

Increment 4

by Navyasree Kumbam

FILE	INCREMENT_4.PDF (2.53M)		
TIME SUBMITTED	28-APR-2017 11:42PM	WORD COUNT	1769
SUBMISSION ID	806820703	CHARACTER COUNT	9357

iHealthCare



Project Plan and Fourth 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 making reports, implementing diagnosis, implementing NLP technique. Apart from these, we had issues like updating the Class diagrams, creating test cases, design patterns and integrating all the modules.

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

This repository Search Pull requests Issues Gist ToDo

Chaitanyaperavali / iHealthCare Watch 1 Star 1 Fork 3

<> Code Issues 7 Pull requests 0 Boards Reports Projects 0 Wiki

Filters - issue is:open Labels Milestones New issue

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

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

This repository Search Pull requests Issues Gist ToDo

Chaitanyaperavali / iHealthCare Watch 1 Star 1 Fork 3

<> Code Issues 2 Pull requests 0 Boards Reports Projects 0 Wiki

Increment 3

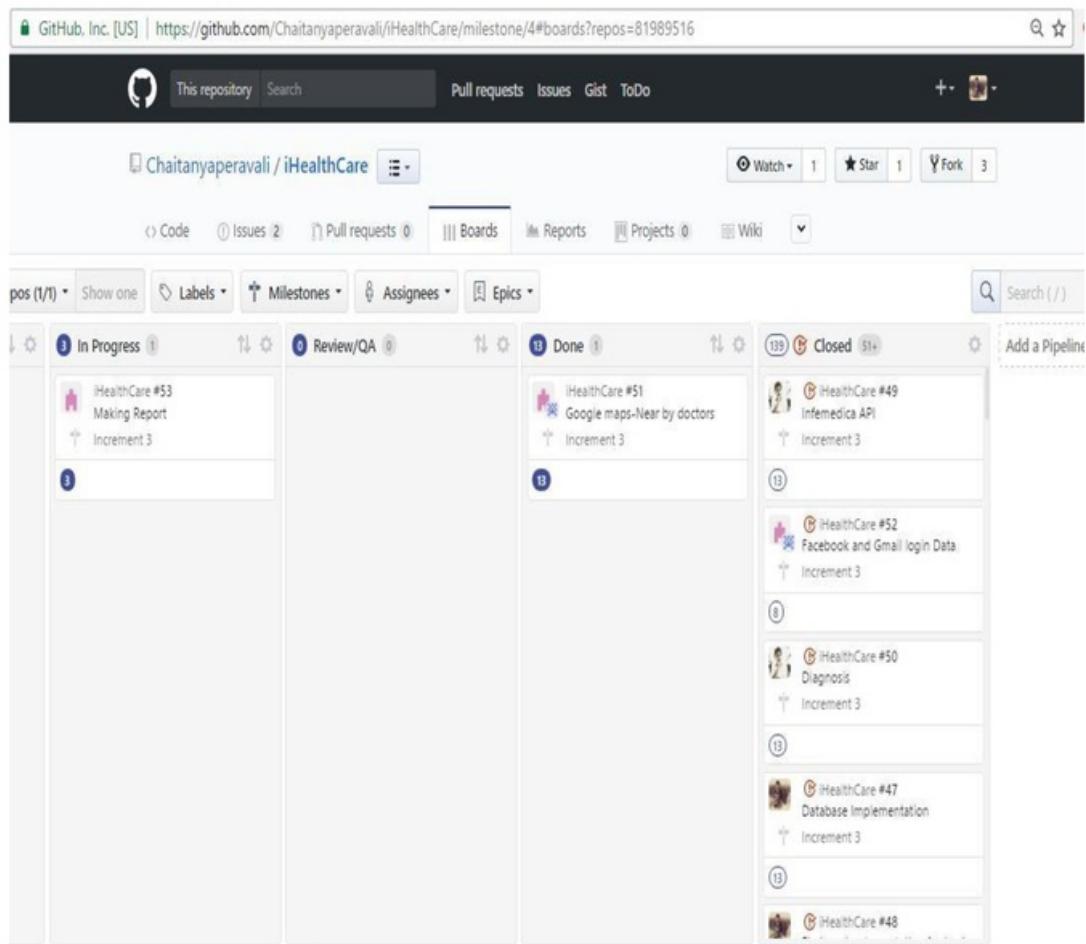
Due by April 10, 2017 71% complete

See this milestone on the board

	2 Open	5 Closed
Infamedica API	#49 by kalyankilaru was closed 37 seconds ago	
Facebook and Gmail login Data	#52 by kalyankilaru was closed 2 minutes ago	
Diagnosis	#50 by kalyankilaru was closed 2 minutes ago	
Database Implementation	#47 by kalyankilaru was closed 2 minutes ago	
Firebase Implementation for Login and Registration	#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 4, which are in open and closed status.



4. Fourth 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:

Like 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.

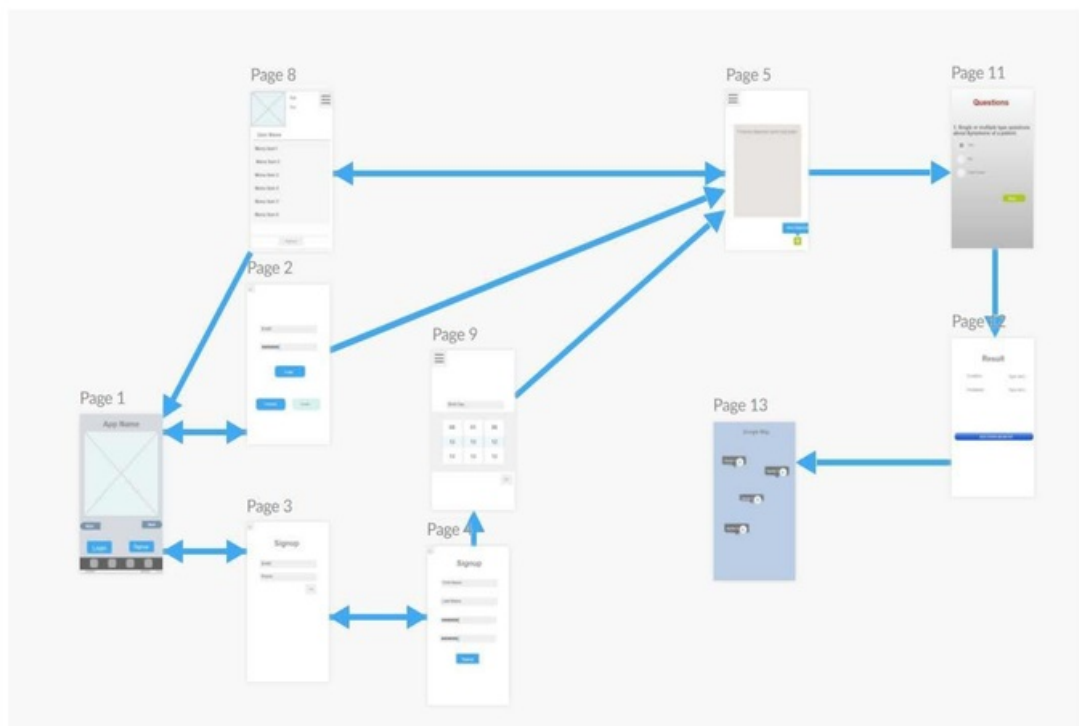
5. Google Maps API:

