

# FIT4039 Mobile Application Design Specification

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# Application Concept

## Introduction

Gym Fitness and Workout Tracker (GFWT for short) is a mobile application that assist the gym in helping their clients keep up with their training. This application designed by Yidi Wu is the simplest and easiest to use fitness application for individual tracking their workout routine.

One of the first objective for a series of bodybuilders or weight trainers in following a program in the gym is recording and planning their personal workout routine. Whether you are beginner or an experienced bodybuilder, GFWT will be made even easier to build and edit your custom workouts. That means you can make a routine with all your favourite exercises, nothing you despise.

The focus of GFWT is to build a mobile application which provides everything you need to record your workouts as effortlessly and as quickly as possible. GFWT is optimised for a progressive routine, but it is easily adaptable to any other routine of your choosing.

Bodybuilders or weight trainers will be able to create a custom routine by choosing the exercise from the database of body weight and duration exercise. Similarly, they also can add the custom exercise. A timer to monitor the user implemented with alters noticing them to change routine. A map integration with location tracking to monitor distance ran in a routine. After routine has been completed, the elapsed time and details of workout will be recorded in your history.

## Target Audience

The intended target audience for the application is aimed at bodybuilder and weight trainer who are required a professional application to assist in helping them manage their workout routine.

Professionals that can be identified within this target audience can include (but not limited to):

### **Personal trainers**

- Weight trainers
- Sports trainers
- Physical therapists
- PE teachers and more.

The application is made with the whole purpose to be for anyone who needs an easier solution for fitness, without the complicated exercise and unnecessary functions you would never use. It is simple, intuitive and functional that the interface is designed which results in allowing users can quickly adapt the application.

Many functions of the application don't require any technical expertise to use. Users can understand the functions quickly through a friendly interface, some tips and some meaningful icons.

## **Application Functionality**

There are several key areas of functionality that help make the mobile application useful to plan a workout programme. Below is an outline of the major functionality accessible within the application:

### **BMR Calculator**

Basal Metabolic Rate (BMR) Calculator find out how many kilojoules or kilocalories your body needs at rest just to fuel its normal metabolic activity. Knowing your Basel Metabolic Rate can help with a weight management program because it can help you to calculate how much energy you spend in a day.

### **BMI Calculator**

Body Mass Index (BMI) is a number calculated from a person's weight and height. BMI provides a reliable indicator of body fatness for most men and women between the ages of 18 and 65 years, and is used to screen for weight categories that may lead to health problems.

### **Exercise List**

More than 15 different kinds of exercise in respect of different muscle group like chest, legs, back, biceps, shoulder, triceps and so on has been provided. Further details regarding the

exercise is available which focus on the terms of difficulty, stance, impact level and focus area. User also can create their additional exercise and add it to the list.

### **Routine List**

Seven default different kinds of routine have been provided for users with various requirements such as weight loss, maintaining fitness, running, toned body and strength basics. Like the exercise list, users also can arrange for their own workout routine by choosing the existing exercises in the exercise list. They are enable to customize the set and repetition for each exercise.

### **Workout History**

After completion of the routine the details of how much set and repetition will be recorded in database. Users can browse their history of workout so that they can significantly improve their workout routine.

### **Timer**

Timer is necessary for a workout application which can monitor the user and alter them to stop or change the exercise. A timer provides continuous visual cues to help the trainer pace progress and stay on task.

### **Pedometer**

Users not only can count their daily step by the pedometer but also measure approximate distance, measure their speed as well.

### **Track on Map**

Map widget is integrated in the application which records your distance ran in a routine and traces your location. It is efficient that help them map out your running routes through this function.

## Innovation via Mobile Technology

Comparison with the application that you can download on the market, the project of this application is rather unique. The purpose of the use of mobile technology is to improve usability and user experience. An outline of innovative functions:

- The details of exercise are available in order to indicate users to choose the appropriate exercises to inflate their personal workout routine.
- The ability to map out the running routes and monitor the distance ran in a routine which enhance the experience of running routine.
- There are two calculators: BMI calculator and BMR calculator.
  - BMR calculator help users to find out their Basal Energy Expenditure (BEE) which usually accounts for 50-80 percent of total energy need.
  - BMI calculator enable user to calculate their Body Mass Index. A healthy BMI score is between 20 and 25. A score below 20 indicates that you may be underweight; a value above 25 indicates that you may be overweight. This one of many possible ways to assess your weight which help user to plan their loss weight programme.
- The ability to count their steps. This data help the user determine their total daily energy expenditure (calories).

## Platform Technology Consideration

To implement the Gym Fitness and Workout Tracker (working title) on both mobile system android and iOS. Several components that should be considered are how to access the sensor, the use of the third-party framework Google map API and how to use the location service with Android and iOS.

How to manage complex data structures should be required to design a database to store the data for the various exercises and routines. Both platform provides different approaches regarding data management. Android use SQLite to create a database, but iOS use the Core data to manage database. AERecord (Tadić, 2014-2016) a third-party library can be used less complicated to operate the core data.

For tracking on the map, the application will need to be able to track the users' location on the map, therefore different frameworks will be chosen to implement this function. Google Map Android API and the Android framework location APIs (Google, 2017) provide a location service. Developers can build some capability into your device using some approaches provided by the framework. Although Google Map SDK for iOS also can be implemented in iOS which can create a map to the iOS application, iOS provides the Core location framework which support developers can use it to get and monitor the device's current location (Apple, 2016).

For the pedometer, the application should be required to access the hardware step-sensor. The step counter sensor provides the number of steps taken by the user since the last reboot while the sensor was activated. iOS provides CMPedometer to retrieve step counts and other information about the distance travelled. The pedometer function use EazeGraphLibrary (Cech, 2015) to show the histogram of the historical data.

For the timer, both platform provide the timer class to create a simple timer. Timecon Library (Derbyshev, 2016) is used to draws the icon. By function timer can be categories as two types, A timer which counts upwards from zero for measuring elapsed time is often called a stopwatch a device which counts down from a specified time interval is more usually called a countdown timer. For my application, a countdown timer will be implement because users always want to set up a compulsory time to complete the routine rather than measure elapsed time.

Considering testing and debugging there are a number of issues and related to do so on both platform. Concerns for testing the pedometer, both the emulator and simulator cannot test it. However, fortunately I have an android device, therefore I probably will choose android over iOS to implement my application.

The Android devices that the application could be tested on include:

- LG K10 with Android 6.0.1 Marshmallow
- X86 Emulator

The iOS devices that the application could be tested on include:

- iphone6 plus
- Simulator

## Scope and Limitations

Because of the complexity of the application and the limited time frame to develop the application, there are some scope choices and limitations were determined in case the time is not enough. To implement the application in an optimal way, so the scopes are divided into two levels. The first level is defined as the necessary scope, which the application must to meet to get highly completeness. The second level of scope are some advanced functions that will improve the usability of the application but will only be attempted if time permit it.

