

1. Design an application that contains Phone Contacts in vertical linear manner. Selected contact appears at the top of the list with a large italicized font and a blue background.

Solution:

1. Activity.xml file

```
<?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">

    <TextView
        android:id="@+id/pc"
        android:layout_width="142dp"
        android:layout_height="49dp"
        android:capitalize="words"
        android:text="@string/phone"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.099"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.103" />

    <ListView
        android:id="@+id/listview"
        android:layout_width="321dp"
        android:layout_height="510dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.633"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.814" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

2. String.xml file in values

```
<resources>
    <string name="app_name">Inchara_Lab1</string>
    <string name="phone">Selected Phone Contacts will Display
Here</string>
```

```

<string-array name="li_contact">
  <item>inchara 8948228669</item>
  <item>bhuvana 9834567876 </item>
  <item>usha 9886978885</item>
  <item>Priyanka 9886965786</item>
  <item>Anusha 8234567899</item>
</string-array>
</resources>

```

3. Main java file

4. **package** com.example.Inchara_Lab1;

```

import androidx.appcompat.app.AppCompatActivity;

```

```

import android.graphics.Typeface;
import android.os.Bundle;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.AdapterView;
import android.widget.ListView;
import android.widget.TextView;

```

```

public class MainActivity extends AppCompatActivity {
    ListView lv;
    TextView tv;
    String [] li;

```

```

    @Override

```

```

    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        // my coding
        li=getResources().getStringArray(R.array.li_contact);
        lv=(ListView) findViewById(R.id.listview);
        tv=(TextView) findViewById(R.id.pc);

```

```

        final ArrayAdapter<String> adapter=new
        ArrayAdapter<String>(this,android.R.layout.simple_list_item_1,android.R.id
        .text1,li);
        lv.setAdapter(adapter);

        lv.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> adapterView, View view,
            int i, long l) {

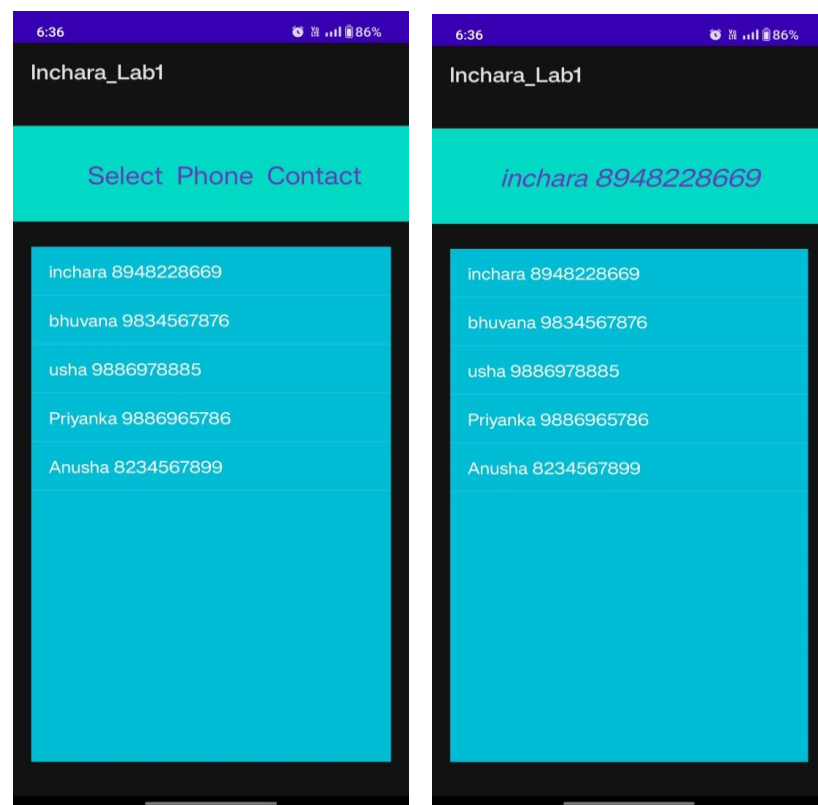
```

```

String value=adapter.getItem(i);
tv.setText(value);
tv.setTypeface(null, Typeface.ITALIC);
    }
});
    }
}

```

Output: -



2. Create an application that uses Layout Managers and Event Listeners.

Activity.xml file

```
<?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:id="@+id/Form_one"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:background="#41939E"
tools:context=".MainActivity">

<TextView
    android:id="@+id/txt_view"
    android:layout_width="254dp"
    android:layout_height="44dp"
    android:text="@string/EV"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintHorizontal_bias="0.191"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.088" />

<TextView
    android:id="@+id/txt_disp"
    android:layout_width="360dp"
    android:layout_height="52dp"
    android:layout_marginTop="52dp"
    android:text="@string/Display_Name"
    android:textSize="30sp"
    app:layout_constraintBottom_toTopOf="@+id/Butt_Convert"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.313"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/txt_view"
    app:layout_constraintVertical_bias="0.011" />

<Button
    android:id="@+id/Butt_Convert"
    android:layout_width="200dp"
    android:layout_height="49dp"
    android:layout_marginBottom="384dp"
    android:text="@string/butt_valu1"
```

```
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.142"
app:layout_constraintStart_toStartOf="parent" />
```

```
<TextView
    android:id="@+id/txt_Dept"
    android:layout_width="346dp"
    android:layout_height="51dp"
    android:layout_marginTop="56dp"
    android:text="@string/Dept"
    android:textSize="30sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.246"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/Butt_Convert" />
```

```
<Spinner
    android:id="@+id/Disp_Spinner"
    android:layout_width="322dp"
    android:layout_height="43dp"
    android:layout_marginStart="8dp"
    android:layout_marginLeft="8dp"
    android:layout_marginTop="64dp"
    android:layout_marginEnd="8dp"
    android:layout_marginRight="8dp"
    android:prompt="@string/Spinner_value"
    android:spinnerMode="dropdown"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.109"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/txt_Dept"
    app:layout_constraintVertical_bias="0.0" />
```

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

String.xml file

```
<resources>
    <string name="app_name">Inchara_Lab2</string>
    <string name="EV">Event Listereners</string>
    <string name="Display_Name">SIT, MCA</string>
    <string name="butt_valu1">Convert to Italic</string>
    <string name="Dept">Department</string>
    <string name="Spinner_value">Select the Department</string>
    <string-array name="depts">
        <item>Select the Your Department</item>
        <item>MCA</item>
        <item>MBA</item>
        <item>BE</item>
    </string-array>
</resources>
```

mainActivity.class file

```
package com.example.Inchara_Lab2;

import androidx.appcompat.app.AppCompatActivity;

import android.graphics.Typeface;
import android.opengl.EGLExt;
import android.os.Bundle;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.AdapterView;
import android.widget.AdapterView.OnItemClickListener;
import android.widget.Button;
import android.widget.Spinner;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    Button btn_convet;
    TextView txtview;
    String[] dept;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btn_convet=(Button)findViewById(R.id.Butt_Convert);
        dept=getResources().getStringArray(R.array.depts);
```

```

Spinner s1=(Spinner)findViewById(R.id.Disp_Spinner);

ArrayAdapter<String> adapter=new
ArrayAdapter<String>(this,android.R.layout.simple_dropdown_item_1line,dept);
s1.setAdapter(adapter);
s1.setOnItemSelectedListener(new OnItemSelectedListener() {
    @Override
    public void onItemSelected(AdapterView<?> adapterView, View view, int i,
long l) {
        int index=adapterView.getSelectedItemPosition();
        if(index>0){
            Toast.makeText(getBaseContext(),"You Have Selected " + dept[index],
Toast.LENGTH_SHORT).show();
        }

