Institute of Distance and Open Learning

Vidya Nagari, Kalina, Santacruz East –
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Subject Name - Ubiquitous Computing

BY

Mr. Mohammed Maaz Shaikh

Application ID- 41775
Seat No - 4100058

Institute of Distance and Open Learning
(IDOL)

University of Mumbai

Certificate

This is to certify that **Mr Mohammed Maaz Shaikh** student of Masters of Computer Science, Part 2, Semester 3 has completed the specified term work in the subject of **Ubiquitous Computing** in satisfactorily manner within this institute as laid down by University of Mumbai during the academic year 2024 to 2025.

M.Sc. - CS Coordinator Examiner

Date: Guide

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Practical no. 1

Aim :- Design and develop location based messaging app

UI Code :-

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayoutxmlns: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.prashant.locationmsg.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>
```

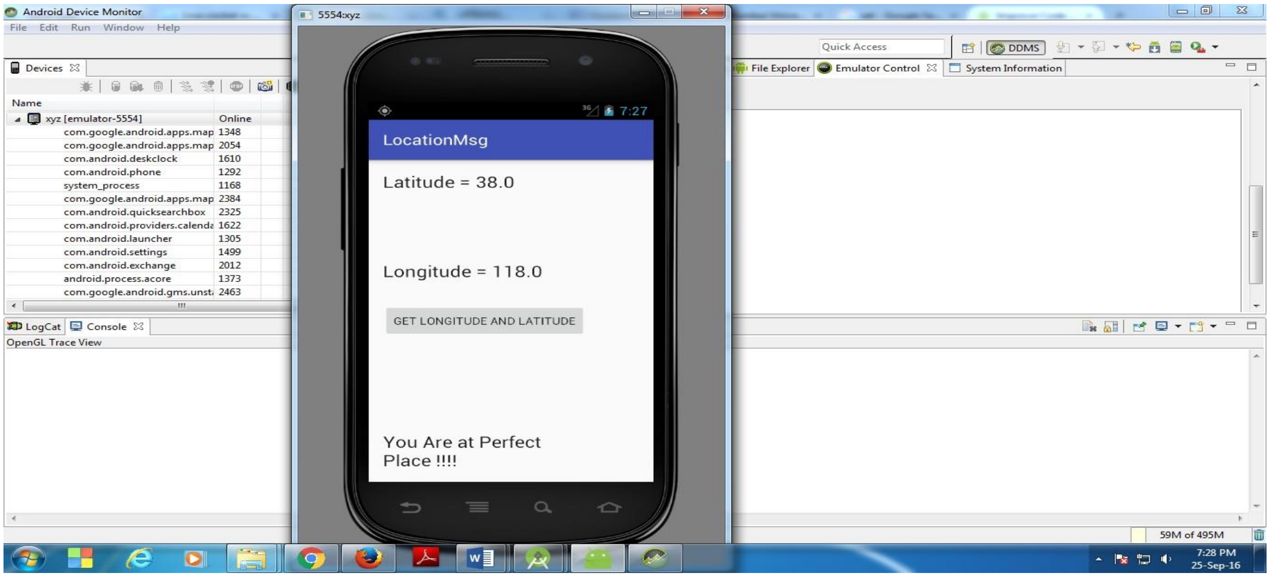
Source code :-

```
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.support.v4.app.ActivityCompat; import
 android.support.v7.app.AppCompatActivity;import
 android.os.Bundle;
 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
 MainActivityextendsAppCompatActivityimplementsLocationListener {TextViewt1, t2, t3;
      Button b1;
 protected LocationManagerlocationManager;
 protected LocationListenerlocationListener;double
 lat, longg;
 private GoogleApiClientclient;
 @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);
// locationManager.requestLocationUpdates(LocationManager.GPS_PROVIDER, 0, 0, this);
        // ATTENTION: This was auto-generated to implement the App Indexing API.
        // See https://g.co/AppIndexing/AndroidStudio for more information.
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 !!!!");
        }



//t1.setText("Latitude:" + location.getLatitude() + ", Longitude:" +
location.getLongitude());
}

@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, intstatus, Bundle extras) {
Log.d("Latitude", "status");
    }

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


client.connect();
        Action viewAction = Action.newAction(
Action.TYPE_VIEW, // TODO: choose an action type.
                "Main Page",
Uri.parse("http://host/path"),
// TODO: Make sure this auto-generated app URL is correct.
```

```
Uri.parse("android-app://com.example.prashant.locationmsg/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.prashant.locationmsg/http/host/path")
            );
AppIndex.AppIndexApi.end(client, viewAction);
client.disconnect();
    }
}
```

Output:-



Name	
xyz [emulator-5554]	Online
com.google.android.apps.map	1348
com.google.android.apps.map	2054
com.android.deskclock	1610
com.android.phone	1292
system_process	1168
com.google.android.apps.map	2384
com.android.quicksearchbox	2325
com.android.providers.calend	1622
com.android.launcher	1305
com.android.settings	1499
com.android.exchange	2012
android.process.acore	1373
com.google.android.gms.unst	2463

LocationMsg

Latitude = 38.0

Longitude = 118.0

GET LONGITUDE AND LATITUDE

You Are at Perfect Place !!!!

Permission

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="com.example.prashant.locationmsg">
 <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:supportsRtl="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>

 <!-- ATTENTION: This was auto-generated to add Google Play services to your projectfor
          App Indexing.   See https://g.co/AppIndexing/AndroidStudio for more information. -
 ->
 <meta-data
 android:name="com.google.android.gms.version"
 android:value="@integer/google_play_services_version" />
 </application>

 </manifest>
```

Practical No .2

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

UI Code:-

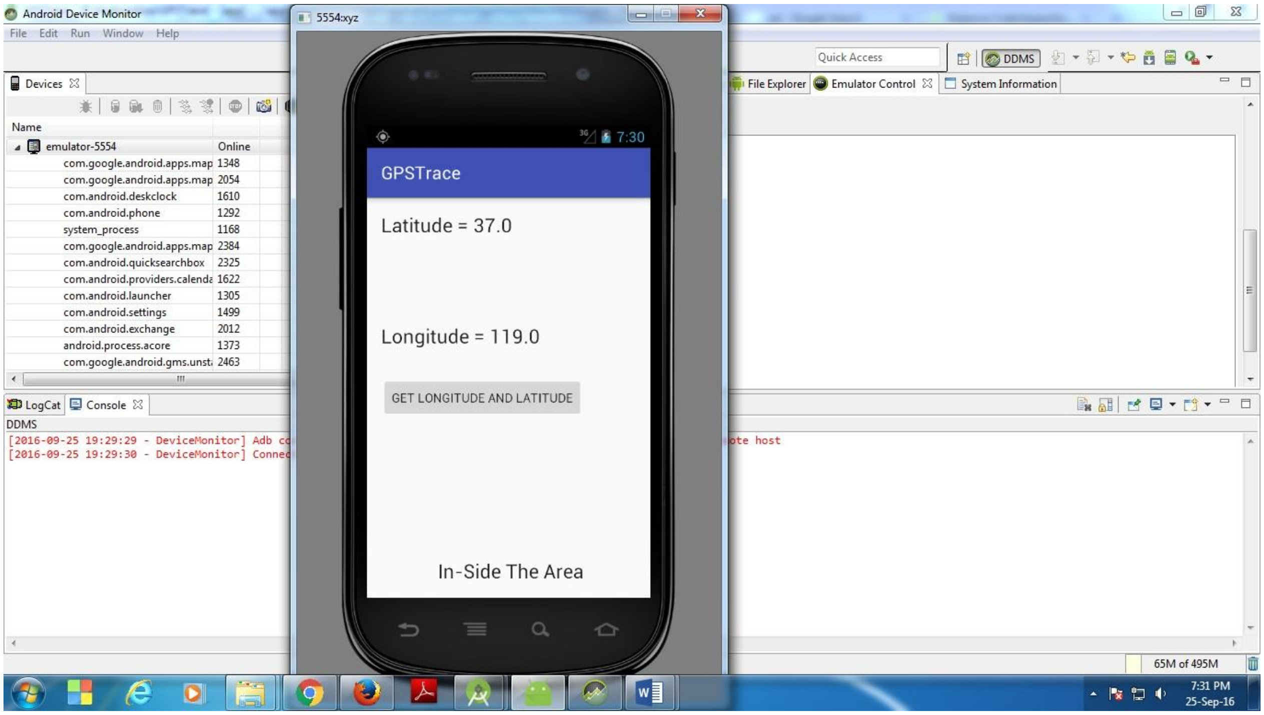
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayoutxmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent" android:paddingBottom="@dimen/activity_vertical_margin"
android:paddingLeft="@dimen/activity_horizontal_margin"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

