

# **iHealthCare**



## **Project Plan and Third Increment Spring 2017**

**Team # 22:** SavvyHackers

**Team members:**

- Sindhu Mudireddy
- Navyasree Kumbam
- Kalyan Kilaru
- Chaitanya Kumar Peravalli

# **1.Introduction**

## **iHealthCare**

iHealthCare is a one stop solution for expensive medical diagnosis.

Using android based mobile application user can perform following operations:

- User can login using Facebook or google or he can register on our domain.
- User can start diagnosis providing minimal details, he/she will get a feel as if they are in conversation with doctor as every response of the user is followed by an adaptive and an intelligent question. I can be a multiple choice or yes/no type.
- On identifying the user condition at the end of diagnosis, we provide a detailed report of the health condition and necessary measures to be taken.
- App suggests nearby doctors, who are specialists in treating patients condition.
- Patient reviews for each practitioner will be displayed to the User.
- On the other hand, based on user condition severity, we monitor user health, posing notification questions and re-diagnosing.
- User will be provided with a graph of his condition severity.

## **2.Project Goal and Objectives(revised)**

### **2.1 Overall goal**

The core idea is to build an intelligent and adaptive symptom checker and to provide the patient with the potential diagnoses and recommend doctor accordingly.

### **2.2 Specific objectives (problem statement)**

To create a unique platform where the application asks patient, possible set of questions on symptoms based on his previous responses and diagnose intelligently.

Provides patient with the possible health conditions along with severity and description of the same.

## 2.3 Specific features

**Diagnose:** This feature makes the patient to interact with a set of possible questions on the symptoms based on the responses given by the user previously.

**Monitoring Health Condition:** This helps the user to monitor his/her health condition based on the previous diagnosis.

**Nearby Doctors:** This feature gives the patient with the nearby doctors list and it will even show the path to the location of doctors within a specified distance.

**2.4 Significance** This app provides the feel as if the patient is speaking to a doctor on a medical condition.

Apart from diagnosis, it also supports the patient by selecting a doctor and scheduling an appointment. This app is a single place where patient can get all these features.

## 3. Project Plan

### 1. Zen-Hub Screenshot

For the second increment, we had the following issues in Zen-Hub as shown in the screen shot, they are implementing Signup screens which fetch user details, implementing diagnosis, implementing Google oAuth and implementing Facebook oAuth. Apart from these, we had issues like updating the Class diagrams, creating test cases and integrating all the modules.

GitHub, Inc. [US] | <https://github.com/Chaitanyaperavali/iHealthCare/issues>

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Filters is:issue is:open Labels Milestones New issue

7 Open	11 Closed	Author	Labels	Projects	Milestones	Assignee	Sort
<b>Making Report</b> 6	#53 opened 12 seconds ago by kalyankilaru	Increment 3	New Issues				
<b>Facebook and Gmail login Data</b> 6	#52 opened 22 minutes ago by kalyankilaru	Increment 3	Done				
<b>Google maps-Near by doctors</b> 13	#51 opened 22 minutes ago by kalyankilaru	Increment 3	In Progress				
<b>Diagnosis</b> 13	#50 opened 23 minutes ago by kalyankilaru	Increment 3	New Issues				
<b>Infemedica API</b> 13	#49 opened 24 minutes ago by kalyankilaru	Increment 3	New Issues				
<b>Firebase Implementation for Login and Registration</b> 6	#48 opened 25 minutes ago by kalyankilaru	Increment 3	In Progress				
<b>Database Implementation</b> 13	#47 opened 26 minutes ago by kalyankilaru	Increment 3	In Progress				

GitHub, Inc. [US] | <https://github.com/Chaitanyaperavali/iHealthCare/milestone/4?closed=1>

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Increment 3 Edit milestone New issue

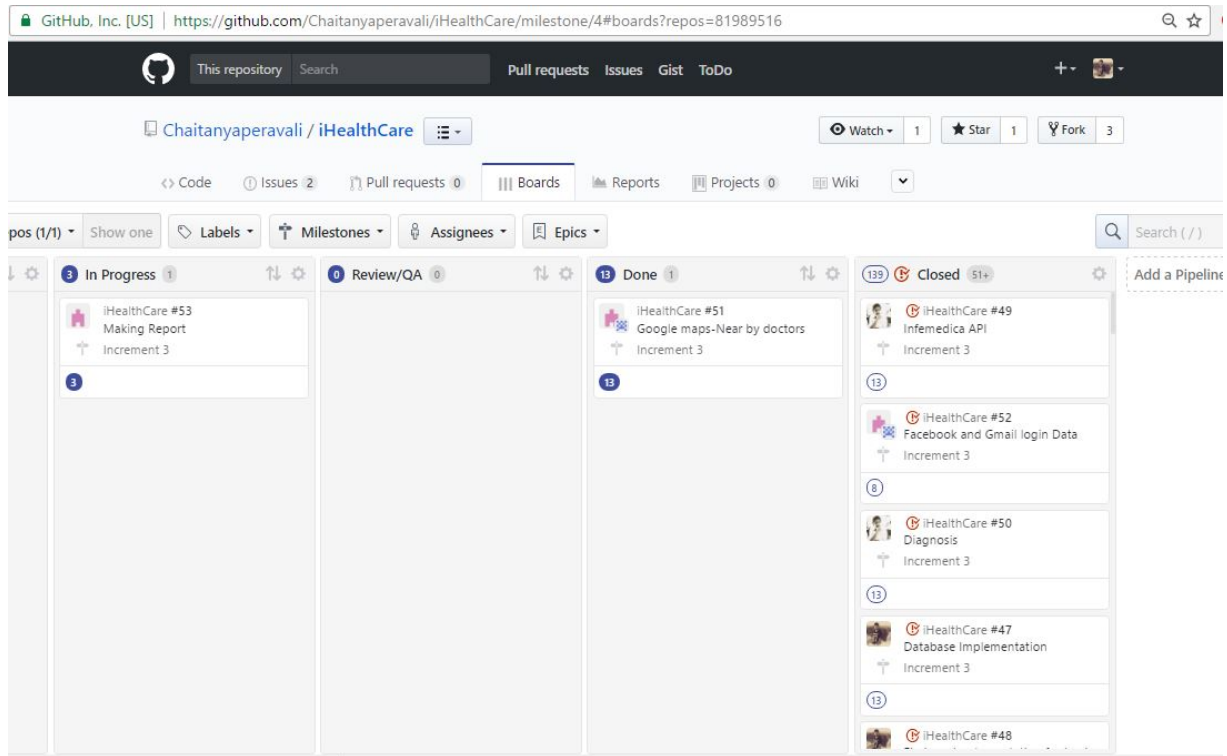
Due by April 10, 2017 71% complete

See this milestone on the board

2 Open	5 Closed
<b>Infemedica API</b> 13	#49 by kalyankilaru was closed 37 seconds ago
<b>Facebook and Gmail login Data</b> 6	#52 by kalyankilaru was closed 2 minutes ago
<b>Diagnosis</b> 13	#50 by kalyankilaru was closed 2 minutes ago
<b>Database Implementation</b> 13	#47 by kalyankilaru was closed 2 minutes ago
<b>Firebase Implementation for Login and Registration</b> 6	#48 by kalyankilaru was closed 4 minutes ago

## Project Timelines, Members, Task Responsibility

Below is the screen shot of the boards, which tracks the issues and the state of the issues like in open state, review, in progress and closed states etc. This also shows the milestone of each issue.



## Burndown Chart

The burndown chart for the total issues of increment 2, which are in open and closed status.

## Increment 3



## 4. Third Increment Report

### 4.1 Existing Services/REST API

The below mentioned API's are used in the second increment to make it a user-friendly application.

#### 1. Facebook Authentication API:

As Facebook is a social platform where many people are connected, the Facebook Authentication API will let users to create an account easily with their Facebook account.

#### 2. Google Authentication API:

In similar to that of Facebook, many users are connected to Google so by making Google Authentication to the users of our will make them easy to sign up to our application.

The following API's are used in the third increment to get the medical information, doctor's details and google maps.

#### 3. Infermedica API:

This is an Artificial Intelligence API which is used for medical Diagnosis. This API is used to take the symptoms of patient, diagnose the condition of the patient and generates the report. At the end patient can get the suggestions of relevant symptoms.

#### **4. BetterDoctor API :**

BetterDoctor API is used to access the information of doctors such as Doctor's Name, location, phone number and specialty.