    }

    @Override
    public void onNothingSelected(AdapterView<?> adapterView) {

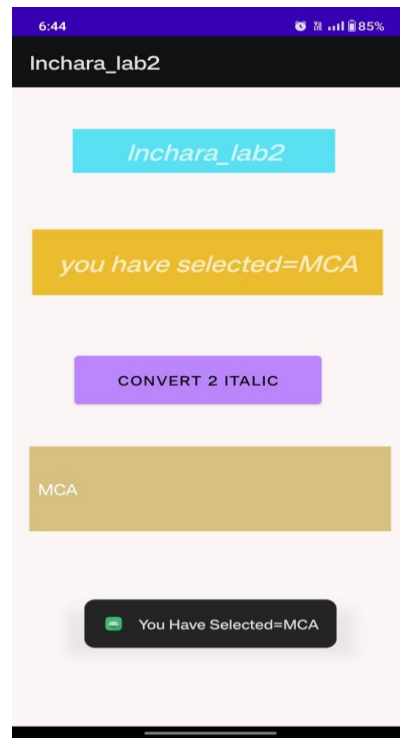
    }
});

btn_convet.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        txtview=(TextView)findViewById(R.id.txt_disp);
        txtview.setTypeface(null, Typeface.ITALIC);

    }
});
}
}

```

OUTPUT:



3. Develop a standard calculator application to perform basic calculations like addition, subtraction, multiplication and division.

Solution:

Activity Xml File

```
<?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"
android:background="#00BFA5"
tools:context=".MainActivity">

<TextView
    android:id="@+id/txt_Num-"
    android:layout_width="149dp"
    android:layout_height="35dp"
    android:layout_marginStart="24dp"
    android:layout_marginLeft="24dp"
    android:layout_marginTop="188dp"
    android:text="@string/second_num"
    app:layout_constraintEnd_toStartOf="@+id/Edit_num-2"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<TextView
    android:id="@+id/Txt_Num-1"
    android:layout_width="162dp"
    android:layout_height="41dp"
    android:layout_marginStart="24dp"
    android:layout_marginLeft="24dp"
    android:layout_marginTop="84dp"
    android:text="@string/fn"
    android:textSize="18sp"
    app:layout_constraintEnd_toStartOf="@+id/Edit_First_num"
    app:layout_constraintHorizontal_bias="0.0"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
```

```
<EditText
    android:id="@+id/Edit_First_num"
    android:layout_width="182dp"
    android:layout_height="40dp"
    android:layout_marginEnd="8dp"
    android:layout_marginRight="8dp"
    android:ems="10"
    android:inputType="numberDecimal"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.93"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.121" />
```

```
<EditText
    android:id="@+id/Edit_num-2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginEnd="12dp"
    android:layout_marginRight="12dp"
    android:ems="10"
    android:inputType="numberDecimal"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.274" />
```

```
<TextView
    android:id="@+id/txt_Result"
    android:layout_width="248dp"
    android:layout_height="47dp"
    android:hint="Result Displayed Here"
    android:text="@string/Result"
    android:textSize="18sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.2"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.433" />
```

```
<Button
    android:id="@+id/Btt_Add"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
```

```
android:layout_marginStart="32dp"
android:layout_marginLeft="32dp"
android:layout_marginTop="412dp"
android:onClick="add"
android:text="Add"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />
```

<Button

```
android:id="@+id/Btt_Sub"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="412dp"
android:layout_marginEnd="28dp"
android:layout_marginRight="28dp"
android:onClick="sub"
android:text="Subtraction"
app:layout_constraintEnd_toStartOf="@+id/Btt_Mul"
app:layout_constraintTop_toTopOf="parent" />
```

<Button

```
android:id="@+id/Btt_Mul"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="412dp"
android:layout_marginEnd="28dp"
android:layout_marginRight="28dp"
android:onClick="mul"
android:text="Mul"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintTop_toTopOf="parent" />
```

<Button

```
android:id="@+id/Btt_Div"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="24dp"
android:layout_marginLeft="24dp"
android:onClick="div"
android:text="Division"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toStartOf="@+id/Btt_Clr"
app:layout_constraintHorizontal_bias="0.38"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.812" />
```

```

<Button
    android:id="@+id/Btt_Clr"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginEnd="136dp"
    android:layout_marginRight="136dp"
    android:onClick="clear_data"
    android:text="Clear"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.812" />
</androidx.constraintlayout.widget.ConstraintLayout>

```

String File

```

<resources>
    <string name="app_name">Simple Calculator</string>
    <string name="fn">Enter First Number</string>
    <string name="second_num">Enter Second Number</string>
    <string name="Result">Result Will be Displayed Here</string>
</resources>

```

Java File

```

package com.example.inchara_lab3;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.widget.EditText;
import android.widget.TextView;
import android.view.View;
import android.widget.Toast;

import org.w3c.dom.Text;

import java.io.IOException;
import java.text.DecimalFormat;

public class MainActivity extends AppCompatActivity {

    @Override

```

```

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

public void add(View v){

    Float num1,num2,sum;

    EditText t1=(EditText)findViewById(R.id.Edit_First_num);
    EditText t2=(EditText)findViewById(R.id.Edit_num_2);
    TextView t3=(TextView)findViewById(R.id.txt_Result);
    t3.setText("Result");
    if(t1.length()==0 || t2.length()==0)
        Toast.makeText(this, "Enter the values for number1 or Number 2",
Toast.LENGTH_SHORT).show();
    else {
        try {

            num1 = Float.parseFloat(t1.getText().toString());
            num2 = Float.parseFloat(t2.getText().toString());

            sum = num1 + num2;
            t3.setText("Result :" + Float.toString(sum));
        }
        catch (NumberFormatException e){
            Toast toast=Toast.makeText(getApplicationContext(),"Enter Number
only",Toast.LENGTH_LONG);
            toast.show();
        }
    }
}

public void sub(View v){
    Float num1,num2,sum;
    EditText t1=(EditText)findViewById(R.id.Edit_First_num);
    EditText t2=(EditText)findViewById(R.id.Edit_num_2);
    TextView t3=(TextView)findViewById(R.id.txt_Result);
    t3.setText("Result");
    if(t1.length()==0 || t2.length()==0)
        Toast.makeText(this, "Enter the values for number1 or Number 2",
Toast.LENGTH_SHORT).show();
    else {
        try {

```

```

        num1 = Float.parseFloat(t1.getText().toString());
        num2 = Float.parseFloat(t2.getText().toString());

        sum = num1 - num2;
        t3.setText("Result :" + Float.toString(sum));
    }
    catch (NumberFormatException e){
        Toast toast=Toast.makeText(getApplicationContext(),"Enter Nmb
only",Toast.LENGTH_LONG);
        toast.show();
    }

}
}
public void mul(View v){
    Float num1,num2,sum;
    EditText t1=(EditText)findViewById(R.id.Edit_First_num);
    EditText t2=(EditText)findViewById(R.id.Edit_num_2);
    TextView t3=(TextView)findViewById(R.id.txt_Result);
    t3.setText("Result");
    if(t1.length()==0 || t2.length()==0)
        Toast.makeText(this, "Enter the values for number1 or Number 2",
Toast.LENGTH_SHORT).show();
    else {

        try {

            num1 = Float.parseFloat(t1.getText().toString());
            num2 = Float.parseFloat(t2.getText().toString());

            sum = num1 * num2;
            t3.setText("Result :" + Float.toString(sum));
        }
        catch (NumberFormatException e){
            Toast toast=Toast.makeText(getApplicationContext(),"Enter Nmb
only",Toast.LENGTH_LONG);
            toast.show();
        }