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

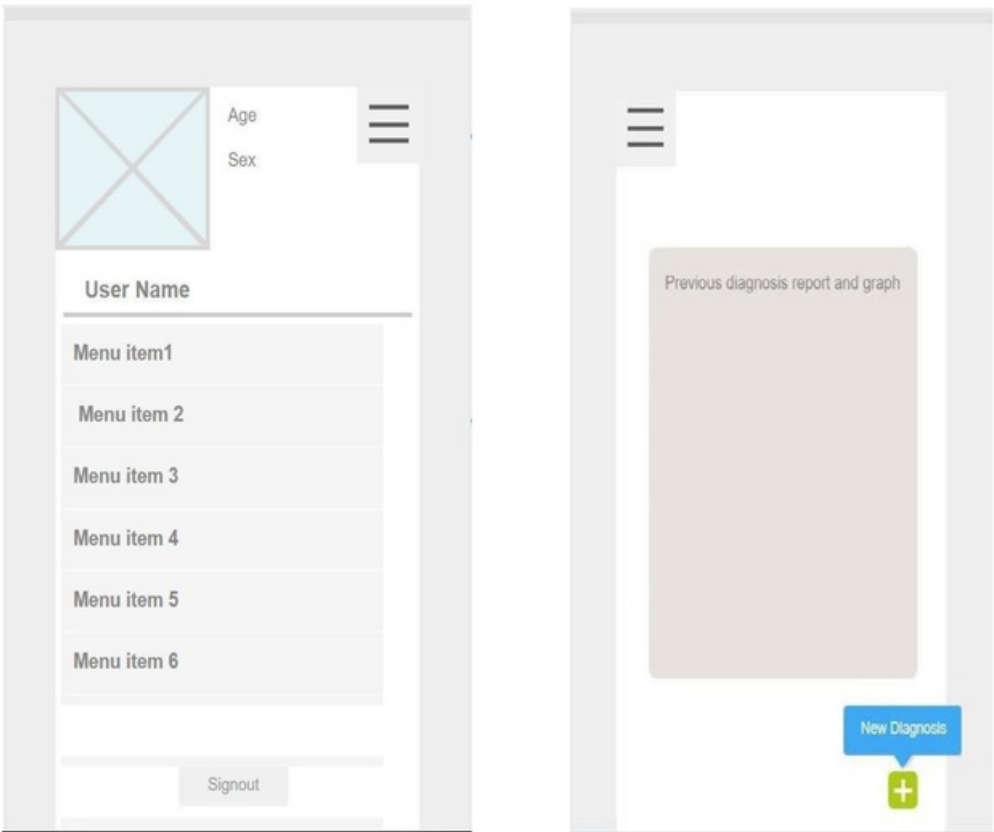
4.2 Detail Design of Features

4.2.1. Wireframes:

Flow Chart:



Home and Diagnosis Screen:



Questions and Condition Screen:

The image displays two mobile application screens side-by-side. The left screen, titled 'Questions', contains a single question: '1. Single or multiple type questions about Symptoms of a patient.' Below the question are three radio button options: 'Yes' (selected), 'No', and 'Dont know'. A green 'Next' button is positioned at the bottom right. The right screen, titled 'Result', shows the diagnosis 'Migraine' and a 'Probability' of '0.945'. A blue button labeled 'DOCTORS NEAR BY' is located at the bottom.