### Necessary Scope

#### **BMR and BMI Calculator**

BMR and BMI calculator are both useful tools integrated in this workout application. They can calculate the BMI score and Basal Energy Expenditure according to the gender, height and weight provided by the user.

#### **Limited number of Available Exercise and Routine**

A minimum of 15 exercises and at least of 7 routine store in a database. Users not only can choose these default exercises to customize their personal routine, but also can add their own exercise.

#### **A simple countdown Timer**

A countdown timer support user to customize such as sound volume adjustments for individual need and choose a custom length. Timecon Library used to design an icon for timer.

#### **History and Schedule**

A workout schedule record user's plan and history. Days are marked on a calendar to represent when you have completed the routine or reminder trainers to stick their schedule.

#### **Pedometer**

Pedometers are now becoming popular as an everyday exercise counter and motivator. It can record how many steps the wearer has walked that day, and thus the kilometres or miles

(distance = number of steps × step length). Step counters can give encouragement to compete with oneself in getting fit and losing weight.

### **Track on Map**

The application allow user to track their running route. So, application allow to get the position information from the user which can help them plan the route.

### **Bonus Scope**

#### **Login System**

Firebase Authentication support to save user's identity in cloud. Firebase Authentication provides backend services, easy-to-use SDKs, and ready-made UI libraries to authenticate users to the application. It supports authentication using passwords, popular federated identity providers like Google, Facebook and Twitter, and more.

#### **More Advanced Timer**

A music player will be integrated in a timer to improve the user experience. The user can choose their favourite music as the background music when they are doing the exercise.

#### **Calories Interactive Visualization**

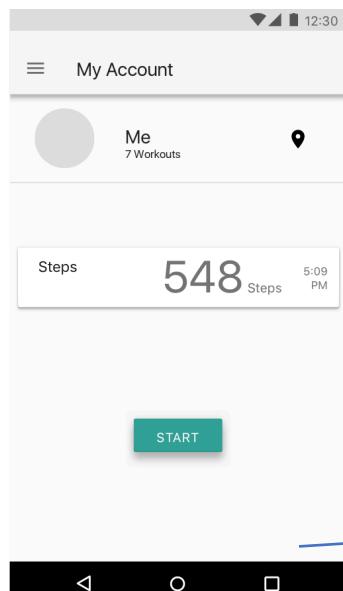
An interactive visualization will be developed to show the calories expenditure. Users can directly compare how many calories they burn each day. HelloCharts library help to easily build a line chart.

#### **Process picture**

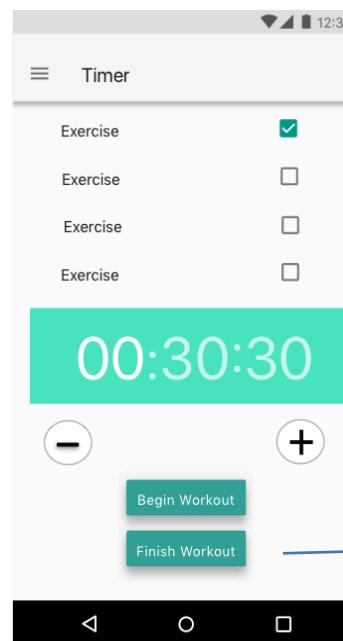
After users completed the planned routine, they can use camera to take a photo for themselves and add it to the historical log. The mirror is your best friend for tracking your transformation. Compare before and after pictures.

# User Interface Design (Storyboards)

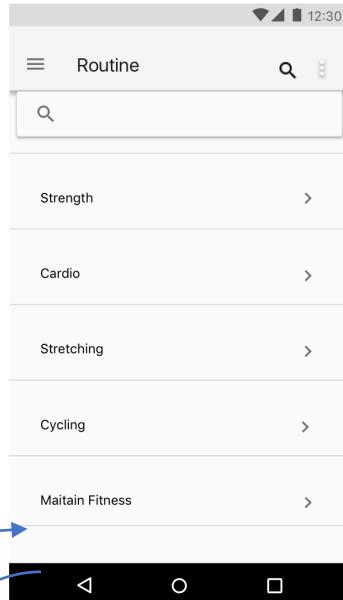
## Android Interface:



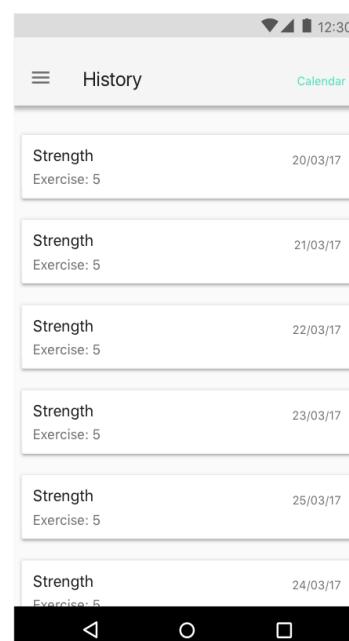
Main Screen to the application. The steps information from pedometer display for the user. Provides two button for user interaction. START button is used to begin your routine. A location icon used to track your location on the map.



Once user choose a routine to begin a workout. The exercise involved in the routine display on the screen. A timer is provided for user which can be customized by plus and minus button. A begin button is used to start the timer. If user finish one exercise, he can select the check box. Once all the routine will be completed, click finish button and the screen navigate to the history.

