BMS INSTITUTE OF TECHNOLOGY AND MANAGEMENT

Doddaballapura Road, Avalahalli, Yelahanka, Bangalore-560064

Affiliated to Visvesvaraya Technological University

DEPARTMENT OF MCA

2nd SEMESTER MCA

COURSE: MOBILE APPLICATIONS LABORATORY

COURSE CODE: 22MCA202

LABORATORY MANUAL

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ACADEMIC YEAR: 2022-23 (EVEN)

BMS Institute of Technology and Management

(Autonomous Under VTU)
Yelahanka, Bengaluru – 560064.

LABORATORY CERTIFICATE

This is to certify that Mr./Ms _____ has satisfactorily completed the course of experiments in practical _____ prescribed by Visveshwaraya Technological University for _____ Semester _____ Course in the Laboratory of the college in the year 2022 - 2023

Head of the Department **Staff incharge of the batch**

Date: _____

Marks	
Maximum	**Obtained**

Name of the Candidate: _____

USN: _____

Signature of the Candidate

Department of MCA

Department Vision

To develop quality professionals in Computer Applications who can provide sustainable solutions to the societal and industrial needs

Department Mission

Facilitate effective learning environment through quality education, state-of-the-art facilities, and orientation towards research and entrepreneurial skills

Programme Educational Objectives (PEOs)

PEO1: Develop innovative IT applications to meet industrial and societal needs

PEO2: Adapt themselves to changing IT requirements through life-long learning

PEO3: Exhibit leadership skills and advance in their chosen career

Programme Outcomes (POs)

PO1: Apply knowledge of computing fundamentals, computing specialization, mathematics and domain knowledge to provide IT solutions.

PO2: Identify, analyse and solve IT problems using fundamental principles of mathematics and computing sciences.

PO3: Design, Develop and evaluate software solutions to meet societal and environmental concerns.

PO4: Conduct investigations of complex problems using research based knowledge and methods to provide valid conclusions.

PO5: Select and apply appropriate techniques and modern tools for complex computing activities.

PO6: Understand professional ethics, cyber regulations and responsibilities.

PO7: Involve in life-long learning for continual development as an IT professional.

PO8: Apply and demonstrate computing and management principles to manage projects in multidisciplinary environments by involving in different roles

PO9: Comprehend& write effective reports and make quality presentations.

PO10: Understand and assess the impact of IT solutions on socio-environmental Issues.

PO11: Work collaboratively as a member or leader in multidisciplinary teams.

PO12: Identify potential business opportunities and innovate to create value to the society and seize that opportunity.

Course Title: Mobile Applications Laboratory
Course Code: 22MCA202

Course Outcomes (PEOs)
CO1: Explore the design features of mobile devices.
CO2: Develop applications using views, intents, fragments and graphics.
CO3: Design an application using Internal and external database.
CO4: Design an application using image capturing and location based.
CO5: Develop a mobile application based on societal and environmental issues.

Laboratory Instructions:

Hardware Requirements:	
Hardware	Above 4GB Ram, Latest Graphic Card, and Android Mobile Phone, Multimedia supported Keyboard and mouse
Software Requirements:	
Operating System	Windows (2007 onwards) / Linux OS (Ubuntu / Fedora)
IDE	Android Studio with Android SDK
Programming Language/s	JAVA JDK 8 onwards
Script	JavaScript, PHP, PERL
Emulator	Built-in with Android Studio or Geny Motion
Database	Built-in SQLite or Firebase

Note:

1. **Students are required to execute one question from lot of all 9 Questions.**
2. **Change of program is not permitted in the examination.**

Particulars of the Experiments to be Performed

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Program-1: Develop a standard calculator application to perform basic calculations like addition, subtraction, multiplication and division using 2 EditText and 1 TextView for displaying result. (Android 4.0 version used)

Xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:orientation="vertical"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:layout_margin="20dp">

<EditText
   android:id="@+id/editText1"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:layout_weight="1"
   android:inputType="numberDecimal"
   android:textSize="20sp" />

<EditText
   android:id="@+id/editText2"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:layout_weight="1"
   android:inputType="numberDecimal"
   android:textSize="20sp" />

<Button
   android:id="@+id/Add"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:layout_weight="1"
   android:text="+"
   android:textSize="30sp"/>

<Button
   android:id="@+id/Sub"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:layout_weight="1"
   android:text="-"
   android:textSize="30sp"/>

<Button
   android:id="@+id/Mul"
```

```
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="*"
    android:textSize="30sp"/>

<Button
    android:id="@+id/Div"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:text="/"
    android:textSize="30sp"/>

<TextView
    android:id="@+id/textView"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="50dp"
    android:text="Answer is"
    android:textSize="30sp"
    android:gravity="center"/>
    </LinearLayout>
```

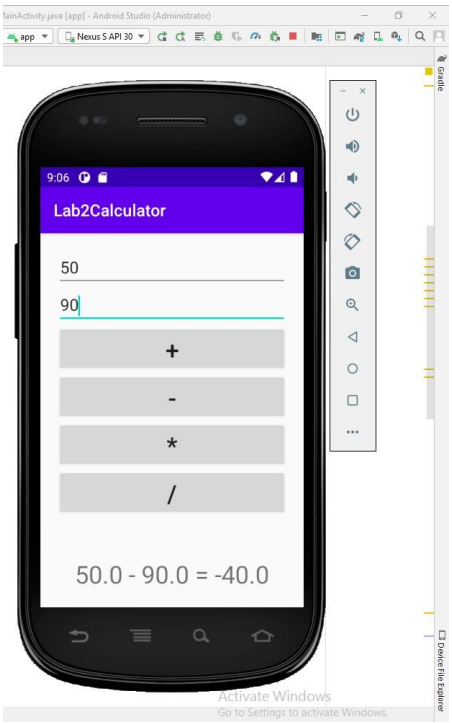
MainActivity.java

```
package com.example.lab2calculator;
import android.annotation.SuppressLint;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import
android.text.TextUtils;
import android.view.View;
import android.view.View.OnClickListener;
import android.widget.Button;
import
android.widget.EditText;
import
android.widget.TextView;
public class MainActivity extends AppCompatActivity implements OnClickListener {
    EditText Num1;
    EditText Num2;
    Button Add;
    Button Sub;
    Button Mul;
    Button Div;
```

```
    TextView Result;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    Num1 = (EditText) findViewById(R.id.editText1);
    Num2 = (EditText) findViewById(R.id.editText2);
    Add = (Button) findViewById(R.id.Add);
    Sub = (Button) findViewById(R.id.Sub); Mul
    = (Button) findViewById(R.id.Mul); Div = (
    Button ) findViewById ( R.id.Div );
    Result = (TextView) findViewById(R.id.textView);
    Add.setOnClickListener(this);
    Sub.setOnClickListener(this);
    Mul.setOnClickListener(this);
    Div.setOnClickListener(this);
    }
    public void onClick (View v)
    {
    float num1 = 0;
    float num2 = 0;
    float result = 0;
    String oper = "";
if (TextUtils.isEmpty(Num1.getText().toString()) || TextUtils.isEmpty(Num2.getText().toString()))
    return;
    num1 = Float.parseFloat(Num1.getText().toString());
    num2 = Float.parseFloat(Num2.getText().toString());
    switch (v.getId())
    {
  case R.id.Add:oper =
    "+";
    result = num1 + num2;
    break;
  case R.id.Sub:oper =
    "-";
    result = num1 - num2;
    break;
  case R.id.Mul:oper =
    "*";
    result = num1 * num2;
      break; case
    R.id.Div:
    oper = "/";
    result = num1 / num2;
      break;
    default:
    break;
```