Questions

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

☒ Yes

☐ No

☐ Dont know

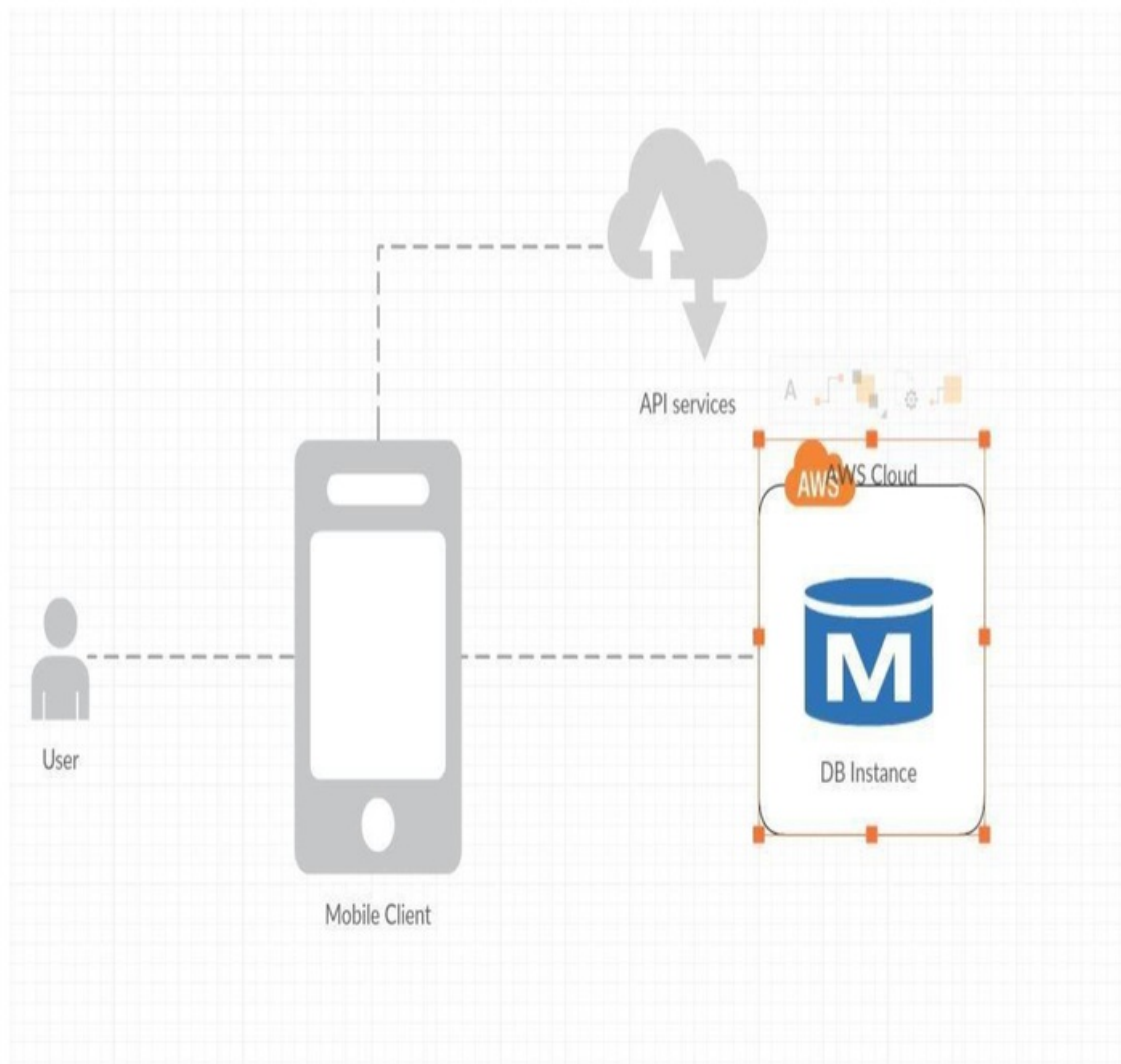
Next

Result

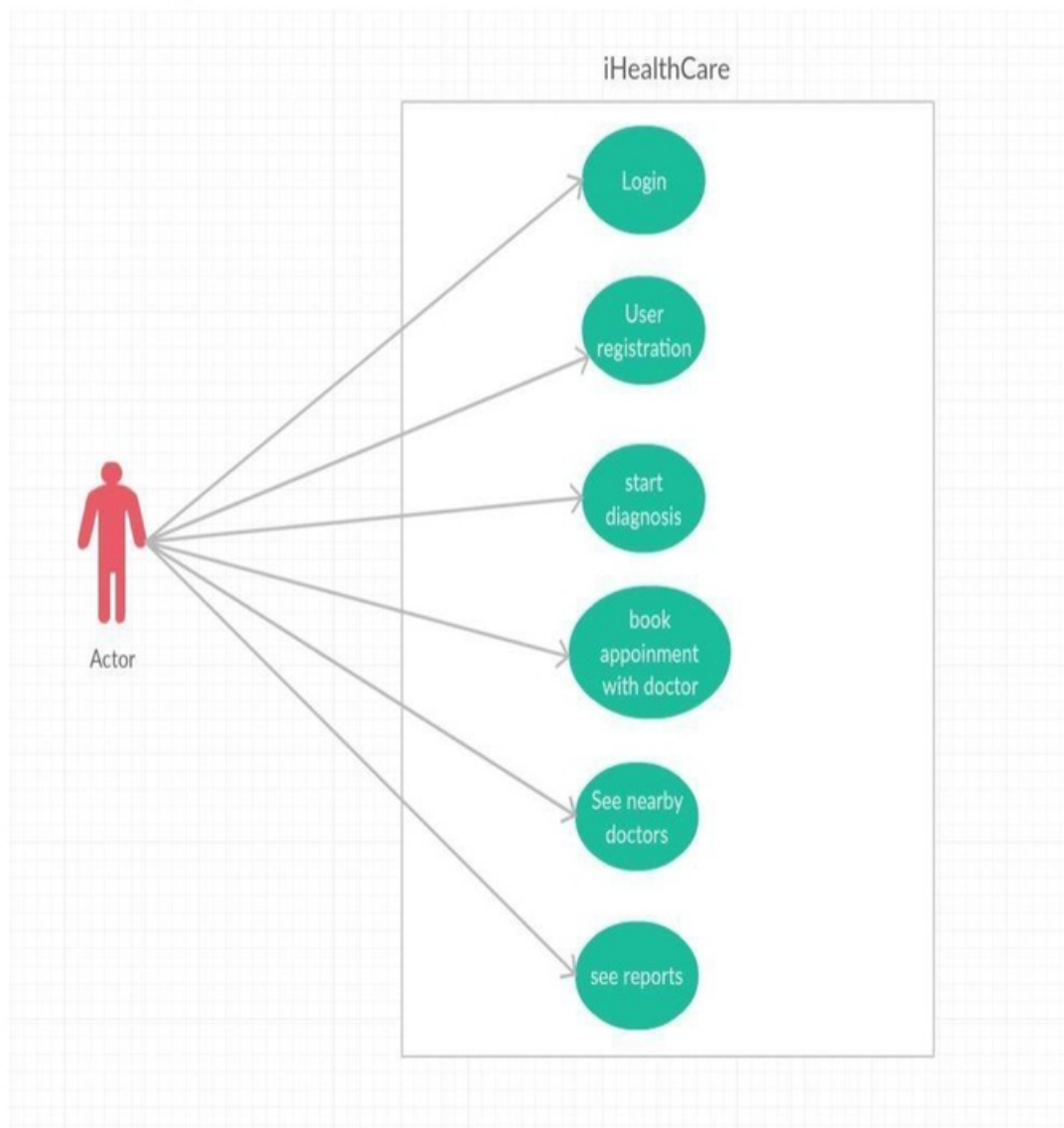
Condition	Migraine
Probability	0.945

DOCTORS NEAR BY

Architecture Diagram:



Use Case Diagram:



Design Pattern:

In this application, we have two types of design patterns. One is singleton design pattern and MVC active pattern.

Singleton Design Pattern: Singleton pattern restricts the instantiation of a class and ensures that only one instance of the class exists in the java virtual machine. The singleton class must provide a global access point to get the instance of the class

In our app, after successful login user details are stored in singleton class which is available across the application.

MVC Pattern: Model–view–controller (MVC) is a software design pattern for implementing user interfaces on computers. It divides a given application into three interconnected parts in order to separate internal representations of information from the ways that information is presented to and accepted from the user. This pattern is used to separate application's concerns. Model - Model represents an object or JAVA POJO carrying data. It can also have logic to update controller if its data changes.

In this app, we have activity called New Diagnosis which acts as controller. It has several fragments that are notified when data in the model changes. This fragment renders the appropriate fragments to handle different question types. The user interactions with the fragments are notified back to the controller from which the model is updated.

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 Enter valid details	Redirected to home page	Pass
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 Signup	Successful registration with all valid data. Successful registration with all valid data.	Redirected to Home page Redirected to Home page	Pass 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

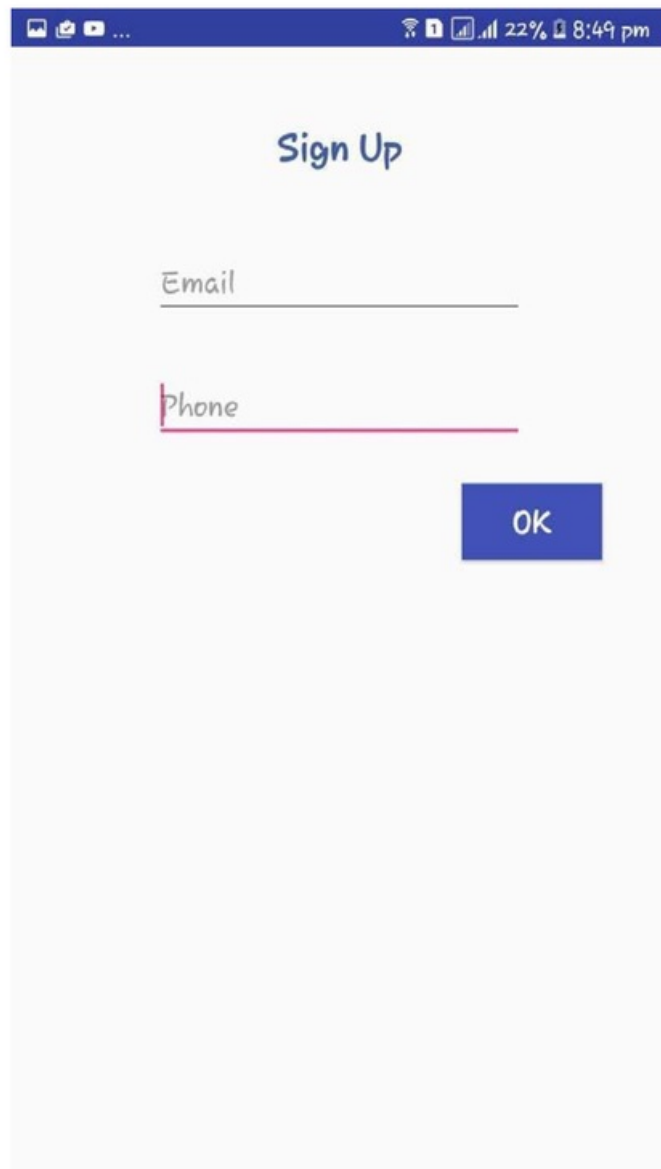
6. Implementation and Deployment

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

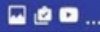
Screenshots:




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 mobile application interface for a sign-up page. At the top is a dark blue status bar with icons for gallery, mail, and a menu, along with connectivity and battery status (22%) and the time (8:49 pm). Below this is a light gray rectangular area containing the text "Sign Up" in a dark blue font. Underneath are two input fields: "Email" and "Phone", each with a horizontal line for text entry. A blue button with the text "OK" is positioned to the right of the "Phone" field.





