

**AN ANDROID BASED MOBILE APPLICATION FOR SECURE MESSAGING**

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

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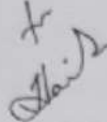
**DHAKA, BANGLADESH**

**DECEMBER 2019**

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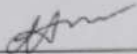
This Project titled “**Android Based Mobile Application for Secure Messaging**”, submitted by Akash Bhowmik, ID No: 161-15-7355 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on December 7, 2019.

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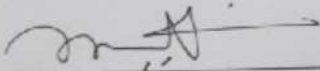
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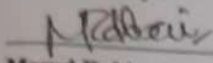
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We hereby declare that we have taken this project under the supervision of Mr. Masud Rabbani, Lecturer, Department of Computer Science and Engineering, Daffodil International University. We also declare that neither this project nor any part of this has been submitted elsewhere for award of any degree.

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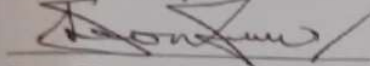
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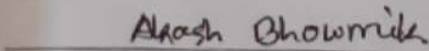
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## **ABSTRACT**

This is an Android Application which focuses mainly in sending secret message. This is basically an online messaging application. You can send an image and there are some text/message hidden in an image. Everyone will have a unique id. When you want to send message someone, firstly you need to connect with his/her id and there is an option that we could easily accept someone's request. You are able to choose any JPEG image for sending message. There is an option to hide the text message .After choosing an image and writing in the text message option then you should encode your message. The receiver will see the hidden message when he/she decodes this image.

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# CHAPTER 1

## INTRODUCTION

### 1.2 Introduction

Nowadays computer programming is the most popular technology in this world. My project is an android based application on secure messaging. In a present time messaging is the common way to connect another's people. Every time everywhere we text others. Text messaging upgraded day by day. Nowadays online messaging is very popular in our world. There are lots of technology in world that we can send message in online. But unfortunately those technology for sending message is not safe because sometimes this message or files leaked out by hacker is called third person. So security is the most important things when you want to send message someone's. My application is help us to send message someone's and fact is the third person can't read the message. Actually my message is hiding in a JPEG image.

### 1.2 Motivation

After a bunch of research, i realized that people in every ages love to do send message someone in online. But nowadays we can see that there are lots of messaging application hacked by third party and they leak out secret message or files. They are so strong in their position. Although maximum are online based application. In this situation I discuss about all security system and know about some technology that I applied in my project. I tried to do use different technology in my project that helps us to make a good application and the application are fully safety to sending message someone and no one can't read the original message. In a present day we often see that the third party hacked someone personal message and after that they demanded worth a great deal of money. So we tried to make an application to helps others that the third party never understand the message. Actually the message hide into a JPEG image. No one can find the hide message from an image. My project will help you that you can easily send message someone and the message will be hide in an image. The third party never understand that some text are hiding in an image.

### **1.3 Objectives**

We belong to the era of online technology. Every person connect with another's by messaging. Our project is online based messaging application .By using this application you can send message. We provide the best privacy when you send secret message. This application have a good technique for hiding our original text message. Your text message will be hidden until the receiver receive the message We need security on our daily life to sending private text someone's id & want that no one can understand this message. By our application you can send image in online and when the receiver decode the image the hidden text (original message) open for show. You can easily reply him/her by sending image and the text hidden in an image until the receiver open the image.

### **1.4 About my App**

This is basically an online messaging application. You can send an image and there are some text/message hidden in an image. Everyone will have a unique id. When you want to send message someone, firstly you need to connect with his/her id and there is an option that we could easily accept someone's request. You are able to choose any JPEG image for sending message. There is an option to hide the text message .After choosing an image and writing in the text message option then you should encode your message. The receiver will see the hidden message when he/she decodes this image.

### **1.5 Expected Outcome**

- This application will help you to share secret text with others & no one can't read this text.
- You can send both image and a secret message at a same time.
- Third party never understand that some text hidden in an image so that they can't crack this text.
- On the contrary, usually this applications protects secret information from visual attacks.

## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Introduction**

My application generally based on secure messaging .Sending and receiving text messages is the most prevalent form of communication for our world. Each and every sector peoples to do love send message. Normally I used steganography technique in my application for hiding message in a JPEG image. Although steganography is not a recent data hiding technique, still researchers find it as a lucrative area of research for further improvement. Apparently, steganography and cryptography both techniques deal with privacy and secrecy related issues of data. However, steganography is comparatively better than cryptography in this aspect. The underlying reason is cipher text generated through a cryptosystem is significantly distinct from the form of plaintext. Thereby attackers may take attempt for cryptanalysis to breach the secrecy of encrypted data. On the contrary, usually, steganography protects secret information from these visual attacks. There are lots of applications with this technique. Most of the steganography technique uses messaging application are offline based. Our application is an online based application but using this application you can't text directly. We used steganography technique that the message hidden in an image. When you received the image and decode this message, then you will see the secret message. The main goal of the project is text someone's by sending a JPEG image. The secret message hidden in an image and the third party never understand that there is some text in an image.

## 2.2 The Proposed Technique of My Project

In this Figure 2 described about the proposed technique. Fig. 2 shows the framework for the overall process of the system. The system is able to hide the data inside the image as well as to retrieve the data from the image.