```
}
Result.setText(num1 + " " + oper + " " + num2 + " = " + result);
}
@Override
public void onPointerCaptureChanged(boolean hasCapture) {

}
}
```

Output:



Program-2: Develop a mobile application to register a form in first activity and display the registeredinformation in second activity using intents.

Solution Code:

activity_main.xml (First Activity)

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/tv1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:fontFamily="sans-serif-black"
        android:gravity="center"
        android:text="Registration Form"
        android:textColor="#9C27B0"
        android:textSize="30dp"
        android:textStyle="bold" />

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="40dp"
        android:gravity="center"
        android:text="Enter Full Name"
        android:textColor="#9C27B0"
        android:textSize="30sp"
        android:textStyle="bold" />

    <EditText
        android:layout_marginTop="15dp"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/fullname"
        android:hint="Full Name"
        android:textSize="25dp"/>

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
```

```
        android:layout_marginTop="25dp"
        android:gravity="center"
        android:text="Enter USN"
        android:textColor="#9C27B0"
        android:textSize="30sp"
        android:textStyle="bold" />

    <EditText
        android:layout_marginTop="20dp"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/stu_usn"
        android:hint="USN"
        android:textSize="25dp"/>

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="25dp"
        android:gravity="center"
        android:text="Enter Department"
        android:textColor="#9C27B0"
        android:textSize="30sp"
        android:textStyle="bold" />

    <EditText
        android:layout_marginTop="20dp"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/clg_Dept"
        android:hint="Department"
        android:textSize="25dp"/>

    <Button
        android:id="@+id/btn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_marginTop="20dp"
        android:background="#1A0467"
        android:text="SHOW"
        android:textColor="#FFFFFF"
        android:textSize="25dp" />


</LinearLayout>
```

activity_display.xml (Second Activity)

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="top"
    android:orientation="vertical">

    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="100dp"
        android:gravity="center"
        android:text="STUDENT Details"
        android:textAlignment="center"
        android:textColor="#C6281C"
        android:textSize="30sp"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/textView1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="210dp"
        android:gravity="center"
        android:text="NAME"
        android:textAlignment="center"
        android:textColor="#C6281C"
        android:textSize="30sp"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/Name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="260dp"
        android:gravity="center"
        android:text="Empty"
        android:textAlignment="center"
        android:textColor="#1682D8"
        android:textSize="30sp"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        android:layout_marginTop="340dp"
        android:gravity="center"
        android:text="USN"
        android:textAlignment="center"
        android:textColor="#C6281C"
        android:textSize="30sp"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/usn2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="380dp"
        android:gravity="center"
        android:text="Empty"
        android:textAlignment="center"
        android:textColor="#1375C3"
        android:textSize="30sp"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="460dp"
        android:gravity="center"
        android:text="DEPARTMENT"
        android:textAlignment="center"
        android:textColor="#C6281C"
        android:textSize="30sp"
        android:textStyle="bold" />

    <TextView
        android:id="@+id/dept2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="500dp"
        android:gravity="center"
        android:text="Empty"
        android:textAlignment="center"
        android:textColor="#1A70B5"
        android:textSize="30sp"
        android:textStyle="bold" />


</RelativeLayout>
```

MainActivity.java

```
package com.example.myindent;

import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {
    public static final String Efn = "com.example.MyIndent.Efn";
    public static final String Eus = "com.example.MyIndent.Eus";
    public static final String Ed = "com.example.MyIndent.Ed";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Button button = (Button) findViewById(R.id.btn);
        button.setOnClickListener(new View.OnClickListener() {

            public void onClick(View view)
            {
                DisActivity();

            }
        });
    }
    public void DisActivity() {
        EditText et1 = (EditText) findViewById(R.id.fullname);
        EditText et2 = (EditText) findViewById(R.id.stu_usn);
        EditText et3 = (EditText) findViewById(R.id.clg_Dept);

        String fn = et1.getText().toString();
        String usn = et2.getText().toString();
        String dept = et3.getText().toString();


        Intent intent = new Intent(this,DisplayActivity.class);
        intent.putExtra(Efn,fn);
        intent.putExtra(Eus,usn);
        intent.putExtra(Ed,dept);
        startActivity(intent);
    }
}
```

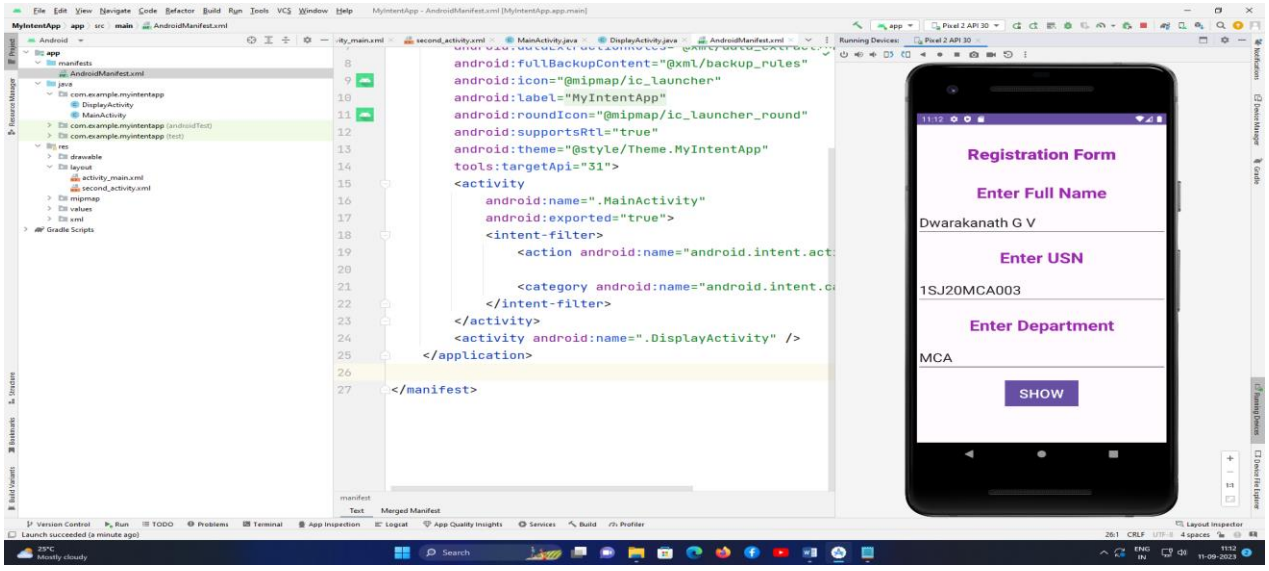
DisplayActivity.java

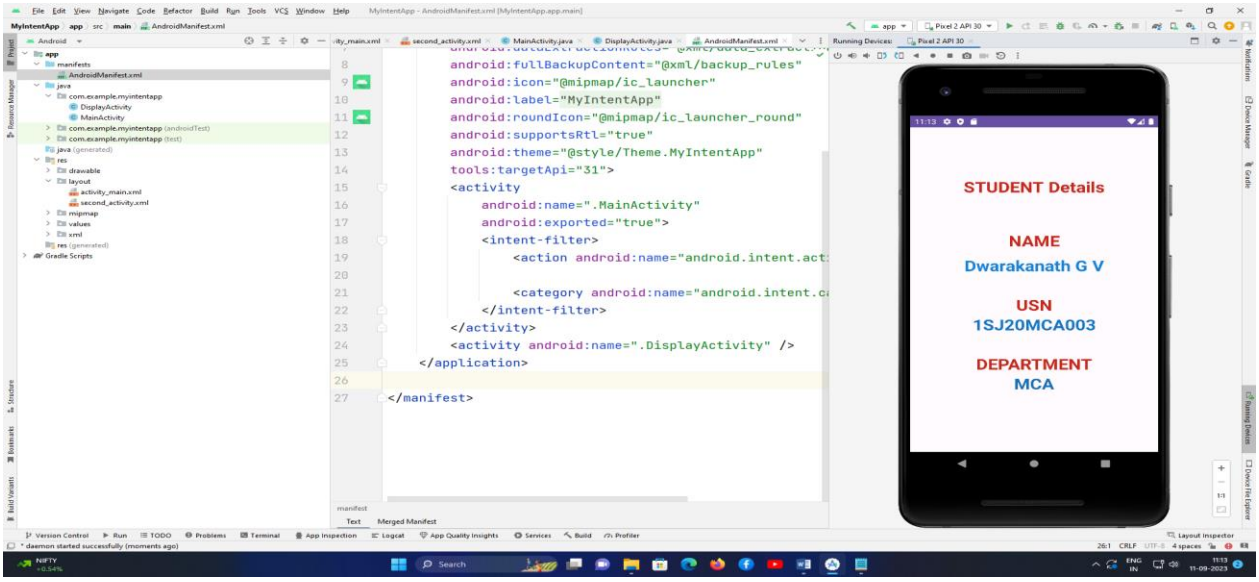
```
package com.example.myindent;

