HealthHub

DESIGN SPECIFICATION REPORT

Course Name	Software Engineering
Course Code	BLG411E
Course CRN	13330
Team Number	21
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Date	28.11.2017

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1. Introduction

This document provides information about design description of HealtHub, which is an Android Project. By preparing this document, we have visualized the design steps of the project in different aspects like data model, software model and user interface. The design specification document will give us many benefits and help us to eliminate the uncertainities during the implementation phase.

1.1. Goal

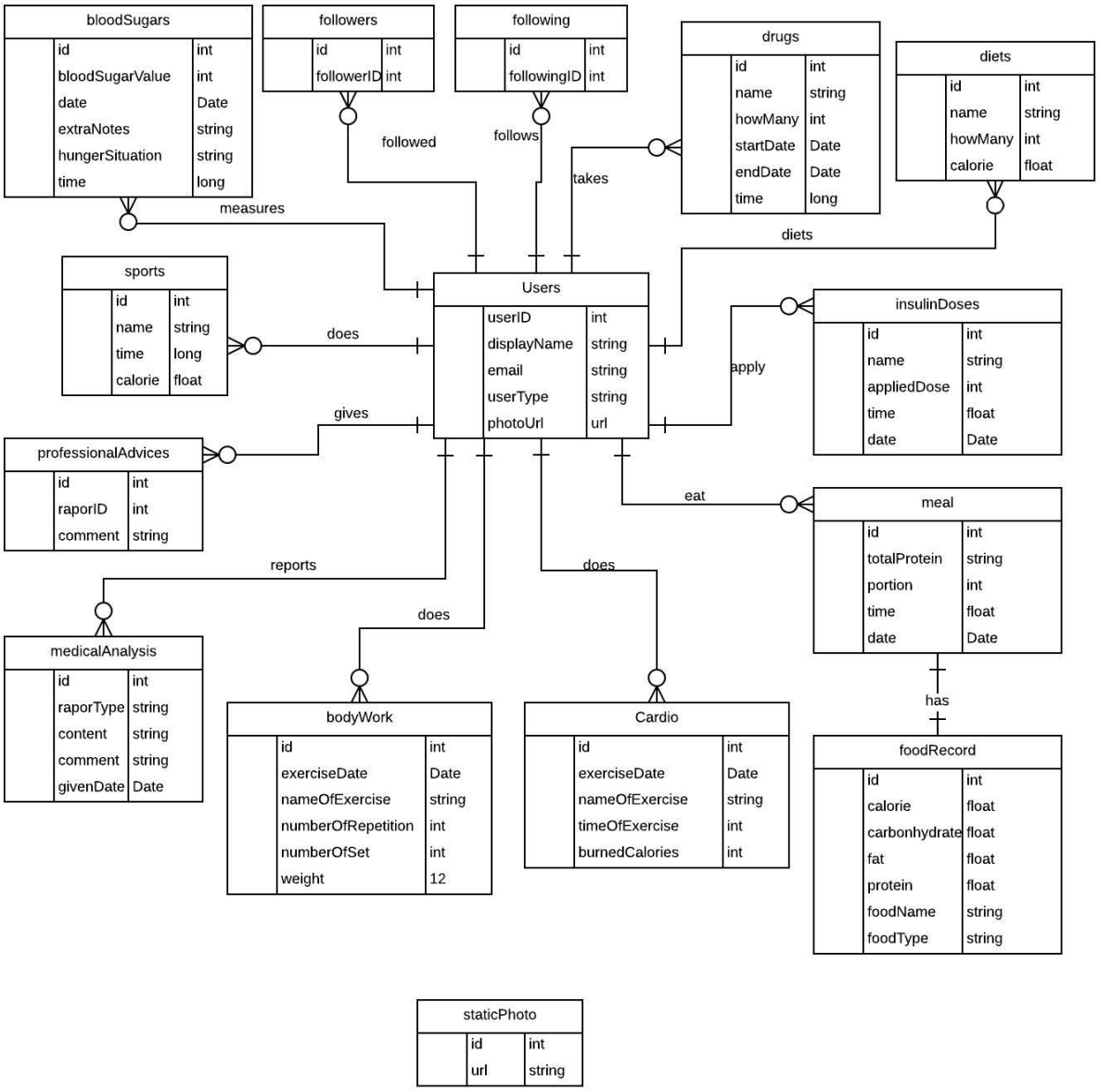
The goal of this document is to design data model, software model and user interface model of the HealthHub Project. These models will help us in communication with customers and among the team. Before the implementation of the project, team members will be able to get a better understanding, in addition the errors that may be caused by misunderstandings of the project will be prevented.

1.2. Contents and Organization

This document is compromised of three main parts which are data modeli software model and user interface model. Data model part includes general data model, important data considerations and data flow. In General Data Model, Entitiy Relationship diagram for the data that is stored in a database is given. In the important data considerations part, we have given details about data format preferences. The last part of the data model section is Data Flow and this part includes Data Flow Diagram with explanations. Software model part contains System Architecture, Component Diagram, Class Diagrams and Sequence Diagrams. In the User Interface Model, we have given mock-ups of the project that are mapped to user stories and project components. We have used 'Proto.io' website to produce screen mock-ups.

2. DATA MODEL

2.1. General Data Model



Entity Relationship Diagram

Entity Relationship Diagram Explanations

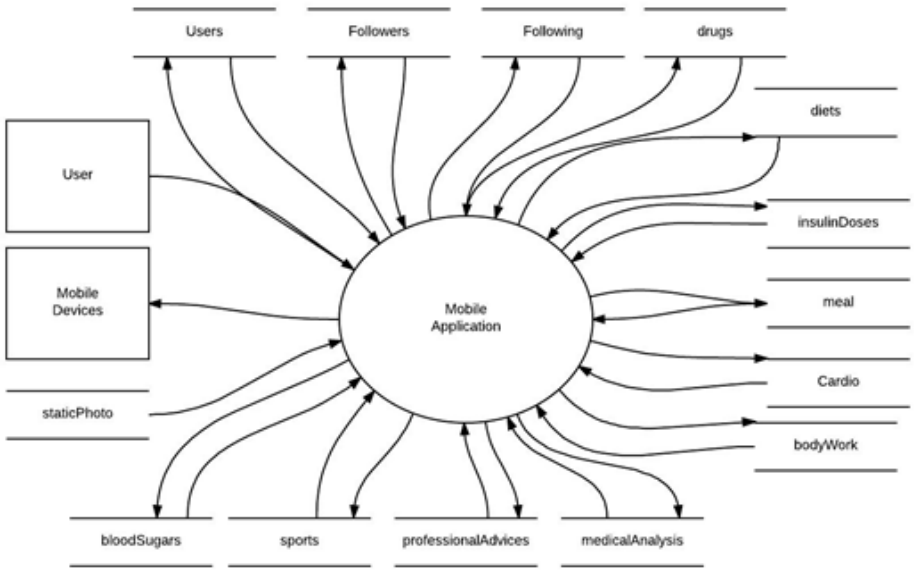
- A user measures 0 to n bloodSugar value(s), and this is a 1 to 0..N relation.
- A user can be followed by other user(s), and this is a 1 to 0..N relation.
- A user follows other user(s), and this is a 1 to 0..N relation.
- A user can take drug(s), and this is a 1 to 0..N relation.
- A user follows diet program(s), and this is a 1 to 0..N relation.
- A user applies insulin dose(s), and this is a 1 to 0..N relation.
- A user eats meal(s), and this is a 1 to 0..N relation.
- A meal has a foodRecord, and this is a 1 to 1 relation.
- A user does cardio work(s), and this is a 1 to 0..N relation.
- A user does bodyWork(s), and this is a 1 to 0..N relation.
- A user reports medicalAnalysis report(s), and this is a 1 to 0..N relation.
- A user gives professionalAdvice(s), and this is a 1 to 0..N relation.
- A user does sport(s), and this is a 1 to 0..N relation.
- Static photo is the component to hold the url's of the photos.

2.2. Important Data Considerations

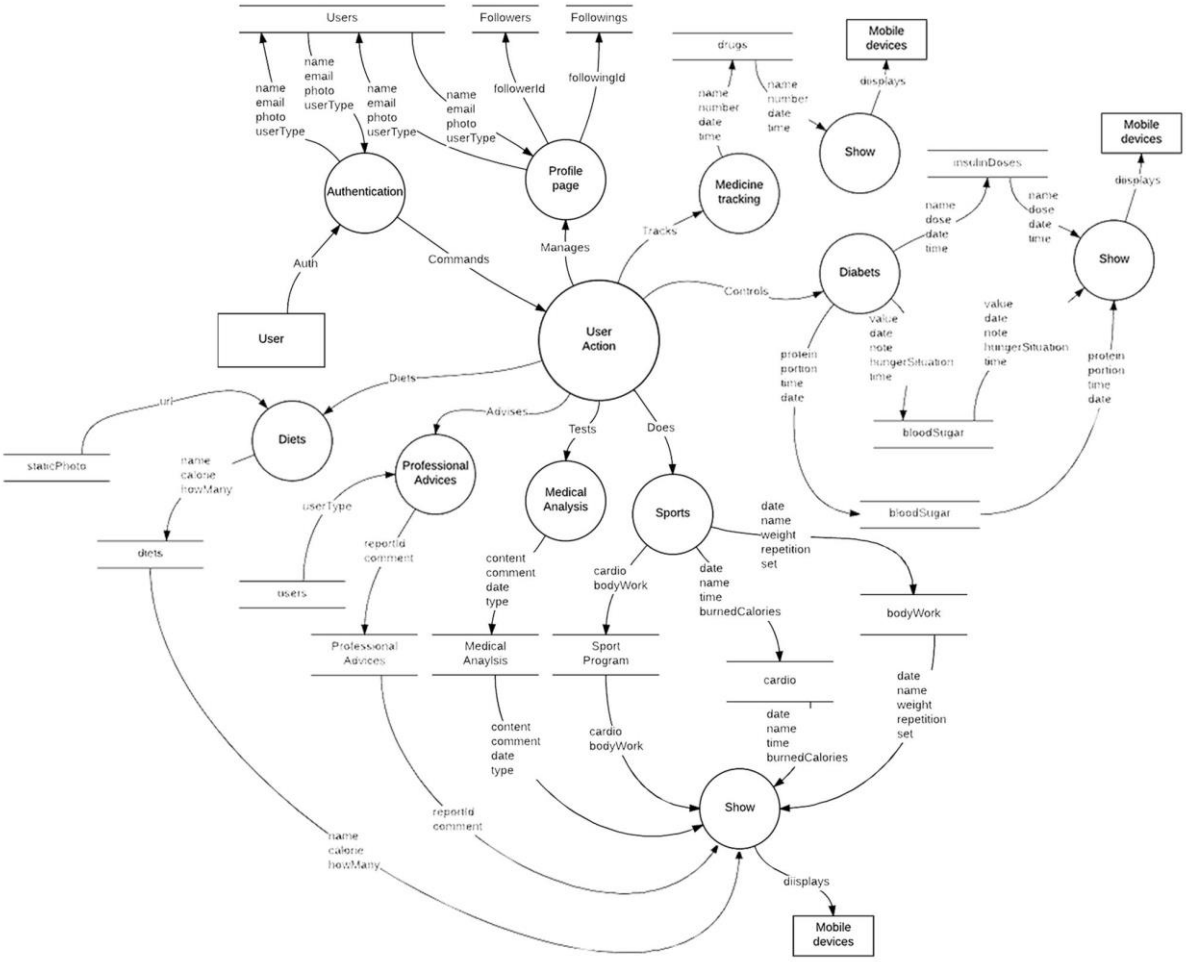
- The Firebase Realtime Database is used for the project.
- The data is stored in the Firebase system.
- The Firebase Realtime Database is built on the JSON which is an open-standard file format. JSON is short for Javascript Object Notation.
- The MVC(Model-View-Controller) software architectural pattern is also used for the project.
- The MVC provided that each model in JSON format is shown in E-R diagram.