    }
}
public void div(View v){

```

```

Float num1,num2,sum;
EditText t1=(EditText)findViewById(R.id.Edit_First_num);
EditText t2=(EditText)findViewById(R.id.Edit_num_2);
TextView t3=(TextView)findViewById(R.id.txt_Result);
t3.setText("Result");

if(t1.length()==0 || t2.length()==0)
    Toast.makeText(this, "Enter the values for number1 or Number 2",
Toast.LENGTH_SHORT).show();
else {

    try {

        num1 = Float.parseFloat(t1.getText().toString());
        num2 = Float.parseFloat(t2.getText().toString());

        if(num2!=0) {
            sum = num1 / num2;
            t3.setText("Result :" + Float.toString(sum));
        }
        else
            Toast.makeText(this, "Enter the Second Number Other Than Zero",
Toast.LENGTH_SHORT).show();

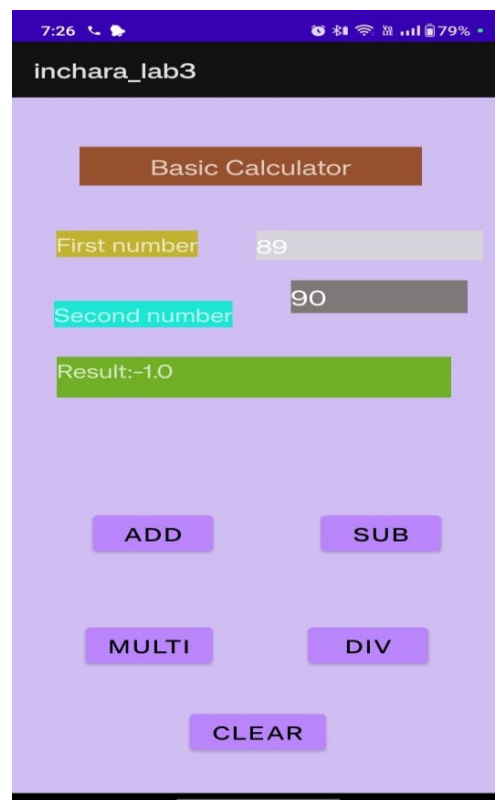
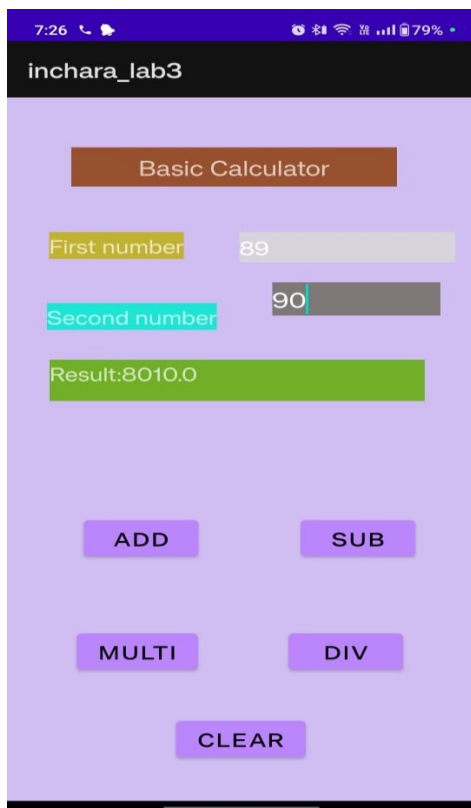
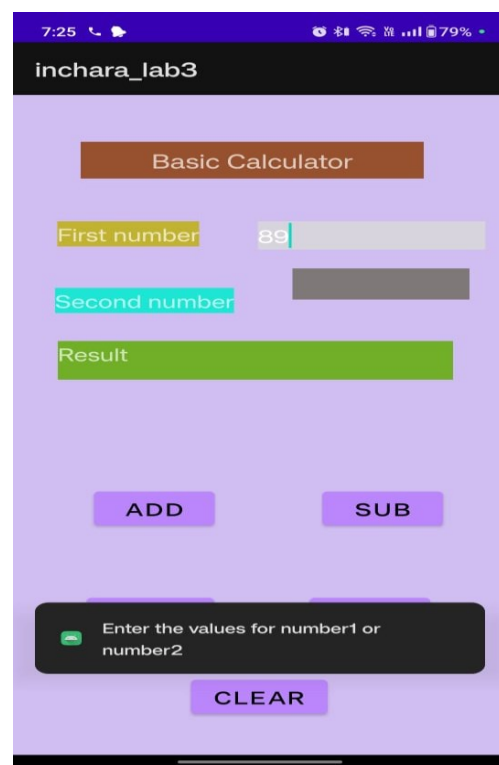
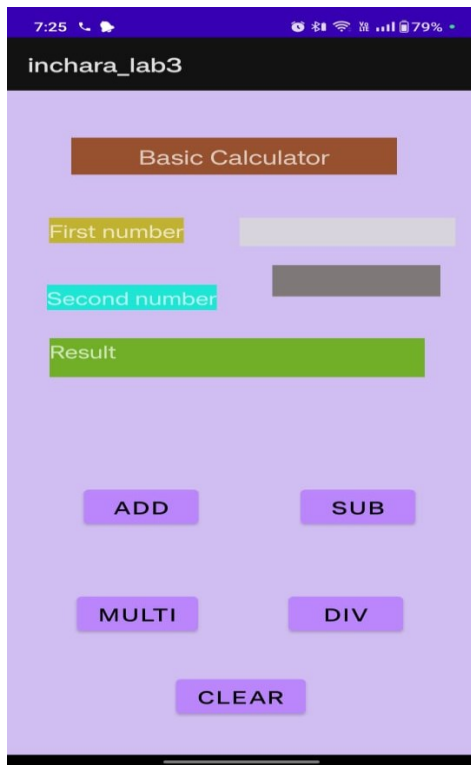
    }
    catch (NumberFormatException e){
        Toast toast=Toast.makeText(getApplicationContext(),"Enter Nmbre
only",Toast.LENGTH_LONG);
        toast.show();
    }
}

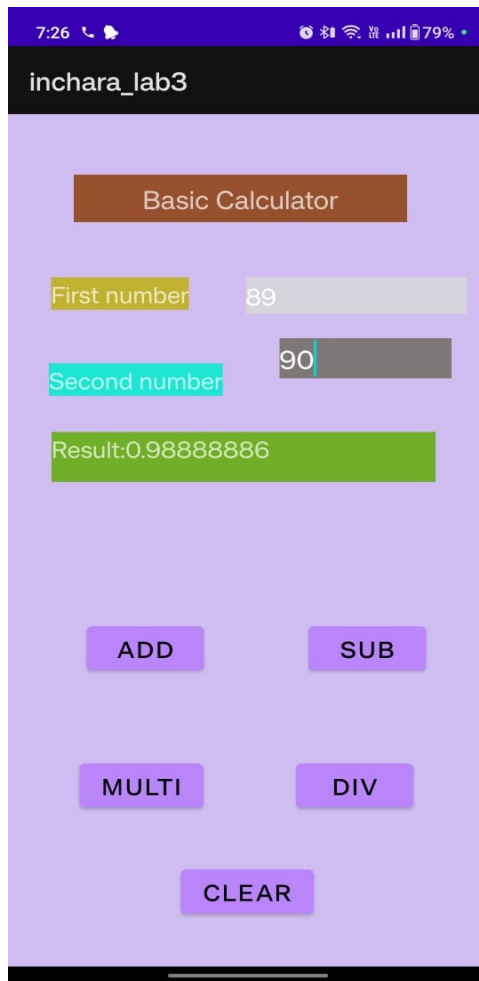
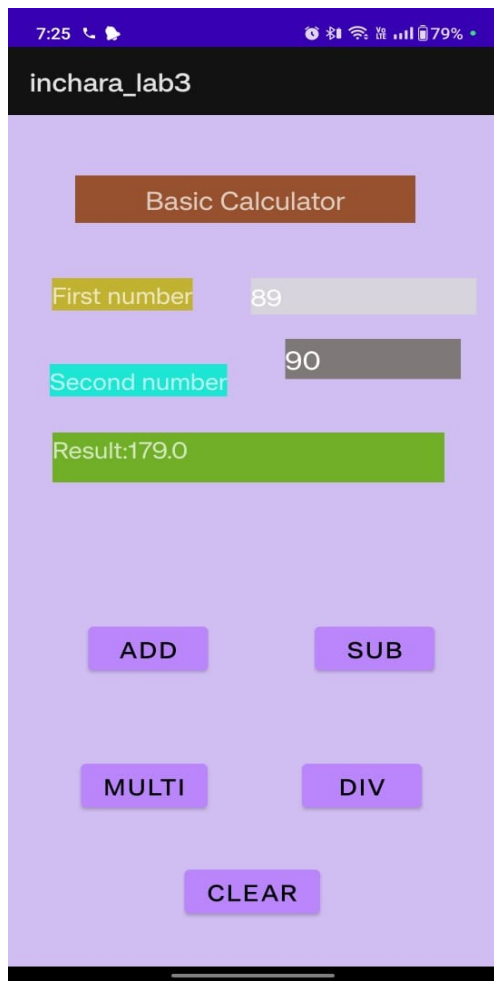
public void clear_data(View v){
    Float num1,num2,sum;
    EditText t1=(EditText)findViewById(R.id.Edit_First_num);
    EditText t2=(EditText)findViewById(R.id.Edit_num_2);
    TextView t3=(TextView)findViewById(R.id.txt_Result);
    t1.setText("");
    t1.setSelection(0);
    t2.setText("");
    t3.setText("Result");

