

**DESIGN AND DEVELOPMENT OF AN ANDROID APPLICATION:
“HELP FINDER”**

By

**A N M Nazmus Sakib
151-15-4752**

And

**Shovon Shahariar Sunny
151-15-4998**

This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering.

Supervised By

Narayan Ranjan Chakraborty
Assistant Professor
Department of CSE
Daffodil International University



DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

DECEMBER 2020

APPROVAL

This Project titled “Help Finder”, submitted by A N M Nazmus Sakib, ID No: 151-15-4752 and Shovon Shahariar Sunny, ID No: 151-15-4998 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 31.01.2021.

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Professor and Head

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University



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Moushumi Zaman Bonny
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Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University



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Md. Sazzadur Ahamed
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Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University



Internal Examiner

Dr. Md Arshad Ali
Associate Professor

Department of Computer Science and Engineering
Hajee Mohammad Danesh Science and Technology University

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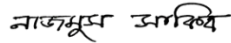
We hereby declare that, this project has been done by us under the supervision of **Narayan Ranjan Chakraborty**, Assistant professor, Department of CSE Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

Supervised by:

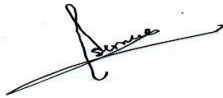


Narayan Ranjan Chakraborty
Assistant professor
Department of CSE
Daffodil International University

Submitted by:



A N M Nazmus Sakib
ID: 151-15-4752
Department of CSE
Daffodil International University



Shovon Shahariar Sunny
ID: 151-15-4998
Department of CSE
Daffodil International University

ACKNOWLEDGEMENT

First of all, we express our deepest gratitude and thanks to the almighty god for His divine blessing to enable us to complete the final year project successfully.

We are deeply grateful and express our profound indebtedness to **Supervisor Narayan Ranjan Chakraborty, Assistant Professor**, Department of CSE Daffodil International University, Dhaka. Our supervisor gave us continual encouragement and constructive criticism. His deep knowledge and keen interest in the field of ‘Android App Development’, endless patience, scholarly guidance, constant and energetic supervision and valuable advice have made it possible to complete this project.

We wish to express our heartiest gratitude to the Head, Department of CSE, Professor Dr. Touhid Bhuiyan for his kind help to finish our project and also to other faculty member and the staff of CSE department of Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

Bangladesh is a small country with densely over population. But according to our population there is no workplace available. And along with that there is lack of education in our society. These uneducated people often involve in crime. Specially if we talk about Dhaka city, people from different places from all over the country come here in search for jobs. But if they couldn't find one some of them end up involving themselves in crime. Because of the lacking of law enforcement in our country these crimes are increasing day by day. And innocent people become the victims of those criminal. Specially ladies and girls suffer the most. If we can find a way by which anyone can call for instant help at any moment, they feel unsafe then that would help a lot of people. Our project works something like that for the users. The aim of our project is to find people help, anytime anywhere using their android devices. This is basically an android application. So, an android device will be needed to run this application. This is a very user-friendly application so users won't face any difficulties using this app. We followed the basic procedure of making an android application using the android application development tool "Android Studio".

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Bangladesh is a small country with densely over population. But according to our population there is no workplace available. And along with that there is lack of education in our society. These uneducated people often involve in crime. Specially if we talk about Dhaka city, people from different places from all over the country come here in search for jobs. But if they couldn't find one some of them end up involving themselves in crime. Because of the lacking of law enforcement in our country these crimes are increasing day by day. And innocent people become the victims of those criminal. Specially ladies and girls suffer the most. If we can find a way by which anyone can call for instant help at any moment, they feel unsafe then that would help a lot of people. Our project works something like that for the users.

1.2 Motivation

We have got used to see about different kinds crimes in our country in news. Since we came in Dhaka city, we are seeing those crimes more closely which is very frightening and painful at the same time. Crimes like Robbery, Theft, Snatching, Rape, Sexual harassment, Abusement even Abduction and Murder have become the part of our daily scene. We also had to be the victims of some thief and robbers once. That time we were so helpless that we couldn't even call for help at that moment. Then we realized if we could call for help silently at the moment, we felt unsafe then we hadn't had to face that. So, from that thought we came up with this idea that we will make a mobile application through which people can call for help anytime and anywhere.

1.3 Objectives

- Verified user.
- Show user's current location on google map.
- Show other active users nearby on google map.
- Notify nearby users if someone needs help.
- Send SMS over phone number.
- Show the location of the help seeker on google map.
- Notify the help seeker if anyone respond to him/her.
- Update user profile.
- Realtime data processing.

1.4 Expected Outcomes

- User has to login/register first.
- User has to verify his/her phone number.
- User can see his/her current location on google map.
- One user can see other users around him/her on google map.
- If someone needs help then that will be shown by a red marker on the map.
- If someone respond to that help seeker then his marker color will also be changed.
- If someone needs help others will get notification about that.
- SMS can also be sent automatically to other user's phone number.
- When someone needs help others will get his location, phone no. and photo.
- User can update his/her own profile.
- All the data will be saved on firebase real-time database and firebase storage.

1.5 Report Layout

Our project is basically an android app. In our app, we connect the users through internet. So, our app needs internet connection at first. And because we are using google map to

show the user's location it needs location information as well to work fully. Then another important feature that we have in our app is sending SMS over the phone numbers. And to get the benefit of that feature user must have a sim card in the device and balance in the account. Through this app, we can call for help in emergency when there is no one else around us to help. Then we can know if someone is in danger and needs help. Our app will provide the exact location along with the phone number and photo of that user so that it can be easier to identify him/her. One can give response to someone's help request so that he/she can know that someone is coming to help.

CHAPTER 2

BACKGROUND

2.1 Preliminaries

Our project is an android based mobile application. For that reason, we had to work with android studio to work on this project and make our application. But we didn't have any previous experience of working on android projects. Still we didn't lose our faith. We started working on our project by ourselves. All we had was the internet and YouTube tutorials [1, 2].

2.2 Related Works

When we had to decide what we were going to make as our final project we decided to make an android app. Because he had this idea on our mind for a long time. And we also looked through google play-store to see if there is an existing app like ours or not. We had found an app called "Help me mobile app" but that app is not so effective in such situation. That app doesn't have much features like ours and that has many flaws. In that app user has to set some contacts manually. In the time of need the app will contact to those selected contacts only. But in our case our app will contact automatically to those users who are available and nearby. In this way our app is very unique and user friendly. We tried our level best to make sure of that.

2.3 Comparative Analysis

we have made an android application. This application will help people who is in need to get help. We tried to focus on the situation and how our app will be able to help a user in that situation. For that we tried to make our app most efficient. To make an android app we have to work with "Java" and "XML" programming languages. So, we did that. We have used the Firebase Realtime Database to store the data and Firebase Storage for our storage purpose [3]. We have also used google map to show the users current location [4, 5].

2.4 Scope of the Problem

There are many android users who are not so educated. Because of that any new app with complex interface can be difficult for them to understand and use. And this is a problem. Almost every application has limitations of its own and in terms of android application these limitations are more than others. New new updates of android version come over the course of a few days and API levels increase frequently. Whenever an update comes many things changes. So, that can cause a lot of problem to our app. But we are hopeful we will be able to overcome those problems easily.