2.3. Data Flow

Data Flow Diagrams:

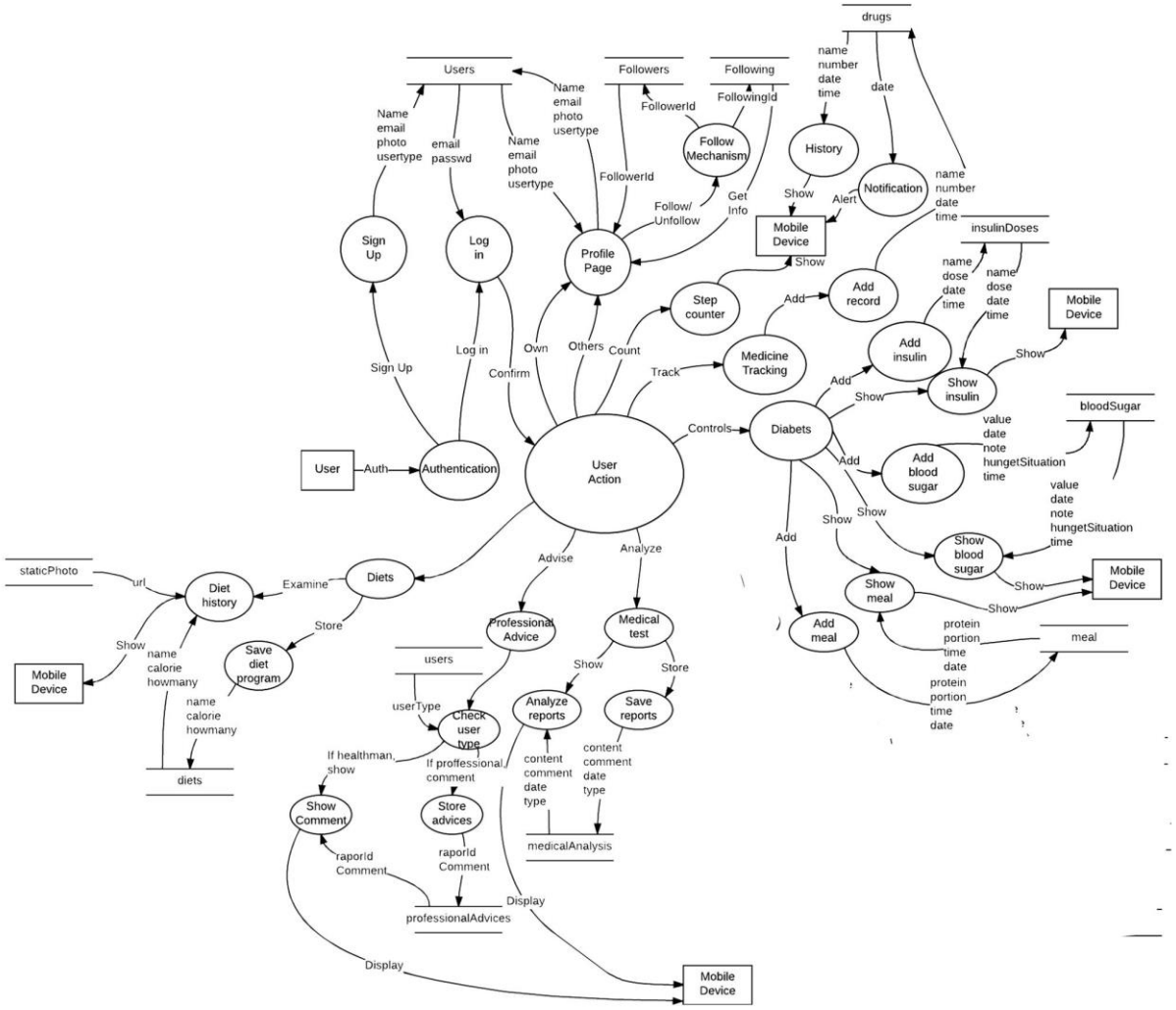


Data Flow Diagram Level-0



Data Flow Diagram Level - 1

See full link here: https://firebasestorage.googleapis.com/v0/b/healthhub-a0d45.appspot.com/o/dfd%20level%201.png?alt=media&token=fd26b55d-5b40-42da-82e8-234c708d2331



Data Flow Diagram Level-2

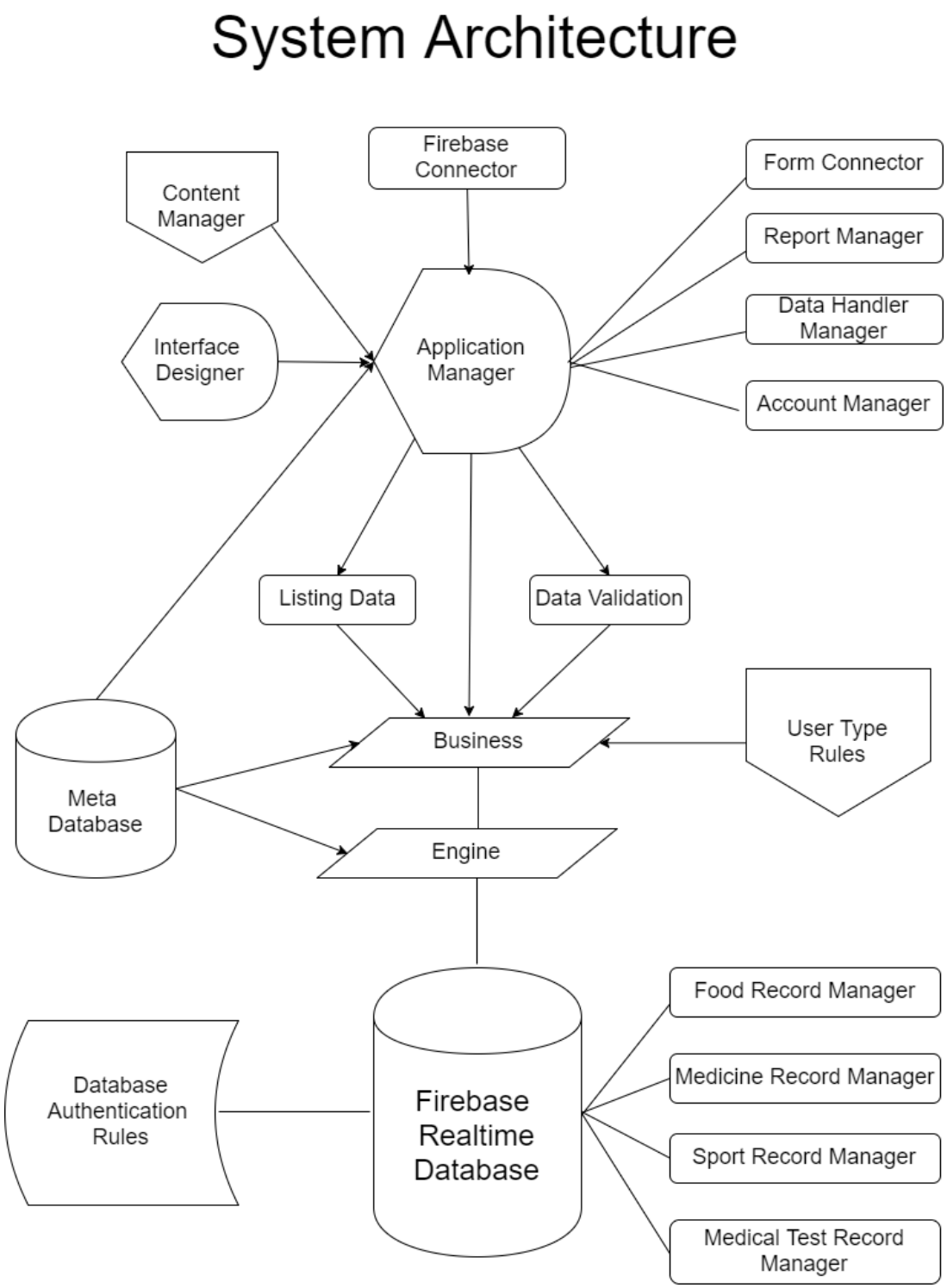
See full link here: https://firebasestorage.googleapis.com/v0/b/healthhub-a0d45.appspot.com/o/dfd%20level%202.png?alt=media&token=644c6ef5-26ad-46b2-bcae-212dc29c692b

Data Flow Diagrams Explanations

- In order to model the behaviour of the data, the data flow diagram is drawn.
- The context level diagram(level 0) includes a general diagram of the data flow.
- The context level diagram(level 1) contains a more detailed diagram of the data flow.
- The context level diagram(level 2) involves the highest detailed diagram of the data flow.
- The diagrams provide information about the flow of the data of the application for the operations.
- The diagram also gives the information about the input, save location of the data and the output.

3. SOFTWARE MODEL

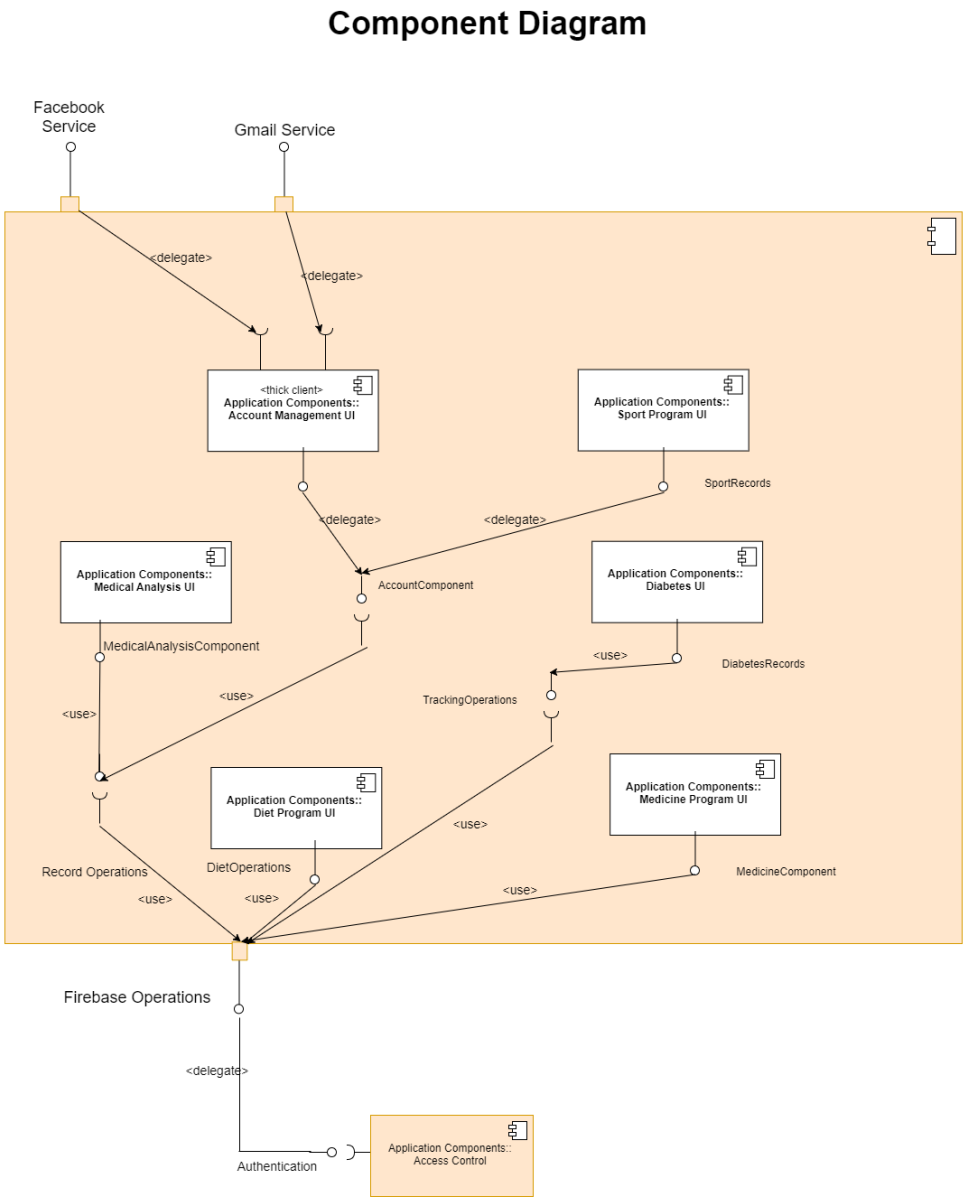
3.1. System Architecture



System Architecture Explanations

- This diagram is composed of system components that will work together to implement the overall system.
- The fundamental components of this diagram are Application manager, Business and Engine components and Firebase Realtime Database.
- Application manager is the main part of the overall program that maintains the fundamental operations of the application.
- This part consists of Form connector, Report Manager, Data handler manager, Account manager, Firebase connector, Content manager and Interface Designer.
- Business and Engine parts provide connections between Application Manager and Firebase Realtime Database parts.
- User type rules are defined in Business part and this part is connectod to Application Manager via Listing Data and Data Validation components.
- Firebase Realtime Database part is responsible for database operations which are data retrieval from Firebase Database, saving the data to Firebase Database and manages the Database Authentication rules.
- The firebase realtime database part consists of Food record manager, medicine record manager, sport record manager and medical test record manager.