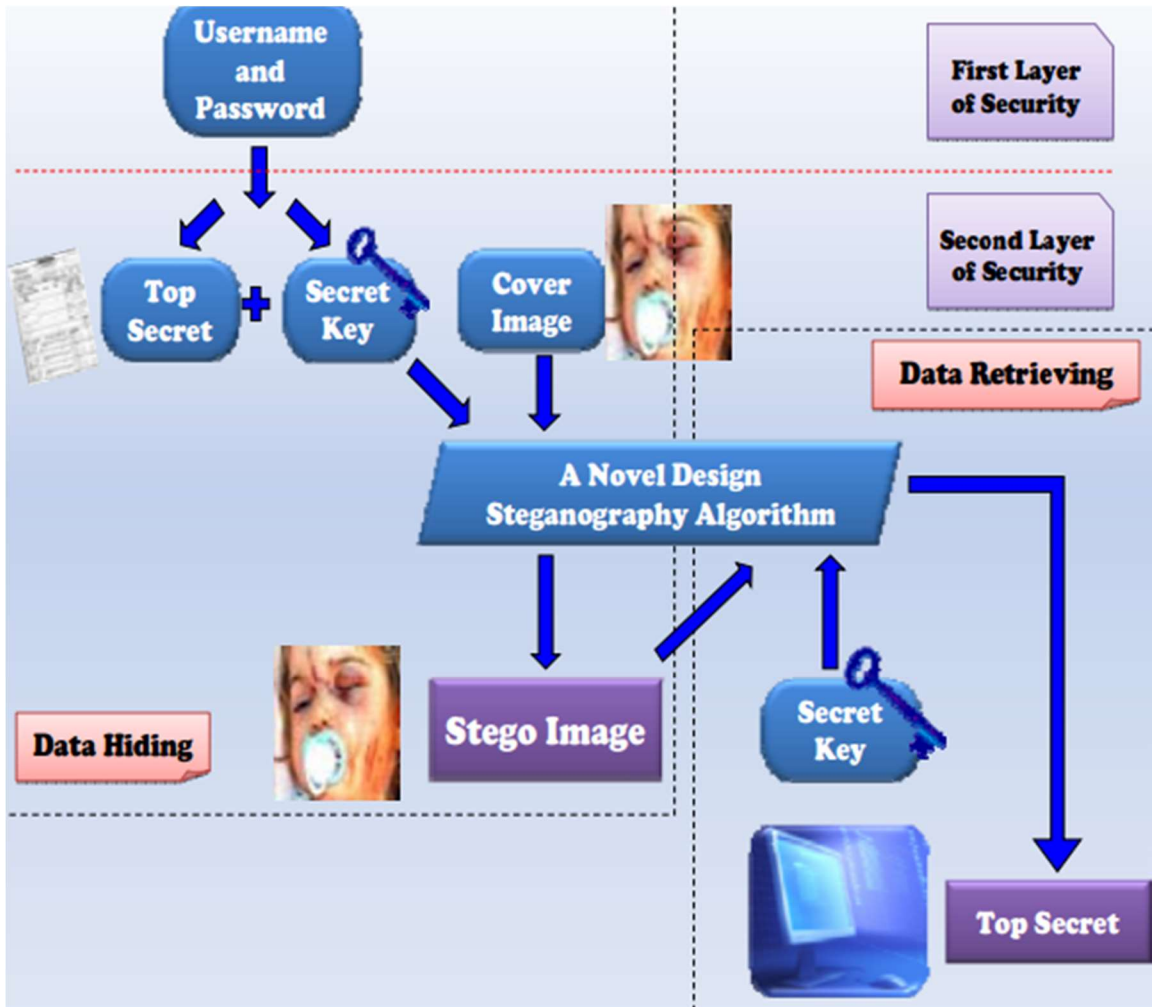


Fig.2 The framework for the system

## **2.3 Related Work**

Normally Steganography technique is hides data inside a cover media such as images, audios even in videos. As we know many researchers have already worked in this field for their further development. The technique proposed in applies JPEG compression on the cover image which was broken into 8x8 blocks of pixels and embedded secret data on the DCT coefficients based on a capacity table and capacity factor for deciding number of bits to be embedded.

When I think about that my project application need to build for my final year project, I search in play store that there have any app like this and didn't find not a single application that is looks like my application but find out there are few applications. However, there are few applications which has two or three features like us but actually not like this. The most importantly my application are online, I can't find any online applications like ours.

## **2.4 Comparative Studies**

As I know about that there are few applications available in play store which are not portfolio developed. I can give a very nice user interface for send image and hidden text. In play store most of the applications are offline. You can't send message in those applications. But in my application you get a nice functions and good interface for send message. My applications is only for android mobile users. User can contact others because there is community feature available in my applications. Peoples can share their experience and feedback. I hope that my user interface is so much simple and the users will enjoy. By using this application I hope that people will enjoy because it is natural to handle, it will be helpful for peoples who need security in their personal life.

## 2.5 Challenges

When a software developer wants to make android application, then the developers always face new stark types of challenges and competition. None of app can completely be good. So this is hard for me to develop my project .Yes I have to face serious problems .Basically my applications is to send private message in online. It is too popular in today's world .There are lots of messaging applications in common world. So that's point this is challenging for me to make different type messaging applications. As my application is online and the message is hidden in an image, so this is very challenging for creating a new server because the server should be in online. There are two or three more user interface in my applications that I never seen before any applications in play store .That is why to create those interface is difficult for me. When I'm started building up this application I always put in my mind that all interface should be simple for users and everything will be performing good. . In future it will be increment with some new concept.

## **CHAPTER 3**

### **REQUIREMENT SPECIFICATIONS**

#### **3.1 Business Process Model**

Business process modeling (BPM) is the activity of representing the process of an enterprise so the current process can be improved, automated and analyzed.

This activity start with login page. If any user is already logged in there, the session will take the user to home, or the activity will require user login or registration. In home page there is a search option that you will search the name those people are connected with you. There is an activity that you will select image from gallery. You will write text that you want to hide. You will encode this message .If you want to send this message someone then you should press the send button.