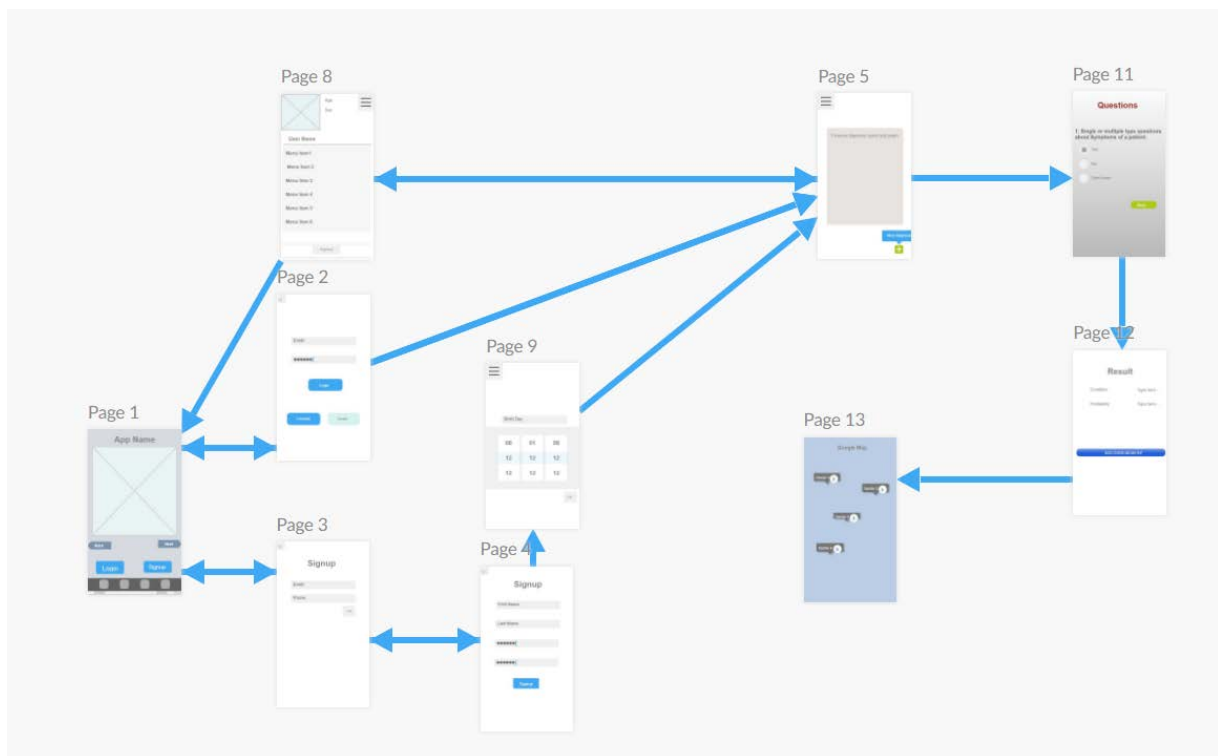
#### **5. Google Maps API :**

Google maps API is used to access the google maps into our application. In this Application google maps displays the information of Doctors for a particular condition.

## 4.2 Detail Design of Features

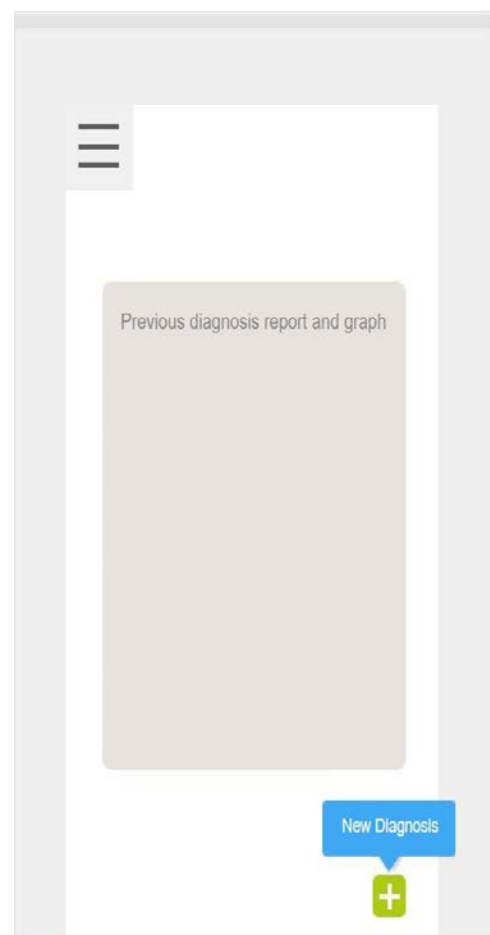
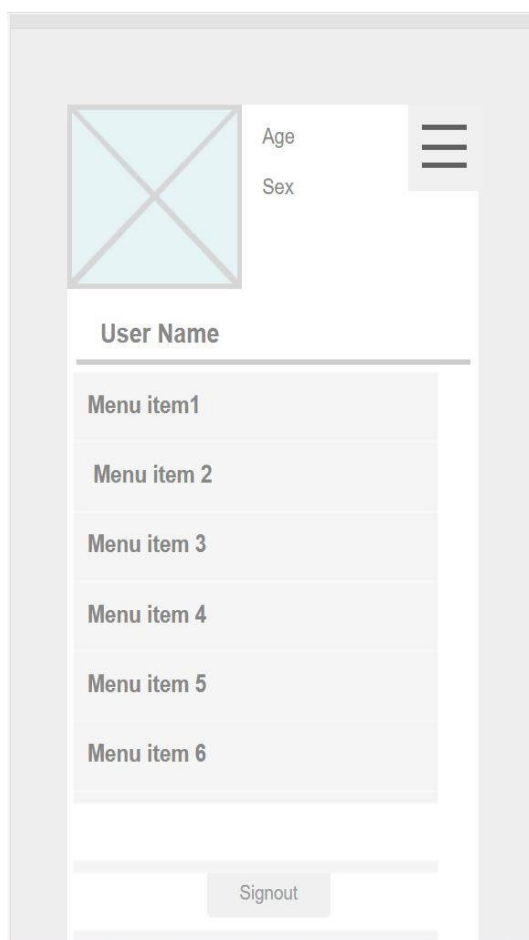
### 4.2.1. Wireframes:

#### Flow Chart:





## Home and Diagnosis Screen:



## Questions and Condition Screen :

### Questions

1. Single or multiple type questions about Symptoms of a patient.

☒ Yes

☐ No

☐ Dont know

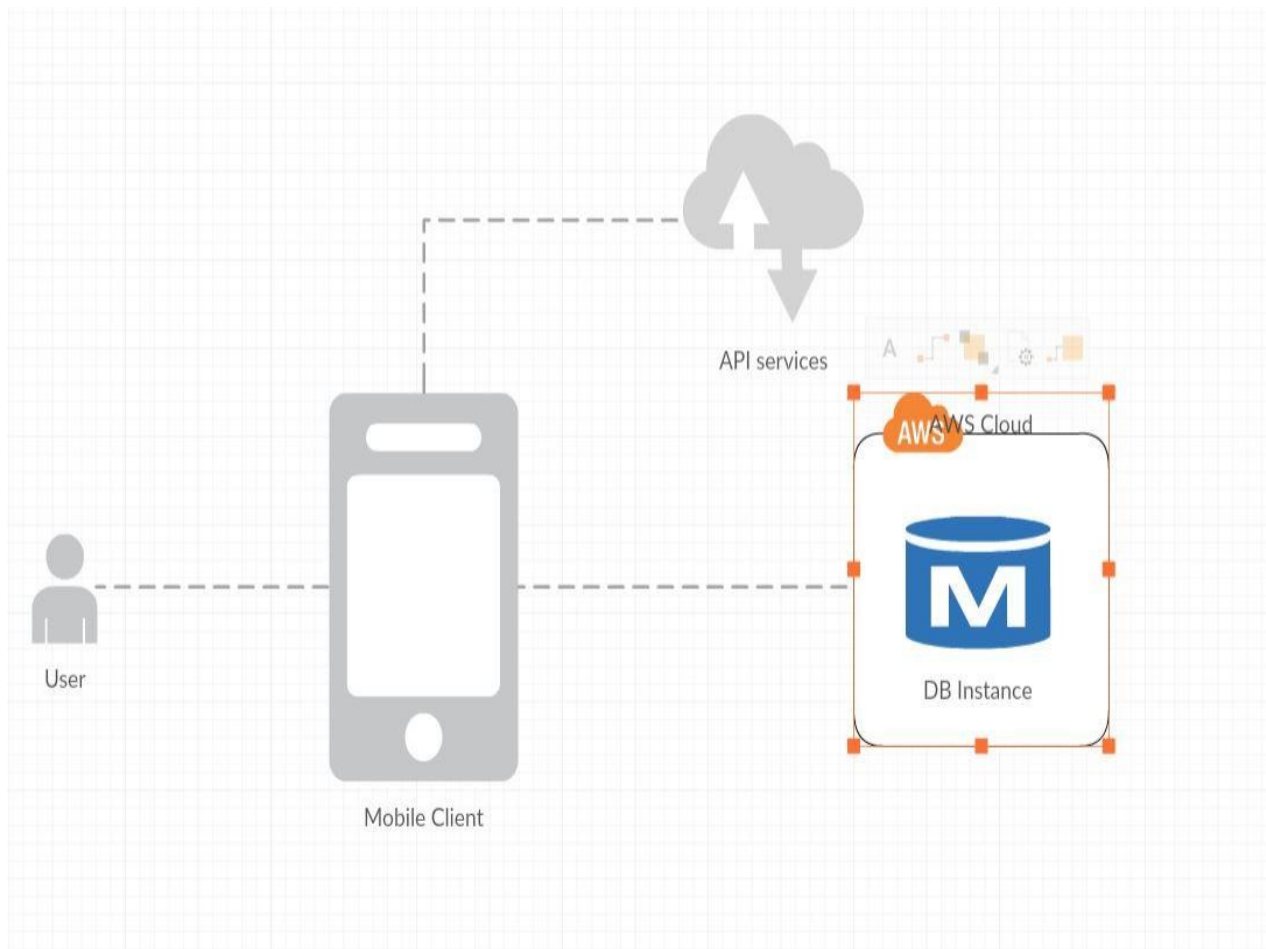
Next

### Result

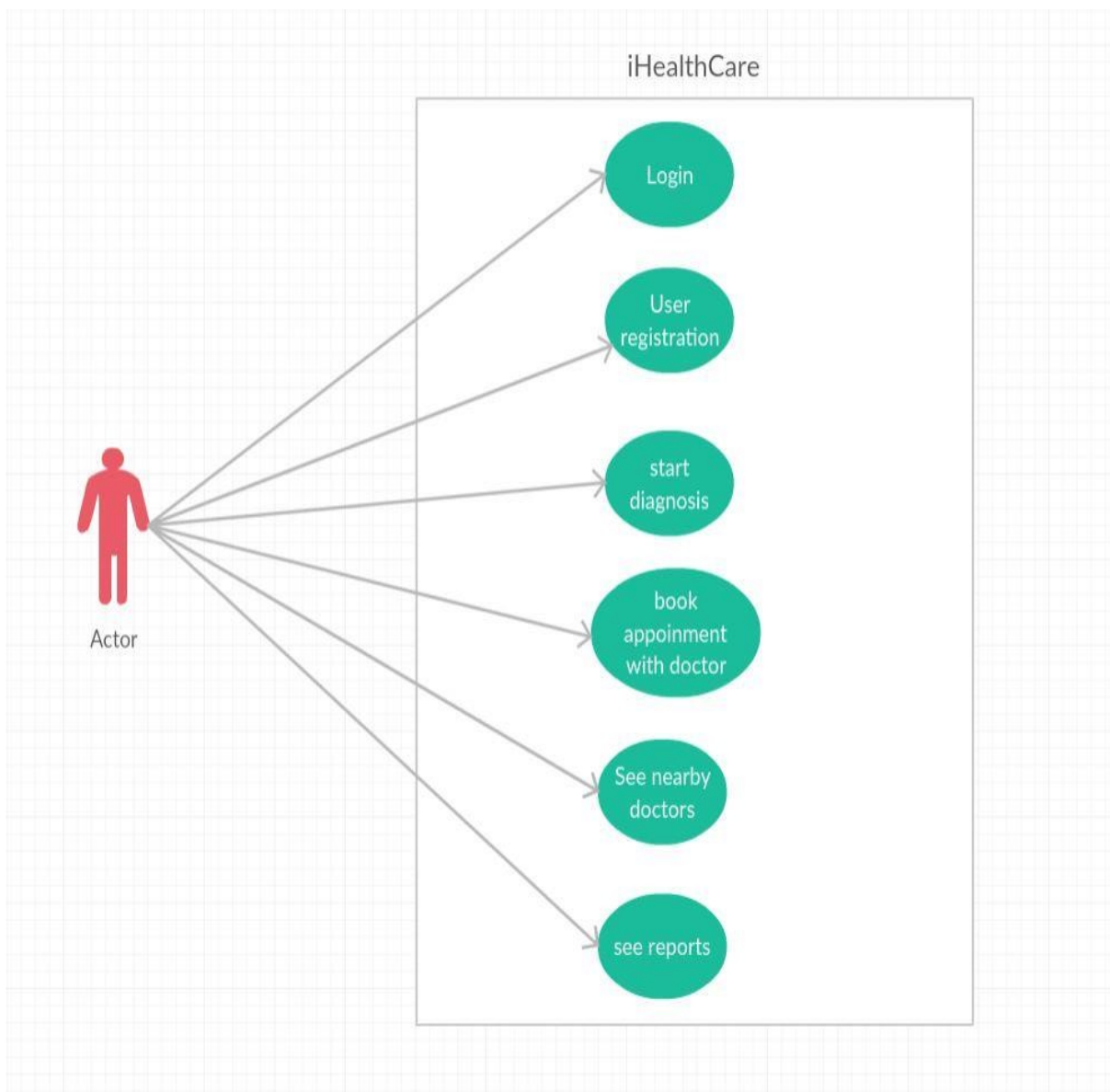
Condition	Migraine
Probability	0.945

DOCTORS NEAR BY

### 4.2.1 Architecture Diagram:



#### 4.2.2 Use Case Diagram:



## 5. Testing

TEST CASE	DESCRIPTION	EXPECTED RESULT	ACTUAL RESULT
Login	Enter invalid username and password	Display error message showing that users credentials are valid	Pass
Login	Enter invalid username and valid password	Display error message showing that users credentials are valid	Pass
Login	Enter valid username and invalid password	Display error message showing that users credentials are valid	Pass
Login	Enter valid username and valid password	Redirected to Home Page	Pass
Login	Login using Google, Enter invalid gmail	Display that given gmail is invalid	Pass
Login	Login using facebook Enter invalid details	Display that given facebook details are invalid	Pass
Login	Login using Google/Facebook	Redirected to home page	Pass

	Enter valid details		
Signup	The email should be in format of @ex.com, give different format	Display invalid email	Pass
Signup	Password should contain 8 characters, Enter characters less than 8	Display password is too short	Pass
Signup	Gender not selected	Displays please select gender	Pass
Signup	Date of Birth/Height/Weight One or more of the these are not entered	Displays please fill this field	Pass
Signup	Successful registration with all valid data.	Redirected to Home page	Pass
Home/Diagnosis	Select new diagnosis,	Symptoms and the adaptive questions with one answer and multiple answer type are asked.	Pass
Report	Given input for the questions asked	Displays a defined report with condition and the probability	Pass

Doctors nearby	Select doctors nearby button	Map with available doctors for the condition in nearby location are displayed along with doctor's details.	Pass
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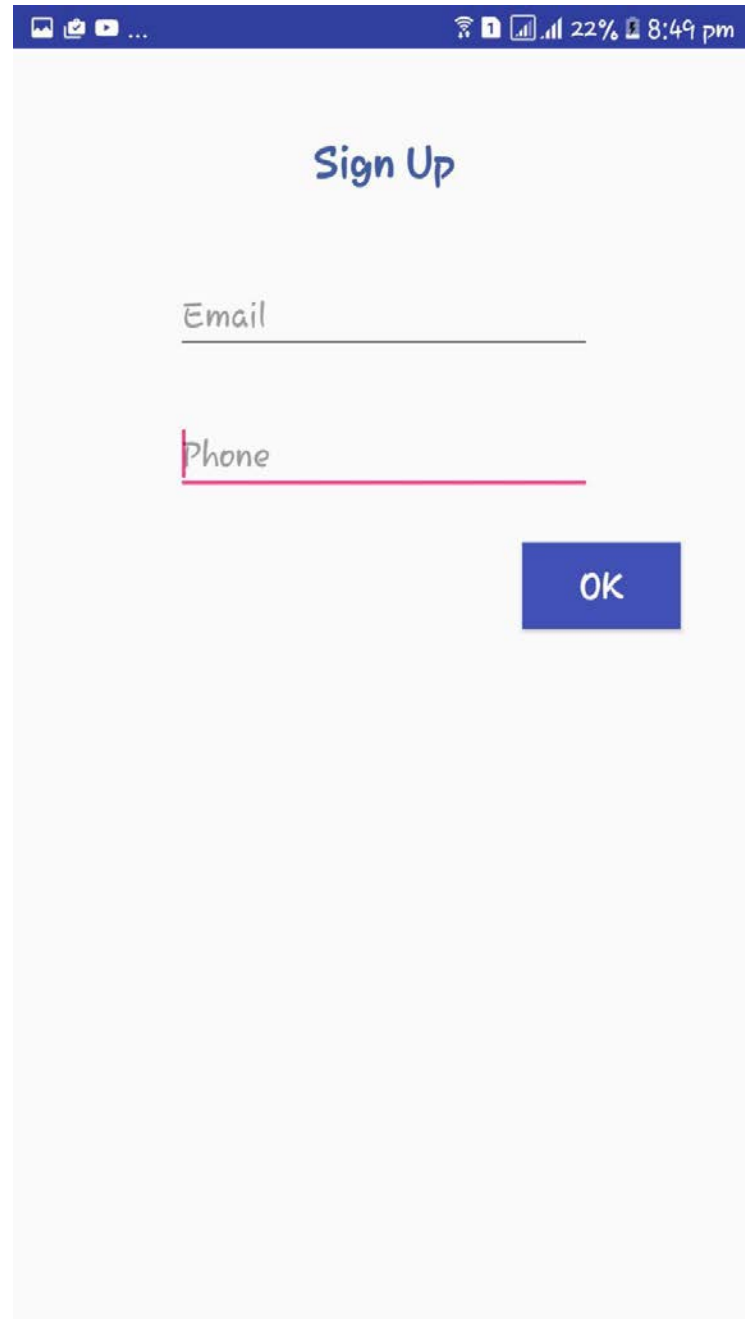
## 6. Implementation and Deployment