import android.content.Intent;
import android.os.Bundle;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class DisplayActivity extends AppCompatActivity {
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.second_activity);
        Intent intent = getIntent();
        String s1 = intent.getStringExtra(MainActivity.Efn);
        String s2 = intent.getStringExtra(MainActivity.Eus);
        String s3 = intent.getStringExtra(MainActivity.Ed);

        TextView t1 = (TextView) findViewById(R.id.Name);
        TextView t2 = (TextView) findViewById(R.id.usn2);
        TextView t3 = (TextView) findViewById(R.id.dept2);


        t1.setText(s1);
        t2.setText(s2);
        t3.setText(s3);

    }

}
```

AndroidManifest.xml

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

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.MyIndent"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

    </application>

</manifest>
```

Output:





Program-3: Develop a mobile application to list the tourist places of Karnataka using ListView.

Solution Code:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
    android:scrollbarTrackVertical="@drawable/gandabherunda"
    android:visibility="visible"
    tools:context=".MainActivity"
    tools:visibility="visible">

<ImageView
    android:id="@+id/Kan"
    android:layout_width="match_parent"
    android:layout_height="76dp"
    android:src="@drawable/gandabherunda"
    android:tooltipText="Emblem of Karnataka State"
    android:background="#3F51B5"/>

<TextView
    android:id="@+id/tours"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:background="#090000"
```

```
   android:gravity="center"
   android:text="Karnataka Tourist Places"
   android:textColor="#FFFFFF"
   android:textSize="30dp"
   android:textStyle="bold"
   android:fontFamily="sans-serif-medium"/>
 <LinearLayout
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   >
<ListView android:id="@+id/places_list"
   android:layout_width="409dp"
   android:layout_height="729dp"
   tools:layout_editor_absoluteX="1dp"
   tools:layout_editor_absoluteY="1dp" />

   </LinearLayout>
   </LinearLayout>
```

Res/layout/Activity_listview.xml

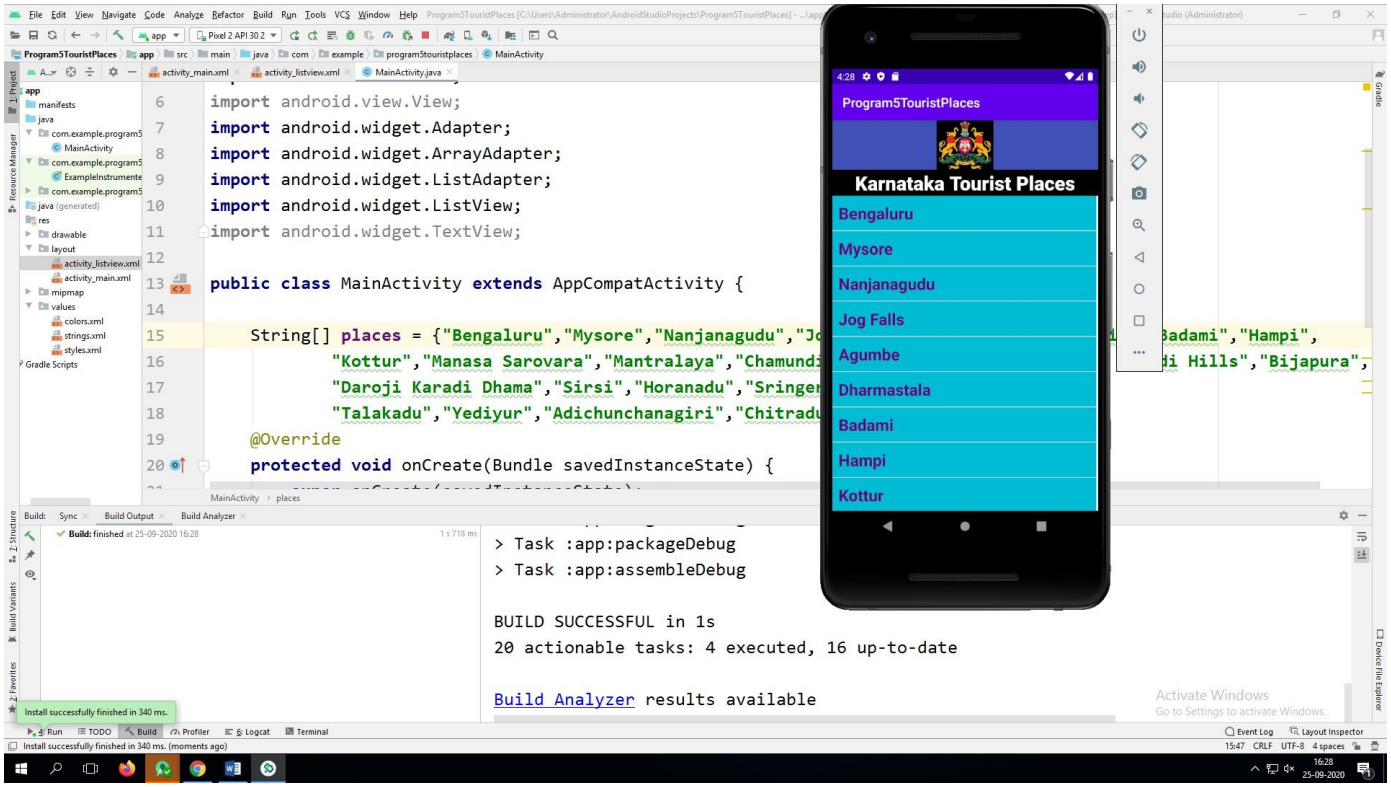
```
   <?xml version="1.0" encoding="utf-8"?>
<TextView xmlns:android="http://schemas.android.com/apk/res/android"
   android:id="@+id/label"
   android:layout_width="fill_parent"
   android:layout_height="fill_parent"
   android:padding="10dip"
   android:textSize="25dip"
   android:textStyle="bold"
   android:textColor="#690C78"
android:background="#00BCD4"
   android:clickable="true">
   </TextView>
```

MainActivity.java