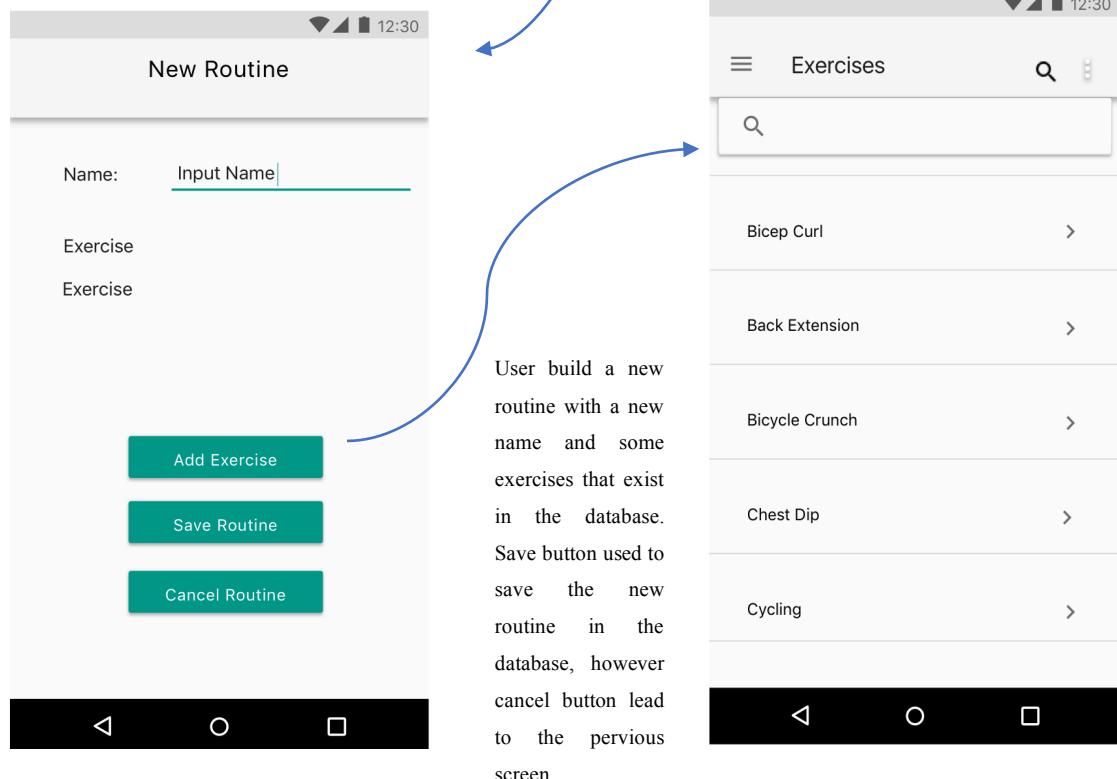
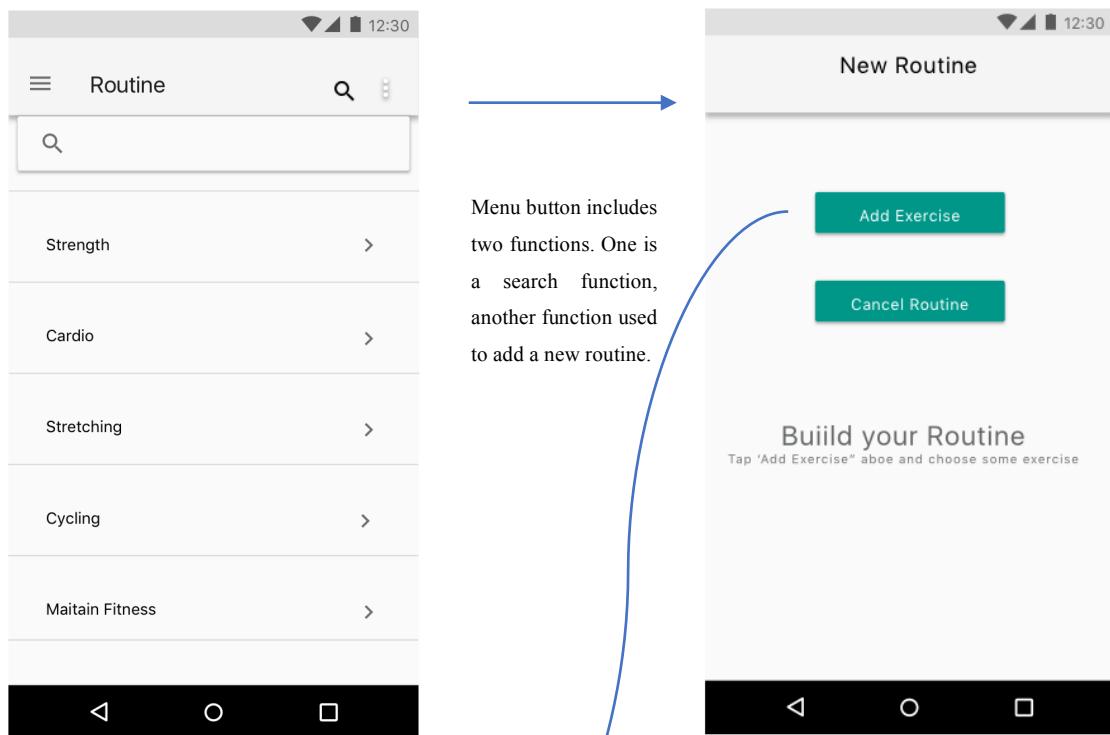


Once user clicks the start button, the view bounds to the Routine list. The menu button is provided for search and add function.



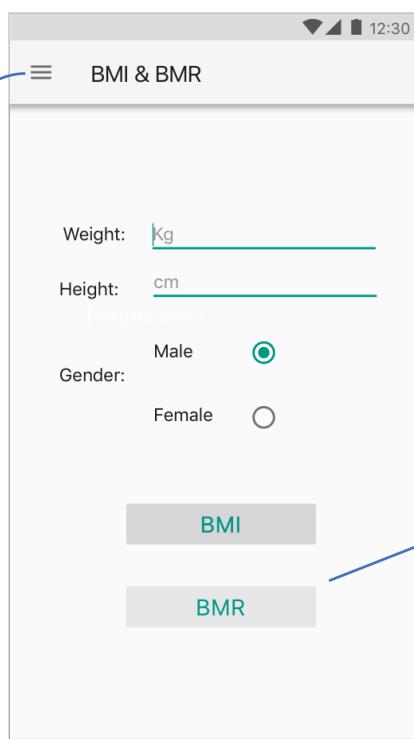
History screen show the historical log of your workout. The date represents the last day you finish this routine. A calendar button provides a calendar to mark the day which user completed the routine.



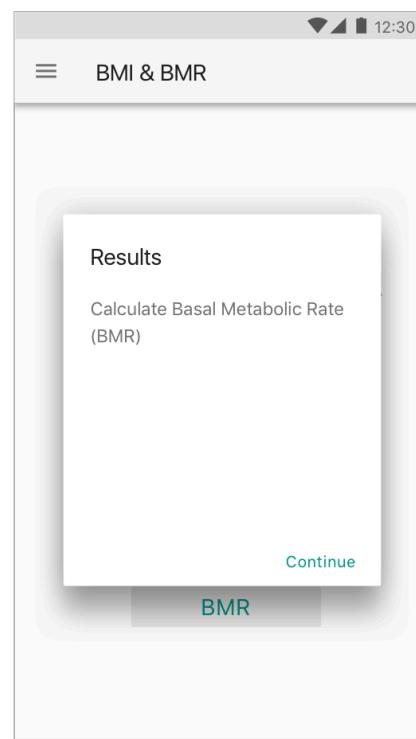


User build a new routine with a new name and some exercises that exist in the database. Save button used to save the new routine in the database, however cancel button lead to the pervious screen.

