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Technical Report

Challenger App



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1 Executive Summary

The main objective of this project is to provide a simple but effective fitness tracking application. The application tracks activities such as running, walking or cycling. Gamification is core of the application as the user is able to earn experience points for competing in different competitions made by other users. The concept of the competition is quite simple in that the user selects one of the challenge activities from a list and sets specific criteria that others must comply with in order to win the challenge (for example complete 5km run in 30 min). By completing the challenges, the user earns points and competes for a higher position in the leaderboard.

The main purpose of this application is to encourage outside activities such as running, walking and cycling. The project was developed using Android Studio IDE, Xml files to design the UI layout, and Java as base of programming language. The application uses a non-SQL database Google Firebase hosted online to store, retrieve and process data of user's fitness activity. The connection online database is implemented via configurations in the project and methods for retrieving, sending and processing the data. The actual mobile device or emulator will be used to test the initial functionality of application.

2 Introduction

2.1 Background

In past years, mobile applications that track fitness activities such as running, hiking and cycling have become quite popular (Examples would be a Google Fit, Fitbit, Runtastic and many others). The main purpose of those apps is to provide assistance to a user when performing exercise activities.

Most of the application serves its purpose very well, which is to track user's performance and encourage exercising. However, from personal and potential users experience it was concluded that most of the current fitness applications are focusing only on the particular user who downloads the application (lack of competitive element). Additionally, many existing apps are designed for people who already have a background in exercising. Apart from the technical part, the main purpose of this app is to promote and encourage people for outside activities by implementing an element of competitiveness through gamified activities. The application aims to benefit users by improving their health conditioning. According to multiple research papers, activities such as running, walking and cycling has a huge impact on our overall wellbeing. Research has showed that it helps to reduce level of stress, prevents heart disease, prevents obesity, and improves physical condition of the body.

2.2 Aims

The purpose of this Android Application project is to develop a user-friendly application, which should provide a beneficial service to the application user. The application should look attractive to the user and serve the initial purpose, which is, track users fitness activity like running, walking or cycling. In addition, to that have implemented gamification elements such as gaining experience points by competing in different challenges. In addition, aim of the project is to develop application, which will promote outside activities also make exercising bit more fun and challenging and try to bring new type of exercise app to the existing market that would aim vast majority of the users.

2.3 Technologies

In order to successfully carry out this project, from the initial stage until completion, the development process was making use of android studio IDE, with developer guidelines provided by android development documentation. The IDE provided the majority of the tools needed in the development of an application.

For additional services and functionalities, the following was in use along:

- Google firebase (Non SQL back-end system)
- Android device sensors
- API and Libraries

3 System

In this section, it will outline the structure of this technical report. It will present a detailed description of the requirements for the Android application. It will then look at the Design and Architecture of the System and how the different components tie together to form the overall working environment

3.1 Functional requirements

1. The application must provide users registration process; user must provide the details for the registration, which will be used to create his account.
2. The application must provide users authentication process; user must be able to provide his credential details that will be used to authenticate him and provide access to his profile.
3. Application must have the function that provides tracking and measuring the fitness activity of the user, such a running, walking or cycling. It would track distance covered, location and the time how long activity was being tracked.
4. Application must allow for user to save his fitness activity result, for example after the user completed his 2km walking, the user should be able to save the result and keep it in user's history record.
5. Application must allow for user to create a challenge activity that would be possible to create after users save his own result. For example, if user completed 5km run, then he/she would be able to save result and assign it to the challenge list.
6. Application must allow for user to choose and compete in the available challenges, for example user should be able to go to challenges list and pick one that he desires to do. As an example he might choose the challenge where he has to make 5km run in 30min.
7. Application must allocate the points to the user after he/she completes the challenge. When user successfully completes the chosen challenge the application will be assigning experience points for the user.
8. Application should allocate users position in the leaderboard after completing the challenge. When the user completes the challenge and earns experience points then the user will be allocated in the leaderboard according his total sum of point he has.

3.1.1 Requirement 1: User Registration

3.1.1.1 Description & Priority:

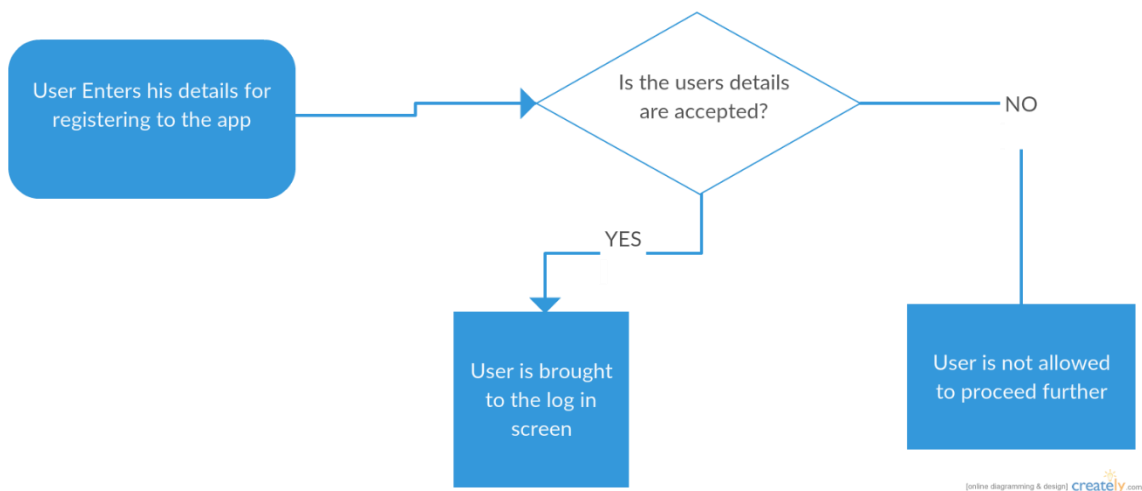
This is high priority requirement of this application, because user will not be able to use the app without successfully registering to the application's system

3.1.1.2 Use case

Scope:

The scope of this use is to demonstrate and describe user's registration process

Use Case Diagram (Flow Diagram):



Precondition:

User must enter his details in provided fields

Activation:

Use case activates when user submits his details

Main Flow:

Typical event course	
Actors action	Response of System
1. User enters his details for registration	1. Application saves the users details in the database 2. Application starts the log in activity

Alternative Flow:

Alternative event course	
Actors action	Response of System
1. User enters wrong or already existing details	1. Application does not save the users details 2. Application returns to the main page

Termination:

The flow is terminated once user is registries and details are being saved

Post condition:

The user will be brought to the log in page and application will go to the “wait state”

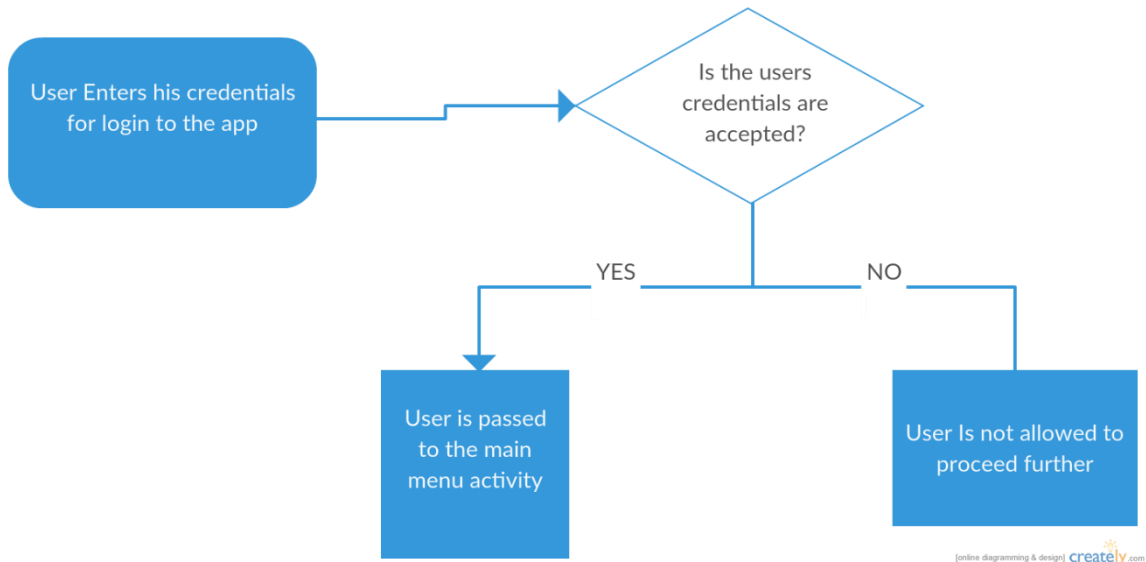
3.1.2 Requirement 2: User Authentication**3.1.2.1 Description & Priority:**

This is high priority requirement of this application, because user will not be able to use the app without successfully passing through the authentication process.

3.1.2.2 Use case**Scope:**

The scope of this use is to demonstrate and describe user’s authentication process

Use Case Diagram (Flow Diagram):



Precondition:

User must enter his credential in provided fields

Activation:

Use case activates when user enters and submits his credentials

Main Flow:

Typical event course	
Actors action	Response of System
1. User enters his credentials for log in	1. Open the main menu activity

Alternative Flow:

Alternative event course	
Actors action	Response of System
1. User wrong or non-existing credentials of log in	1. Credentials are not accepted 2. and further actions in application are prohibited 3. Application return to main page

Termination:

The flow is terminated once user is brought to main menu activity

Post condition:

The user is being brought to the main menu and application will go to the “wait state”

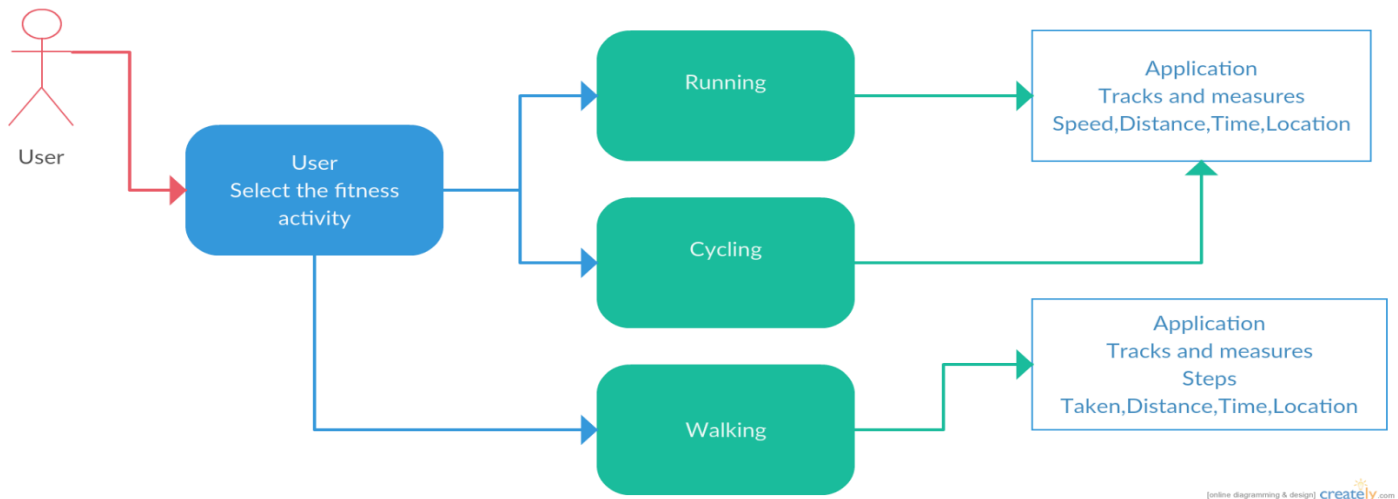
3.1.3 Requirement 3: Tracking and display of fitness activity**3.1.3.1 Description & Priority:**

This is high priority requirement of this application, as the application domain is fitness activities so with no option to track user’s performance the majority of the rest functionalities is not valid to be performed

3.1.3.2 Use case (Flow diagram)**Scope:**

The scope of this use is to demonstrate and describe user’s tracking of fitness activity process

Use Case Diagram (Flow Diagram):



Precondition:

Application is in the wait state

Activation:

Use case activates when user starts one of possible activities

Main Flow:

Typical event course	
Actors action	Response of System
1. User selects one of possible options for fitness activity 2. User Starts the activity	1. Application start to track the fitness activity

Alternative Flow:

Alternative event course	
Actors action	Response of System
1. User does not select any of given activities	1. Application does not track user's activities 2. Application stays in wait state

Termination:

The flow is terminated once user's activity is being tracked

Post condition:

Users activity is tracked by application

3.1.4 Requirement 4: Saving result and Creating Challenge

3.1.4.1 Description & Priority:

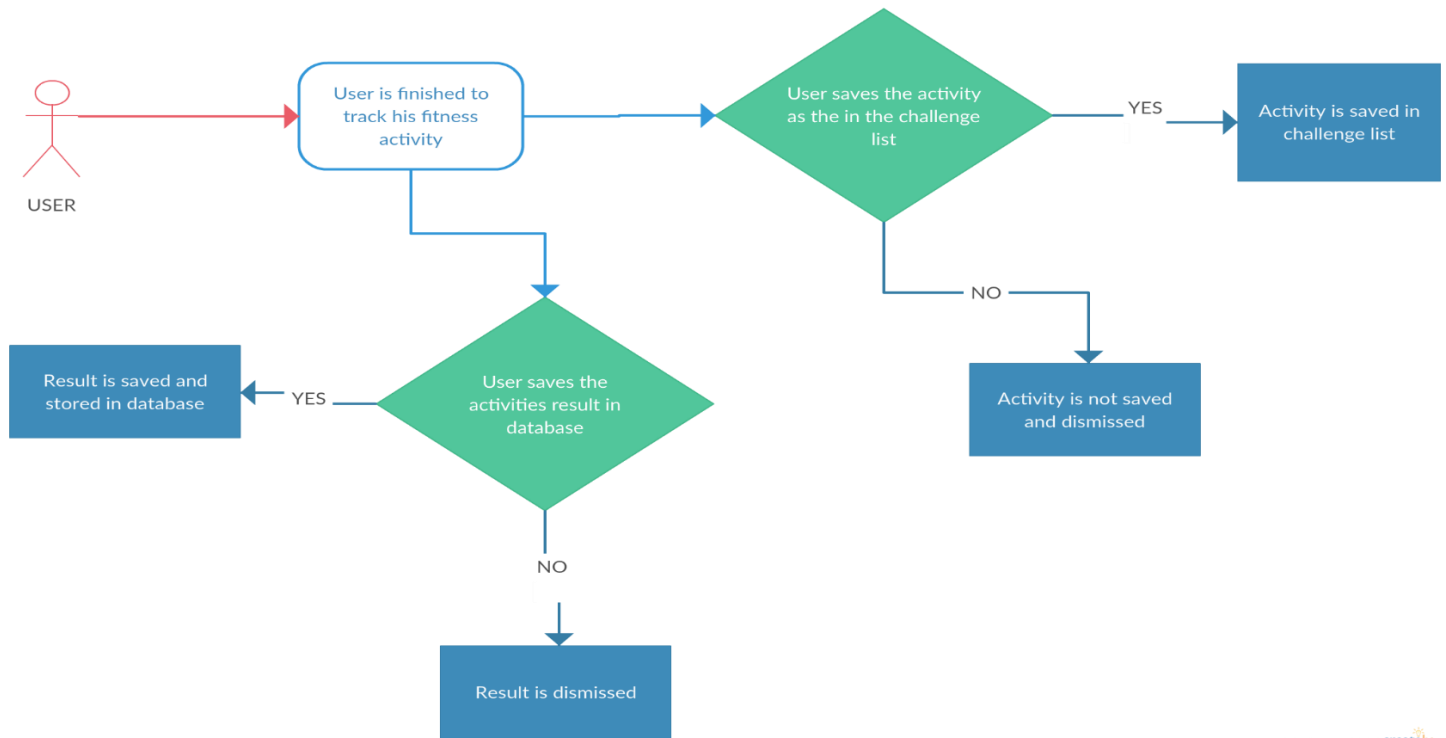
The next in priority is saving the activities results and creating a challenge, at this stage user should be finished to track his fitness activity

3.1.4.2 Use case

Scope:

The scope of this use is to demonstrate and describe how user saving his result and creating a challenge activity

Use Case Diagram (Flow Diagram):



Precondition:

User must finish to track his activity

Activation:

Use case activates when user has finished to track his fitness activity

Main Flow:

Typical event course	
Actors action	Response of System
1. User stops tracking the activity	1. Application stops the tracking
2. User saves the result	2. Result is saved in database
3. User saves his activity result in challenge list	3. Result is saved as challenge and put in challenge list

Alternative Flow:

Alternative event course	
Actors action	Response of System
1. User Stop his activity 2. User does not save his result and does not make a new challenge 3. User saves only result or only makes a new challenge	1. Application stops tracking the activity of the user 2. Application saves only the result 3. Application creates only the challenge 4. Application does not save neither result neither creates a challenge

Termination:

The flow is terminated once user's saves the result or/and saved result as the challenge

Post condition:

Users activity result is save into database and new challenge is created

3.1.5 Requirement 5: Choosing and competing in the challenges

3.1.5.1 Description & Priority:

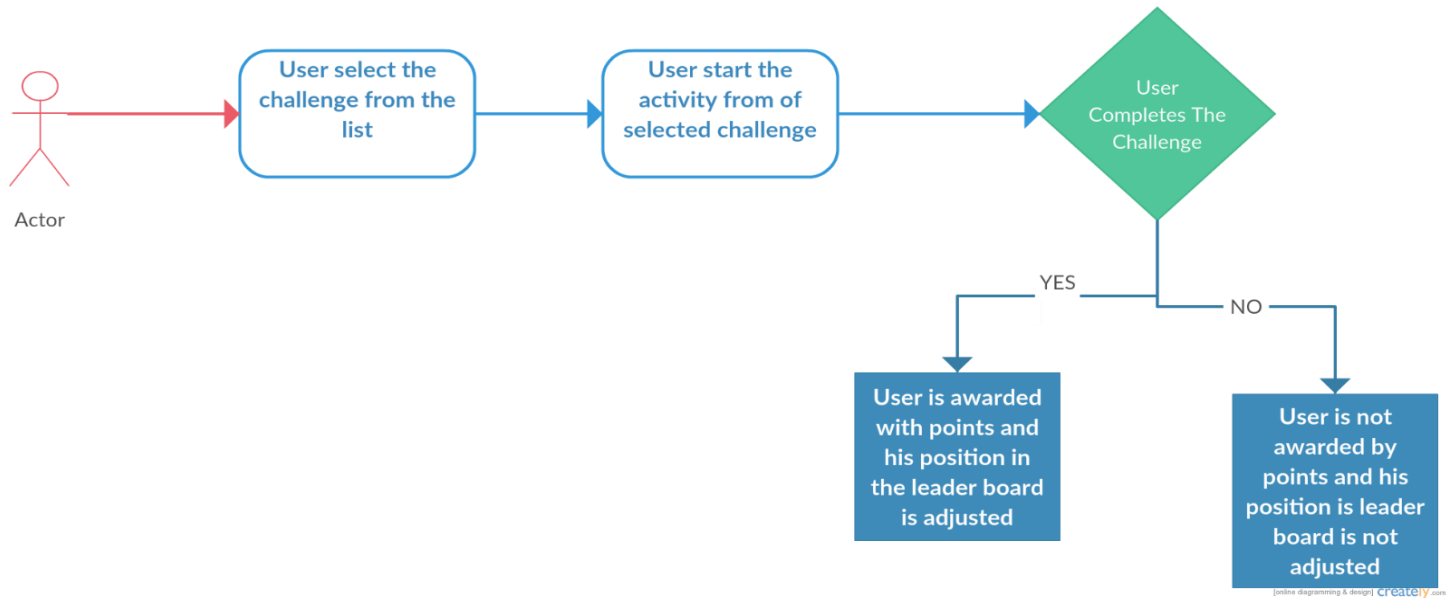
The next in priority is selecting the challenge activities and comparing the activity result against the selected challenge

3.1.5.2 Use case

Scope:

The scope of this use is to demonstrate and describe how user selects and starts the challenge from the challenge list and the results of activities are compare

Use Case Diagram (Flow Diagram):



Precondition:

System is in the wait state

Activation:

Use case activates when user select the challenge from the list

Main Flow:

Typical event course	
Actors action	Response of System
1. User selects the challenge from the challenge list	1. Application start tracking user's activity
2. User starts the challenge activity	2. Application stops tracking the activity
3. User completes the challenge	3. Application compares users result against the challenge
	4. Application assigns points to the user
	5. Application adjust users position in the leaderboard

Alternative Flow:

Alternative event course	
Actors action	Response of System
1. User select the challenge from the list	1. Application start tracking user's activity
2. User Starts the challenge activity	2. Application stops tracking the activity
3. User fails to complete the challenge	3. Application does not assign points to the user
	4. Application does not adjust users position in the leaderboard

Termination:

The flow is terminated once users completes the challenge

Post condition:

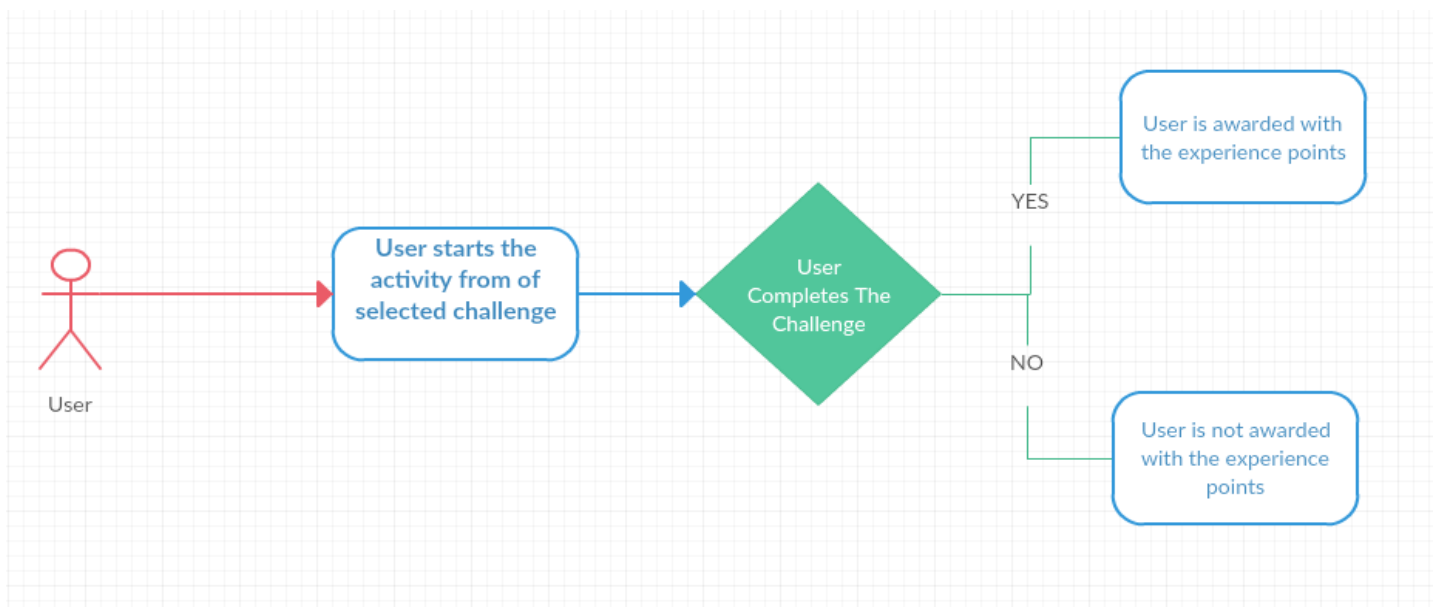
Users activity result is compared against the challenge, points are allocated to user and position in the leaderboard are adjusted.

3.1.6 Requirement 6: Points allocation for the user**3.1.6.1 Description & Priority:**

The next in priority is the allocating points for the users after they completes the challenge

3.1.6.2 Use case**Scope:**

The scope of this use case is to demonstrate and describe how user will be allocated points

Use Case Diagram (Flow Diagram):**Precondition:**

User must select activity from the challenge list

Activation:

Use case activates when user start the challenge activity

Main Flow:

Typical event course	
Actors action	Response of System
1. User selects the activity from the challenge list 2. User starts the activity 3. User completes the challenge activity	1. Application start tracking user's activity 2. Application stops tracking the activity 3. Application compares the users result with the challenge 4. Application assigns the experience points to the user

Alternative Flow:

Alternative event course	
Actors action	Response of System
1. User selects the activity from the challenge list 2. User starts the activity 3. User does not complete the challenge activity	1. Application start tracking user's activity 2. Application stops tracking the activity 3. Application compares the users result with the challenge 4. Application does not reward the user with experience points

Termination:

The flow is terminated once users completes the challenge

Post condition:

Users activity result is compared against the challenge, points are allocated to user

3.1.7 Requirement 7: Users allocation in the leader board

3.1.7.1 Description & Priority:

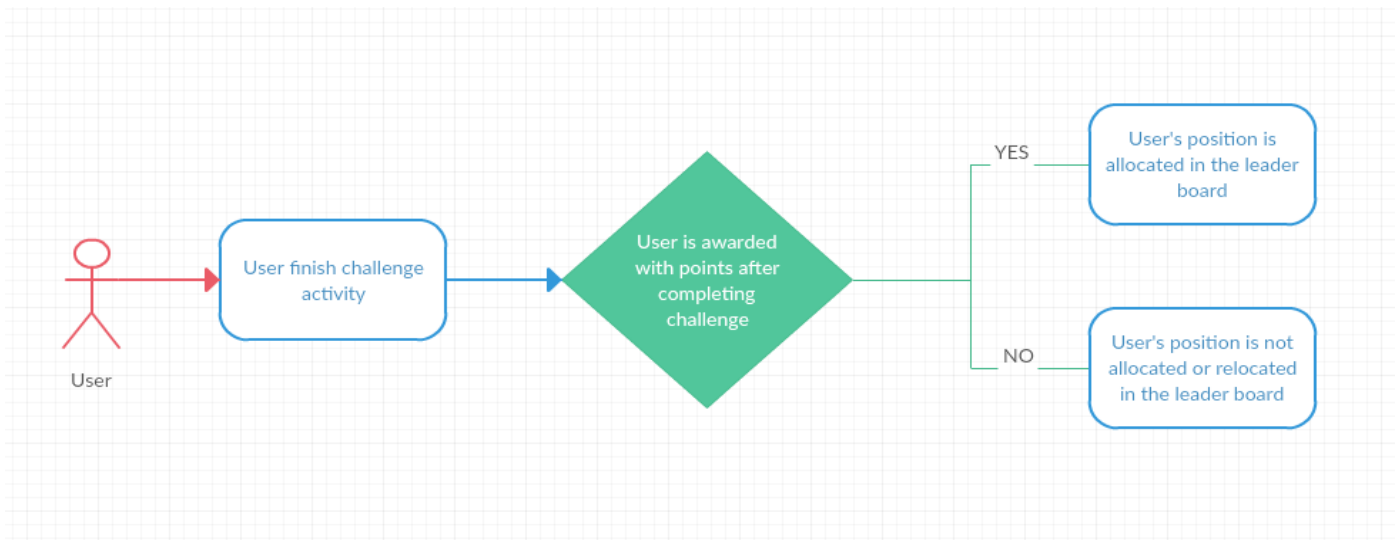
The next in priority is the allocating points for the users after they completes the challenge

3.1.7.2 Use case

Scope:

The scope of this use case is to demonstrate and describe how user will be assigned in the leader board

Use Case Diagram (Flow Diagram):



Precondition:

User must select finish the activity from the challenge list

Activation:

Use case activates when user stops the challenge activity

Main Flow:

Typical event course	
Actors action	Response of System
1. User selects the activity from the challenge list 2. User starts the activity 3. User completes the challenge activity	1. Application start tracking user's activity 2. Application stops tracking the activity 3. Application compares the users result with the challenge 4. Application assigns or reassigns the position in the leader board

Alternative Flow:

Alternative event course	
Actors action	Response of System
1. User selects the activity from the challenge list 2. User starts the activity 3. User does not complete the challenge activity	1. Application start tracking user's activity 2. Application stops tracking the activity 3. Application compares the users result with the challenge 4. Application does not assign or reassigns position in the leaderboard

Termination:

The flow is terminated once users completes the challenge

Post condition:

Users activity result is compared against the challenge, position in the leader board is allocated to User

3.2 Non-Functional Requirements

3.2.1 Performance/Response time requirement

Taking into the account that the domain of this application is to track fitness activates, it is necessary that user's fitness activity records would be captured and measured with very little or no calculation errors.