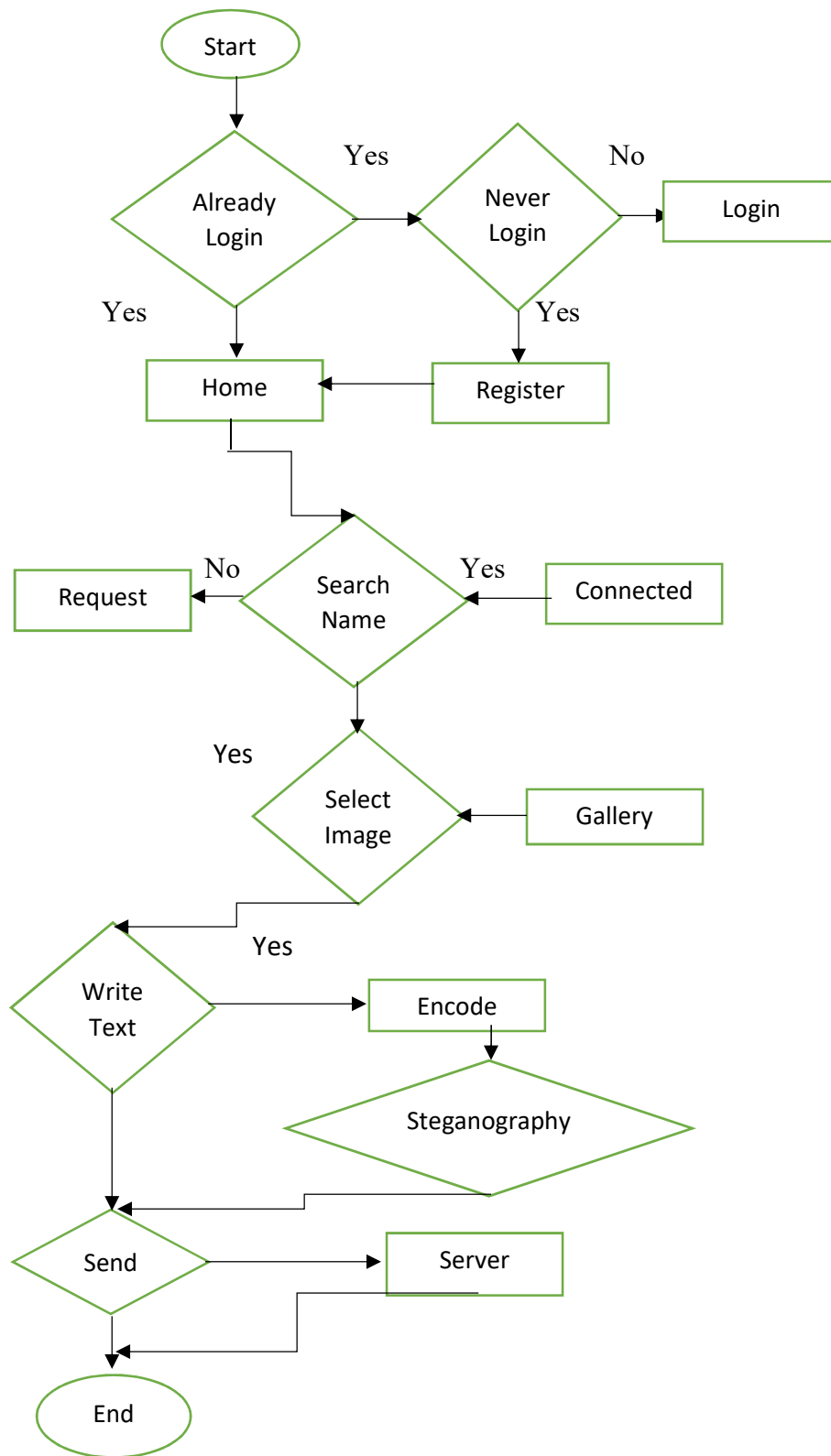


Fig. 3.1. The Business Process Model of Exertion

## **3.2 Requirement Analysis**

Requirement analysis is called as requirement engineering which is the process of determining user's expectation for a new event system. We analyze, refine, and scrutinize the gathered requirements to make consistent and unambiguous requirements. This activity reviews all requirements and may provide a graphical view of the entire system.

For my project development process, we can see that there are two types of requirements. One is called functional requirements and another is called non-functional requirement.

## **3.3 Functional Requirement**

In computer engineering, functional requirement is defines a system or its component, a system is likely how to perform. Look likes, my application also has some functional requirements as like maintaining server and there is a send button where user send message. There is a search option where the users find people by this application and the select image button where users chose image from gallery. This is some functional requirement in my application.

## **3.4 Non-functional Requirement**

Non-functional requirement is a process that have specifies some criteria when anyone implement an app. This is like's application is how much efficient for users, how soft to use this, the performance issue, etc. After discussing, the application has many functional requirement. User interface of application is also so much friendly and nice for user. Non-functional has many build in function that I used in app. The application is only for android users. An android OS based device with internet connection.

## **3.5 Use Case Modeling and Description**

Use case is a description about how a user will use the application. This is indicate how a user use the system of accomplish his business goals. There are many function in this model and described about whole things of use cases and the main part of actor. Use case always remind that this will be easy and understanding when a user use your application.

In figure 3.2 I show how to use my application and the first page is homepage and then another activity. There are some button in include there. If a user tries to open my application first press any button whatever he/she want. Use case is normally show how to use the app or something else. In my figure 3.2 use case indicates the same thing. In this picture I include everything that a user happy when he use this.

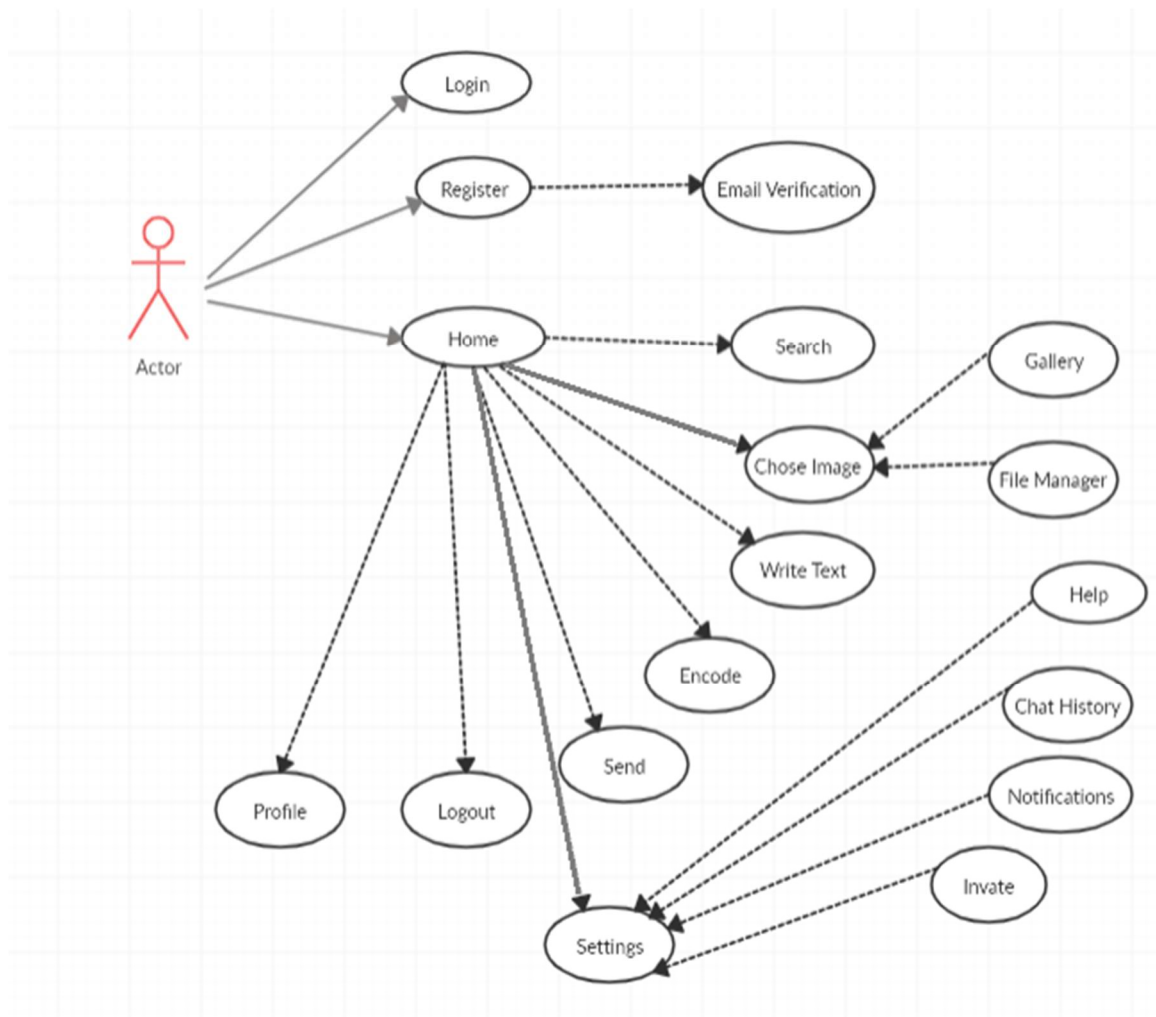


Fig. 3.2 Use Case Modeling for My Application

### 3.6 Logical Data Model

Logical data model generally consisted of some elements like's data entities, attributes and some keys and their relationship between the entities.