```
   package com.example.program5touristplaces;
   import
   androidx.appcompat.app.AppCompatActivity;
   import android.os.Bundle;
   import android.view.View;
   import
   android.widget.Adapter;
   import
   android.widget.ArrayAdapter;
   import android.widget.ListAdapter;
   import android.widget.ListView;
   import android.widget.TextView;
```

```
public class MainActivity extends AppCompatActivity {

String[] places = {"Bengaluru","Mysore","Nanjanagudu","Jog Falls","Agumbe",
"Dharmastala","Badami","Hampi", "Bagali", "Manasa Sarovara", "Mantralaya", "Chamundi
Hills", "Sirsi", "Mahadeswara Hills", "Nandi Hills","Bijapura", "Daroji Karadi Dhama" ,
"SiddaroodaMatt", "Horanadu", "Sringeri","Udupi","Madikeri", "Talakadu", "Mekedatu",
"Yediyur", "Adichunchanagiri", "Chitradurga","Kottur","Sangama"};
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
ListView listView = (ListView) findViewById(R.id.places_list);
Adapter adapter = new ArrayAdapter<String> (this,R.layout.activity_listview, places);
listView.setAdapter((ListAdapter) adapter);
}
}
```

Output:



Program-4: Devise an application that draws basic graphical primitives (rectangle, circle) on the screen

Xml:

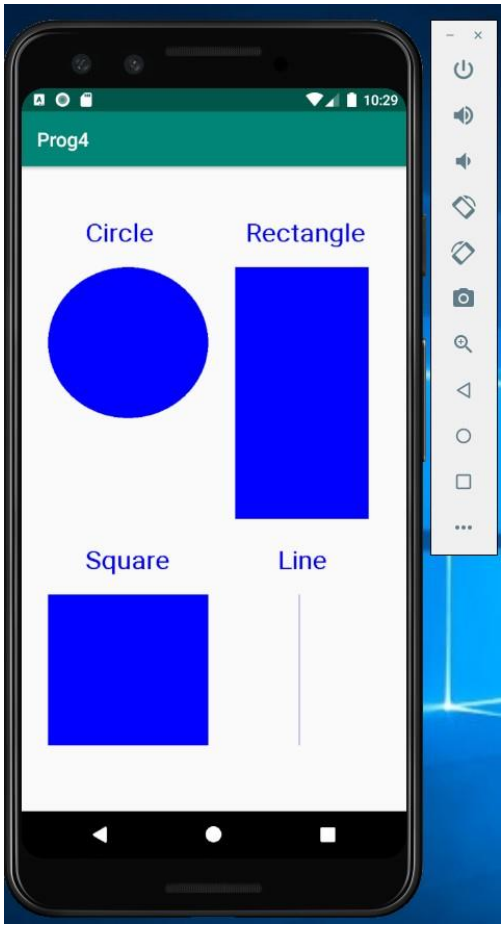
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

<ImageView
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:id="@+id/imageView" />
    </RelativeLayout>
```

Java:

```
package com.example.prog4;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import
android.graphics.Bitmap;
import
android.graphics.Canvas;
import android.graphics.Color;
import android.graphics.Paint;
import android.graphics.drawable.BitmapDrawable;
import android.os.Bundle;
import android.widget.ImageView;

public class MainActivity extends AppCompatActivity {
    @Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate ( savedInstanceState ); setContentView
    ( R.layout.activity_main );
    Bitmap bg = Bitmap.createBitmap(720, 1280, Bitmap.Config.ARGB_8888);
    ImageView i = (ImageView) findViewById(R.id.imageView);
    i.setBackgroundDrawable(new BitmapDrawable(bg));
    Canvas canvas = new Canvas(bg);
    Paint paint = new Paint();

    paint.setColor(Color.BLUE);
    paint.setTextSize(50);


    canvas.drawText("Rectangle", 420, 150, paint);
```

```
canvas.drawRect(400, 200, 650, 700, paint);

canvas.drawText("Circle", 120, 150, paint);
canvas.drawCircle(200, 350, 150, paint);


canvas.drawText("Square", 120, 800, paint);
canvas.drawRect(50, 850, 350, 1150, paint);


canvas.drawText("Line", 480, 800, paint);
canvas.drawLine(520, 850, 520, 1150, paint);
}
}
```

Output:



Program-5: Build a mobile application that create, save, update and delete data in a database.Xml:

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

<AbsoluteLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent">
<TextView
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_x="50dp"
   android:layout_y="20dp"
   android:text="Student Details"
   android:textSize="30sp" />

<TextView
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_x="20dp"
   android:layout_y="110dp"
   android:text="Enter Rollno:"
   android:textSize="20sp" />

<EditText
   android:id="@+id/Rollno"
   android:layout_width="150dp"
   android:layout_height="wrap_content"
   android:layout_x="175dp"
   android:layout_y="100dp"
   android:inputType="number"
   android:textSize="20sp" />

<TextView
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_x="20dp"
   android:layout_y="160dp"
   android:text="Enter Name:"

   android:textSize="20sp" />

<EditText android:id="@+id/Name"
   android:layout_width="150dp"
   android:layout_height="wrap_content"
   android:layout_x="175dp"
   android:layout_y="150dp"
```

```
   android:inputType="text"
   android:textSize="20sp" />

<TextView
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_x="20dp"
   android:layout_y="210dp"
   android:text="Enter Marks:"
   android:textSize="20sp" />

<EditText
   android:id="@+id/Marks"
   android:layout_width="150dp"
   android:layout_height="wrap_content"
   android:layout_x="175dp"
   android:layout_y="200dp"
   android:inputType="number"
   android:textSize="20sp" />

   <Button

   android:id="@+id/Insert"
   android:layout_width="150dp"
   android:layout_height="wrap_content"
   android:layout_x="25dp"
   android:layout_y="300dp"
   android:text="Insert"
   android:textSize="30dp" />

