



**NEW HORIZON
COLLEGE OF ENGINEERING**

Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC
Accredited by NAAC with 'A' Grade, Accredited by NBA

A LAB BASED PROJECT REPORT

for

MOBILE APP DEVELOPMENT LAB(21CSL551)

on

FITNESS TRACKER

Submitted by

DEEPIKA SINGH N, 1NH21CS068 , SEM-SEC: 5-B

Academic Year: 2023-2024



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CERTIFICATE

This is to certify that the lab based project work titled

FITNESS TRACKER

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EVEN SEMESTER 2022-2023

For

COURSE: MOBILE APP DEVELOPMENT LAB(21CSL551)

Signature of Reviewer

Signature of HOD

ABSTRACT

The "Fitness Tracker" app represents a robust tool for individuals seeking to optimize their health and fitness regimen. By harnessing the power of modern technology, this application facilitates the seamless monitoring of crucial health metrics, thereby empowering users to make informed decisions about their well-being.

At its core, the app enables users to input essential personal data, including weight, height, age, and gender. These inputs serve as the foundation for the app's sophisticated algorithms, which swiftly compute two key health indicators: Body Mass Index (BMI), Basal Metabolic Rate (BMR) and Calories Burnt.

BMI, a widely recognized measure of body composition, offers users valuable insights into their overall health status by evaluating the relationship between weight and height. By interpreting BMI results, users can gauge whether their weight falls within healthy parameters or if adjustments to their lifestyle are warranted.

Meanwhile, BMR estimation provides users with a deeper understanding of their metabolic needs. By calculating the minimum number of calories required by the body at rest, BMR offers valuable guidance for establishing dietary and exercise routines tailored to individual energy requirements.

Navigating the app's user-friendly interface is intuitive, with clear prompts guiding users through the data input process. Upon submission of personal information, the app swiftly generates precise BMI and BMR and Calories Burnt values, presenting users with actionable insights into their health and fitness journey.

Ultimately, the "Fitness Tracker" app serves as a comprehensive health companion, empowering users to take proactive steps towards achieving their fitness goals. By providing personalized health assessments and fostering a deeper understanding of individual health metrics, this app equips users with the knowledge and motivation needed to pursue a healthier, more active lifestyle.

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DEEPIKA SINGH N, 1NH21CS068 ,SEM-SEC: 5-B

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INTRODUCTION

In today's fast-paced world, maintaining a healthy lifestyle has become increasingly important. However, with busy schedules and numerous distractions, it can be challenging for individuals to prioritize their health and fitness goals. To address this need, the "Fitness Tracker" app has been developed as a comprehensive solution to help users monitor and manage their fitness journey effectively.

This innovative app leverages the capabilities of modern mobile technology to provide users with a user-friendly platform for tracking essential health metrics. By seamlessly integrating features such as data input, calculation algorithms, and results display, the "Fitness Tracker" app offers a holistic approach to fitness management.

At its core, the app focuses on two primary health indicators: Body Mass Index (BMI), Basal Metabolic Rate (BMR) and Calories Burnt. These metrics serve as key benchmarks for evaluating overall health and guiding users towards making informed decisions about their fitness goals.

By empowering users to input vital information such as weight, height, age, and gender, the app lays the groundwork for personalized health assessments. Through intuitive data entry interfaces and clear instructions, users can easily provide the necessary data to the app.

Upon input submission, the app's advanced algorithms swiftly compute BMI, BMR and Calories Burnt values, providing users with instant feedback on their health status. This real-time information enables users to gauge their progress, identify areas for improvement, and make adjustments to their fitness routines accordingly.

With its user-centric design and focus on actionable insights, the "Fitness Tracker" app aims to empower individuals to take control of their health and well-being. By providing a comprehensive toolkit for fitness management, this app serves as a valuable companion on the journey towards a healthier, more active lifestyle.