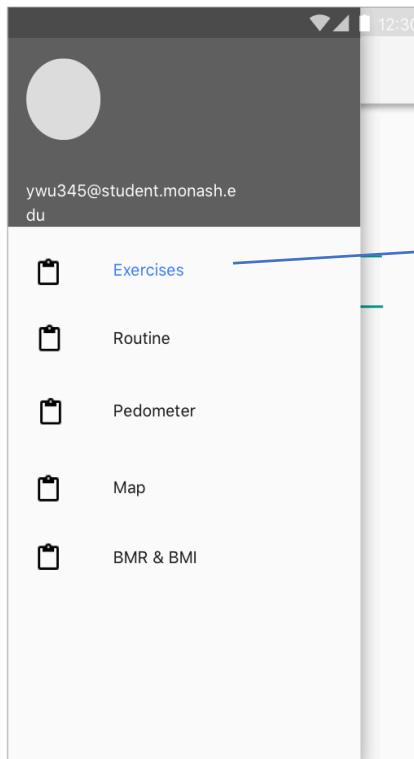
Add Exercise button allows user start to create a new routine, cancel button allows user to go back.



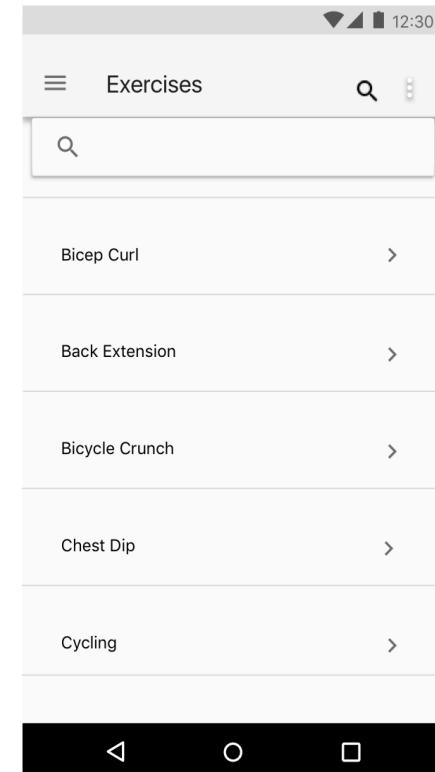
Provides two mode of calculator. BMI and BMR mode can calculate the result regarding the weight and height user input as well as the gender chosen.

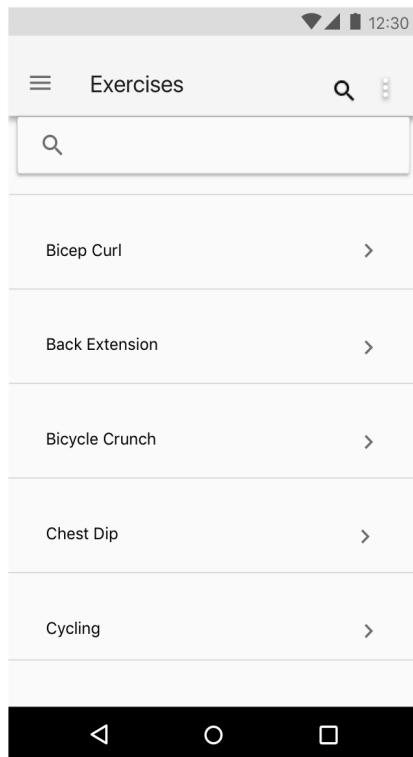


Result dialog will present until user click one button.

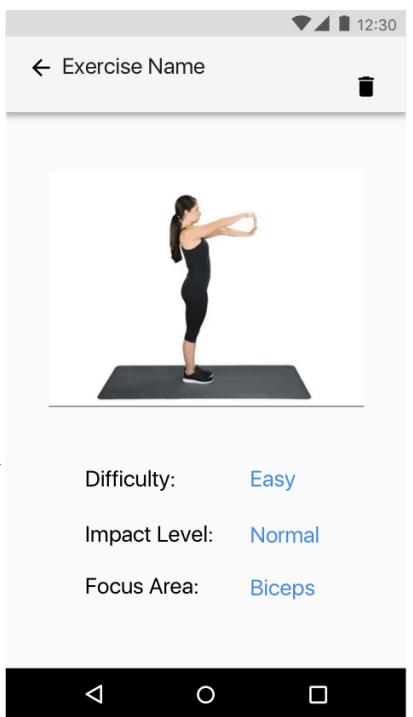
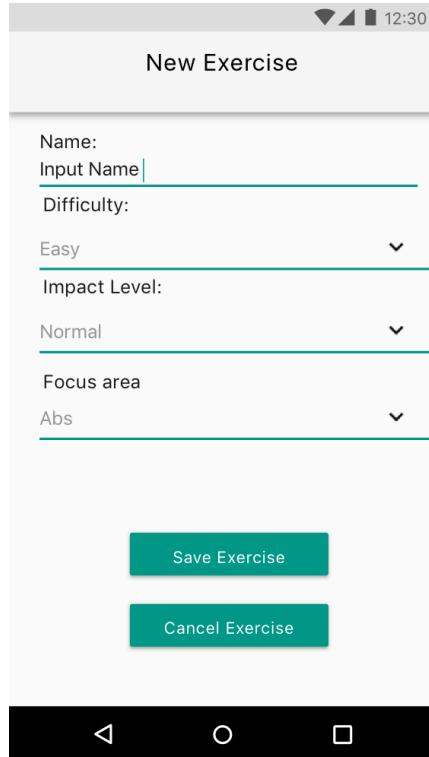


Users can access to every view via the left navigation bar.