The application is developed in Android Studio and is deployed in the Emulator and Android Mobile.

### Screenshots:

Below are the screen shots of the login and signup pages. In addition to that Home Screen and Diagnosis where Patient can start his diagnosis. Apart from that the symptoms screen where the patient can select multiple symptoms which are experienced by him. After that user interactive questions screen which contains single type and multiple type questions to get the condition of the patient and Displays the result. Next screen shows Doctors for that condition in the map if required. Maps screen displays the name, image, ratings and information about the doctor.

## Signup page:



A screenshot of a mobile application's signup page. The page has a light gray background. At the top, there is a dark blue status bar with white icons for gallery, messages, and YouTube, followed by a blue header bar with white icons for Wi-Fi, cellular signal, and battery status (22% at 8:49 pm). The main content area is centered and contains the text "Sign Up" in a dark blue, sans-serif font. Below this, there are two input fields. The first is labeled "Email" in a light gray font, with a thin gray underline. The second is labeled "Phone" in a light gray font, with a thin pink underline. To the right of the "Phone" field, there is a blue button with the text "OK" in white, sans-serif font.

Sign Up

Email

Phone

OK



## Sign Up


First Name \_\_\_\_\_






Last Name \_\_\_\_\_

Password \_\_\_\_\_

Confirm Password \_\_\_\_\_

OK



23%8:51 pm

## Sign Up

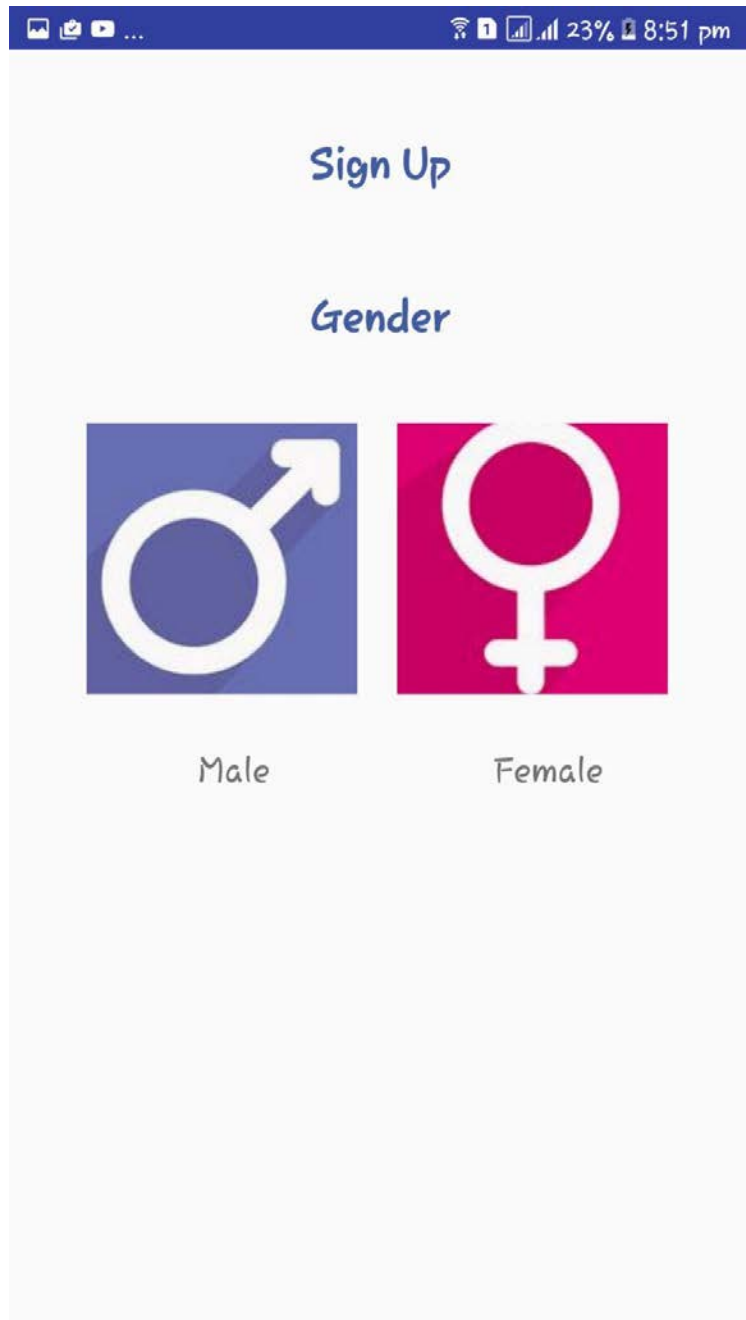
Kalyan


kilaru

.....

.....

OK



A mobile status bar at the top of the screen with a dark blue background. It contains icons for signal strength, Wi-Fi, battery level (26%), and time (9:04 pm).

Date Of Birth

16

Nov

1990

17

Dec

1991

18

Jan

1992

Height

162

Weight

130

SIGN UP

Authentication failed.

## Sign Up

Date Of Birth

09	Mar	2016
10	Apr	2017
11	May	2018



Height

Height in cms

Weight

Weight in Pounds

SIGN UP



## Sign Up

005kvs@gmail.com

8167459970

OK


## Login Page:


The screenshot shows a mobile application interface for a login page. At the top, there is a status bar with icons for gallery, mail, and YouTube, along with network, battery (22%), and time (8:46 pm) indicators. The main content area has a light gray background. In the center, there are two input fields: the first contains the email address '005kvs@gmail.com' and the second contains masked characters '.....'. Below these fields are three buttons: a blue 'LOGIN' button, a white 'Sign In' button with a Google logo, and a blue 'Continue with Facebook' button with a Facebook logo. At the bottom, a dark gray rounded rectangle displays the message 'Authentication failed.'

005kvs@gmail.com

.....

