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MSc CS - Part II
SEM III
E-Journal

Roll No.	054
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Subject	UBIQUITOUS COMPUTING



Thakur Educational Trust's (Regd.)

THAKUR COLLEGE OF SCIENCE & COMMERCE

AUTONOMOUS COLLEGE, PERMANENTLY AFFILIATED TO UNIVERSITY OF MUMBAI

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CERTIFICATE

This is here to certify that ~~Mr.~~Ms. Raval Palak Rajanikant
Seat Number 054 of M.Sc. Computer Science Part II, has
satisfactorily completed the required number of
experiments prescribed by the UNIVERSITY OF
MUMBAI during the academic year 2021 – 2022.

Date: -09-2022

Place: Mumbai

Teacher In-Charge

Head of Department

External Examiner

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Sr. No.	Practical Name	Date	Sign
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4	Develop application demonstrating Human Computer Interaction.		
5	Write a Java Card applet.		
6			
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Practical No: 1

Aim : Design and develop location based messaging app.

Source Code:

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context="com.example.dell.lbmsg.MainActivity">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textAppearance="?android:attr/textAppearanceLarge"
        android:text="Large Text"
        android:id="@+id/textView"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textAppearance="?android:attr/textAppearanceLarge"
        android:text="Large Text"
        android:id="@+id/textView3"
        android:layout_below="@+id/textView"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_marginTop="96dp" />

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Get Longitude and Latitude"
        android:id="@+id/button"
        android:layout_centerVertical="true"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true" />
```

```

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textAppearance="?android:attr/textAppearanceLarge"
    android:text="Large Text"
    android:id="@+id/textView2"
    android:layout_alignParentBottom="true"
    android:layout_alignRight="@+id/button"
    android:layout_alignEnd="@+id/button" />

```

```

</RelativeLayout>

```

MainActivity.java

```

package com.example.dell.lbmsg;
import android.Manifest;
import android.content.Context;
import android.content.pm.PackageManager;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.net.Uri;
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.support.v4.app.ActivityCompat;
import android.util.Log;
import android.view.View; import
android.widget.Button; import
android.widget.TextView;

import com.google.android.gms.appindexing.Action;
import com.google.android.gms.appindexing.AppIndex;
import com.google.android.gms.common.api.GoogleApiClient;

public class MainActivity extends AppCompatActivity implements LocationListener {
    TextView t1, t2, t3;
    Button b1;
    protected LocationManager locationManager;
    protected LocationListener locationListener;
    double lat, longg;
    private GoogleApiClient client;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        t1 = (TextView) findViewById(R.id.textView);

```

```

t2 = (TextView) findViewById(R.id.textView3);
t3 = (TextView) findViewById(R.id.textView2);
b1 = (Button) findViewById(R.id.button);

b1.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        t1.setText("Latitude = " + lat);
        t2.setText("Longitude = " + longg);

        if (lat<38 &&lat>36 &&longg<122 &&longg>118) {
            t3.setText("In-Side The Area");
        } else {
            t3.setText("Out-Side The Area");
        }
    }
});

locationManager = (LocationManager) getSystemService(Context.LOCATION_SERVICE);

if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION) !=
PackageManager.PERMISSION_GRANTED && ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_COARSE_LOCATION) !=
PackageManager.PERMISSION_GRANTED) {
    return;
}
locationManager.requestLocationUpdates(LocationManager.GPS_PROVIDER, 0, 0,
this);

client = new GoogleApiClient.Builder(this).addApi(AppIndex.API).build();
}

@Override
public void onLocationChanged(Location location) {
// txtLat = (TextView) findViewById(R.id.textview1);
    lat = location.getLatitude();
    longg = location.getLongitude();
    Log.d("'' + lat, '' + lat);
    Log.d("'' + longg, '' + longg);

    if (lat== 38 &&longg== 118) {
        t3.setText("You Are at Perfect Place !!!!");
    } else {
        t3.setText("You are not at Perfect Place !!!!");
    }
}

@Override
public void onStatusChanged(String provider, int status, Bundle extras)
    { Log.d("Latitude", "status");
    }
}

```

```
@Override
public void onProviderDisabled(String provider) {
    Log.d("Latitude", "disable");
}
```

```
@Override
public void onProviderEnabled(String provider)
{ Log.d("Latitude", "enable");
}
```

```
@Override
public void onStart()
{ super.onStart();
```

```
// ATTENTION: This was auto-generated to implement the App Indexing API.
// See https://g.co/AppIndexing/AndroidStudio for more information.
client.connect();
Action viewAction = Action.newAction( Action.TYPE_VIEW,
    // TODO: choose an action type.
    "Main Page", // TODO: Define a title for the content shown.
    // TODO: If you have web page content that matches this app activity's content,
    // make sure this auto-generated web page URL is correct.
    // Otherwise, set the URL to null.
    Uri.parse("http://host/path"),
// TODO: Make sure this auto-generated app URL is correct.
    Uri.parse("android-app://com.example.dell.lbmsg/http/host/path")
);
AppIndex.AppIndexApi.start(client, viewAction);
}
```

```
@Override
public void onStop()
{
    super.onStop();
```

```
// ATTENTION: This was auto-generated to implement the App Indexing API.
// See https://g.co/AppIndexing/AndroidStudio for more information.

Action viewAction = Action.newAction(
    Action.TYPE_VIEW, // TODO: choose an action type.
    "Main Page", // TODO: Define a title for the content shown.
    // TODO: If you have web page content that matches this app activity's content,
    // make sure this auto-generated web page URL is correct.
    // Otherwise, set the URL to null.
    Uri.parse("http://host/path"),
// TODO: Make sure this auto-generated app URL is correct.
    Uri.parse("android-app://com.example.dell.lbmsg/http/host/path")
);
AppIndex.AppIndexApi.end(client, viewAction);
client.disconnect();
}
```


AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.dell.lbmsg">
    <uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"
    />

    <uses-permission android:name="android.permission.INTERNET"
    /> <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER"
                /> </intent-filter>
            </activity>
            <meta-
            data

            android:name="com.google.android.gms.version"
            android:value="@integer/google_play_services_version"
            />

        </application>
    > </manifest>
```

Output:



Practical No : 2

Aim : Design and develop chat messaging app which is a location based.