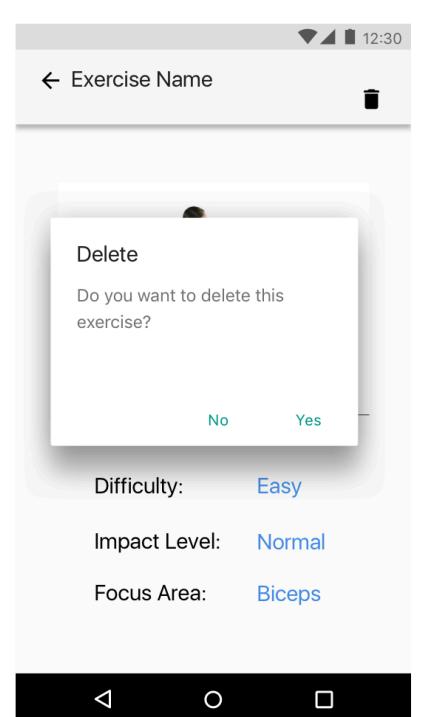


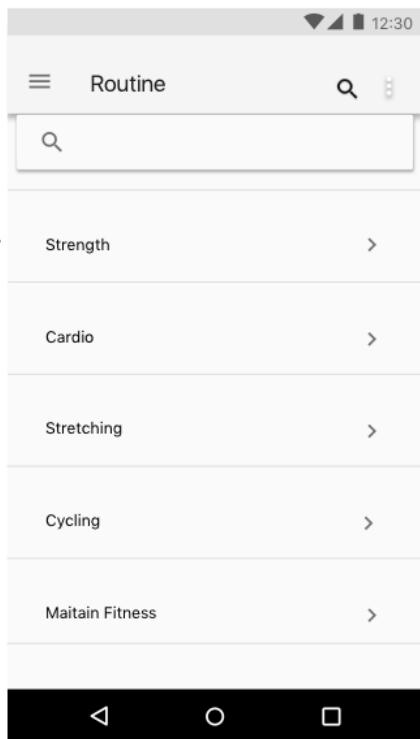


Menu bar contains two functions: search and add exercise. Clicks the cell show the details of the exercise.

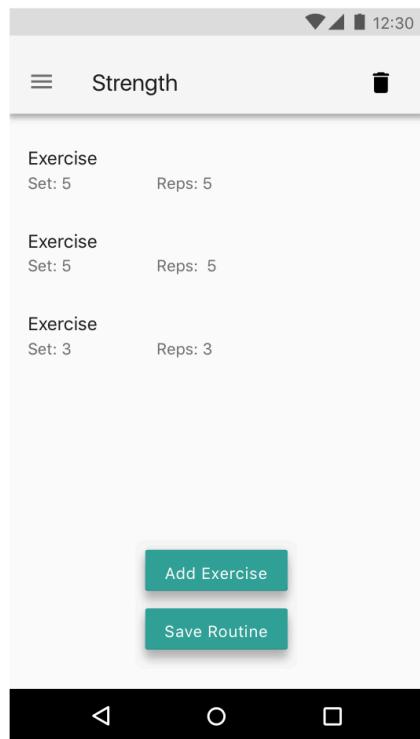


Click cell to display the specific information of each exercise and a delete button is on the right corner. Click it, then a dialog will present to remind you whether to delete.

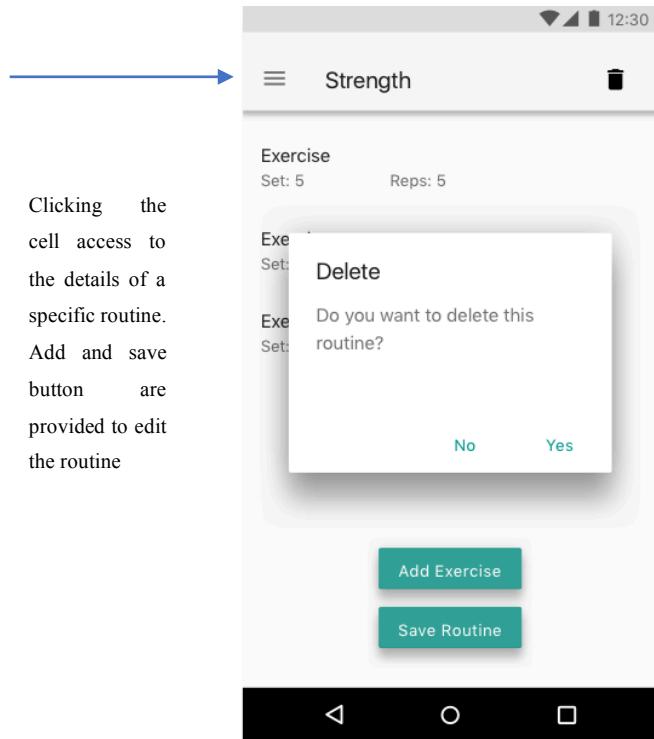




Similarly, routine list contains the menus bar including the same function as the exercise list.

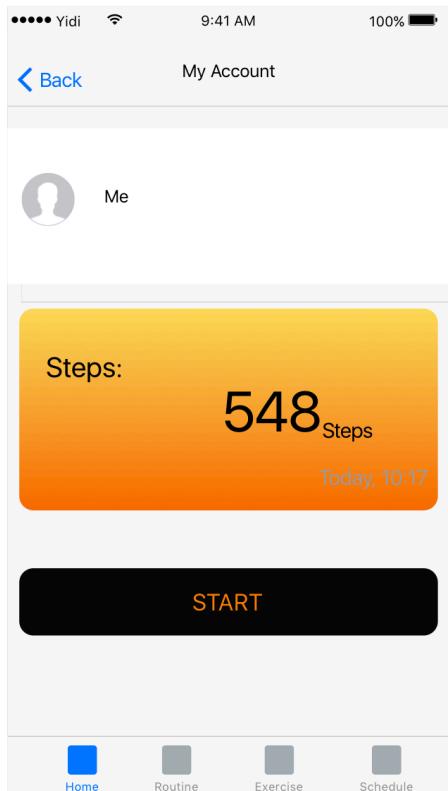


Clicking the cell access to the details of a specific routine. Add and save button are provided to edit the routine

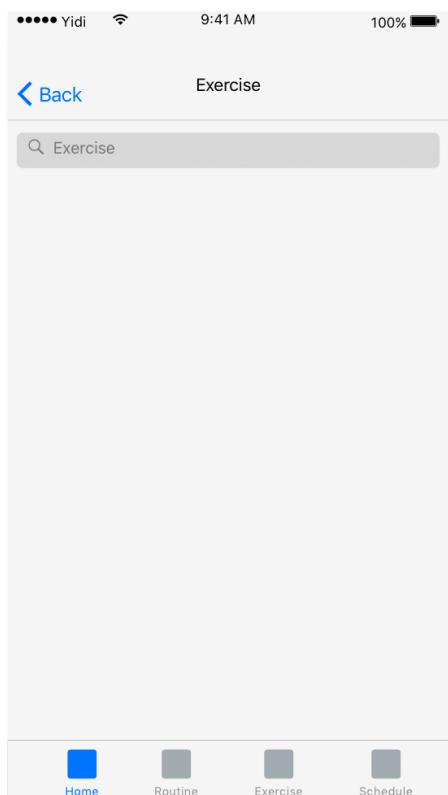


If user want to delete a routine, a dialog will make confirmation.

