



FLEX

Workout App

ABSTRACT

The Flex Workout Application is a mobile app designed to streamline and optimize fitness routines. It helps users overcome common challenges like inconsistent workout logs and complex fitness calculations by providing a user-friendly interface, customizable workout plans, and tools for calculating calories burned and One Rep Max

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Abstract

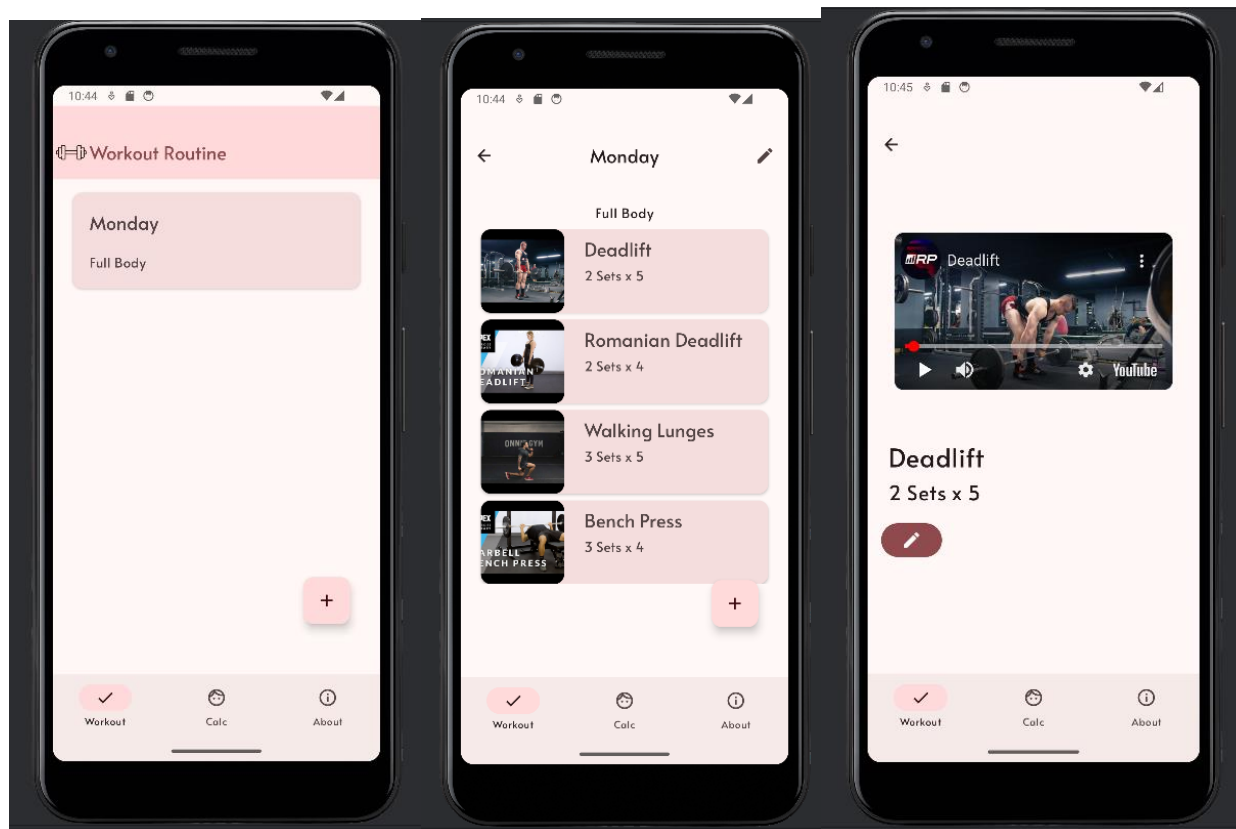
The Flex Workout Application is an advanced mobile app designed to enhance the way fitness enthusiasts organize and optimize their workout routines. This application addresses prevalent challenges such as maintaining consistent workout logs, accurately calculating fitness metrics like calories burned and One Rep Max, and managing diverse workout plans. By offering a user-friendly interface, customizable workout routines, and sophisticated calculation tools, Flex Workout simplifies the fitness journey and helps users achieve their health goals more effectively. The app features a comprehensive workout tracking system that allows users to add, edit, and delete workout routines and exercises. Additionally, it includes a robust Calculator Page that computes Basal Metabolic Rate (BMR) and One Rep Max, providing crucial insights into users' fitness levels and progress. The application's design is built on a 2-Tier Architecture with a client-side interface and a local database, ensuring efficient data management and seamless user interaction. Developed using state-of-the-art technologies such as Kotlin, Android Studio, Material3, and Jetpack Compose, Flex Workout is both reliable and responsive. The project follows a meticulous development process, including rigorous testing to ensure functionality and performance. By integrating user feedback and continuously refining its features, Flex Workout aims to enhance the overall fitness experience, making it accessible and enjoyable for all users. This presentation outlines the key features, system design, and development process of the Flex Workout Application, providing a comprehensive overview of how this innovative tool can transform the way users manage their fitness routines.

Introduction

The Flex Workout Application is a revolutionary tool designed to assist individuals in organizing their workout plans efficiently. This application allows users to create structured workout routines, each containing a variety of exercises. Users can calculate their calories burned using the Basal Metabolic Rate (BMR) formula and determine their One Rep Max, providing a comprehensive fitness tracking solution. The purpose of this project is to provide a seamless and intuitive way for users to manage their fitness activities, ultimately helping them achieve their health and fitness goals.

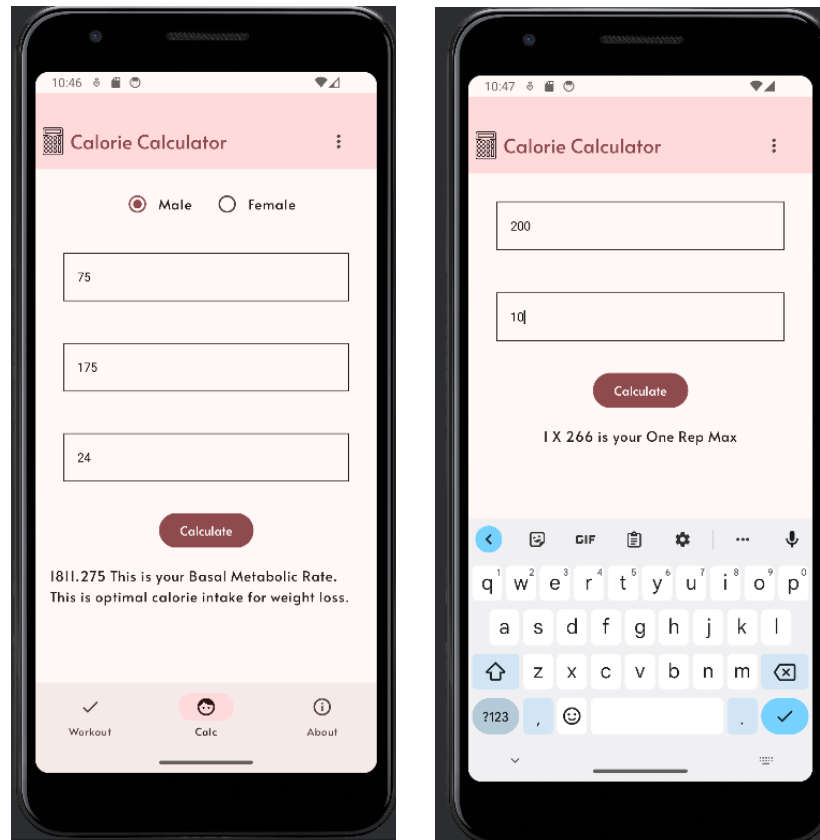
Features and Usage

1. The workout page will allow you to add, edit or delete workout plans. You can have as many workout routines as the user would like. It will ask you to enter the Workout Routine Name and Description
2. In the Exercise page you can also add, edit, or delete. It will ask you for the exercise name, number of repetitions and sets as well as a YouTube URL
3. The Calculator page will take in the Gender, Weight(kg), Height(cm), and Age. It will calculate the Basal Metabolic Rate which tells the user how many calories they need to help them with weight loss.
4. The drop-down menu will allow the user to switch to the One Rep Max Calculator
5. In the One Rep Max Calculator, it will ask the user for the Target weight(lbs.) and Repetition