3.2.2 Availability requirement

The application systems shall be operational 24 hours a day about 99.999999% of the time with expectation for one-hour downtime each month for database maintenance and backups.

3.2.3 Maintainability requirement

No method in any object may exceed 450 lines of code and all code must be heavily commented and referenced. Installation and updates of the methods shall not affect leave all database contents and all personal settings unchanged this include both personal and public records of fitness activities

3.2.4 Recover requirement

In case of system failure and being unresponsive to the user, the system should be recovered to the fully working condition in no more than one working day. As well all the user should be informed about system downtime and how long will it take to bring system back.

3.2.5 Extendibility requirement

The system shall be extensible enough so that the development team can add additional functionalities or make updates without major changes of existing code or changes in its basic architecture.

3.2.6 Security requirement

For security reasons only authenticated (registered) users/admin may be allowed access to the system. For this a login feature will be included to provide the authentication and authorization of the user. Storing the activity result into the database will only be available for authorized users. In order to protect account information all passwords must be encrypted.

3.2.7 Portability requirement

The system shall be accessible on any modern smart phone with android operating system that has an internet connection.

3.3 Data requirements

This will describe the data requirements, which are essential to implementing the functions key functionalities outlined in the document.

- User name and User email – will be required and stored as it will be required to create users profile on the application
- User location – application will be capturing the user's location in order to track the place of fitness activity
- User activity records – application will be recording and storing the fitness activity records such as distance, speed etc. that will be used in further functionalities
- Google Firebase – The application will store all the data in the non SQL back end system, this will involve user's profiles, activity records act.
- The back end system will be joined with the application using the dependencies added in the configuration files of application.

3.4 User expectations

After talking and discussing to the users of who would be interested in using the Challenger app will, the following requirements is a reasonable description of what the users of a Challenger App will expect from this application to be successful.

3.4.1 The expectations:

- A simple to use android app that would be used to track fitness activities like running, walking or cycling.
- The application shall allow to save the performance results and make them available to see afterwards
- The application should allow to create different fitness competition task such as take a 5km run and make it in 30min.
- The application shall provide opportunity to select different competition tasks.
- To make application more fun the completion of different competition tasks, should provide some sort of reward for example experience points. And leaderboard should be available for users to compare their results against the others users.
- Application must simple interface that would be easy to navigate and would be overwhelmed with unnecessary elements.

3.5 Environmental requirements

In this section, it will talk about the environmental requirements. These are the vital requirements that must be present when developing the application.

- **Windows Machine:** This application will be developed Windows laptop with android studio as the Android development IDE.
- **Android Device:** An android device will require during the running and testing of application in the development stages.
- **Internet Access:** Internet access is required in order to test particular functions in application and connecting to database.
- **Photoshop:** Photoshop was used to customize any images and graphical assets used during the development of my application.

3.6 Usability requirements

This section will define the non-functional usability requirements. These requirements will provide objectives that should be met during the graphical user interface, creating and designing process. These requirements are derived from the other requirements detailed above.

- **Easy to Understand:** All elements in graphical interface must be simple and easy to understand and navigate.
- **Operation:** All errors, such as internet connectivity issues, should be displayed when necessary.

- **Learnability:** The application should be easy to learn to use, in a matter of instances. GUI, must be easy on the eye, and easy to navigate. A new user to android should be able to operate the application with or little effort.
- **Attractiveness:** The application should be easy to comprehend, look bright and catch the user's attention. The layout of the screens should be modern and appealing.

4 Design and Architecture

The main architectural aim of the android app is to ensure it is as lightweight as possible. This is essential because the user will have to allocate space on their device to house the application

The application will be hosted locally on a device running on Android OS. The application will have a back end DB (Google Firebase) that will store all the users account including the fitness activities results, challenge list etc. As well application will be using some API services such as Google maps.

The main reason to go with this approach due to the fact of separating all major components which would allow better maintainability and flexibility of the application.

Regarding resource consciousness, the application will be using built in, "onPause" and "onResume" methods, to save CPU and RAM resources. These methods pause the screen when the device decides to save resources and displays the screen to its current state when resumed.

4.1 GUI

The application will provide the user with following graphical interfaces

- Main page
- Registration page
- Log in page
- Main menu page
- Account page
- Start the Activity page
- Activity page
- Save Activity page
- Challenge List page

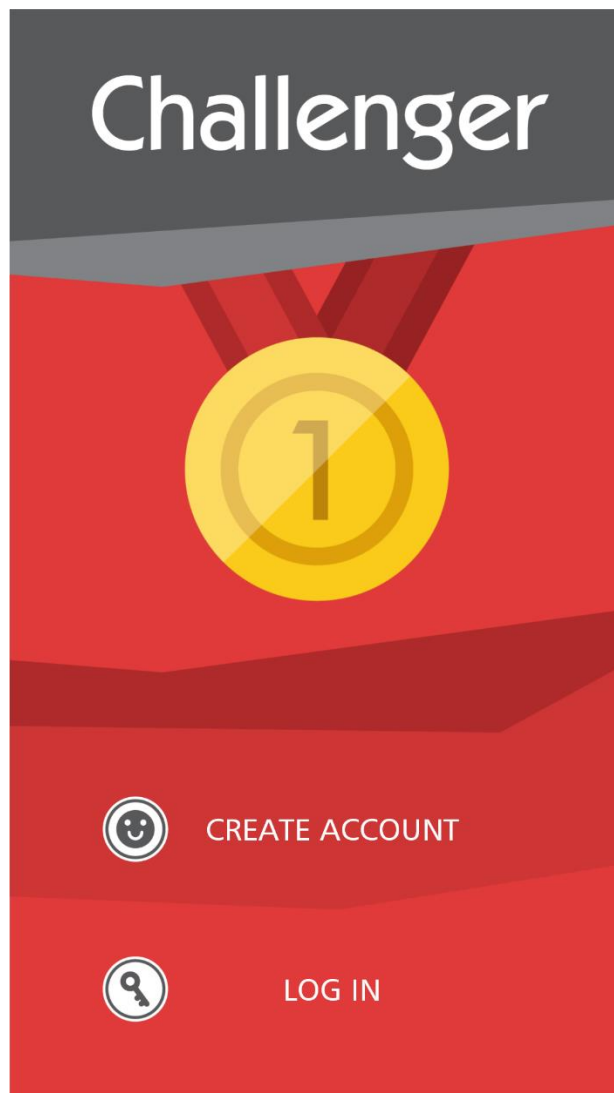
4.1.1 Main Page

Main page or welcome screen is where the user will “land” when launching the application first time or after the log out.

This menu should provide the player with 2 different options:

- Log in: by choosing this option user will be brought to log in page
- Register: by Choosing this option user will be brought to registration page

Main page:

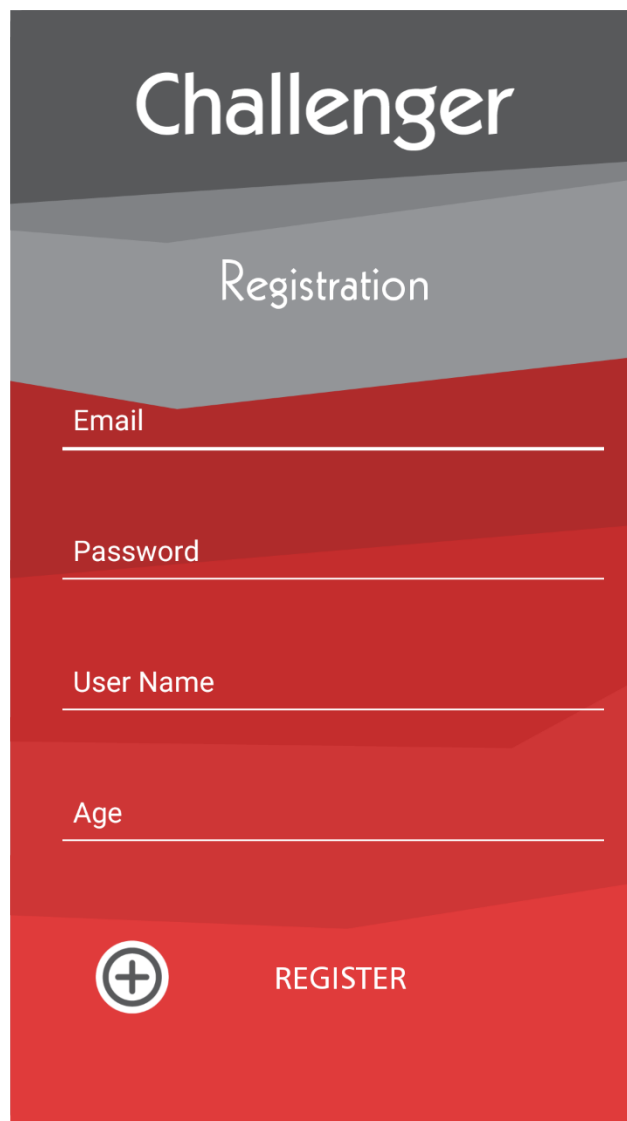


4.1.2 Registration page

Registration page will be the place where brand new user enters his details in order to create an account. User will be prompted with several text fields where he has to fill all the details in order to create an account.

The Registration page will contain single button “Register”. After clicking this button user’s details will be checked and if all details will pass the validation user’s account will be created and user will be brought to “Main menu” page

Registration page:

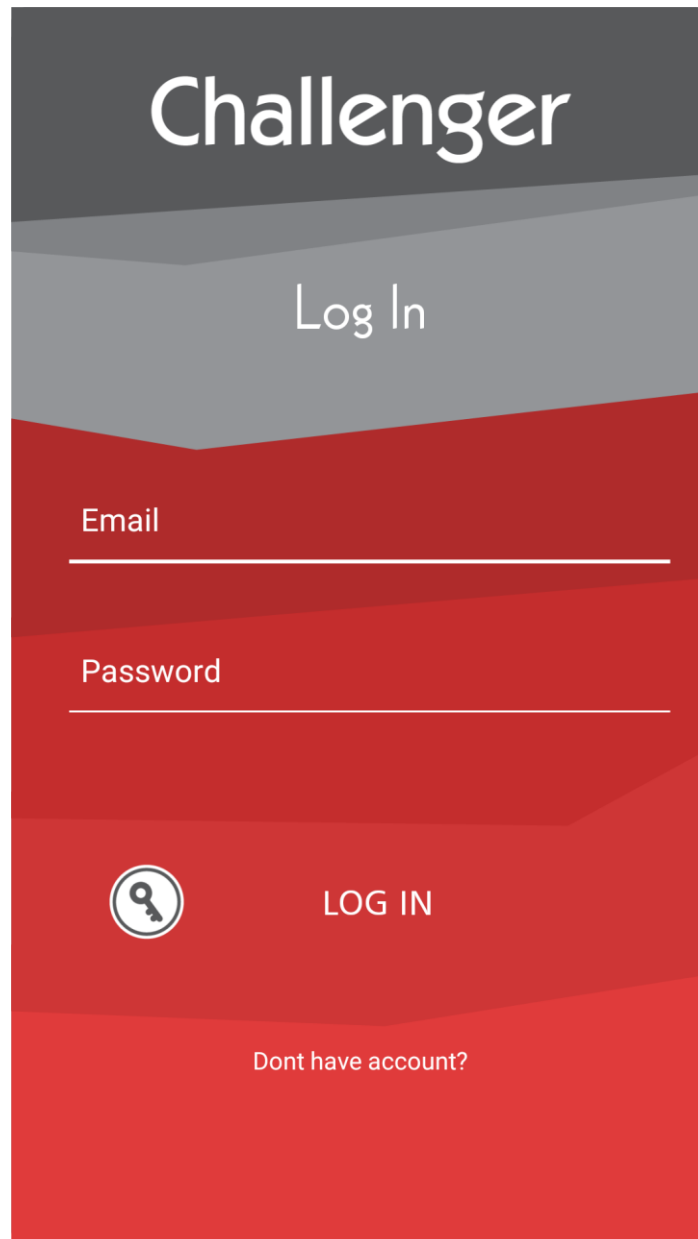


The image shows a mobile app registration screen. At the top, a dark grey header contains the word "Challenger" in white. Below this, a lighter grey section contains the word "Registration". The main body of the screen is red and contains four white text input fields, each with a label above it: "Email", "Password", "User Name", and "Age". At the bottom of the red section, there is a white circular button with a plus sign inside, followed by the word "REGISTER" in white capital letters.

4.1.3 Log in page

Log-In page will be the place where user enters his details in order to access his account. User will be prompted with two text field where he has to fill all the details in order to log in to his account. After the user fill the details, and it has been validated user will be brought to main menu page.