OBJECTIVES

The primary aim of the "Fitness Tracker" project is to develop an advanced mobile application that serves as a comprehensive tool for individuals to monitor and manage their health and fitness goals. Through a combination of sophisticated algorithms and intuitive user interfaces, the app seeks to offer users personalized insights into their unique body composition and metabolic requirements.

Central to the app's functionality is the ability for users to input essential personal data, including weight, height, age, and gender. Leveraging this information, the app will employ complex calculations to derive two key health indicators: Body Mass Index (BMI) and Basal Metabolic Rate (BMR).

BMI serves as a widely recognized measure of body composition, providing users with valuable insights into their overall health status by assessing the relationship between their weight and height. This information will empower users to gain a deeper understanding of whether their current weight falls within healthy parameters, helping them to set realistic fitness goals and make informed lifestyle choices.

In addition to BMI, the app will also compute the Basal Metabolic Rate (BMR), which estimates the minimum number of calories required by the body at rest. By providing users with insights into their metabolic needs, the app will enable them to tailor their dietary and exercise routines to better align with their individual energy requirements.

To ensure user engagement and motivation, the app will feature user-friendly interfaces, intuitive navigation, and visually appealing design elements. Clear and actionable feedback on BMI and BMR results will be provided to users, guiding them in making informed decisions about their health and fitness journey.

Furthermore, the app will prioritize accuracy and reliability in calculations, undergoing rigorous testing and validation processes to ensure the highest level of precision. Real-time feedback and progress tracking features will be integrated to enhance user experience and encourage continued engagement with the app.

Ultimately, the overarching objective of the "Fitness Tracker" project is to empower users to take proactive steps towards achieving their fitness goals and adopting a healthier, more active lifestyle. By providing personalized insights and actionable guidance, the app aims to support users on their journey towards improved health and well-being.

METHODOLOGY

The methodology employed in the "Fitness Tracker" project is centered around a structured approach to software development, encompassing various stages from conceptualization to implementation and testing. The methodology involves the following key steps:

1. **Requirements Gathering:** The project begins with a thorough examination of user needs and requirements. This involves conducting surveys, interviews, and research to understand the target audience's preferences, fitness goals, and expectations from the app.
2. **Design Phase:** In this phase, the project team collaborates to create a detailed design plan for the app. This includes defining the app's features, user interface layout, data input mechanisms, and algorithms for calculating BMI, BMR and Calories Burnt. Prototyping tools may be utilized to visualize the app's design and functionality.
3. **Development:** Once the design phase is complete, the development process begins. The app is built according to the design specifications using programming languages such as Java or Kotlin for Android development. The team follows best practices in coding, including modularization, code documentation, and version control.
4. **Testing:** Throughout the development process, rigorous testing is conducted to identify and rectify any bugs, errors, or inconsistencies in the app's functionality. Various testing techniques, including unit testing, integration testing, and user acceptance testing, are employed to ensure the app's reliability and usability.
5. **Refinement:** Based on feedback from testing, the app undergoes iterative refinement to address any identified issues and enhance its performance, usability, and user experience. This may involve fine-tuning algorithms, optimizing code, and making adjustments to the user interface based on user feedback.
6. **Deployment:** Once the app meets the desired quality standards, it is prepared for deployment to the Google Play Store. This involves packaging the app, creating promotional materials, and adhering to submission guidelines set forth by the app store.

EXPECTED OUTCOMES

The "Fitness Tracker" project anticipates several outcomes that align with its objectives of empowering users to monitor and improve their health and fitness. These expected outcomes encompass:

1. **Enhanced User Engagement:** The app aims to captivate users through its intuitive interface, personalized features, and actionable insights. By providing users with valuable information about their body composition and metabolic needs, the app encourages continued engagement and active participation in their fitness journey.
2. **Improved Health Awareness:** Through the provision of BMI and BMR calculations, the app seeks to raise users' awareness about their current health status and potential areas for improvement. By understanding their body composition and metabolic rate, users can make informed decisions regarding their diet, exercise, and overall lifestyle choices.
3. **Goal Setting and Progress Tracking:** The app empowers users to set personalized fitness goals based on their BMI, BMR, Calories Burnt and individual preferences. By offering tools for tracking progress and monitoring achievements, the app enables users to stay motivated and focused on their health and fitness objectives.
4. **Behavior Change and Adherence:** By fostering a deeper understanding of the relationship between lifestyle choices and health outcomes, the app aims to facilitate behavior change and encourage adherence to healthy habits. Through regular use and engagement with the app, users can cultivate long-term habits that support their overall well-being.
5. **Positive Impact on Health Outcomes:** Ultimately, the overarching goal of the "Fitness Tracker" project is to contribute to positive health outcomes for users. By promoting a holistic approach to health and fitness and providing tools for self-monitoring and improvement, the app aims to support users in achieving their health goals and leading healthier, more fulfilling lives.

These expected outcomes reflect the project's commitment to delivering a valuable and impactful solution that empowers users to take control of their health and well-being. Through continuous refinement and adaptation based on user feedback and emerging trends in health technology, the app strives to remain relevant and effective in addressing users' evolving needs and aspirations.

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware Requirements:

- Computer: A desktop or laptop computer capable of running Android Studio.
- Processor: Intel Core i3 or equivalent processor (or higher recommended).
- Memory (RAM): 8 GB RAM
- Storage: At least 2 GB of available disk space for Android Studio installation and project files.
- Internet Connection: Required for downloading Android Studio and necessary SDK components.

Software Requirements:

- Operating System: Windows 11 (64-bit)
- Java Development Kit (JDK): Version 8 or higher. You can download JDK from the official Oracle website.
- Android Studio: The official integrated development environment (IDE) for Android app development. Download and install the latest version from the Android Developer website.

SOFTWARE TECHNOLOGIES USED

The "Fitness Tracker" project leverages a range of cutting-edge software technologies to deliver its functionality and achieve its objectives. These technologies encompass:

1. **Android Development Platform:** The app is developed using the Android platform, utilizing tools and frameworks provided by Google's Android Studio IDE. Android development allows for the creation of native mobile applications that are optimized for performance and compatibility with a wide range of devices running the Android operating system.
2. **Java/Kotlin Programming Languages:** The app is programmed using Java or Kotlin, the two official languages for Android development. Java is a widely-used, object-oriented programming language with a rich ecosystem of libraries and frameworks, while Kotlin offers modern features and syntactic sugar that enhance developer productivity and code readability.
3. **Android SDK (Software Development Kit):** The Android SDK provides developers with a comprehensive set of tools, APIs, and libraries for building Android applications. It includes essential components such as UI widgets, data storage, networking, and multimedia support, enabling developers to create feature-rich and robust apps.
4. **XML (eXtensible Markup Language):** XML is used for designing the app's user interface layout and defining UI elements such as views, layouts, and widgets. XML layouts allow for the creation of visually appealing and responsive user interfaces that adapt to different screen sizes and orientations.
5. **Android Architecture Components:** The app may utilize Android Architecture Components such as LiveData, ViewModel, and Room Persistence Library to implement robust, maintainable, and scalable architecture patterns such as MVVM (Model-View-ViewModel). These components help manage app data, handle UI-related tasks, and ensure separation of concerns in the app's architecture.
6. **Firebase:** Firebase may be employed for backend services such as user authentication, real-time database storage, and cloud messaging. Firebase provides a scalable and secure platform for building serverless applications, enabling seamless integration of cloud-based features into the app.