Source Code :

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent" android:layout_height="match_parent"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context="com.example.dell.location_based.MainActivity">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textAppearance="?android:attr/textAppearanceLarge"
        android:text="Large Text"
        android:id="@+id/textView"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textAppearance="?android:attr/textAppearanceLarge"
        android:text="Large Text"
        android:id="@+id/textView3"
        android:layout_below="@+id/textView"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_marginTop="96dp" />

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Get Longitude and
        Latitude" android:id="@+id/button"
        android:layout_centerVertical="true"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true" />
```

```

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textAppearance="?android:attr/textAppearanceLarge"
    android:text="Large Text"
    android:id="@+id/textView2"
    android:layout_alignParentBottom="true"
    android:layout_alignRight="@+id/button"
    android:layout_alignEnd="@+id/button" />

```

```

</RelativeLayout>

```

MainActivity.java

```

package com.example.dell.location_based;

```

```

import android.Manifest;
import android.content.Context;
import android.content.pm.PackageManager;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.support.v4.app.ActivityCompat;
import android.util.Log;
import android.view.View; import
android.widget.Button; import
android.widget.TextView;

```

```

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;

```

```

public class MainActivity extends AppCompatActivity implements LocationListener {
    TextView t1, t2, t3;
    Button b1;
    protected LocationManager locationManager;
    protected LocationListener locationListener;
    double lat, longg;

```

```

@Override

```

```

protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main); // setContentView(R.layout.activity_main);

```

```

    t1 = (TextView) findViewById(R.id.textview);
    t2 = (TextView) findViewById(R.id.textview3);
    t3 = (TextView) findViewById(R.id.textview2);
    b1 = (Button) findViewById(R.id.button);
    b1.setOnClickListener(new View.OnClickListener()
    { @Override

```

```
public void onClick(View view) {  
    t1.setText("Latitude = " + lat);  
    t2.setText("Longitude = "+ longg);  
  
    if(lat<38 &&lat>36 &&longg<122 &&longg>118)  
    {  
        t3.setText("In-Side The Area");  
    }  
    else {
```

```

        t3.setText("Out-Side The Area");
    } }
});

locationManager= (LocationManager)
getSystemService(Context.LOCATION_SERVICE);
if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION) !=
PackageManager.PERMISSION_GRANTED&&ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_COARSE_LOCATION) !=
PackageManager.PERMISSION_GRANTED) {
    return;
}
locationManager.requestLocationUpdates(LocationManager.GPS_PROVIDER, 0,
0, this);
}
@Override
public void onLocationChanged(Location location)
{ lat=location.getLatitude();
longg= location.getLongitude();
Log.d(""+lat,""+lat);
Log.d(""+longg,""+longg);

if(lat<38 &&lat>36 &&longg<122 &&longg>118) {
    t3.setText("In-Side The Area");
}
else {
    t3.setText("Out-Side The Area");
}
}
@Override
public void onProviderDisabled(String provider) {
    Log.d("Latitude","disable");
}

@Override
public void onProviderEnabled(String provider)
{ Log.d("Latitude","enable");
}
@Override
public void onStatusChanged(String provider, int status, Bundle extras)
{ Log.d("Latitude","status");
}
}
}

```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
```

```

<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.dell.location_based">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportRtl="true"
        android:theme="@style/AppTheme">

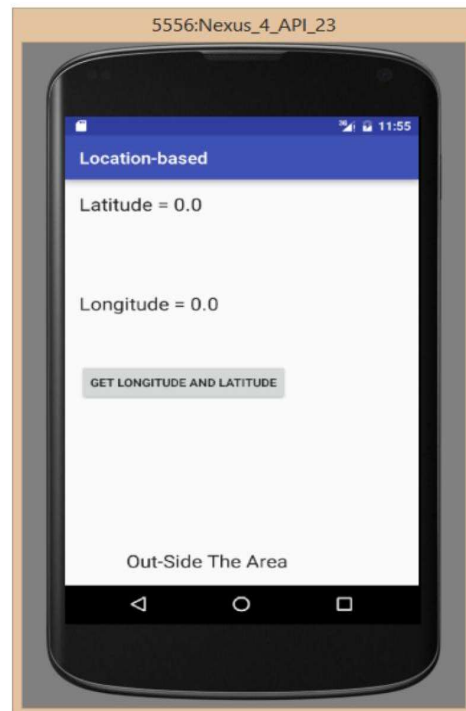
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER"
            /> </intent-filter>
        </activity>
    </application>
    <uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"
    /> <uses-permission android:name="android.permission.INTERNET" />

</manifest>

```

Output :



Practical No : 3

Aim : Demonstrate use of OpenGTS (Open Source GPS TrackingSystem)

Settings:-

Required Software:-

- 1) JDK 1.6(Any Version)
- 2) XAMPP Server
- 3) Mysql-java connector(copy .jar file and paste it into)

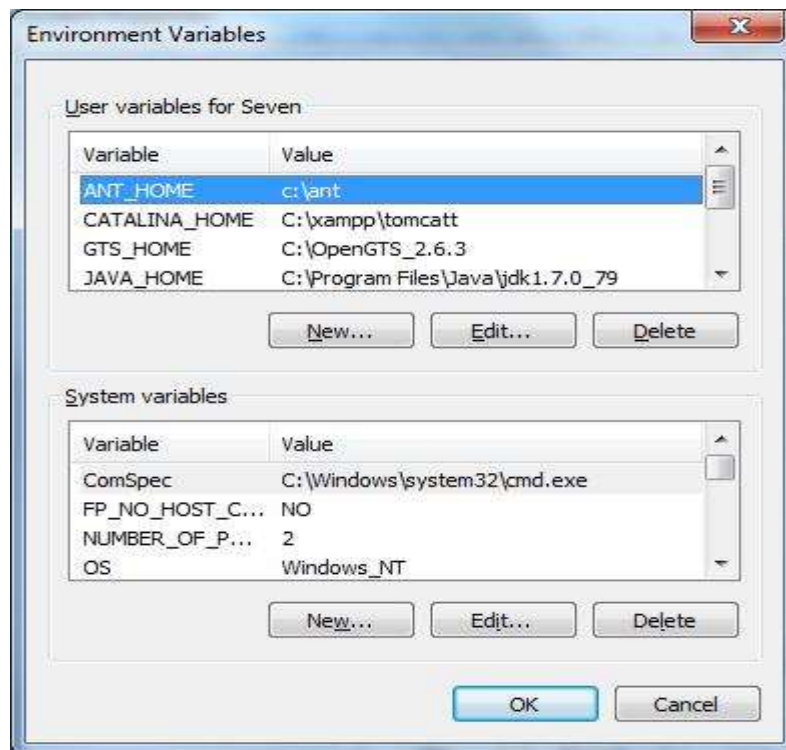
----- C:\Program Files\Java\jdk1.8.0_111\jre\lib\ext