Log in:



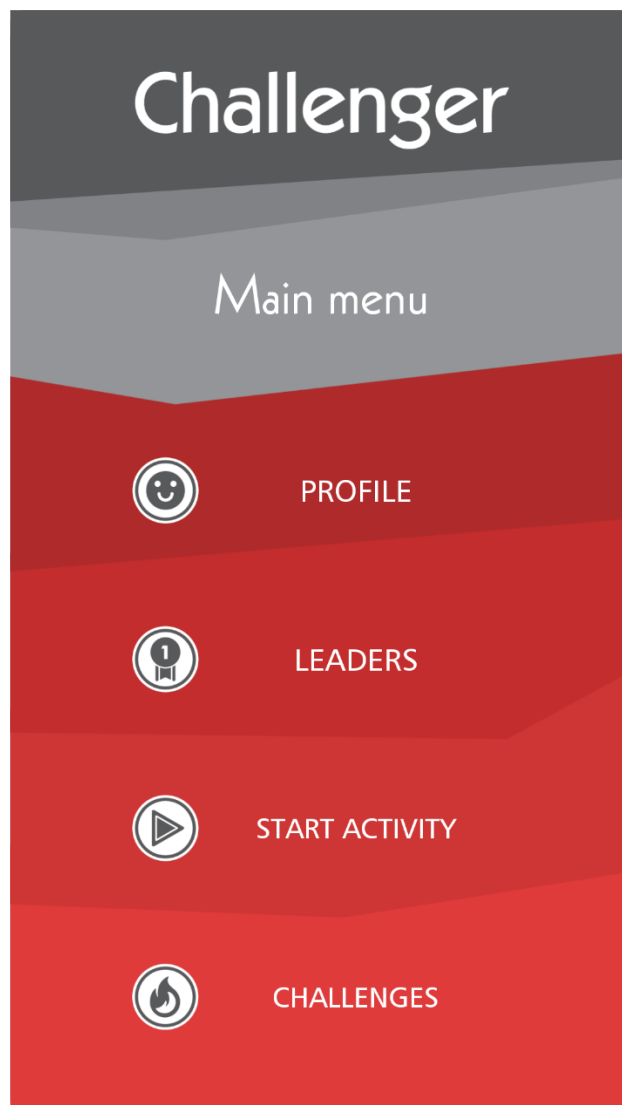
The image shows a mobile app login screen for 'Challenger'. The background is a dark grey gradient at the top, transitioning to a lighter grey, and then a red gradient at the bottom. The word 'Challenger' is written in large white letters at the top. Below it, 'Log In' is written in white. There are two white text input fields: 'Email' and 'Password'. Below the 'Password' field is a circular icon containing a key. To the right of the icon is the text 'LOG IN'. At the bottom, there is a link that says 'Dont have account?'.

4.1.4 Main menu page

After user has been registered or logged in the main menu page will be brought to his screen. The main menu page will contain following options

- Account: by choosing this option user will be brought to his account page
- Challenges: by choosing this option user will be brought to the challenge list page
- Start Activity: by choosing this option user will be brought a start activity page
- Challenges: by choosing this option user will brought to challenges list

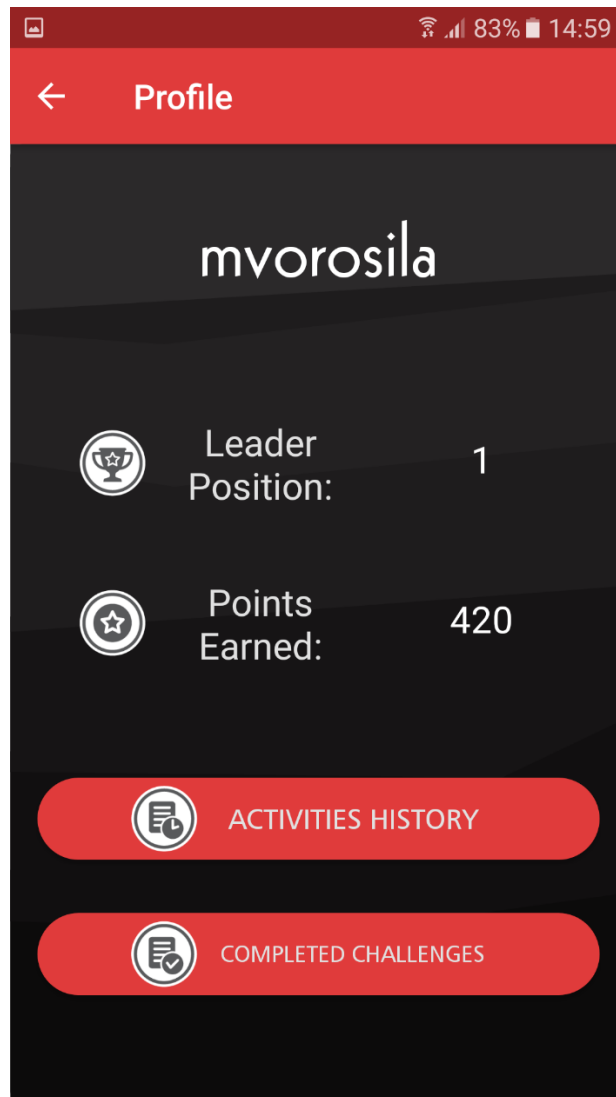
Main menu:



4.1.5 Account page

- In this page user will be have following options:
- Points: by choosing this option user will be able to see points earned from completing the challenges
- History: by choosing this option user will be able to view his saved results

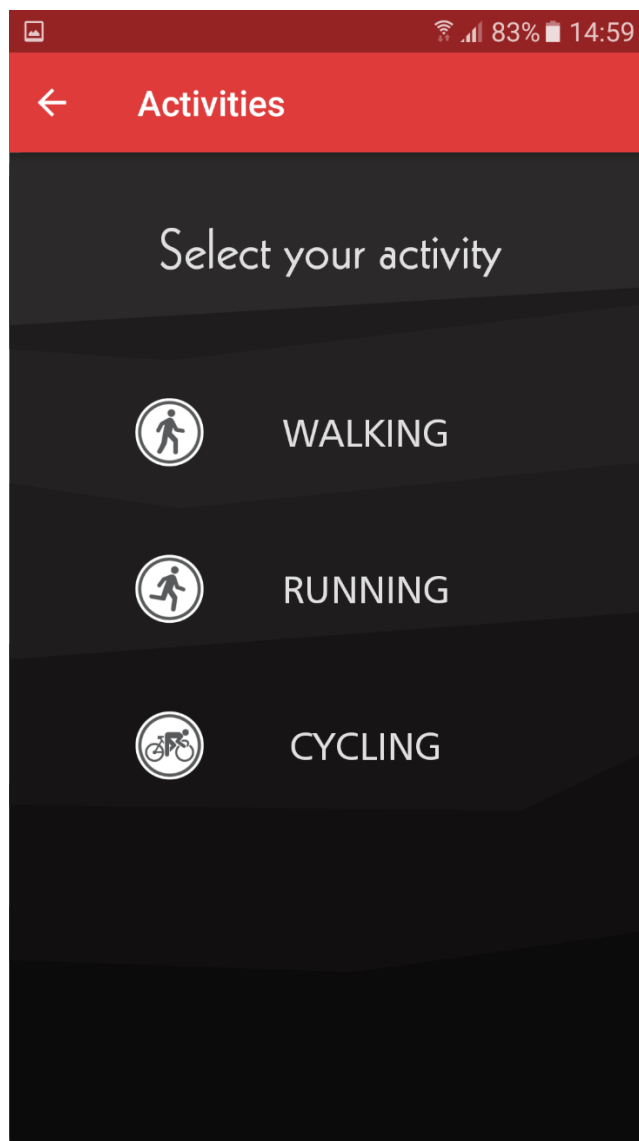
Account Page:



4.1.6 Start Activity Page

In this page user will be provided by map interface which would show his current location. Also user will be provided by simple dropdown menu where he would select desirable activity (Running, Waling, Cycling). By selecting one of the options user will be able to start recording his activity by clicking button “Start activity”

Start activity page:

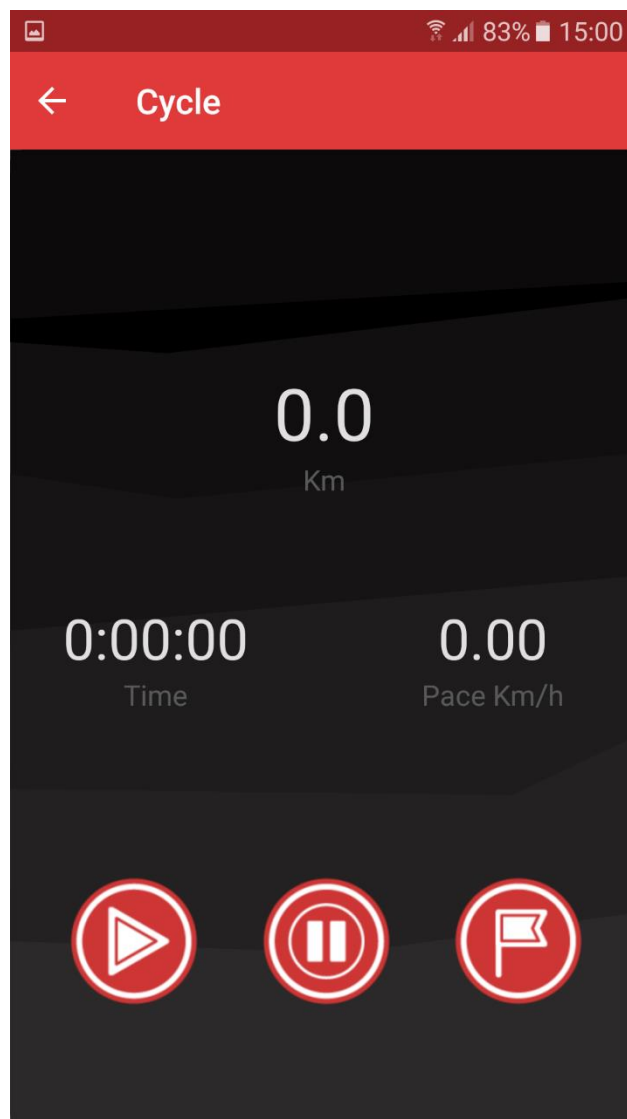


4.1.7 Activity Page

This page will be brought to the user as soon as he starts activity from the “Start Activity” page. In this section user will be able to monitor his fitness performance by checking the speed, distance, average speed, or step taken. User will have two options in this page.

- Pause activity: by choosing this option, user will pause his tracking and will be able to continue by clicking button second time
- Stop activity: by choosing option user will stop tracking his activity and will be brought to save activity page

Activity Page:

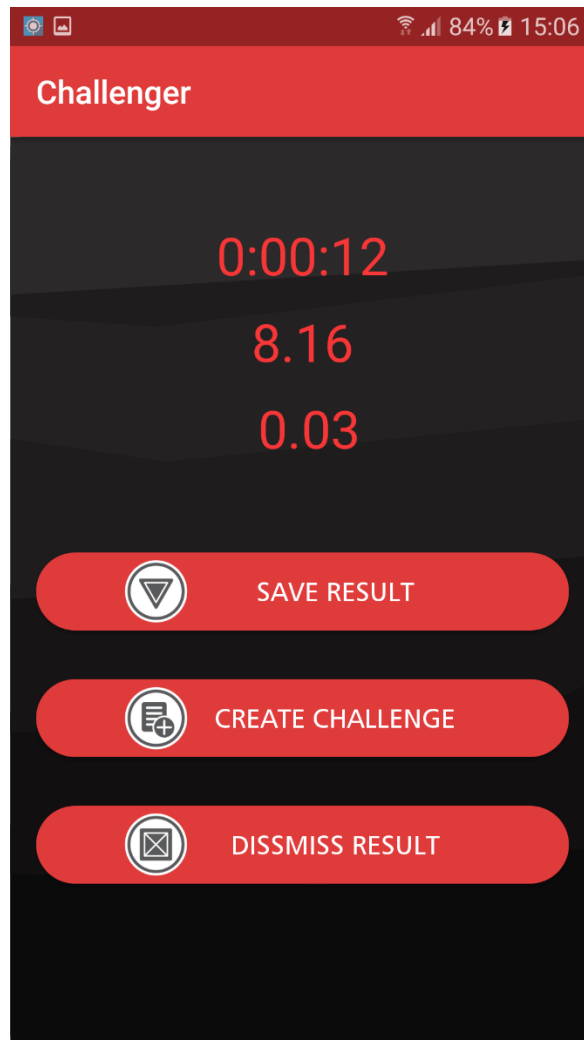


4.1.8 Save Activity Page

This page will appear to the user once he stops tracking his activity, in this page user will have three options to choose.