23%

8:51 pm

Sign Up

First Name

Last Name

Password

Confirm Password

OK

23%8:51 pm

Sign Up

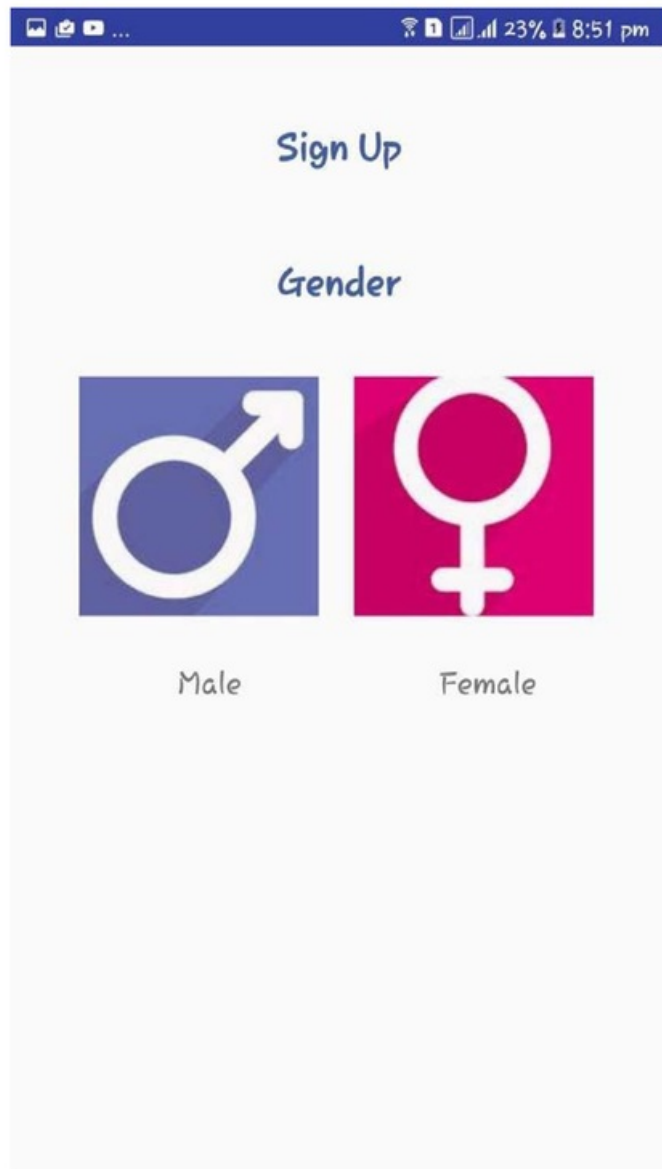
Kalyan


kilaru





.....




.....

OK









26% 9:04 pm

Date Of Birth

Sign Up

16

Nov

1990

17

Dec

1991

18

Jan

1992

Height

162


Weight

130

SIGN UP

Authentication failed.

21 | Page

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

Date Of Birth

Sign Up

09

Mar

2016

10

Apr

2017

11

May

2018


Height

Height in cms

Weight

Weight in Pounds

SIGN UP

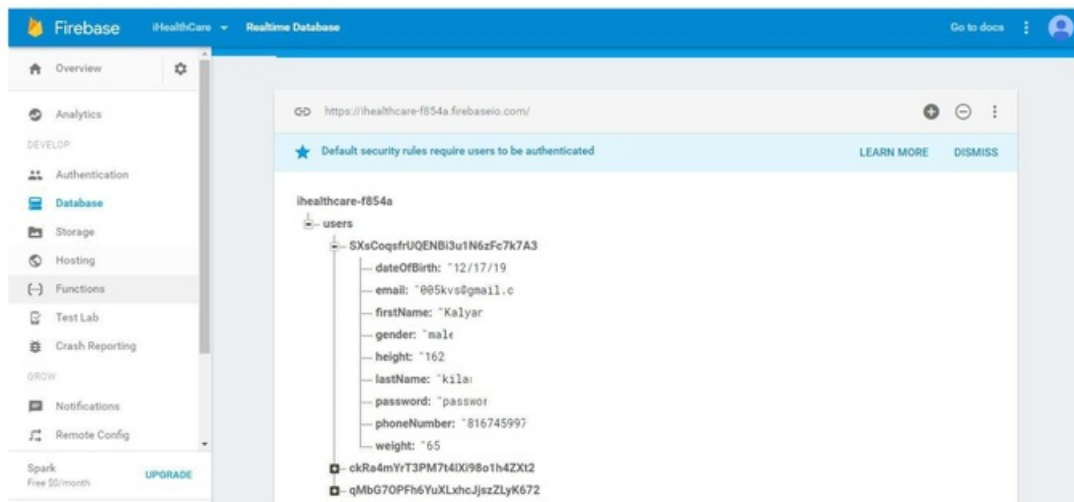
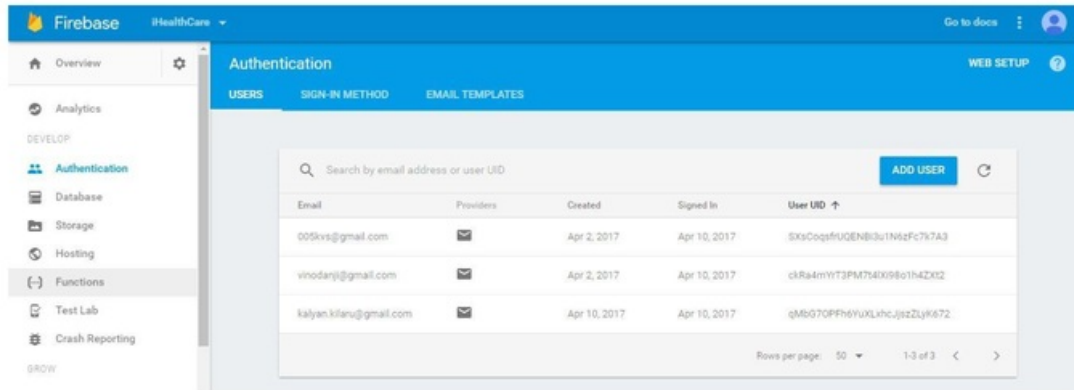
The status bar at the top of the screen is blue and contains icons for gallery, messages, and a video call, followed by a blue bar with icons for Wi-Fi, cellular signal, and battery status (22%) and time (8:47 pm).