Source Code:-

```
package com.example.prashant.gpstrace;

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.support.v7.app.AppCompatActivity;
import android.os.Bundle; import
android.util.Log; import
android.view.View; import
android.widget.Button;
import android.widget.TextView;

public class MainActivityextendsAppCompatActivityimplementsLocationListener {

TextViewt1, t2, t3;
        Button b1;
protected LocationManagerlocationManager;
protected LocationListenerlocationListener;double
lat, longg;
@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);
// locationManager.requestLocationUpdates(LocationManager.GPS_PROVIDER, 0, 0, this);
}

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



//t1.setText("Latitude:" + location.getLatitude() + ", Longitude:" +location.getLongitude());
}

@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, intstatus, Bundle extras) {
Log.d("Latitude","status");
      }

}
```

Output:-



Name	
emulator-5554	Online
com.google.android.apps.map	1348
com.google.android.apps.map	2054
com.android.deskclock	1610
com.android.phone	1292
system_process	1168
com.google.android.apps.map	2384
com.android.quicksearchbox	2325
com.android.providers.calenda	1622
com.android.launcher	1305
com.android.settings	1499
com.android.exchange	2012
android.process.acore	1373
com.google.android.gms.unst	2463

DDMS

```
[2016-09-25 19:29:29 - DeviceMonitor] Adb co                    ote host
[2016-09-25 19:29:30 - DeviceMonitor] Connec
```

7:30

GPSTrace

Latitude = 37.0

Longitude = 119.0

GET LONGITUDE AND LATITUDE

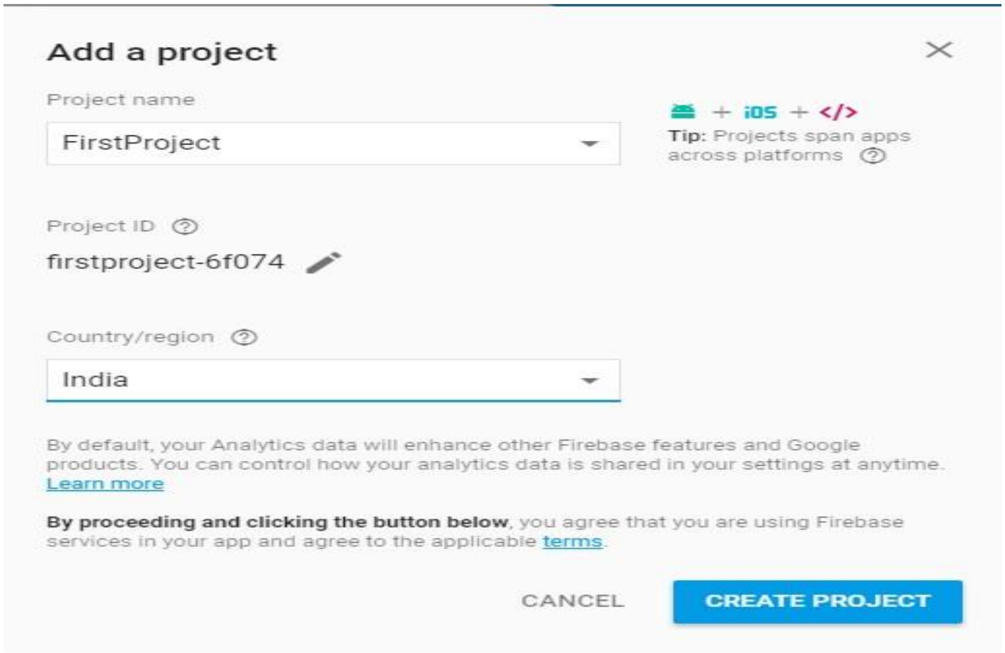
In-Side The Area

Permission :-

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="com.example.prashant.gpstrace">

<application android:allowBackup="true"
android:icon="@mipmap/ic_launcher"
android:label="@string/app_name"
android:supportsRtl="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>
```

Practical No. 3

Aim: - Design and develop app demonstrating Simple Downstream Messaging.



Add a project

Project name: FirstProject

Tip: Projects span apps across platforms

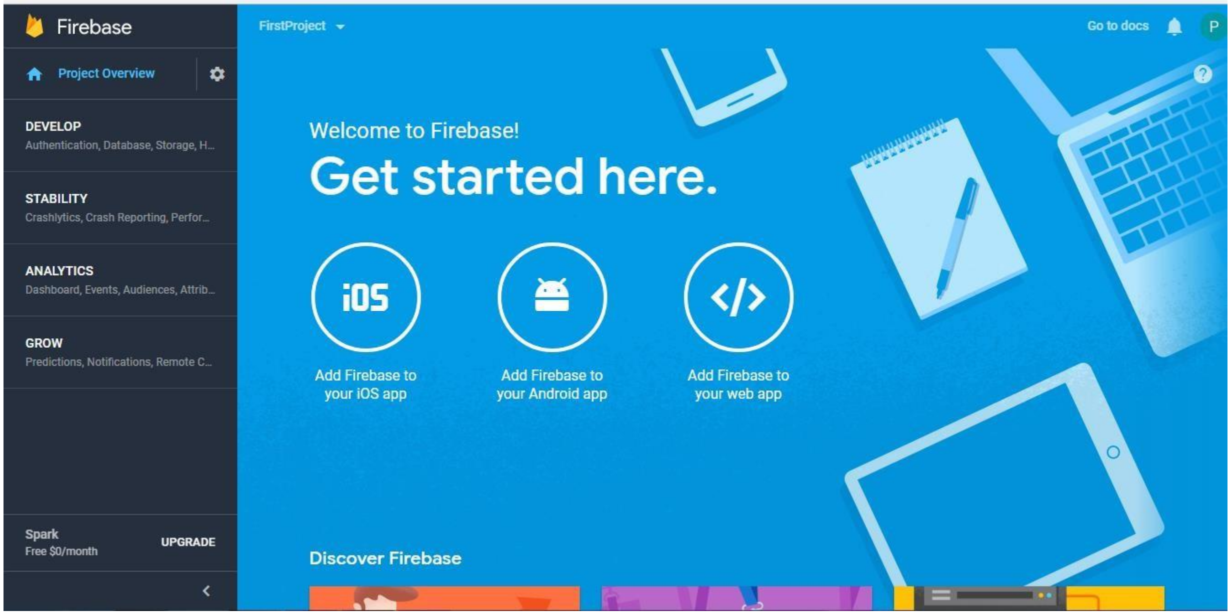
Project ID: firstproject-6f074

Country/region: India

By default, your Analytics data will enhance other Firebase features and Google products. You can control how your analytics data is shared in your settings at anytime. Learn more

By proceeding and clicking the button below, you agree that you are using Firebase services in your app and agree to the applicable terms.

+ iOS + </>
CANCEL
CREATE PROJECT

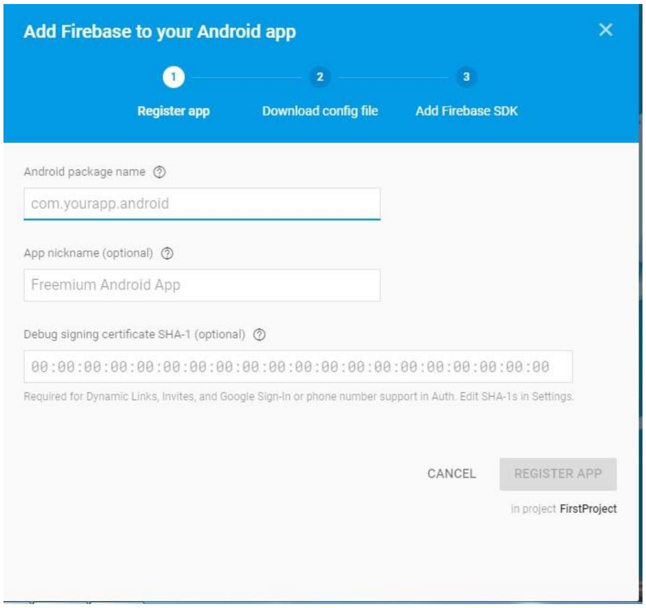


Welcome to Firebase!

Get started here.

Firebase
FirstProject
Go to docs
P
Project Overview
DEVELOP
Authentication, Database, Storage, H...
STABILITY
Crashlytics, Crash Reporting, Perfor...
ANALYTICS
Dashboard, Events, Audiences, Attrib...
GROW
Predictions, Notifications, Remote C...
Spark
Free $0/month
UPGRADE
iOS
Add Firebase to your iOS app
Add Firebase to your Android app
</>
Add Firebase to your web app
Discover Firebase

1) Create project in firebase console and follow their steps:



Add Firebase to your Android app

Android package name ⓘ

com.yourapp.android

App nickname (optional) ⓘ

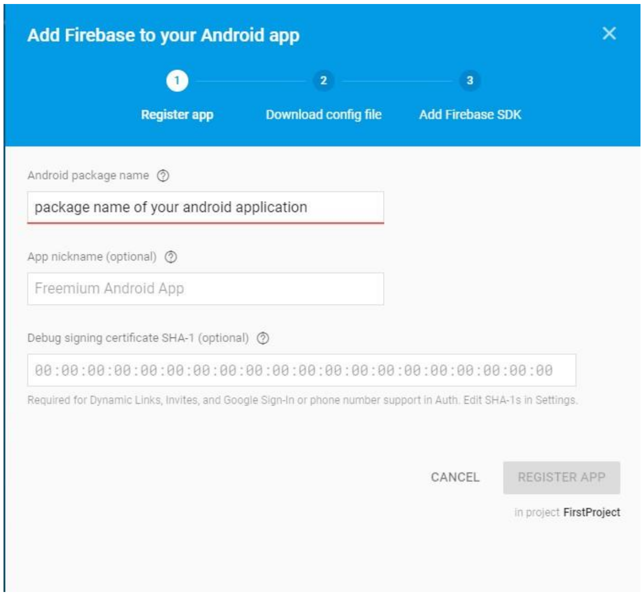
Freemium Android App

Debug signing certificate SHA-1 (optional) ⓘ

00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00

Required for Dynamic Links, Invites, and Google Sign-In or phone number support in Auth. Edit SHA-1s in Settings.

in project **FirstProject**



Add Firebase to your Android app

Android package name ⓘ

package name of your android application

App nickname (optional) ⓘ

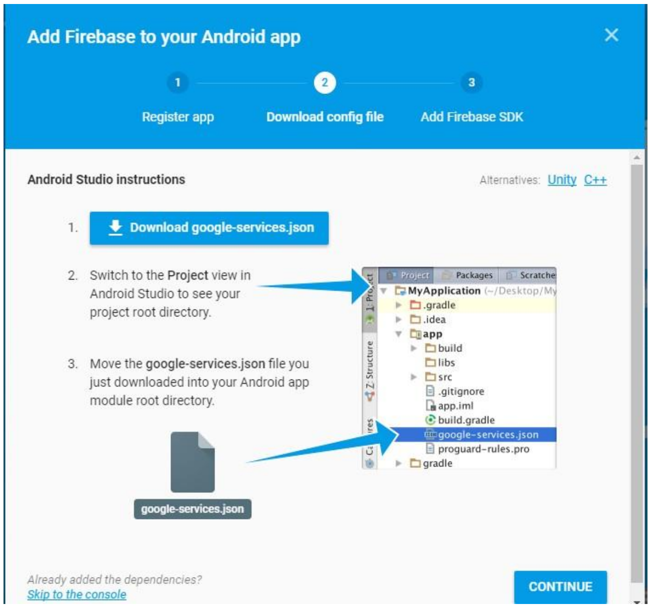
Freemium Android App

Debug signing certificate SHA-1 (optional) ⓘ

00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00:00

Required for Dynamic Links, Invites, and Google Sign-In or phone number support in Auth. Edit SHA-1s in Settings.

in project **FirstProject**



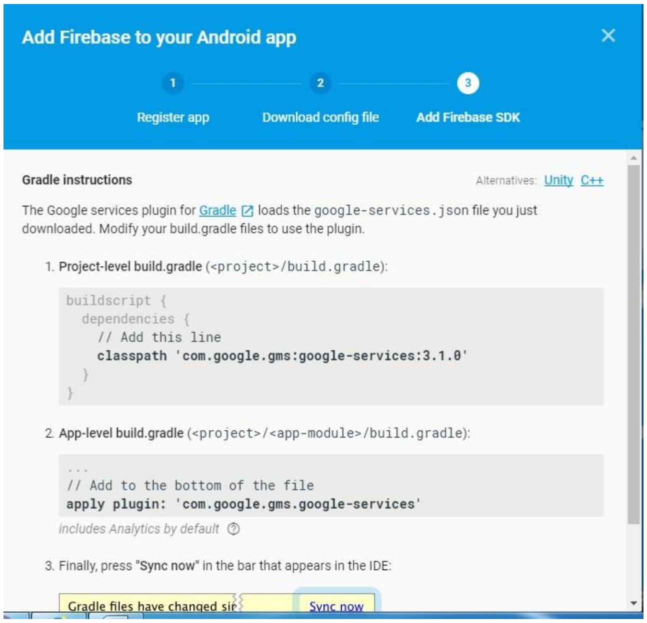
Add Firebase to your Android app

Android Studio instructions

1. Download google-services.json
2. Switch to the **Project** view in Android Studio to see your project root directory.
3. Move the **google-services.json** file you just downloaded into your Android app module root directory.

Already added the dependencies?
Skip to the console

Download google-services.json and copy it to app folder and follow the steps



Add Firebase to your Android app

Gradle instructions

The Google services plugin for Gradle loads the `google-services.json` file you just downloaded. Modify your build.gradle files to use the plugin.

1. **Project-level build.gradle** (`<project>/build.gradle`):