2.5 Challenges

If someone wants to make an app which is very unique and useful the developer has to face many problems and challenges. And for us it was totally a new challenge. So, we had more difficulties and had to face more problems. Our app is a very helpful app. It's like a bridge between those who need help and those who want to help others.

Besides that, we were worried because some users can be anxious of the fact that their personal information is being provided to other users. But what could we do? There was no other option. We need to provide the exact information of the user who is in need of help which is very tough. Then we wanted to make our interface most user friendly. And to do that we had to work very hard and overcome many obstacles. We also did some survey. Even we had to change the designs and layout orders multiple times. This was very challenging part itself but the most challenging part to create the database and sort the database. We had to create a very well-planned database to that it can work efficiently. And to make sure of that we had to change the database also multiple times.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Introduction

Requirement specifications is the first thing to do before making an app or developing any system. First, we think about what would be our requirements as a user from an app like this. But our requirements weren't enough we had to think about other people's perspectives also. So, we gathered requirements from different different people then analyze them and then made our app according to that.

3.2 Requirement Collection and Analysis

Finding ourselves in helpless situation is very unpleasant to us. People can't find anyone around them to help at the time they are in danger. But ours is the age of internet. Everything we need we can find on the internet now-a-days. So, why not help? With this concept we decided to develop a platform where willful people will be connected to each other and they can stand by each other whenever they need each other.

The most essential requirements we found that had to be fulfilled are:

- Creation of an online platform which will be an android based mobile application.
- One's request for help should be delivered to others.
- Other users should get the current status of the help seeker.
- Google map should be used to show the user's current position.
- Other users should get the picture of the help seeker so that they could identify him/her easily.
- Other users should be able to response to the help seeker so that he/she can know that someone is coming to help.
- There should be an additional feature of sending SMS over phone no. to double assure that the help seeker is reaching out to other users.

3.3 Use Case Diagram

To know the relationship between the user and the application a use case diagram is very essential. We get to understand how the user and the application will interact with each other through the use case diagram. The use case diagram of our project showed in figure 3.3.1.

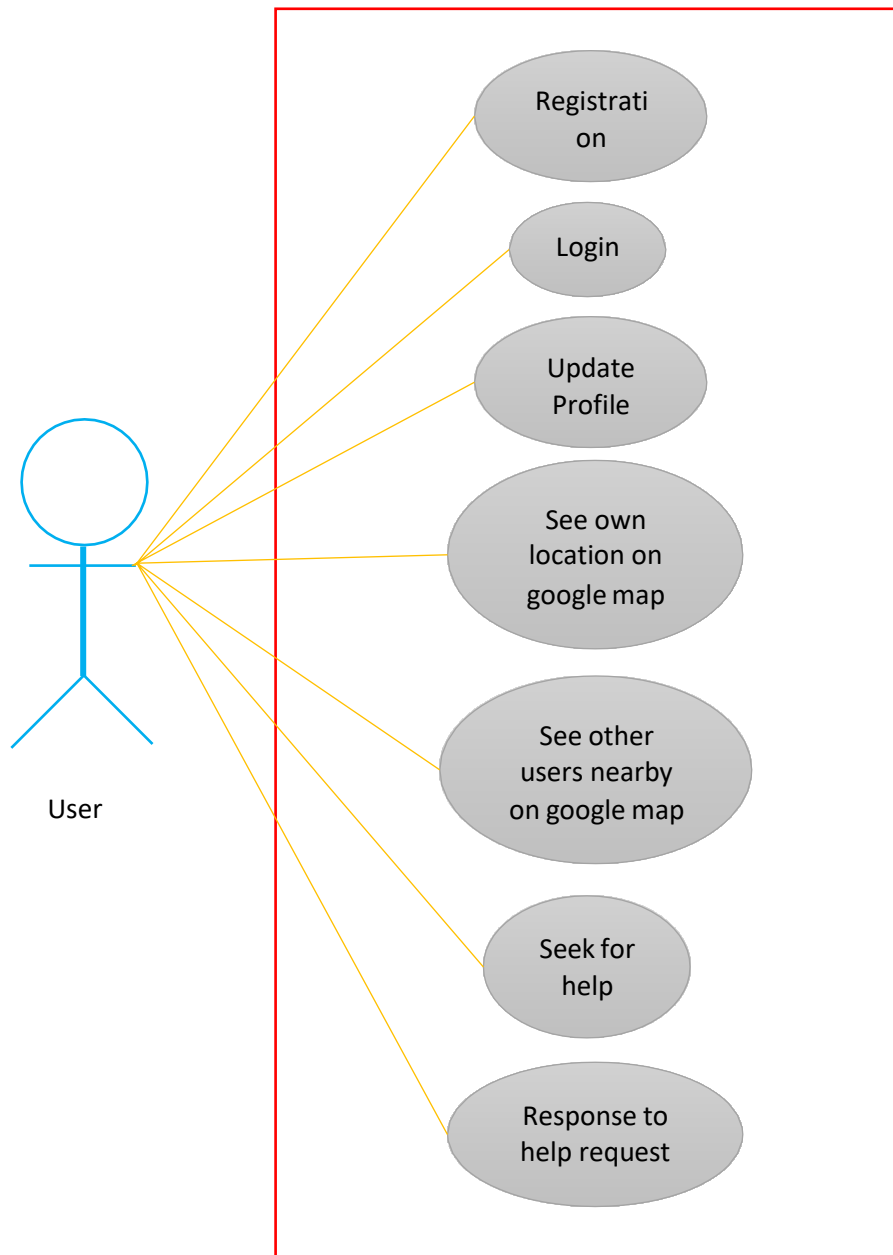


Figure 3.3.1: Use Case Diagram

3.4 Business Process Model

Graphical representation of the workflow of a system is called business process model. Flowchart, data-flow diagram and different graphing methods are used in business process model. Our project's business process model is showed in figure 3.4.1.