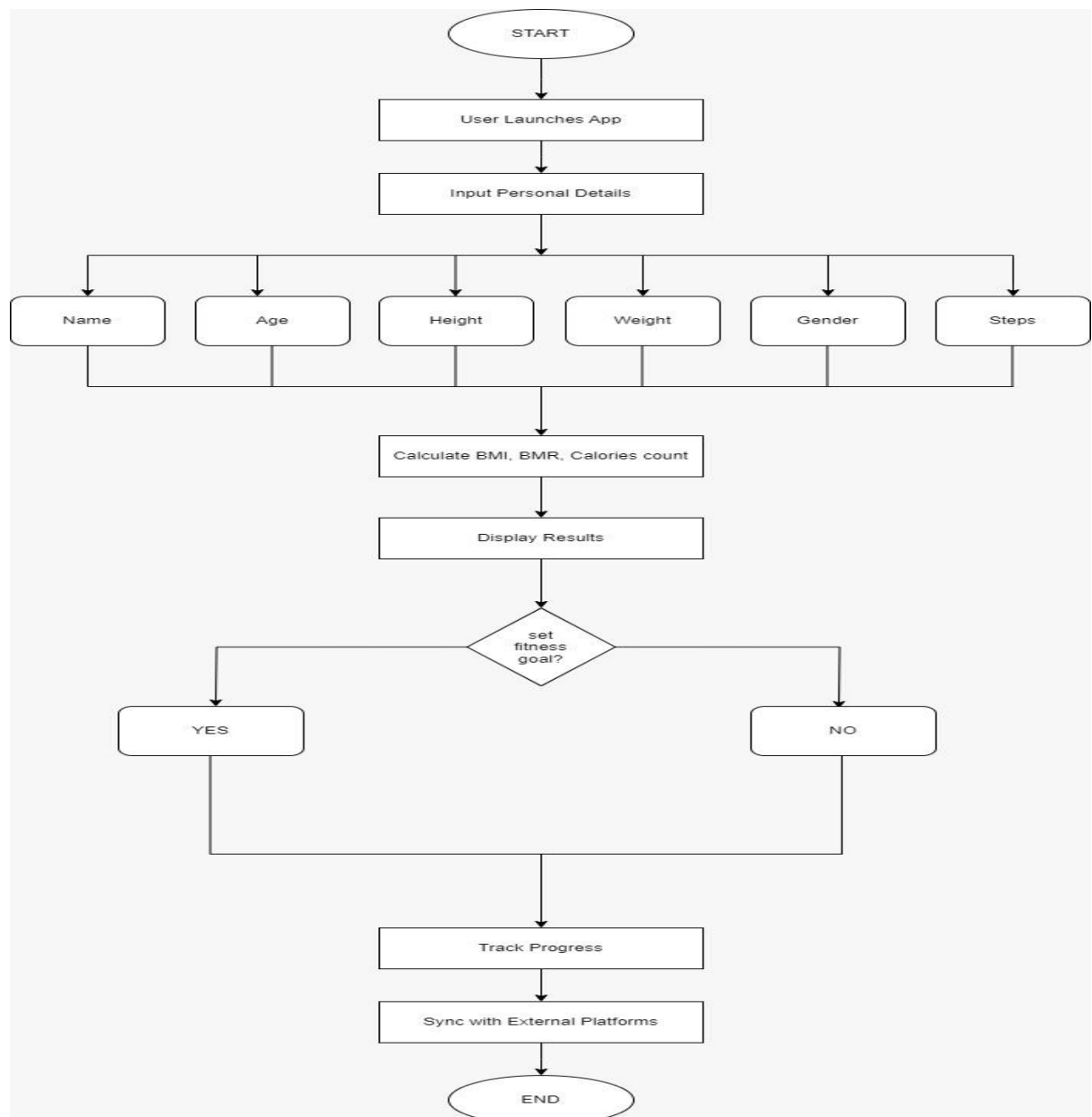
7. Google Play Services: The app may utilize Google Play Services APIs for accessing Google services such as Maps, Location, and Fitness. These APIs enable features such as location tracking, mapping functionalities, and integration with other Google services, enhancing the app's functionality and user experience.

By leveraging these software technologies, the "Fitness Tracker" project aims to deliver a robust, user-friendly, and feature-rich mobile application that empowers users to monitor, manage, and improve their health and fitness effectively.