<Button android:id="@+id/Delete"
   android:layout_width="150dp"
   android:layout_height="wrap_content"
   android:layout_x="200dp"
   android:layout_y="300dp"
   android:text="Delete"
   android:textSize="30dp" />

<Button android:id="@+id/Update"
   android:layout_width="150dp"
   android:layout_height="wrap_content"
   android:layout_x="25dp"
   android:layout_y="400dp"
   android:text="Update"
   android:textSize="30dp" />

   <Button
   android:id="@+id/View"
```

```
    android:layout_width="150dp"

    android:layout_height="wrap_content"
    android:layout_x="200dp"
    android:layout_y="400dp"
    android:text="View"
    android:textSize="30dp" />

<Button
    android:id="@+id/ViewAll"
    android:layout_width="200dp"
    android:layout_height="wrap_content"
    android:layout_x="100dp"
    android:layout_y="500dp"
    android:text="View All"
    android:textSize="30dp" />

    </AbsoluteLayout>
```

Java:

```
    package com.example.prog5;
    import android.app.Activity;
    import android.app.AlertDialog.Builder;
    import android.content.Context;
    import android.database.Cursor;
    import android.database.sqlite.SQLiteDatabase;
    import android.os.Bundle;
    import android.view.View;
    import android.view.View.OnClickListener;
    import android.widget.Button;
    import android.widget.EditText;

    public class MainActivity extends Activity implements OnClickListener
    {
    EditText Rollno,Name,Marks;
    Button Insert,Delete,Update,View,ViewAll;
    SQLiteDatabase db;

    @Override
    public void onCreate(Bundle savedInstanceState)
    {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    Rollno=(EditText)findViewById(R.id.Rollno);
    Name=(EditText)findViewById(R.id.Name);
```

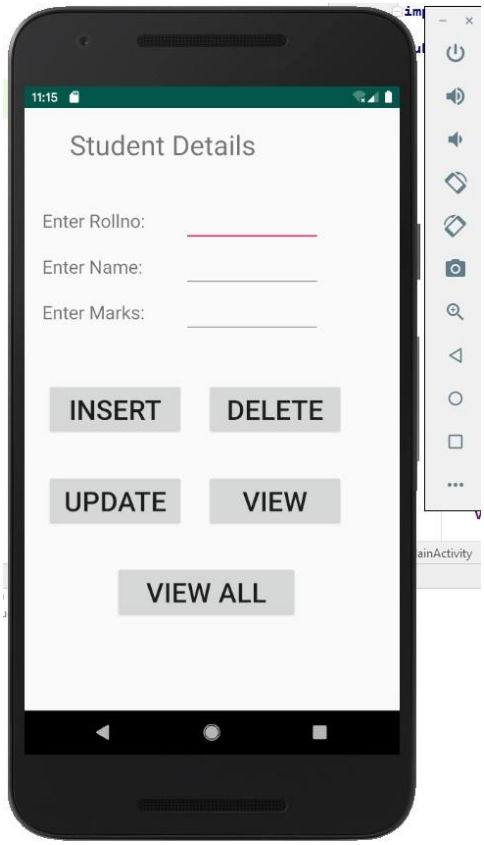
```
Marks=(EditText)findViewById(R.id.Marks);
Insert=(Button)findViewById(R.id.Insert);
Delete=(Button)findViewById(R.id.Delete);
Update=(Button)findViewById(R.id.Update);
View=(Button)findViewById(R.id.View);
ViewAll=(Button)findViewById(R.id.ViewAll);
Insert.setOnClickListener(this);
Delete.setOnClickListener(this);
Update.setOnClickListener(this);
View.setOnClickListener(this);
ViewAll.setOnClickListener(this);


db=openOrCreateDatabase("StudentDB", Context.MODE_PRIVATE, null);
db.execSQL("CREATE TABLE IF NOT EXISTS student(rollno VARCHAR,name
VARCHAR,marks VARCHAR);");
}
public void onClick(View view)
{

if(view==Insert)
{
 if(Rollno.getText().toString().trim().length()==0||
Name.getText().toString().trim().length()==0||
Marks.getText().toString().trim().length()==0)
{
showMessage("Error", "Please enter all values");return;
}
db.execSQL("INSERT INTO student VALUES('"+Rollno.getText()+"','"+Name.getText()+
"','"+Marks.getText()+"');");
showMessage("Success", "Record added");
clearText();
}

if(view==Delete)
{
if(Rollno.getText().toString().trim().length()==0)
{
showMessage("Error", "Please enter Rollno");return;

        }
        Cursor c=db.rawQuery("SELECT * FROM student WHERE rollno='"+Rollno.getText()+"'",
nul
l);
```

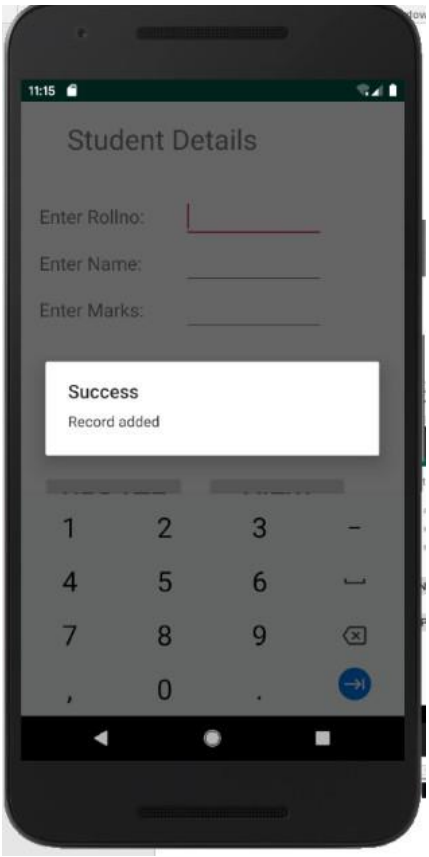
```
if(c.moveToFirst())
{

db.execSQL("DELETE FROM student WHERE rollno='"+Rollno.getText()+"'");
showMessage("Success", "Record Deleted");


}
else
{
showMessage("Error", "Invalid Rollno");
}
clearText();
}

if(view==Update)
{

if(Rollno.getText().toString().trim().length()==0)
{
showMessage("Error", "Please enter Rollno");return;
}
        Cursor c=db.rawQuery("SELECT * FROM student WHERE rollno='"+Rollno.getText()+"'",
nul
l);     if(c.moveToFirst()) {
        db.execSQL("UPDATE student SET name='" + Name.getText() + "',marks='" +
        Marks.getText() +
              "' WHERE rollno='"+Rollno.getText()+"'");
        showMessage("Success", "Record Modified");