}
}

```

OUTPUT:





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

Solution:

Activity Xml File

```
<?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:id="@+id/cc"

    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#7A7878"
    tools:context=".MainActivity">

    <ImageView
        android:id="@+id/ivg"
        android:layout_width="324dp"
        android:layout_height="160dp"
        android:contentDescription="@string/todo"
        android:saveEnabled="true"
        app:layout_constraintBottom_toTopOf="@+id/btt_rec"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.37"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.517"

        tools:srcCompat="@tools:sample/avatars" />

    <Button
        android:id="@+id/btt_rec"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/rec"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.051"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.579" />

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

```
android:layout_width="116dp"
android:layout_height="56dp"
android:text="@string/cir"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.464"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.585" />
```

<Button

```
android:id="@+id/btt_line"
android:layout_width="116dp"
android:layout_height="62dp"
android:text="@string/SL"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.945"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.591" />
```

<Button

```
android:id="@+id/butt_reset"
android:layout_width="139dp"
android:layout_height="59dp"
android:onClick="pgk"
android:text="@string/CLN"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.748" />
```

<Button

```
android:id="@+id/butt_square"
android:layout_width="109dp"
android:layout_height="62dp"
android:text="@string/Button_square"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.033"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.751" />
```

<Button

```

    android:id="@+id/Button_Exit"
    android:layout_width="115dp"
    android:layout_height="66dp"
    android:text="@string/exit"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.979"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.766" />

```

<TextView

```

    android:id="@+id/txtview"
    android:layout_width="331dp"
    android:layout_height="51dp"
    android:foregroundGravity="center"
    android:gravity="center"
    android:text="@string/namedisp"
    android:textColor="@android:color/holo_orange_dark"
    android:textSize="30sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.355"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.036" />

```

</androidx.constraintlayout.widget.ConstraintLayout>

String File

<resources>

```

    <string name="app_name">Drawing Shapes</string>
    <string name="CLN">Clear The Image</string>
    <string name="SL">Straight Line</string>
    <string name="rec">Rectangle</string>
    <string name="cir">Circle</string>
    <string name="todo">TODO</string>
    <string name="Button_square">Square</string>
    <string name="exit">exit</string>
    <string name="namedisp">Drawing the Shapes</string>

```

</resources>

Java File

```
package com.example.Inchara_lab4;
```

```
import android.widget.ImageView;  
import android.graphics.Bitmap;  
import android.graphics.Canvas;  
import android.graphics.Color;  
import android.graphics.Paint;  
import android.graphics.Rect;  
import android.view.View;  
import android.widget.Button;  
import android.app.Activity;  
import android.widget.Toast;
```

```
import android.graphics.drawable.BitmapDrawable;  
import android.os.Bundle;
```

```
public class MainActivity extends Activity {  
    ImageView iv;  
  
    Button button, button1, button2, button4, button5, button6;  
  
    Bitmap bitmap;  
    Canvas canvas;  
    Paint paint;  
  
    int sp = 55;  
    Rect rect;  
    int CanvasRadius;  
    int CanvasPadding = 7;  
    int height, width;  
  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
  
        iv = (ImageView) findViewById(R.id.ivg);  
        button = (Button) findViewById(R.id.btt_rec);  
        button1 = (Button) findViewById(R.id.Btt_Circle);  
        button2 = (Button) findViewById(R.id.btt_line);  
        button4 = (Button) findViewById(R.id.butt_square);  
        button5 = (Button) findViewById(R.id.Button_Eixt);  
        button6 = (Button) findViewById(R.id.butt_reset);  
    }  
}
```

```

}

public void Draw_pgk (View view){

    bitmap = Bitmap.createBitmap(400, 250, Bitmap.Config.RGB_565);
    canvas = new Canvas(bitmap);
    canvas.drawColor(Color.CYAN);
    paint = new Paint();
    paint.setStyle(Paint.Style.FILL_AND_STROKE);
    paint.setColor(Color.BLUE);
    paint.setAntiAlias(true);// smoothen the edges

    if (view == button) {

        rect = new Rect(55, 55, 350, 200);

        canvas.drawRect(rect, paint);

        iv.setImageBitmap(bitmap);
        Toast toast = Toast.makeText(getApplicationContext(), "Recangle Image
Drawn", Toast.LENGTH_LONG);
        toast.show();
    }

    if (view == button1) {

        CanvasRadius = Math.min(canvas.getWidth(), canvas.getHeight() / 2);
        canvas.drawCircle(canvas.getWidth() / 2,
            canvas.getHeight() / 2,
            CanvasRadius - CanvasPadding,
            paint
        );

        iv.setImageBitmap(bitmap);
        Toast toast = Toast.makeText(getApplicationContext(), "Circle Image
Drawn", Toast.LENGTH_LONG);
        toast.show();
    }

    if (view == button2) {

        canvas.drawLine(200, 55, 200, 300, paint);
    }
}