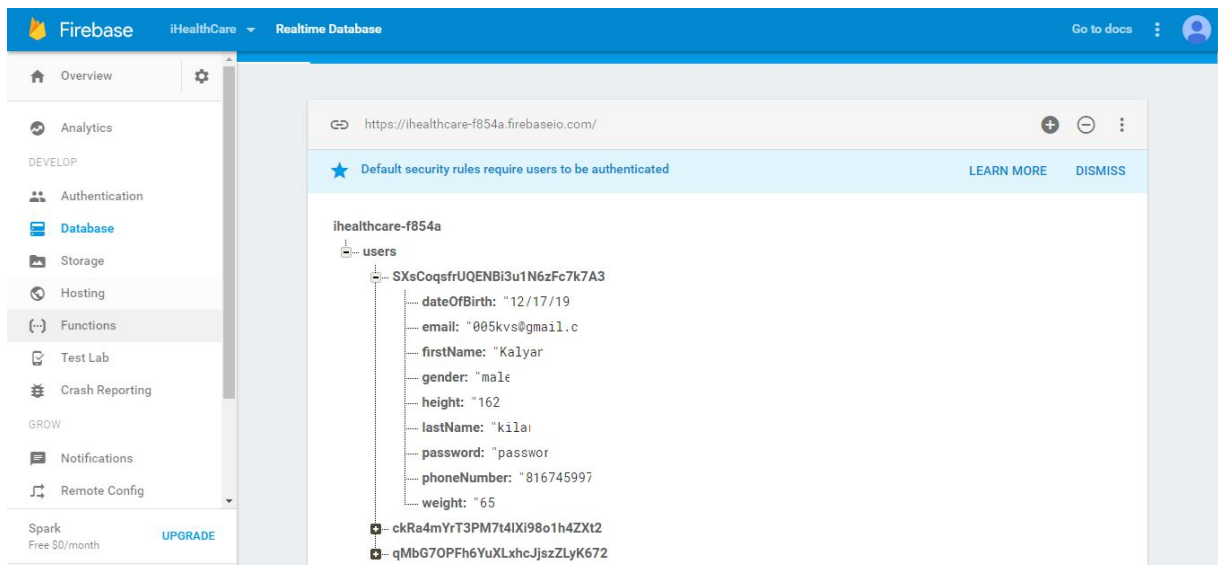
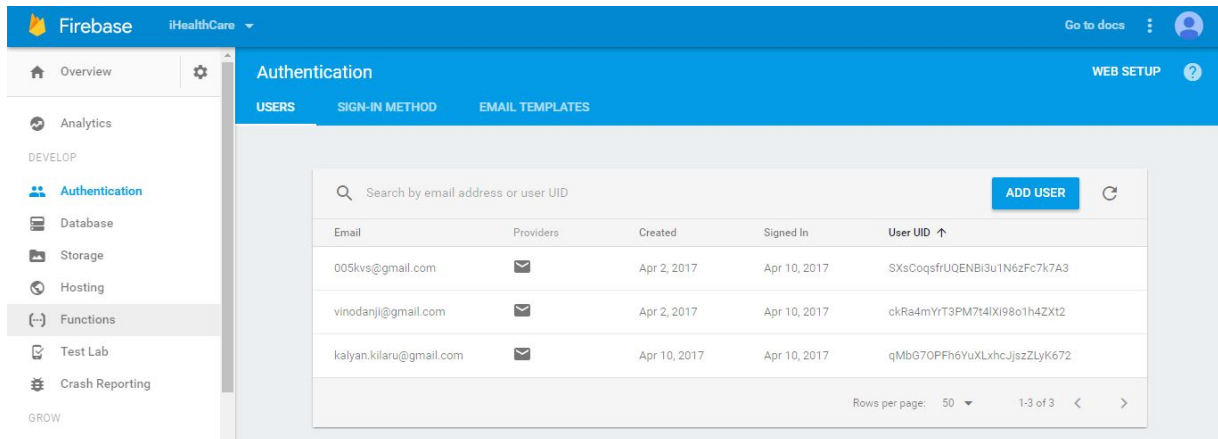
LOGIN

 Sign In

 Continue with Facebook

Authentication failed.

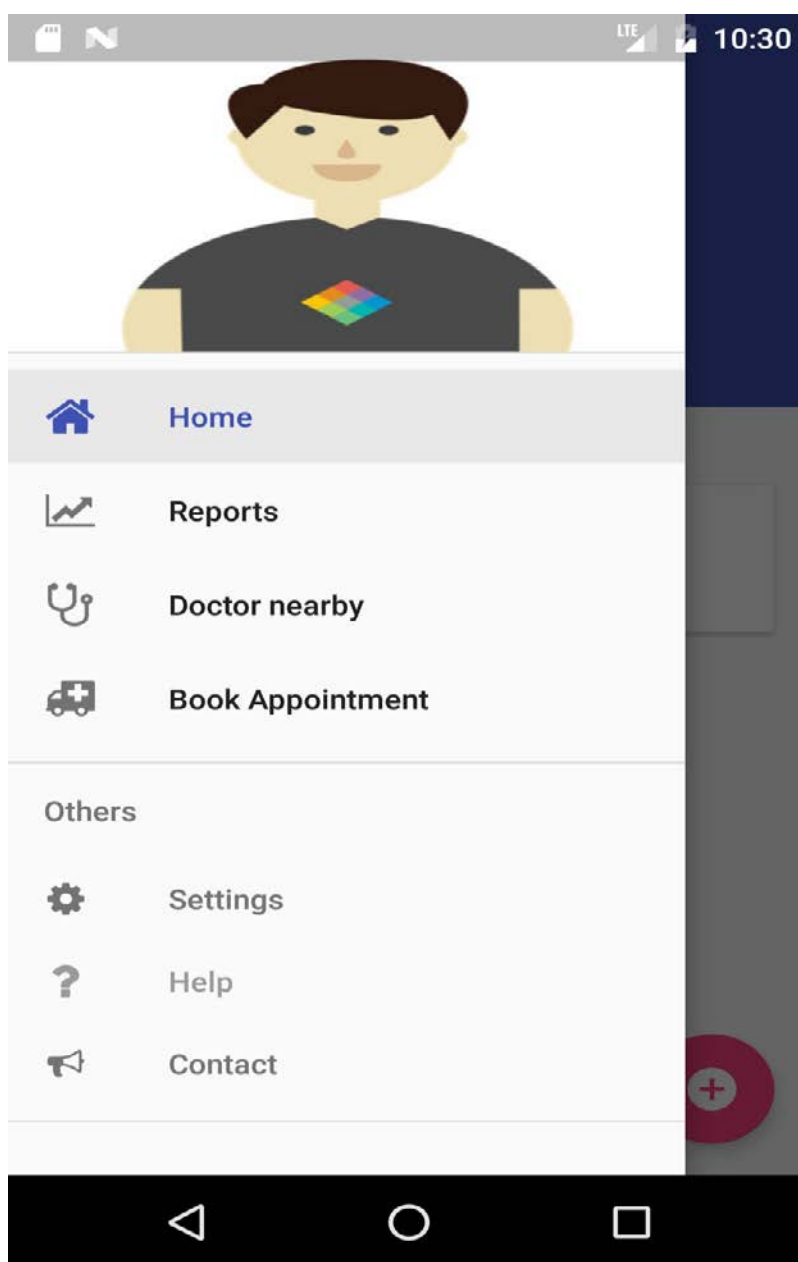
## Firestore for authentication:



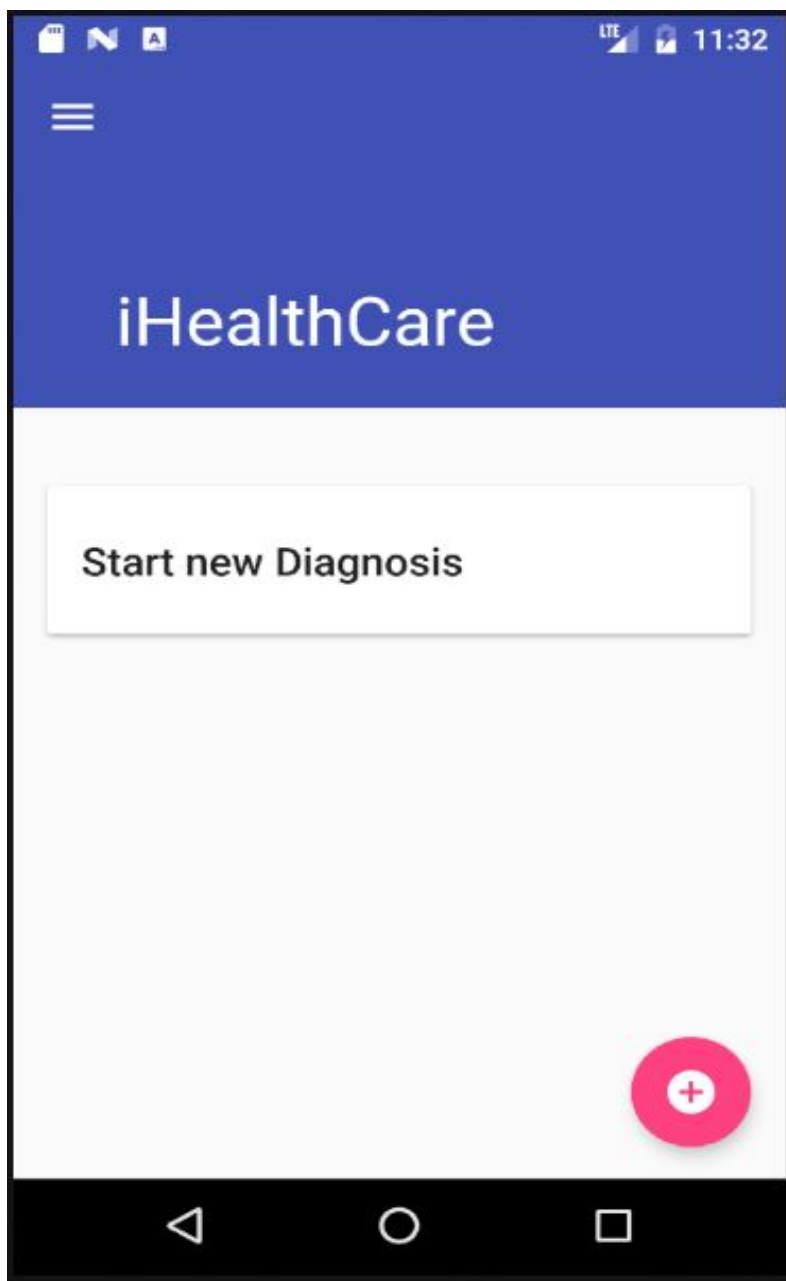


## Home Screen:

The user can start the diagnosis here by responding to some questions that are posted in this screen and depending on the user's response to the previous question the next question will be posted. Apart from the diagnosis the user can check the previous reports here.