----- C:\Program Files\Java\jre1.8.0_111\lib\ext

- 4) OpenGTS application.

- 5) Apache Ant

<http://www.opengts.org>



ADMIN CMD--

- 1) Open command Prompt and go to D:\OpenGTS_2.6.2
- 2) Type command ant all



```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd \OpenGTS_2.6.3

C:\OpenGTS_2.6.3>ant all
Buildfile: C:\OpenGTS_2.6.3\build.xml

clean:
[delete] Deleting directory C:\OpenGTS_2.6.3\build
[delete] Deleting: C:\OpenGTS_2.6.3\src\org\opengts\CompileTime.java
[delete] Deleting: C:\OpenGTS_2.6.3\src\org\opengts\war\tools\Writelister.java

custom.jar:
[echo] Skipping General Custom build ...

customtrack.jar:
[echo] Skipping Track Custom build ...

custom:

prepare:
[mkdir] Created dir: C:\OpenGTS_2.6.3\build
[mkdir] Created dir: C:\OpenGTS_2.6.3\build\lib
[echo] OS = Windows 10
[echo] JavaHome = C:\Program Files\Java\jdk1.8.0_111\jre
[exec] java version "1.8.0_111"
[exec] Java(TM) SE Runtime Environment (build 1.8.0_111-b14)
[exec] Java HotSpot(TM) 64-Bit Server VM (build 25.111-b14, mixed mode)
[copy] Copying 2 files to C:\OpenGTS_2.6.3\build\lib
```

- 3) Type command ant track



```
Administrator: Command Prompt

C:\OpenGTS_2.6.3>ant track
Buildfile: C:\OpenGTS_2.6.3\build.xml

tomcat.home:
[echo] 'CATALINA_HOME' is defined - C:\xampp\tomcat

tomcat.env:

prepare:
[echo] OS = Windows 10
[echo] JavaHome = C:\Program Files\Java\jdk1.8.0_111\jre
[exec] java version "1.8.0_111"
[exec] Java(TM) SE Runtime Environment (build 1.8.0_111-b14)
[exec] Java HotSpot(TM) 64-Bit Server VM (build 25.111-b14, mixed mode)
[echo] (Ignore copy 'not found' warnings)

gtsutils.compile:
[echo] Compiling gtsutils.jar source ...
[echo] Compiling SendMailArgs.java (optional if 'mail.jar' not available) ...
[javac] Compiling 1 source file to C:\OpenGTS_2.6.3\build
[javac] warning: [options] bootstrap class path not set in conjunction with -source 1.7
[javac] C:\OpenGTS_2.6.3\src\org\opengts\util\SendMailArgs.java:39: error: package javax.mail does not exist
[javac] import javax.mail.*;
[javac] ^
[javac] C:\OpenGTS_2.6.3\src\org\opengts\util\SendMailArgs.java:40: error: package javax.mail.internet does not exist
[javac] import javax.mail.internet.*;
[javac] ^
[javac] C:\OpenGTS_2.6.3\src\org\opengts\util\SendMailArgs.java:449: error: cannot find symbol
[javac]     private static InetAddress[] convertRecipients(String type, String to[], String addTo)
[javac]                                     ^
[javac]     symbol:   class InetAddress
[javac]     location: class SendMailArgs
```

4) Type command ant track.deploy

```
Administrator: Command Prompt

C:\OpenGTS_2.6.3>ant track.deploy
Buildfile: C:\OpenGTS_2.6.3\build.xml

tomcat.home:
[echo] 'CATALINA_HOME' is defined - C:\xampp\tomcat

tomcat.env:

track.prepare:
[copy] Warning: C:\OpenGTS_2.6.3\dcservers does not exist.
[echo] (Ignore '.../clients/gts/private not found' warnings)
[copy] Warning: C:\OpenGTS_2.6.3\clients\gts\private does not exist.
[echo] (Ignore '.../clients/gts/war/track/custom not found' warnings)
[copy] Warning: C:\OpenGTS_2.6.3\clients\gts\war\track\custom does not exist.
[copy] Warning: C:\OpenGTS_2.6.3\imagePack does not exist.

track.war:
[echo] Creating 'track.war' archive ...
[delete] Deleting: C:\OpenGTS_2.6.3\build\track.war
[war] Building war: C:\OpenGTS_2.6.3\build\track.war

track.deploy:
[echo] Deploying 'track.war' to C:\xampp\tomcat\webapps\track.war
[copy] Copying 1 file to C:\xampp\tomcat\webapps
[copy] Copying C:\OpenGTS_2.6.3\build\track.war to C:\xampp\tomcat\webapps\track.war
[echo] Deployed C:\xampp\tomcat\webapps\track.war

BUILD SUCCESSFUL
Total time: 1 second
```