DESIGN GOALS

1. User-Centric Design: Prioritize intuitive interfaces and navigation for a seamless user experience.
2. Personalization: Tailor features to individual users, enhancing engagement and motivation.
3. Clear Data Visualization: Present BMI and BMR data in easily understandable formats.
4. Goal Setting and Tracking: Enable users to set and monitor fitness goals effectively.
5. Accuracy and Reliability: Ensure precise calculations and error handling mechanisms.
6. Integration: Seamlessly integrate with external health and fitness platforms for a comprehensive user experience.
7. Scalability and Maintainability: Design architecture for future updates and enhancements.

FLOW CHART:



SOURCE CODE

Main Activity class:

```
package com.example.deepika;

import android.os.Bundle;
import android.text.TextUtils;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText editTextName, editTextAge, editTextHeight, editTextWeight, editTextSteps;
    private RadioGroup radioGroupGender;
    private Button buttonCalculate;
    private TextView textViewResult;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        editTextName = findViewById(R.id.editTextName);
        editTextAge = findViewById(R.id.editTextAge);
        editTextHeight = findViewById(R.id.editTextHeight);
        editTextWeight = findViewById(R.id.editTextWeight);
        editTextSteps = findViewById(R.id.editTextSteps);
        radioGroupGender = findViewById(R.id.radioGroupGender);
        buttonCalculate = findViewById(R.id.buttonCalculate);
        textViewResult = findViewById(R.id.textViewResult);

        buttonCalculate.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                calculate();
            }
        });
    }

    private void calculate() {
        String name = editTextName.getText().toString();
        int age = Integer.parseInt(editTextAge.getText().toString());
        double height = Double.parseDouble(editTextHeight.getText().toString());
```



```

double weight = Double.parseDouble(editTextWeight.getText().toString());
int steps = Integer.parseInt(editTextSteps.getText().toString());

RadioButton selectedGender =
findViewById(radioGroupGender.getCheckedRadioButtonId());
String gender = selectedGender.getText().toString();

// Perform calculations for calories burnt, BMI, BMR
// For simplicity, I'll just set some sample values here
double caloriesBurnt = 2500; // Sample value
double bmi = weight / ((height / 100) * (height / 100));
double bmr = (10 * weight) + (6.25 * height) - (5 * age);
// Generate greeting message

// Display the results
String result =

    "\nSteps: " + steps +
    "\nCalories Burnt: " + caloriesBurnt +
    "\nBMI: " + bmi +
    "\nBMR: " + bmr;
// Generate greeting message
String greeting = "Hello " + name + ", welcome to FitTrack !";
result = greeting + "\n\n" + result;

textViewResult.setText(result);

}
}

```

XML File :

```

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#CD9AD8"
    android:backgroundTint="#DABBD9"
    android:orientation="vertical"
    android:padding="16dp"
    tools:context=".MainActivity">

    <TextView

```

```
android:id="@+id/textViewHeading"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_gravity="center_horizontal"
android:paddingBottom="16dp"
android:text="FITNESS TRACKER"
android:textColor="#E91E63"
android:textSize="24sp"
android:textStyle="bold" />
```

<EditText

```
android:id="@+id/editTextName"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:fontFamily="sans-serif-black"
android:foregroundTint="#000000"
android:hint="Name"
android:textStyle="italic" />
```

<EditText

```
android:id="@+id/editTextAge"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:fontFamily="sans-serif-black"
android:hint="Age"
android:inputType="number"
android:textStyle="italic" />
```

<EditText

```
android:id="@+id/editTextHeight"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:fontFamily="sans-serif-black"
android:hint="Height (cm)"
android:inputType="numberDecimal" />
```