### 3.7 Design Requirements

- In my system, I'm design a registration form and a login section.
- I'm design a profile that users changed their name and information. User create new password and update his /her personal information.
- I'm design a settings option where users give feedback, invite others, if users face any problem then they ask for help from application and users check chat history from settings.
- I'm design a select image option where users chose image from gallery or file manager.
- I'm design a search option where users search another users.
- There are an option name write text and that text hidden in an image.
- There are an encode option that encode your message.
- And finally that send button where users send their message.
  
- An android OS based device with internet connection.

Through this is an online based application so every users must be connected in a server for sending message and getting message.

I'm tried my best to build my application as so much easy and comfortable. I'm always think about my app user when I'm increment the project. For this reason, my android application is so comfortable for use. In application store there is no application like my app. So we think that my application very helpful for peoples.

## CHAPTER 4

### DESIGN SPECIFICATION

#### 4.1 Front-end Design

The front-end design is everything involved with what the user sees, including design and some languages. When a user open any app and then the app how looks like is called front-end design .This is need so friendly and soft because a user most interact with this front-end design. The application will hopefully fails if the front-end design is not so good.

The front-end design of my project is as follows

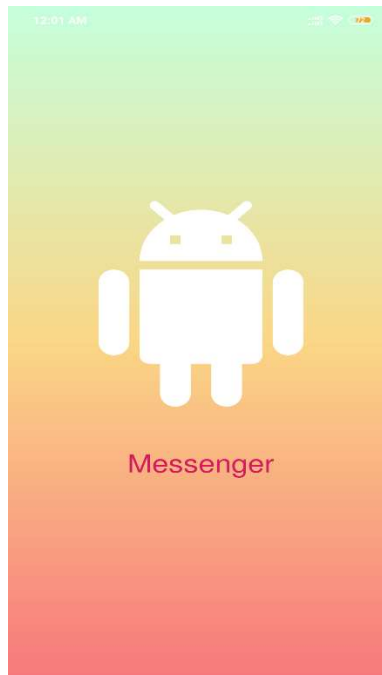


Figure 4.1: A Screenshot of Front-end Design of My Application (Mobile Application)

In figure 4.1 shows the front page of the user interface. Every time the users will see this when he/she open this application. I tried my best to create this simple and beautiful.

## Login page:

User can login this page by input their valid Gmail and password. If they give wrong Gmail or password then it doesn't work. If they login correctly then they go directly home page.

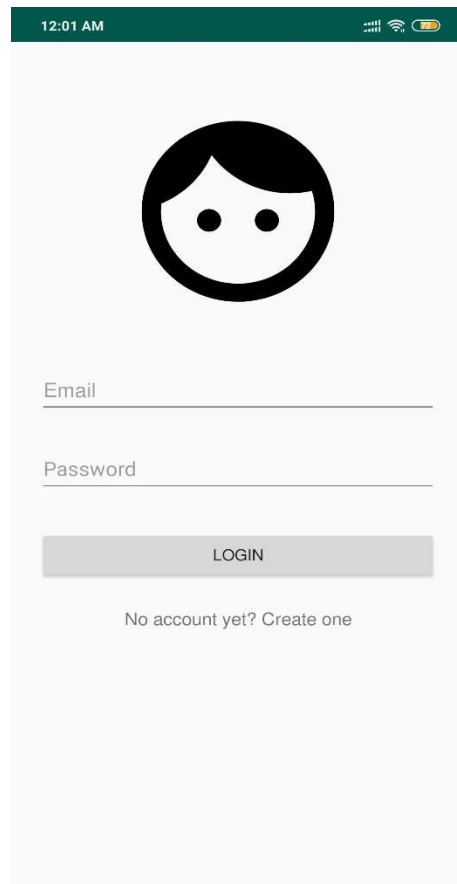


Figure 4.2: Screenshot of Login Page.

If a user don't have any account then they should go in sign up. For sign up they need to click No account yet. Then they go sign up page. After sign up the users use the app.

### Account create page:

At first User need to registration for using this app. Here is the page of my application for registration. For registration user input their name, then email and set a password for sing up.

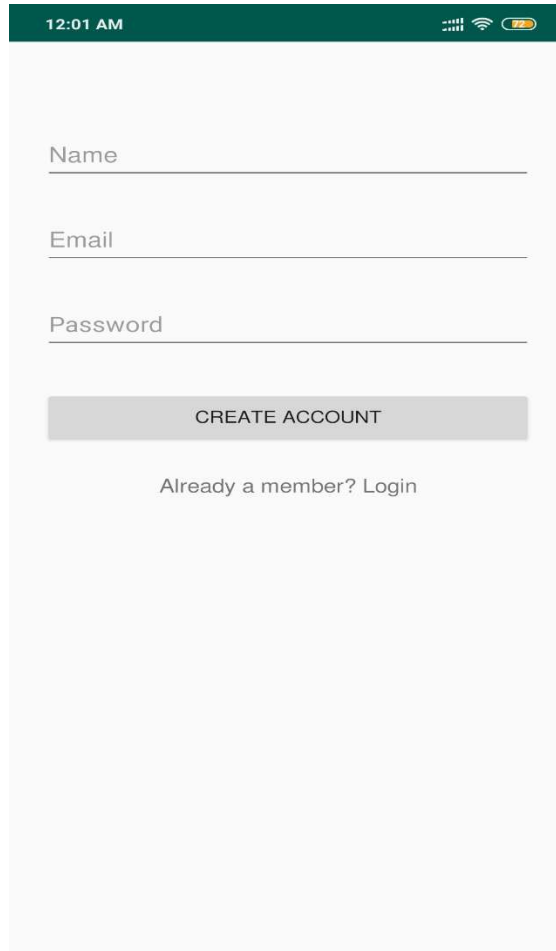
A screenshot of a mobile application's 'Create Account' page. The page has a white background and a dark green header bar at the top. The header bar contains the time '12:01 AM' on the left and icons for signal strength, Wi-Fi, and battery level on the right. Below the header, there are three input fields with labels 'Name', 'Email', and 'Password' positioned above each field. Below the input fields is a grey button with the text 'CREATE ACCOUNT'. At the bottom of the page, there is a link that says 'Already a member? Login'.

Figure 4.3: Screenshot of Create Account Page.

After sing up open another page Figure 4.2. With mail sign up, system also provide verification code in Gmail. This is based on good security for users.

## Home page:

After completing login, you go in home page .here is our home page screenshot. In home page you can go friends where the friend was connected. There are another option and one option is nearby. You can log out sign when you are in home page.