```
buildscript {
  dependencies {
    // Add this line
    classpath 'com.google.gms:google-services:3.1.0'
  }
}
```

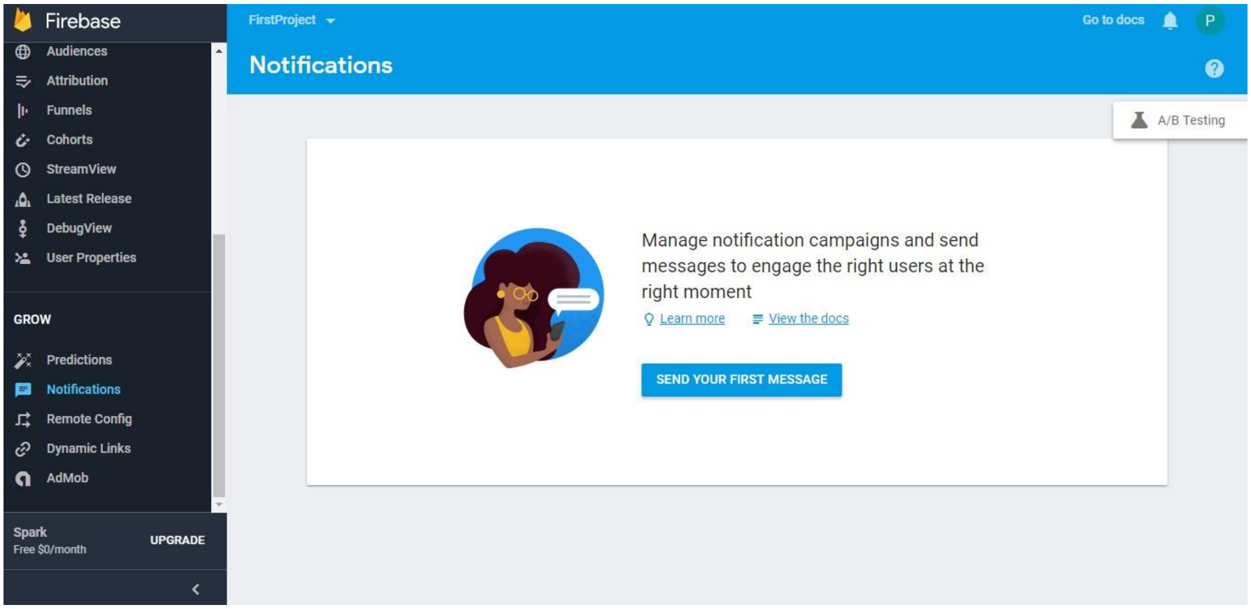
2. **App-level build.gradle** (`<project>/<app-module>/build.gradle`):

```
...
// Add to the bottom of the file
apply plugin: 'com.google.gms.google-services'
```

includes Analytics by default

3. Finally, press "**Sync now**" in the bar that appears in the IDE:

In Grow tab select notification for sending messages



Manage notification campaigns and send messages to engage the right users at the right moment

MainActivity.java

```
package com.example.prashant.firebasedemo;

import android.support.v7.app.AppCompatActivity;import android.os.Bundle;
import android.app.Notification;
import android.app.NotificationManager;import
android.content.Context;
import android.os.Build; import
android.os.Bundle;
import android.support.v7.app.AppCompatActivity;import android.util.Log;
import android.view.View; import
android.widget.Button;import
android.widget.Toast;

import com.google.firebase.iid.FirebaseInstanceId; import
com.google.firebase.messaging.FirebaseMessaging;

 public class MainActivity extends AppCompatActivity {

        private static final String TAG = "MainActivity";@Override
        protected void onCreate(Bundle savedInstanceState) {
                super.onCreate(savedInstanceState);
                setContentView(R.layout.activity_main);
                if (getIntent().getExtras() != null) {
                        for (String key : getIntent().getExtras().keySet()) {Object value =
                                getIntent().getExtras().get(key); Log.d(TAG, "Key: " + key + " Value: " +
                                value);
                        }
        }
        // [END handle_data_extras]

        Button subscribeButton = (Button)findViewById(R.id.button3);
        subscribeButton.setOnClickListener(new View.OnClickListener()
{
            @Override
            public void onClick(View v) {
                // [START subscribe_topics]


 FirebaseMessaging.getInstance().subscribeToTopic("news");
 // [END subscribe_topics]

                // Log and toast
                String msg = getString(R.string.msg_subscribed);Log.d(TAG, msg);
                Toast.makeText(MainActivity.this, msg,
Toast.LENGTH_SHORT).show();
            }
        });

        Button logTokenButton = (Button)findViewById(R.id.button4);
        logTokenButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // Get token String
                token =
FirebaseInstanceId.getInstance().getToken();