<EditText

```
android:id="@+id/editTextWeight"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:fontFamily="sans-serif-black"
android:hint="Weight (kg)"
```

```
android:inputType="numberDecimal" />
```

```
<RadioGroup
```

```
    android:id="@+id/radioGroupGender"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:orientation="horizontal">
```

```
<RadioButton
```

```
    android:id="@+id/radioButtonMale"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="Male" />
```

```
<RadioButton
```

```
    android:id="@+id/radioButtonFemale"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="Female" />
```

```
</RadioGroup>
```

```
<EditText
```

```
    android:id="@+id/editTextSteps"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:fontFamily="sans-serif-black"  
    android:hint="Steps"  
    android:inputType="number" />
```

```
<Button
```

```
    android:id="@+id/buttonCalculate"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:text="Calculate" />
```

```
<TextView
```

```
    android:id="@+id/textViewResult"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:paddingTop="16dp"  
    android:text=""  
    android:textSize="18sp" />
```

```
<TextView
    android:id="@+id/textView6"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="STAY FIT, STAY HEALTHY"
    android:textColor="#DC0A51"
    android:textColorHint="#B36E08"
    android:textSize="16sp"
    android:textStyle="bold|italic" />
```

```
<androidx.constraintlayout.utils.widget.ImageFilterView
    android:id="@+id/imageFilterView3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:adjustViewBounds="false"
    android:cropToPadding="true"
    android:scaleType="fitEnd"
    app:srcCompat="@drawable/fit" />
```

```
</LinearLayout>
```

IMPLEMENTATION PROCESS

The implementation process for the "Fitness Tracker" project involves several stages aimed at translating the design goals and requirements into a functional mobile application. This process encompasses:

1. **Requirement Analysis:** The first step involves gathering and analyzing requirements from stakeholders and users. This includes understanding user needs, defining features and functionalities, and identifying technical constraints and dependencies.
2. **Design and Prototyping:** In this stage, the app's architecture, user interface, and interactions are designed. Designers create wireframes, mockups, and prototypes to visualize the app's layout, navigation flow, and key features. Iterative feedback and refinement ensure that the design aligns with user expectations and project goals.
3. **Development:** Developers begin coding the app based on the finalized design and specifications. They use programming languages such as Java or Kotlin for Android development and leverage frameworks, libraries, and SDKs to implement features such as BMI and BMR calculations, user input validation, and data visualization.
4. **Testing:** Quality assurance (QA) engineers conduct various types of testing, including functional testing, usability testing, and performance testing. They ensure that the app functions correctly, is user-friendly, and performs well under different conditions and on various devices. Bugs and issues are identified, reported, and addressed through bug fixing and iterative testing cycles.
5. **Integration:** The app may integrate with external services and APIs to enhance its functionality. Integration with health and fitness platforms, wearable devices, and cloud services enables features such as data synchronization, social sharing, and extended analytics capabilities. Integration testing ensures that the app communicates effectively with external systems and maintains data integrity.
6. **Deployment:** Once testing is complete and the app meets quality standards, it is prepared for deployment to app stores. Developers generate release builds, configure app metadata, and adhere to submission guidelines for platforms such as Google Play Store. App updates and version management

are considered for future releases.

7. Maintenance and Updates: After deployment, the app requires ongoing maintenance and support to address user feedback, fix bugs, and implement new features. Continuous monitoring, performance optimization, and periodic updates ensure that the app remains functional, secure, and competitive in the ever-evolving mobile landscape.

By following this implementation process, the "Fitness Tracker" project aims to deliver a high-quality, user-centric mobile application that empowers users to improve their health and fitness effectively. Collaboration among cross-functional teams, adherence to best practices, and a focus on continuous improvement contribute to the success of the implementation effort.

MODULES USED TO BUILD PROJECT

1. **User Interface (UI) Module:** This module focuses on designing and implementing the app's user interface. It includes activities, fragments, layouts, and UI components that enable users to interact with the app seamlessly. Design principles such as material design guidelines and responsive layouts are applied to ensure a visually appealing and intuitive user experience.