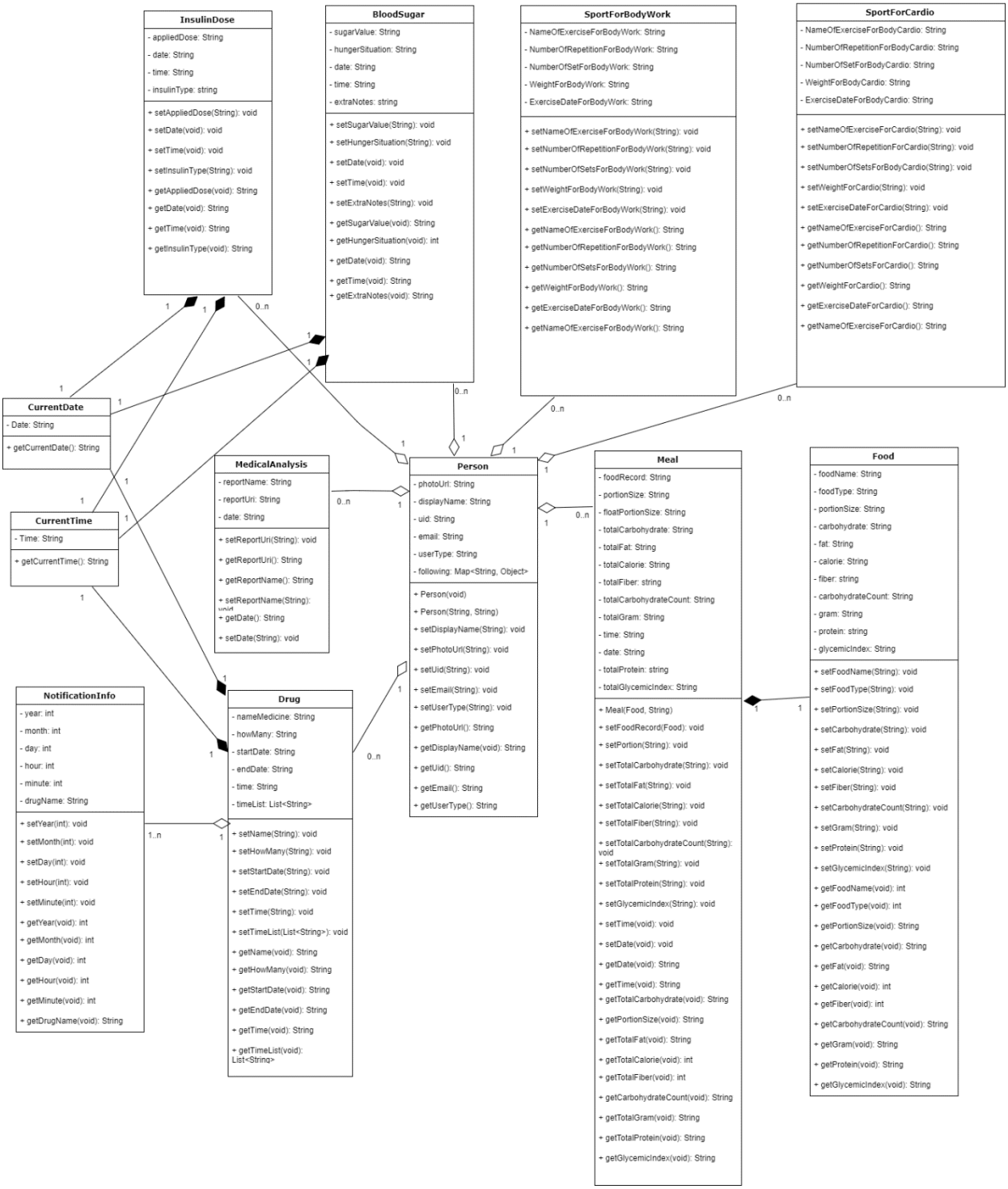
3.2. Component Diagram



Component Diagram Explanations

- This diagram depicts how components are linked together to form larger components or software system.
- The components involved in this diagram are stereotypes including executable components, documents, data tables and files.
- Delegation connectors are responsible from linking external services to internal behavior of the application.
- Facebook and Gmail service are external components which delegate the internal account management component.
- There are five Application UI components which are Sport Program UI, Medical Analysis UI, Diabetes UI, Diet Program UI and Medicine Program UI.
- These five components are all use the Firebase Operations which is an external part of the application.
- By Authentication rules which are defined on Firebase operations component, it delegates the Access control component of the application.

3.3. Class Diagrams

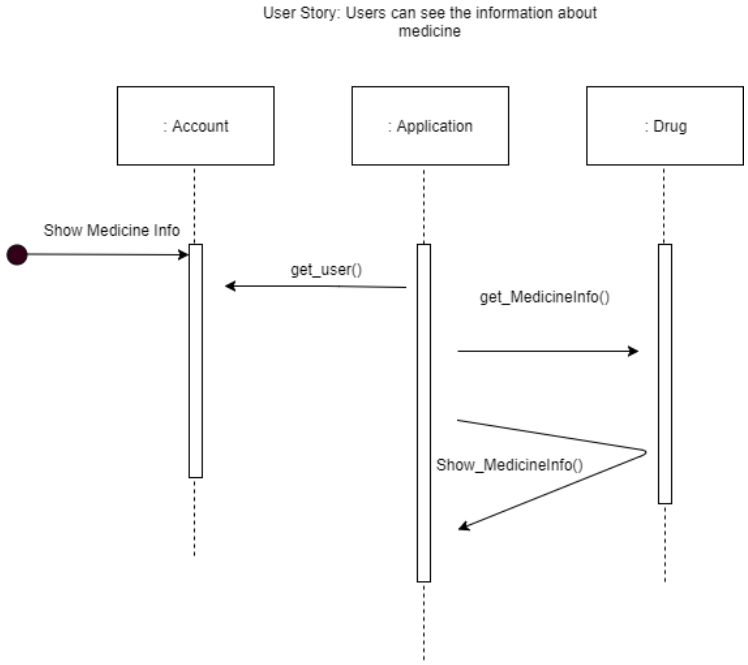


Class Diagram Explanations

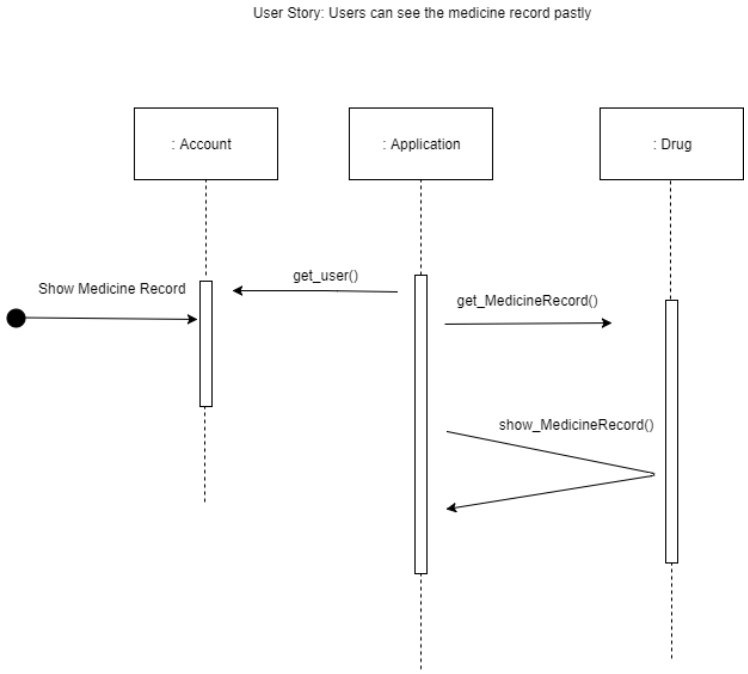
- The class diagrams are created according to the Unified Modeling Language(UML).
- The class diagram defines the system's classes, attributes, methods and operations and the relationships of the objects.
- The class diagram is a static diagram.
- The class diagram provides the visualization of the system's system's classes, attributes, methods and operations and the relationships of the objects according to the object oriented approach.
- The class diagrams also provides ease in the construction of the program.
- The HealthHub project contains 12 classes.
- The names of the classes are written in the top of the rectangles.
- The private attributes are written after the "-" signs in the rectangles.
- The public attributes are written after the "+" signs in the rectangles.
- The methods of the classes are defined using the syntax:
- -methodName(input parameters' types):output parameter's type
- +methodName(input parameters' types):output parameter's type
- The constructors are defined using the syntax:
- +constructorName(input parameters' types)

3.4. Sequence Diagrams

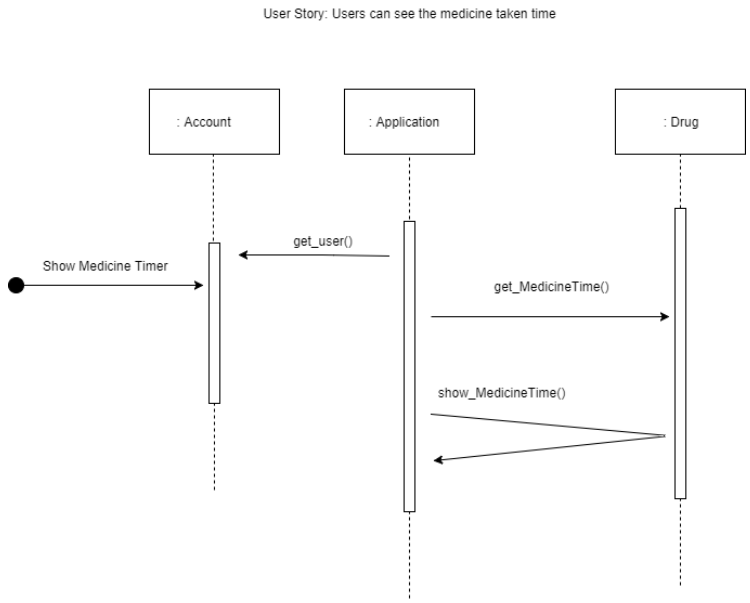
- User story: Keep medicine information in order to display medicine table to user. Application should keep the medicine information



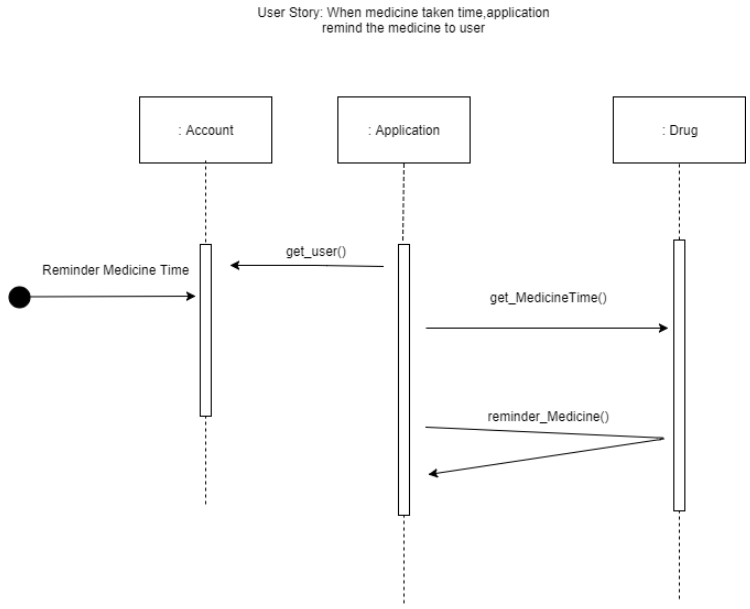
- User story: Keep medicine that previously taken in order to display previously taken medicine to user. Application should keep the medicine history.



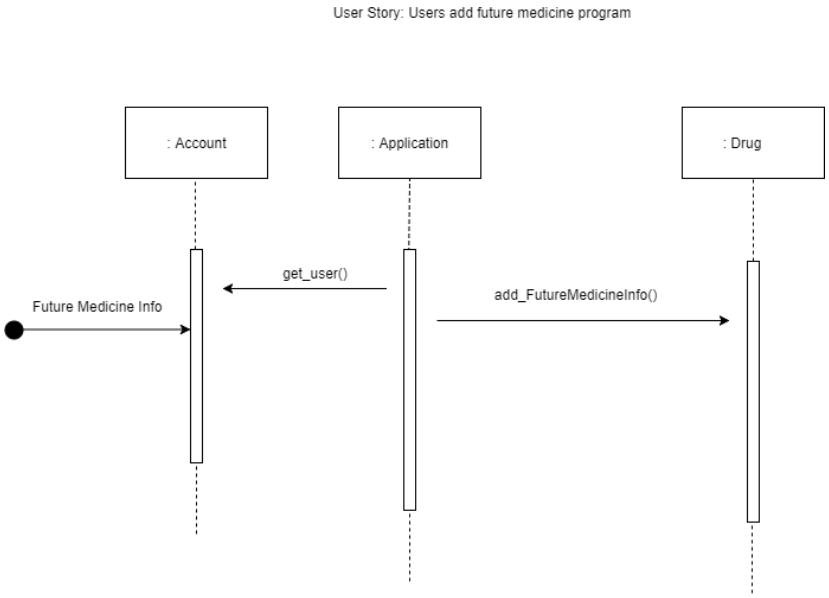
- User story: Keep medicine intake frequency in order to show time to take medicine. Application should save proper time of medicine record



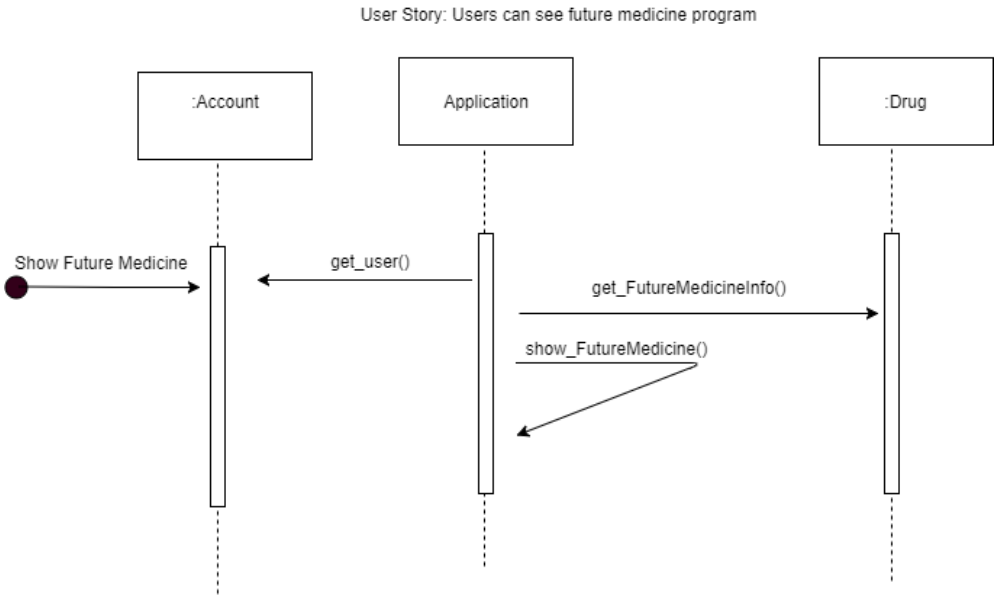
- User story: Keep time of taken medicine for remind in order to remind time of taken medicine. Application keep proper time of taken medicine.