```

```

        iv.setImageBitmap(bitmap);
        Toast toast = Toast.makeText(getApplicationContext(), "Straight Line
Drawn", Toast.LENGTH_LONG);
        toast.show();

    }

    if (view == button4) {

        rect = new Rect(55, 55, 200, 200);
        canvas.drawRect(rect, paint);
        iv.setImageBitmap(bitmap);
        Toast toast = Toast.makeText(getApplicationContext(), "Square Drawn",
Toast.LENGTH_LONG);
        toast.show();

    }

    if (view == button5) {
        finish();
    }

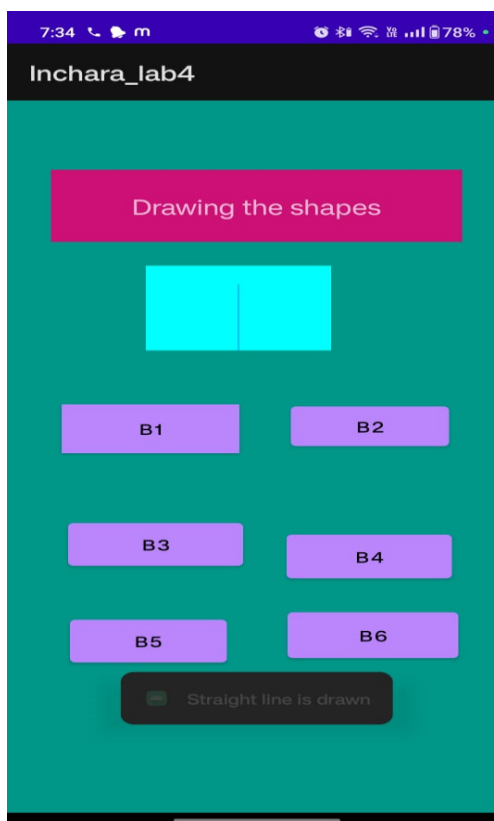
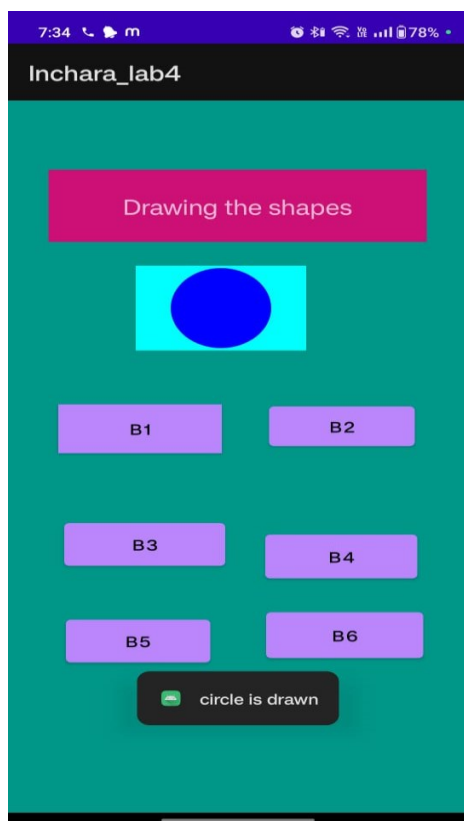
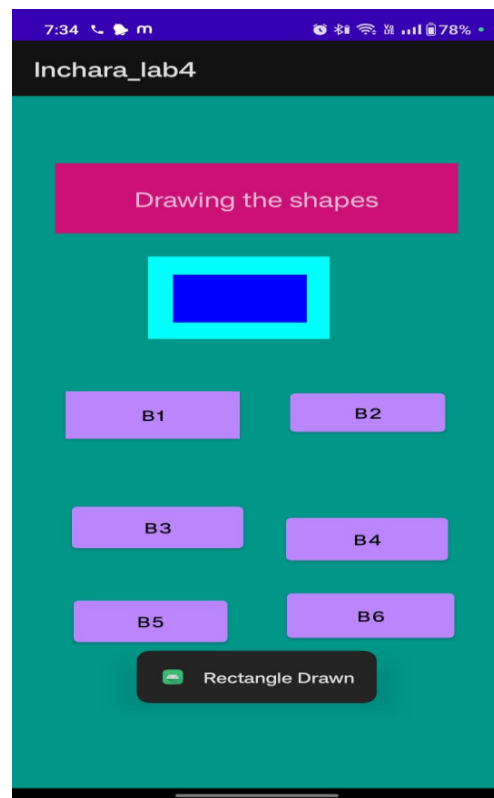
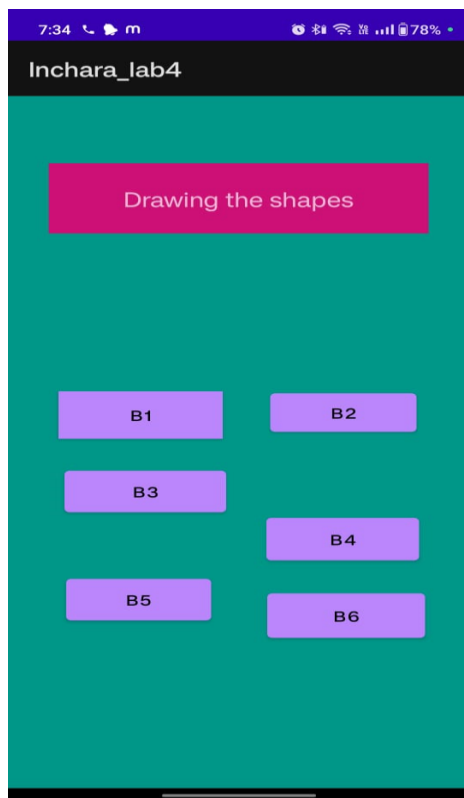
    if(view==button6){
        iv.setImageDrawable(null);

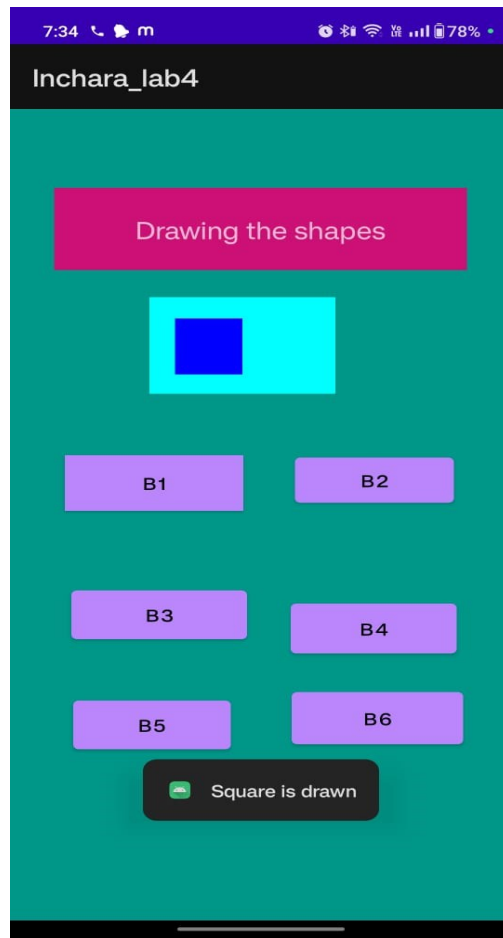
    }

}
}

```

OUTPUT:





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

Activity File

```
<?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:id="@+id/database"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:background="#00BFA5"
tools:context=".MainActivity">

<TextView
    android:id="@+id/txt_name"
    android:layout_width="126dp"
    android:layout_height="34dp"
    android:layout_marginLeft="28dp"
    android:layout_marginTop="8dp"
    android:layout_marginEnd="248dp"
    android:layout_marginRight="248dp"
    android:text="@string/Name"
    android:textSize="18sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.085" />

<EditText
    android:id="@+id/ed_name"
    android:layout_width="184dp"
    android:layout_height="43dp"
    android:autofillHints="@string/eyn"
    android:ems="10"
    android:hint="@string/eyn"
    android:inputType="textPersonName"
    android:textSize="18sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.812"
    app:layout_constraintStart_toStartOf="parent"
```

```
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.098" />
```

<TextView

```
android:id="@+id/txt_surname"
android:layout_width="85dp"
android:layout_height="41dp"
android:text="@string/surname"
android:textSize="18sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.11"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.168" />
```

<EditText

```
android:id="@+id/ed_surname"
android:layout_width="196dp"
android:layout_height="40dp"
android:autofillHints="@string/Surname"
android:ems="10"
android:hint="@string/Surname"
android:inputType="textPersonName"
android:textSize="18sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.851"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.183" />
```

<EditText

```
android:id="@+id/ed_id"
android:layout_width="209dp"
android:layout_height="42dp"
android:autofillHints="@string/Id"
android:ems="10"
android:hint="@string/Id"
android:inputType="textPersonName"
android:textSize="18sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.905"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
```

```
app:layout_constraintVertical_bias="0.267" />
```

```
<TextView
```

```
    android:id="@+id/txt_id"  
    android:layout_width="83dp"  
    android:layout_height="36dp"  
    android:text="@string/Did"  
    android:textSize="18sp"  
    app:layout_constraintBottom_toBottomOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.115"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toTopOf="parent"  
    app:layout_constraintVertical_bias="0.264" />
```

```
<Button
```

```
    android:id="@+id/btt_add"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="@string/AddData"  
    app:layout_constraintBottom_toBottomOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.112"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toTopOf="parent"  
    app:layout_constraintVertical_bias="0.411" />
```

```
<Button
```

```
    android:id="@+id/btt_view"  
    android:layout_width="86dp"  
    android:layout_height="41dp"  
    android:text="@string/ViewAll"  
    app:layout_constraintBottom_toBottomOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.129"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toTopOf="parent"  
    app:layout_constraintVertical_bias="0.527" />
```

```
<Button
```

```
    android:id="@+id/btt_update"  
    android:layout_width="93dp"  
    android:layout_height="45dp"  
    android:text="@string/Update"  
    app:layout_constraintBottom_toBottomOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"
```

```

app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.413" />