        }
        else {
        showMessage("Error", "Invalid Rollno");
}
clearText();
}

if(view==View)
{

if(Rollno.getText().toString().trim().length()==0)
{
showMessage("Error", "Please enter Rollno");return;
}
```

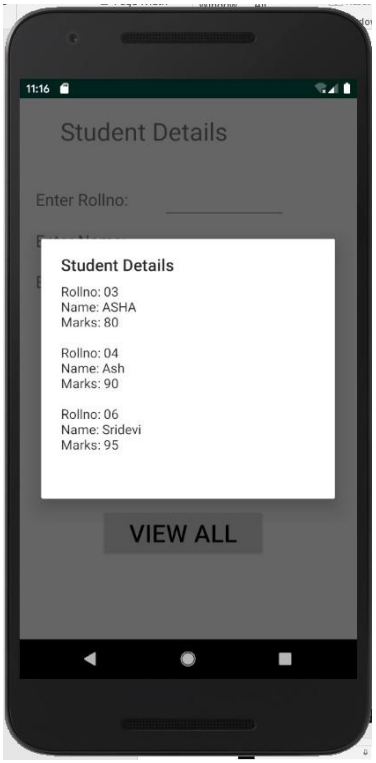
```
null);

c=db.rawQuery("SELECT * FROM student WHERE rollno='"+Rollno.getText()+"'",

if(c.moveToFirst())
{

Name.setText(c.getString(1));
Marks.setText(c.getString(2));
}
else
{
showMessage("Error", "Invalid Rollno");


clearText();
}
}

if(view==ViewAll)

{
Cursor c=db.rawQuery("SELECT * FROM student", null);
if(c.getCount()==0)
{
showMessage("Error", "No records found");return;
}
StringBuffer buffer=new StringBuffer();
while(c.moveToNext())
{
buffer.append("Rollno: "+c.getString(0)+"\n");
buffer.append("Name: "+c.getString(1)+"\n");
buffer.append("Marks: "+c.getString(2)+"\n\n");
}
showMessage("Student Details", buffer.toString());
}
}
public void showMessage(String title,String message)
{
Builder builder=new Builder(this);
builder.setCancelable(true);
builder.setTitle(title);
builder.setMessage(message);
builder.show();
}
public void clearText()
{
```

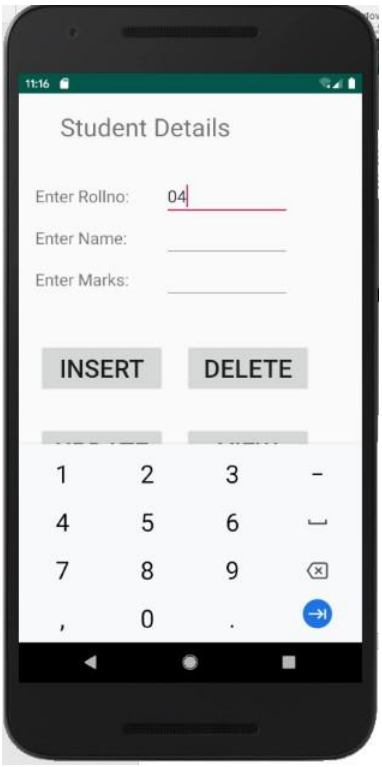
```
Rollno.setText("");
Name.setText("");
Marks.setText("");
Rollno.requestFocus();
}
}
```

Output:






11:16
Student Details
Enter Rollno:
Student Details
Rollno: 03
Name: ASHA
Marks: 80
Rollno: 04
Name: Ash
Marks: 90
Rollno: 06
Name: Sridevi
Marks: 95
VIEW ALL


11:16
Student Details
Enter Rollno: 04
Enter Name:
Enter Marks:
INSERT
DELETE


11:18
Enter Marks:
INSERT
DELETE
Student Details
Rollno: 03
Name: Asha H
Marks: 95
Rollno: 06
Name: Sridevi
Marks: 95

Program-6: Develop a mobile application that uses GPS location

informationXml:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context=".MainActivity">
<LinearLayout
android:layout_width="368dp"
android:layout_height="551dp"
android:layout_marginBottom="8dp"
android:layout_marginEnd="8dp"
android:layout_marginStart="8dp"
android:orientation="vertical"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent" app:layout_constraintStart_toStartOf="parent">
<TextView android:id="@+id/textView3"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:gravity="center"
android:text="Current Location"
android:textSize="30sp"
android:textStyle="bold" tools:text="Current
Location" />
<TextView android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text=" " />
<TextView android:id="@+id/textView1"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_marginLeft="10dp"
android:text="TextView" android:textSize="24sp"
/>
<TextView android:id="@+id/textView2"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_marginLeft="10dp"
android:text="TextView" android:textSize="24sp"
/>
```

```
    </LinearLayout>
    </androidx.constraintlayout.widget.ConstraintLayout>
```

Manifest:

```
    <?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.prog7">

    <uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"/>
<application android:allowBackup="true"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:roundIcon="@mipmap/ic_launcher_round"
    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>
     </manifes
        t>
```

Java:

```
    package com.example.prog7;
    import androidx.appcompat.app.AppCompatActivity;
    import android.annotation.SuppressLint;
    import android.os.Bundle;
    import
    android.content.Context;
    import
    android.location.Criteria;
    import
    android.location.Location;
    import
    android.location.LocationListener;
    import
    android.location.LocationManager;
    import android.os.Bundle;
    import android.widget.TextView;
    import android.widget.Toast;
```

```
public class MainActivity extends AppCompatActivity implements LocationListener {
    @SuppressLint("MissingPermission")
    @Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    LocationManager lm=(LocationManager)getSystemService(Context.LOCATION_SERVICE);
    Criteria c=new Criteria();
    String s=lm.getBestProvider(c, false);
    if(s!=null && !s.equals(""))
    {
    @SuppressLint("MissingPermission") Location l=lm.getLastKnownLocation(s);
    lm.requestLocationUpdates(s,20000, 1, this);
if(l!=null) onLocationChanged(l);
    else
                Toast.makeText(getApplicationContext(), "Location can't be retrieved
    !!!",Toast.LENGTH_LONG).show();
    }
    else
    Toast.makeText(getApplicationContext(), "Provider not found
    !!!",Toast.LENGTH_LONG).show();
    }
    @Override
    public void onLocationChanged(Location arg0) {
    // TODO Auto-generated method stub
    TextView t1=(TextView)findViewById(R.id.textView1);
    t1.setText("Latitude : \n"+arg0.getLatitude()); TextView
    t2=(TextView)findViewById(R.id.textView2);
    t2.setText("Longitude : \n"+arg0.getLongitude());
    }
    public void onProviderDisabled(String arg0) {
    // TODO Auto-generated method stub
    }@
    Override
    public void onProviderEnabled(String arg0) {
    // TODO Auto-generated method stub
    }@
    Override
    public void onStatusChanged(String arg0, int arg1, Bundle arg2) {
    // TODO Auto-generated method stub
    }
    }
```

Output:

GO to Settings in the

EmulatorSelect Apps &

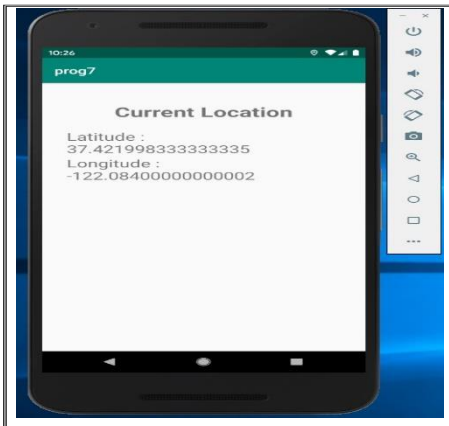
Notifications Select Program

Name

Select Permission

Select Location

(on)



Program-7: Create an application that read/writes data to the internal storage of mobile.