## iOS Interface:



Concerns for the differences between the iOS and Android interface in terms of the style and the position of the navigation bar. Android using material design but iOS choosing the flat design. According to the design principle of iOS, navigation bar is assigned at bottom of the screen. The second difference between two platforms is the button style. Float button is implemented in the Android design. For iOS button interface, a round-corner and filled button is used to implement.



iOS search bar is quite different from Android. As we can see, Android still using the float style, and integrate it with the menu bar. However, iOS set the bar on the top of the table view, and the hint is placed in the box.

## Project Timeline

Prototype1	
Week 5 - 6	Research Google Maps Android API and Google Maps SDK for iOS. Learn how to use a CMPedometer object to fetch pedestrian-related data.
Week 7	Design and create the database for the application. Implement table view.
Week 8 - 9	Implement object detection and recognition
Week 10	Present Prototype including working object recognition Fix any bugs relating to object recognition. Implement the timer function.
Prototype 2	
Week 11	Integrate with the Google map
Week 12	Add the pedometer function
Final Submission	
Week13 -14	Bug fixing & Testing Float time (Implement extra features or finish any unfinished features)

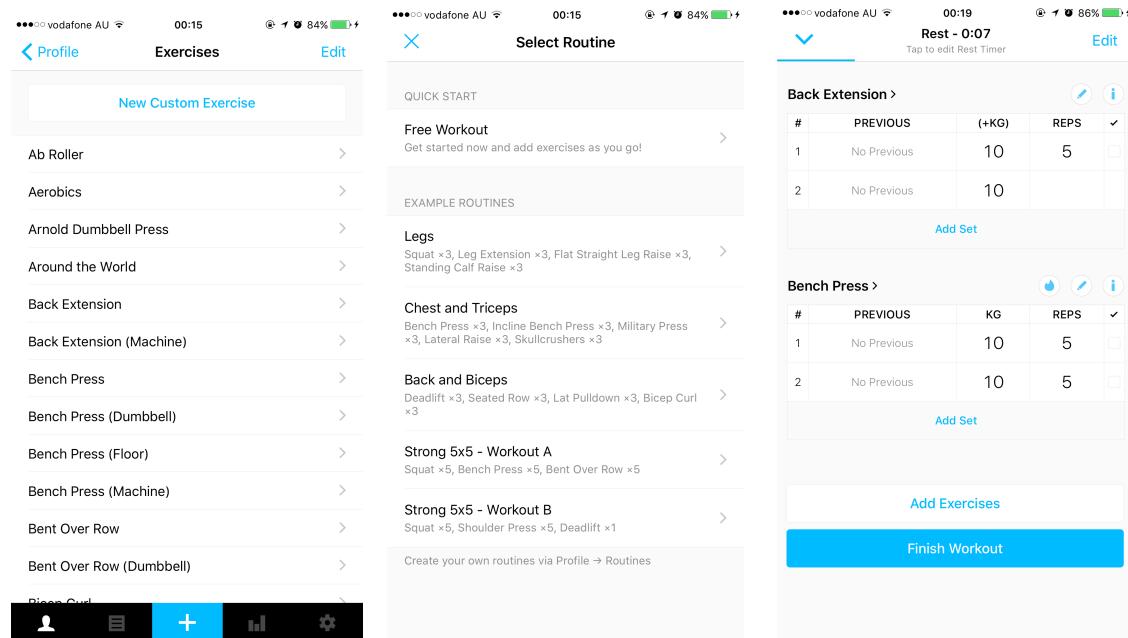
# Competitive Analysis

Nowadays, using an application to manage workout routine is being popular. Although people require different demand involved in building muscle, losing fat, increasing strength, improving performance, as well as being healthier, for application it must to meet almost of these demands. Therefore, application not only support amount of data for exercises or routines, but also help user to build and customize the workout routine for themselves.

Searching in both Apple's App Store and Google Play Store, there are various of workout applications in which I choose four typical and high ranking application to examine. Compare the design and functionality among these four application, meanwhile the strength and weakness also will be analysed.

## Strong - Workout Tracker for Strength

URL: <https://itunes.apple.com/au/app/strong-workout-tracker-for-strength-fitness/id464254577?mt=8>



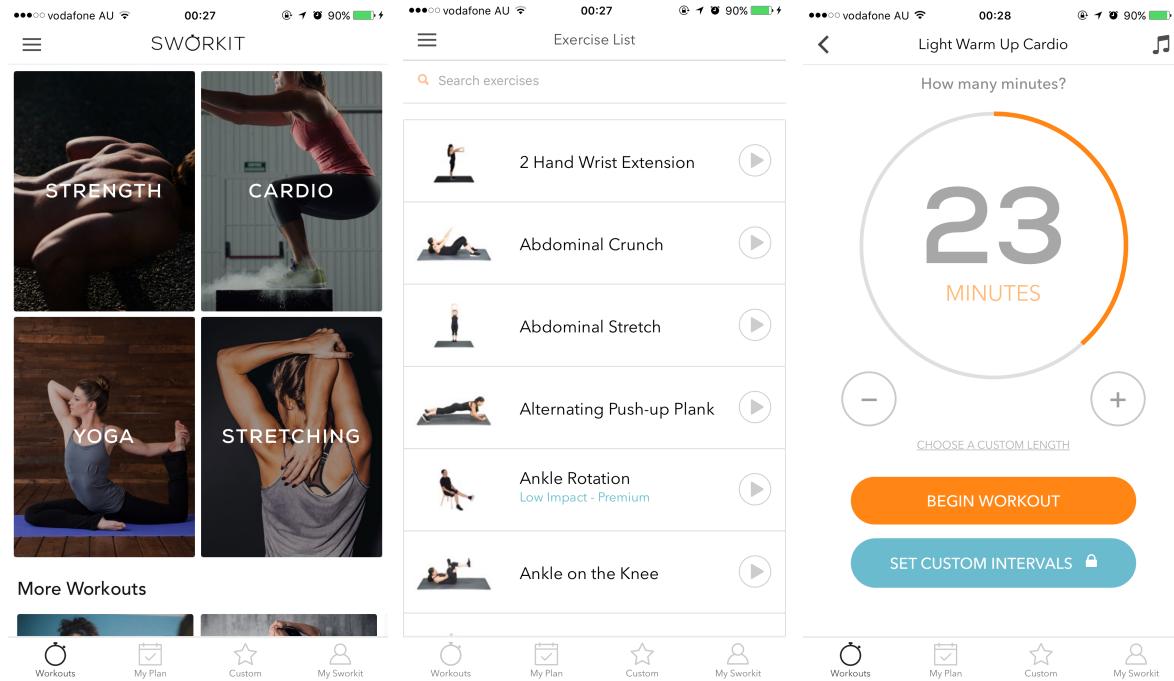


The first application I examined is searched from Apple's store which is ranked on the top 5 fitness app in over 20 countries. Strong - Workout Tracker for Strength & Fitness by Strong Fitness Ltd is the simplest and easiest to use fitness application for tracking your weightlifting workouts. Whether you're a beginner or an experienced powerlifter, Strong provides everything you need to record your workouts as effortlessly and as quickly as possible. Unlike other fitness applications, Strong doesn't bog you down with pictures and videos you don't need, and provide unnecessary functions you would never use. Although a very simple interface optimises the usability of the application, lack of instruction lead several problems. As we all known, almost users except professional sports trainers are not familiar with the exercise. Unsuitable techniques, facilities in poor condition, and improper exercise methods can all lead to unnecessary injuries to the trainers.