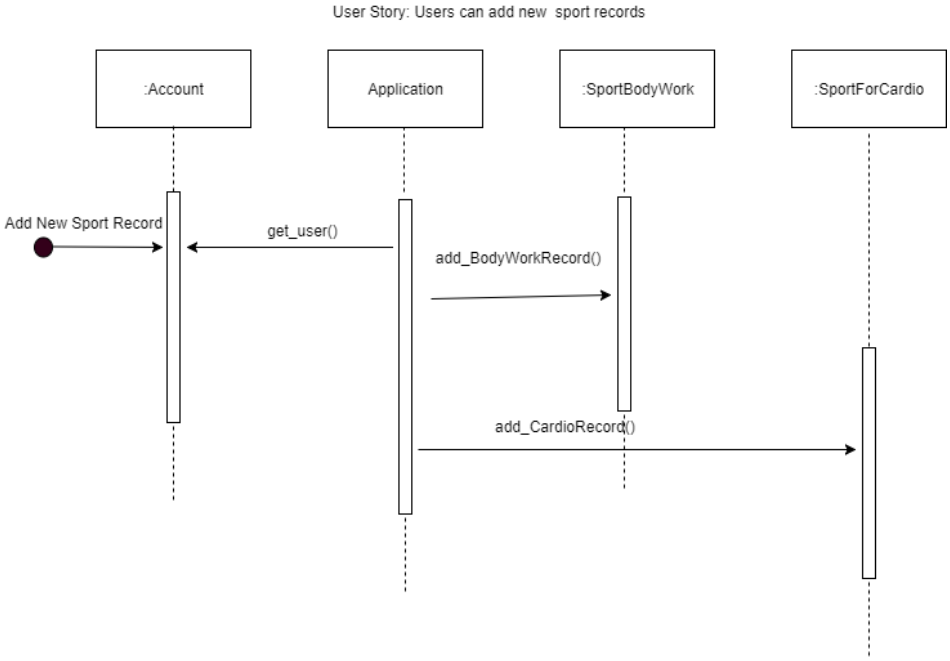
- User story: Keep medicine of information in order to display information of medicines that taken future table to user.



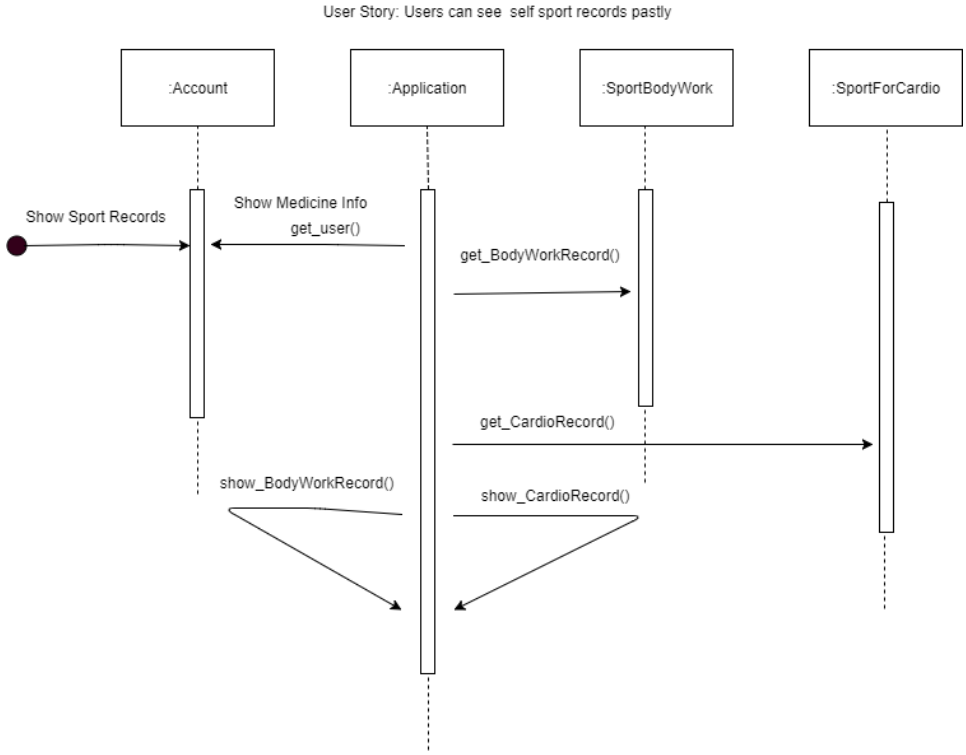
- User story: Show medicine that must be used in future in order to display that medicine. Application save medicine that used in future.



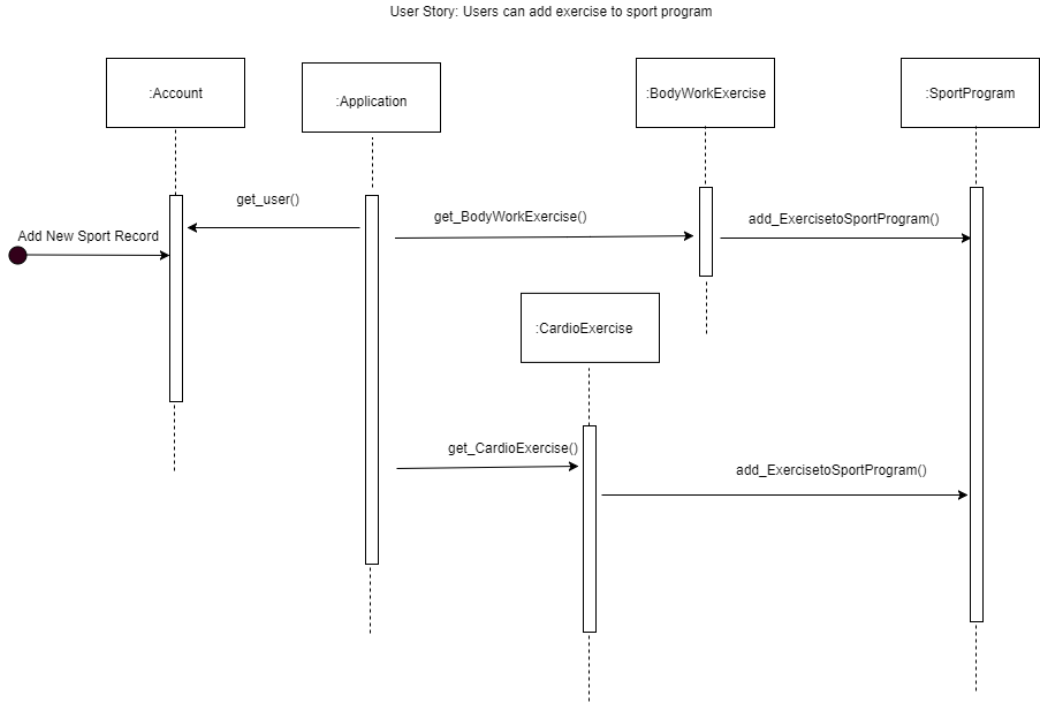
- User story: Keep sport information in order to display sport table to user. Application should keep the sport information.



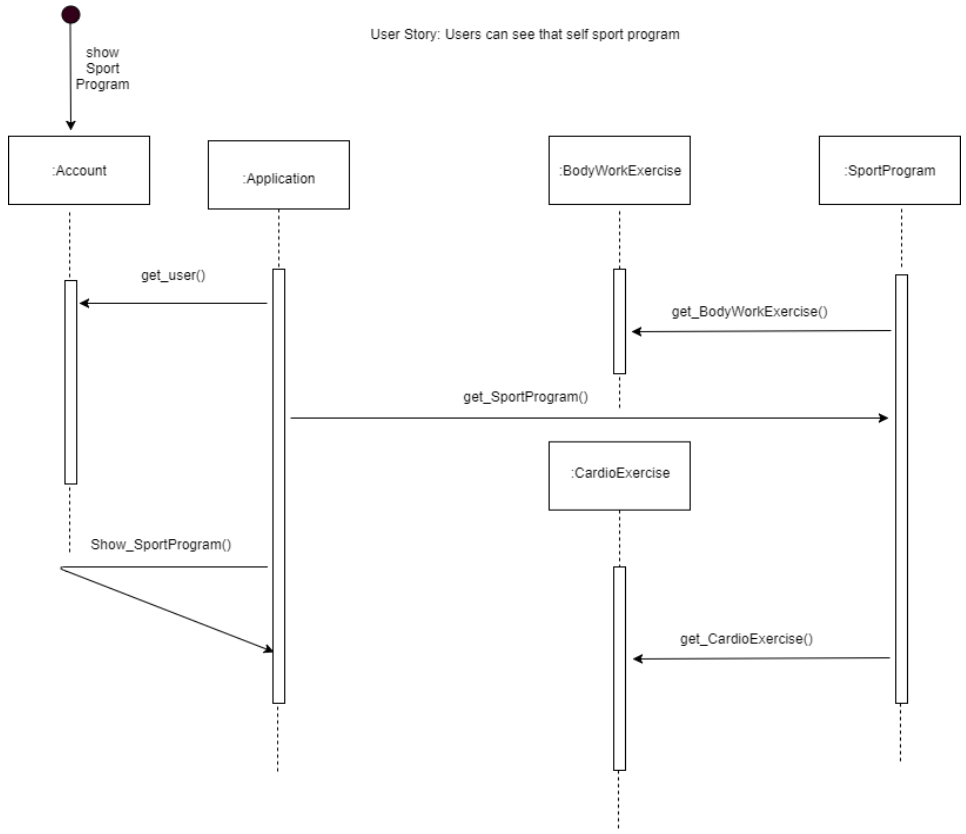
- User story: Show sport exercise record in order to display that made sport exercise in the past time. Application should save sport exercise record.



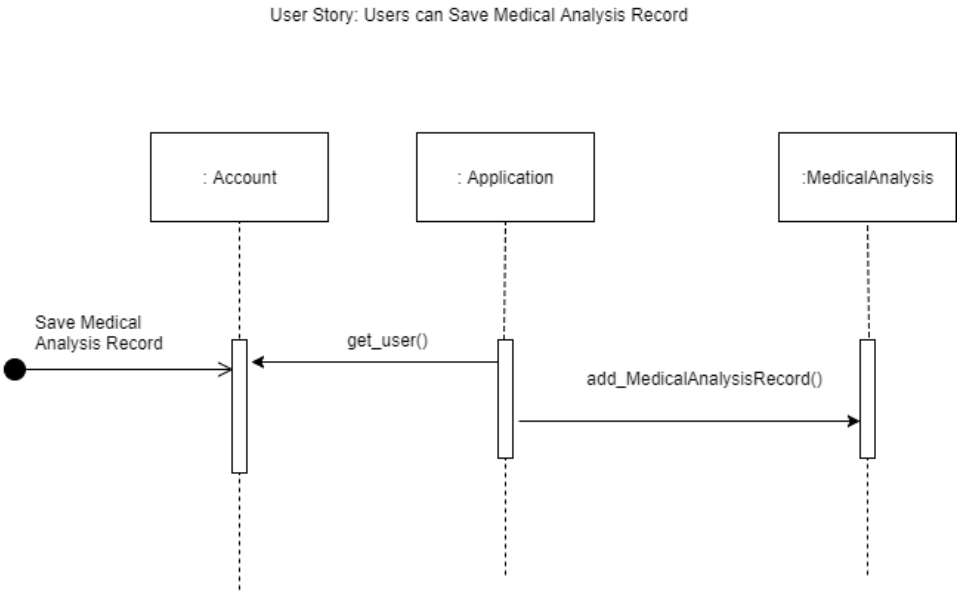
- User story: Keep sports that planned to do in future in order to display sports that taken future table to user. Application should keep the Sports information.



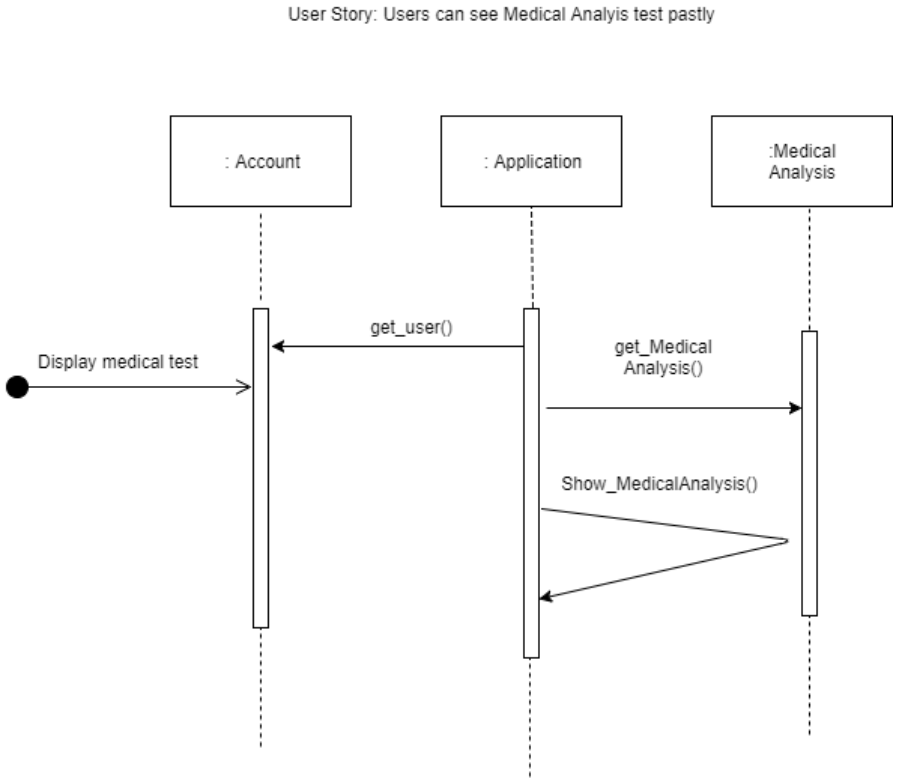
- User story: Show Sports and exercises that must be used in future in order to display that Sports and exercises. Application save Sports and exercises that used in future.