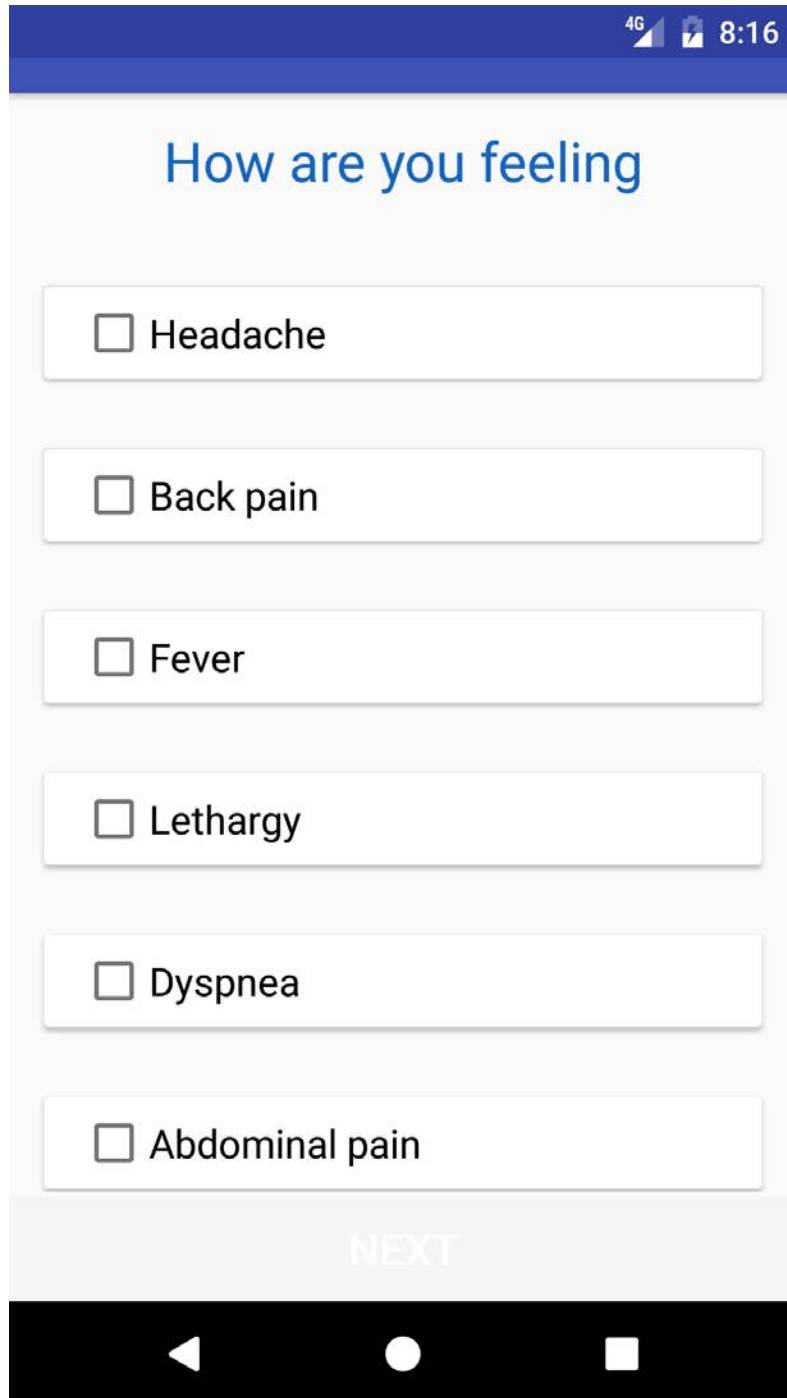


## New Diagnosis:



### Symptoms:

Here user can select the symptoms of a patient and then next button enables. If he clicks the next button then it takes to the questions screen.