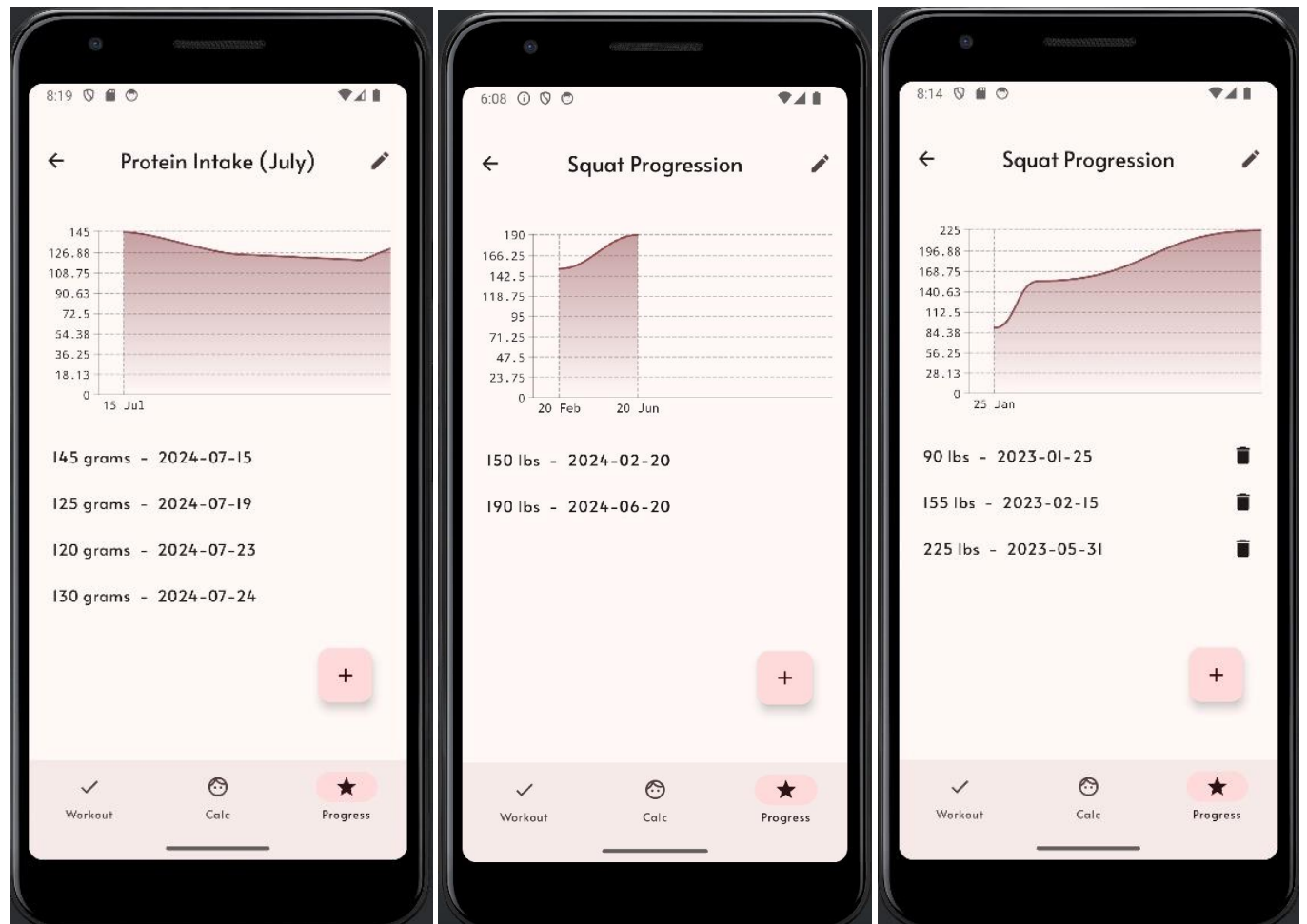
Calculator Page:

This feature helps users determine their Basal Metabolic Rate (BMR) to identify how many calories they need for weight loss. Users input their gender, weight (kg), height (cm), and age. The page also includes a drop-down menu to access the One Rep Max Calculator. It calculates the maximum weight users can lift for one repetition of a given exercise based on their target weight (lbs) and repetitions.



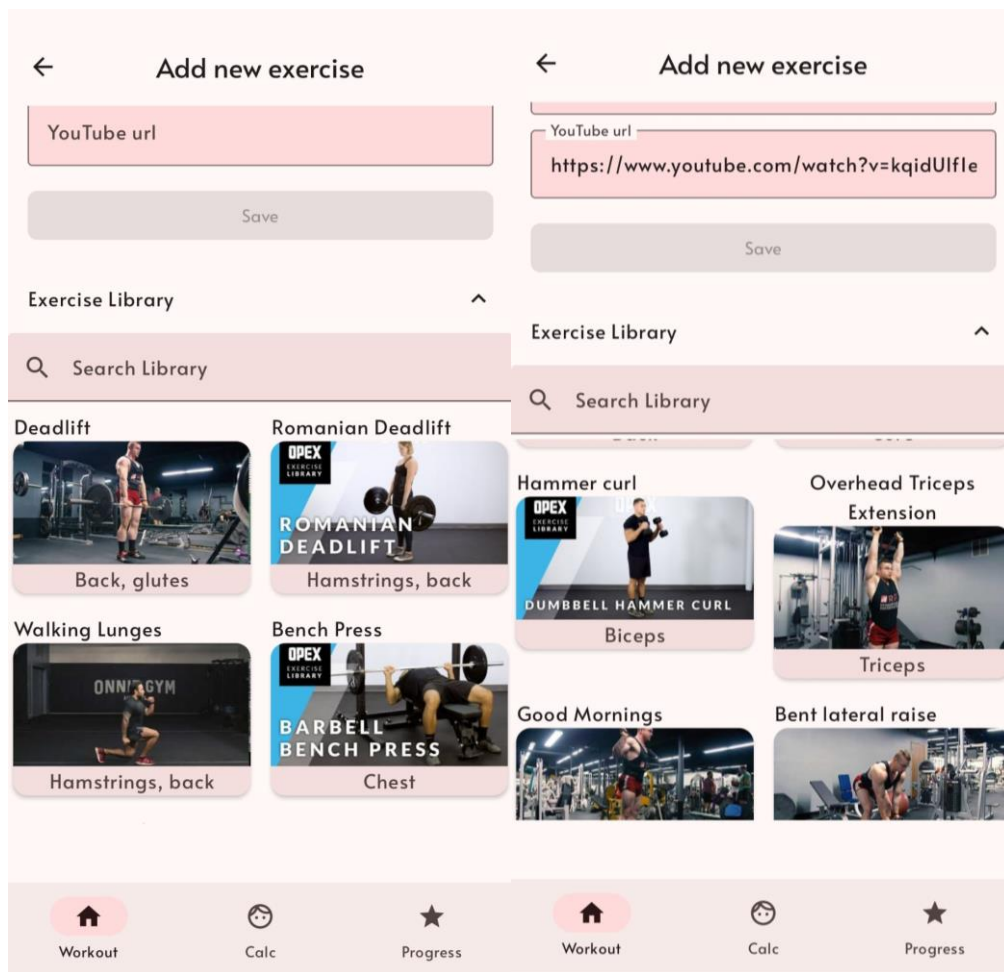
Progression Tracker

The Progression Tracker provides users with a detailed view of their fitness journey, tracking workouts, reps, and weights used. It visually represents progress over time through graphs, helping users stay motivated and informed about their improvements. Additionally, it contains information about the project and the team members who developed the application, offering transparency and highlighting the collaborative effort behind Flex Workout.



Search Gallery

The Exercise Search Gallery is a feature that enhances the user experience by allowing users to search for exercises within the app. This feature includes a searchable exercise library, where users can browse through various exercises, view demonstration videos, and add exercises to their workout routines. The search functionality makes it easy to find specific exercises, ensuring users can quickly locate and incorporate new exercises into their plans.