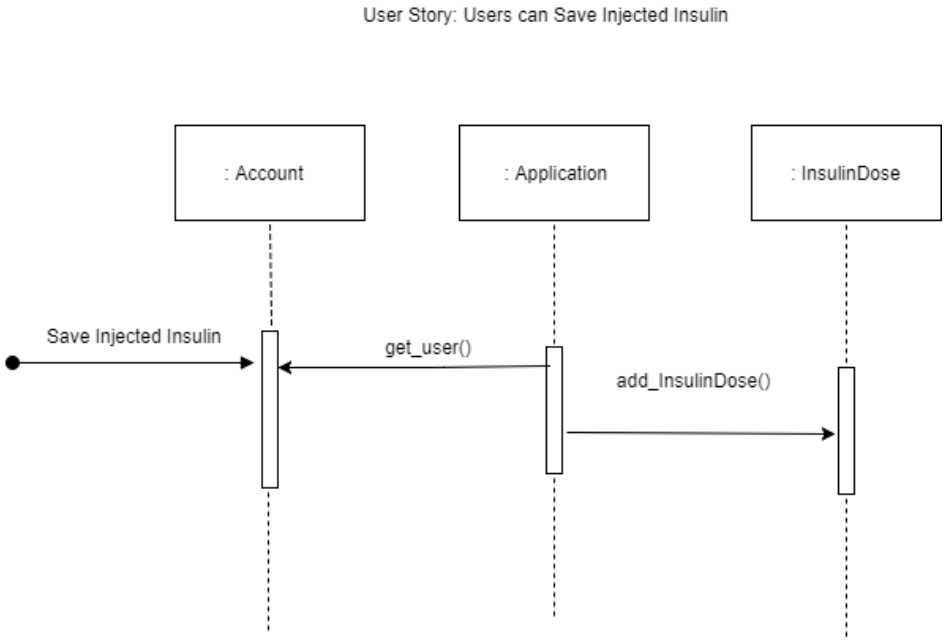
- User story: Keep pastly medical test in order to save medical test. Application add medical test to app database.



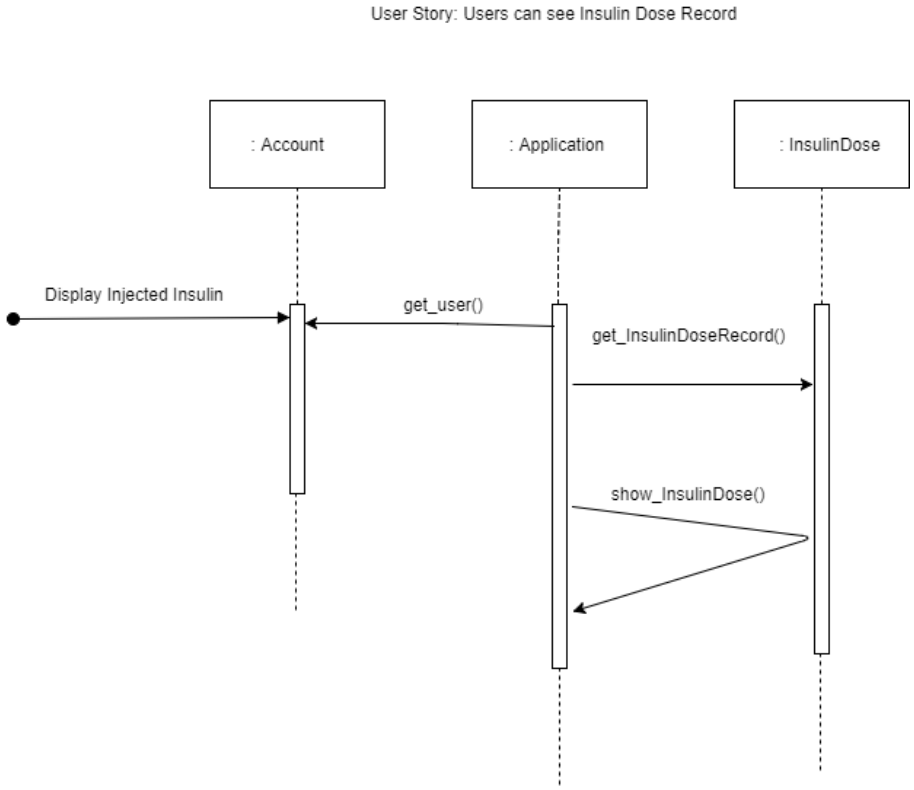
- User story: Show record of medical test in order to display the record of medical test. Application should keep the record of medical test in database.



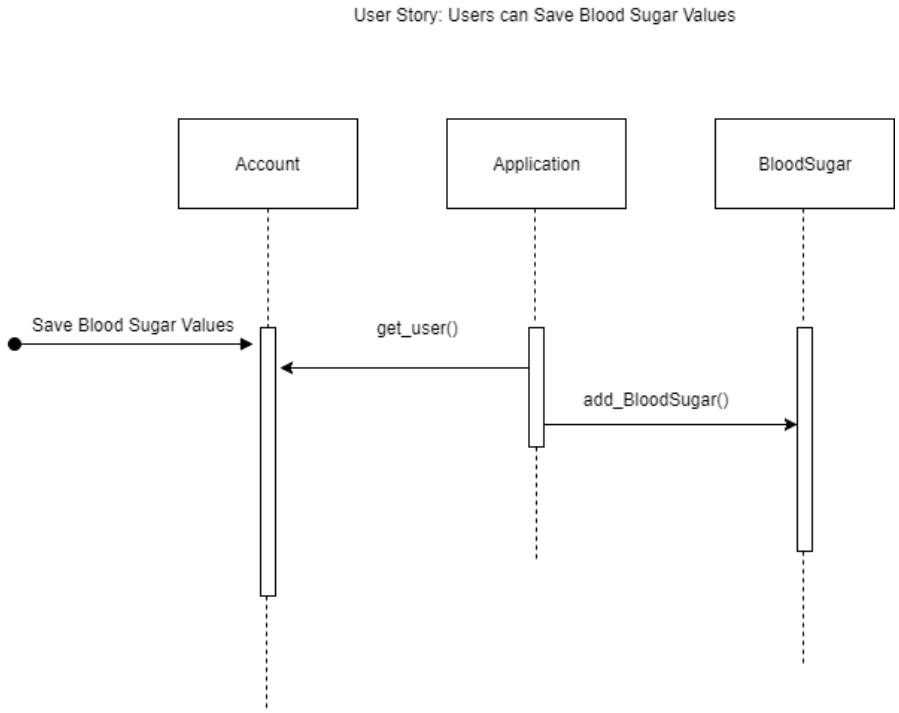
- User story: Save injected insulin doses in order to save total injected dose. Application should keep injection time and date data.



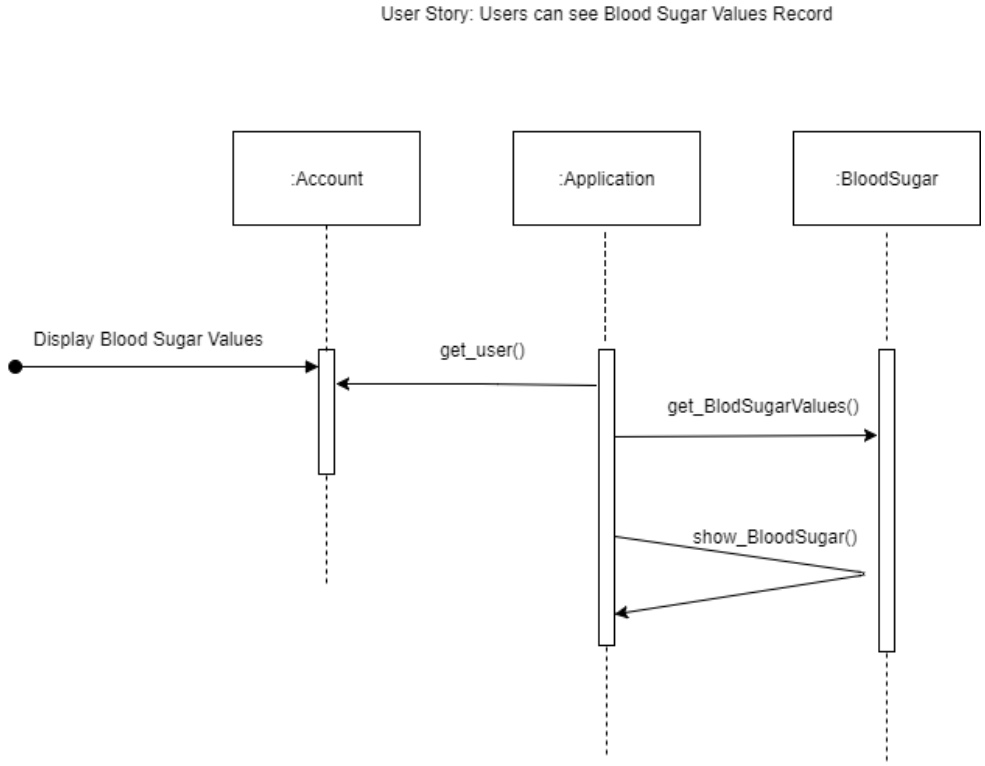
- User story: Display injected insulin doses in order to display total injected dose. Application retrieve the injection data.



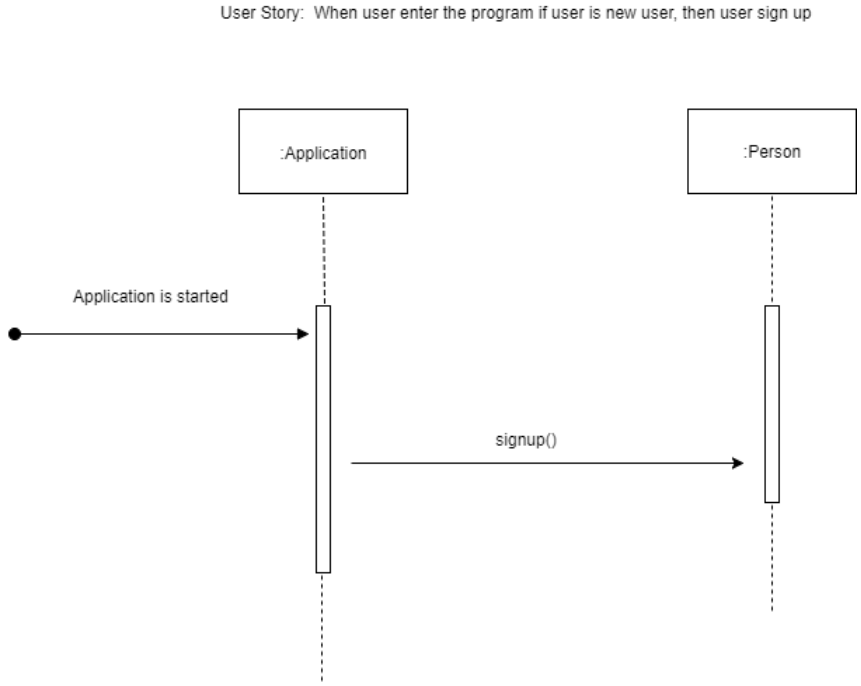
- User story: Save blood sugar values in order to save blood sugar values. Application display the input form.



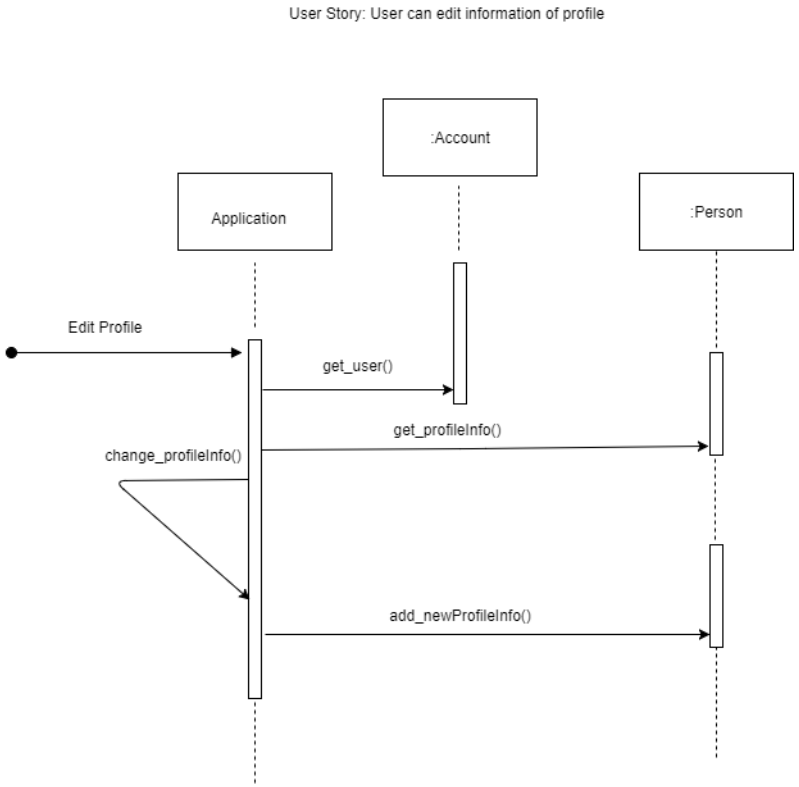
- User story: Display blood sugar values in order to display blood sugar values. Application display the record table.