```

```

<Button
    android:id="@+id/btt_delete"
    android:layout_width="75dp"
    android:layout_height="46dp"
    android:text="@string/Delete"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.869"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.41" />

```

```

<Button
    android:id="@+id/Button_exit"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/exit"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.492"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.532" />

```

```

</androidx.constraintlayout.widget.ConstraintLayout>

```

String file

```

<resources>
    <string name="app_name">Database Operation</string>
    <string name="eyn">Enter your Name</string>
    <string name="AddData">Add Data</string>
    <string name="ViewAll">View all</string>
    <string name="Update">Update</string>
    <string name="Delete">Delete</string>
    <string name="Name">Name:</string>
    <string name="Surname">Enter your Surname</string>
    <string name="Id">Id</string>
    <string name="Did">ID</string>
    <string name="surname">Surname</string>
    <string name="exit">Clear</string>
</resources>

```

Java file(3 files)

1. Customer model

```
package com.example.pgk_database_sql;
```

```
public class CustomerModel {  
    public String id;  
    public String name;  
    public String Sname;  
  
    public CustomerModel() {  
    }  
  
    public CustomerModel(String id, String name, String Sname) {  
        this.id = id;  
        this.name = name;  
        this.Sname = Sname;  
    }  
  
    @Override  
    public String toString() {  
        return "CustomerModel{" +  
            "id=" + id + '\n' +  
            ", name=" + name + '\n' +  
            ", Sname=" + Sname + '\n' +  
            "}";  
    }  
  
    public String getId() {  
        return id;  
    }  
  
    public void setId(String id) {  
        this.id = id;  
    }  
  
    public String getName() {  
        return name;  
    }  
  
    public void setName(String name) {  
        this.name = name;  
    }  
  
    public String getSname() {
```

```

        return Sname;
    }

    public void setSname(String Sname) {
        this.Sname = Sname;
    }
}

```

2. DB Helper

```

package com.example.pgk_database_sql;

import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

import androidx.annotation.Nullable;
import android.content.Context;
import android.widget.Toast;

import org.w3c.dom.Text;

public class DBHelper extends SQLiteOpenHelper {
    public static final String Database_Name="student.db";
    public static final String Table_name="student_table";
    public static final String Col_1="Id";
    public static final String Col_2="Name";
    public static final String Col_3="Surname";

    public DBHelper(@Nullable Context context) {
        super(context, Database_Name, null, 1);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        String query=("Create Table "+Table_name+"( Id Integer Primary
key Autoincrement ,Name Text,Surname Text)");
        db.execSQL(query);
    }
}

```

```

@Override
public void onUpgrade(SQLiteDatabase db, int oldVersion, int
newVersion) {
    db.execSQL(" Drop Table If Exists "+Table_name);
    onCreate(db);

}
public boolean insertData(String id, String Name,String Surname)
{
    SQLiteDatabase db=this.getWritableDatabase();
    ContentValues contentValues=new ContentValues();
    if(id.length()==0 || Name.length()==0 || Surname.length()==0)
        return false;
    else {
        contentValues.put(Col_1, id);
        contentValues.put(Col_2, Name);
        contentValues.put(Col_3, Surname);
        long result = db.insert(Table_name, null, contentValues);
        if (result == 1)
            return false;
        else
            return true;
    }
}

public Cursor getAllData()
{
    SQLiteDatabase db=this.getWritableDatabase();
    Cursor res=db.rawQuery(" select * from "+Table_name,null);
    return res;
}
public boolean updateData(String id,String name,String surname)
{
    int i;
    SQLiteDatabase db=this.getWritableDatabase();
    if(name.isEmpty() || surname.isEmpty() || id.isEmpty())
        return false;
    ContentValues contentValues=new ContentValues();
    contentValues.put(Col_1,id);
    contentValues.put(Col_2,name);
    contentValues.put(Col_3,surname);
    i=db.update(Table_name,contentValues,"Id=?",new String[]{id});
    if(i>0)
        return true;
    else

```



```

        return false;
    }
    public Integer DeleteData(String id)
    {
        SQLiteDatabase db=this.getWritableDatabase();
        return db.delete(Table_name,"ID=?",new String[]{id});
    }
}

```

3. Main activity

```

package com.example.pgk_database_sql;

import androidx.appcompat.app.AppCompatActivity;

import android.database.Cursor;
import android.os.Bundle;
import android.view.View;
import android.widget.Adapter;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.EditText;
import android.widget.ListView;
import android.widget.Toast;
import android.app.AlertDialog;

import java.util.ArrayList;
import java.util.List;

public class MainActivity extends AppCompatActivity {
    DBHelper mydb;
    EditText ename, esurname, eid;
    Button btt_add, btt_view, btt_delete, btt_update,bclear;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        mydb = new DBHelper(this);
        ename = (EditText) findViewById(R.id.ed_name);
        esurname = (EditText) findViewById(R.id.ed_surname);
        eid = (EditText) findViewById(R.id.ed_id);
        btt_add = (Button) findViewById(R.id.btt_add);
    }
}

```

```

btt_delete = (Button) findViewById(R.id.btt_delete);
btt_update = (Button) findViewById(R.id.btt_update);
btt_view = (Button) findViewById(R.id.btt_view);
bclear=(Button)findViewById(R.id.Button_exit);

AddData();
viewAllData();
UpdateData();
DeleteData();
Cleardata();
}

private void Cleardata() {
    bclear.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            ename.setText("");
            eid.setText("");
            esurname.setText("");
            ename.setCursorVisible(true);
        }
    });
}

public void AddData() {
    btt_add.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            boolean isInserted = mydb.insertData(eid.getText().toString(),
ename.getText().toString(), esurname.getText().toString());
            System.out.println(isInserted);
            if (isInserted == true)
                Toast.makeText(MainActivity.this, "Data Inserted",
Toast.LENGTH_SHORT).show();
            else
                Toast.makeText(MainActivity.this, "Data Not Inserted",
Toast.LENGTH_SHORT).show();
        }
    });
}

public void DeleteData() {
    btt_delete.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {

```

```

        Integer dr = mydb.DeleteData(eid.getText().toString());
        if (dr > 0)
            Toast.makeText(MainActivity.this, "Record Deleted",
Toast.LENGTH_SHORT).show();
        else
            Toast.makeText(MainActivity.this, "Record not found",
Toast.LENGTH_SHORT).show();
    }
});
}

public void UpdateData() {
    btt_update.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            boolean ud = mydb.updateData(eid.getText().toString(),
ename.getText().toString(), esurname.getText().toString());
            if (ud == true)
                Toast.makeText(MainActivity.this, "Record Updated",
Toast.LENGTH_SHORT).show();
            else
                Toast.makeText(MainActivity.this, "Data not updated",
Toast.LENGTH_SHORT).show();
        }
    });
}

public void viewAllData() {
    btt_view.setOnClickListener(new View.OnClickListener() {

        @Override
        public void onClick(View v) {
            Cursor res = mydb.getAllData();

            if (res.getCount() == 0)
                Toast.makeText(MainActivity.this, "No record",
Toast.LENGTH_SHORT).show();
            else {
                StringBuffer buffer = new StringBuffer();
                while (res.moveToNext()) {
                    buffer.append("Id:" + res.getString(0) + "\n");
                    buffer.append("Name:" + res.getString(1) + "\n");
                    buffer.append("Surname:" + res.getString(2) + "\n");
                    buffer.append("\n");
                }
                showMessage("Data from Database", buffer.toString());
            }
        }
    });
}