Sign Up

Login Page:

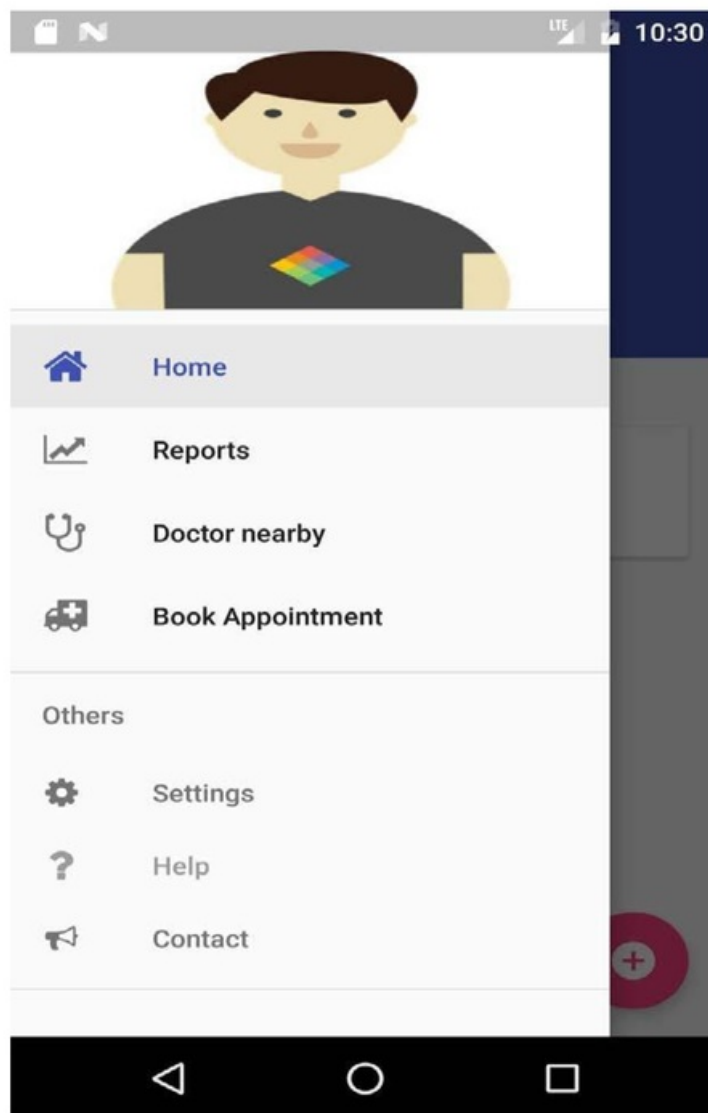
The image shows a mobile application login screen. At the top is a dark blue status bar with icons for gallery, camera, and video, along with signal, Wi-Fi, and battery (22%) indicators, and the time 8:46 pm. The main area is light gray. It features two input fields: the first contains the email '005kvs@gmail.com' and the second contains masked characters '.....'. Below these are three buttons: a blue 'LOGIN' button, a white button with the Google 'G' logo and 'Sign In' text, and a blue button with the Facebook 'f' logo and 'Continue with Facebook' text. At the bottom, a dark gray rounded rectangle displays the message '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.



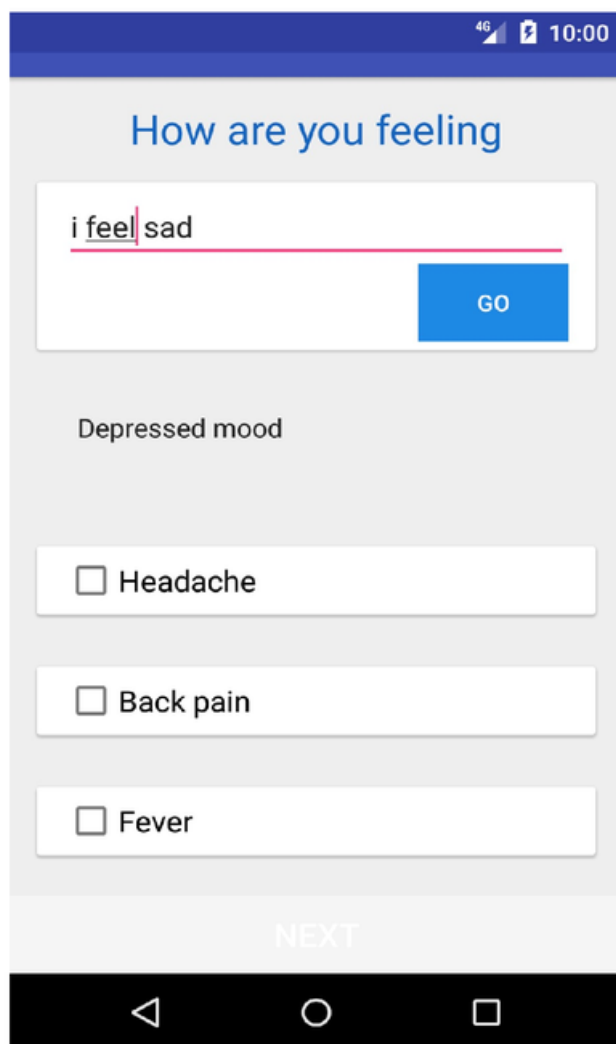
New Diagnosis:



Symptoms:

Here user is provided with symptoms which can be selected. Also, the user can describe how he is feeling, the application automatically generates conditions depending upon how the user is feeling. Then that condition is added to the list of symptoms and next button is enabled.

If he clicks the next button then it takes to the questions screen.



The screenshot shows a mobile application interface with a blue header bar containing the text "4G" and "10:00". Below the header, the title "How are you feeling" is displayed in blue. A text input field contains the text "i feel sad" with a red underline. To the right of the input field is a blue button labeled "GO". Below the input field, the text "Depressed mood" is displayed. There are three checkboxes with labels: "Headache", "Back pain", and "Fever". At the bottom of the form, there is a light gray button labeled "NEXT". The bottom of the screen shows a black navigation bar with three white icons: a back arrow, a circle, and a square.