For my application, the difficulty level, impact level and focus area are provided to guide trainers to be quickly familiar with the exercise in case of injuries. The historical workout data is visualized by a bar chart, so trainers easily to see their progress and improvement over time. A timer, intuitive tools to power trainers through their workout. It is easy to track trainers' progress and view the history.

## Sworkit - Custom Workouts for Exercise & Fitness

URL: <https://itunes.apple.com/au/app/sworkit-custom-workouts-for-exercise-fitness/id527219710?mt=8>

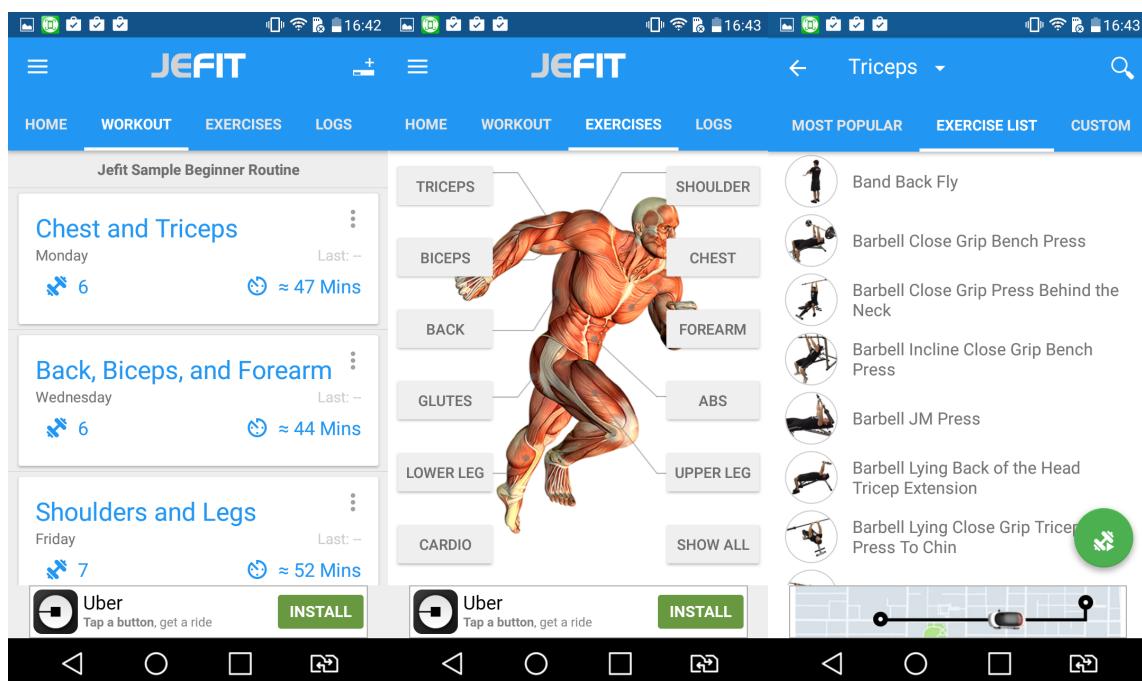


Sworkit is created by Nexercise which supplies a large number of exercises and routines. The reason why I recommend this application is that every exercise displayed with a GIF. The beginners can follow the movement via the GIF to familiar with the exercise they never take. In comparison to my Gym Fitness and Workout Tracker application, Sworkit designed with a large quantity of vivid picture and several scientific routines are provided, however some of these routines require a further payment. Although it is easier to build and edit users' custom workouts, follow a guide plan or choose individual workouts, as well as, follow real trainers, some limitation is also obvious. So the competition of my application is that some additional function like BMI and BMR calculator provided to help user build their individual routine which is suitable for themselves. The Body Mass Index and Basal Metabolic Rate with regard to the energy expenditure (calories) which is the most important data help bodybuilders or weight trainers to set their goals and create a suitable workout schedule. The interface of Sworkit is very complicated which take me a long time to adapt it. As we all known, most of users hope to familiar with a new application as quickly as possible. They want to focus on the

actual workout rather than learn how to use the application. Aside the complicated interface, it is an awesome application with all necessary functions.