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"
   >

   <TextView
      android:id="@+id/textView1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_alignParentLeft="true"
      android:layout_alignParentRight="true"
      android:padding="5dp"
      android:text="Android Read and Write Text from/to a File"
      android:textStyle="bold"
      android:textSize="28sp" />

   <EditText
      android:id="@+id/editText1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:hint="Enter Text"
      android:layout_alignParentLeft="true"
      android:layout_alignParentRight="true"
      android:layout_below="@+id/textView1"
      android:layout_marginTop="22dp"
      android:minLines="5"
      android:layout_margin="5dp">
      <requestFocus />
   </EditText>

   <Button
      android:id="@+id/button1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Write Text into File"
      android:onClick="WriteBtn"
      android:layout_alignTop="@+id/button2"
      android:layout_alignRight="@+id/editText1"
      android:layout_alignEnd="@+id/editText1" />
```

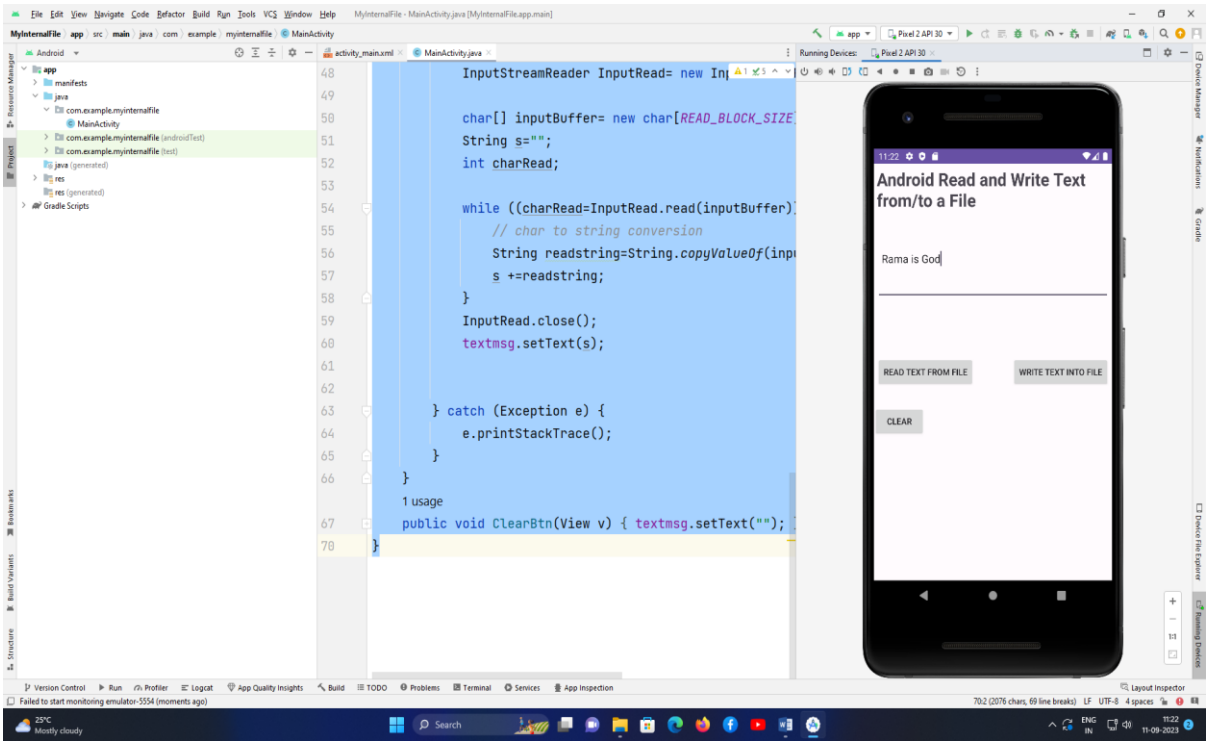
```
    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Read Text From file"
        android:onClick="ReadBtn"
        android:layout_centerVertical="true"
        android:layout_alignLeft="@+id/editText1"
        android:layout_alignStart="@+id/editText1" />

    <Button
        android:id="@+id/button3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/button1"
        android:layout_marginTop="30dp"
        android:onClick="ClearBtn"
        android:text="Clear" />
</RelativeLayout>
```

Java:

```
package com.example.myinternalfile;

import android.os.Bundle;
import android.app.Activity;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.InputStreamReader;
import java.io.OutputStreamWriter;

public class MainActivity extends Activity {

    EditText textmsg;
    static final int READ_BLOCK_SIZE = 100;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        textmsg=(EditText)findViewById(R.id.editText1);
    }

    // write text to file
    public void WriteBtn(View v) {
```

```
        // add-write text into file
        try {
            FileOutputStream fileout=openFileOutput("mytextfile.txt", MODE_APPEND);
            OutputStreamWriter outputWriter=new OutputStreamWriter(fileout);
            outputWriter.write(textmsg.getText().toString());
            outputWriter.close();

            //display file saved message
            Toast.makeText(getBaseContext(), "File saved successfully!",
                    Toast.LENGTH_SHORT).show();

        } catch (Exception e) {
            e.printStackTrace();
        }
    }

    // Read text from file
    public void ReadBtn(View v) {
        //reading text from file
        try {
            FileInputStream fileIn=openFileInput("mytextfile.txt");
            InputStreamReader InputRead= new InputStreamReader(fileIn);

            char[] inputBuffer= new char[READ_BLOCK_SIZE];
            String s="";
            int charRead;

            while ((charRead=InputRead.read(inputBuffer))>0) {
                // char to string conversion
                String readstring=String.copyValueOf(inputBuffer,0,charRead);
                s +=readstring;
            }
            InputRead.close();
            textmsg.setText(s);


        } catch (Exception e) {
            e.printStackTrace();
        }
    }
    public void ClearBtn(View v) {
        textmsg.setText("");
    }
}
```

OUTPUT:


Android Read and Write Text from/to a File
Rama is God
READ TEXT FROM FILE
WRITE TEXT INTO FILE
CLEAR

Program-8: Build a mobile application to send SMS based on given mobile number with PendingIndents

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity" >

    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="50dp"
        android:gravity="center"
        android:text="SMS Delivery APP"
        android:textColor="#B15031"
        android:textSize="35sp"
        android:textStyle="bold" />

    <EditText
        android:id="@+id/editText1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="50dp"
        android:ems="10"
        android:hint="Enter Mobile Number"
        android:inputType="phone"
        android:textColor="#33B339"
        android:textSize="25sp"
        android:textStyle="bold" />

    <EditText
        android:id="@+id/editText2"
        android:layout_width="match_parent"
        android:layout_height="150dp"
        android:layout_marginTop="25dp"
        android:ems="10"
        android:hint="Enter Message"
        android:inputType="text|textMultiLine"
        android:textColor="#2A6DA3"
        android:textSize="25sp"
        android:textStyle="bold" />
```

```
    <Button
        android:id="@+id/Btn"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="60dp"
        android:text="SEND"
        android:textSize="25sp"
        android:textStyle="bold" />
</LinearLayout>
```