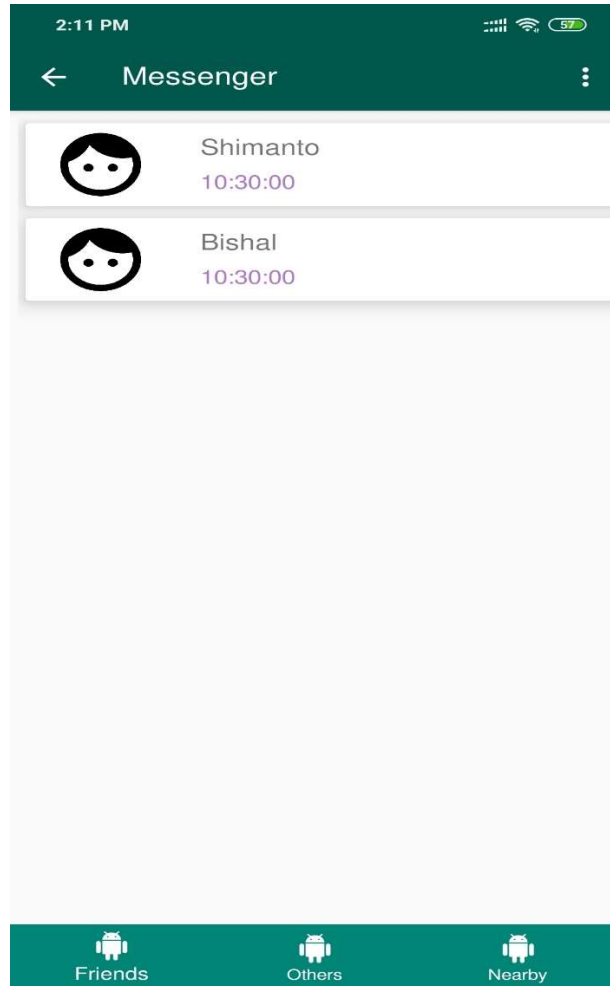


Figure 4.4 Screenshot of My Home page

If you have no friends before you could add him/her by give request. If you go in others you can see other connected people and nearby means if there are any user close with you.



## Messaging:

In this figure 4.5 we can see that the messaging. Here we see that you can send image or text both .Write a message and click the send button. The message will received by connected person.

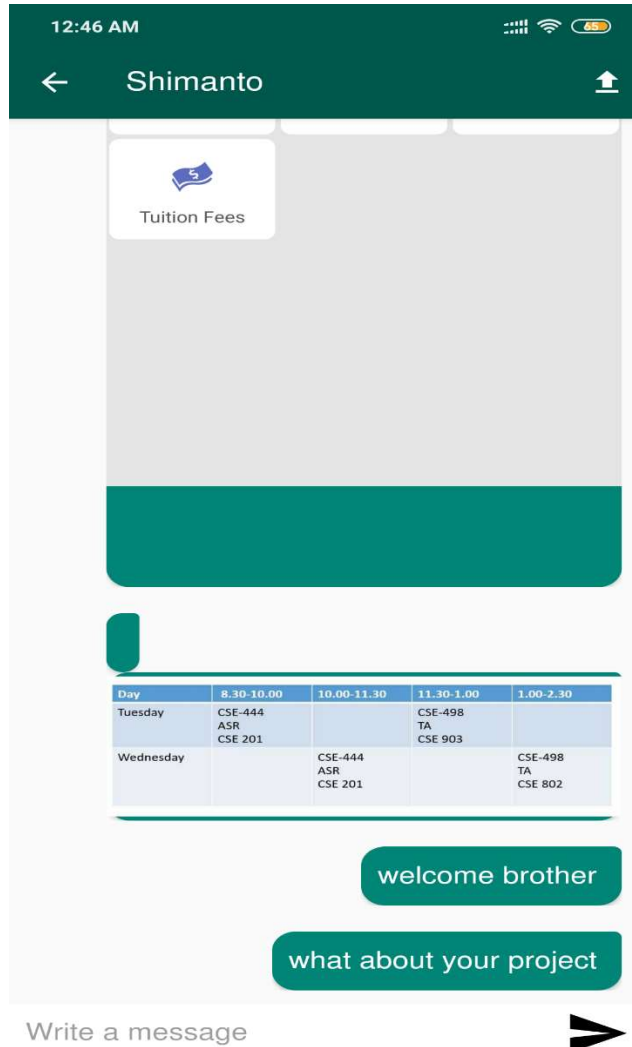


Figure 4.5 Screenshot of Messaging

In this figure you I show that the messaging list with your friends. You can send image and text both of this.

### Choose image:

This option are for choosing any image from gallery or file manager or others. Users send picture when the picture was selected.



Figure 4.6 Screenshot of choosing image

In this figure 4.5 show that when you choose an image for sending .When you want to send an image in message you choose image from gallery or file manager whatever you want.

## Encode messaging:

In this figure 4.7 we can see that the messaging. Here you can send image and the text will hide in image .You give a key .Without key anyone can't see the hide message. Write a message and click the send button. The message will received by connected person.

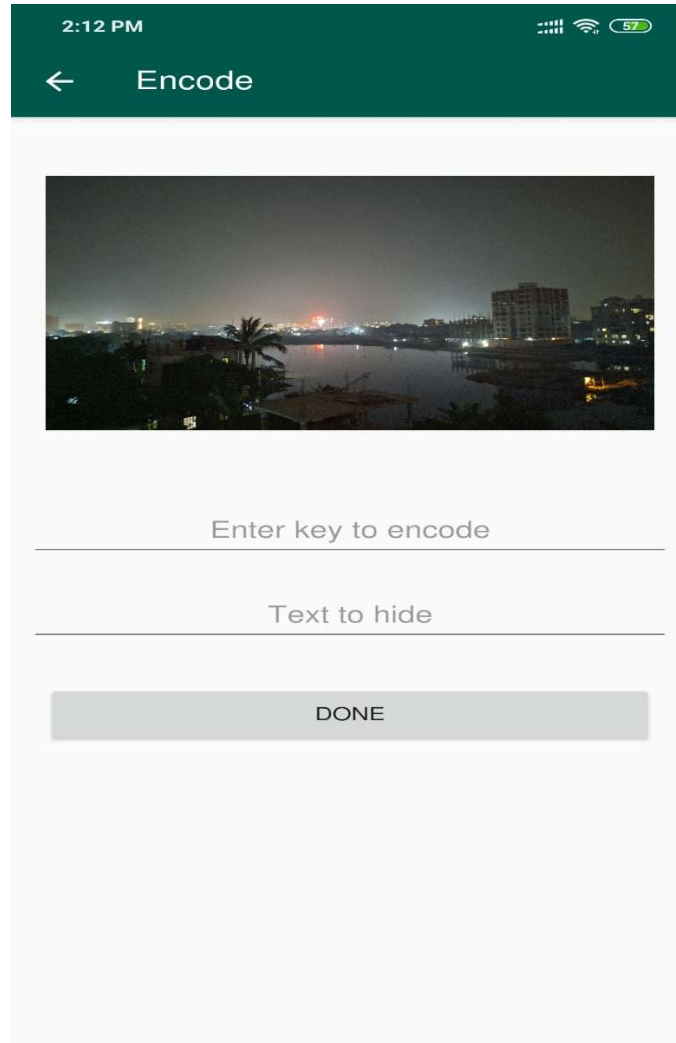


Figure 4.7 Screenshot of Encode Messaging

In this figure you I show that the encode messaging. You can send image and text will hide in an image.