4G 10:00

How are you feeling

i am feeling pain in foot

GO

Joint pain, metatarsalgia

☐ Headache

☐ Back pain

☐ Fever

NEXT

4G 10:01

How are you feeling

i feel cold

GO

Cold sensitivity

☐ Headache

☐ Back pain

☐ Fever

NEXT

4G 10:04

How are you feeling

i

GO

☒ Headache

☐ Back pain

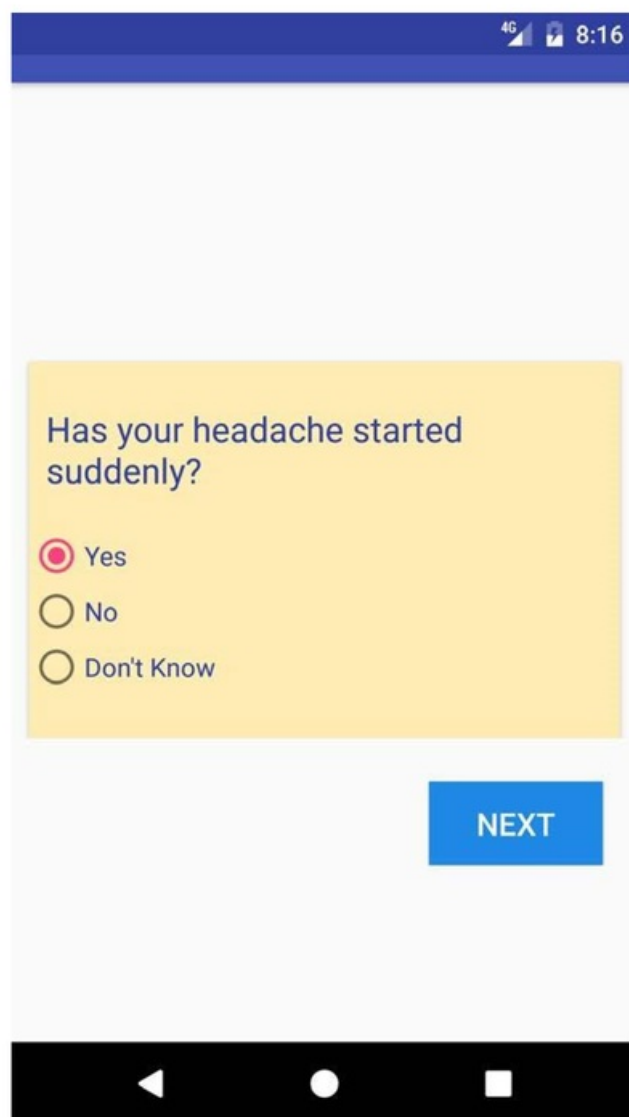
☐ Fever

☐ Abdominal pain

NEXT

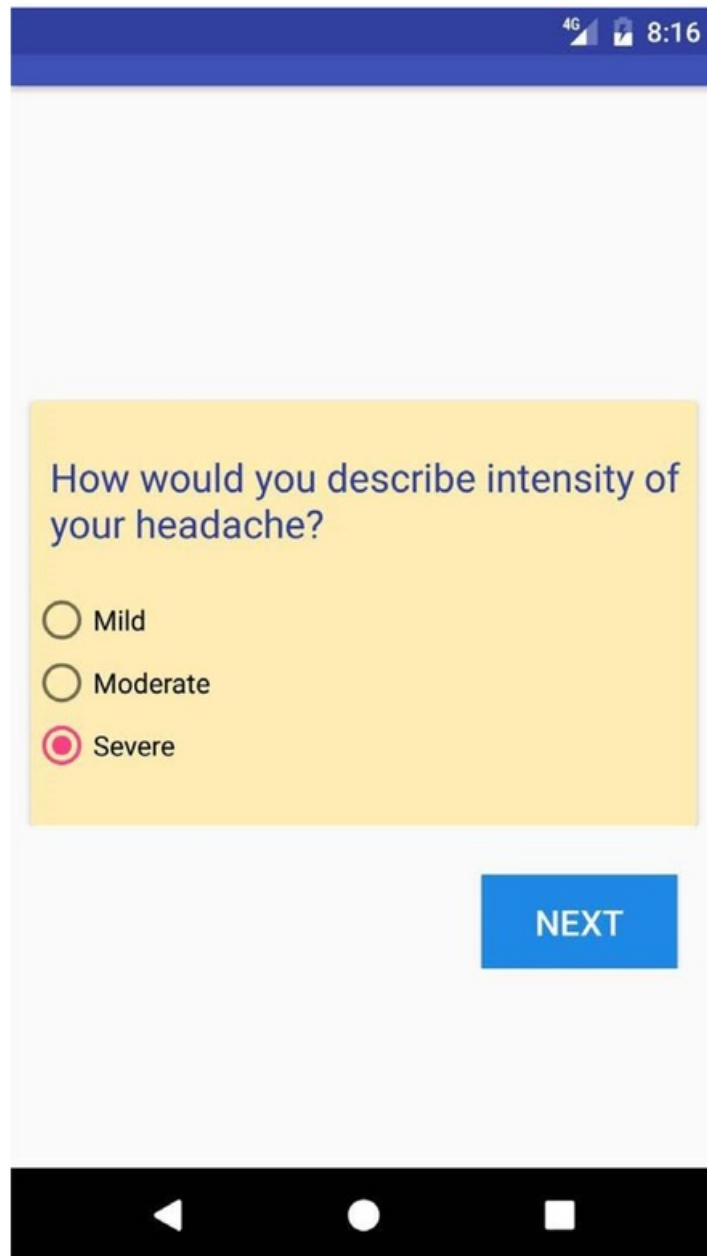
Questions:

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 status bar with a blue background, displaying '4G', a battery icon, and the time '8:16'. Below the status bar is a large white rectangular area. In the center of this area is a yellow rectangular box containing the text 'Has your headache started suddenly?'. Below this text are three radio button options: 'Yes' (which is selected, indicated by a red dot), 'No', and 'Don't Know'. At the bottom right of the white area is a blue rectangular 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 blue status bar shows '4G', a battery icon, and the time '8:16'. The main content area has a light gray background. A yellow rectangular box contains the text 'How would you describe intensity of your headache?'. Below this text 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, there is a blue rectangular button with the text 'NEXT'. 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

A screenshot of a mobile application interface. At the top, a dark blue status bar displays '4G', a battery icon, and the time '8:17'. The main content area has a light gray background. A yellow rectangular box contains the text 'What is your body temperature?' in a dark blue font. Below this text are two radio button options: 'Between 99.5 and 101 °F (37 and 38 °C)' with an unselected radio button, and 'Above 101 °F (38 °C)' with a selected radio button (indicated by a pink dot). To the right of the yellow box is a blue rectangular button with the word 'NEXT' in white capital letters. 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

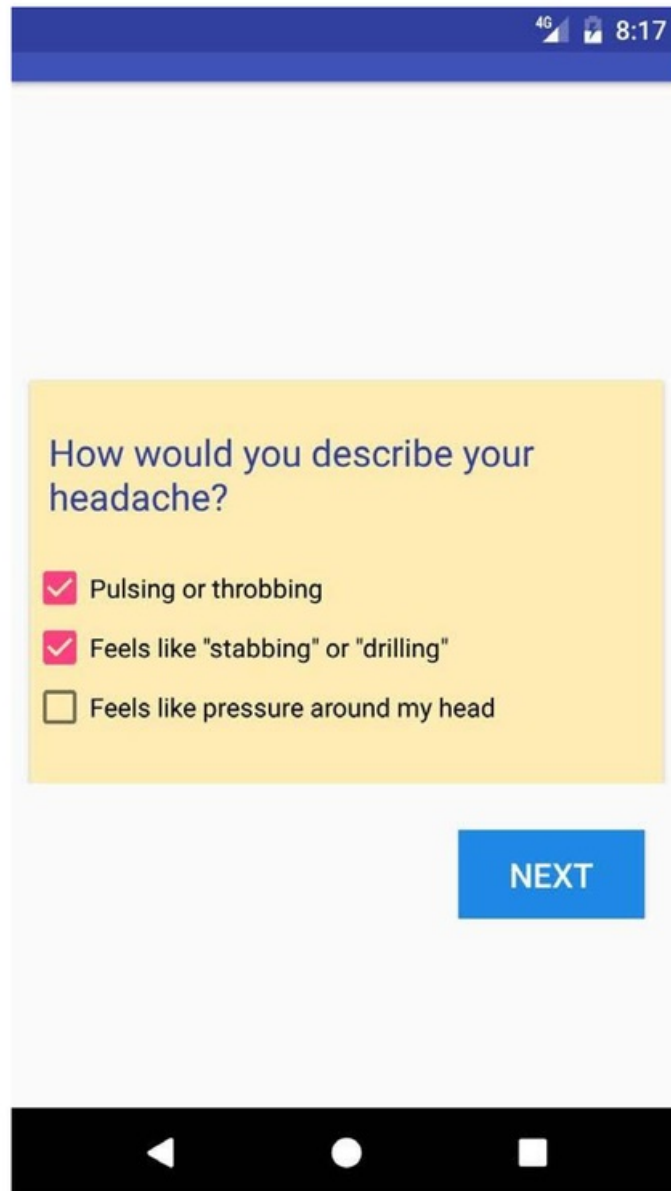
What is your body temperature?