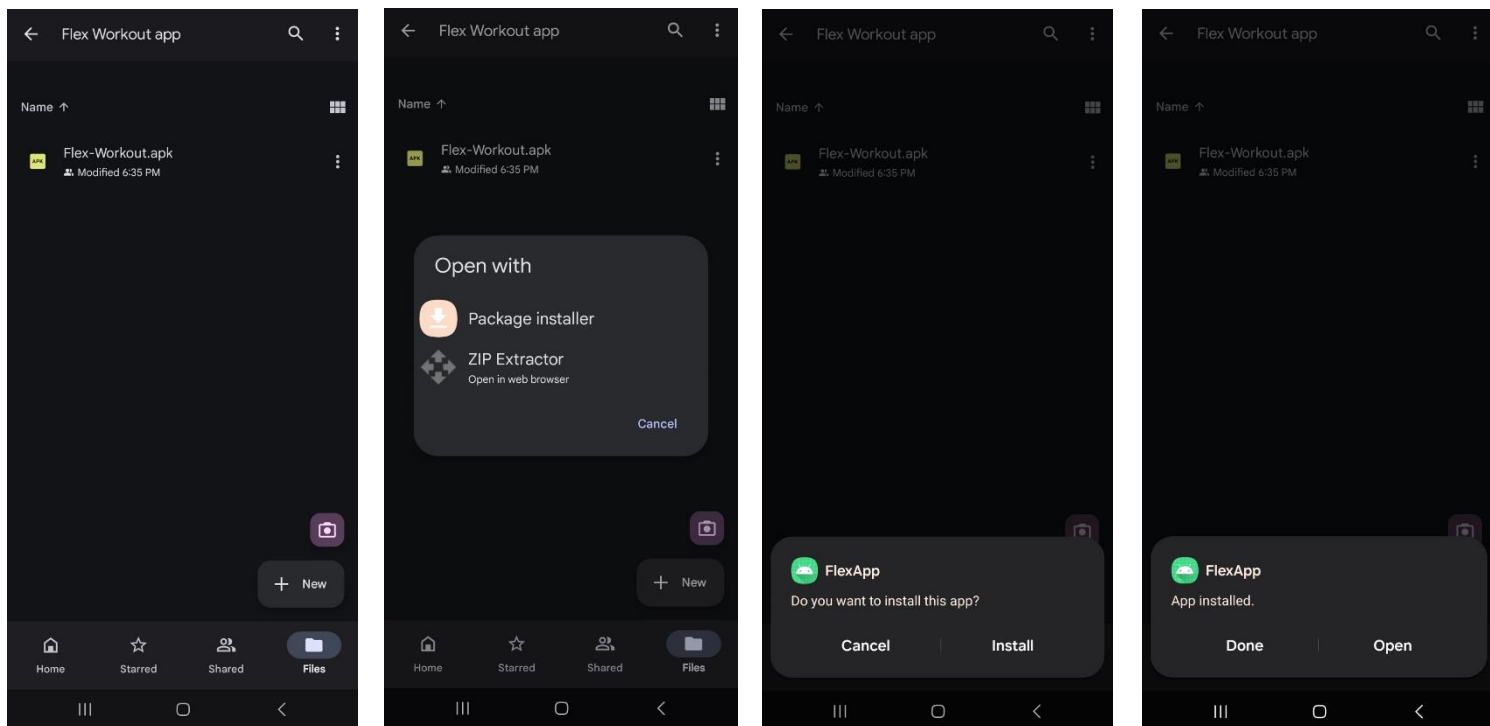
Installation Guide

Prerequisites:

To get started with the Flex Workout Application, you only need an Android device and download the APK file from the link provided.

Installation Steps:

1. Download the APK file from the following link: FlexApp.apk
2. Once the download is complete, locate the APK file on your device.
3. Open the APK file to start the installation process.
4. If prompted, enable installation from unknown sources in your device settings.
5. Follow the on-screen instructions to complete the installation.
6. Once installed, open the Flex Workout Application and start managing your workout routines efficiently.



(Follow this steps if you want to access the code)

1. Unzip the “[FlexWorkout.zip](#)” file or visit “[Flex App GitHub](#)”
2. Open Android Studio. And Open the extracted folder
3. Click the Green Play button and app will run on emulation

Prerequisites

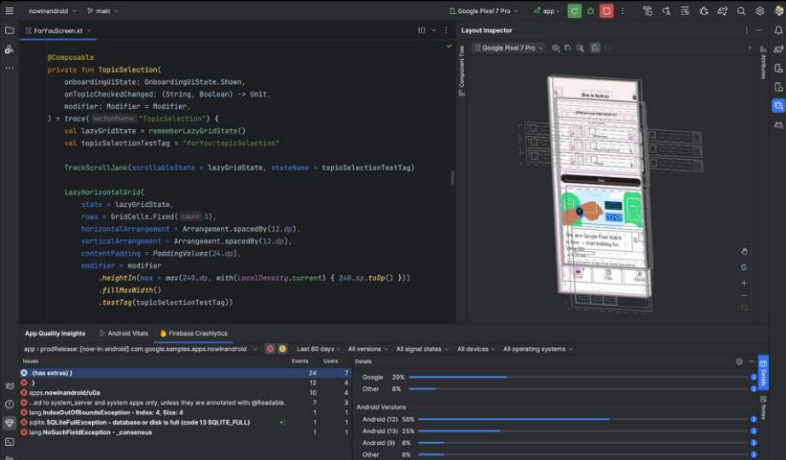
[Click to download Android Studio](#)

Android Studio

Get the official Integrated Development Environment (IDE) for Android app development.

Download Android Studio Koala 

[Read release notes](#) 



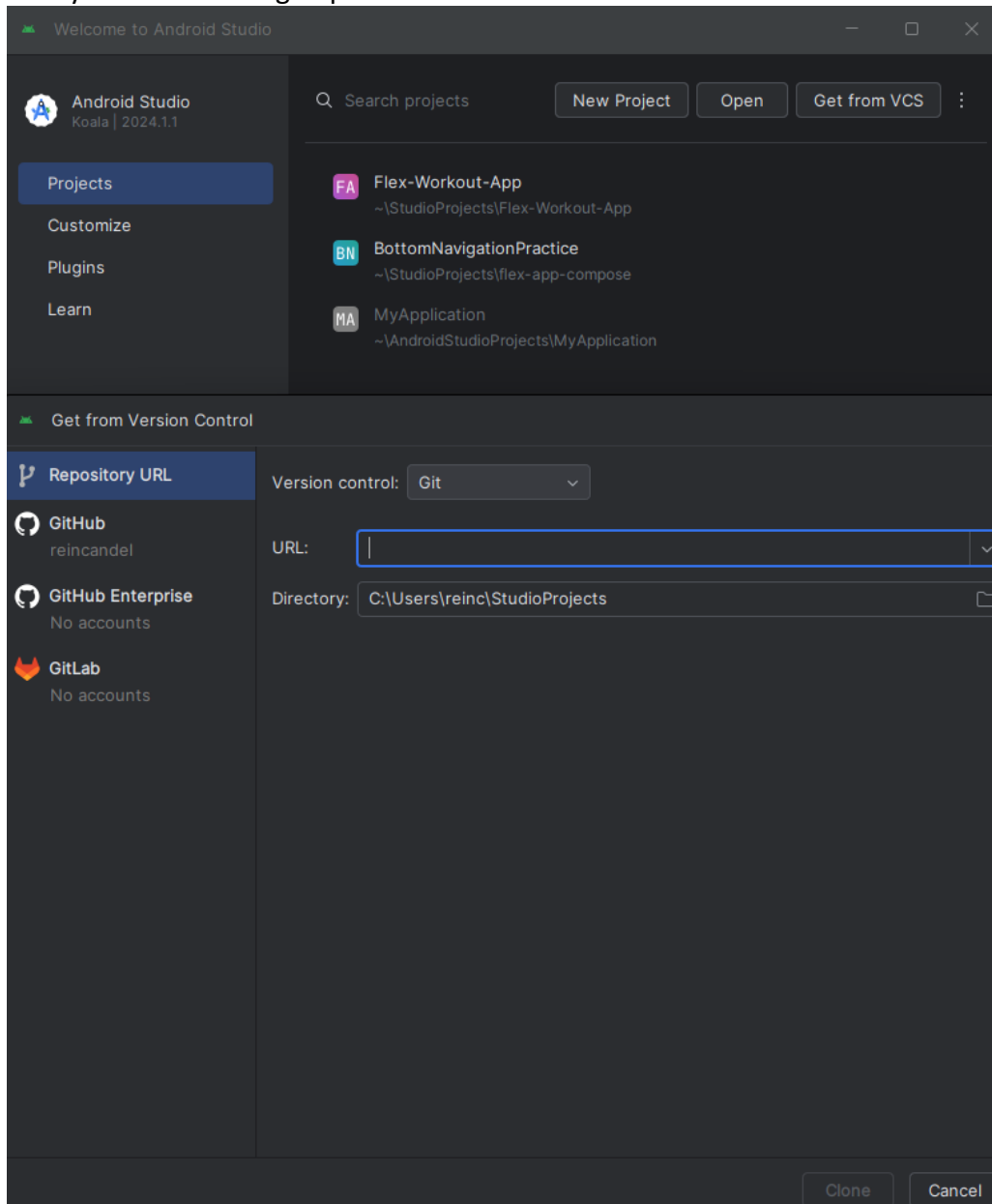
The screenshot displays the Android Studio interface. The central editor shows Kotlin code for a `TopicSelection` screen, including state management with `MutableList` and `MutableBoolean`, and a `LazyHorizontalGrid` for displaying items. To the right, a mobile emulator shows the app's UI. At the bottom, the 'App Quality Insights' dashboard is visible, featuring a table of crash reports and a bar chart of crash rates across different Android versions.