2. **Data Input and Validation Module:** Responsible for capturing user input data, this module includes features for input validation and error handling. It ensures that users provide accurate and valid information when entering personal data such as weight, height, age, and gender. Validation rules are enforced to prevent incorrect inputs and ensure data integrity.

3. **BMI and BMR, Calories Count Calculation Module:** This module computes Body Mass Index (BMI) and Basal Metabolic Rate (BMR) based on user-provided data. It implements algorithms and formulas for accurate calculations and generates results that reflect users' current health and fitness metrics. The module also handles unit conversions and formatting to present results in a user-friendly manner.

4. **Goal Setting and Tracking Module:** Focused on helping users set and monitor fitness goals, this module allows users to define specific objectives based on their BMI, BMR, and other metrics. It provides tools for tracking progress, setting reminders, and visualizing goal achievements over time. Personalized recommendations and feedback are provided to motivate users and keep them engaged in their fitness journey.

5. **Integration and Connectivity Module:** This module facilitates integration with external platforms, services, and APIs to extend the app's functionality. It includes features for data synchronization, social sharing, and interoperability with health and fitness ecosystems. Integration with wearable devices, health trackers, and cloud services enables seamless data exchange and enhances the app's capabilities.

6. **Data Storage and Persistence Module:** Responsible for managing app data and ensuring data persistence, this module utilizes local storage mechanisms such as SQLite databases or Shared Preferences. It stores user profiles, preferences, and historical data related to BMI, BMR, goals, and

progress. Data encryption and backup mechanisms may be implemented to safeguard user information and ensure data integrity.

7. Testing and Quality Assurance Module: Integral to ensuring the reliability and performance of the app, this module includes various testing techniques and methodologies. It encompasses unit testing, integration testing, and user acceptance testing to validate app functionality, usability, and performance. Test automation tools and frameworks may be employed to streamline testing processes and improve test coverage.

By effectively leveraging these modules in the project development process, the "Fitness Tracker" app aims to deliver a comprehensive and user-friendly solution for tracking and improving health and fitness goals. Collaboration among development teams, adherence to coding standards, and continuous refinement of modules contribute to the success of the project.

RESULTS

9:50

FITNESS TRACKER

Name

Age

Height (cm)

Weight (kg)

☐ Male ☐ Female

Steps

Calculate

STAY FIT, STAY HEALTHY

Exercise icons grid:

- Top row: Running, Jogging, Walking
- Middle row: Cycling, Yoga, Swimming
- Bottom row: Push-ups, Squats, Lunges