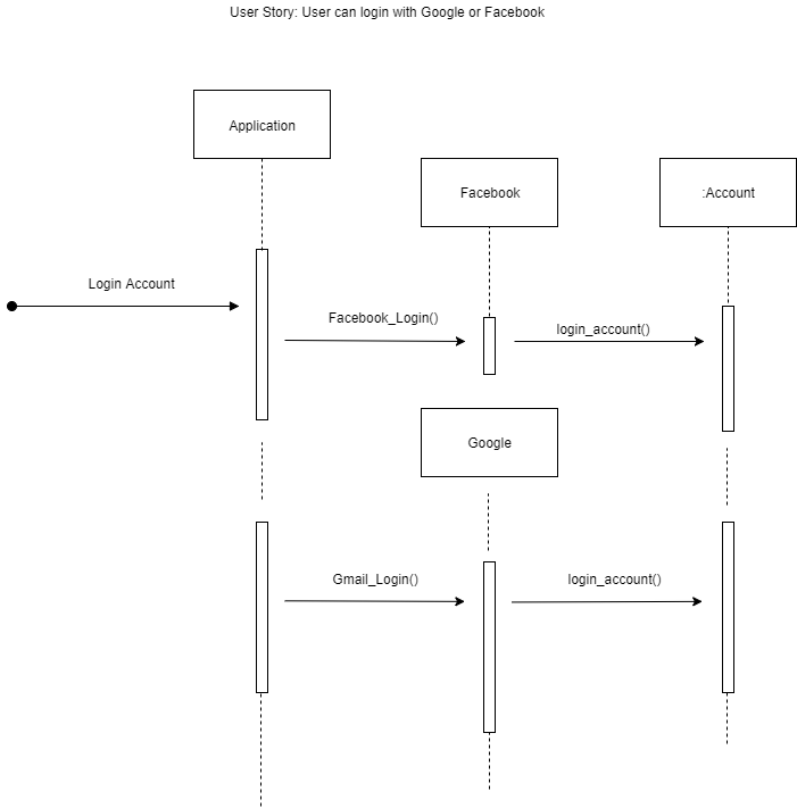
- User story: Create a new account in order to sign up new users to the system. Users need to create accounts.



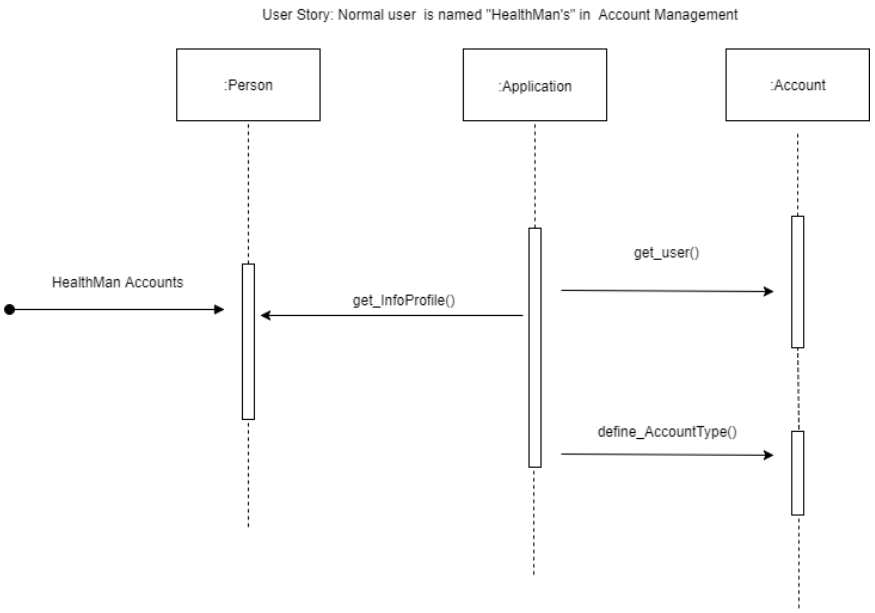
- User story: Edit an account information in order to change the given information.



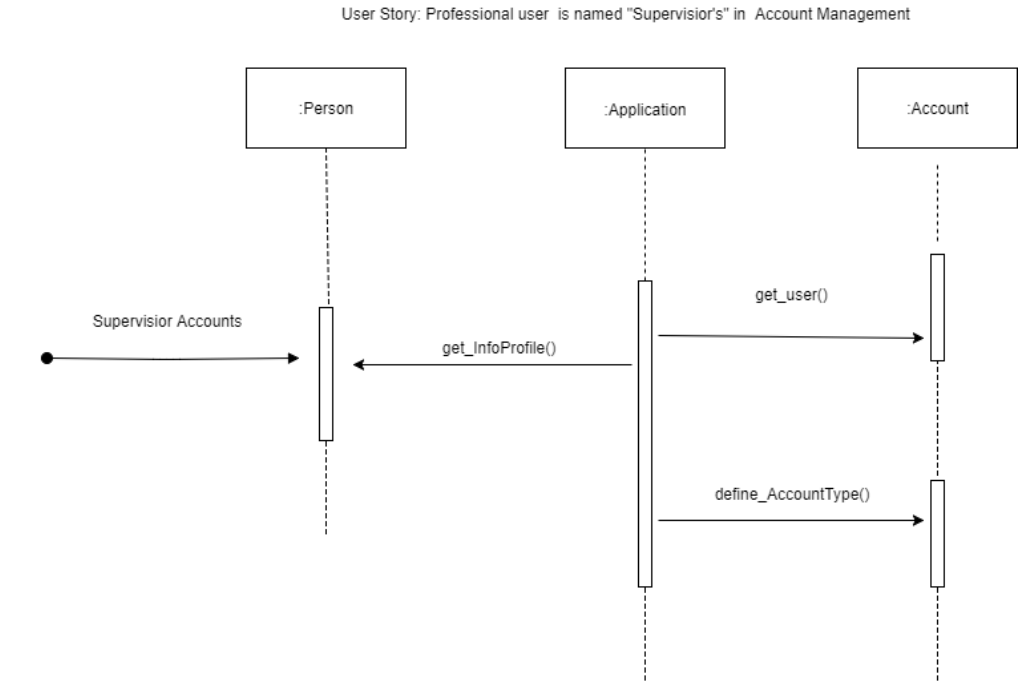
- User story: Social media login to application in order to login via Facebook and Google Accounts.



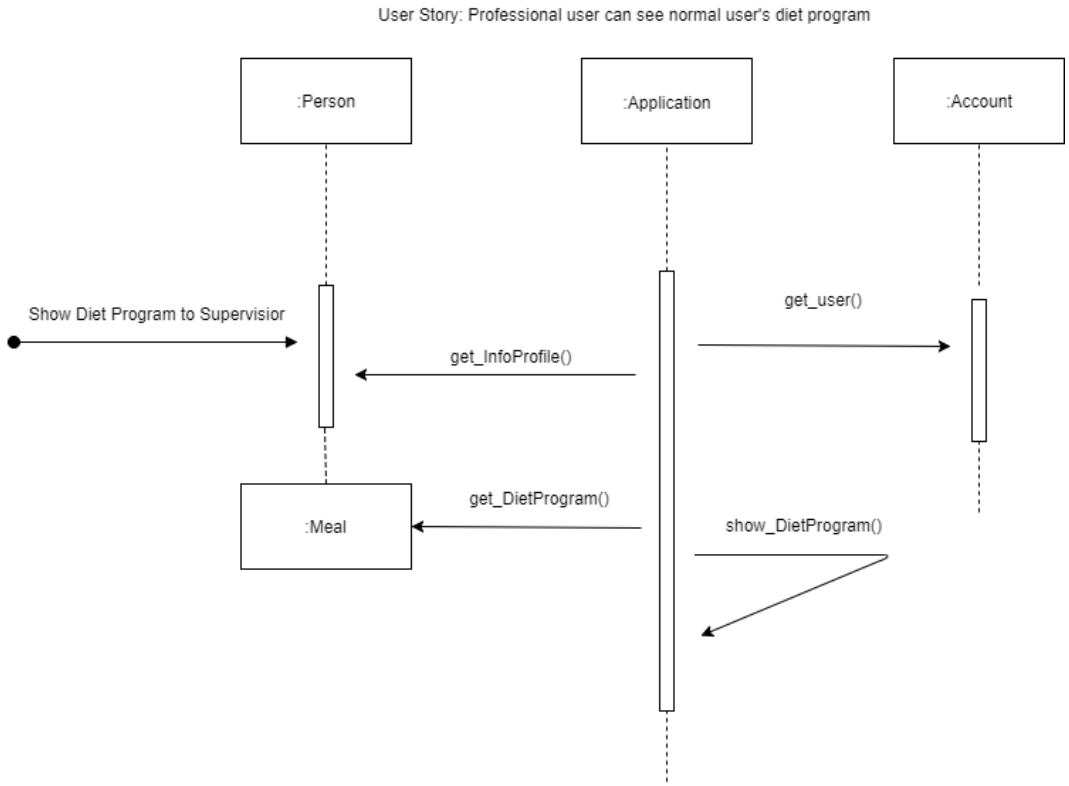
- User story: Normal user (named "HealthMan's") Account Management in order to manage the rights of HealthMan Accounts.



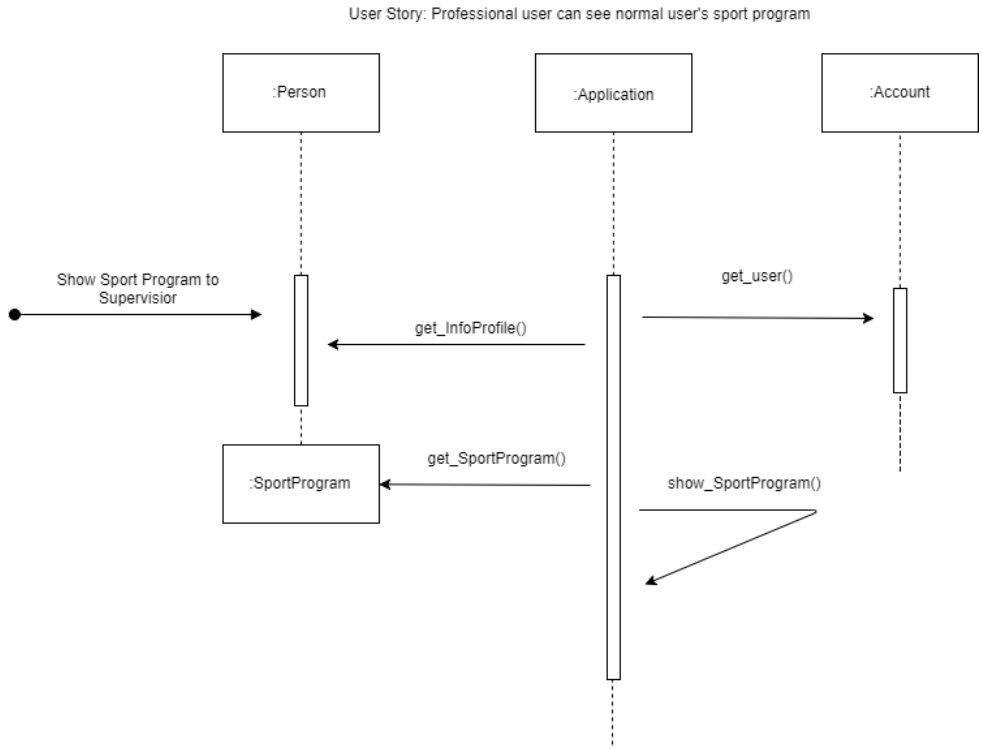
- User story: Professional user (named "Supervisor's") Account Management in order to manage the rights of Supervisor Accounts.



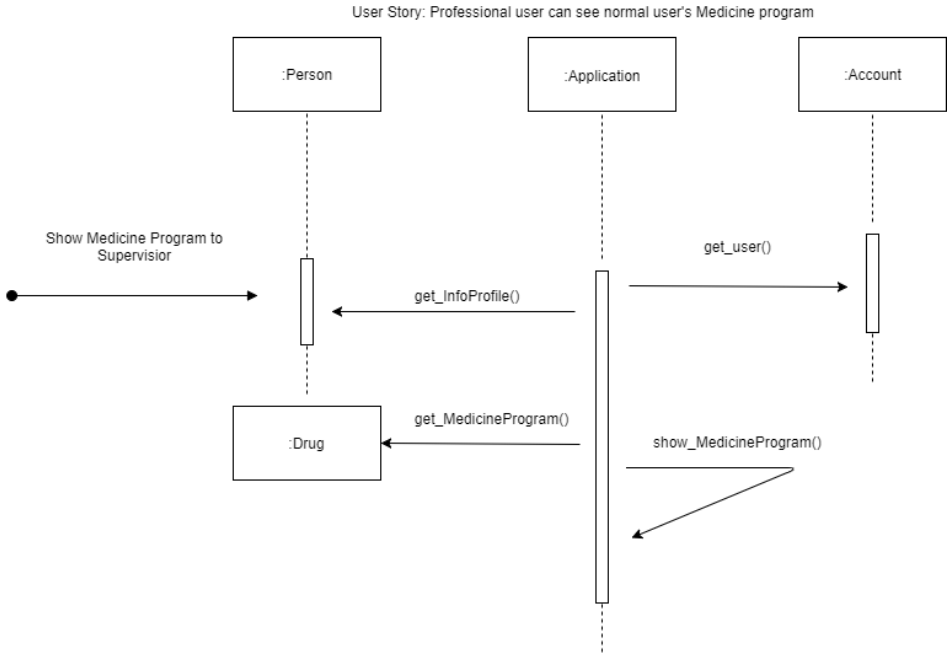
- User story: Supervisor is allowed to access diet information of his/her followers in order to access the HealthMan's diet schedule.