Crash	Events	Users	Details
Max extras	24	7	Google 23%
android.os.Bundle\$BundleTooLargeException	10	4	Other 85%
java.lang.IllegalArgumentException: Index 4, Size 4	2	2	Android Versions
android.os.Bundle\$BundleTooLargeException - database or disk is full (code 13 SQLITE_FULL)	1	1	Android (22) 50%
java.lang.NullPointerException - java.lang	1	1	Android (22) 50%
			Android (8) 8%
			Other 8%

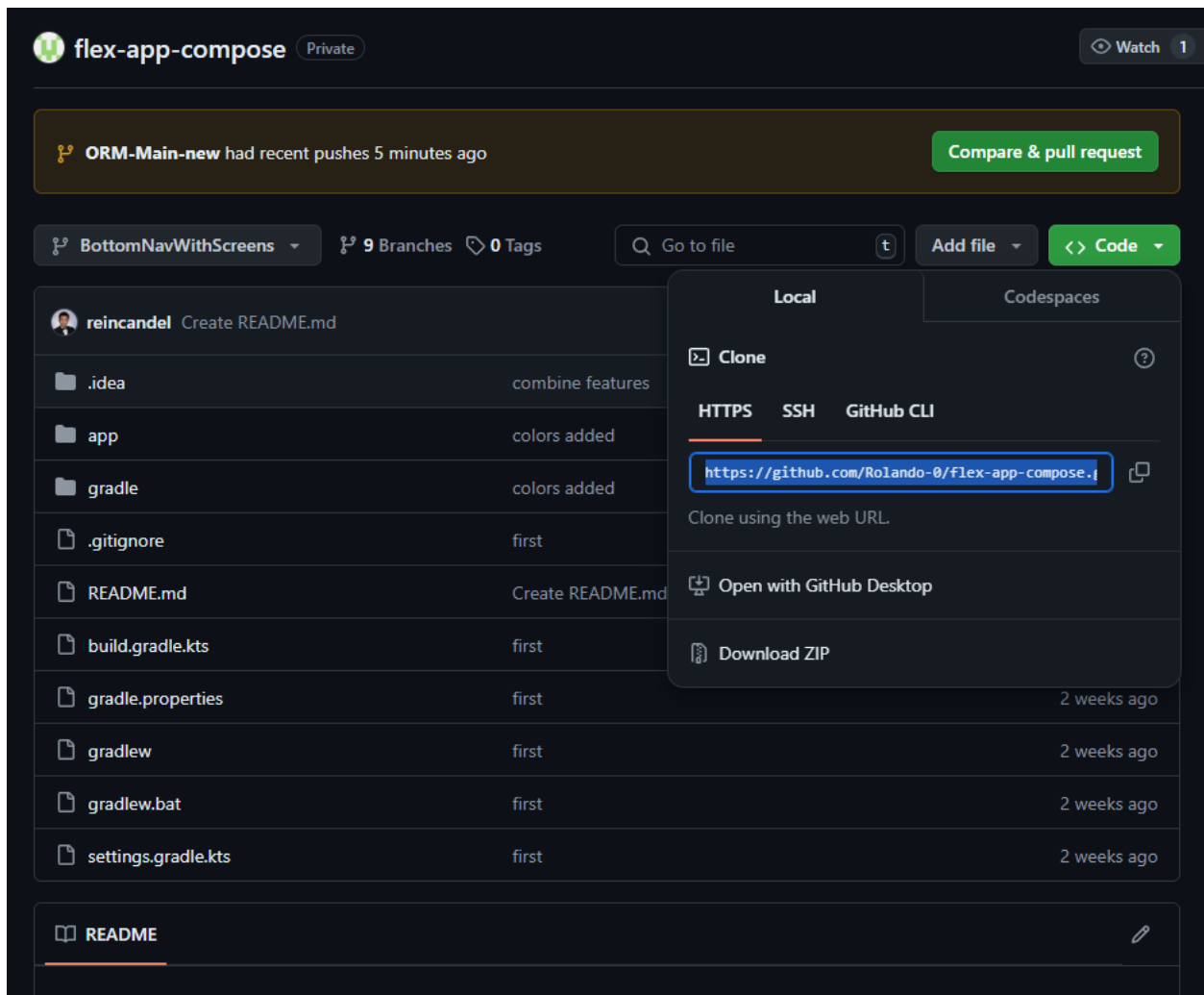
User Manual

Getting Started

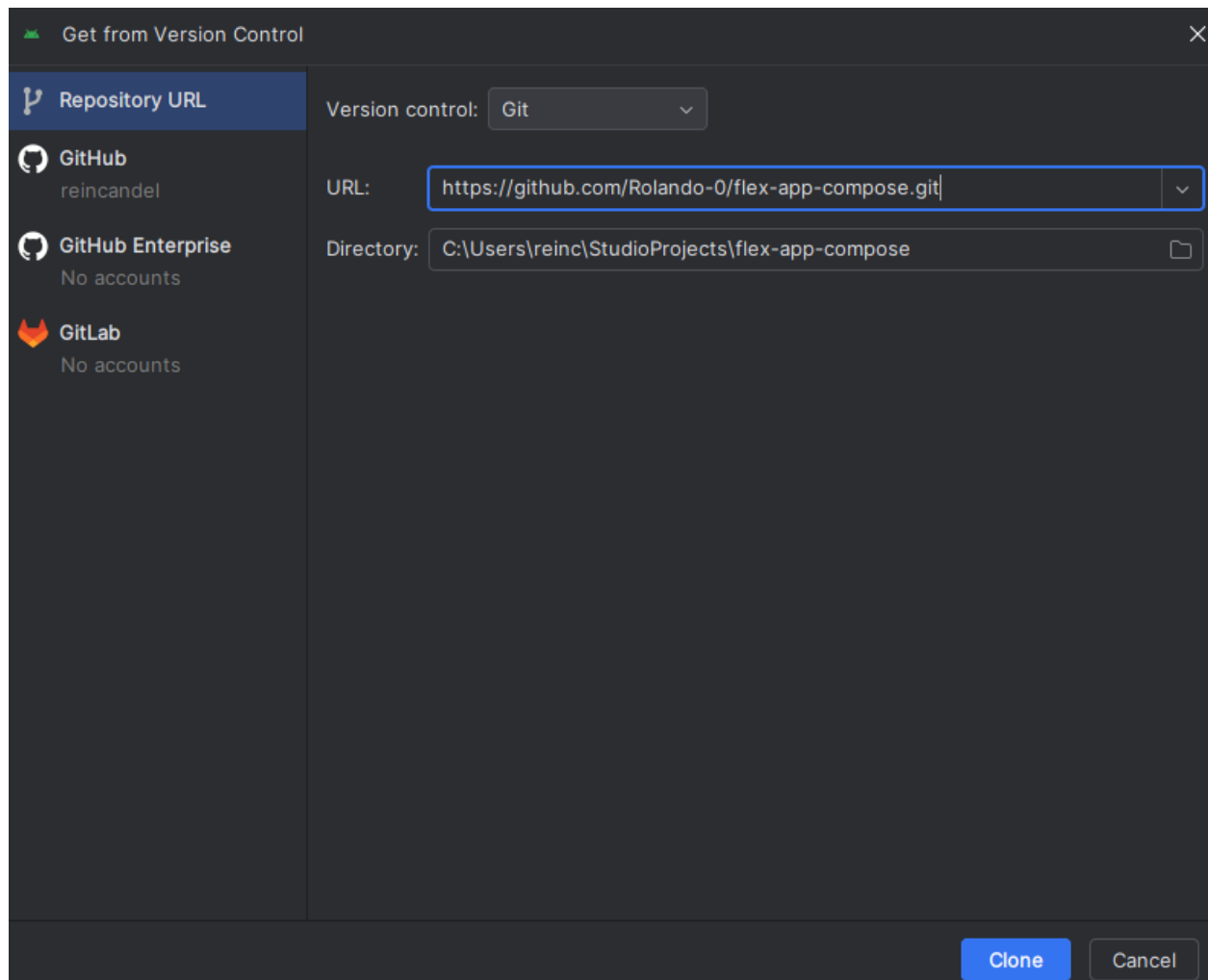
1. First you will need to go open Android Studio. And click on “Get from VCS”