5) (type cd bin)Type command initdb.bat -rootUser=root -rootPass=root ----- start Tomcat/MySQL.

```
Administrator: Command Prompt

C:\OpenGTS_2.6.3>cd bin

C:\OpenGTS_2.6.3\bin>initdb.bat -rootUser=root -rootPass=root
"C:\Program Files\Java\jdk1.8.0_111\bin\java" "-Dfile.encoding=UTF-8" -classpath "C:\OpenGTS_2.6.3\build\lib\gtsdb.jar;
"C:\OpenGTS_2.6.3\build\lib\gtsutils.jar;"C:\OpenGTS_2.6.3\build\lib\optdb.jar;"C:\OpenGTS_2.6.3\build\lib\ruledb.jar;
"C:\OpenGTS_2.6.3\build\lib\bccrossdb.jar;"C:\OpenGTS_2.6.3\build\lib\custom.jar;"C:\OpenGTS_2.6.3\build\lib\dmtpserv
.jar;"C:\OpenGTS_2.6.3\build\lib\gtsdmtpl.jar; org.opengts.db.DBConfig -conf:"C:\OpenGTS_2.6.3\default.conf" -log.file.e
nable:false -initTables -rootUser root -rootPass root
Version: 2.6.3
[WARN ]DBAdmin.execCommands:938] Database already exists: gts
Privileges granted to user: gts

Validating table columns ...
-----
Table 'Account'                2 Validating columns ...
Table 'AccountString'          0 Validating columns ...
Table 'User'                    0 Validating columns ...
Table 'UserAcl'                 0 Validating columns ...
Table 'GroupList'               0 Validating columns ...
Table 'Device'                  0 Validating columns ...
Table 'Transport'               0 Validating columns ...
Table 'UniqueXID'               0 Validating columns ...
Table 'DeviceGroup'             0 Validating columns ...
Table 'DeviceList'              0 Validating columns ...
Table 'Driver'                  0 Validating columns ...
Table 'EventData'               0 Validating columns ...
Table 'Geozone'                 0 Validating columns ...
Table 'Resource'                0 Validating columns ...
Table 'Role'                    0 Validating columns ...
```

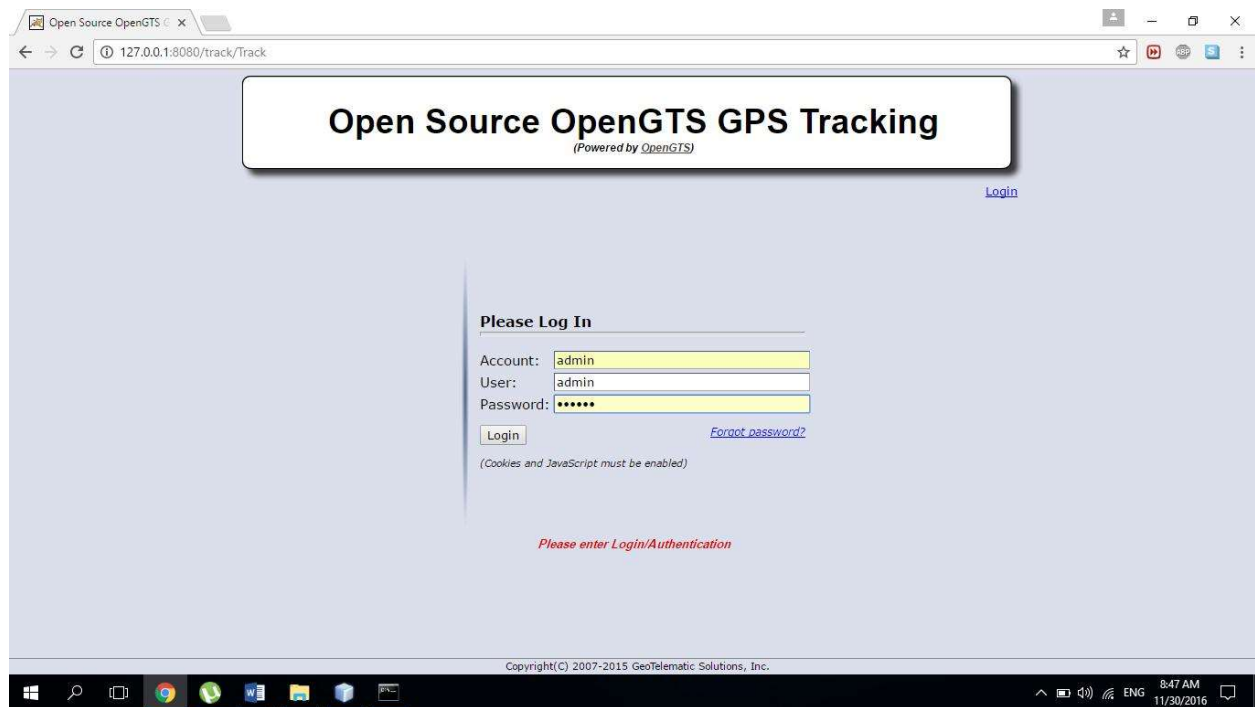
6) Type Command admin.bat Account -account:admin -pass:123456 -create

```
Administrator: Command Prompt

C:\OpenGTS_2.6.3\bin>admin.bat Account -account:admin -pass:123456 -create

"C:\OpenGTS_2.6.3\build\lib\gtsutils.jar;"C:\OpenGTS_2.6.3\build\lib\optdb.jar;"C:\OpenGTS_2.6.3\build\lib\ruledb.jar;
"C:\OpenGTS_2.6.3\build\lib\bccrossdb.jar;"C:\OpenGTS_2.6.3\build\lib\custom.jar;"C:\OpenGTS_2.6.3\build\lib\dmtpserv
.jar;"C:\OpenGTS_2.6.3\build\lib\gtsdmtpl.jar; org.opengts.db.tables.Account -conf:"C:\OpenGTS_2.6.3\default.conf" -log.
file:...
```

7) Type url 127.0.0.1:8080/track/Track and login with admin and 123456



Open Source OpenGTS GPS Tracking
(Powered by OpenGTS)

Account: New Account [admin] (admin) [Logout](#)

Main Mapping Reports Administration

Main Menu
Please select an item from the following menu:

- Mapping
 - [Track Vehicle locations on a map](#)
Select and Track the location of a Vehicle on a map
 - [Track Group locations on a map](#)
Select and Track the location of a Vehicle on a map
- Reports
 - [Vehicle Detail Reports](#)
Display various Vehicle detail reports
 - [Group Detail Reports](#)
Display various Group detail reports
 - [Group Summary Reports](#)
Display various Group summary reports
 - [Device Performance Reports](#)
Display various device performance reports
 - [Driver Performance Reports](#)
Display various driver performance reports
- Administration
 - [View/Edit Account Information](#)
View and Edit the current Account information
 - [View/Edit User Information](#)
View and Edit User information
 - [View/Edit Vehicle Information](#)
View and Edit Vehicle information
 - [View/Edit Group Information](#)
View and Edit Group information
 - [View/Edit Geozone Information](#)
View and Edit Geozone information