Fig 2.0 Result 1

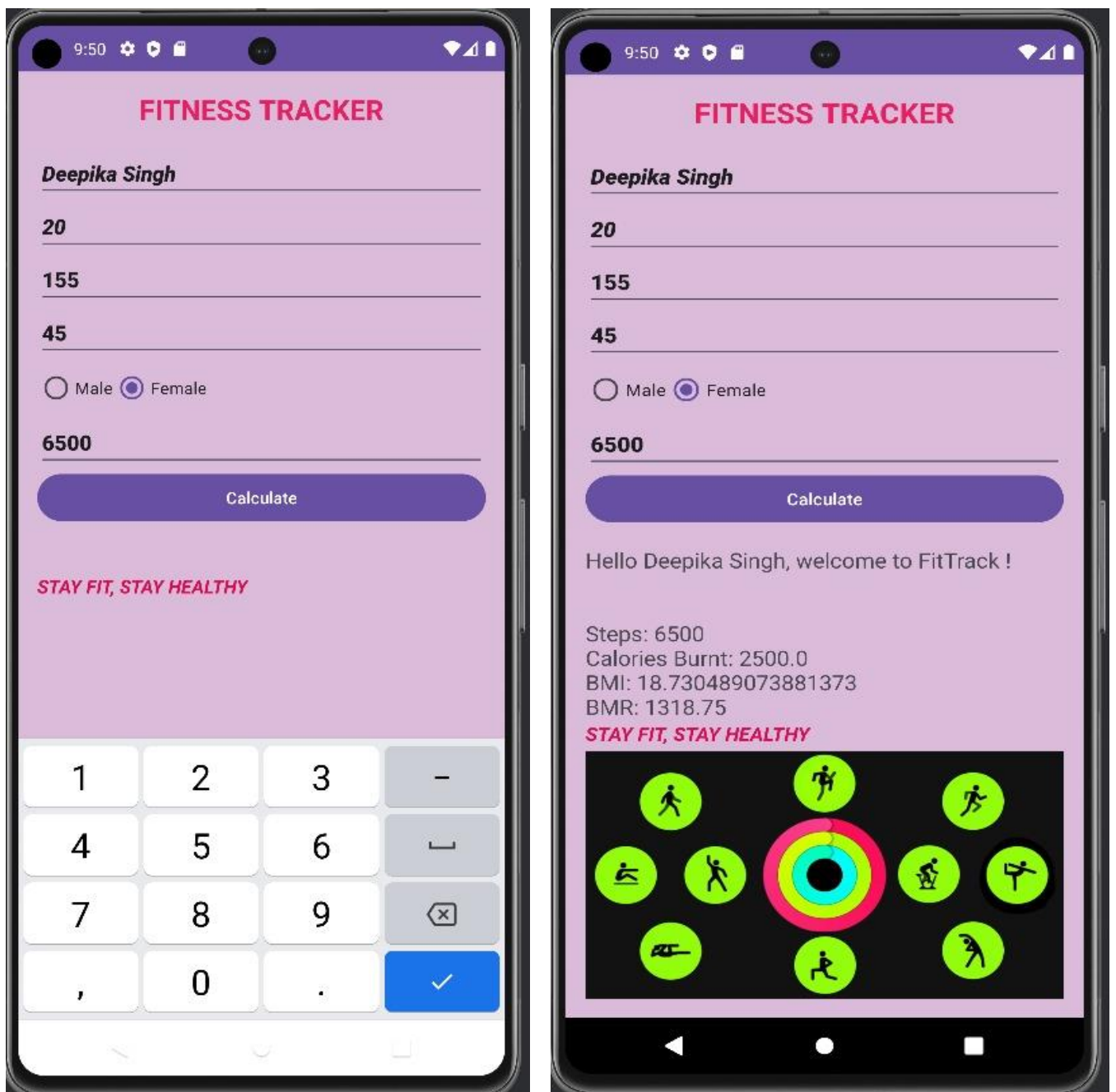


Fig 3.0 Result 2

CONCLUSION

The "Fitness Tracker" project represents a significant endeavor aimed at empowering users to lead healthier and more active lifestyles. By leveraging modern mobile technology and innovative design principles, the project endeavors to provide a user-friendly and comprehensive solution for tracking and improving health and fitness goals. Through meticulous requirement analysis, thoughtful design, and diligent implementation, the project has developed a feature-rich mobile application equipped with modules for capturing user data, calculating BMI and BMR, setting and tracking fitness goals, and integrating with external platforms and services. These modules work harmoniously to deliver a seamless user experience, fostering user engagement and motivation in their fitness journey.

Furthermore, the project emphasizes accuracy, reliability, and scalability, ensuring that BMI and BMR calculations are precise, data storage mechanisms are secure, and the app architecture is adaptable to future enhancements and updates. Rigorous testing and quality assurance processes have been employed to validate app functionality, usability, and performance, ensuring a high standard of quality and reliability.

The "Fitness Tracker" project stands as a testament to the potential of mobile technology to promote health and well-being. By providing users with personalized insights, actionable recommendations, and intuitive tools for monitoring progress, the project aims to inspire positive lifestyle changes and contribute to the overall improvement of public health. As the project continues to evolve and grow, it remains committed to its mission of empowering individuals to take control of their health and fitness journey, one step at a time.

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