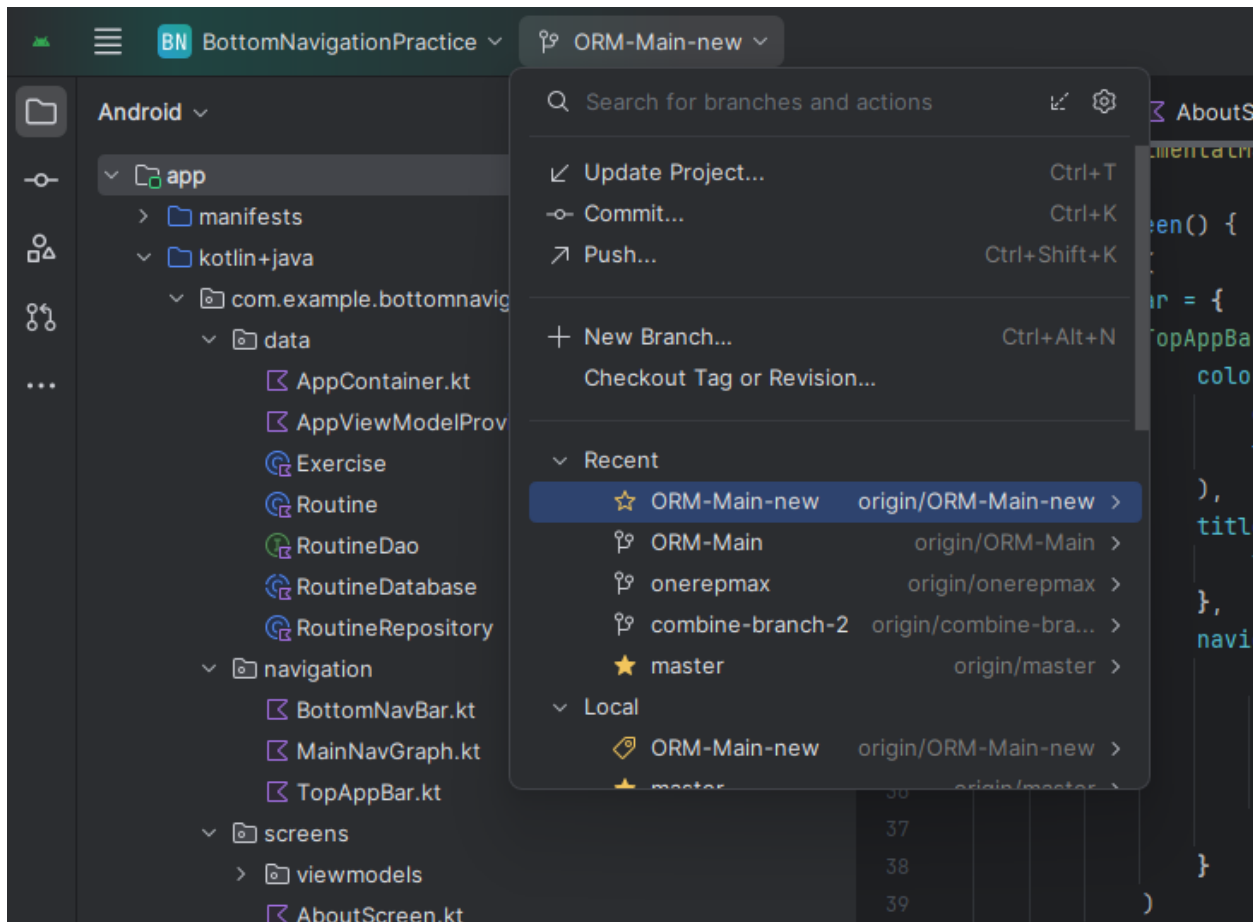
2. Get the URL in our GitHub [“Flex App GitHub”](#)