- Save activity: by choosing this option user will save his result into the database and will be able to view this result in account(history) page
- Make new challenge: by choosing this option user will capture his result and will save it in the challenge list available to the rest of the users
- Dismiss result: by choosing this option user will discard his result and it won't be saved neither as history neither as challenge

Save activity page:

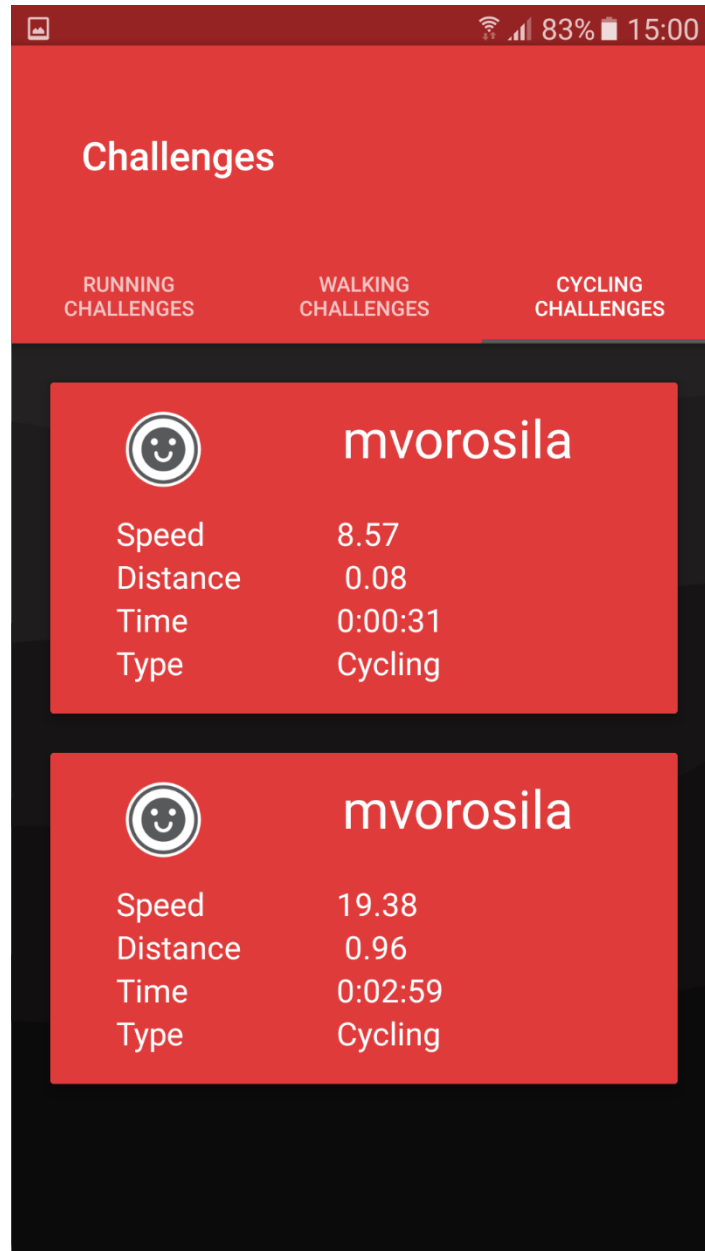


4.1.9 Challenge List Page

This page will be accessible from the user from the main menu page.

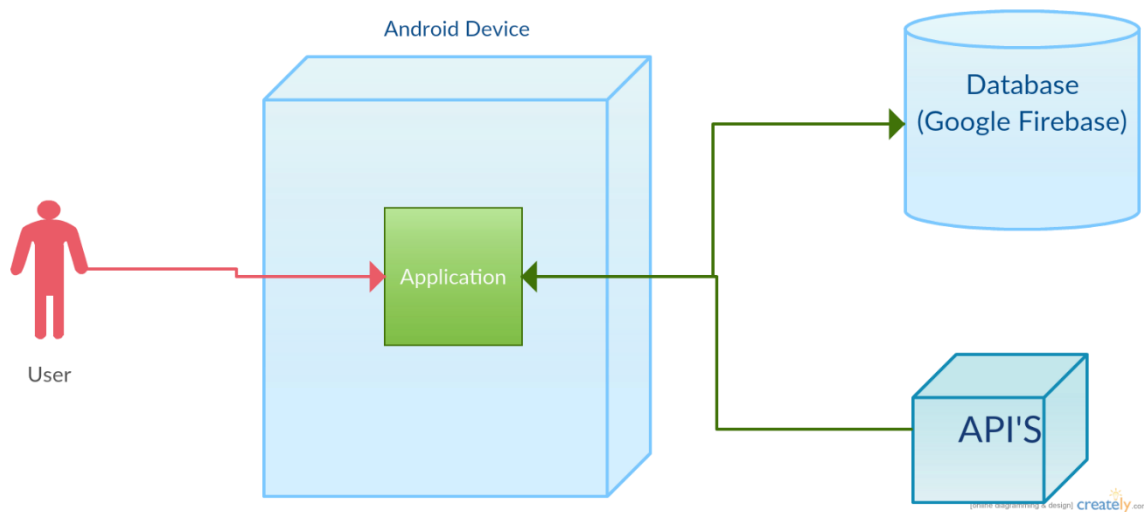
In this page user will be given the list of available challenges, user will be able to select one of the challenge after which he will be brought to the activity page.

Challenge List Page:

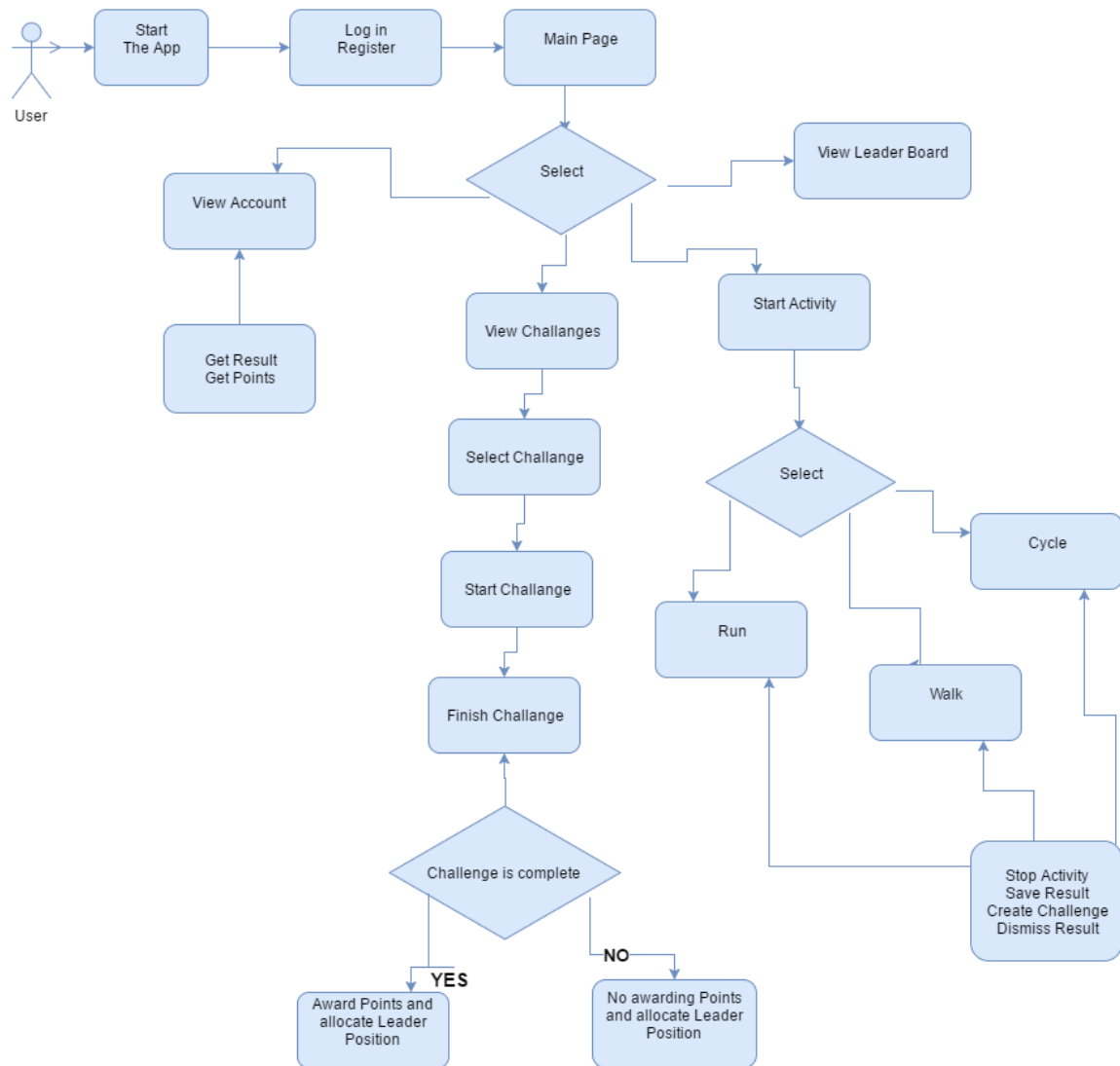


5 System Architecture

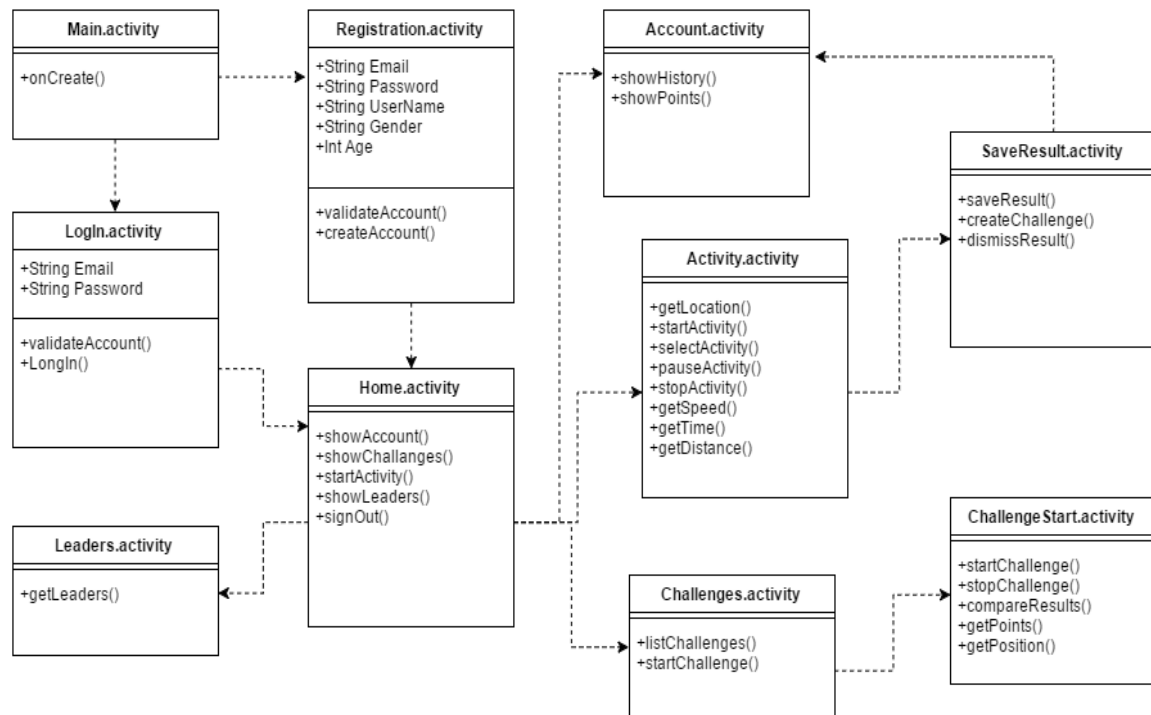
The following is a representation of the system architecture. The application is hosted locally on a device running on Android OS. The application have a back end DB (Google Firebase) that will store all the users account including the fitness activities results, challenge list etc. As well application will be using some API services. This approach was chosen due to the fact of separating all major components which would allow better maintainability and flexibility of the application.



5.1 Flow diagram



5.2 Activity Diagram



6 Analysis and Design

6.1 Purpose of the Product Design Specification Document

This section of document defines and records the architecture and system design decisions in order to provide guidance during the development cycle.

This section was created during the Planning Phase and is aimed at the developers of the Challenger app system

7 General Overview and Design Guidelines/Approach

This section describes the principles and strategies to be used as guidelines when designing and implementing the system of Challenger app.

7.1 Assumptions / Constraints / Standards

The Challenger application will require an active Internet connection during some operations.

Another constraint that could be faced when doing this application could be outdated coding examples, the online making it difficult to find the right thing that you are looking for. Another constraint could be not having the knowledge that you need to be able to perform a certain task and then having to learn the method from scratch in order to complete the task.

8 Architecture Design

8.1 Logical View

The logical view for Challenger application will be split into three parts:

The user interface build using xml, the android activities dealing with the business logic and the Google Firebase back end system to hold all of the information received from the application.

8.2 Hardware Architecture

From the market, research the hardware that is required for the application is android device running on OS level 19 and have 2Gb RAM.

8.3 Software Architecture

This project will use the Android studio, android libraries and Google firebase back end system.

Other Requirements of software:

- **Windows Machine:** This application will be developed Windows laptop.
- **Android Device:** An android device is require during the running and testing of application in the development stages.
- **Internet Access:** Internet access is required in order to test particular functions in application and connecting to database.
- **Photoshop:** Photoshop used to customize any images and graphical assets used during the development of my application.

8.4 Security Architecture

The main security architecture will be to make sure that unauthorized people will not be able to get any access to the system. This will mean the coding of the log in and registration system will need to very good. This will be achieved with the help of Google Firebase authentication system.

9 System Design

9.1 Application Algorithms and methods

This will describe the main methods and algorithms required, which are essential to implementing functionalities outlined in the document.