127.0.0.1:8080/track/Track?device

Open Source OpenGTS GPS Tracking
(Powered by OpenGTS)

Account: New Account [admin] (admin) [Main Menu](#) [Logout](#)

Main Mapping Reports Administration

Vehicle Map:

Description	ID
-------------	----



(Last Event: unavailable)

Select Date Range:

From: 2016/11/30 | 00:00
To: 2016/11/30 | 23:59

TimeZone: GMT

Update:

Replay:

Cursor Location:
53.0462, -126.6465
Distance (ctrl-drag): 0.00 Miles

Pushpin Legend:
More than 20 mph
More than 5 mph
Less than 5 mph

Practical No : 4

Aim : Develop application demonstrating Human Computer Interaction.

Source Code:

```
import java.awt.Color;
import java.awt.Frame;
import java.awt.Window;
import java.awt.event.WindowEvent;
import java.awt.event.WindowListener;
```

public class CloseableSimpleWarning extends Frame implements WindowListener{

```
static private final int frame_height = 150;
static private final int frame_width = 250;
```

```
public CloseableSimpleWarning() {
    setBackground(Color.gray);
    setForeground(Color.black);
    setTitle("HCI"); setSize(frame_width,
    frame_height);
    addWindowListener(this);
}
@Override
public void windowClosing (WindowEvent e) {
    System.out.println("Window is closing.");
    dispose();
}
public void windowClosed (WindowEvent e) {
    System.out.println("Window closed.");
}
@Override
public void windowIconified (WindowEvent e) {
    System.out.println("Window iconified.");
}
@Override
public void windowDeiconified (WindowEvent e)
{ System.out.println("Window deiconified.");
}
```

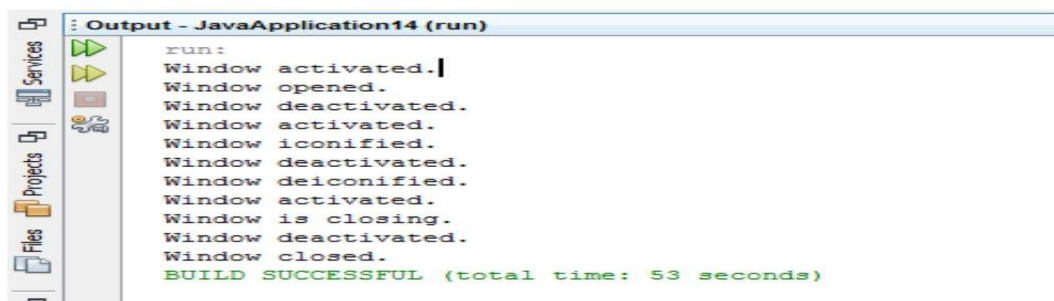
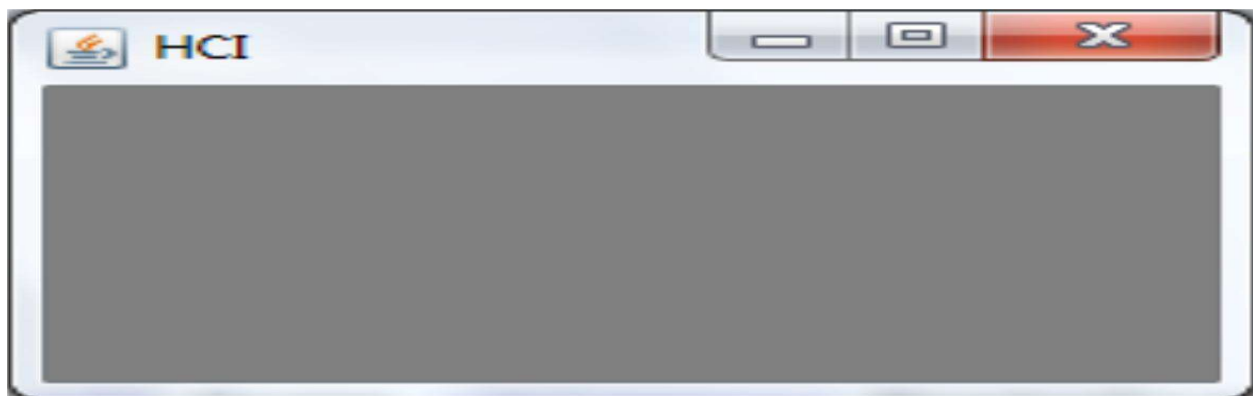
```

@Override
public void windowOpened (WindowEvent e) {
    System.out.println("Window opened.");
}
@Override
public void windowActivated (WindowEvent e)
{ System.out.println("Window activated.");
}
@Override
public void windowDeactivated (WindowEvent e) {

    System.out.println("Window deactivated.");
}
public static void main(String [] args) {
    CloseableSimpleWarning f = new
    CloseableSimpleWarning(); f.setVisible(true);
}
}

```

OUTPUT:



Practical No : 5

Aim : Write a Java Card applet.