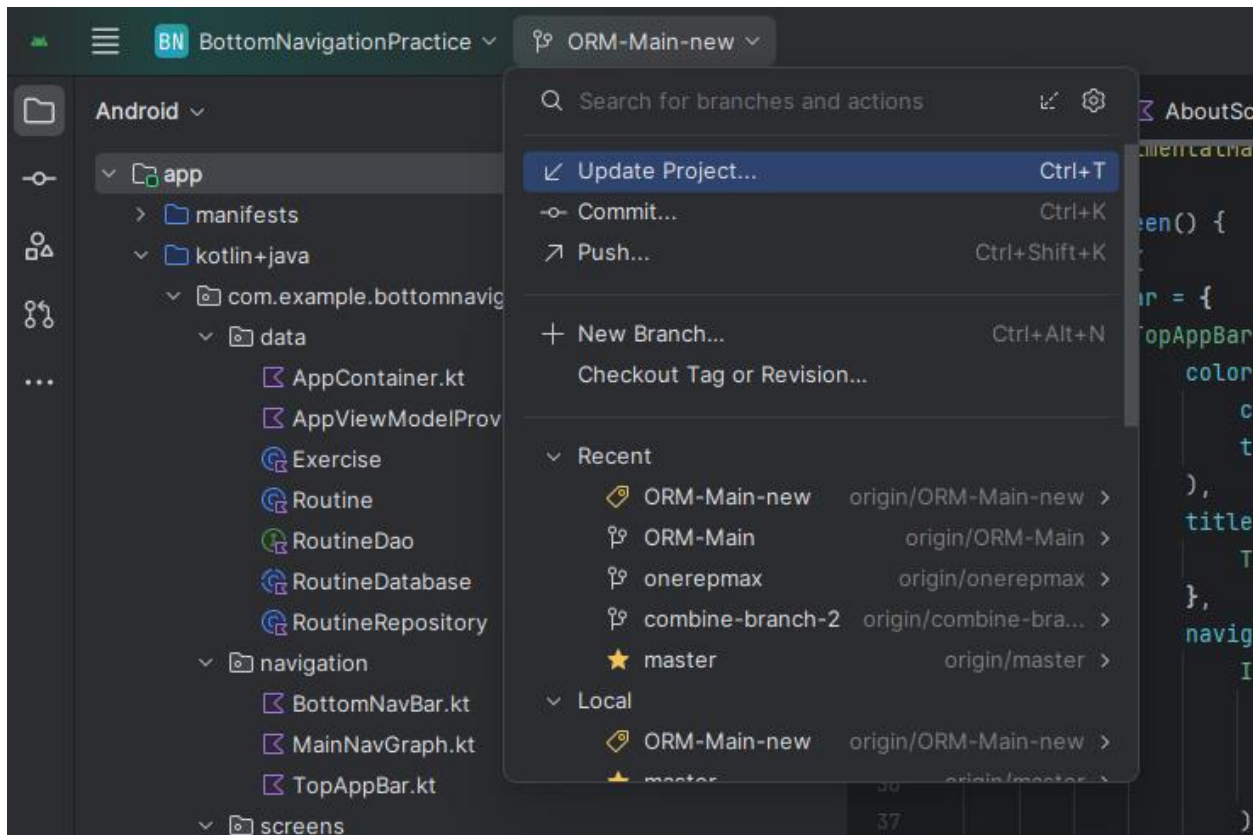
3. Clone and it should open the project



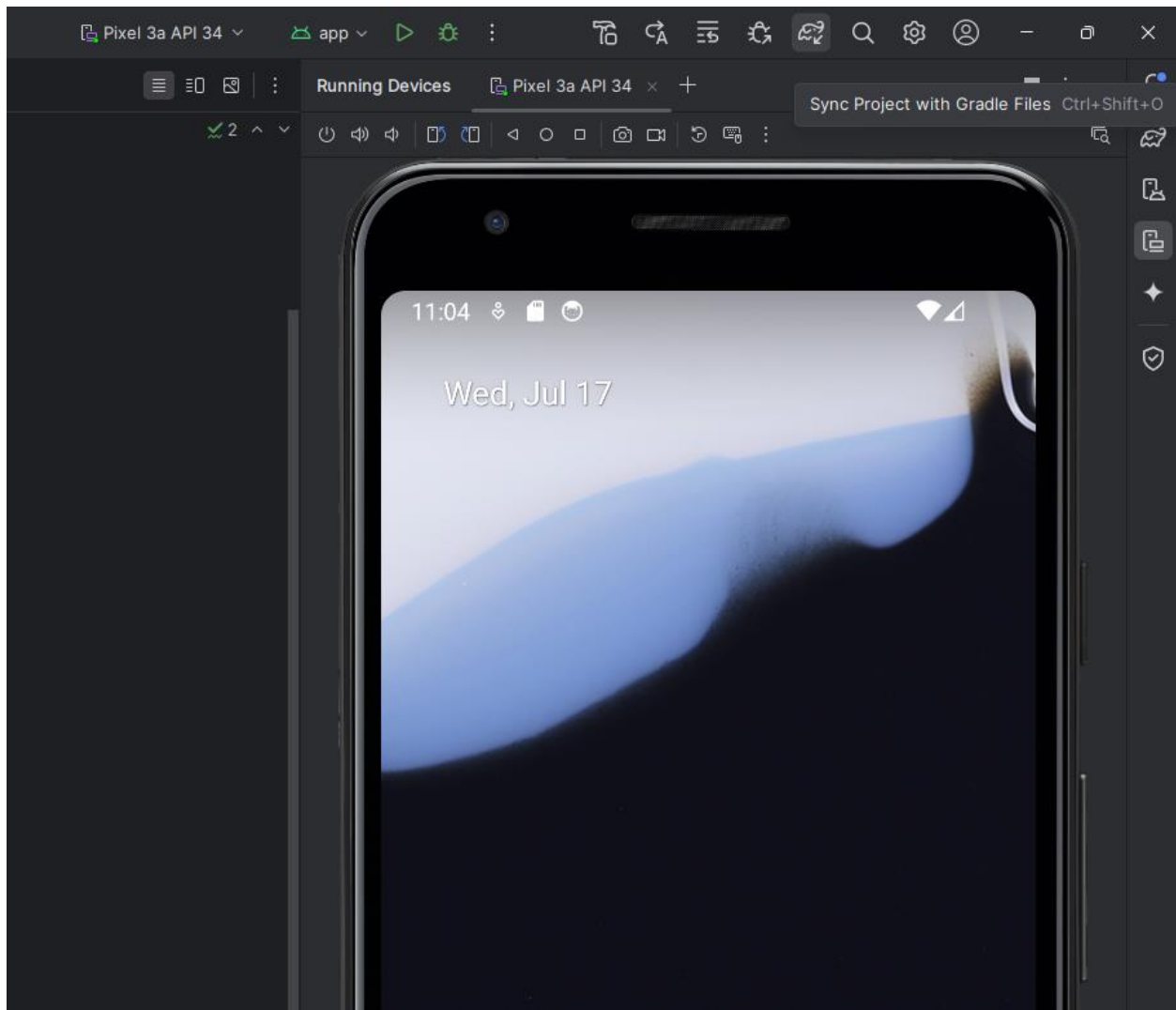
4. Once in, on the top click on ORM-Main-new branch



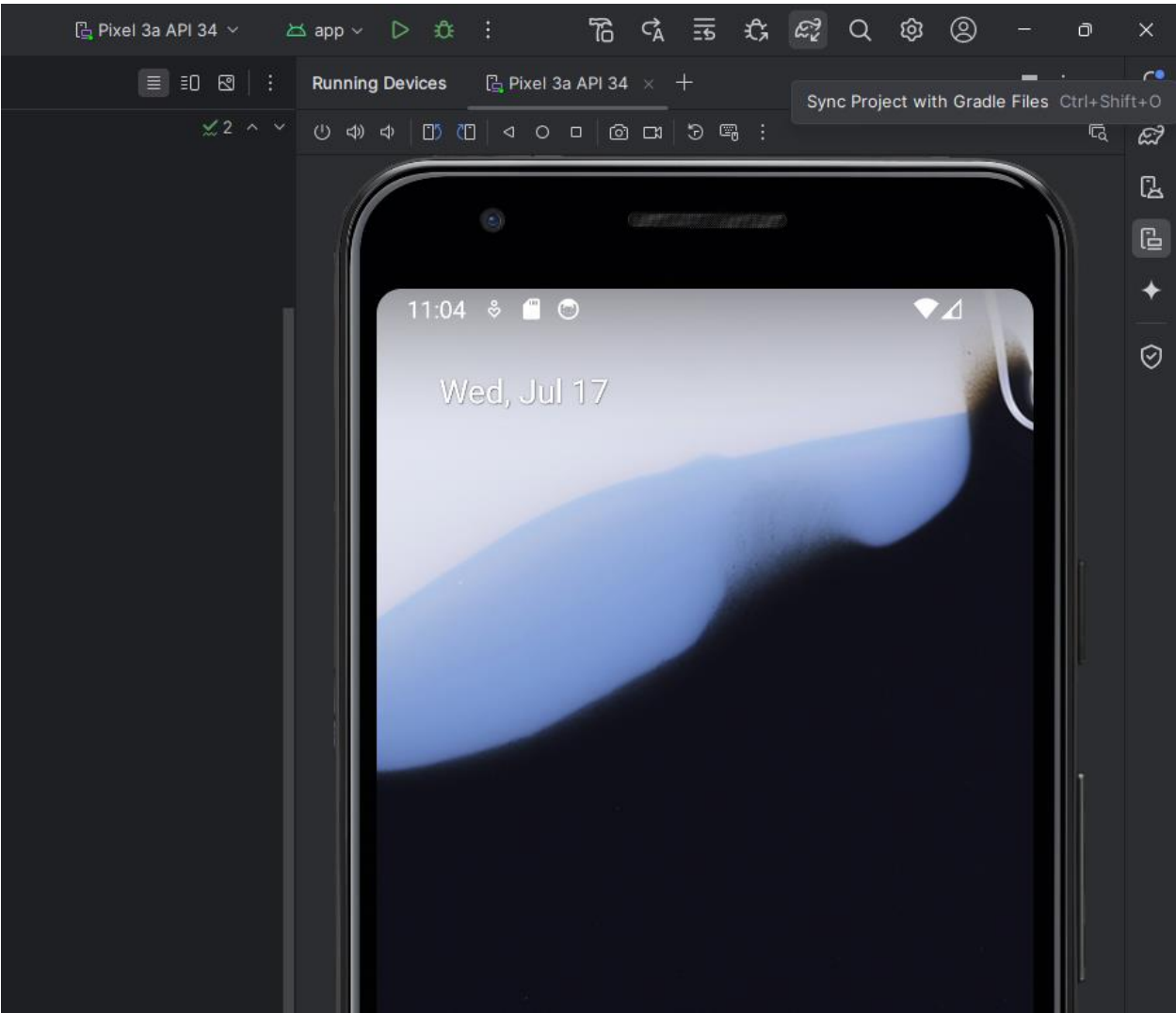
5. After that click on update project.