Java:

```
package com.example.mysmsdeliveryapp;

import android.Manifest;
import android.app.Activity;
import android.app.PendingIntent;
import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends Activity {
    private static final int MY_PERMISSIONS_REQUEST_SEND_SMS = 123; // You can choose any unique
request code

    private EditText recipientEditText;
    private EditText messageEditText;
    private Button sendButton;

    private PendingIntent sentPendingIntent;
    private PendingIntent deliveredPendingIntent;

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

        recipientEditText = findViewById(R.id.editText1);
        messageEditText = findViewById(R.id.editText2);
        sendButton = findViewById(R.id.Btn);
```

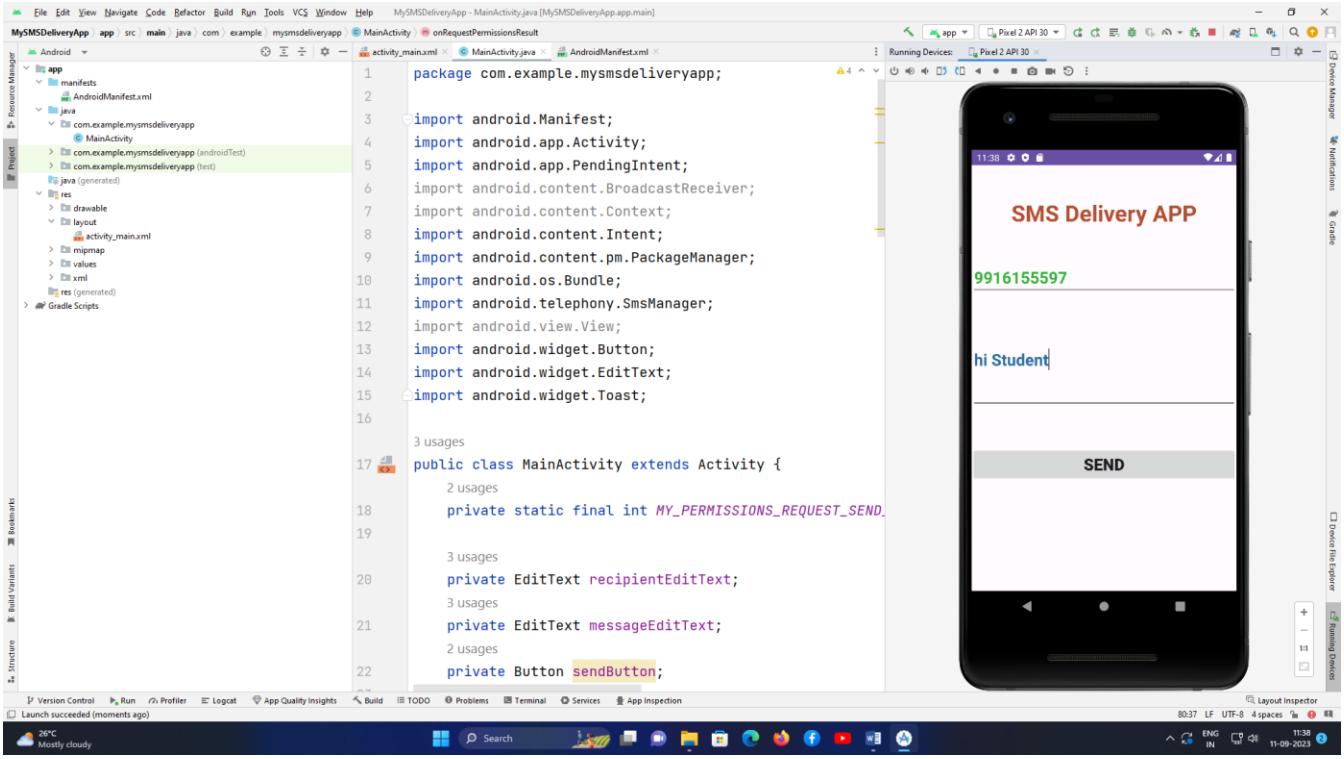
```
        sentPendingIntent = PendingIntent.getBroadcast(this, 0,
                new Intent("SMS_SENT"), PendingIntent.FLAG_IMMUTABLE);
        deliveredPendingIntent = PendingIntent.getBroadcast(this, 1,
                new Intent("SMS_DELIVERED"), PendingIntent.FLAG_IMMUTABLE);

        sendButton.setOnClickListener(view -> {
            String recipient = recipientEditText.getText().toString();
            String message = messageEditText.getText().toString();

            if (recipient.isEmpty() || message.isEmpty()) {
                Toast.makeText(MainActivity.this, "Recipient and message cannot be empty",
                        Toast.LENGTH_SHORT).show();
                return;
            }

            // Check for permission before sending SMS
            if (checkSelfPermission(Manifest.permission.SEND_SMS) !=
PackageManager.PERMISSION_GRANTED) {
                // Permission is not granted, request it
                requestPermissions(new String[]{Manifest.permission.SEND_SMS},
                        MY_PERMISSIONS_REQUEST_SEND_SMS);
            } else {
                // Permission is already granted, send the SMS
                sendSMS(recipient, message);
            }
        });
    }

    private void sendSMS(String recipient, String message) {
        try {
            SmsManager smsManager = SmsManager.getDefault();
            smsManager.sendTextMessage(recipient, null, message, sentPendingIntent,
                    deliveredPendingIntent);
            Toast.makeText(this,"Message Sent Successfully", Toast.LENGTH_SHORT).show();
        } catch (Exception e) {
            Toast.makeText(this, "Failed to send SMS", Toast.LENGTH_SHORT).show();
            e.printStackTrace();
        }
    }

    @Override
    public void onRequestPermissionsResult(int requestCode, String[] permissions, int[] grantResults) {
        super.onRequestPermissionsResult(requestCode, permissions, grantResults);

        if (requestCode == MY_PERMISSIONS_REQUEST_SEND_SMS) {
            if (grantResults.length > 0 && grantResults[0] == PackageManager.PERMISSION_GRANTED) {
                // Permission granted, send the SMS
```

```
            String recipient = recipientEditText.getText().toString();
            String message = messageEditText.getText().toString();
            sendSMS(recipient, message);
        } else {
            // Permission denied, show a message to the user
            Toast.makeText(this, "SMS permission denied. Cannot send SMS.",
                    Toast.LENGTH_SHORT).show();
        }
    }
  }
}
```

Manifest.xml

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

    <uses-feature
        android:name="android.hardware.telephony"
        android:required="false" />

    <uses-permission android:name="android.permission.SEND_SMS"/>

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.MySMSDeliveryApp"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Output:



Program-9: Create simple mobile application using Flutter (Open Ended Program)

Instructions: Student can create any simple mobile application on any scenario using Flutter IDE