9.2 Sign up and authentication

Sign up and authentication for the application will be done using Google Firebase provided methods of authentication and registration

```

userAuth.createUserWithEmailAndPassword(email,password).addOnCompleteListener((task) → {

    if(task.isSuccessful()) {

        String user_id = userAuth.getCurrentUser().getUid();
        DatabaseReference current_user_db = DatabaseOfUsers.child(user_id);
        current_user_db.child("email").setValue(email);
        current_user_db.child("username").setValue(username);
        current_user_db.child("Age").setValue(age);

        showProgress.dismiss();
        Toast.makeText(getApplicationContext(),"Account Created Successfully",Toast.LENGTH_LONG).show();

        //After user is created main screen intent is called
        Intent mainpage = new Intent(RegisterActivity.this, MainPageActivity.class);
        mainpage.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP | Intent.FLAG_ACTIVITY_NEW_TASK);
        startActivity(mainpage);
        finish();

    }

    else if(!task.isSuccessful()){
        showProgress.dismiss();
        Toast.makeText(RegisterActivity.this,"Error While Register",Toast.LENGTH_LONG).show();
    }

});

```

```

private void login(){

    String email = Email.getText().toString().trim();
    String password = Password.getText().toString().trim();

    //check the user input fields
    if (!TextUtils.isEmpty(email) && !TextUtils.isEmpty(password)) {

        showProgress.setMessage("Checking the account");
        showProgress.show();

        //Call authentication method from Firebase
        userAuth.signInWithEmailAndPassword(email, password).addOnCompleteListener((task) → {
            if (task.isSuccessful()) {
                showProgress.dismiss();
                checkUser();
            }
            else if(!task.isSuccessful()){
                showProgress.dismiss();
                Toast.makeText(LoginActivity.this,"Error While Signing in ",Toast.LENGTH_LONG).show();
            }
        });
    }
    else {
        Toast.makeText(LoginActivity.this, "Enter all the details", Toast.LENGTH_LONG).show();
    }
}

```


9.3 Getting location of user

Location of the user will be captured using the GPS and location manager provided by Android API

```
start.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View view) {  
  
        //location wont be updated if permission is not granted  
        if (ActivityCompat.checkSelfPermission  
            (getApplicationContext(), Manifest.permission.ACCESS_FINE_LOCATION)  
            != PackageManager.PERMISSION_GRANTED &&  
            ActivityCompat.checkSelfPermission  
            (getApplicationContext(), Manifest.permission.ACCESS_COARSE_LOCATION)  
            != PackageManager.PERMISSION_GRANTED) {  
  
            return;  
        }  
  
        //location wont be updated if permission is not granted  
        locationManager.requestLocationUpdates("gps", 1000, 0, locationListener);  
        running = true;  
    }  
});  
  
finish.setOnClickListener((view) -> { stopActivity(); });  
}
```

9.4 Measuring speed

Application will be using location manager as provider to measure the speed

```
//get the speed from the given location updates
public void getSpeed(Location location) {
    currentSpeed = (location.getSpeed() * 3600 / 1000);
    String convertedSpeed = String.format("%.2f", currentSpeed);

    //get average speed
    String[] secondParts = time.split(":");
    double avgSpeed =
        distance / (Double.parseDouble(secondParts[0])*3600+
            Double.parseDouble(secondParts[1])*60+Double.parseDouble(secondParts[2]))*3600 ;
    double roundOff = Math.round(avgSpeed * 100.0) / 100.0;
    speedTxt.setText(roundOff+"");
}

//get the distance between lat and long while updating the values
```

9.5 Measuring distance

Measuring distance traveled, application will be using GPS to get longitude and latitude and passing these as parameters into Haversine formula to get the most accurate distance results.

```

//get the distance between lat and long while updating the values
private void getDistance(Location location) {

    //to capture current location and keep as starting position of person
    if (pLat == 500.0 && pLng == 500.0) {
        pLat = location.getLatitude();
        pLng = location.getLongitude();
    }

    if (cLat == 500.0 && cLng == 500.0) {
        cLat = location.getLatitude();
        cLng = location.getLongitude();
    }

    //to check is the person has changed location
    if (pLat != cLat && pLng != cLng) {
        pLat = cLat;
        pLng = cLng;
    }

    //update the current location
    cLat = location.getLatitude();
    cLng = location.getLongitude();

    //call the calculation method
    distance += getDistanceBetweenGeoPoints(cLat, cLng, pLat, pLng);
    String convertedDistance = String.format("%.2f", Math.round(distance * 100) / 100.0);
    distanceTxt.setText(" " + convertedDistance);
}

```

```

/*calculating distance between two points using Haversine formula
The haversine formula determines the great-circle distance between two points
on a sphere given their longitudes and latitudes
*/
public double getDistanceBetweenGeoPoints(Double cLat, Double cLng, Double pLat, Double pLng) {
    // CALCULATE DISTANCE BETWEEN TWO POINTS
    double earthRadius = 6367; //meters
    double dLat = Math.toRadians(cLat - pLat);
    double dLng = Math.toRadians(cLng - pLng);
    double a = Math.sin(dLat / 2) * Math.sin(dLat / 2) +
        Math.cos(Math.toRadians(cLat)) * Math.cos(Math.toRadians(pLat)) *
        Math.sin(dLng / 2) * Math.sin(dLng / 2);
    double c = 2 * Math.atan2(Math.sqrt(a), Math.sqrt(1 - a));
    double dist = (double) (earthRadius * c);
    //remove the math round to avoid calculation bugs
    //dist = Math.round(dist * 100) / 100.0;

    return dist;
}

```

9.6 Measuring steps

Application will be using built in phone sensors to capture the steps, and provided method will be performing the calculation

```
@Override
//method is triggered once the sensor is activated and captures the environment changes
public void onSensorChanged(SensorEvent event) {

    Sensor sensor = event.sensor;
    //launch step counter if walking is true, else break
    switch(sensor.getType()) {
        case Sensor.TYPE_STEP_COUNTER:
            if (walking){
                stepCount++;
                stepTxt.setText(stepCount+"");
            }
            break;
    }
}

@Override
```

9.7 Database connection

Application will be using Firebase provided methods for the connection to the backend system.

9.8 Gamification

The main feature of the application, which is points awarding and competing for the highest leader board position is done by comparing current user's result against the given challenge. At the beginning application will capture current user and its current score.

Later on when challenge activity is stopped the application will measure the performance metrics against the metrics of particular challenge. Depending on how those metrics are stand against each other, user will be awarded respectively to that. For example if user run speed is higher but the distance is shorter, user will be awarded 10 points. If on the other hand user overcame speed and distance metrics, he then will be awarded 20 points.

Eventually once the user will complete the challenge he will given certain amount of experience points. Once he receives the points user will be assigned to certain leader position depending on points he has.

```

builder.setMessage("Are you sure you want to stop?");

builder.setPositiveButton("YES", (dialog, which) → {

    locationManager.removeUpdates(locationListener);

    // Get the activity results
    String speedText = speedTxt.getText().toString();
    String distanceText = distanceTxt.getText().toString();

    //check does the speed and distance is better
    if(Double.parseDouble(distance_challenge) <= Double.parseDouble(distanceText) &&
        Double.parseDouble(speed_challenge) <= Double.parseDouble(speedText) ){
        //Toast.makeText(getApplicationContext()," Challenge level 2 ",Toast.LENGTH_LONG).show();
        getPointstTwenty();
    }

    //check does speed or distance is better
    else if(Double.parseDouble(speed_challenge) <= Double.parseDouble(speedText) ||
        Double.parseDouble(distance_challenge) <= Double.parseDouble(distanceText)){
        //Toast.makeText(getApplicationContext()," Challenge level 1 ",Toast.LENGTH_LONG).show();
        getPointstTen();
    }

    //failed the challenge

    // get total leaders from the list
    int total = (int) dataSnapshot.getChildrenCount();

    //counter
    int i = 0;

    // loop through dataSnapshot
    for (DataSnapshot childSnapshot : dataSnapshot.getChildren()) {
        uID = (String) childSnapshot.child("uID").getValue();
        if (uID.equals(mCurrentUser.getUid())){
            // the list is ascending, when finally reach user
            int userPlace = total - i;// gives 2
            int score = childSnapshot.child("Score").getValue(Integer.class);

            Position.setText(userPlace+"");
            Points.setText(score + "");

            break;
        } else {
            i++;
        }
    }
}

```

10 Testing

10.1 Think Aloud Test

For the testing purposes think aloud testing was chosen as it provides a broad view of how our users mind works using the application and documents their thought process. From this type of testing, it was possible to capture the majority of issues before the application final release. A series of common tasks of the app where added to the think aloud testing and list of questions were asked which probed the design and layout of the application.

10.2 Think Aloud Tasks

- Create an account
- Login
- Go to your profile
- Open leader board
- Navigate to Activities menu
- Start walking activity
- Start running activity
- Start cycling
- Save your result of any of above activities
- Create the challenge on any given activities
- Navigate to Challenges
- Start any give challenge
- Check your score after completing the challenge
- Check your position in the leader board
- Check your results

10.3 Think Aloud Test: Results Summary

Task	Result
Create an Account	All participants had no major issue or hesitation in completing this task. The task was completed quickly and efficiently
Login	Same as Creating the account user was able log in to their account very quickly with no hesitation
Go to your profile	All participants was able to find their profile in the application straight forward
Open leader board	Opening leaderboard was very efficient and caused no major hesitation in completing this task
Navigate to Activities menu	Find the fitness activities was very straight forward for all the users
Start walking activity	While performing walking track user was able to complete that very smoothly and efficiently
Start running activity	User who tracked their running was quite satisfied with simplicity of the functionality and had issues in completed the given task
Start cycling	Those who were testing application on cycling track was satisfied quite much was had no hesitation while performing the given task
Save your result of any of above activities	No hesitation and straight forward completeness of task
Create the challenge on any given activities	No hesitation and straight forward completeness of task
Navigate to Challenges	All participants was able to find challenges very quickly and with any major issues
Start any give challenge (Walking, Running, Cycling)	Same as the tracking their fitness activities, user had problem in selecting the challenge and trying to repeat the given challenge

Check your score after completing the challenge	Completeness of the task was straight forward
Check your position in the leader board	Completeness of the task was straight forward
Check your results	Completeness of the task was straight forward

10.4 Effectiveness

The test showed that users had no major difficulty in navigating and finding certain sections of the app. The users seemed to be able to find their way to complete given task immediately. Once the user had identified what needed to be done the steps involved matched closely with what was expected.

10.5 Efficiency

Unlimited time had been allowed for the testing and most ended up being between 30 to 50 minutes in duration, depending on the users chosen activities. Regards to the tasks themselves it was observed that users interaction with the application was quite efficient with no major issues. At the end all task that have been given for testers was completed successfully.

10.6 Scope for Further Improvements

No issues were raised while testing the application; however, at the end few valid and very well proposed changes to the usability of the application was given that will need to be implemented and further testing will be carried out

10.7 Testing: Conclusions

During the testing it has been found that users was able successfully achieve their tasks in a relatively short period of time, giving the application a high level of effectiveness. There was very little effort required to complete each objective, making the application very efficient and the overall user experience was proven very satisfactory.

10.8 System Usability Scale

In addition of the usability testing the participant were given to complete the SUS (system usability scale) which was used for evaluation of overall usability of the application. Each participant were given ten question where he had to answer by scaling his answer from 1 to 5 (1 = strongly disagree, 5 = Strongly Agree). The following questions were:

- I think that I would like to use this system frequently
 - I found the system unnecessarily complex
 - I thought the system was easy to use
 - I think that I would need the support of a technical person to be able to use this system
 - I found the various functions in this system were well integrated
 - I thought there was too much inconsistency in this system
 - I would imagine that most people would learn to use this system very quickly
 - I found the system very cumbersome to use
 - I felt very confident using the system
 - I needed to learn a lot of things before I could get going with this system
- (May, 2017)

Eventually after completing system usability scale calculations, the conclusion has been made that application overall user experience of using this application was very well received by the users. The average score of SUS was 80.5 which based on the industry standards is above the average and it proves that application met high usability standards.

11 System Evolution

Considering the current state of the application and looking forward into further application development. The application could be updated by implementing social media aspect into the app, such as sharing the results in your Facebook, Twitter pages. As well to encourage the application usage application can extend its gamification element by awarding user by special icons, “trophies” etc. Additionally application can be implemented with the dynamic map, which would show real time location of the user.

12 Appendix

12.1 Proposal

12.1.1 Overview Challenger-app:

The is going to an android mobile application, the main purpose and idea of this app is to encourage outside activities such as running and hiking. The key aspect and unique selling point of this app is going to be interactivity between the users of the application. Main functionalities will be the tracking and recording user’s activities, for example speed, distance, location on the map and time spent on it. Apart from this app will allow to for users to issue and complete the challenges. According the sample scenario, the app will allow for users to challenge each other on the different exercise tasks such as hiking,

running, or cycling. However before giving challenge to somebody, the person has complete task by him/herself. As an example, run for 5km. After the activity is finished person can challenge the others to repeat or overcome the result. Eventually if the challenges have been completed, the person who completes it will gain certain amount of points (XP) that will be displayed on the leader board.

The greatest benefit of this app is to promote and encourage people for outside activities by applying interactivity and gamification elements in the app. Apart from that, application will benefit users by improving their health conditioning. As according multiple research that has been done over the last number of years, the activities such as running, walking, cycling etc.

has huge impact on our overall wellbeing. Research has showed that it helps to reduce level of stress, prevents heart disease, prevents obesity, improves physical condition of the body, and this is just few point of why outside activities is beneficial for us.

As well the app might be interesting and useful because a lot of people who is beginners at exercising they tempt to give it up very fast. Usually people stop to exercise after few or less weeks. And the biggest reason for this is that they feel discouraged or simple bored to continue on. However, by implementing interactivity between the users of the application, by allowing them to challenge each other and compete for points and higher position on the leader board.

People will be more motivated to go outside and do some exercise. Also users will be feeling less focused just on their self-performance as app will provide option to see your friend's activities and achievements and vice versa. This will create a feeling that you have a "gym-buddy" that keeps you on the track and always gives you a new challenge to move forward.

From the market perspective application can be very successful as despite the fact that there is already a lot of apps that is focused on fitness market. The Challenger app will bring some extra elements that most apps don't have. Majority of the fitness mobile applications is focusing only the single user that downloads the app. It allows to track his/her performance, it provides the progress reports the user can check and later on share it on social media if desired to do so. However, the Challenger app might be a "game-changer" as it will bring functionalities based on interactivity of multiple users by creating its own small community and implementation of gamification.

12.1.2 Target group:

The main target group of this app will be people from age of 16 years to 60 years.

12.1.3 Functionality:

Authentication of the users:

Provide the functionality of user registration and log in via email or social media account

Tracking and measuring the activity of the user:

Application will provide functionality that will track and measure the performance of the user's activity, for example the distance of the run, average speed etc.

Issuing the challenge:

This is one the main functionalities of this app which will allow user to issue the challenge to the other users (friends) to repeat or overcome their performance of activity

Display list of Challenges:

This functionality will be responsible for allowing users to the list of completed or on holding challenges

Points Allocation:

The will also be calculating and allocating the points that will be given after the completion of challenge and will be displayed on the leader-board.