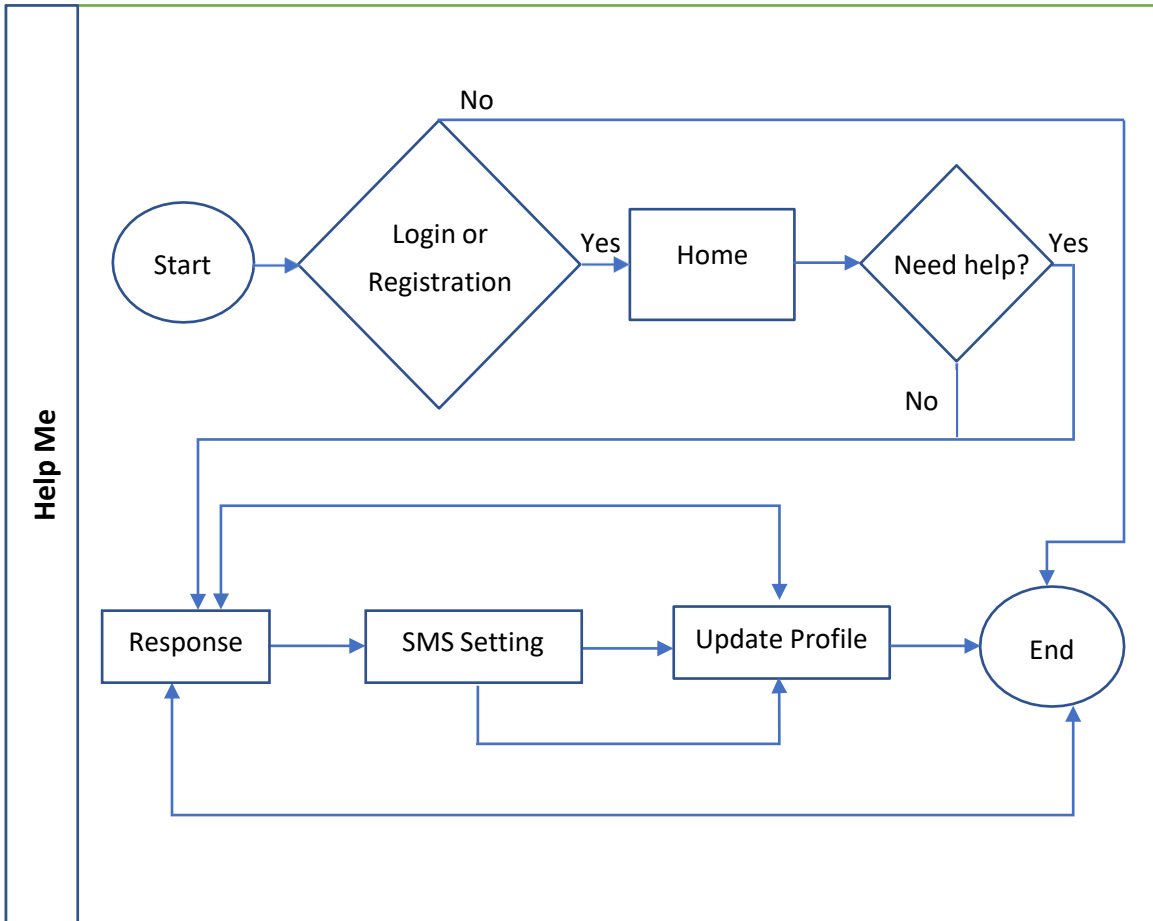


Figure 3.4.1: Business Process Model

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front End Design

A system's graphical form is meant by front-end design. When user opens an app or any software whatever he/she sees as the interface is basically the front-end design. It has the most importance because the users can be attracted by this. That's why front-end design of any application or software should be very attractive and beautiful. So that it can make people interested toward the app. We worked very hard on the front-end design to make our app so simple to use as well as attractive. Because if the front-end design which in other word we can say the user interface is complex then the user can not use the app properly and might end up losing interest on our app. We had to work with XML language to do the front-end designing of our project.

4.2 Back End Design

The behavior of a system or an application is determined by the back-end design which is also known as server-side design. It controls every action of the system so it is the main part of a system. In case of our project it was the most critical part. The security of the system, structure and other contents are depended on the back-end design. For the back end designing of our project we have used Java language.

4.3 UI Design

When the front-end design represents graphically it is called the user interface (UI). When a user opens an application, he/she sees the user interface (UI). And through the user interface the user has to use that application. We focused on our app's UI design as soon as we finalized the requirements. We tried our level best to make the UI most simple and user friendly.

4.4 Activity Layouts

- Splash Screen
- Starting Page
- Registration Page
- Phone Number Verification
- Login Page
- Help Page
- Response Page
- Update Profile
- SMS Setting

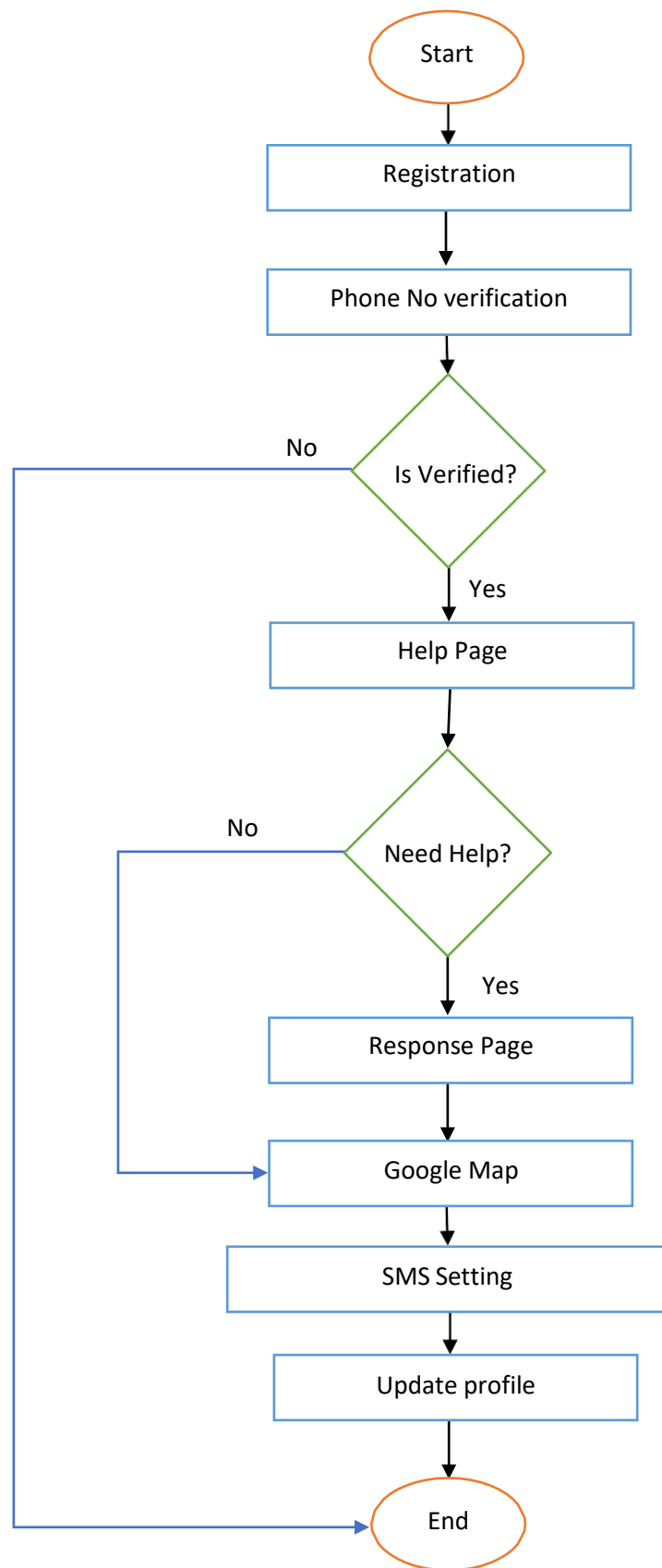


Figure 4.4.0: Activity Layout Flowchart

4.4.1 Starting Page

The following figure 4.4.1 is the first activity. When a new user opens the app, this activity will appear. From here the user will have to go to the login or registration activity [1].