## Decode messaging:

In this figure you can see that the decode messaging .When someone send an image .If you want to show the hide message, first you need the same key which are gave by sender. If you match by key then you will show the hide message.

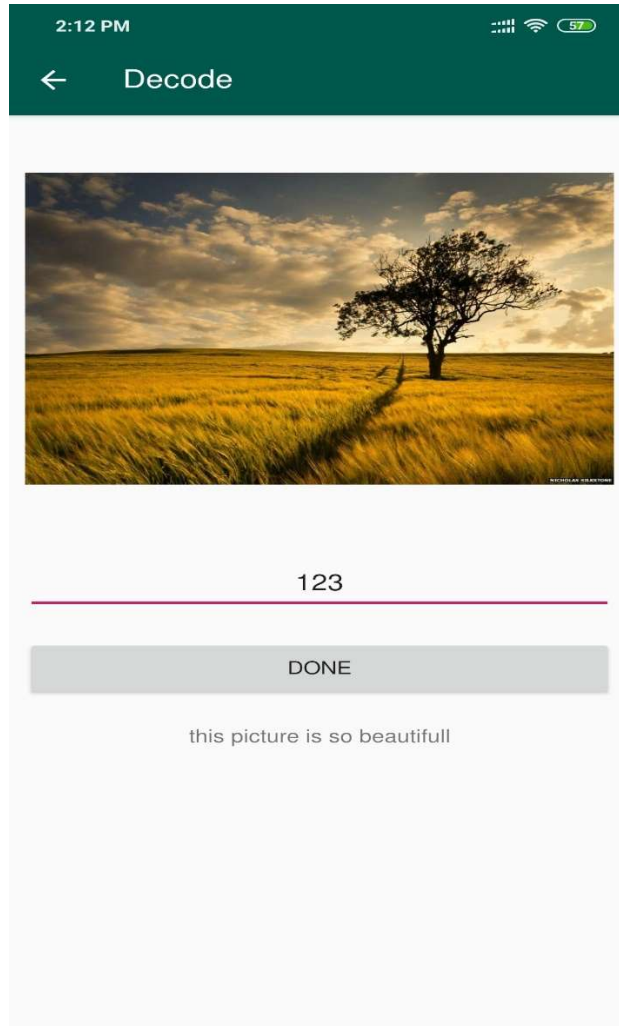


Figure 4.8 Screenshot of Decode Messaging

## Logout:

Here figure 4.9 we show that logout option. User can logout from one account to another account .When you logout from one account then the page will go figure no 4.2 login page. After login you will use another account.

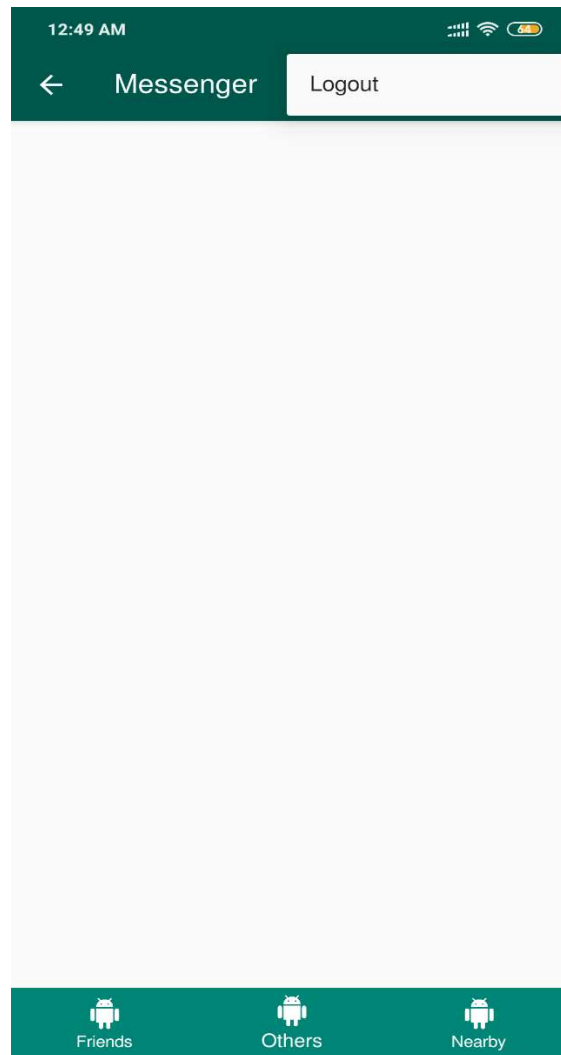


Figure 4.9 Screenshot of My Logout page

This is a page of log out option. When you can click on log out option and you go directly log in page.

## **4.2 Back-end Design**

The back-end design is the most important part for application. This is mainly the visual representation of the backend. Back-end is the momentous part for any application. So for this reason the quality of the project, structure and the content management is very important. This is generally includes database and server .We know that the sever and database is the main part for application. Without this two we can't run of our application. Yes I have an also server and database .In future I will improve all of this back-end design for users.

## **4.3 Implementation Requirement**

I use lots of different types of implementation and few components, there are some attributes and tools to build my application. Making my application need to easily accessible and useful for people. I implement the core code that is the Java code and XML code in my project. The important thing is in my application that it's written by English.

For implementation this application needs the following issue:

### **4.3.1 Android Studio**

Android Studio is the IDE (integrated development environment) to run android operating system. Generally this is design for android app development. My application is also android based so I'm designed this app by android studio.

### **4.3.2 Android SDK**

Android SDK means Software Development Kit. If you build an application on android you must be needed this SDK. Without this you can't do anything with your application. At first you need to install this and then you need to set up in android studio.

### **4.3.3 Java Development Kit (JDK)**

JDK is so much important for android studio. There are many JDk file likes Java SE, Java EE or Java ME platforms.

### **4.3.4 Android Virtual Device (AVD)**

People who used android studio, they need to an emulator to check to your application. If you want to increment an application, after completing that how do you that your application is good .For this checking you need a device or emulator. When a run your application you will see that the app in emulator or device what you connected with your android studio.

## **4.4 Interaction Design and UX**

Interaction design is called discipline that observes the interaction between a process and its user. Actually interaction design is the system which understand the user problem, lacks or drawback and find out the results, perform actions by results and solve the problem. I keep my application too simple and also easily for better feelings, better experience and better performance for the user when they using my application. For UX I tried my best to put some fantabulous experience by my android application. My system is very simple and easier for performing better.