```

```

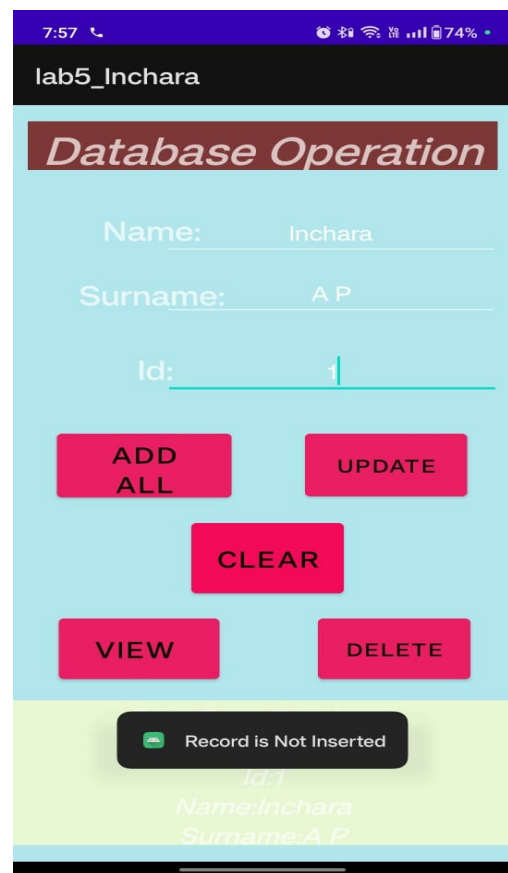
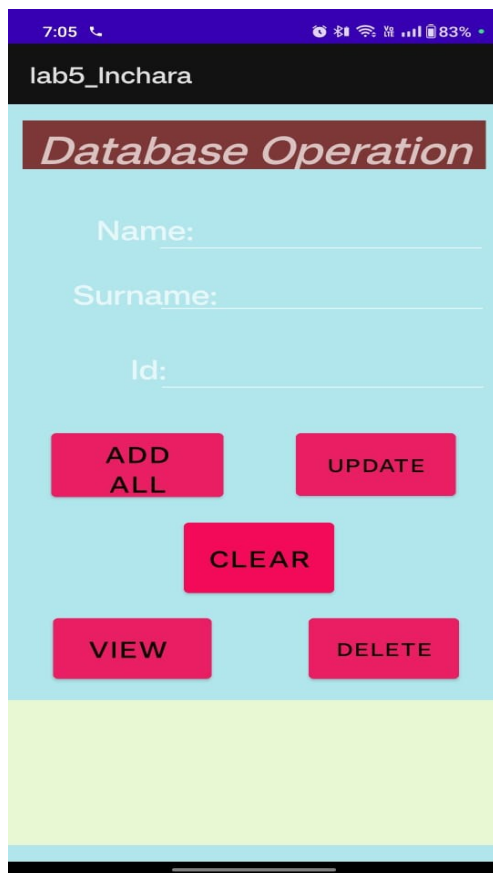
        }
    }
});

}

public void showMessage(String title, String Message) {
    AlertDialog.Builder builder = new AlertDialog.Builder(this);
    builder.setCancelable(true);
    builder.setTitle(title);
    builder.setMessage(Message);
    builder.show();
}
}
}

```

OUTPUT:



7:47 m 76%

lab5_Inchara

Database Operation

Name:

Surname:

Id:

ADD ALL **UPDATE**

CLEAR

VIEW **DELETE**

Data From Database

Id:1
Name:Inchara
Surname:A P

7:42 m 77%

lab5_Inchara

Database Operation

Name:

Surname:

Id:

ADD ALL **UPDATE**

CLEAR

VIEW **DELETE**

Data From Database

Id:1
Name:Inchara
Surname:A P

Record Updated

6. Devise an application that implements Multi-threading.

Soln:

XML file

```
<?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:layout_width="389dp"
        android:layout_height="65dp"
        android:gravity="center"
        android:text="@string/DT"
        android:textColor="@android:color/holo_orange_dark"
        android:textSize="25sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="250dp"
        android:layout_height="250dp"
        android:layout_gravity="center"
        android:layout_margin="50dp" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_margin="10dp"
        android:text="Load Image 1"
        app:backgroundTint="#EA5E8E" />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
```

```

        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_margin="10dp"
        android:text="Load image 2"
        app:backgroundTint="#EA5E8E" />

```

</LinearLayout>

Java files

```

package com.example.inchara_lab6;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.ImageView;

public class MainActivity extends AppCompatActivity {
    ImageView img;
    Button bt1, bt2;
    int count=0;

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

        bt1 = (Button)findViewById(R.id.button);
        bt2 = (Button)findViewById(R.id.button2);
        img = (ImageView)findViewById(R.id.imageView);

        bt1.setOnClickListener(new View.OnClickListener(){
            @Override
            public void onClick(View v) {
                new Thread(new Runnable(){
                    @Override
                    public void run(){
                        img.post(new Runnable(){
                            @Override
                            public void run(){

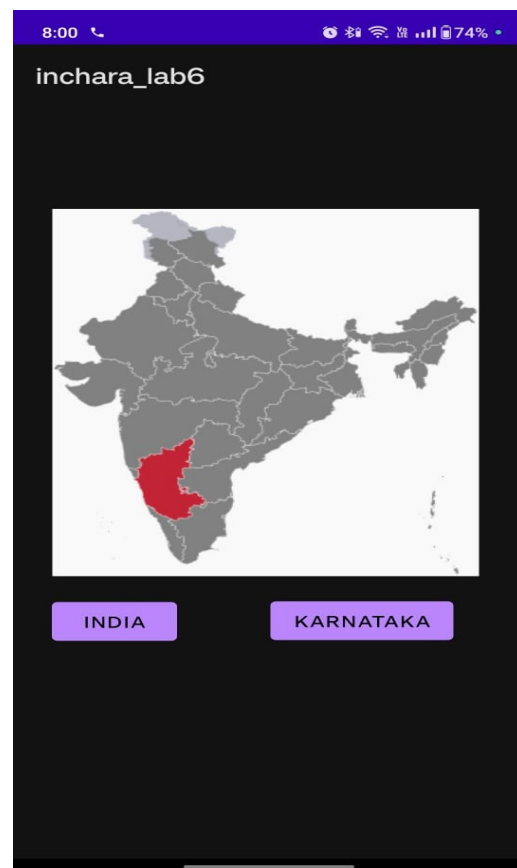
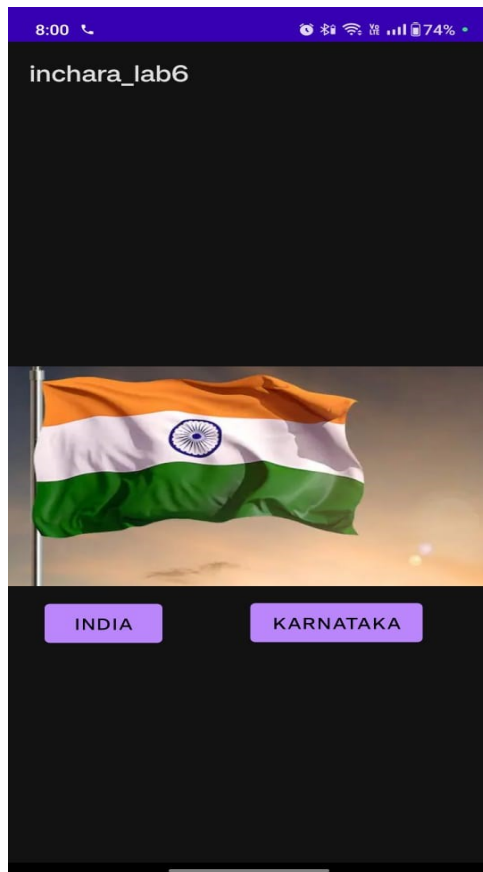
```