                // Log and toast Log.d(TAG,

                "Done");
                Toast.makeText(MainActivity.this, "Done",
Toast.LENGTH_SHORT).show();
            }
        });
    }

}
```

MyFirebaseInstanceIDService.java

```
package com.example.prashant.firebasedemo;

/**
  * Created by PRASHANT on 13-Nov-17.
  */

import android.util.Log;

import com.google.firebase.iid.FirebaseInstanceId;
import com.google.firebase.iid.FirebaseInstanceIdService;


public class MyFirebaseInstanceIDService extendsFirebaseInstanceIdService {

        private static final String TAG = "MyFirebaseIIDService";

        /**
          *  Called if InstanceID token is updated. This may occur if thesecurity of
          *  the previous token had been compromised. Note that this iscalled when the
 InstanceID token
          *  is initially generated so this is where you would retrieve thetoken.
          */
        // [START refresh_token]
        @Override
        public void onTokenRefresh() {
                // Get updated InstanceID token.String
                refreshedToken =
FirebaseInstanceId.getInstance().getToken();
                Log.d(TAG, "Refreshed token: " + refreshedToken);

                // If you want to send messages to this application instance
or
                // manage this apps subscriptions on the server side, send the
                // Instance ID token to your app server. sendRegistrationToServer(refreshedToken);
        }
        // [END refresh_token]

        /**
          *  Persist token to third-party servers.
          *
          *  Modify this method to associate the user's FCM InstanceID tokenwith any server-side
 account
          *  maintained by your application.
          *
          *  @param token The new token.
          */
        private void sendRegistrationToServer(String token) {
                // TODO: Implement this method to send token to your app
server.
        }
}
```

MyFirebaseMessagingService.java

```
package com.example.prashant.firebasedemo;

/**
   * Created by PRASHANT on 13-Nov-17.
   */

import android.app.NotificationManager;import
android.app.PendingIntent; import
android.content.Context;
import android.content.Intent;
import android.media.RingtoneManager;import
android.net.Uri;
import android.support.v4.app.NotificationCompat;import android.util.Log;

import com.google.firebase.*;
import com.google.firebase.messaging.FirebaseMessagingService;import
com.google.firebase.messaging.RemoteMessage;
import com.firebase.jobdispatcher.Constraint;
import com.firebase.jobdispatcher.FirebaseJobDispatcher;import
com.firebase.jobdispatcher.GooglePlayDriver; import
com.firebase.jobdispatcher.Job;



public class MyFirebaseMessagingService extendsFirebaseMessagingService {

        private static final String TAG = "MyFirebaseMsgService";

        /**
          *   Called when message is received.
          *
          *   @param remoteMessage Object representing the message receivedfrom Firebase Cloud
 Messaging.
          */
        // [START receive_message]
        @Override
        public void onMessageReceived(RemoteMessage remoteMessage) {
               // [START_EXCLUDE]
              // There are two types of messages data messages andnotification messages. Data
messages are handled
              // here in onMessageReceived whether the app is in theforeground or background.
Data messages are the type
              // traditionally used with GCM. Notification messages are onlyreceived here in
onMessageReceived when the app
```

```
          // is in the foreground. When the app is in the background anautomatically generated notification is
displayed.
          // When the user taps on the notification they are returned tothe app. Messages containing
both notification
          // and data payloads are treated as notification messages. TheFirebase console always sends
notification
          // messages. For more see: https://firebase.google.com/docs/cloud-
messaging/concept-options
           // [END_EXCLUDE]

           // TODO(developer): Handle FCM messages here.
          // Not getting messages here? See why this may be:https://goo.gl/39bRNJ
           Log.d(TAG, "From: " + remoteMessage.getFrom());

           // Check if message contains a data payload.if
           (remoteMessage.getData().size() > 0) {
               Log.d(TAG, "Message data payload: " +
remoteMessage.getData());

               if (/* Check if data needs to be processed by long runningjob */ true) {
                    // For long-running tasks (10 seconds or more) useFirebase Job Dispatcher.
                     scheduleJob();
                } else {
                     // Handle message within 10 secondshandleNow();
                }

           }

           // Check if message contains a notification payload.if
           (remoteMessage.getNotification() != null) {
               Log.d(TAG, "Message Notification Body: " +
remoteMessage.getNotification().getBody());
           }

          // Also if you intend on generating your own notifications asa result of a received FCM
          // message, here is where that should be initiated. SeesendNotification method below.
      }
      // [END receive_message]

      /**
        *   Schedule a job using FirebaseJobDispatcher.
        */
      private void scheduleJob() {
           // [START dispatch_job] FirebaseJobDispatcher
           dispatcher = new
FirebaseJobDispatcher(new GooglePlayDriver(this));
```

```
        Job myJob = dispatcher.newJobBuilder()
                .setService(MyJobService.class)
                .setTag("my-job-tag")
                .build(); dispatcher.schedule(myJob);
        // [END dispatch_job]

    }

    /**
     *   Handle time allotted to BroadcastReceivers.
     */
    private void handleNow() {
        Log.d(TAG, "Short lived task is done.");
    }

    /**
     *   Create and show a simple notification containing the receivedFCM message.
     *
     *   @param messageBody FCM message body received.
     */
    private void sendNotification(String messageBody) { Intent intent = new Intent(this,
        MainActivity.class);intent.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP);
        PendingIntent pendingIntent = PendingIntent.getActivity(this,
0 /* Request code */, intent,
                PendingIntent.FLAG_ONE_SHOT);

      // String channelId = getString(R.string.default_notification_channel_id);
       Uri defaultSoundUri= RingtoneManager.getDefaultUri(RingtoneManager.TYPE_NOTIFICATION);
        NotificationCompat.Builder notificationBuilder =new
                NotificationCompat.Builder(this)
                        .setSmallIcon(R.mipmap.ic_launcher)
                        .setContentTitle("FCM Message")
                        .setContentText(messageBody)
                        .setAutoCancel(true)
                        .setSound(defaultSoundUri)
                        .setContentIntent(pendingIntent);

        NotificationManager notificationManager =
                (NotificationManager)
getSystemService(Context.NOTIFICATION_SERVICE);

       notificationManager.notify(0 /* ID of notification */,notificationBuilder.build());
    }
}
```

MyJobService.java

```
package com.example.prashant.firebasedemo;

/**
   * Created by PRASHANT on 13-Nov-17.
   */
import android.util.Log;

import com.firebase.jobdispatcher.JobParameters;import
com.firebase.jobdispatcher.JobService;

public class MyJobService extends JobService {

        private static final String TAG = "MyJobService";@Override
        public boolean onStartJob(JobParameters jobParameters) { Log.d(TAG, "Performing long
                running task in scheduled job");
                // TODO(developer): add long running task here.return false;
        }

        @Override
        public boolean onStopJob(JobParameters jobParameters) {return false;
        }

}
```

Practical No. 4

Aim: - Design and develop app demonstrating Send Upstream Messages.

Code :-

Init.php

```
<?php

$host = "localhost";
$db_user = "root";
$db_password = "";
$db_name = "fcm_db";

$con = mysqli_connect($host, $db_user, $db_password, $db_name);

if($con)
echo " Connection Successful ";

else

?>


echo "Connection error" ;
```

Fcm_insert.php

```
<?php

require "init.php";
$fcm_token = $_POST["fcm_token"];
$sql = "insert into fcm_info values('".$fcm_token."');"; mysqli_query($con, $sql);
mysqli_close($con);

?>
```

MainActivity.java

```
package com.example.prashant.gcmmanager;

import android.content.Context;
import android.content.SharedPreferences;
import android.support.v7.app.AppCompatActivity; import android.os.Bundle;
import android.view.View; import android.widget.Button;

import com.android.volley.AuthFailureError; import com.android.volley.Request;
import com.android.volley.Response; import com.android.volley.VolleyError;

import com.android.volley.toolbox.StringRequest;

import java.util.HashMap; import java.util.Map;
```

```
public class MainActivity extends AppCompatActivity { Button button;
String app_server_url = "http://10.0.2.2/fcmtest/fcm_insert.php";
@Override
protected void onCreate(Bundle savedInstanceState) { super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
button = (Button)findViewById(R.id.button2); button.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) { SharedPreferences sharedPreferences =
getApplicationContext().getSharedPreferences(getString(R.string.FCM_PR EF), Context.MODE_PRIVATE);
final String token = sharedPreferences.getString(getString(R.string.FCM_TOKEN),"");
StringRequest stringRequest = new StringRequest(Request.Method.POST, app_server_url, new
Response.Listener<String>() {
@Override
public void onResponse(String response) {

}
}, new Response.ErrorListener() { @Override
public void onErrorResponse(VolleyError error) {

}

})
{


AuthFailureError {



@Override
protected Map<String, String> getParams() throws

Map<String,String> params = new

HashMap<String, String>();
params.put("fcm_token",token); return params;
}
};

