to access fitness-related information and connect with other fitness enthusiasts. The app aims to assist users in their fitness journey by offering various features and functionalities. Here is an adapted description of the Fitness App app:

The Fitness App app is a free mobile application designed to support individuals in their fitness endeavors. The app serves as a comprehensive fitness companion, offering a range of features to help users achieve their fitness goals. Users can access workout routines, track their progress, connect with other fitness enthusiasts, and find useful resources related to health and fitness.

To get started, users are required to register on the app by creating a unique login authentication, including a password. Once registered, users can log in using their credentials each time they access the app.

The app provides an extensive library of workout routines and exercises, categorized based on specific fitness goals such as weight loss, muscle building, and cardiovascular fitness. Users can browse through the available workout plans, select their desired routines, and add them to their personal workout schedule.

Additionally, users can track their progress and set fitness targets within the app. They can record their workouts, monitor their weight and body measurements, and track their achievements over time. The app also offers features like a calorie counter and a step tracker to help users monitor their daily activity levels and manage their nutrition effectively.

Fitness App enables users to connect with a community of fitness enthusiasts. Users can create profiles, share their progress, and engage in discussions with like-minded individuals. The app includes forums, chat features, and social media integration to foster a sense of community and support.

The app utilizes Firebase as the backend technology to store user information securely. It ensures reliable and efficient performance, allowing users to have a seamless experience while accessing fitness-related information and features. Users can also receive notifications and updates regarding their fitness journey, such as workout reminders or achievements unlocked.

In summary, the Fitness App app is a free fitness application that aims to assist users in achieving their fitness goals. It offers workout routines, progress tracking, community engagement, and reliable backend technology to provide a seamless and enjoyable user experience.

The only investment one makes is time.

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