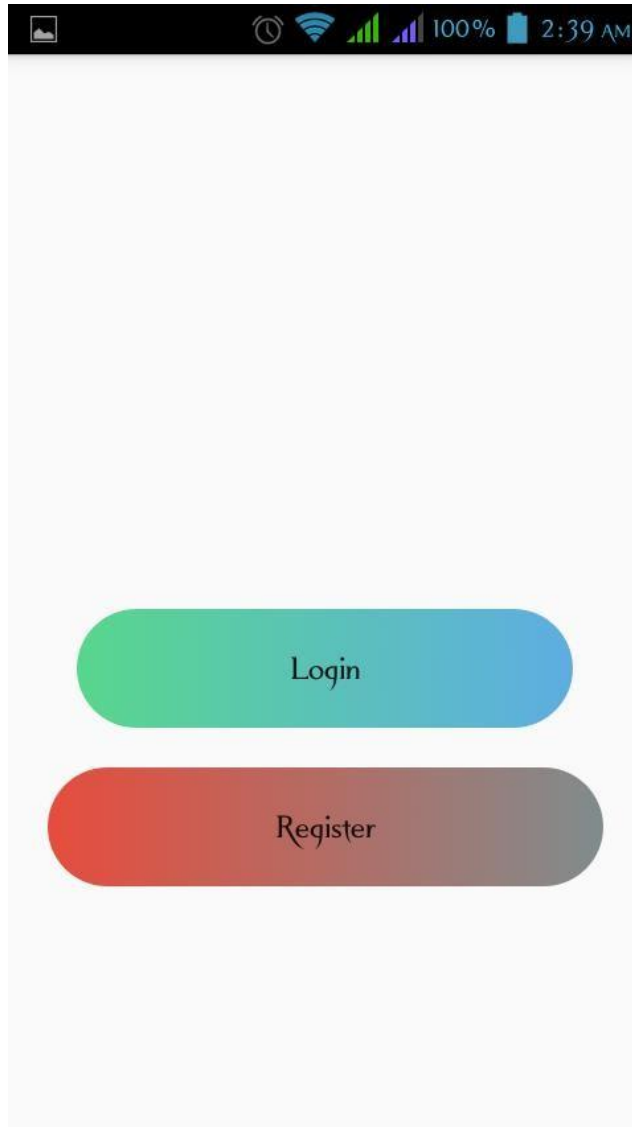
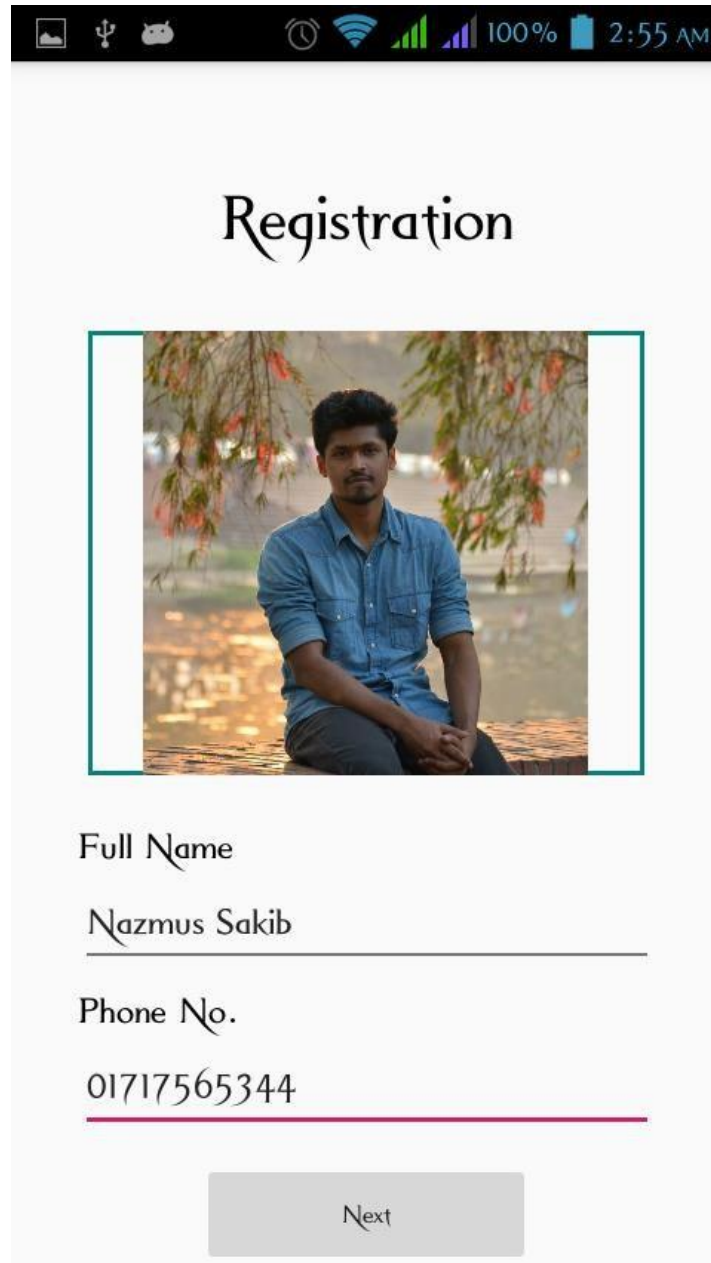



Figure 4.4.1: Starting page

4.4.2 Registration Page

The following figure 4.4.2 is the registration page. If the user is not registered to our app then he/she has to come to this page and register with his name, phone no and a picture.



Registration



Full Name

Nazmus Sakib

Phone No.

01717565344

Next

Figure 4.4.2: Registration page

4.4.3 Phone Number Verification

The following figure 4.4.3 is the phone verification page. When user fill up all the information needed in the registration activity and clicks the next button this activity will appear. A 6 digits verification will be sent to the number given in the registration activity. The user needs to put that number here in order to complete the registration.

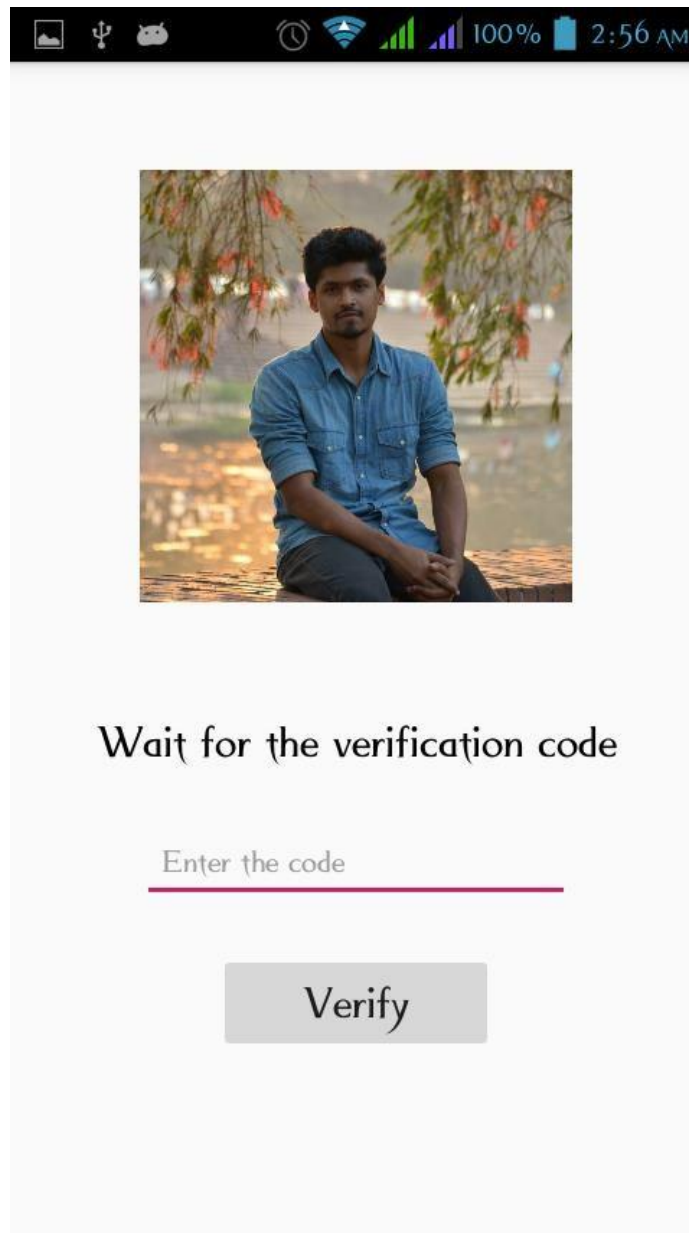


Figure 4.4.3: Phone number verification

4.4.4 Login Page

The following figure 4.4.4 is the login page. In this activity the user has to login with his/her phone number from which he/she has registered before. If the user is not registered then he/she can't go further from this activity.