MySingleton.getmInstance(MainActivity.this).addtoreque(stringRequest);
}

});
}
}
```

FCMInstanceIDService.java

```
package com.example.prashant.gcmmanager; import android.content.Context;
import android.content.SharedPreferences;
import com.google.firebase.iid.FirebaseInstanceId;
import com.google.firebase.iid.FirebaseInstanceIdService;

/**
* Created by PRASHANT on 15-Nov-17.
*/
public class FCMInstanceIDService extends FirebaseInstanceIdService { @Override
public void onTokenRefresh() {

String recent_token = FirebaseInstanceId.getInstance().getToken();
SharedPreferences sharedPreferences =
getApplicationContext().getSharedPreferences(getString(R.string.FCM_PR EF), Context.MODE_PRIVATE);
SharedPreferences.Editor editor= sharedPreferences.edit();
editor.putString(getString(R.string.FCM_TOKEN),recent_token); editor.commit();

}
}
```

FCMMessagingService.java

```
package com.example.prashant.gcmmanager;

import android.app.NotificationManager; import android.app.PendingIntent; import
android.content.Context;
import android.content.Intent;
import android.support.v7.app.NotificationCompat;


import com.google.firebase.messaging.FirebaseMessagingService; import
com.google.firebase.messaging.RemoteMessage;

/**
* Created by PRASHANT on 15-Nov-17.
*/
public class FCMMessagingService extends FirebaseMessagingService { @Override
public void onMessageReceived(RemoteMessage remoteMessage) {
String title = remoteMessage.getNotification().getTitle(); String message =
remoteMessage.getNotification().getBody();

Intent intent = new Intent(this,MainActivity.class); intent.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TASK);
PendingIntent pendingIntent =
PendingIntent.getActivity(this,0,intent,PendingIntent.FLAG_ONE_SHOT); NotificationCompat.Builder
notificationBuilder = new
NotificationCompat.Builder(this); notificationBuilder.setContentTitle(title);
notificationBuilder.setContentText(message); notificationBuilder.setSmallIcon(R.mipmap.ic_launcher);
notificationBuilder.setAutoCancel(true); notificationBuilder.setContentIntent(pendingIntent);
NotificationManager notificationManager =
(NotificationManager) getSystemService(Context.NOTIFICATION_SERVICE); notificationManager.notify(0,
notificationBuilder.build());

super.onMessageReceived(remoteMessage);
}
}


MySingleton.java package com.example.prashant.gcmmanager; import android.content.Context;
import com.android.volley.Request; import com.android.volley.RequestQueue;
import com.android.volley.toolbox.Volley;

/**
* Created by PRASHANT on 15-Nov-17.
*/

public class MySingleton {
private static MySingleton mInstance; private static Context mctx;
private RequestQueue requestQueue; private MySingleton(Context context)

{
mctx = context;
requestQueue =getRequestQueue();
}

private RequestQueue getRequestQueue()
{
if(requestQueue ==null)
{
requestQueue = Volley.newRequestQueue(mctx.getApplicationContext());
}
return requestQueue;
}