6. After that click on “Sync Project with Gradle File”

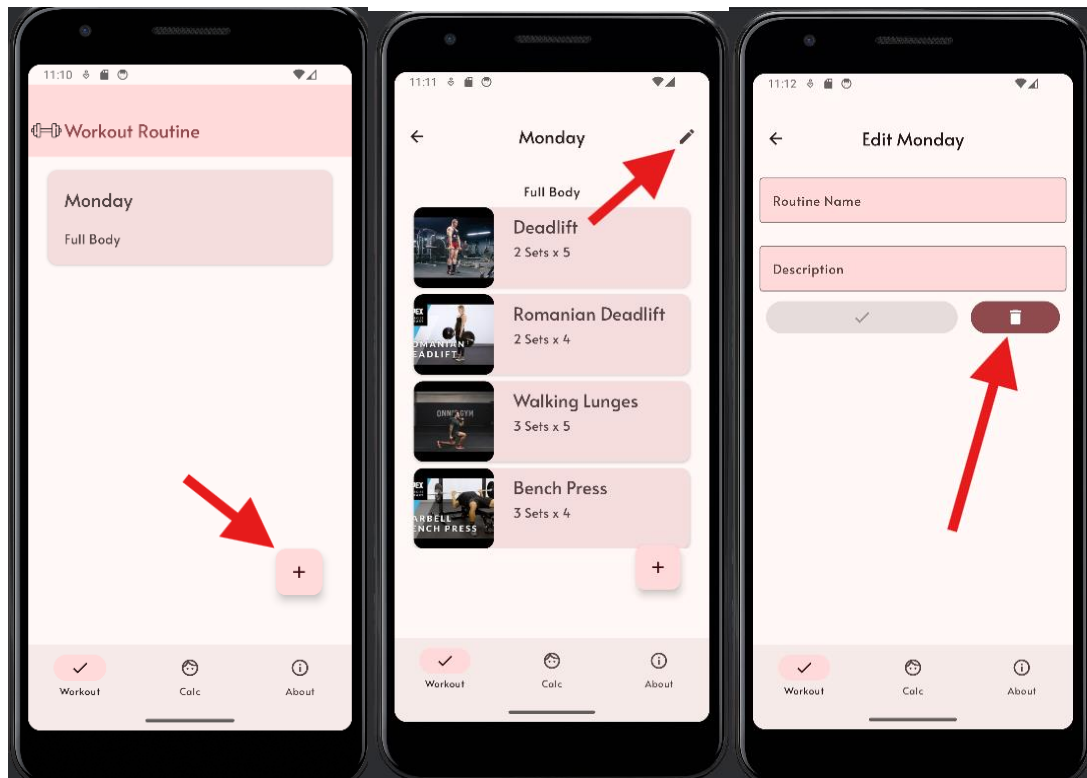


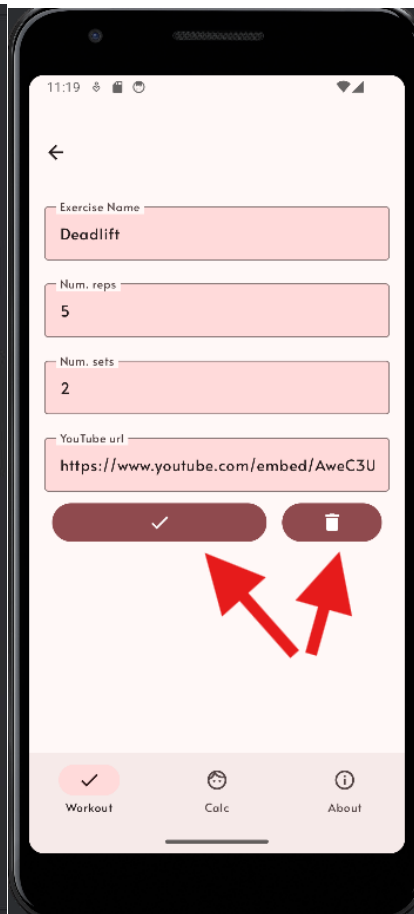
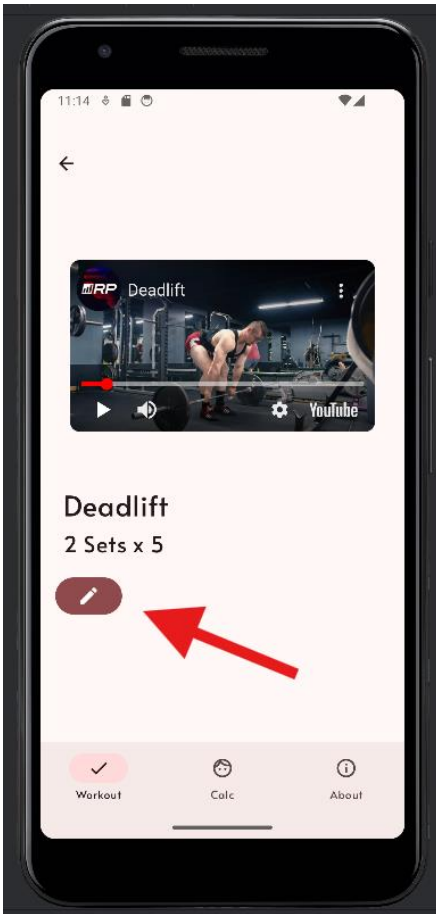
7. Then click on "Run 'app'"



Screenshots

Workout Page Screenshots





Calculator Page

11:23

Calorie Calculator

☒ Male ☐ Female

75

175

24

Calculate

1811.275 This is your Basal Metabolic Rate.
This is optimal calorie intake for weight loss.

Workout Calc About

11:23

Calorie Calculator

☒ Male ☐ Female

75

175

24

Calculate

1811.275 This is your Basal Metabolic Rate.
This is optimal calorie intake for weight loss.

Workout Calc About

11:24

Calorie Calculator

200

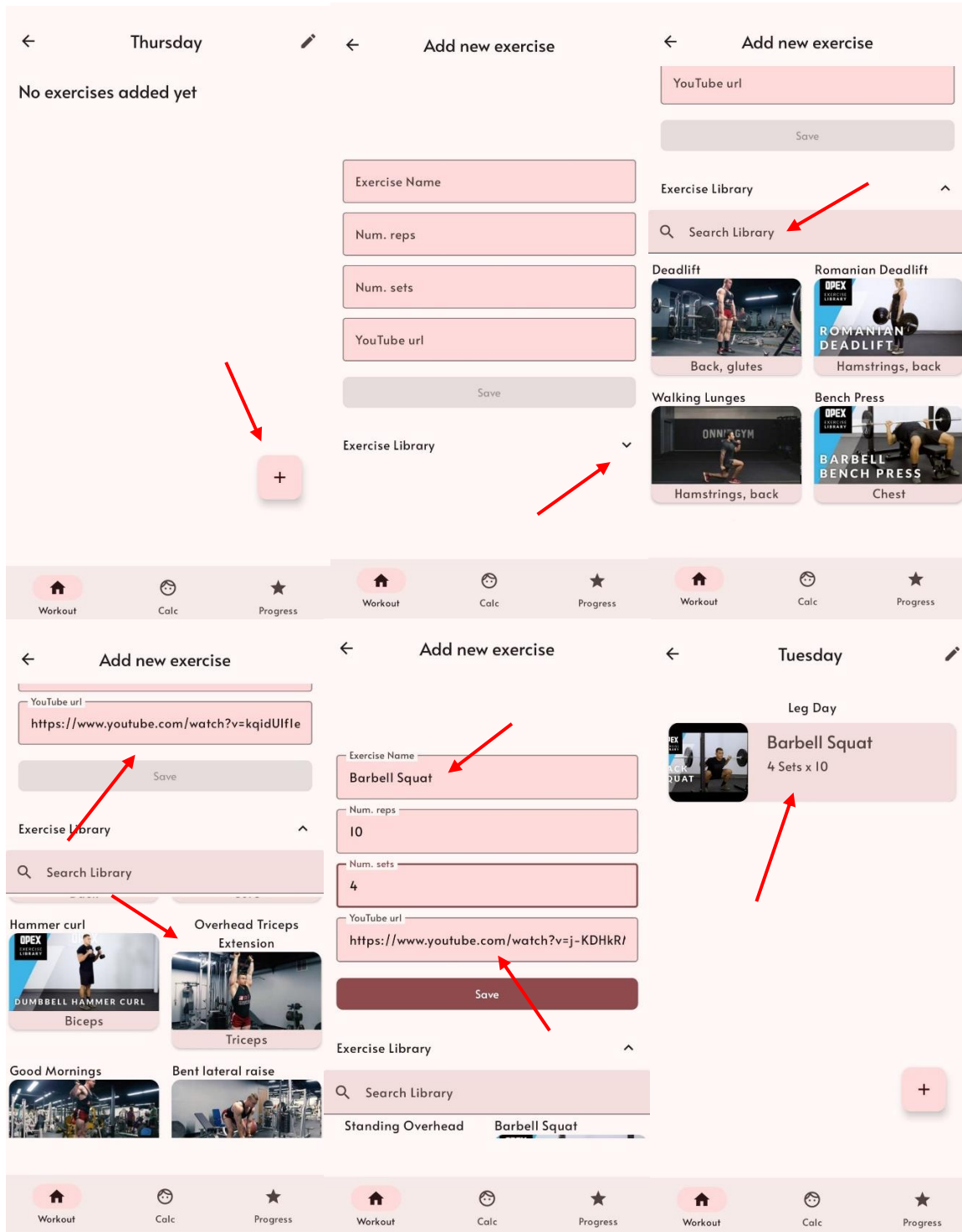
10

Calculate

1 X 266 is your One Rep Max

Workout Calc About

Search Library



Wishlist for Future Features in the Flex Workout Application

1. **Social Sharing:**

- Allow users to share their workout routines and progress with friends and other users on social media platforms or within the app community.

2. **Workout Community:**

- Create a community feature where users can join groups, participate in challenges, and share tips and advice.

3. **Routine Marketplace:**

- Implement a marketplace where users can buy and sell workout routines, offering both free and premium plans created by fitness experts.

4. **Customizable Templates:**

- Provide users with customizable workout templates that they can personalize based on their fitness goals and preferences.

5. **Advanced Analytics:**

- Offer advanced analytics and insights into workout performance, including trends, strengths, weaknesses, and personalized recommendations for improvement.

6. **Wearable Integration:**

- Integrate with popular fitness wearables (e.g., Fitbit, Apple Watch) to automatically track and sync workout data.

7. **Nutrition Tracking:**

- Add a nutrition tracking feature where users can log their meals and monitor their calorie intake, macros, and nutritional goals.

8. **Voice Commands:**

- Implement voice command functionality to allow users to control the app hands-free, making it easier to log workouts and navigate the app during exercise.

9. **Video Tutorials:**

- Include a library of video tutorials demonstrating various exercises and routines, with expert tips and guidance.

10. Progress Photos:

- Allow users to upload and track progress photos to visually document their fitness journey over time.

11. Goal Setting:

- Enable users to set specific fitness goals (e.g., weight loss, muscle gain, endurance) and track their progress towards achieving them.