Implementation :

Step 1 :-> Download Java Card Sdk from

<http://www.oracle.com/technetwork/java/embedded/javacard/downloads/javacard-sdk-2043229.html>

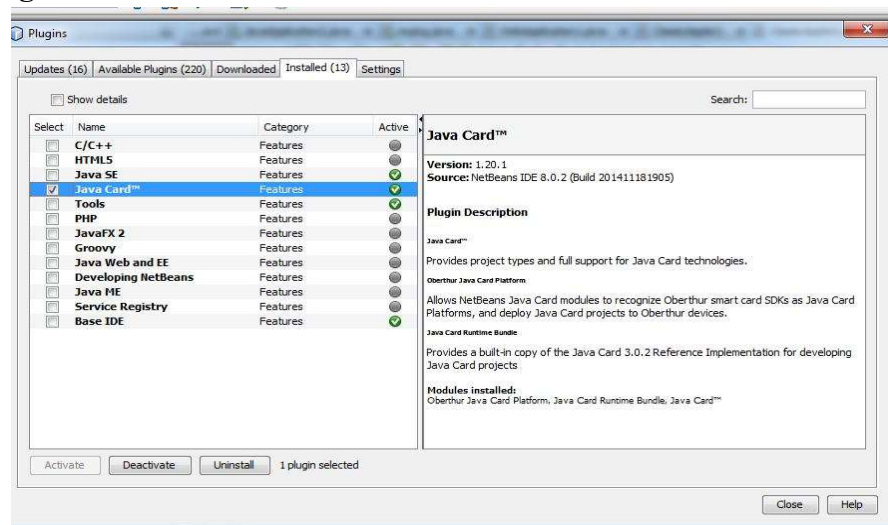
if (plugin is there in

NetBeans) Do nothing;

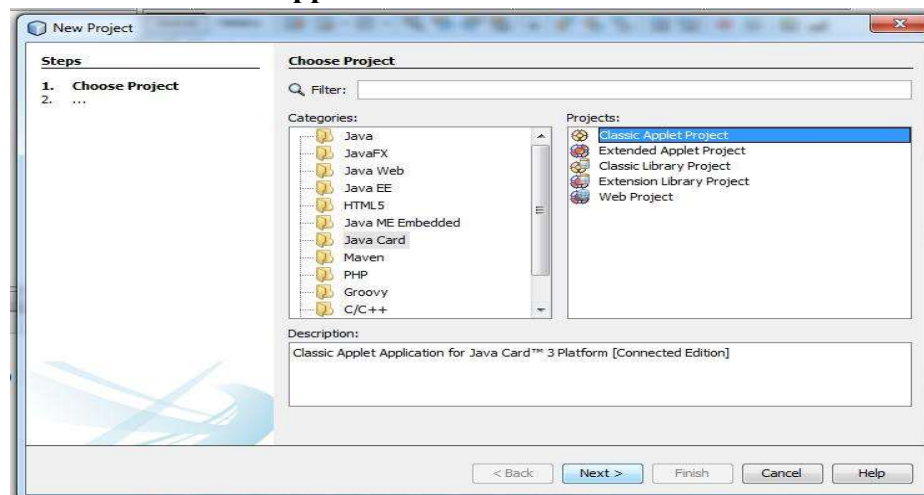
else

Install in Netbeans as plugin :-

Tools -> Plugin



Step 2:->Create a Java Card Application



New Project

Steps

1. Choose Project
2. Enter Name & Runtime Info
3. **Enter Package AID**

Create Project

Project Name:

Project Location:

Project Folder:

Platforms:

Cards:

Applet AID:

Base package name:

< Back Next > Finish Cancel Help

New Project

Steps

1. Choose Project
2. Enter Name & Runtime Info
3. **Enter Package AID**

Create Project

Project Name:

Project Location:

Project Folder:

Platforms:

Cards:

Applet AID:

Base package name:

< Back Next > Finish Cancel Help

New Project

Steps

1. Choose Project
2. Enter Name & Runtime Info
3. **Enter Package AID**

Enter Package AID

Classic Package AID

//aid/ /

(RID: 5 bytes hexadecimal) (PIX: 0-11 bytes hexadecimal)

The Classic Package AID is a unique ID for the package of this classic applet or classic library JAR (such projects only contain one package).

The RID portion is a unique ID of your organization, assigned by a standards body such as the ISO (International Standards Organization). It can be set for all new projects in Tools > Options > Miscellaneous > Java Card.

The PIX (proprietary identifier) simply uniquely identifies one Java package. It is generated by the IDE and can be set as you wish. No specific value is required for development purposes.

< Back Next > Finish Cancel Help

Source Code :


```

package classicapplet1;
import
javacard.framework.*;
public class ClassicApplet2 extends Applet
{ private byte[] received;
private static final short MAX_LENGTH = 256;
    private static final byte[] helloFidesmo={ (byte)'H',(byte)'e',(byte)'l',(byte)'l',(byte)'o',(byte)'
',(byte)'F',(byte)'i',(byte)'d',(byte)'e',(byte)'s',(byte)'m',(byte)'o',(byte)'!'};

public static void install(byte[] bArray, short bOffset, byte bLength)
{ new ClassicApplet2();
}
/**
 * Only this class's install method should create the applet
object. */
protected ClassicApplet2() {
received = new
byte[MAX_LENGTH]; register();
}
public void process(APDU apdu)
{ //Insert your code here
byte buffer[] = apdu.getBuffer();
short length = (short) helloFidesmo.length;
Util.arrayCopyNonAtomic(helloFidesmo, (short)0, buffer, (short)0,
(short)length); apdu.setOutgoingAndSend((short)0, length);
}
}