public static synchronized MySingleton getmInstance(Context context)
{
if(mInstance == null)
{
mInstance = new MySingleton(context);
}
return mInstance;
}
public void addtoreque(Request<?> request)
{
getRequestQueue().add(request);
}
}
```

Practical No. 7

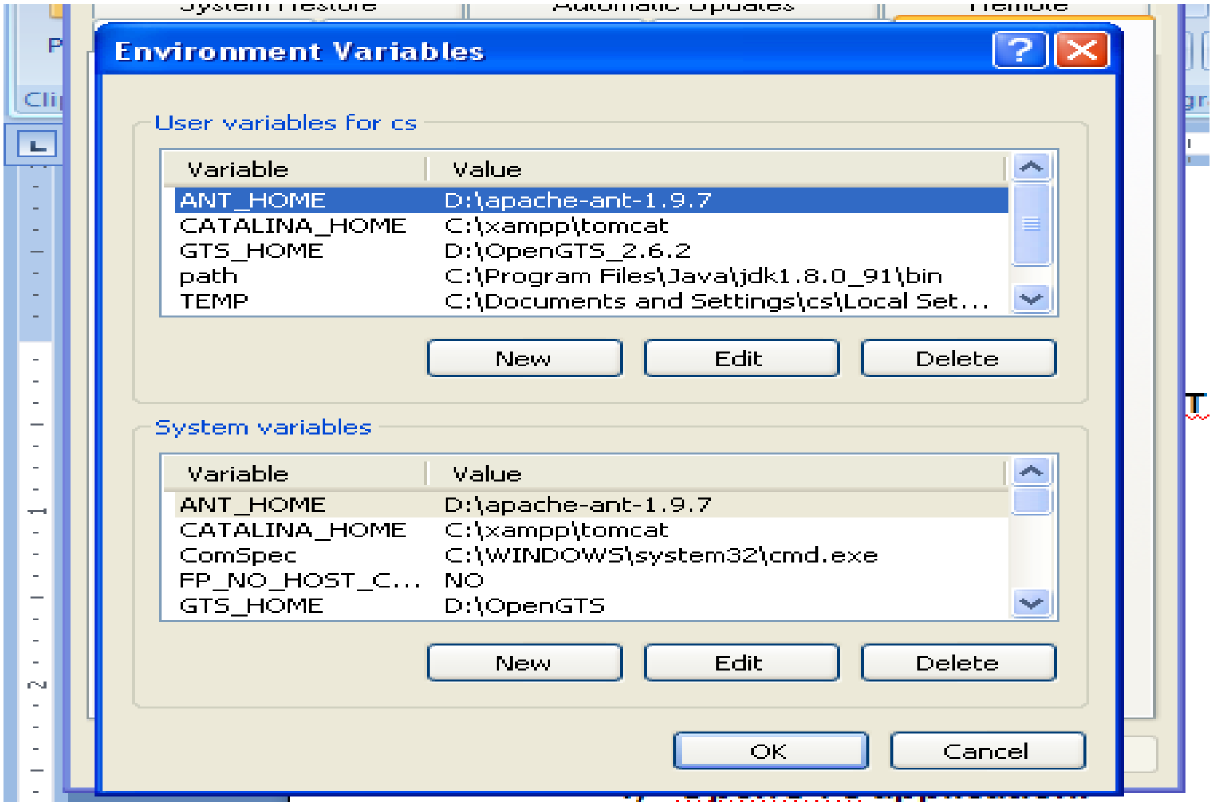
Aim: - Demonstrate use of OpenGTS (Open Source GPS Tracking System).Settings:-

Required Software:-

1) **JDK 1.6**
2) **XAMPP Server**
3) **Mysql-java connector**
4) **OpenGTS application.**

   http://www.opengts.org/

Set Environment Variables:-



Environment Variables

User variables for cs

Variable	Value
ANT_HOME	D:\apache-ant-1.9.7
CATALINA_HOME	C:\xampp\tomcat
GTS_HOME	D:\OpenGTS_2.6.2
path	C:\Program Files\Java\jdk1.8.0_91\bin
TEMP	C:\Documents and Settings\cs\Local Set...

System variables

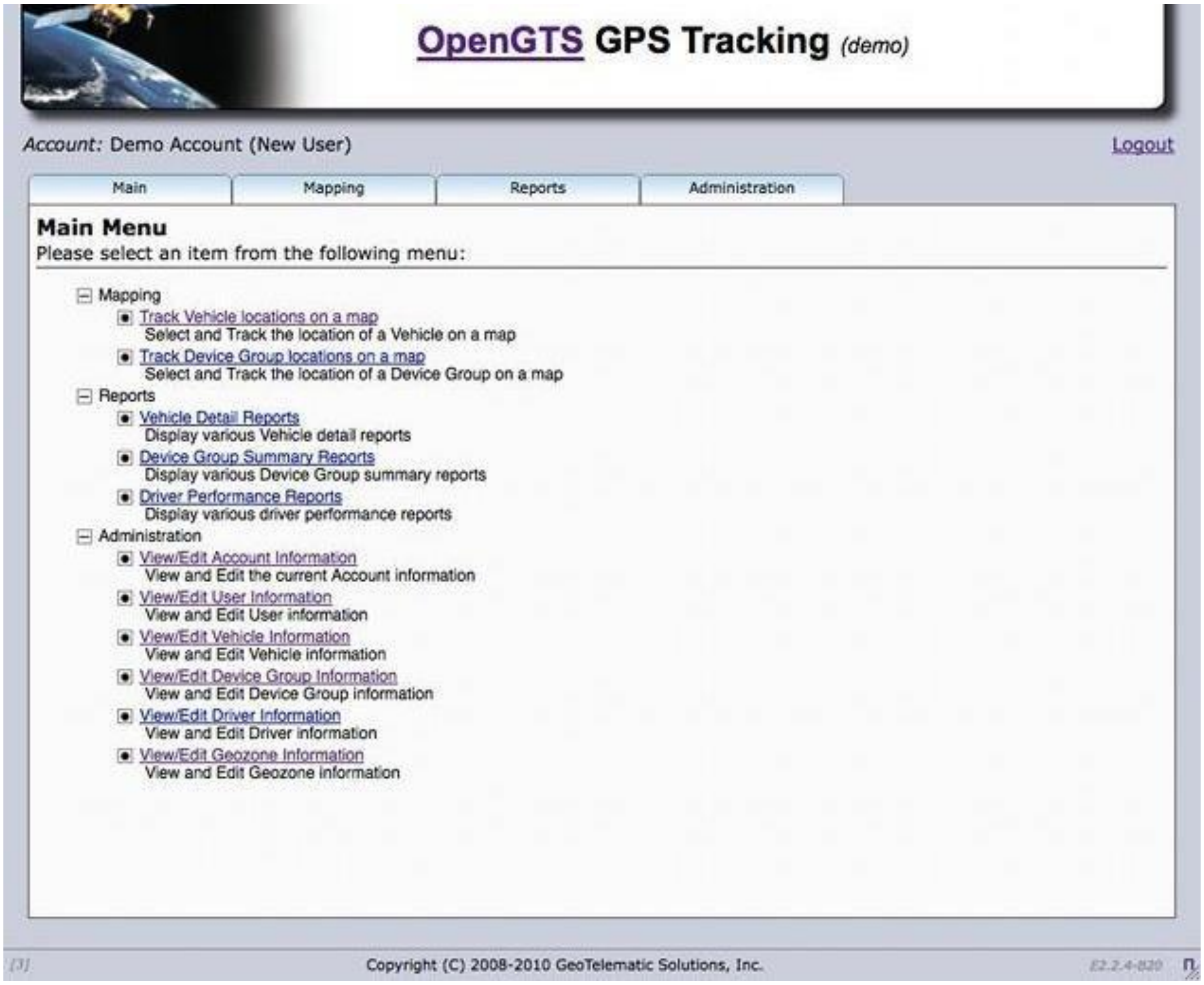
Variable	Value
ANT_HOME	D:\apache-ant-1.9.7
CATALINA_HOME	C:\xampp\tomcat
ComSpec	C:\WINDOWS\system32\cmd.exe
FP_NO_HOST_C...	NO
GTS_HOME	D:\OpenGTS

5) **Open command Prompt and go to D:\OpenGTS_2.6.2**
6) **Type command ant all**
7) **Type command ant track**
8) **Type command ant track.deploy**

9) Type command initdb.bat –rootUser=root –pass=123456789

10) Type Command admin.bat Account –account:admin –pass:123456 –create

11) Type url 127.0.0.0:8080/track/Track and login with admin and 123456



Account: Demo Account (New User)

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 Device Group locations on a map
  Select and Track the location of a Device Group on a map

⊟ Reports
- Vehicle Detail Reports
  Display various Vehicle detail reports
- Device Group Summary Reports
  Display various Device Group summary 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 Device Group Information
  View and Edit Device Group information
- View/Edit Driver Information
  View and Edit Driver information
- View/Edit Geozone Information
  View and Edit Geozone information

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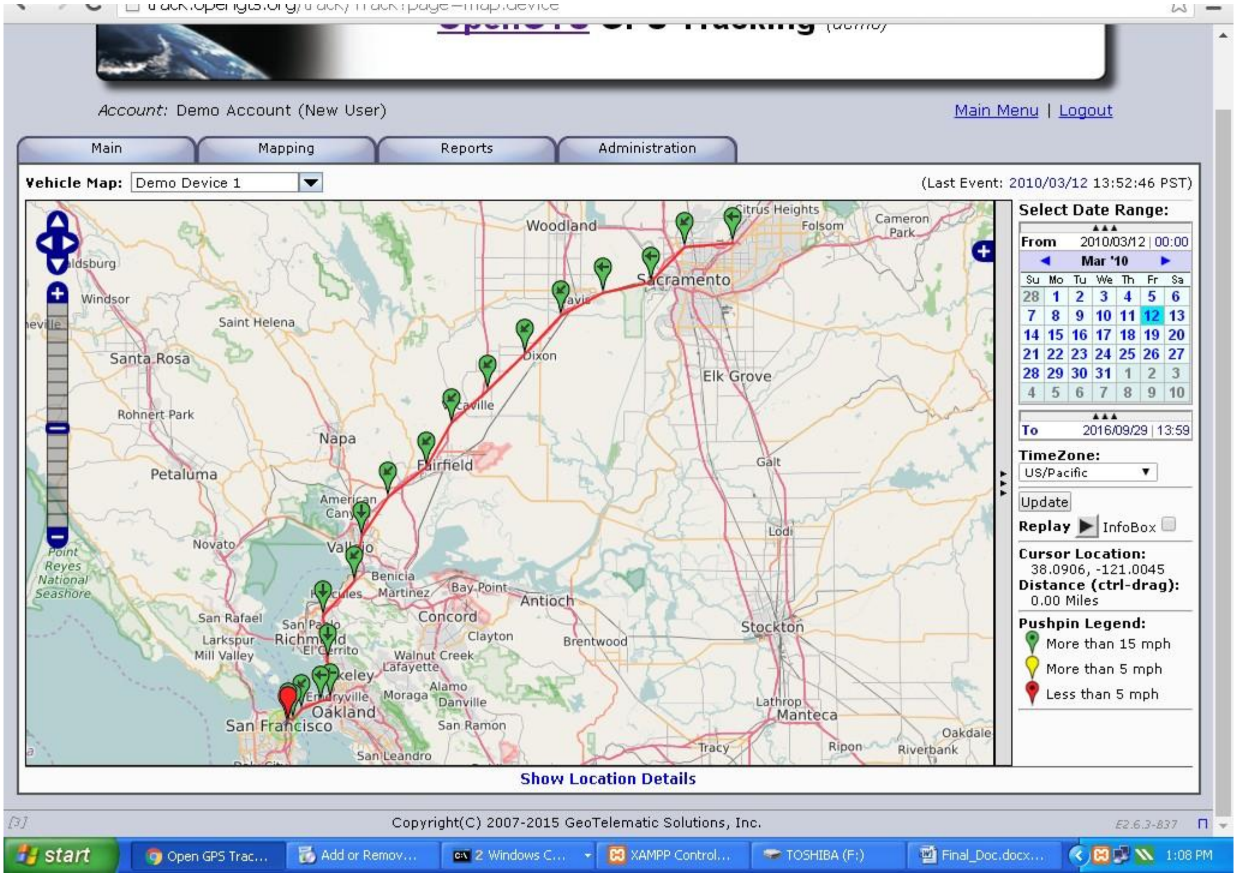


Account: Demo Account (New User)

Vehicle Map: Demo Device 1

(Last Event: 2010/03/12 13:52:46 PST)

Select Date Range:

From 2010/03/12 | 00:00

Mar '10

Su	Mo	Tu	We	Th	Fr	Sa
28	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

To 2016/09/29 | 13:59

TimeZone: US/Pacific

InfoBox □

Cursor Location: 38.0906, -121.0045

Distance (ctrl-drag): 0.00 Miles

Pushpin Legend:

🟩 More than 15 mph

🟨 More than 5 mph

🟥 Less than 5 mph

[3] Copyright(C) 2007-2015 GeoTelematic Solutions, Inc. E2.6.3-837

Practical No. 8

Aim: - Context-Aware system.

Context-awareness is a key concept in ubiquitous computing. The Java Context-Awareness Framework (JCAF) is a Java-based context-awareness infrastructure and programming API for creating context-aware applications
https://sourceforge.net/projects/jcaf/

Practical No. 9

Aim: - Develop application demonstrating Human Computer Interactions

Code :-

```
import java.awt.*; importjava.awt.event.*;

public class CloseableSimpleWarning extends Frame implementsWindowListener
{

static private final intframe_height = 150;static private
final intframe_width = 250;

publicCloseableSimpleWarning()
            {
                        //setBackground(Color.red);
                        //setForeground(Color.black);
setTitle("Warning");
setSize(frame_width, frame_height);
addWindowListener(this);
            }

public void windowClosing (WindowEvent e)
            {
System.exit(0);
            }

public void windowClosed (WindowEvent e)
            {
System.exit(0);
            }

public void windowIconified (WindowEvent e)
            {
System.exit(0);
            }

public void windowDeiconified (WindowEvent e)
            {
System.exit(0);
            }

public void windowOpened (WindowEvent e)
```

```
                {
System.exit(0);
                }

public void windowActivated (WindowEvent e)
                {
System.exit(0);
                }

public void windowDeactivated (WindowEvent e)
                {
System.exit(0);
                }

public static void main(String [] args)
                {
CloseableSimpleWarning f = new CloseableSimpleWarning();