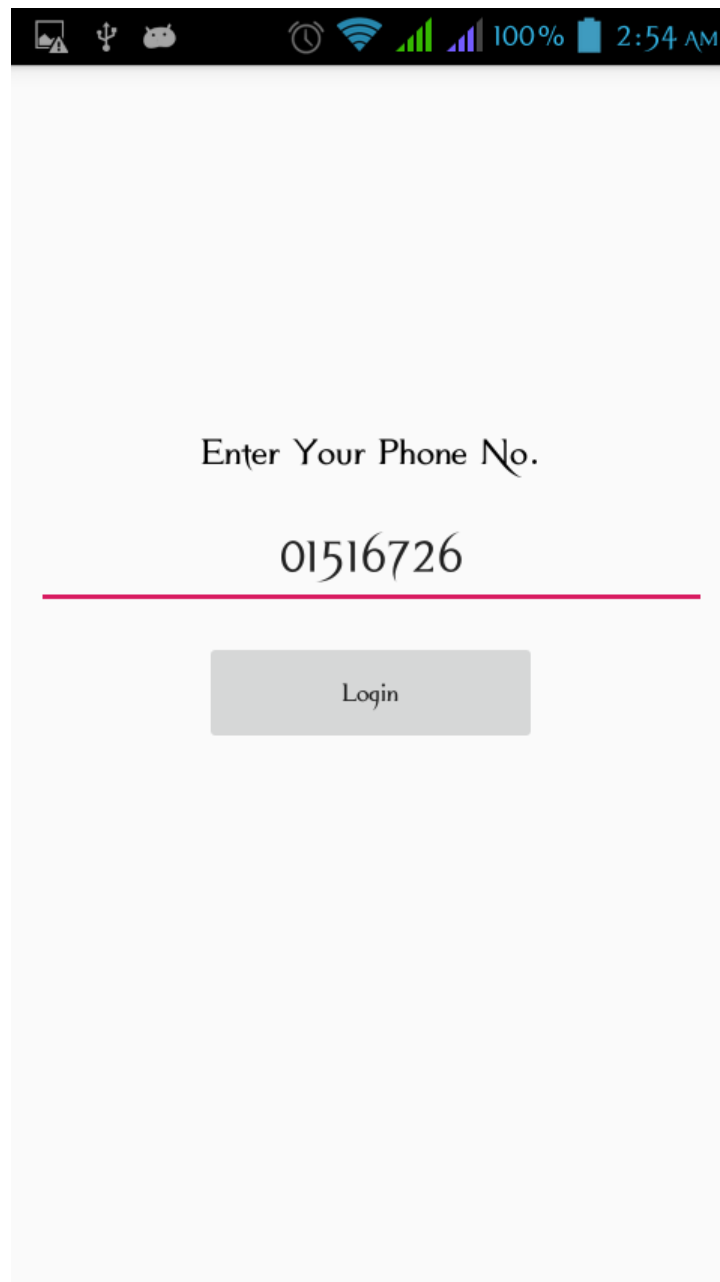


Figure 4.4.4: Login Page

4.4.5 Help Page

The following figure 4.4.5 is showing the help page.

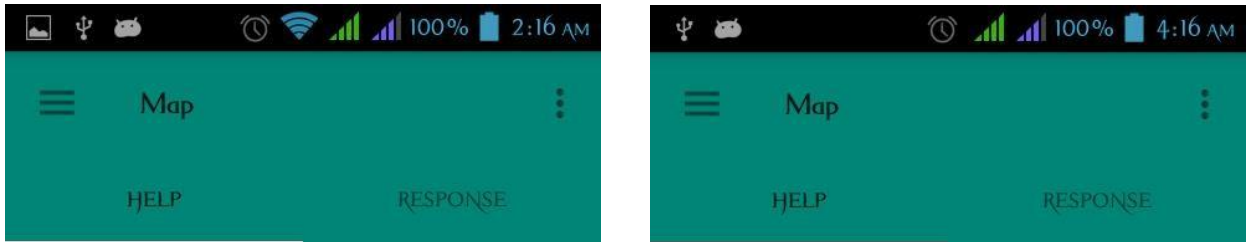


Figure 4.4.5: Help Page

4.4.6 Response Page

The following figure 4.4.6 is showing the response page. In this page all the user's location will be shown in google map. And if someone seeks for help another user can respond to that user from this page.