12.1.4 Special resources required:

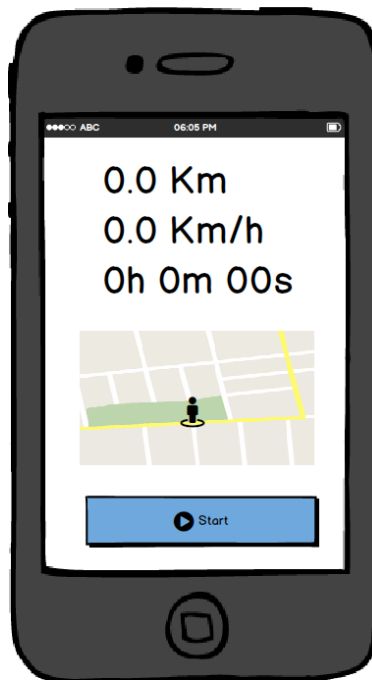
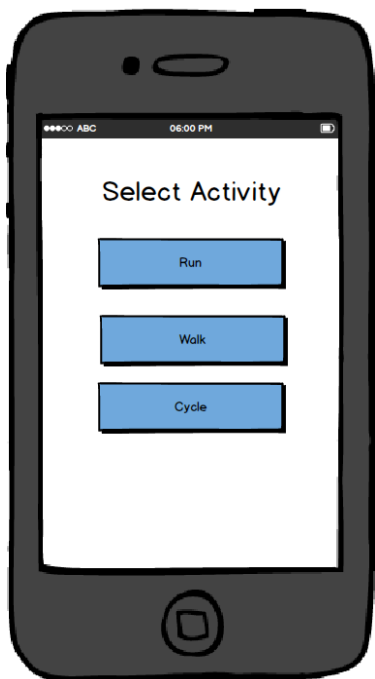
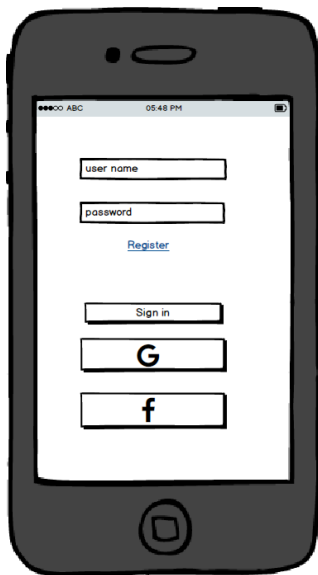
The main external resource that will be required during the production of project is android mobile device, preferably phone with the minimum level 19 of android APK. The mobile device will be used to test the app on the actual environment of Android OS. Alternatively, to serve the testing purpose, android emulator can be used as well.

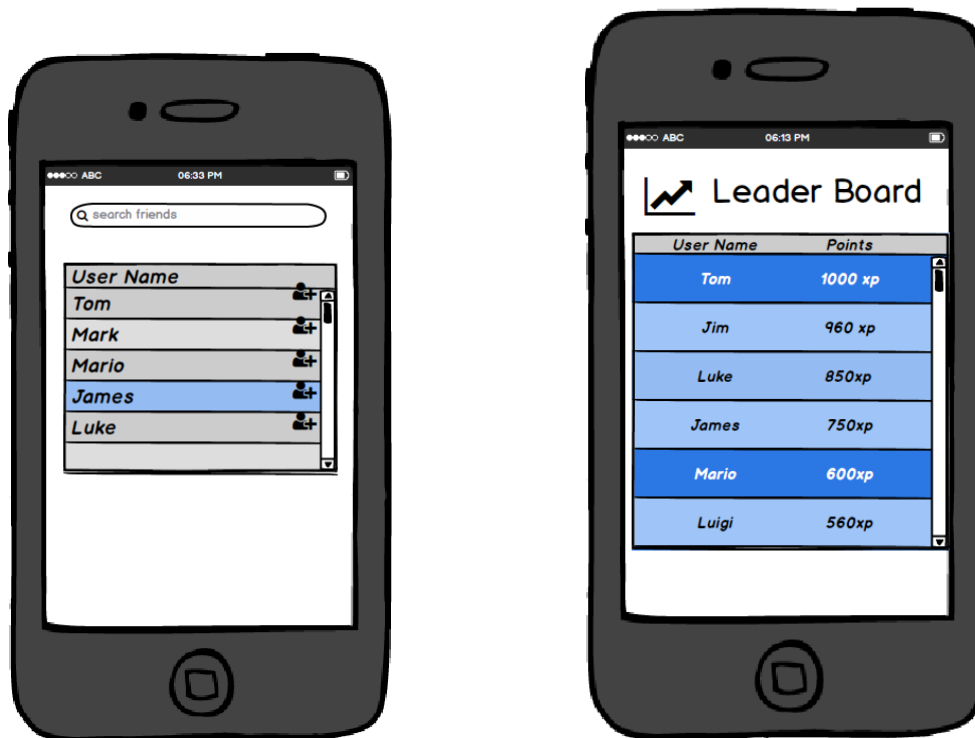
12.1.5 Technologies to be used:

For the completion of the application, the necessary technologies and environment will be required:

- Android Studio (programing language and IDE that will be base for producing application)
- Google firebase (Non SQL back-end system)
- Android device sensors
- API and Libraries

12.1.6 Mock Ups:





12.1.7 Summary:

The aim to produce a mobile application that will encourage and promote fitness activities. This will be done with assistance of user's interactivity and gamification elements. At this stage the biggest challenge that will be faced during the production time is going to be joining all the different technologies and functionalities. It will be challenging to mesh together and make it work smoothly as single unit, which may require additional time and effort to achieve.

12.2 Research of similar apps

12.2.1 Google Fit app:

Google Fit is an Android fitness application that is built to use the sensors built into most Android devices to track how much exercise you are doing. Main feature of google it is to allows users to set fitness goals and accomplish them by measuring progress and the types of exercises (Running, walking, cycling etc.) being performed

In contrast with a more propelled fitness applications accessible in the market, Google Fit appears to be quite simple. However, the straightforwardness is one of principle perspective that makes the application fun to use. It is not jumbled with interminable bar diagrams or immense measures of information pushed in your face. The data's there, but it is kept away so the user only focuses exercise here and now.

Google Fit utilizes the accelerometer built in your Android phone to take measurements of your movements and activities. Also, if user is having an Android Wear gadgets then it will utilize the pedometer incorporated with those gadgets. Google fit can likewise exploit high precision mode in most Android smartphones today, which will enhance more accurate data of your exercises.

Google Fit is surely in its earliest stages and in some ways it feels that way. However, there are some capable components to the application and the spotless interface with more itemized information concealed in it absolutely has bid.

(Clinton, 2015)

12.2.2 Runtastic Running & Fitness:

The Runtastic running app is a running tracker application that by using GPS helps to track your runs, see your progress, and set your fitness goals. App allows to track activities such as running, jogging, cycling, walking, etc. As well it tracks duration, distance, elevation, calories burned and more.

On top of being a run tracker, Runtastic running app provides you with many additional features to improve your fitness. It provides different types of exercises options such as aerobics, sprinting, jogging etc.

The graphical user interface in comparison to other similar app is quite easy on the eye, it provides the basic details to the user while running. It shows the speed, average speed, distance covered and also the user's location the map. Similar to the Google Fit app, Runtastic provides support for modern wearable devices which is providing more accurate data as well as additional information like temperature of body, heartbeat etc.

Overall taking all main features and functionalities as well as friendly user interface, makes Runtastic a great tool for people who loves go out and take few miles of run.

(Duffy, 2016)

12.2.3 Fitbit:

Fitbit like any other recent fitness applications allows user to track their fitness activities in addition Fitbit provides some other functionalities like enables you to logging and tracking your sleep patterns to lose or gain weight.

One of the main features of Fitbit is ability to make personalized fitness recommendation based on user's physical aspects such as age, height, weight etc. As well it provides

performance charts and food logging. It makes Fitbit more advanced fitness application as it function as personal fitness trainer. Fitbit also has one of the best-looking interface among other fitness apps around, it provides a streamlined interface that uses colorful progress bars, charts, and buttons to make the user experience intuitive and enjoyable.

However the main disadvantage of Fitbit is that to experience full functionalities of the application user must own a wearable device that is used for synchronizing users performance data. Eventually if user has no wearable device, he will not experience much of the difference from other existing fitness application

(Duffy, 2016)

12.2.4 Overall Review of competitor apps:

Pros:

- Appealing user interface
- Accurate activity tracking
- Serves its purpose well

Cons:

- Wearable device required for full user experience
- Unnecessary functions

12.2.5 The summary of the exercising benefits

According the “University of British Columbia” research, it has been found that regular excusing helps to improve your hearth heart and your sweat glands pumping, appears to boost the size of the hippocampus, the brain area involved in verbal memory and learning. (Godman, 2016)

12.2.6 Exercise and the brain

Exercise enhances the memory and other brain activity considering in both immediate and long-term means. The advantages of exercising come specifically with its capacity to diminish insulin resistance increase the generation of chemicals in the brain that influence well-being of brain cells, the recovery and development of fresh vessels in brain, and even the survival of new brain cells. Overall, consistent practicing enhances state of mind and altogether decreases level of stress and tension. (Godman, 2016)

12.2.7 Exercise controls weight

Exercise helps to prevent as well as stabilize weight gain, and helps to control healthy weight loss. While performing any physical activity person burns the calories eventually, the more intense is activity the higher amount of calories is burned. (activity, 2016)

12.2.8 Exercise combats health conditions and diseases

Regularly exercising allows person to control normal your blood flow, this is important as it reduces the risk cardiovascular diseases.

In addition to that, exercise helps to avoid a lot of potential diseases which can be metabolic syndrome, diabetes, or even depression. (activity, 2016)

12.2.9 Fatigue

Various research in the previous 15 years have demonstrated that physical action is critical for defeating weakness and diminished physical capacity after transplantation. As well studies have revealed that regular exercising at least for 30 min have positive impact for people who were ongoing cancer or heart diseases. People were going through chemotherapy much easier, people who had heart problems were able to stabilize heart functioning. Overall people mood was better, fatigue level was Much lower and in general people were feeling much better (Exercise, 2016)

13 Monthly Journals (September)

Reflective Journal

Student name: Marius Brivinskas

Programme BSc in Computing (Mobile development)

My Achievements

The last month my aim was to come up several potential ideas for my project. First thing what I did was a research of existing mobile apps. This allowed me see that kind of apps are trending at the moment, as well as to see what kind of app are getting the highest ratings and why. After the research I have been doing some brain storming that allowed me to select few project ideas that seemed to have best chances to be successful at the end.

After I have come up with those ideas I made review of the ideas by presenting them to my friends and family members.

It allowed me to get the view from the general user of apps and to see what he/she thinks about the ideas I have presented.

My Reflection

I believe that the last month was quite successful as I was able to get a lot of ideas for my project and most importantly I was able to select the one idea that I believe will be the best option for me to proceed with. The biggest factor that allowed me to get the idea for my project was the review of the people. It allowed me to get the opinion of the day to day user of the mobile apps and get better understand of which of my ideas was not good enough and which would be useful and interesting to the user.

Intended Changes

The main aims for next moth is to prepare my idea for pitch presentation and if everything will go well I will be aiming to start work on my project proposal.

Reflective Journal (October)

Student name: Marius Brivinskas

Programme BSc in Computing (Mobile development)

My Achievements

In last month I managed to prepare my idea and have it presented to the commission of lectures. I was delighted that my idea was approved and got a green light to move further. After that I moved to the actual project proposal documentation where I was expanding my idea bit further by providing overview and background of my project. Later in month I was assigned to work with Damien Mac Namara as my project supervisor. Unfortunately, due to the circumstances we had no chance to meet each other in person, however we have been exchanging the emails where I presented my project idea and proposal.

As part of my next delivery goal of the project I have to make system requirements document. In order to make the documentation as good as possible I started to make deeper research on some specific functionalities that I am going to implement in my mobile app. I also got in touch and joined some android developer's groups where I was looking for some information and advices that I could apply during the project development.

My Reflection

By reflecting last month, I think I made some progress on my project. I strongly believe that my research on some specific functionalities for my application gave me bit more clear view where I should focus on my project. As well from the research made I got bit worried as I was not able to find some clear examples or information on how does the android app can track the speed and distance. It made me worried as this functionality is very important and crucial for the completeness and success of the project. Despite that I believe I will find the solution.

Intended Changes

For the next step of my project I will be working on my requirements specification document, as well as continue to make my research and build solid foundation for the stage where I have to develop the application. As well one of main objective for next month will be develop solid prototype, I do not expect some major functionalities implemented as I still making the research. By reflecting last month and recalling that I was not able to find sample code or clear information on how to implement distance and speed tracking into the application, I will try to reach for some help and advice from faculty members who specialize at mobile development.

Reflective Journal (November)

Student name: Marius Brivinskas

Programme BSc in Computing (Mobile development)

My Achievements

The last month my aim was to come prepare the technical report of the project. Which mainly involved summarizing my project proposal, system requirements and research documents into single document. All this process of putting all pieces together was closely advised with my supervisor Damien Mac Namara. It was great help as it allowed me to put all my requirements and research in a single unit, which allows me now to have a clear path where I will move forward towards my prototype development and further stage of applications.

My Reflection

I believe that the last month was successful enough as I was able to get my technical report ready for my mid-point presentation. However due to big time constraints from the other modules deliverables, I was not able to start my development work for prototype. However, despite that, I have my main documentation ready and I will be able to prepare my prototype and presentation for mid-point.

Intended Changes

The main aims for next month is to finalize my prototype which I plan to be a low fidelity with little functionality working. As well, get myself ready for the presentation

Reflective Journal (December)

Student name: Marius Brivinskas

Programme BSc in Computing (Mobile development)

My Achievements

The last month my aim was to develop a low fidelity prototype that I could demonstrate during my presentation. I was able to achieve this quite well taking in consideration all the time and other constraints. I made small android application that was reflecting the core and concept idea of my main project. The prototype had no major functionalities working apart from the speedometer that is going to be used further developing “challenger app”. Apart from having my prototype ready, I also had done my midpoint presentation where I was presenting my project idea as well as technical report, which was expanding project it in more details and clarifying the core principles, background and idea behind the project.