     f.show();
                 }
}
```

Practical No. 10

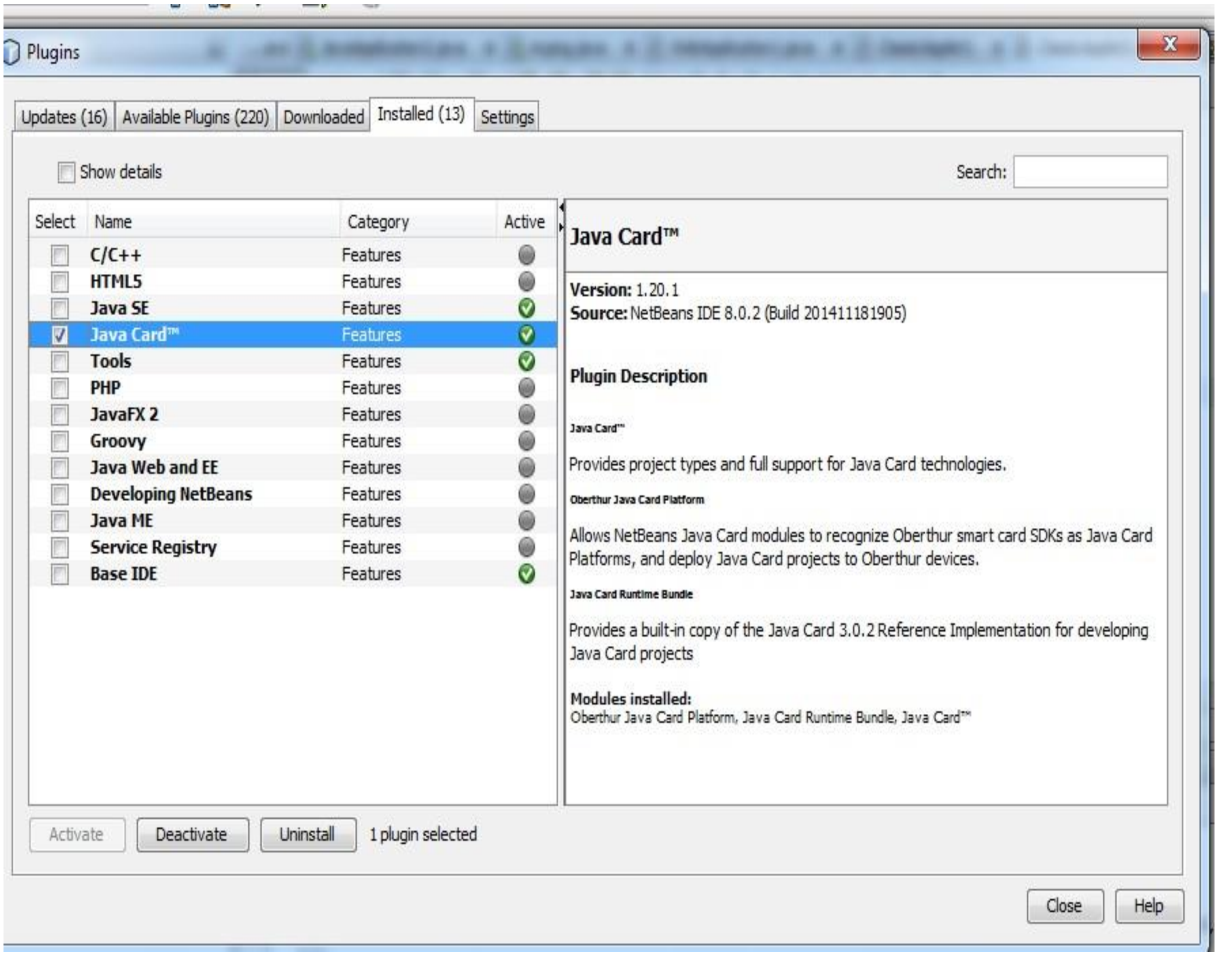
Aim: - Write a Java Card applet

Download Java Card Sdk from

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

Install in Netbeans as plugin :-

Tools -> Plugin



Select	Name	Category	Active
☐	C/C++	Features	●
☐	HTML5	Features	●
☐	Java SE	Features	✓
☑	Java Card™	Features	✓
☐	Tools	Features	✓
☐	PHP	Features	●
☐	JavaFX 2	Features	●
☐	Groovy	Features	●
☐	Java Web and EE	Features	●
☐	Developing NetBeans	Features	●
☐	Java ME	Features	●
☐	Service Registry	Features	●
☐	Base IDE	Features	✓

Java Card™

Version: 1.20.1
Source: NetBeans IDE 8.0.2 (Build 201411181905)

Plugin Description

Java Card™

Provides project types and full support for Java Card technologies.

Oberthur Java Card Platform

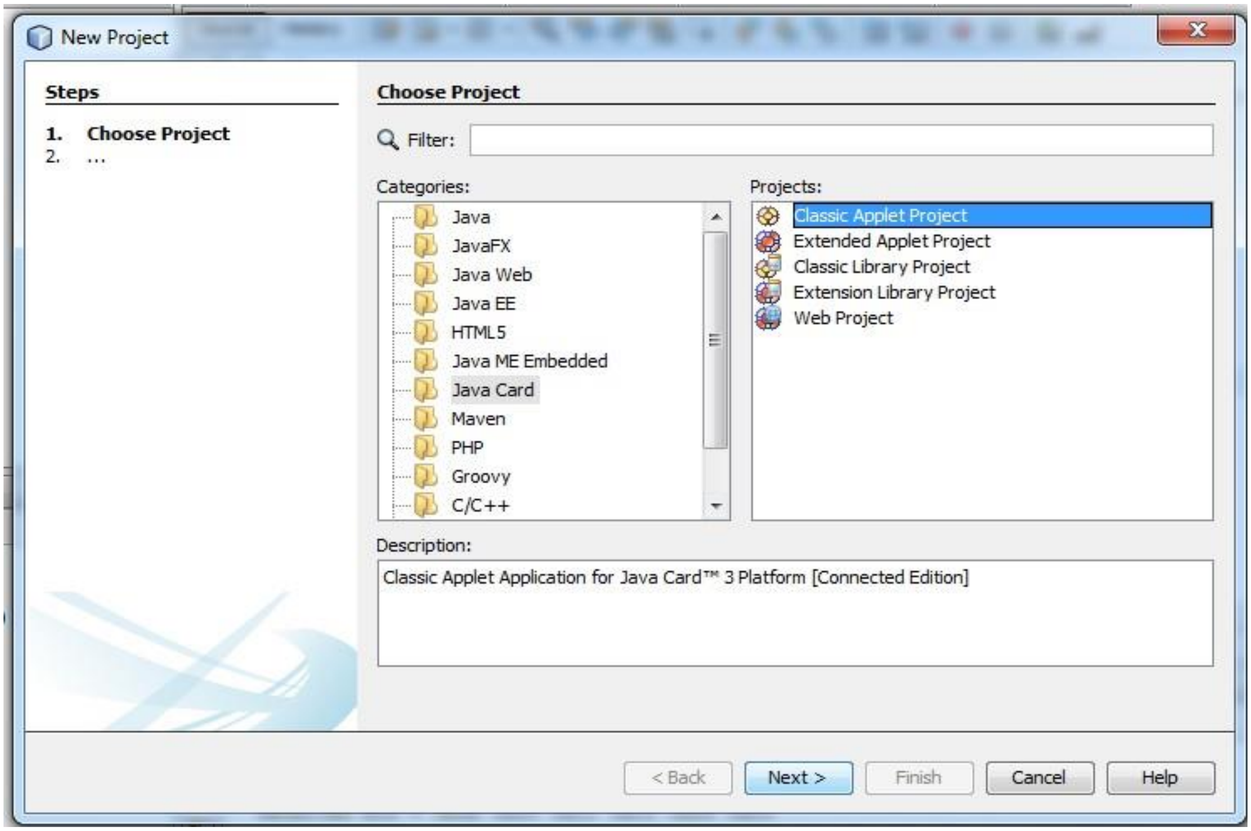
Allows NetBeans Java Card modules to recognize Oberthur smart card SDKs as Java Card Platforms, and deploy Java Card projects to Oberthur devices.

Java Card Runtime Bundle

Provides a built-in copy of the Java Card 3.0.2 Reference Implementation for developing Java Card projects

Modules installed:
Oberthur Java Card Platform, Java Card Runtime Bundle, Java Card™

Create an application



1. Choose Project
2. …

Choose Project

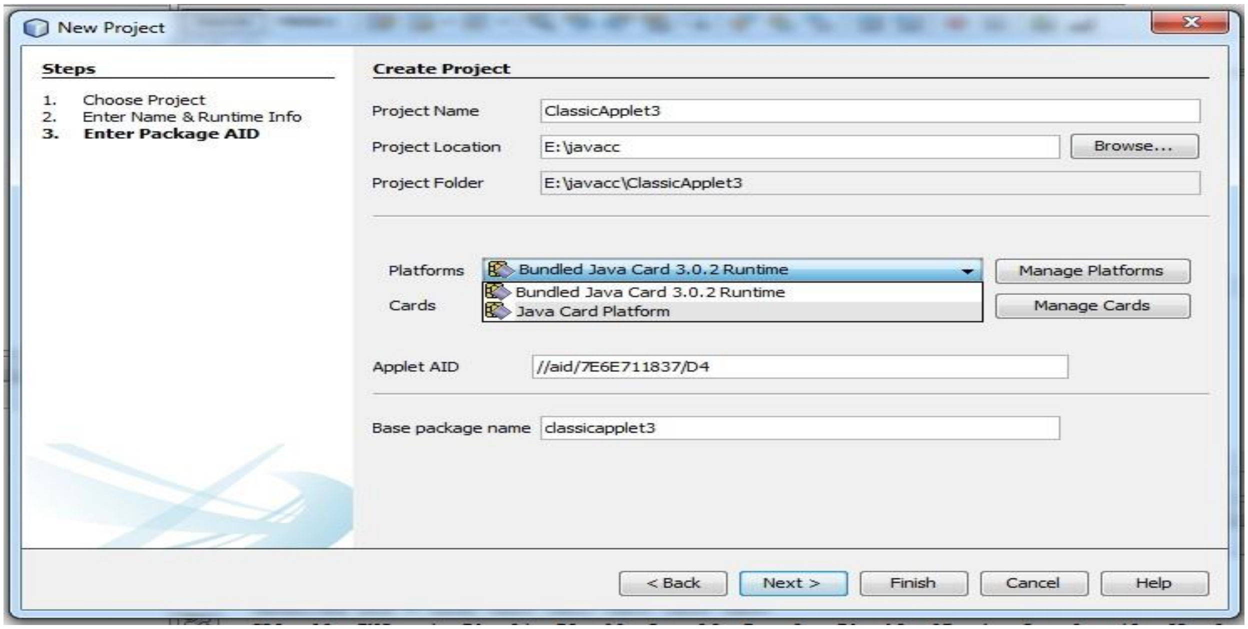
Filter:

Categories: Java Card

Projects: Classic Applet Project

Description:

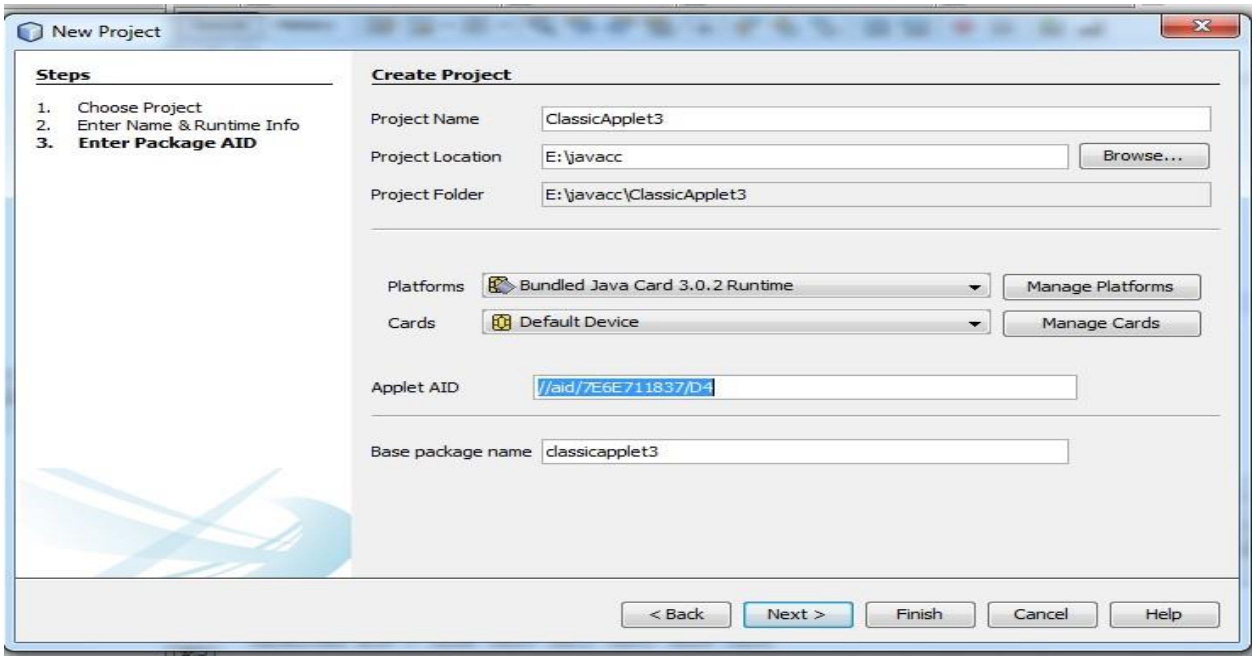
Classic Applet Application for Java Card™ 3 Platform [Connected Edition]



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