12. Personal Trainer Mode:

- Introduce a personal trainer mode that provides customized workout plans, regular check-ins, and virtual coaching.

13. Habit Tracking:

- Add a habit tracking feature to help users build and maintain healthy habits beyond just workout routines (e.g., hydration, sleep, meditation).

14. Offline Mode:

- Develop an offline mode that allows users to access their workout routines and log their progress without needing an internet connection.

15. In-App Messaging:

- Implement an in-app messaging system so users can communicate with friends, trainers, and group members directly within the app.

16. Gamification:

- Introduce gamification elements such as badges, achievements, and leaderboards to motivate users and make the fitness experience more engaging.

17. Integration with Music Apps:

- Allow integration with popular music streaming apps (e.g., Spotify, Apple Music) to let users create workout playlists and control music directly from the app.

18. Multilingual Support:

- Provide support for multiple languages to make the app accessible to a broader audience.

19. Accessibility Features:

- Implement accessibility features to ensure the app is usable for individuals with disabilities, including voice-over support and customizable text sizes.

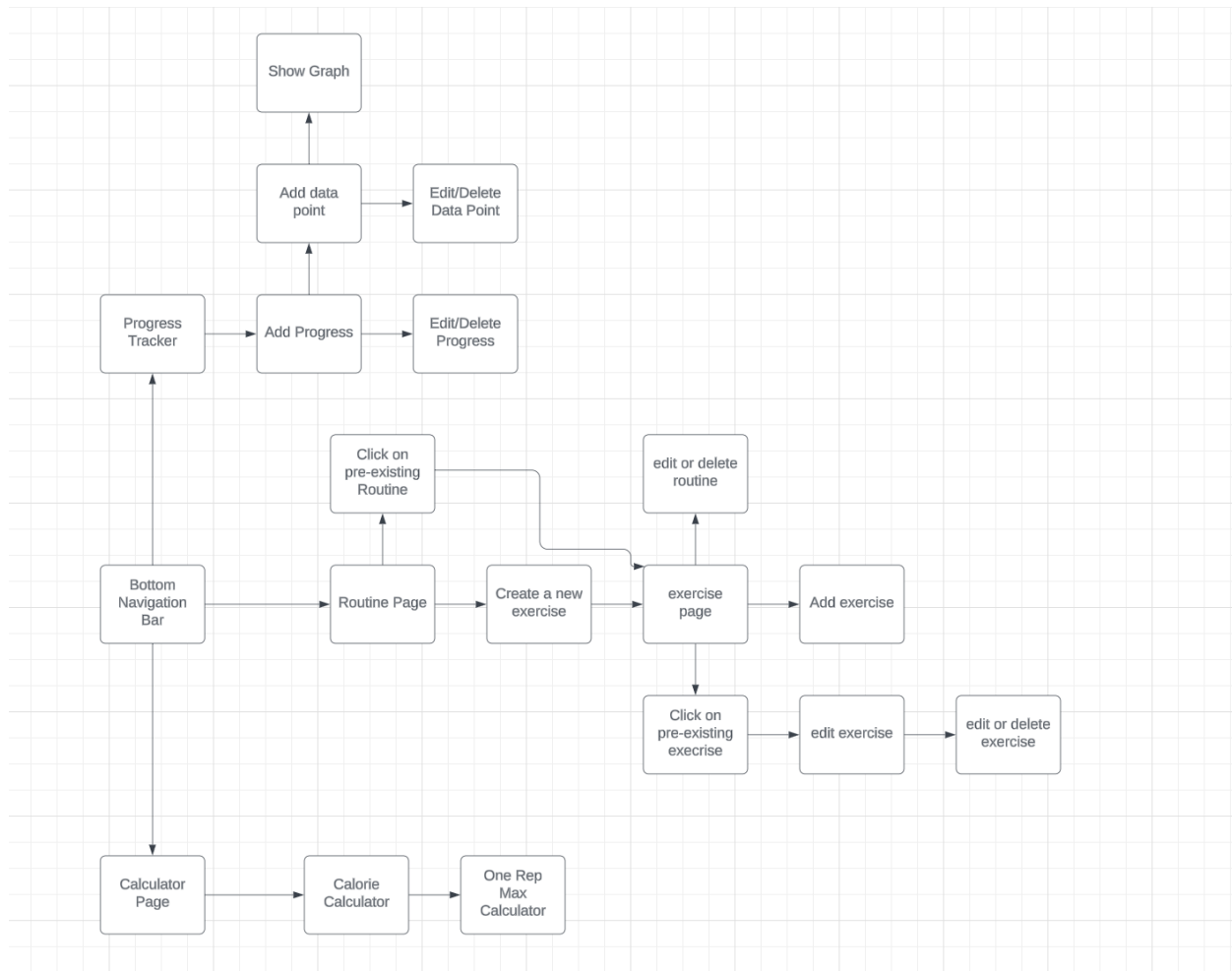
20. Advanced Search Filters:

- Enhance the search functionality with advanced filters to help users find routines based on specific criteria such as equipment required, difficulty level, duration, and targeted muscle groups.

By continuously expanding and improving the Flex Workout Application with these features, we aim to provide a comprehensive and engaging fitness platform that caters to the diverse needs of all users.

Architecture and Design

The Flex Workout Application is designed with a 2-Tier Architecture, comprising a client-side interface and a local database. This architecture ensures efficient data management and seamless user interaction, providing a responsive and reliable user experience. The application is developed using Kotlin and Android Studio, with Material3 and Jetpack Compose used for creating a modern and intuitive user interface.



Model-View-ViewModel (MVVM)

Pattern in Flex Workout Application

Throughout the Flex Workout Application, we adhered to the Model-View-ViewModel (MVVM) design pattern. This architectural pattern enhances the separation of concerns, making the codebase more manageable and testable. Following this consistent pattern made adding new screens, entities, and features a more straightforward process.

MVVM Overview: MVVM comprises three main components:

Model:

- **Description:** The Model represents the data layer of the application, including data sources like databases or remote servers. It handles business logic, data retrieval, and data manipulation. The Model is independent of the View and ViewModel.
- **Example in Flex Workout Application:** The Model for the routine details consists of two entities: exercises and routines, along with their attributes and relationships. It also includes the set of queries used to interact with them.

View:

- **Description:** The View represents the UI layer of the application. It displays the data and forwards user interactions to the ViewModel. In Android, this could be activities, fragments, or Compose UI components.
- **Example in Flex Workout Application:** The View for the routine details screen is a Compose UI component that displays a list of exercises within a column and includes a button for adding exercises.

ViewModel:

- **Description:** The ViewModel acts as a bridge between the Model and the View. It holds the application's presentation logic and state. The ViewModel retrieves data from the Model, processes it if needed, and exposes it in a form that the View can observe and display. It also handles user input from the View and updates the Model accordingly.
- **Example in Flex Workout Application:** The ViewModel for the routine details screen is initialized with a repository object. This repository provides a layer of abstraction for accessing the database. The View listens to the state of the ViewModel and automatically updates itself and any UI components that observe this state.

By following the MVVM pattern, the Flex Workout Application maintains a clean separation between the UI and business logic, which improves maintainability, scalability, and testability. This approach allows for more straightforward development and integration of new features, ultimately leading to a more robust and user-friendly application.

Development Process

Technologies Used

- Android Studio: Integrated Development Environment (IDE)
- Kotlin: Primary programming language
- Material3: UI Library
- Jetpack Compose: Toolkit for building native UIs

Code Structure

- Data Folder: Contains the database and links routines and exercises together.
- Navigation Folder: Contains the code for the navigation bar (top and bottom bar).
- Screens Folder: Contains the bulk of the program, including the different screens the application has.
- UI.Theme Folder: Contains the colors and themes of the entire program.
- res Folder: Contains necessary images and XML files.
- Gradle Scripts: Contains the implementations for the project.

Code

<https://github.com/Rolando-0/flex-app-compose>

Testing

Manual Regression Testing:

Rigorous manual regression testing is conducted to ensure that all features function correctly and to identify any potential issues. This thorough testing process helps maintain the app's reliability and user satisfaction.

Conclusion

The Flex Workout Application, developed using Kotlin and Material3, is designed to help users maintain organized workout plans and achieve their fitness goals. By providing tools for tracking workouts, calculating fitness metrics, and offering personalized recommendations, the app ensures that users can manage their fitness activities effectively. Looking ahead, we plan to introduce new features and improvements to further enhance the user experience and meet the evolving needs of fitness enthusiasts.

References

- [Material Design](#)
- [Kotlin Language](#)
- [Athlean-X One Rep Max Calculator](#)
- [Calorie Calculator](#)
- [Android YouTube Player on GitHub](#)