My Reflection

I believe that the last month very successful, as I was able to develop small prototype app that was able to demonstrate for the lectures during my presentation. As well despite very tight and intense schedule of college, I was able to deliver my project documentation on time and be able to present it.

Intended Changes

The main aims for next month is to start get in to more developing of the actual application as by now I have done vast majority of documentation necessary for me to move on to development of the app. As well by having the low fidelity prototype I can use as solid fundamental which can be used to build all the main and necessary functionalities for the final version of app.

Reflective Journal (January)

Student name: Marius Brivinskas

Programme BSc in Computing (Mobile development)

My Achievements

The last month my aim was to start to implement further functionalities of the application. At the stage of prototype, I had only speed measuring working. Therefore, the next step was to implement rest of the mechanical aspect of the application, which is tracking the travelled distance, steps made, and time spend on fitness activity. After some time spent on research to find the best way of achieving my goals, I have successfully managed to get all mechanic working fine and have tested them to make sure applications work with no errors.

My Reflection

I believe that the last month very successful as I have managed to achieved my goals of the month.

I have managed to get the very important aspect of the application working which was tracking the fitness activities. Despite the fact that some of the functions was looking quite simple from the first glance, I still have faced some issues and difficulties of completing them. For example the distance tracking was quite complex to achieve desired result. As on my first implementation of function for tracking distance, I got a bug in testing. The issue was that the function I used was measuring distance in “straight-line” ignoring all the turns between point A and point B. So eventually after some extra time of research, I have found a Haversian formula, which by applying it and making some extra configuration with variables, I have succeeded to achieve desired result. Regarding the functions for step counting and time measuring less complicated as it had a lot of open source examples and good documentation.

Intended Changes

The main aims for next moth is to start work with the back end of my application which mainly involves to implement ability to save the users result of fitness activity which later on will be used in implementing gamification element

Reflective Journal (February)

Student name: Marius Brivinskas

Programme BSc in Computing (Mobile development)

My Achievements

The last month my aim was to start to continue to build up upon existing functionalities of the application. The main functionalities achieved quite successfully, which was tracking running, walking and cycling. Upon that, the application was connected to the backend system Google firebase where user is able to save his fitness results and create challenge activities. In addition to working on application expansion, I was documenting system analysis and design where I stated the design of my application using class diagrams, explain main functionalities with a use cases and code snippets as well as sample user interface.

My Reflection

I believe that the last month very successful as I have continued to build upon existing functionalities and expand it further more by connecting application to the back end systems. As well, I was happy to achieve that the user is able to save his fitness result and create a challenge activities, which is very important for the last development stage of the project. I feel that I could achieve even more in the last month, however due to time constraints and the time required to be spent on the other college assignment I was not able to do that. Despite I still feel happy as I keep moving forward and getting closer to finish my project.

Intended Changes

The main aims for next moth is to continue to work with the back end system and implement functionality where user can select the challenge and compete for the experience points.

Reflective Journal (March)

Student name: Marius Brivinskas

Programme BSc in Computing (Mobile development)

My Achievements

During the last month, I was able to integrate more functionalities related with back-end system, which one of the function was to allow user to select the challenge from the given list of challenges.

Apart from allowing user to select and start the challenge, I also was able to achieve that user results would be compared against the challenge and the points would be given to user respectively.

My Reflection

I believe that the last month was quite good regarding the project progress as I made the progress in working with the back end system. Which is highly important for overall project result. I would like to achieve more in the last month but taking in account that a lot of time was taken away by other college assignments I feel satisfied enough with the last month result.

Intended Changes

The main aim for the last month of the project development I aim to polish the back end integration of the project. Once this is done, I will test the application and will finalize the project report.

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Responses cannot be edited

Fitness Apps

Whats your age

- ☐ 0-15
- ☒ 16-25
- ☐ 26-45
- ☐ 45-60

Gender

- ☒ Male
- ☐ Female

Name the fitness applications you used before or using now

Google fit , Fitbit, Runtastic

How helpful and useful do you think the applications was for you and did it served its purpose ?

It was helpful tool for assisting me when excerssing

What did you liked most about the applications you used?

Graphical interface, simplicity of using

What you did not liked most about the applications you used ?

Too much unnecessary stuff like , food planner , water usage meter

If you had a change to make an ideal fitness app what kind of app it would be ?

Simple app that would track my performance that I could save it and keep track of it

How would you make the app different from already existing apps ?

I would app competitiveness aspect such as issuing the challenges for the others

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Fitness Apps

Whats your age

- ☐ 0-15
- ☐ 16-25
- ☒ 26-45
- ☐ 45-60

Gender

- ☐ Male
- ☒ Female

Name the fitness applications you used before or using now

Google Fit

How helpful and useful do you think the applications was for you and did it served its purpose ?

It was helpful and it served its purpose quite well as it allowed me easily to track my fitness performance and keep it in my profile so I could review the result and compare it later on.

What did you liked most about the applications you used?

It was layout very nice, it had clear design that was easy to use so you knew where and what you are doing.

It had no unnecessary elements that would complicate usage of the app

What you did not liked most about the applications you used ?

The basic functionalities works very good on the phone , however a lot of extra functionality was available only if you had an wearable device

If you had a change to make an ideal fitness app what kind of app it would be ?

The best app for me would be a simple application that would allow easily to track my fitness performance such as walking running or cycling

How would you make the app different from already existing apps ?

I would make my app different by allowing people to compete against each other, like some kind of game where by competing with each other you could earn points, gain higher position among the other users etc. I think this would bring attention of people as it would encourage them to go outside and be active, similarly like "Pokemon GO"

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Fitness Apps

Whats your age

- ☐ 0-15
- ☒ 16-25
- ☐ 26-45
- ☐ 45-60

Gender

- ☒ Male
- ☐ Female

Name the fitness applications you used before or using now

FitBit

How helpful and useful do you think the applications was for you and did it served its purpose ?

I found it help for me to track my performance of my exercising and keep the record of it

What did you liked most about the applications you used?

I was quite easy to use, it had all the function I wanted to , such as tracking my speed, distance, step count etc. It provided easy flow of navigation in the app as it was easy to move from one screen to another.

What you did not liked most about the applications you used ?

It had some functions that I have never used as I think it was something extra that I would never use. For example food planer, water usage meter, etc. Also I did not like that to gain full experience of the app I would need to have android wearable device.

If you had a change to make an ideal fitness app what kind of app it would be ?

The best app in my mind would be a simple fitness tracking application that to track my fitness performance, and nothing more. No need for wearable device as well as I would only want to use my phone.

How would you make the app different from already existing apps ?

Even though the FitBit has some competition options in the app, some of the other apps are missing that. Even the simplest competition among the users would be very great as it would make app more fun to use

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Responses cannot be edited

Fitness Apps

Whats your age

- ☐ 0-15
- ☐ 16-25
- ☒ 26-45
- ☐ 45-60

Gender

- ☐ Male
- ☒ Female

Name the fitness applications you used before or using now

S-Health, FitBit

How helpful and useful do you think the applications was for you and did it served its purpose ?

It was quite useful and helpfull for tracking my fitness perfromace

What did you liked most about the applications you used?

It provide quite accurate results of my performance on the daily basis and it was easy to use

What you did not liked most about the applications you used ?

The app like FitBit was quite good, however the challenges provided for the users was made focusing people who already had some fitness background and this was quite discouraging to continue to use the application. As well it was giving some unnecessary data like diet plans, minimum protein intake per day ect.

If you had a change to make an ideal fitness app what kind of app it would be ?

I would love to make an app that would simple be my assistant when I am doing my fitness. For example track how fast I run, how far did I run etc. I would not add anything extra as all I would need just a tool that would show my progress on the day to day or weekly basis.

How would you make the app different from already existing apps ?

To make my application different I would make it interactive with other people. Make some kind of leader board where people could show their result and compare it against the others

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System Usability Scale

Participant name: Laura

Please answer all following questions by rating them from one to five.
(1 = strongly disagree, 5 = Strongly Agree)

1. I think that I would like to use this system frequently

1	2	3	4	5

2. I found the system unnecessarily complex

1	2	3	4	5

3. I thought the system was easy to use

1	2	3	4	5

4. I think that I would need the support of a technical person to be able to use this system

1	2	3	4	5

5. I found the various functions in this system were well integrated

1	2	3	4	5

6. I thought there was too much inconsistency in this system

1	2	3	4	5

7. I would imagine that most people would learn to use this system very quickly

1	2	3	4	5

8. I found the system very cumbersome to use

1	2	3	4	5

9. I felt very confident using the system

1	2	3	4	5

10. I needed to learn a lot of things before I could get going with this system

1	2	3	4	5

Score = 33 * 2.5 = 82.5

Participant name: Tomas

Please answer all following questions by rating them from one to five.
(1 = strongly disagree, 5 = Strongly Agree)

1) I think that I would like to use this system frequently

1	2	3	4	5

2) I found the system unnecessarily complex

1	2	3	4	5

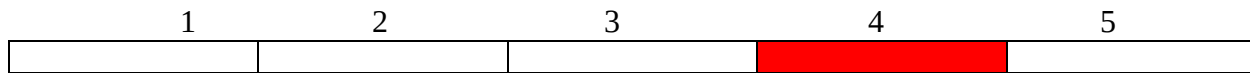
3) I thought the system was easy to use

1	2	3	4	5

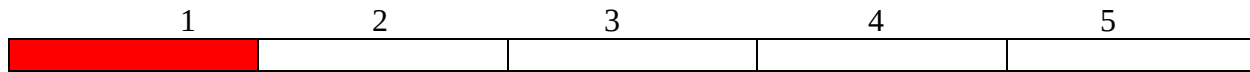
4) I think that I would need the support of a technical person to be able to use this system

1	2	3	4	5

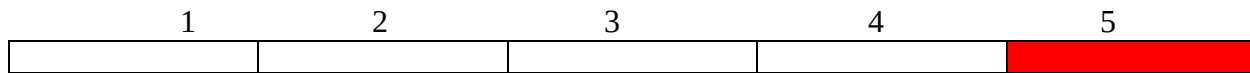
5) I found the various functions in this system were well integrated



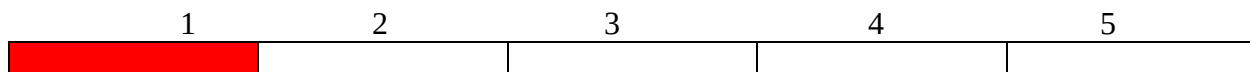
6) I thought there was too much inconsistency in this system



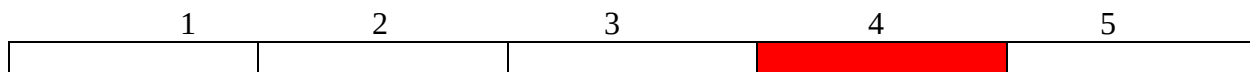
7) I would imagine that most people would learn to use this system very quickly



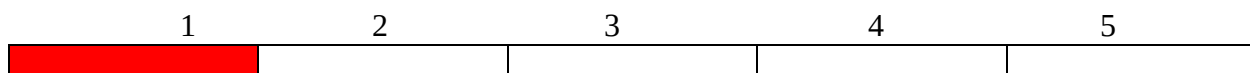
8) I found the system very cumbersome to use



9) I felt very confident using the system



10) I needed to learn a lot of things before I could get going with this system



SUS score = 35 * 2.5 = 87.5

Participant name: **Tomas.M**

Please answer all following questions by rating them from one to five.
(1 = strongly disagree, 5 = Strongly Agree)

1. I think that I would like to use this system frequently

1	2	3	4	5

2. I found the system unnecessarily complex

1	2	3	4	5

3. I thought the system was easy to use

1	2	3	4	5

4. I think that I would need the support of a technical person to be able to use this system

1	2	3	4	5

5. I found the various functions in this system were well integrated

1	2	3	4	5

6. I thought there was too much inconsistency in this system

1	2	3	4	5

7. I would imagine that most people would learn to use this system very quickly

1	2	3	4	5

8. I found the system very cumbersome to use

1	2	3	4	5

9. I felt very confident using the system

1	2	3	4	5

10. I needed to learn a lot of things before I could get going with this system

1	2	3	4	5

Score = 37 *2.5 = 92

Participant name: **Snezana**

Please answer all following questions by rating them from one to five.
(1 = strongly disagree, 5 = Strongly Agree)

1. I think that I would like to use this system frequently

1	2	3	4	5

2. I found the system unnecessarily complex

1	2	3	4	5

3. I thought the system was easy to use

1	2	3	4	5

4. I think that I would need the support of a technical person to be able to use this system

1	2	3	4	5

5. I found the various functions in this system were well integrated

1	2	3	4	5

6. I thought there was too much inconsistency in this system

1	2	3	4	5

7. I would imagine that most people would learn to use this system very quickly

1	2	3	4	5

8. I found the system very cumbersome to use

1	2	3	4	5

9. I felt very confident using the system

1	2	3	4	5

10. I needed to learn a lot of things before I could get going with this system

1	2	3	4	5

Score = 33 *2.5 = 82.5

Participant name: Lukas

Please answer all following questions by rating them from one to five.
(1 = strongly disagree, 5 = Strongly Agree)

1. I think that I would like to use this system frequently

1	2	3	4	5

2. I found the system unnecessarily complex

1	2	3	4	5

3. I thought the system was easy to use

1	2	3	4	5

4. I think that I would need the support of a technical person to be able to use this system

1	2	3	4	5

5. I found the various functions in this system were well integrated

1	2	3	4	5

6. I thought there was too much inconsistency in this system

1	2	3	4	5

7. I would imagine that most people would learn to use this system very quickly

1	2	3	4	5

8. I found the system very cumbersome to use

1	2	3	4	5
☒	☐	☐	☐	☐

9. I felt very confident using the system

1	2	3	4	5
☐	☐	☐	☐	☒

10. I needed to learn a lot of things before I could get going with this system

1	2	3	4	5
☐	☒	☐	☐	☐

Score = 33 *2.5 = 82.5