Create Project

Project Name	ClassicApplet3
Project Location	E:\javacc
Project Folder	E:\javacc\ClassicApplet3
Platforms	Bundled Java Card 3.0.2 Runtime
Cards	Bundled Java Card 3.0.2 Runtime Java Card Platform
Applet AID	//aid/7E6E711837/D4
Base package name	classicapplet3



Steps

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

Create Project

Project Name: ClassicApplet3

Project Location: E:\javacc

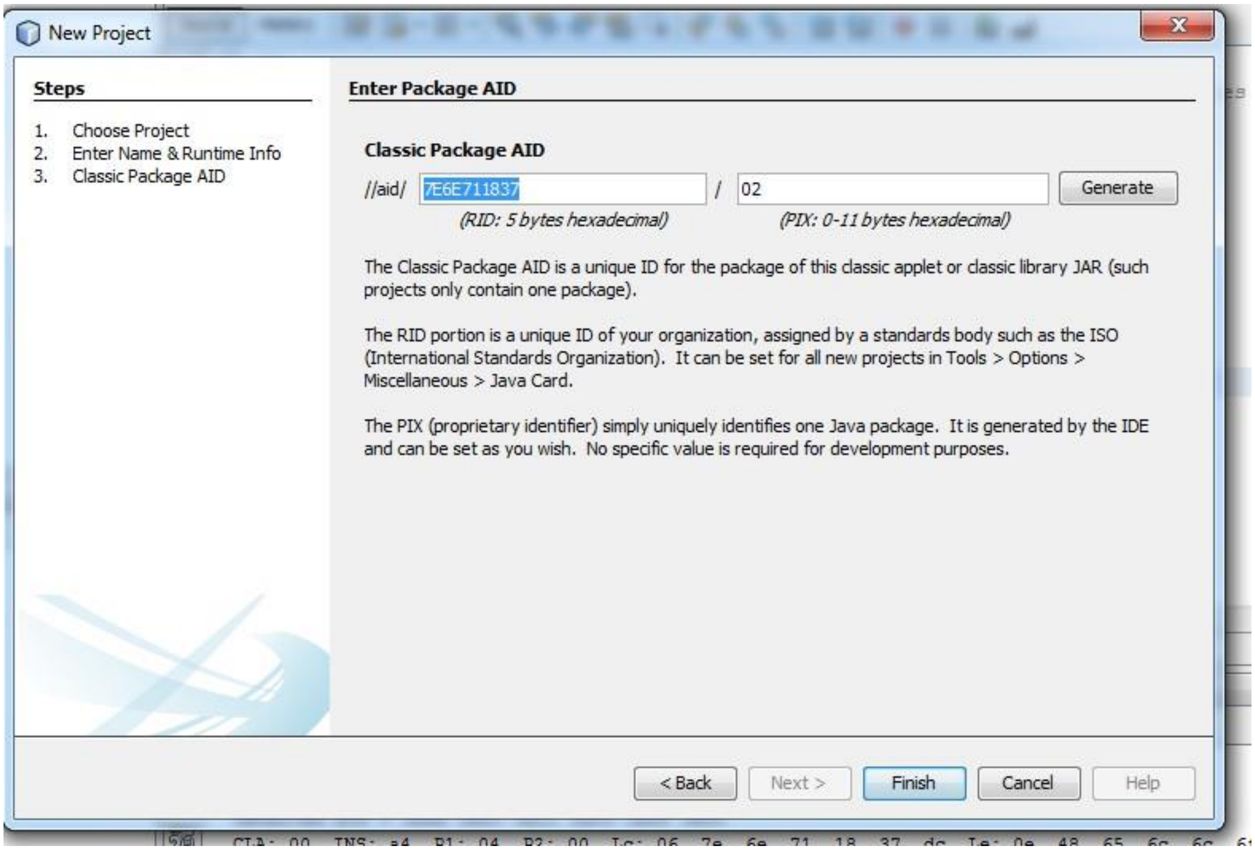
Project Folder: E:\javacc\ClassicApplet3

Platforms: Bundled Java Card 3.0.2 Runtime

Cards: Default Device

Applet AID: //aid/7E6E711837/D4

Base package name: classicapplet3



Steps

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

Enter Package AID

Classic Package AID

//aid/ 7E6E711837 / 02

(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.

Code:-

```
/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */

package classicapplet2;

importjavacard.framework.*;

/**
 *
 * @author Prashant
 */
public class ClassicApplet2 extends Applet {

    /**
     * Installs this applet.
     *
     * @parambArray
     *            the array containing installation parameters
     * @parambOffset
     *            the starting offset in bArray
     * @parambLength
     *            the length in bytes of the parameter data in bArray
     */
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();
    }

    /**
     * Processes an incoming APDU.
     *
     * @see APDU
     * @paramapdu
     *            the incoming APDU
     */
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);



    }
}
```