## JEFIT Workout Tracker Gym Log

URL: <https://play.google.com/store/apps/details?id=je.fit>

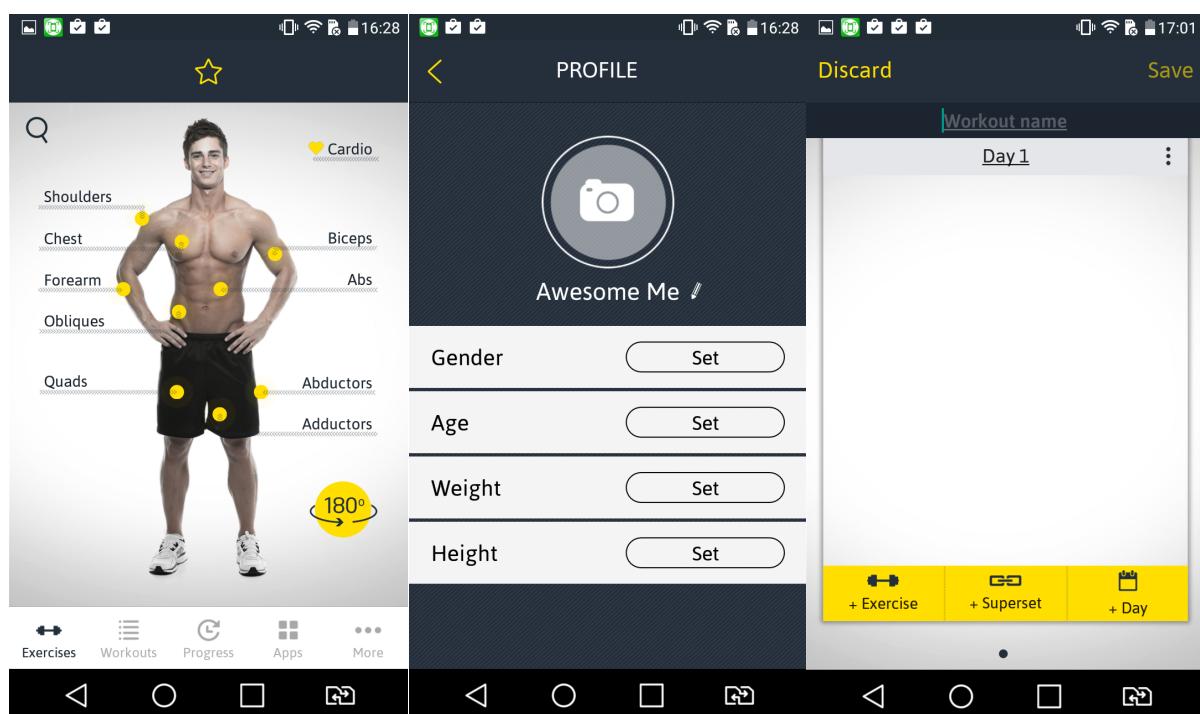


JEFIT was created by Jefit Inc. Health & Fitness which is one of the simplest workout applications for recording and logging workout routine. Personal trainers can easily track workout and progress, create routines and exercise or access the large exercise database. Most workout applications require constant interaction thus you waste time configuring application instead of working out. However, the JEFIT is different, a friendly interface help users focus on actual workout. Another advantage of this application is that it helps user set their fitness goals, for example reduce body fat and create a personal custom routine plan to achieve it. JEFIT helps users with social-driven motivation by building an active community with millions of members on the web which helps boost motivation as you can share your progress and even compare stats with friends or other community members. A very competitive function allows users access to the online community, users can easily communicate with the trainers with the

same goal to receive feedback, tips or even the encouragements you need to stay focused. The exercise list interface set a human image view to help users easily find the exercise they want regarding the focus area. JEFIT helps improve users by providing advanced personal reports to analyse their progress which involved in a professional field. From body stats to goal charts, users will be able to delve into workout logs and see what they can change to motivate themselves on pushing previous records. With JEFIT user's data synchronized in the cloud which means it gives users the freedom to use it on any devices (iOS and Android) and even access it via the web with them same account. Although JEFIT has those huge advantages of my application it does not has, the pedometer and map function make my application more competitive. Pedometer using the motion sensor to count the steps and calculate the daily energy expenditure. Data regarding calories expenditure allows users to plan their workout routine and recognize the status in order to modify their plan.

## Gym Workout Tracker & Trainer

URL: <https://play.google.com/store/apps/details?id=com.fitness22.workout>



Gym Workout Tracker & Trainer was created by Fitness22 which is the world's easiest and most successful way to get in shape and stay in shape for life. Whether you are new to weight lifting and bodybuilding or senior trainer, Gym Workout Tracker & Trainer provides sharp videos and clear exercise photos to help their user to follow with. A large exercise database is provided involved in weight training exercise for toning, strength training, slimming and more. Users can set their personal information in terms of gender, age, weight and height through this application. It is convenience that user can star the exercise they preferred so that the favourite exercises and the recent exercises appear on the top of the list. Similarly, Gym Workout Tracker & Trainer allow user to view and track their progress. There are lots of exercises with more than 3000 possible variations. Although there are rich photos and videos of each exercise, the easy-to-understand detailed descriptions and a search way by muscle group and equipment type of key word, it is hard to build workout routine because a large amount of information confuse trainer to make choice. In comparison to my application, although the exercise list is shorter than Gym Workout Tracker, it is easier to find exercise that is suitable for your goals. For my application, freedom is given to user to customize their workout routine and add the exercise they prefer.

Both Gym Workout Tracker and the JEFIT implement the application interface based on the material design. As we can see, shadows are created by the elevation difference between overlapping material. Use cards to organize content when specific behaviours are needed or if groupings of information need more separation than what whitespace or dividers can provide (see JEFIT). The difference between the JEFIT and Gym Workout Tracker & Trainer is the navigation patterns. JEFIT implement tabs which allow users to quickly move between small number of equally important views, however, Gym Workout Tracker & Trainer use a bottom navigation bar which allows user to quickly move between a small number of top-level views.

Although these four applications got a high rank in respective app market, all of them does not have the pedometer and the map function which is the main advantage of my application. Users can set a goal for themselves like achieve compulsory steps each day which motivate them keep on training. My application is the workout tracker that help users keep them focused and strongly motivated to achieve their fitness goals. Map function is another useful function for workout application. Users can record their running route and plan a new route via this function. Searching from the Apple's store and android market, less workout application have map

function to support user for planning route. On the other hand, for Gym Fitness & Workout Tracker it cannot share the progress and communicate with another people as disadvantage to compete with other congeneric application.

## Reference

- Apple. (2017). *CMMotionManager - Core Motion | Apple Developer Documentation*. *Developer.apple.com*. Retrieved 25 March 2017, from <https://developer.apple.com/reference/coremotion/cmmotionmanager>
- Apple. (2017). *Getting the User's Location*. *Developer.apple.com*. Retrieved 25 March 2017, from [https://developer.apple.com/library/content/documentation/UserExperience/Conceptual/LocationAwarenessPG/CoreLocation/CoreLocation.html#/apple\\_ref/doc/uid/TP40009497-CH2-SW1](https://developer.apple.com/library/content/documentation/UserExperience/Conceptual/LocationAwarenessPG/CoreLocation/CoreLocation.html#/apple_ref/doc/uid/TP40009497-CH2-SW1)
- Cech, P. (2017). *blackfizz/EazeGraph*. *GitHub*. Retrieved 25 March 2017, from <https://github.com/blackfizz/EazeGraph>
- Derbyshev, A. (2017). *alxrm/animated-clock-icon*. *GitHub*. Retrieved 25 March 2017, from <https://github.com/alxrm/animated-clock-icon>.
- Google. (2017). *Location and Maps | Android Developers*. *Developer.android.com*. Retrieved 25 March 2017, from <https://developer.android.com/guide/topics/location/index.html>
- Google. (2017). *Motion Sensors | Android Developers*. *Developer.android.com*. Retrieved 25 March 2017, from [https://developer.android.com/guide/topics/sensors/sensors\\_motion.html#sensors-motion-stepcounter](https://developer.android.com/guide/topics/sensors/sensors_motion.html#sensors-motion-stepcounter)
- Tadić, M. (2014 - 2016). *tadija/AERecord*. *GitHub*. Retrieved 25 March 2017, from <https://github.com/tadija/AERecord#easy-queries>