```

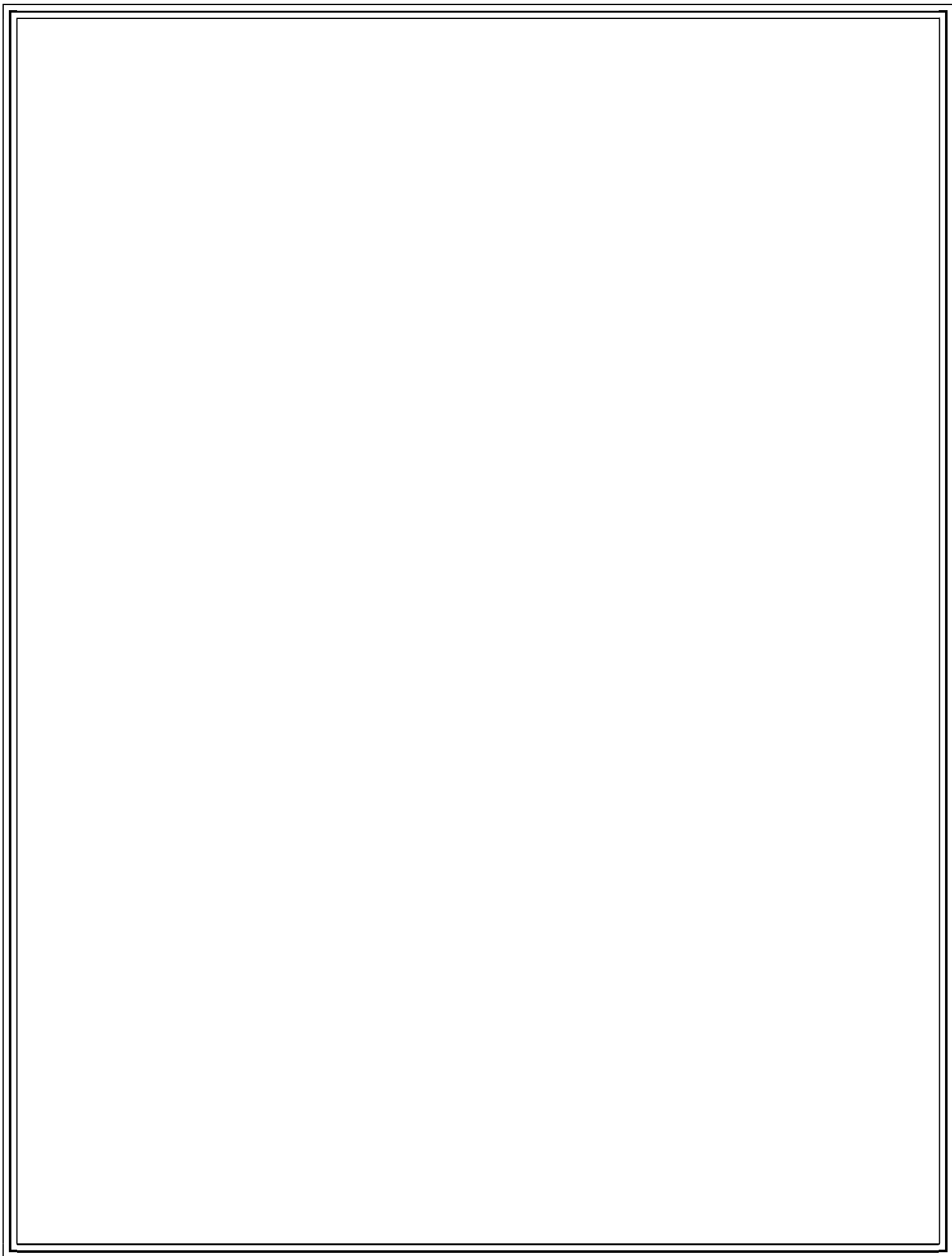
OUTPUT:



```

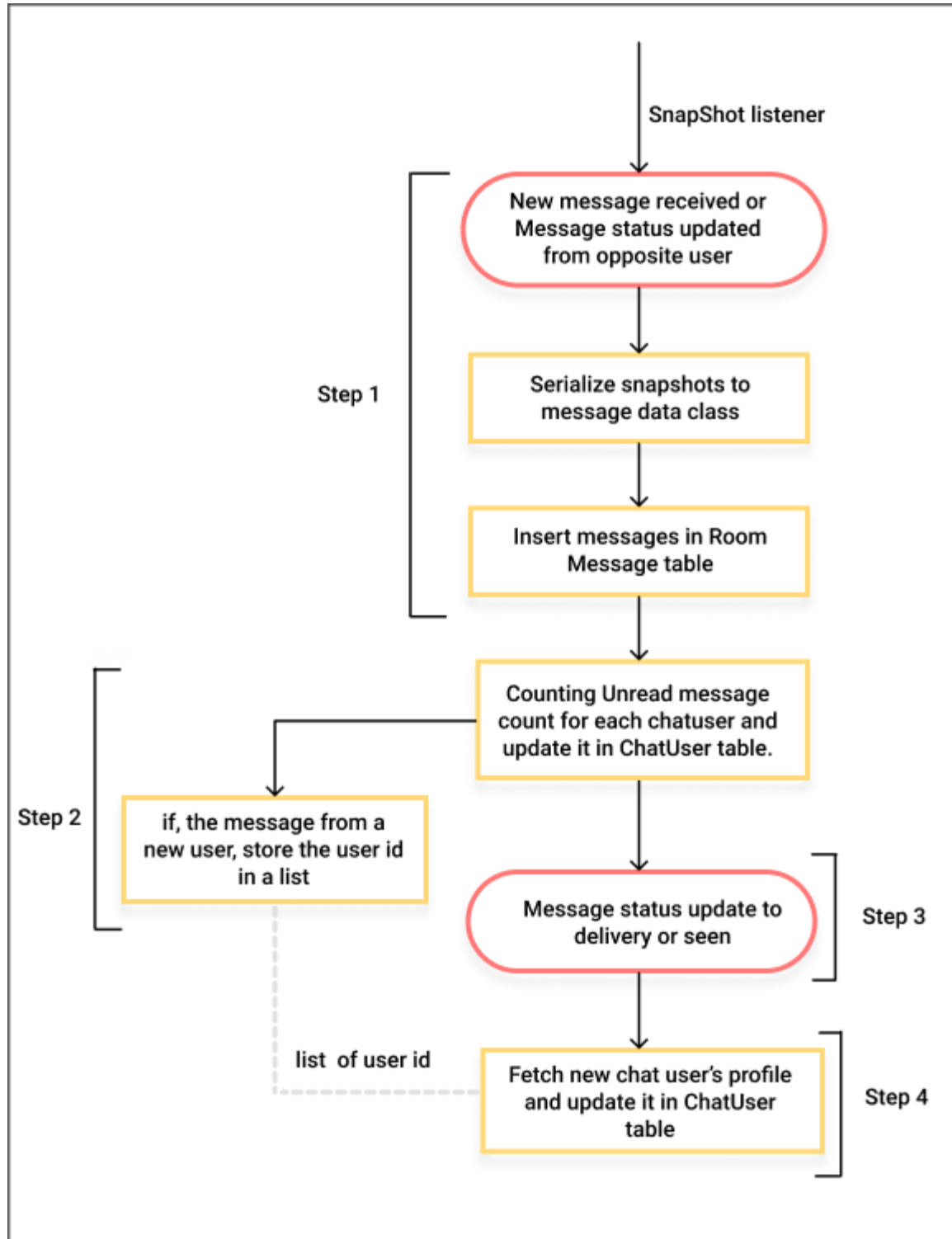
Default Device x build.xml (run) x
[ INFO: ] Loading app bundle C:\Users\jv\Documents\NetBeansProjects\ClassicApplet1\build\ClassicApplet1.jar
[ INFO: ] "Off Card Installer Validating load information"
[ INFO: ] "Off Card Installer sending load request"
[ INFO: ] Operation completed successfully.
create-instance:
OffCard Installer [v3.0.2]
Copyright (c) 2009 Sun Microsystems, Inc.
All rights reserved.
Use is subject to license terms.
[ INFO: ] [Creating an instance of ClassicApplet1 with instance ID //aid/11B8A76660/DF on http://localhost:8019/cardmanager]
[ INFO: ] "Off Card Installer validating create information"
[ INFO: ] "Off Card Installer preparing create information"
[ INFO: ] "Off Card Installer sending create request"
[ INFO: ] Operation completed successfully.
An instance //aid/11B8A76660/DF is created for //aid/11B8A76660/DE.
run-client:
run-script:
Invoking apduTool on C:\Users\jv\Documents\NetBeansProjects\ClassicApplet1\scripts\classicapplet1.scr
ApduTool [v3.0.2]
Copyright (c) 2009 Sun Microsystems, Inc.
All rights reserved.
Use is subject to license terms.
Opening connection to localhost on port 9025.
Connected.
Received ATR = 0x3b 0x50 0x11 0x00 0xff 0x00
CLA: 00, INS: a4, P1: 04, P2: 00, Lc: 06, 11, b8, a7, 66, 60, df, Le: 0a, 48, 65, 6c, 6c, 6f, 20, 46, 69, 64, 65, 73, 6d, 6f, 21, SW1: 90, SW2: 00
run:
BUILD SUCCESSFUL (total time: 6 seconds)