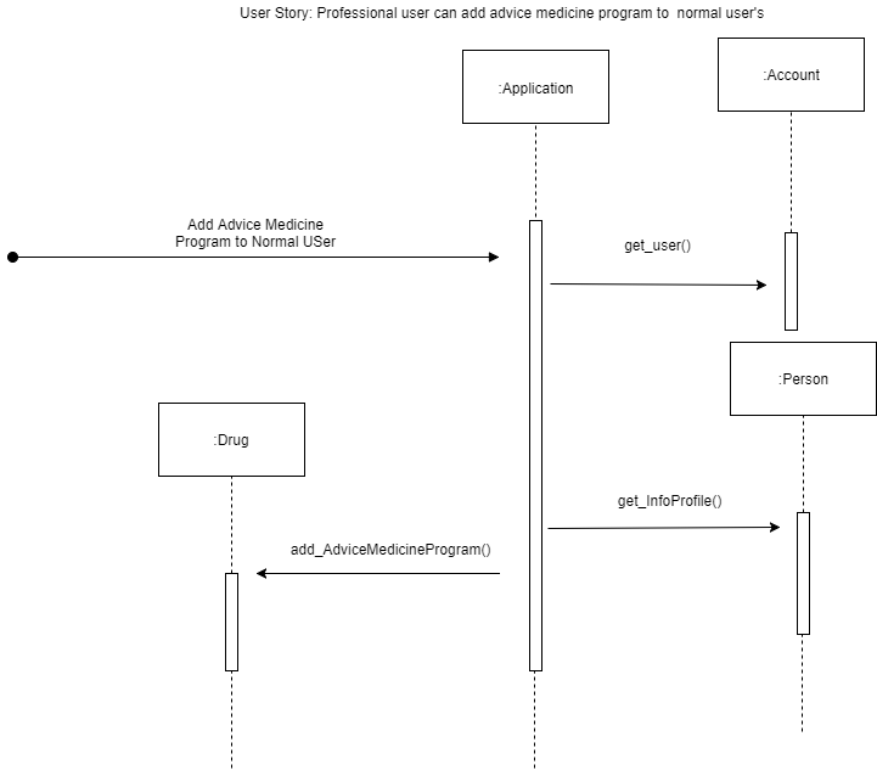
- User story: Supervisor is allowed to access sport information of his/her followers in order to access the HealthMan's sport schedule.



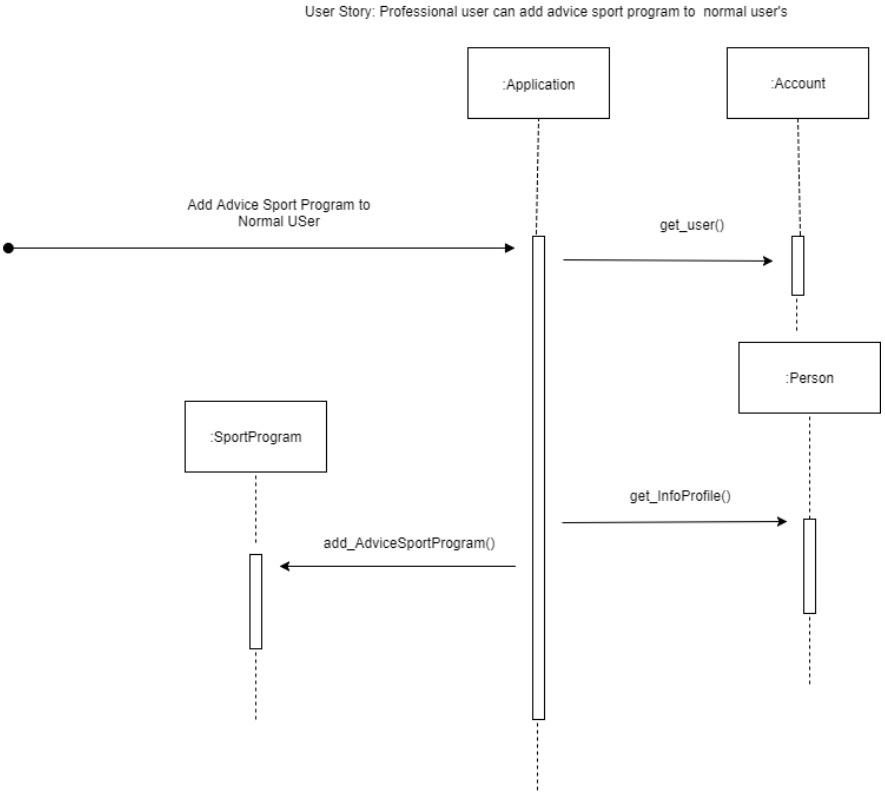
- User story: Supervisor is allowed to access medicine information of his/her followers in order to access the HealthMan's medicine schedule.



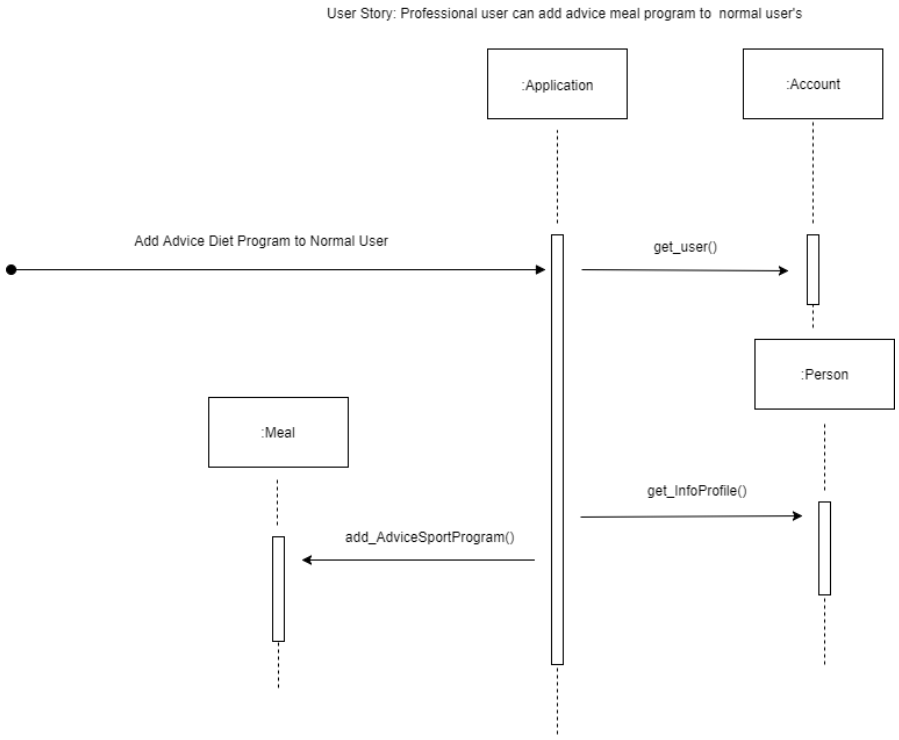
- User story: Supervisor can give medicine recipe advice to HealthMan in order to treat the HealthMan with suitable medicines.



- User story: Supervisor can give sport schedule advice to HealthMan in order to train HealthMan with suitable sport program.



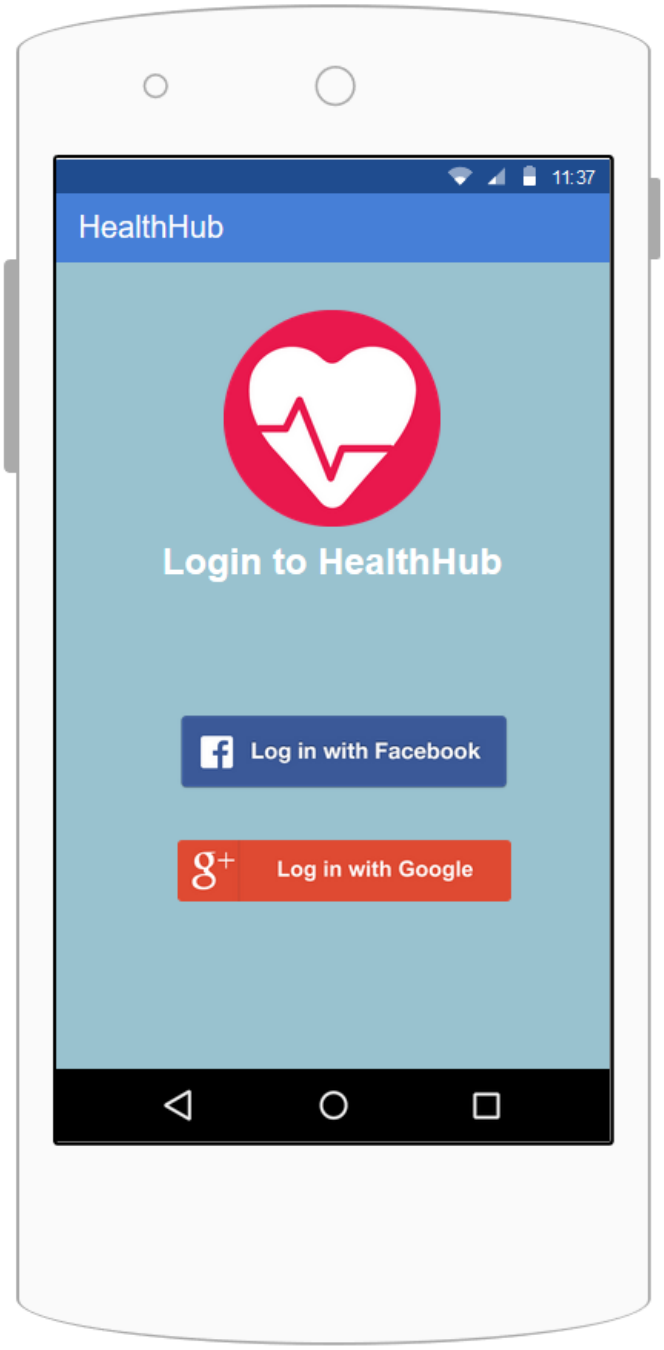
- User story: Supervisor can give diet schedule advice to HealthMan in order to give better diet programs to HealthMan's.



4. USER INTERFACE MODEL

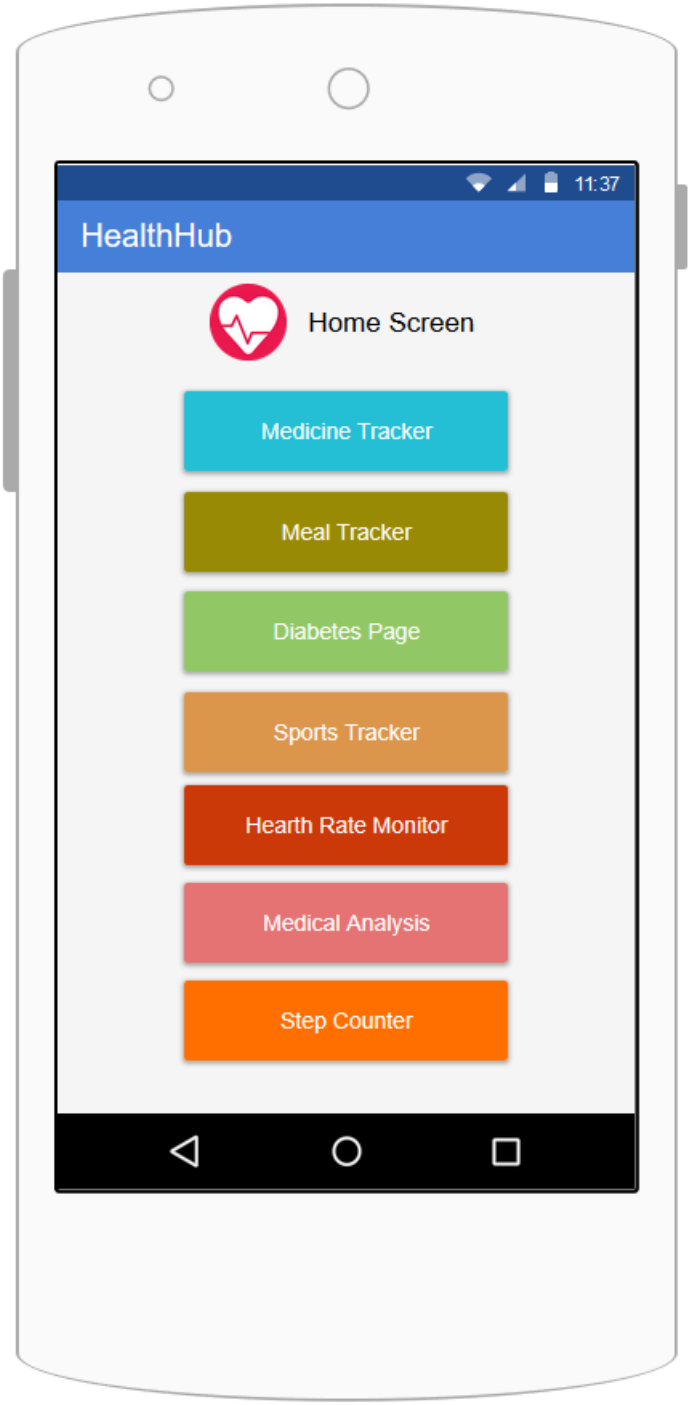
4.1. Log in page mock-up

Mapped user story: Social media login to application in order to login via Facebook and Google Accounts.