4G 8:16

## How are you feeling

☐ Headache

☐ Back pain

☐ Fever

☐ Lethargy

☐ Dyspnea

☐ Abdominal pain

NEXT

4G 8:16

## How are you feeling

☒ Headache

☐ Back pain

☐ Fever

☐ Lethargy

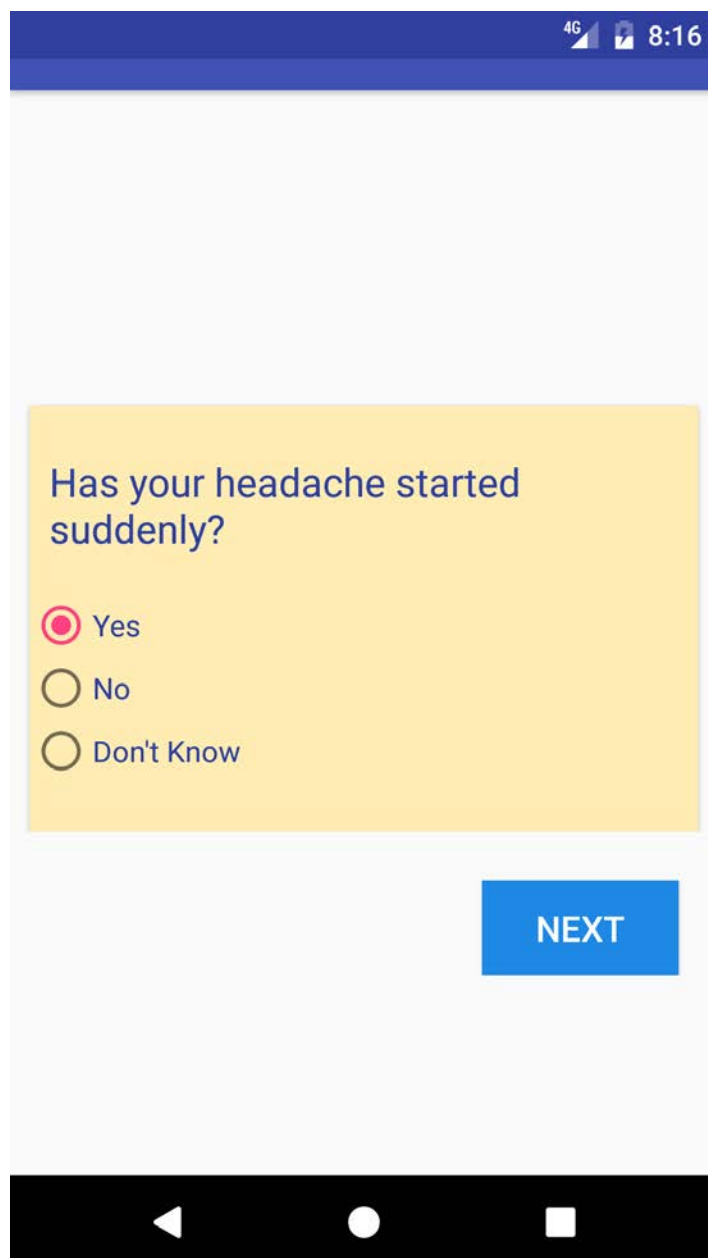
☐ Dyspnea

☐ Abdominal pain

NEXT

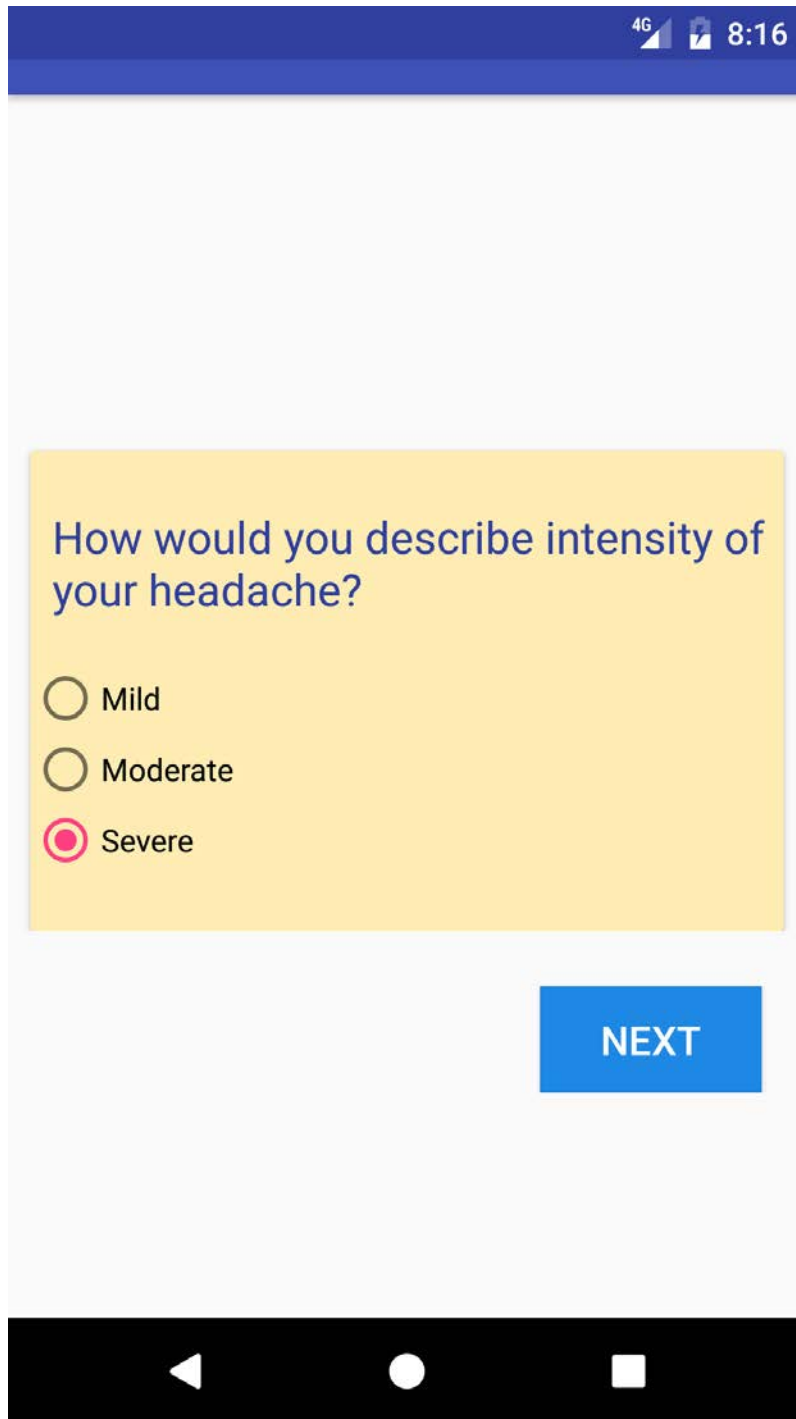
### Questions:

According to the above selected symptoms the application asks the user some single type or multiple type questions to diagnose and get the condition of the user. Once if the next button is clicked user will be navigated to further different questions adaptively.



The screenshot shows a mobile application interface. At the top, there is a dark blue status bar with '4G' and a battery icon on the left, and '8:16' on the right. Below this is a light gray header area. The main content area is a light gray rectangle. In the center of this area is a yellow rounded rectangle containing the text 'Has your headache started suddenly?'. Below this text are three radio button options: 'Yes' (selected with a red dot), 'No', and 'Don't Know'. At the bottom right of the yellow rectangle is a blue button with the text 'NEXT'. At the very bottom of the screen is a black navigation bar with three white icons: a back arrow, a circle, and a square.

**Single type questions:** user can select only one option.



A screenshot of a mobile application interface. At the top, a dark blue status bar shows '4G', a battery icon, and the time '8:16'. The main content area is light gray. A yellow rectangular box contains the question 'How would you describe intensity of your headache?' in dark blue text. Below the question are three radio button options: 'Mild', 'Moderate', and 'Severe'. The 'Severe' option is selected, indicated by a pink dot in the center of the radio button. At the bottom right of the yellow box is a blue button with the text 'NEXT' in white. The bottom of the screen features a black navigation bar with three white icons: a back arrow, a circle, and a square.

4G 8:16


How would you describe intensity of your headache?

☐ Mild

☐ Moderate

☒ Severe

NEXT

4G  8:17

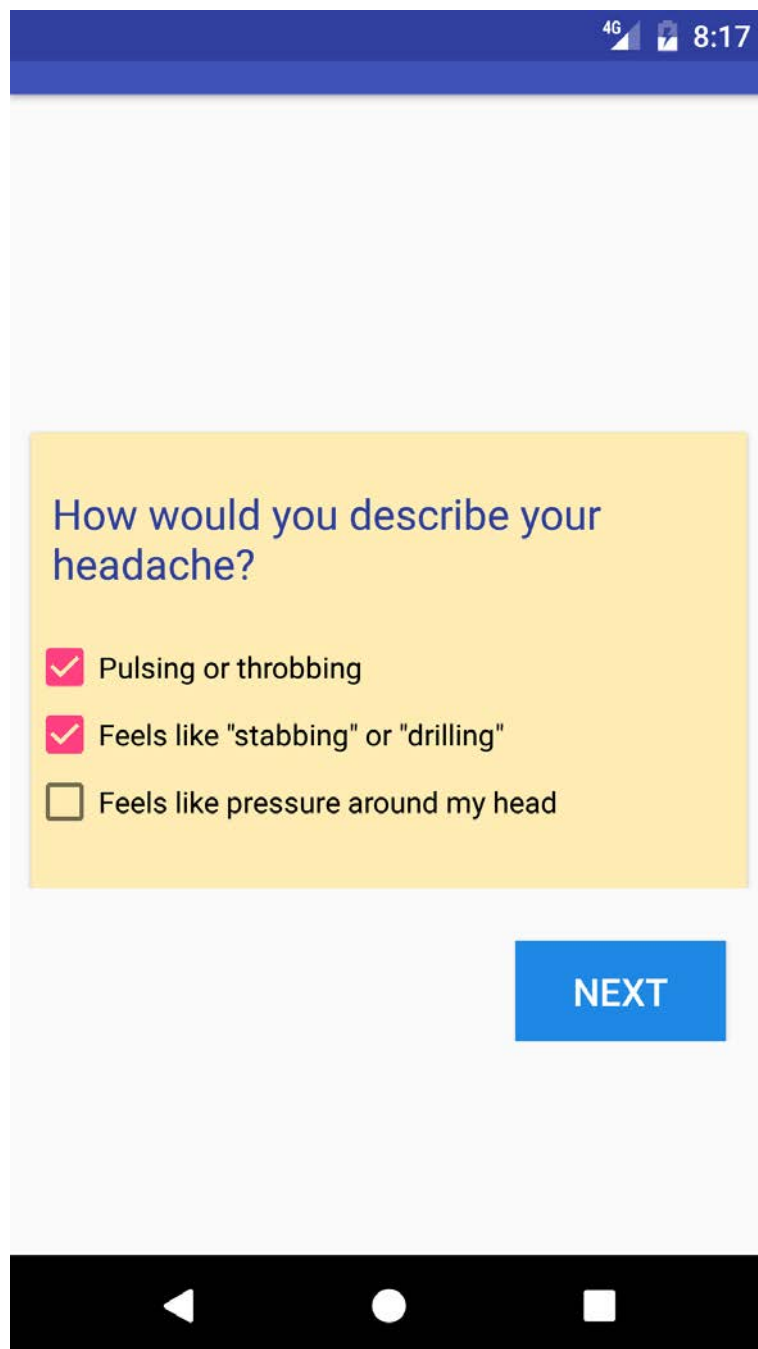
What is your body temperature?

☐ Between 99.5 and 101 °F (37 and 38 °C)

☒ Above 101 °F (38 °C)

NEXT

**Multiple type questions:** User can select multiple options according to his symptoms and condition.



A screenshot of a mobile application interface. At the top, a dark blue status bar shows '4G', a battery icon, and the time '8:17'. Below this is a light gray header area. The main content area features a yellow rectangular box with the question 'How would you describe your headache?' in dark blue text. Below the question are three options, each with a checkbox: 'Pulsing or throbbing' (checked with a red checkmark), 'Feels like "stabbing" or "drilling"' (checked with a red checkmark), and 'Feels like pressure around my head' (unchecked). To the right of the yellow box is a blue button with the text 'NEXT' in white. At the bottom of the screen is a black navigation bar with three white icons: a back arrow, a circle, and a square.