☐ 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.



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

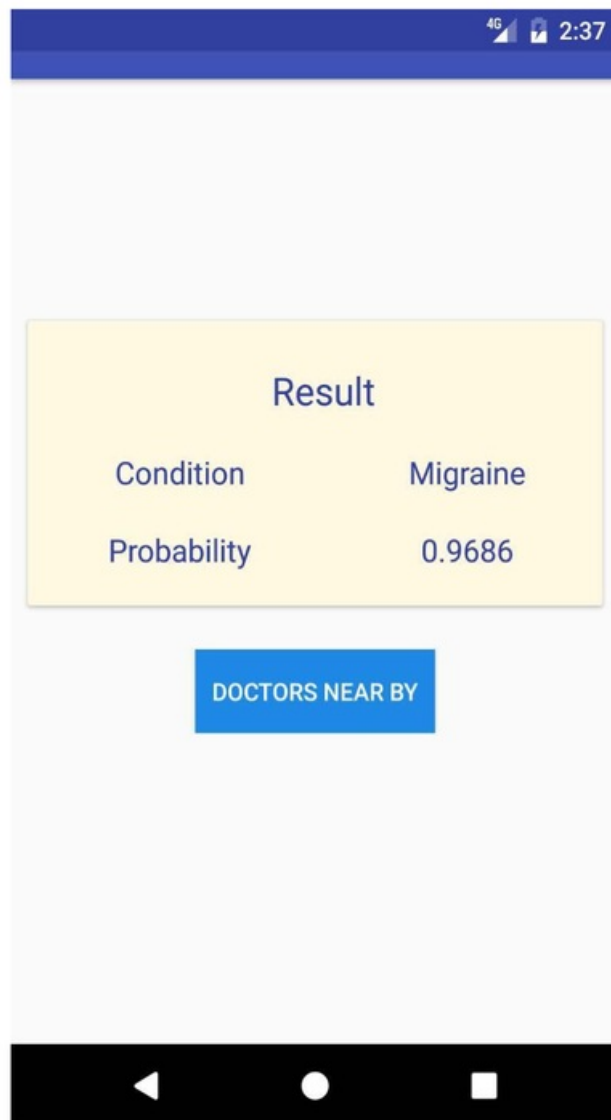
4G 8:17

How would you describe your headache?

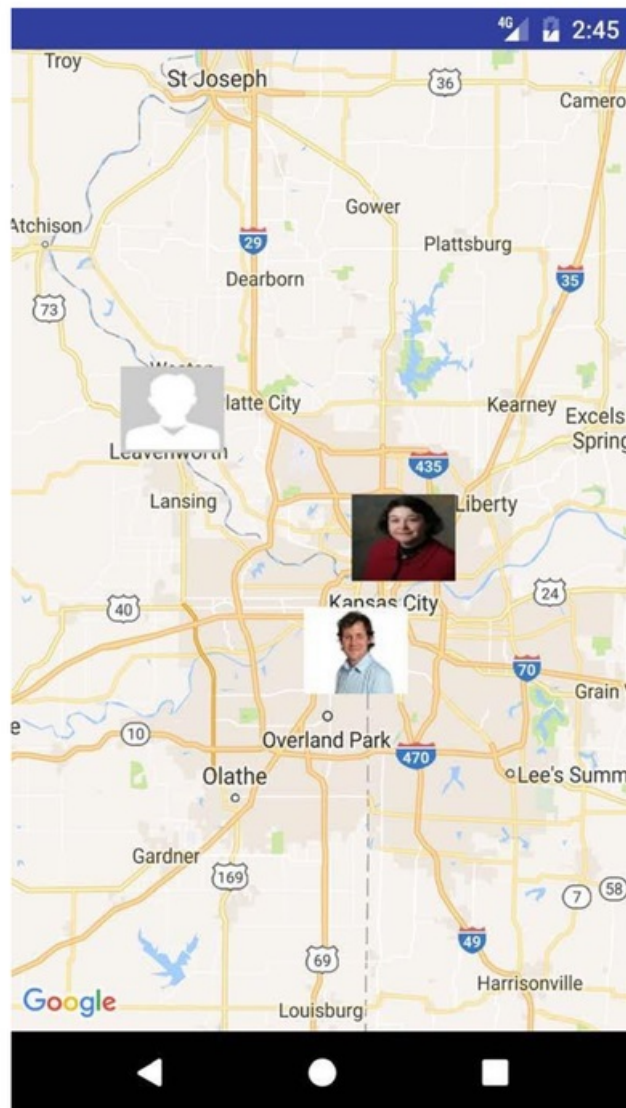
- ☒ Pulsing or throbbing
- ☒ Feels like "stabbing" or "drilling"
- ☐ Feels like pressure around my head