```



Practical No: 6

Aim: Design and develop app for Device Group Messaging



```

class FSingleChat : Fragment(), MessageSenderCallback{
@Inject
lateinit var dbRepository: DbRepository

fun sendMessage(){
val message= createMessage("my first
message") msgDao.insertMessage(message)
val db = FirebaseFirestore.getInstance() val
messageCollection=
db.collection("Messages")
val messageSender= MessageSender(msgCollection=
messageCollection, dbRepo: dbRepository, chatUser:
currentChatUser, listener: this)
messageSender.send(fromUser=
myUserId, toUser= currentChatUser.id,
message= message)
}

fun createMessage(msg: String):
Message{ return Message(id=
generateId(), createdAt= dateToUtc(),
from= myUserId, to=
currentChatUser.id,
chatUsers= listOf(myUserId,currentChatUser.id),
textMessage= TextMessage(msg))
}

fun generateId(length: Int= 20): String{ val
alphaNumeric = ('a'..'z') + ('A'..'Z') +
('0'..'9')

```

```
return alphaNumeric.shuffled().take(length).joinToString("") //ex: bwUIoWNCSQvPZh8xaFuz
}
```

```
fun dateToUTC(date: Date=Date()): String {
    // will be converted back to local time zone before showing in recycler view
    val formatterUTC: DateFormat = SimpleDateFormat("yyyy-MM-dd'T'HH:mm:ss.SSS'Z'",
        Locale.getDefault())
    formatterUTC.timeZone = TimeZone.getTimeZone("UTC")
    return formatterUTC.format(date)
}
```

```
override fun onSuccess(message: Message) {
    LogMessage.v("Message sender Sucesss ${message.id}")
    messageDao.insertMessage(message)
    //push notification code goes here
}
```

```
override fun onFailed(message: Message) {
    LogMessage.v("Message sender Failed ${it.message}")
    messageDao.insertMessage(message)
}

}
```

```
interface
MessageSenderCallback{ fun
onSuccess(message:
Message) fun
onFailed(message: Message)
}
```

```
class MessageSender(private val msgCollection:
CollectionReference, private val dbRepo: DbRepository, private
```

```

val chatUser: ChatUser, private val listener:
MessageSenderCallback) { fun send(fromUser: String, toUser:
String, message: Message) { val docId = chatUser.documentId if
(!docId.isNullOrEmpty()){
Timber.v("Case 1 ${chatUser.documentId}")
send(docId, message)
} else {
//so we don't create multiple nodes for same chat
msgCollection.document("${fromUser}_${toUser}").
get().addOnSuccessListener { documentSnapshot -
> if (documentSnapshot.exists()) {
//this node exists send your message
Timber.v("Case 2")
send("${fromUser}_${toUser}", message)
} else {
//senderId_receiverId node doesn't exist check
receiverId_senderId
msgCollection.document("${toUser}_${fromUser}").get()
.addOnSuccessListener { documentSnapshot2 -> if
(documentSnapshot2.exists()) { Timber.v("Case 3")
send("${toUser}_${fromUser}", message)
} else {
//no previous chat history(senderId_receiverId & receiverId_senderId both don't exist)
//so we create document senderId_receiverId then messages array then add messageMap
to messages
//this node exists send your message
//add ids of chat members
Timber.v("Case 4")
msgCollection.document("${fromUser}_${toUser}")

```



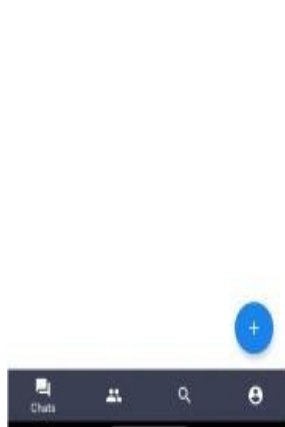
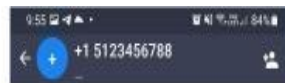
```

SetOptions.merge()
).addOnSuccessListener {
    listener.onSuccess(message)
}.addOnFailureListener {
    message.status=4
    listener.onFailed(message)
}
} catch (e: Exception) {
    e.printStackTrace()
} }

}

```

Output -



Case 1



Case 2(message received from the same user)