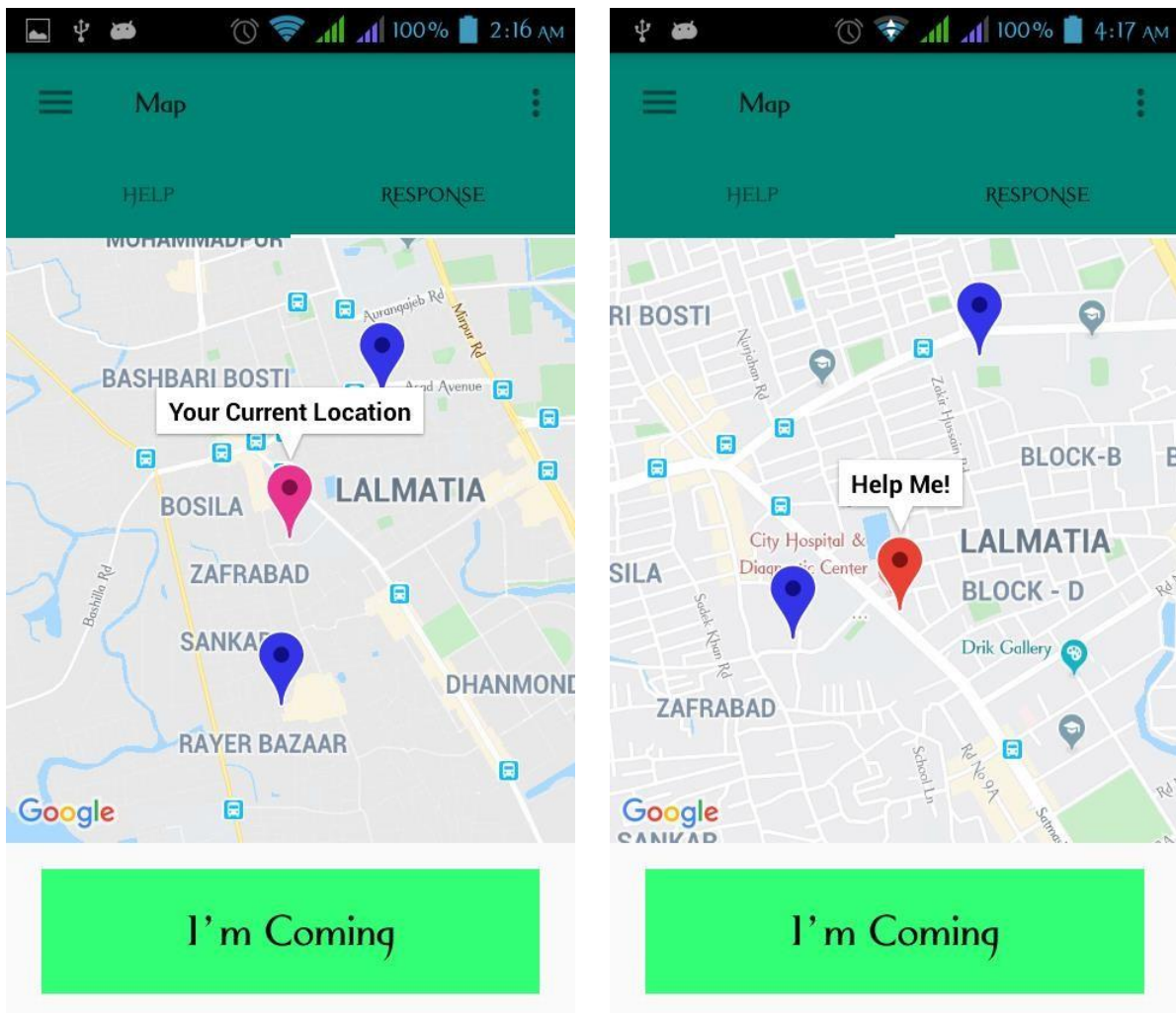


Figure 4.4.6: Response Page

4.4.7 Update Profile Activity

The following figure 4.4.7 is showing the update profile activity.



Figure 4.4.7: Update Profile

4.4.8 Navigation Drawer Activity

The following figure 4.4.8 is showing the navigation drawer activity. This is the navigation drawer activity. Here we can see our profile. From here we can go to different activities.

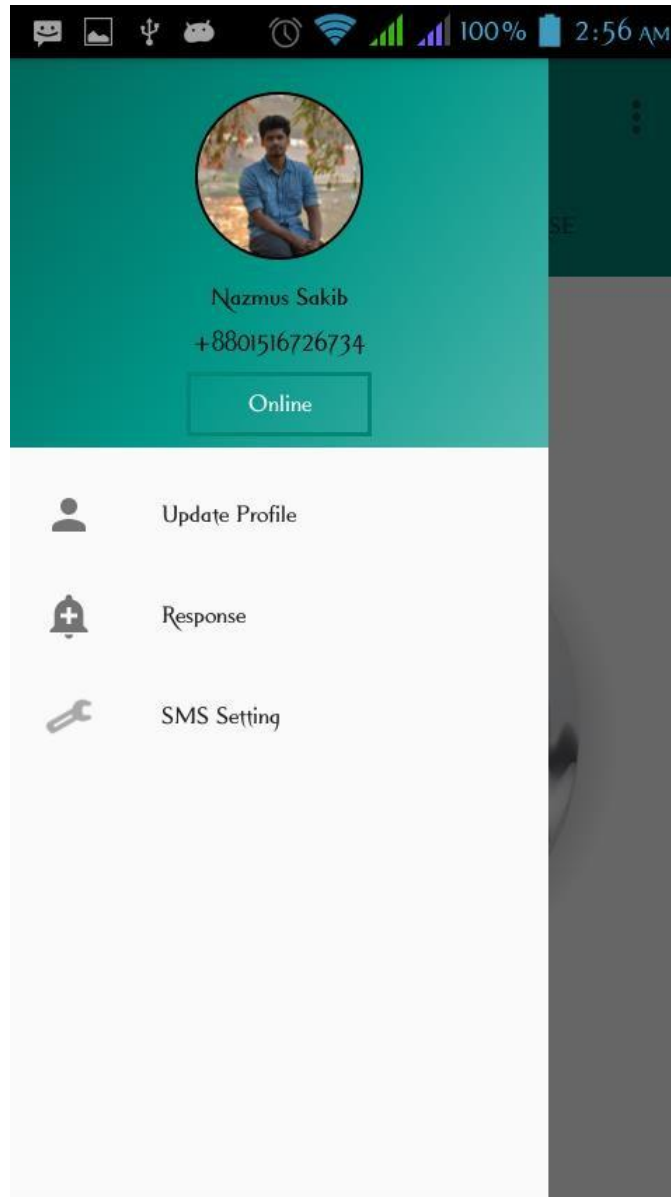


Figure 4.4.8: Navigation Drawer Activity

4.5 Implementation Tools

To work on some project the most important things that are must are the implementation tools. In our project we needed a lot of them. Here we have described about some of the most important implementation tools of our project.

4.5.1 Android Studio

Android studio is the official development tool for Google's android operating system [6]. Without android studio we couldn't have built our project. So, it was the most important implementation tool for our project.

4.5.2 Android SDK

Android SDK is the software development kit for android applications [7]. It provides a set of tools that the developers need to develop android applications. The tools that android SDK provides are following:

- Required libraries
- Debugger
- An emulator
- Relevant documentation for the Android application program interfaces (APIs)
- Sample source code
- Tutorials for the Android OS

4.5.3 JDK

JDK means java development kit which is an environment for software development [8]. To develop java applications, developers need to use JDK. It includes the following components:

- Java Runtime Environment (JRE)
- Interpreter/loader (java)
- Compiler (javac)
- Archiver (jar)
- Documentation generator (javadoc)

4.5.4 Android Device

An android device is a very essential thing to build an android application. Because he had to run and test the application again and again to make sure that the app is working correctly. And without running our app on an actual android device we couldn't be sure that our app is working fine.

4.5.5 Permission

For the necessity of our project we had to add some permissions to the manifest file of our project. The permissions are for the internet access, location access and to send SMS over phone numbers.

“android.permission.INTERNET”

“android.permission.ACCESS_FINE_LOCATION”

“android.permission.SEND_SMS”

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Testing Implementation

When we finished building our app successfully then came the time to test the application to see the result. But the problem was we were very familiar with the application and its UI. Now if we test the app ourselves then there is no meaning of testing it at all. So, it has to be other people who do not know much about it. That's why we took help of our friends and other known people to test the application on their device and to take their feedback. After the testing period we were assured about our app's performance and its usefulness.

5.2 Test Result and Reports

After the completion of testing process, we had the following results:

- Good quality application.
- Innovative way of finding to-let.
- User friendly application.
- Easy to use.
- Small but useful application.

CHAPTER 6

IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

6.1 Impact on Society

Now a day, we can see many criminal cases like robbery, theft etc. It is increasing day by day & specially for girl, they are being harassed anywhere anytime. The rape rate has been increased and it made us so conscious. Through this app we can help some people who needs help in any kind of situation. By using “Help Finder” we can decrease the rate of theft, robbery & rape from society. Rapid use of this application can remove all kind of criminal occurrence.