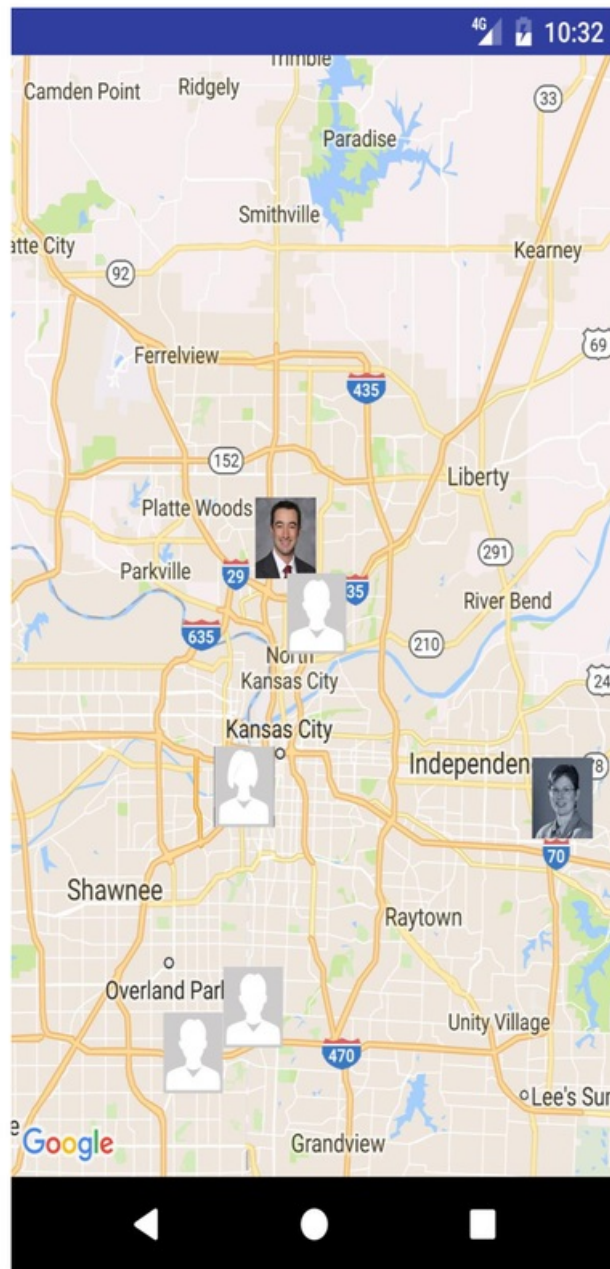
NEXT

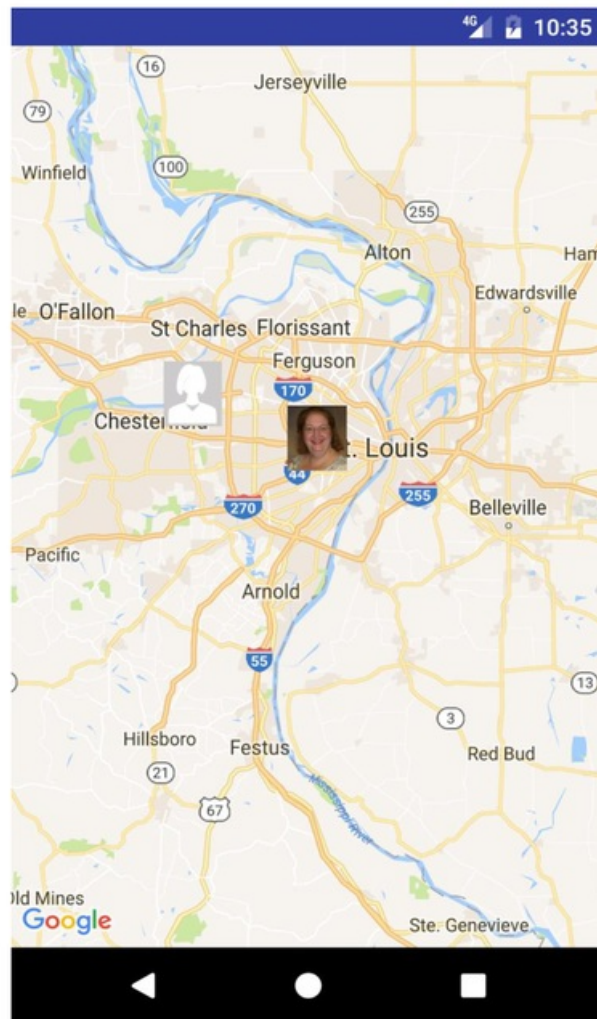
Conditions: According to the response given by the user, application generates the report which involves the condition and its probability. If the probability is greater than 0.8 then user will be given a button doctors nearby. By clicking on this button, the user can find the doctors according to the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



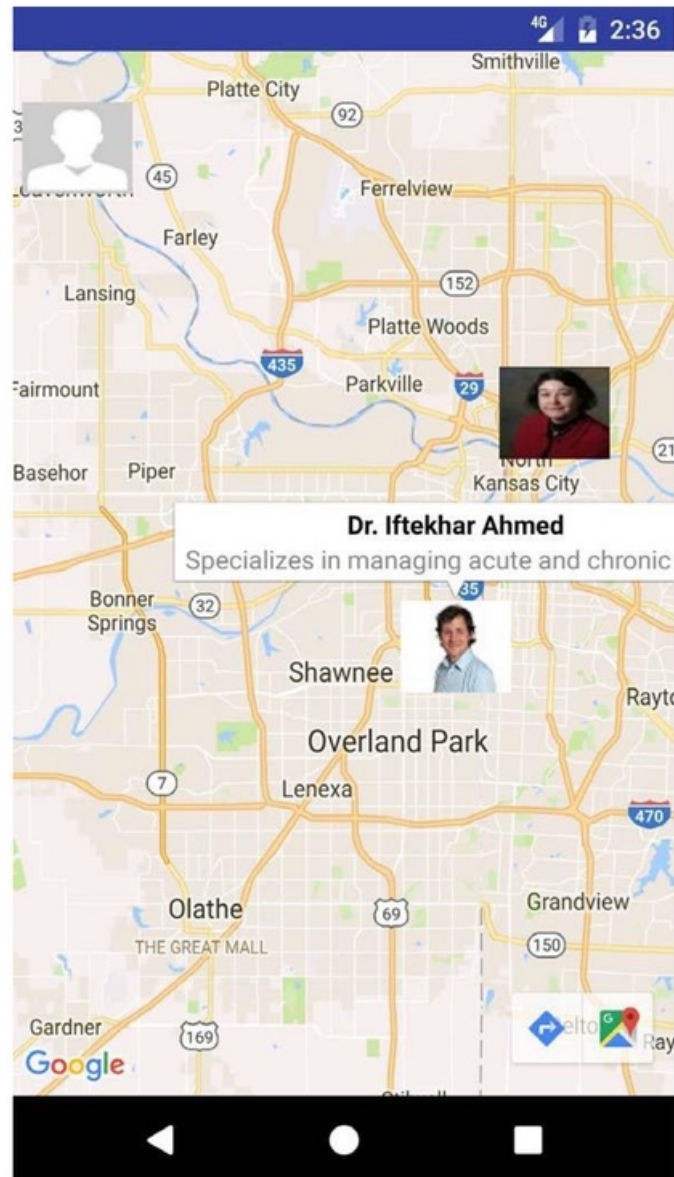
Maps-NearBy Doctors: This google maps displays the doctors near the location of user according to his health condition.







When the user click on the doctor it specifies the information related to doctor.



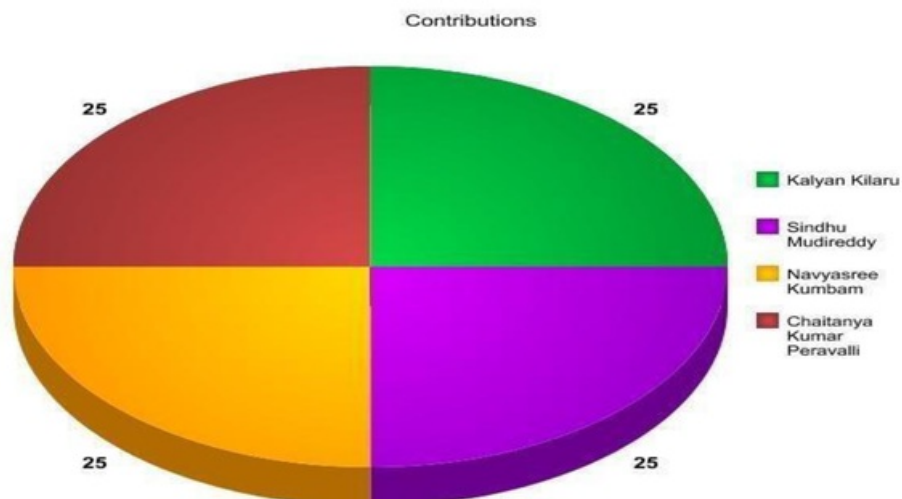
6. Project Management

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.
- NLP technique has been implemented.

Contributions:

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



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/>