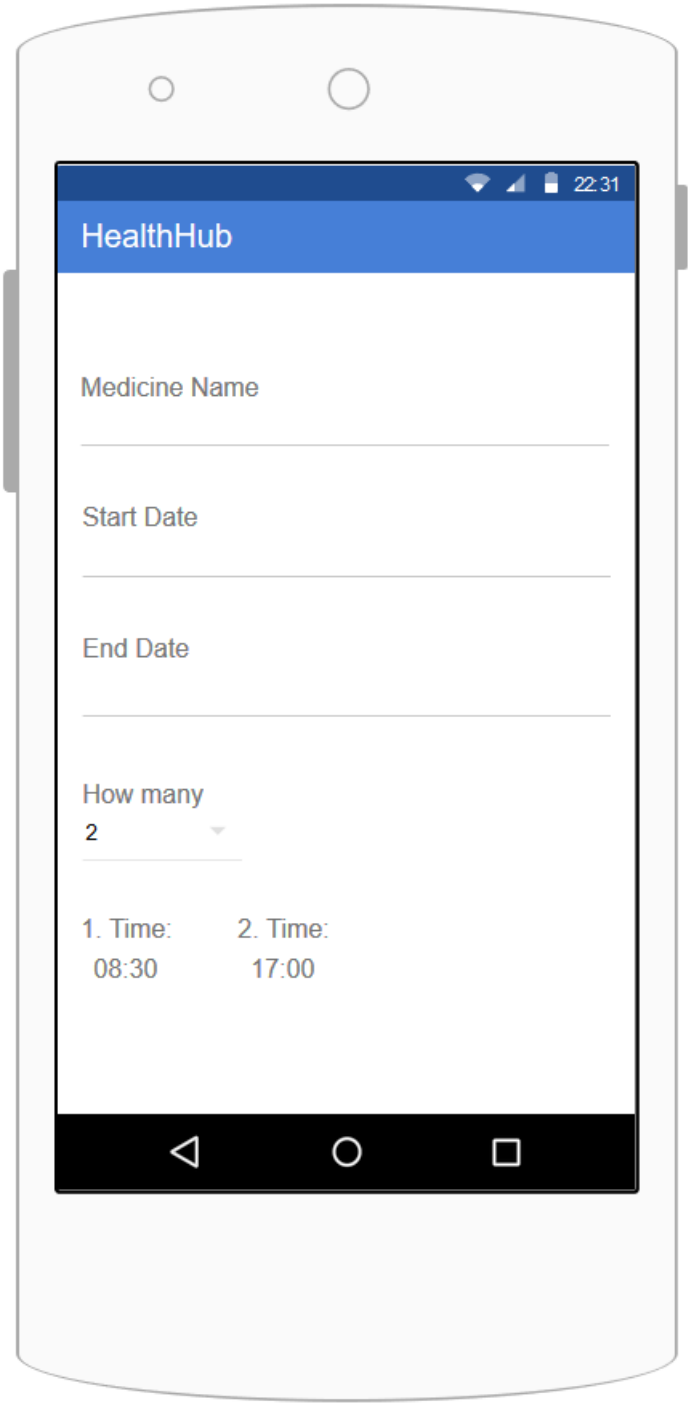
4.2. Homepage Mock-up

Mapped user story: User can reach the all the components of the application from that page.



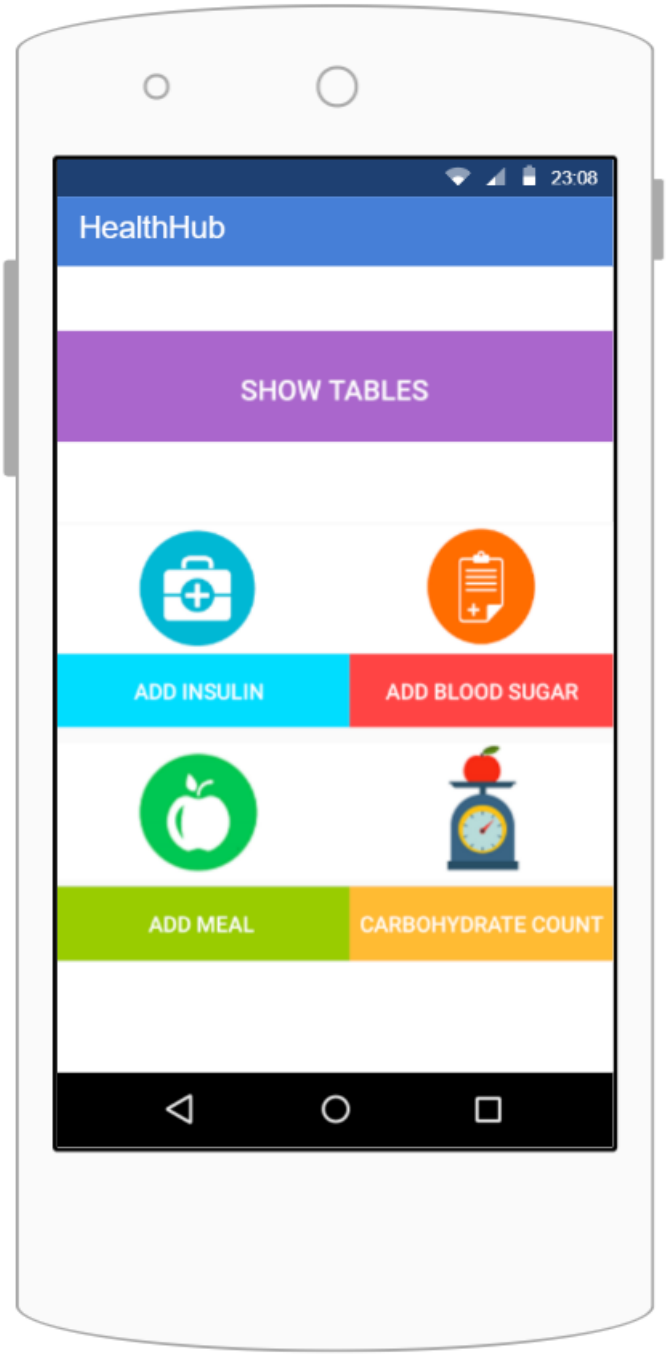
4.3. Medicine Record Page Mock-up

Mapped user story: User can save medicine record in order to keep track of his/her medicine usage.



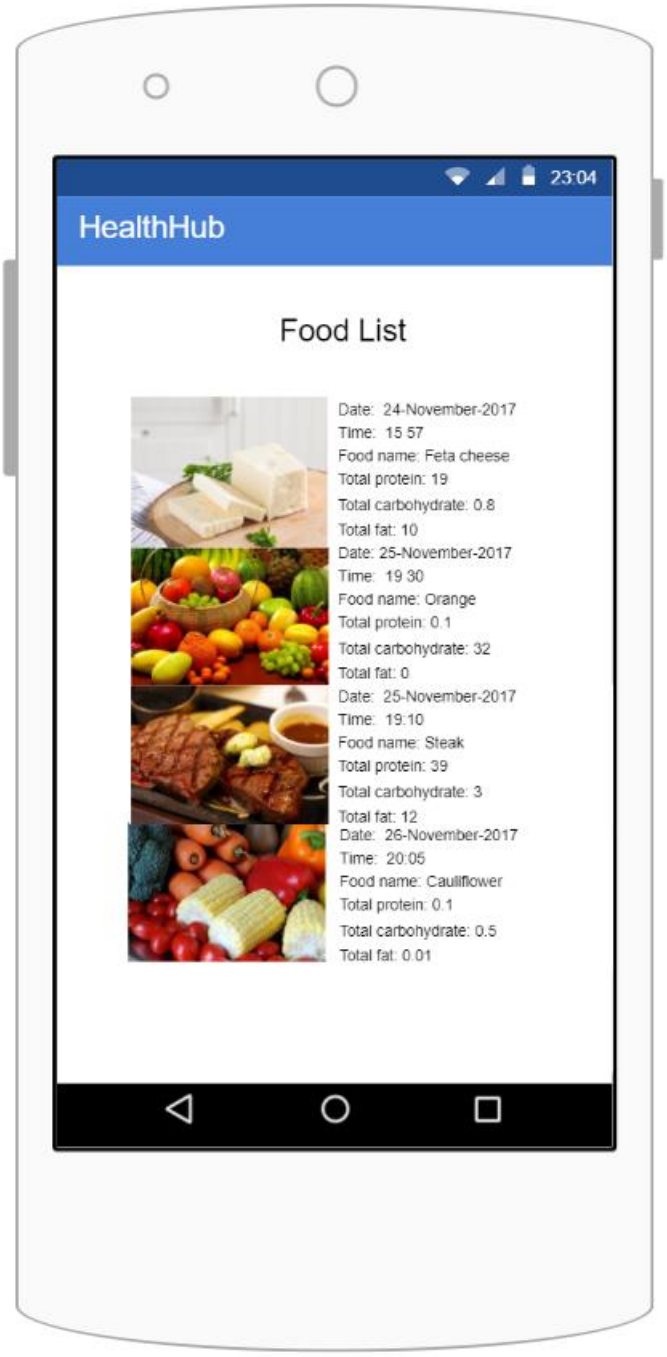
4.4. Diabetes Homepage Mock-up

Mapped user story: User can reach the components of diabetes page of this application from the diabetes homepage.



4.5. Food List Mock-up

Mapped user story: User can reach the records of meal nutritions.

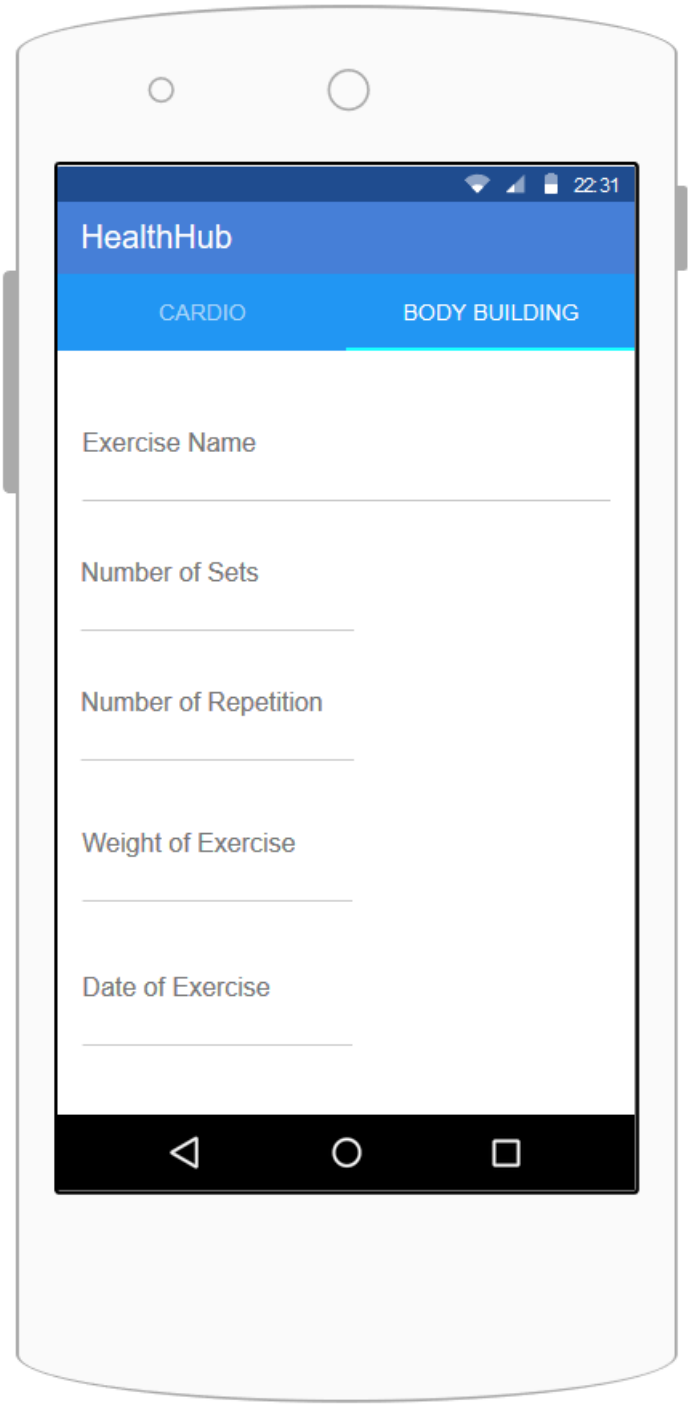


4.6. Medical Analysis Page Mock-up

Mapped user story: User can save and show the medical analysis reports from medical analysis homepage.

4.7. Sport Page Mock-up

Mapped user story: User can save the cardio and bodybuilding records.



4.8. Step Counter Homepage Mock-up

Mapped user story: User can show the step counts and start the pedometer.