6.2 Impact on Environment

There is no such impact on environment using this application.

6.1 Ethical Aspects

As “Help Finder” is a location shearing based application we will keep everyone’s current location safe. We will keep all the data of every user private that no one can harm them by using their information. The main focus using this app is to help people not to harm them.

6.4 Sustainability Plan

We may have become successful to build the app but there are some limitations still exist. Such as we wanted to send the help request to a limited user who are the closest to the help seeker. But we couldn’t do it. Then another thing we wanted is to use the volume button

command to send the help request when the screen of the device is locked. But we couldn't find any way to do that.

CHAPTER 7

CONCLUSION AND FUTURE SCOPE

7.1 Conclusion

The successful development of this project was a big achievement for us. And through this process we have gained a lot of experience and our confidence level have increased. At the beginning we had doubts on us that maybe we couldn't complete this project. So, we were very afraid. But as we kept on working our confidence level kept on increasing. And now all our fear has gone. Now we have that inspiration to make better projects in future.

At the end of this project we know that we have successfully achieved our goal. Being a victim of crimes like robbery, theft, sexual harassment has become a common scenario in our country. It ruins a lot of people's life, self-confidence and money. People needs a solution of this problem. But there is no way in our country for the normal people to be of help to each other in the time of emergency. Our application can be a life saver for a lot of people in such situation. Hopefully our will be useful to everyone. There is a help button and when that is pressed a notification will be sent to the nearby users who are available at that moment. Then if any user opens the app, he/she can see the help seeker's current position on google map with a red marker. Then that user can send a response so that the help seeker and other users also know that someone has respond and he/she is willing to help.

Finishing this project was not an easy task for us. We had to break many barriers that came across our way. That has made us stronger and more confidence. For now, we think our project is absolutely ready and we didn't miss anything. So, we can say that our application will hopefully satisfy the requirements and fulfill its goal.

7.2 Scope for Further Developments

It is impossible to make a system or software application absolutely perfect for everyone. Because we all know that in this world nothing is perfect. But we can always make things better. So, we made future plans to make improvement to our project, overcome all the limitations and fulfill all the needs of a user in future.

Some of the things that we want to do in future are followings:

- Send help request to a limited number of users who are the closest.
- Send a proper response notification to the help seeker.
- Trigger help action even if the device is locked, etc.