## CHAPTER 5

### IMPLEMENTATION AND TESTING

#### 5.1 Implementation

First you need to open the app and click button then it will be open for users. I have database for connect with server. Every chapter I implement and specify every chapter of my app. When I run it runs so smoothly. I mainly implement in here the online server .In my app there is no menu bar. There is a search bar where you search any name.

#### 5.2 TESTING

Testing is the main part for software development. Like you increment an android application in android studio .After that you need to build and run this app. When you run this it is uses for people but you need to more device for testing .Because there are many version in mobile .You should check in all device that your app will work properly or not. The “Secure Messaging” app is work properly with android device and mention that the android version is equal or greater than 4.2. It works in all android device nicely.

#### 5.3 Implementation of Front-end Design

This is a good challenge for you when you increment your android application and need a good interface. Without an attraction interface peoples never use your application because when a user open your app first he saw that your front-end design. The interface should be so easy and comfortable for users. I also try some materials and tools design for making and creating attraction to the user. Unfortunately this is the most challenging part to create my application. There are many types device in world, sometimes many mobile’s hardware is so weak that any apps didn’t install or if install then it will be crushed. On the other hand there are lot of good hardware mobile. So my target is in all device my application will run so smoothly .Sometimes there are some button that didn’t work properly so we need care about this.



## **5.4 Implementation of Java and XML Code**

Using android studio for my application UI design with file and for java code to connect with the XML file, using Xampp server to save user's data .I use android studio for my application design. In android studio many kind of language are supported. There are many language that I used in my application. In xml code I take some text-view, edit text, button and image view for this application. This app design by using in xml coding.

Figure 6.3 of appendix section I use the screenshot of the XML code.

Figure 6.2 of the appendix section, it shows screenshot of Java code.

## 5.6 Testing Implementation

Table 5.4: Test Case for Project on Secure Messaging

Test Case	Test Input	Expected Outcome	Actual Outcome	Result	Tested On
1.Install Application	Tested on Various – 1. Jelly Bean (4,1-4.3.1) 2. KitKat (4.4-4.4.4) 3. Lollipop (5.5-5.0.2) 4. Marshmallow (6.0) 5. Nougat (7.0-7.1) 6. Oreo (8.0-8.1) 7. Pie (9.0)	Successfully install all those versions.	Install successful	Passed	28.10.2019

## 5.6 Test Results and Reports

I'm improve my application based on user's feedback, until they're the best. I tested my application with my three friends. They gave some advice to me that my system need more user friendly and developed. My application has not published yet in market. I have respect their advice. Their review so much helped me to make my application more attractive and user friendly than before. I hope peoples can easily use and understand my application.

## CHAPTER 6

### CONCLUSION AND FUTURE SCOPE

#### 6.1 Conclusion

My android based mobile application “Secure Messaging” has been successfully implemented. For this implementing my application, I tested my application with many types of smart phones, I saw that most of the times my application worked properly. In application google store there is no app like my application. My application is based on online. Nowadays messaging is the common way to connect others people. For this reason there have many apps in play store. So in the other hand from all of this application choosing my app it’s difficult. A good interface and likely when people use this app it should be useful for users. By using my app one think clear that my app is useful who need to privacy for sending private message.

My application design is so beautiful and most importantly my application have good interface. All of this interface designed so smartly. If you look on my application you see that my application is so simple .It’s not looking likes a complex. Anyone can handle easily. When I’m starting to develop this application I tried my best to give a smart app for peoples. I tried my best to fulfill all requirement that we faces every day in privacy section. This project helps me to know about privacy in online .I learn so many things about security system. Here are following things

1. To know about security system
2. To know about some technique that used by many application in real life.
3. To know about image compression.

## **6.2 Limitations of our Application**

My application has some limitation I will overcome this limitation in future.

There is no search option in this application.

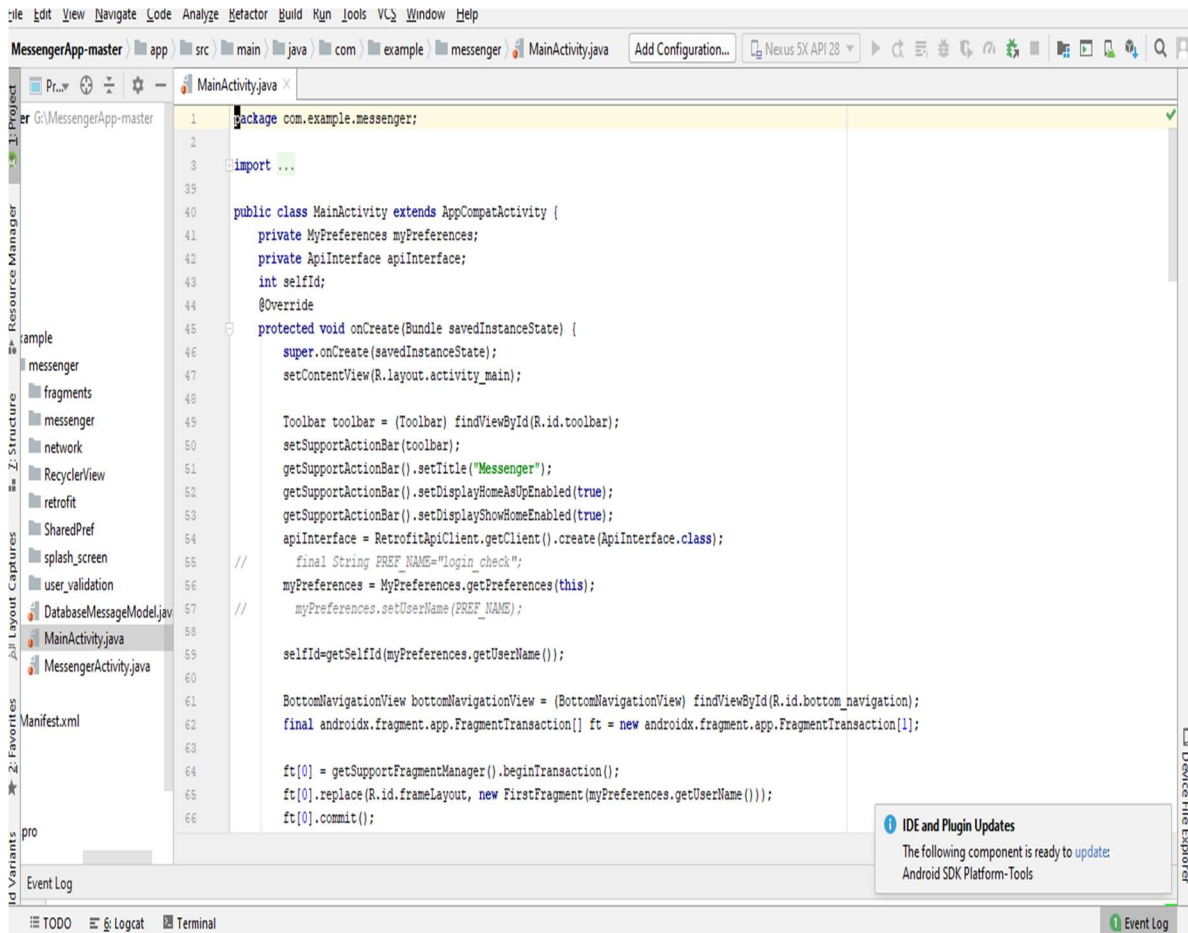
1. Without Picture or image user can't send file in message option.
2. User can't update their profile.
3. Through this is an online application so everyone need verification when they logged in by Gmail but we don't do that.
4. User can't download any image from messaging option.