4G 8:17

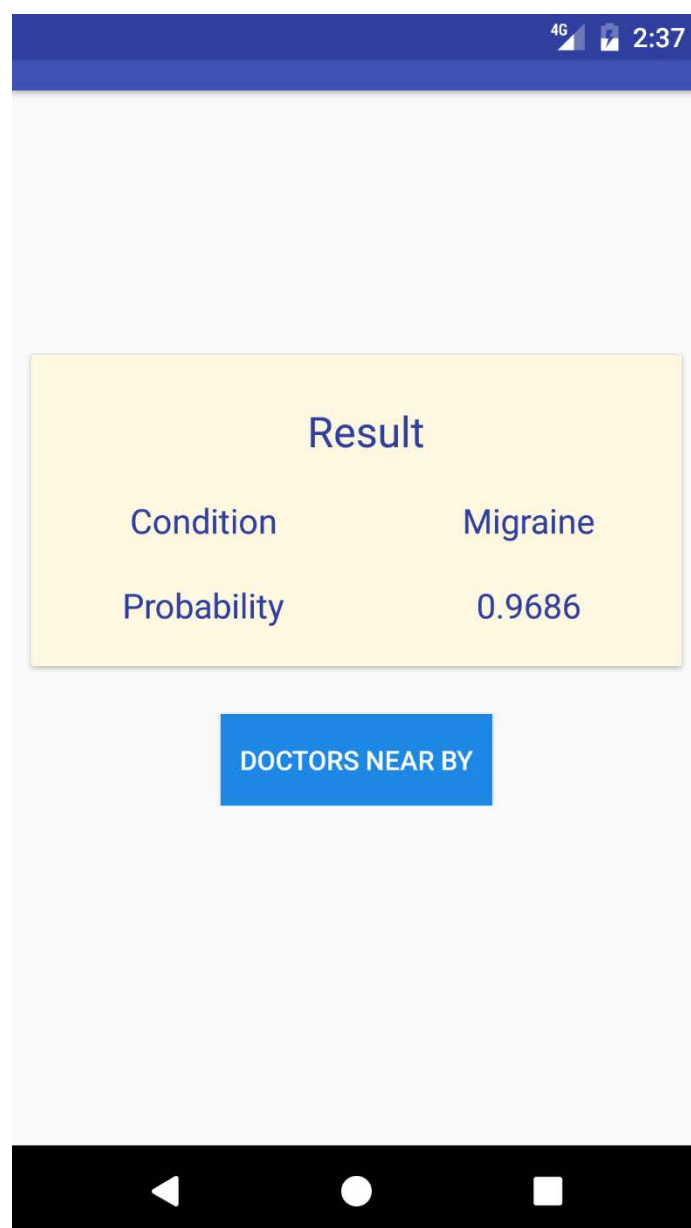
How would you describe your headache?

- ☒ Pulsing or throbbing
- ☒ Feels like "stabbing" or "drilling"
- ☐ Feels like pressure around my head

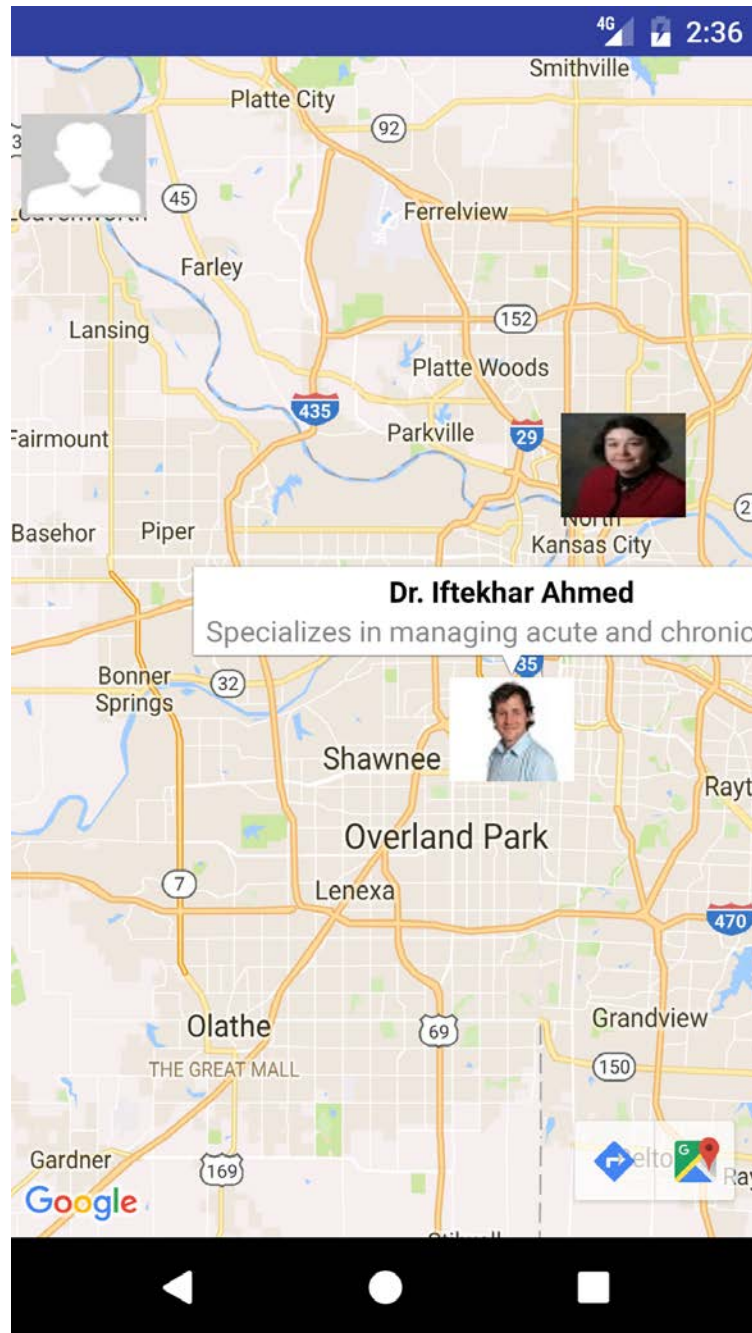
NEXT



**Conditions:** According to the response given by the user, application generates the report which involves the condition and its probability. If the probability is greater than 0.8 then user will be given a button doctors near by. By clicking on this button the user can find the doctors according to the condition near his current location.







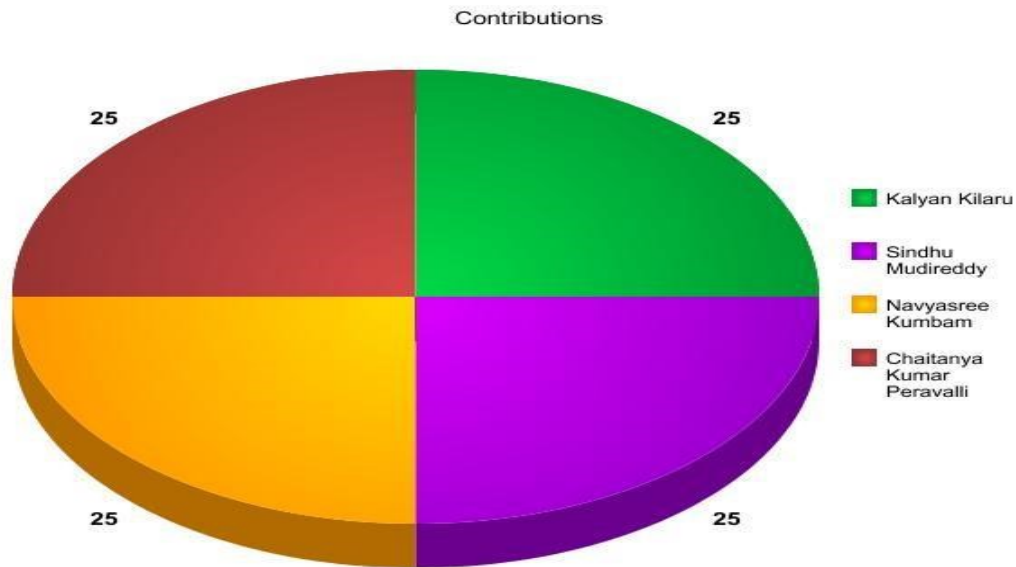
## **6. Project Management**

### **Work Completed:**

- Design and Architecture of the application
- Login authentication using Google Firebase.
- Generated the report by diagnosis using Infermedica API
- Collected the information of doctors using BetterDoctor API
- Maps activity is implemented which displays the doctor's details.

### **Contributions:**

- Sindhu Mudireddy - 25%
- Navyasree Kumbam -25%
- Kalyan Kilaru -25%
- Chaitanya Kumar Peravalli -25%



### Work to be Completed:

- Storing all the reports of the user such that they can be accessed in future at any time.
- Improving the User Interface if still required.

#### 7. Bibliography

- <https://developers.facebook.com/docs/facebook-login/android>
- <https://developers.google.com/identity/protocols/OAuth2>
- <https://developer.infermedica.com/>
- <https://creatly.com/>
- <http://stackoverflow.com/>
- <https://www.fluidui.com/>