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APPENDIX

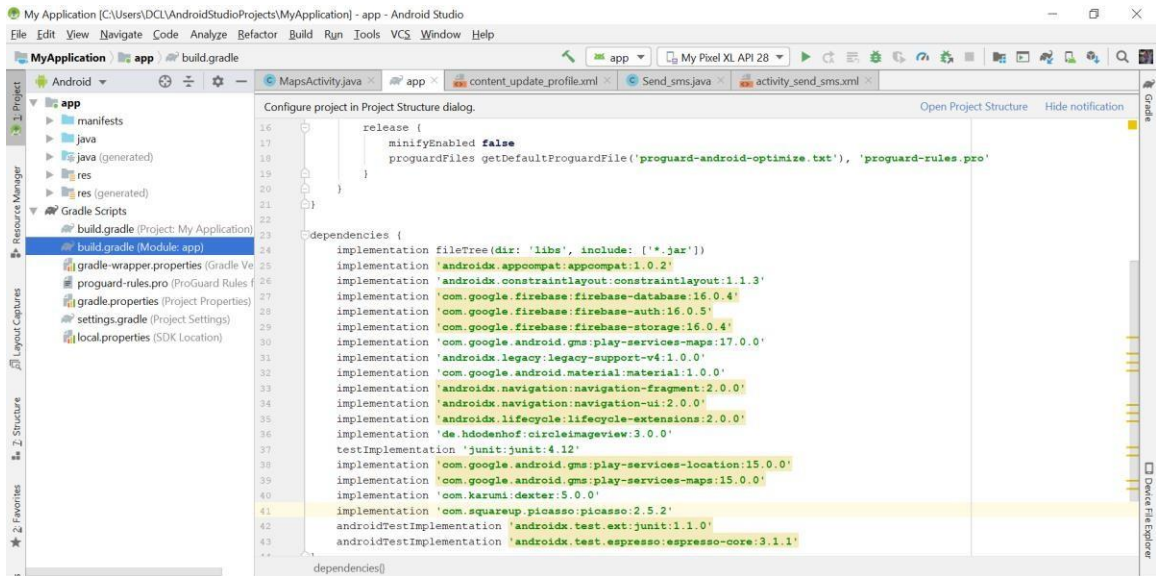


Figure A-1: App level gradle file

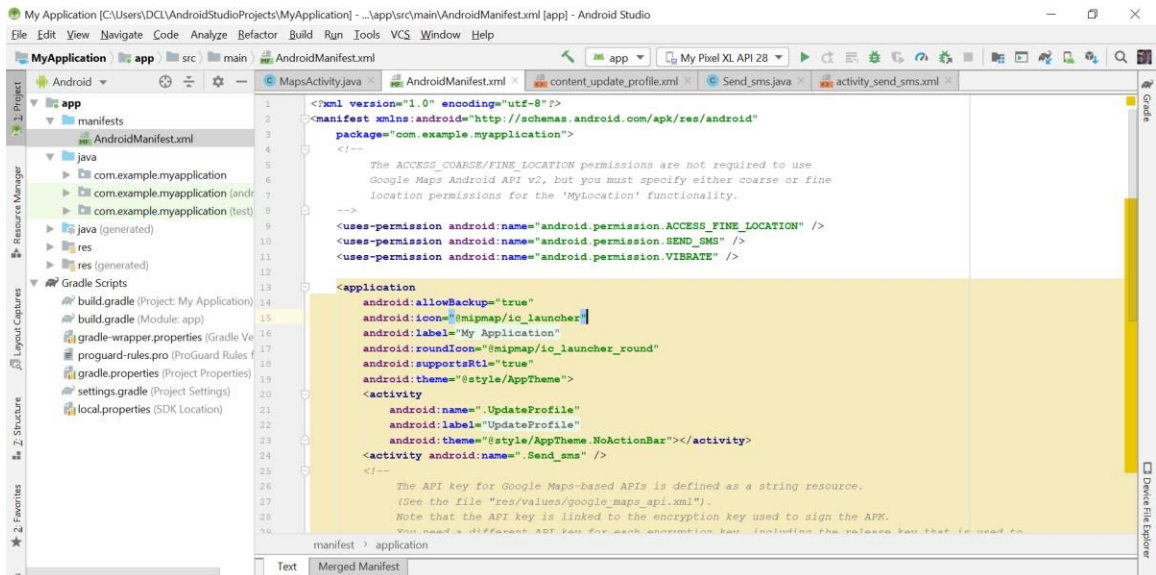


Figure A-2: Android Manifest file

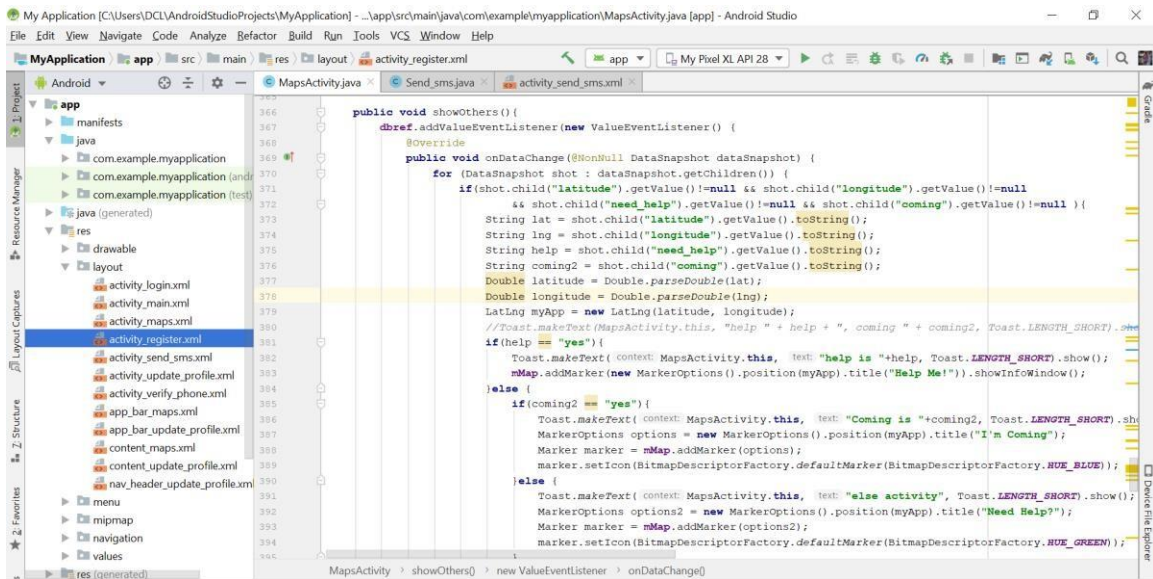


Figure A-3: Java code of the Map activity

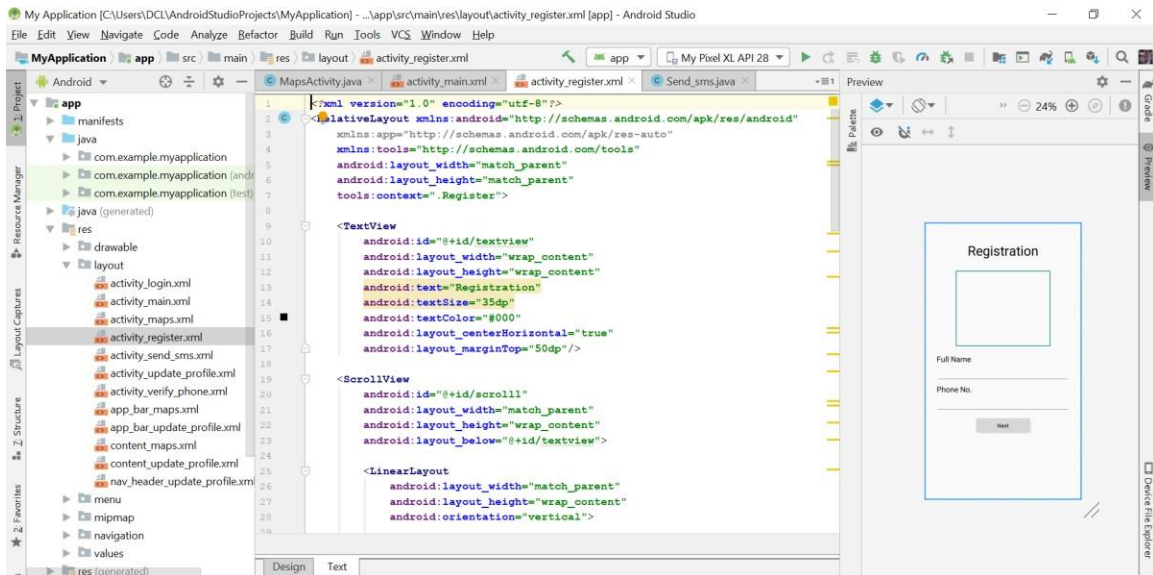


Figure A-4: XML code of Registration layout

The screenshot shows the Firebase Authentication console. The left sidebar contains navigation options: Project Overview, Develop (Authentication, Database, Storage, Hosting, Functions, ML Kit), Quality (Extensions), and Spark (Free \$0/month, Upgrade). The main content area is titled 'Authentication' and has tabs for Users, Sign-in method, Templates, and Usage. A search bar is present with the text 'Search by email address, phone number, or user UID'. Below the search bar is a table with the following data:

Identifier	Providers	Created	Signed in	User UID ↑
+8801516726734	📞	Oct 24, 2019	Oct 25, 2019	Qh6MLWQ99CQVf2gZm85WsiNB3...
+8801835222980	📞	Oct 25, 2019	Oct 25, 2019	uk5qJht1Sgc4sUsqVDd0VrYVE6j2

At the bottom right of the table, it says 'Rows per page: 50' and '1-2 of 2'.

Figure A-5: Firebase authentication table

The screenshot shows the Firebase Realtime Database console. The left sidebar is similar to the previous image but highlights the 'Database' option. The main content area is titled 'Database' and has tabs for Data, Rules, Backups, and Usage. A browser window shows the URL 'https://help-a31ac.firebaseio.com/'. The data is displayed as a JSON tree structure:

```

help-a31ac
├── Data
│   ├── Qh6MLWQ99CQVf2gZm85WsiNB3LR2
│   │   ├── imageUrl: "https://firebasestorage.googleapis.com/v0/b/help-a31ac.firebaseio.com/o/tonmoy.jpg"
│   │   ├── name: "Tonmoy"
│   │   └── phone: "+8801516726734"
│   ├── uk5qJht1Sgc4sUsqVDd0VrYVE6j2
│   │   ├── imageUrl: "https://firebasestorage.googleapis.com/v0/b/help-a31ac.firebaseio.com/o/tonmoy_rob1.jpg"
│   │   ├── name: "Tonmoy Rob1"
│   │   └── phone: "+8801835222980"
│   └── Status
│       ├── -LrzJfzEcMggJkDJP2M4
│       └── Qh6MLWQ99CQVf2gZm85WsiNB3LR2
│           ├── coming: "no"
│           ├── latitude: "23.745751"
│           └── longitude: "90.3627523"

```

Figure A-6: Firebase Realtime database table

The screenshot shows the Firebase Storage console interface. On the left is a dark sidebar with navigation options: Project Overview, Develop (Authentication, Database, Storage, Hosting, Functions, ML Kit), Quality (Extensions), and Spark (Free \$0/month, Upgrade). The main content area is titled 'Storage' and shows the path 'gs://help-a31ac.appspot.com'. Below the path is a table of storage items:

<input type="checkbox"/>	Name	Size	Type	Last modified
<input type="checkbox"/>	[-] LrzJfzEcMggJkDJP2M4/	—	Folder	—
<input type="checkbox"/>	[img] images	449,22 KB	image/jpeg	Oct 25, 2019
<input type="checkbox"/>	[+] Qh6MLWQ99CQVf2gZm85WsiNB3LR2/	—	Folder	—
<input type="checkbox"/>	[+] uk5qlht1Sgc4sUsqVDd0VYVE6j2/	—	Folder	—

Below the table, it states 'Location of default bucket: us'. There is also an 'Upload file' button and a '+ Add' icon in the top right of the table area.

Figure A-7: Firebase storage table