## **6.3 Future Scope**

I'm try my best to develop this application. In this fact there is no search option in my application. So in future I will do it for users then they easily find their friends. I will try to best to create an option for send file. In my application users can't update their name and profile so I will do it for users. Every Gmail users need verification when they input their Gmail. I will create an option for download when anyone give an image in message. In future I will increment this app in IOS.

# APPENDIX A

## Java Code

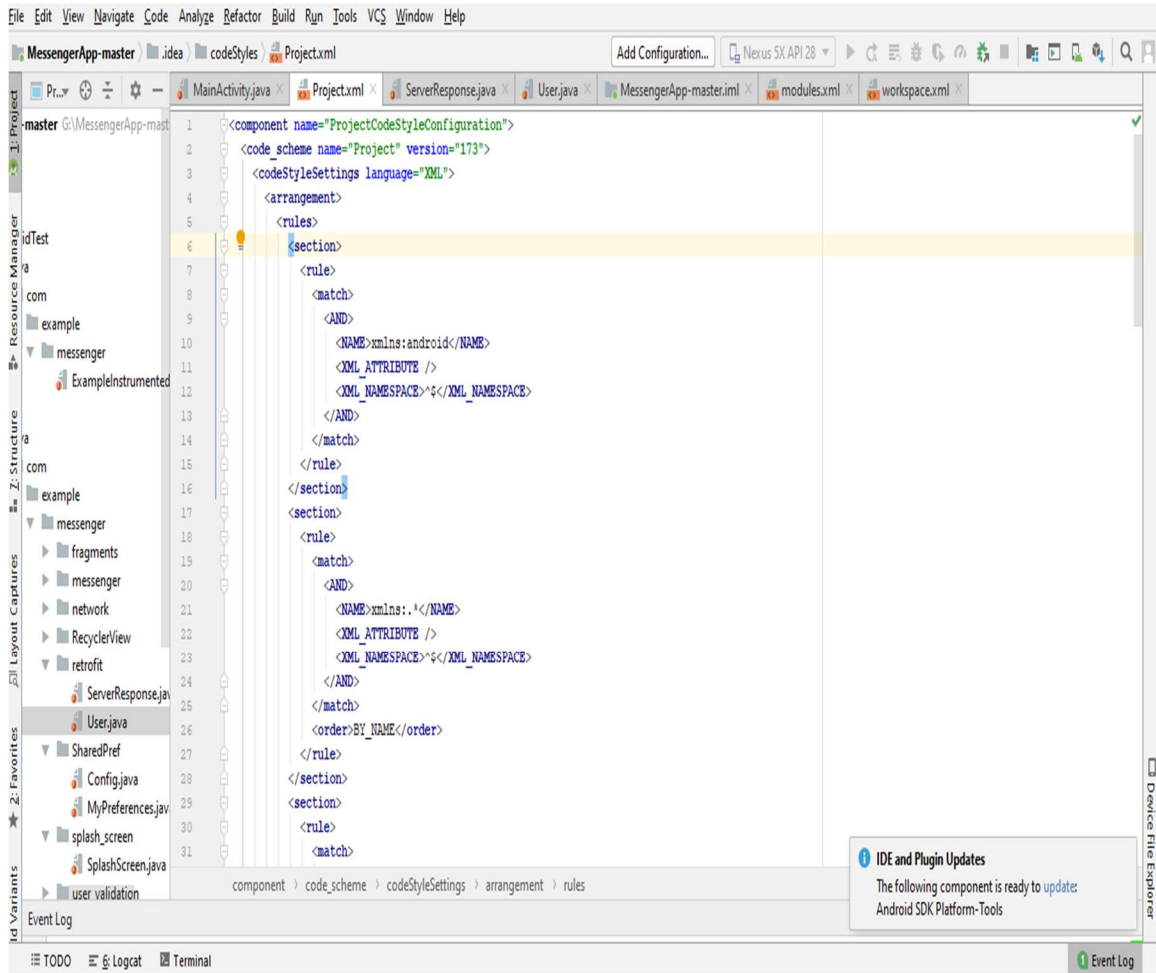


```
1 package com.example.messenger;
2
3 import ...
4
39
40 public class MainActivity extends AppCompatActivity {
41     private MyPreferences myPreferences;
42     private ApiInterface apiInterface;
43     int selfId;
44     @Override
45     protected void onCreate(Bundle savedInstanceState) {
46         super.onCreate(savedInstanceState);
47         setContentView(R.layout.activity_main);
48
49         Toolbar toolbar = (Toolbar) findViewById(R.id.toolbar);
50         setSupportActionBar(toolbar);
51         getSupportActionBar().setTitle("Messenger");
52         getSupportActionBar().setDisplayHomeAsUpEnabled(true);
53         getSupportActionBar().setDisplayShowHomeEnabled(true);
54         apiInterface = RetrofitApiClient.getClient().create(ApiInterface.class);
55         // final String PREF_NAME="login_check";
56         myPreferences = MyPreferences.getPreferences(this);
57         // myPreferences.setUsername(PREF_NAME);
58
59         selfId=getSelfId(myPreferences.getUserName());
60
61         BottomNavigationView bottomNavigationView = (BottomNavigationView) findViewById(R.id.bottom_navigation);
62         final androidx.fragment.app.FragmentTransaction[] ft = new androidx.fragment.app.FragmentTransaction[1];
63
64         ft[0] = getSupportFragmentManager().beginTransaction();
65         ft[0].replace(R.id.frameLayout, new FirstFragment(myPreferences.getUserName()));
66         ft[0].commit();
```

IDE and Plugin Updates  
The following component is ready to update  
Android SDK Platform-Tools

# APPENDIX B

## XML Code



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## AN ANDROID BASED MOBILE APPLICATION ON SECURE MESSAGING

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### ORIGINALITY REPORT

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★ Nur Imtiazul Haque, Kazi Md. Rokibul Alam, Tasfia Mashiat, Yasuhiko Morimoto. "A Technique to Enrich the Secrecy Level of High Capacity Data Hiding Steganography Technique in JPEG Compressed Image", 2018 5th International Conference on Networking, Systems and Security (NSysS), 2018

Publication