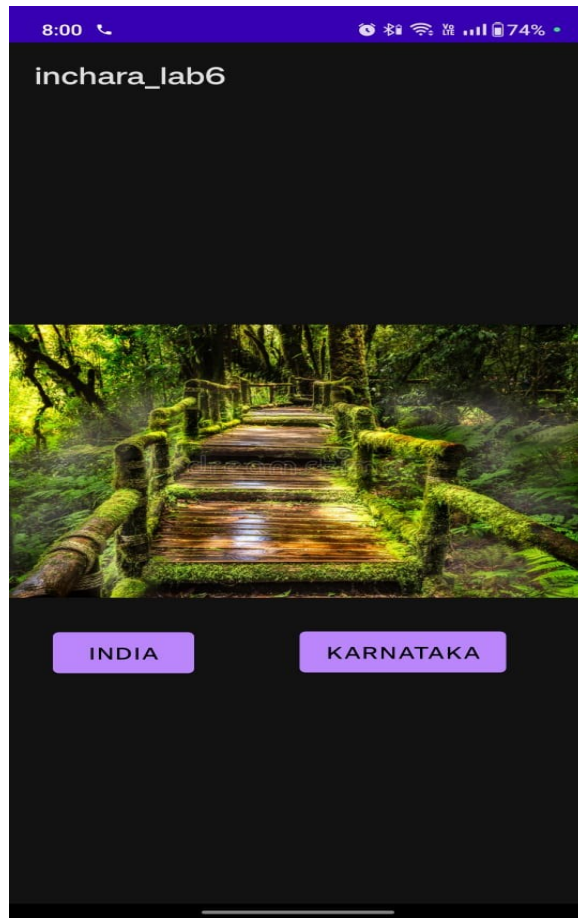
```

        if(count==0) {
            img.setImageResource(R.drawable.india);
            count=count+1;
        }
        else {
            img.setImageResource(R.drawable.karnataka);
            count=count-1;
        }
    }
    });
}
}).start();
}
});
bt2.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v)
    {
        new Thread(new Runnable(){
            @Override
            public void run(){
                img.post(new Runnable(){
                    @Override
                    public void run() {
                        img.setImageResource(R.drawable.nature);
                    }
                });
            }
        }).start();
    }
});
}
}

```


Output:





7. Develop a mobile application that uses GPS location information

Xml file

```
<?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:id="@+id/linearLayout"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context=".MainActivity">

<TextView
    android:id="@+id/showLocation2"
    android:layout_width="316dp"
    android:layout_height="66dp"
    android:hint="Location"
    android:textColor="#E91E63"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.294"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.627" />

<TextView
    android:id="@+id/textView"
    android:layout_width="273dp"
    android:layout_height="66dp"
    android:gravity="center"
    android:text="Google Location "
    android:textColor="#E91E63"
    android:textSize="30sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintHorizontal_bias="0.34"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.069" />

<TextView
    android:id="@+id/showLocation"
    android:layout_width="316dp"
```

```

    android:layout_height="66dp"
    android:hint="Location"
    android:textColor="#E91E63"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.294"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.478" />

```

<Button

```

    android:id="@+id/retrieve_location_button"
    android:layout_width="244dp"
    android:layout_height="wrap_content"
    android:onClick="getLocation"
    android:text="Retrieve Location"
    android:textColor="#FFFFFF"
    app:backgroundTint="#E91E63"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.598"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.812" />

```

</androidx.constraintlayout.widget.ConstraintLayout>

Java file

```
package com.example.madseventh;
```

```

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

```

```

import android.Manifest;
import android.app.AlertDialog;
import android.content.Context;
import android.content.DialogInterface;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.location.Location;

```

```

import android.location.LocationListener;
import android.location.LocationManager;
import android.os.Bundle;
import android.provider.Settings;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    GpsTracker gpsTracker;
    TextView tvLatitude,tvLongitude;

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

        tvLatitude = (TextView)findViewById(R.id.showLocation);
        tvLongitude = (TextView)findViewById(R.id.showLocation2);

        try {
            if (ContextCompat.checkSelfPermission(getApplicationContext(),
                android.Manifest.permission.ACCESS_FINE_LOCATION) !=
                PackageManager.PERMISSION_GRANTED ) {
                ActivityCompat.requestPermissions(this, new
                String[]{android.Manifest.permission.ACCESS_FINE_LOCATION}, 101);
            }
        } catch (Exception e){
            e.printStackTrace();
        }
    }

    public void getLocation(View view){
        gpsTracker = new GpsTracker(MainActivity.this);
        if(gpsTracker.canGetLocation()){
            double latitude = gpsTracker.getLatitude();
            double longitude = gpsTracker.getLongitude();
            tvLatitude.setText("Latitude---" + String.valueOf(latitude));
            tvLongitude.setText("Longitude---" + String.valueOf(longitude));
        }else{
            gpsTracker.showSettingsAlert();
        }
    }
}

```

```
}  
}
```

Gps Tracker java file

```
package com.example.madseventh;
```

```
import android.Manifest;  
import android.app.Activity;  
import android.app.AlertDialog;  
import android.app.Service;  
import android.content.Context;  
import android.content.DialogInterface;  
import android.content.Intent;  
import android.content.pm.PackageManager;  
import android.location.Location;  
import android.location.LocationListener;  
import android.location.LocationManager;  
import android.os.Bundle;  
import android.os.IBinder;  
import android.provider.Settings;  
import android.util.Log;  
import android.widget.Toast;
```

```
import androidx.core.app.ActivityCompat;
```

```
import java.security.Provider;
```

```
public class GpsTracker extends Service implements LocationListener {  
    private final Context mContext;
```

```
    // flag for GPS status
```

```
    boolean isGPSEnabled = false;
```

```
    // flag for network status
```

```
    boolean isNetworkEnabled = false;
```

```
    // flag for GPS status
```

```
    boolean canGetLocation = false;
```

```
    Location location; // location
```

```
    double latitude; // latitude
```

```
    double longitude; // longitude
```

```
    // The minimum distance to change Updates in meters
```

```
    private static final long MIN_DISTANCE_CHANGE_FOR_UPDATES = 10; // 10  
    meters
```

```

// The minimum time between updates in milliseconds
private static final long MIN_TIME_BW_UPDATES = 1000 * 60 * 1; // 1 minute

// Declaring a Location Manager
protected LocationManager locationManager;

public GpsTracker(Context context) {
    this.mContext = context;
    getLocation();
}

public Location getLocation() {
    try {
        locationManager = (LocationManager)
mContext.getSystemService(LOCATION_SERVICE);

        // getting GPS status
        isGPSEnabled =
locationManager.isProviderEnabled(LocationManager.GPS_PROVIDER);

        // getting network status
        isNetworkEnabled = locationManager
            .isProviderEnabled(LocationManager.NETWORK_PROVIDER);

        if (!isGPSEnabled && !isNetworkEnabled) {
            // no network provider is enabled
        } else {
            this.canGetLocation = true;
            // First get location from Network Provider
            if (isNetworkEnabled) {
                //check the network permission
                if (ActivityCompat.checkSelfPermission(mContext,
Manifest.permission.ACCESS_FINE_LOCATION) !=
PackageManager.PERMISSION_GRANTED &&
ActivityCompat.checkSelfPermission(mContext,
Manifest.permission.ACCESS_COARSE_LOCATION) !=
PackageManager.PERMISSION_GRANTED) {
                    ActivityCompat.requestPermissions((Activity) mContext, new
String[]{android.Manifest.permission.ACCESS_FINE_LOCATION,
Manifest.permission.ACCESS_COARSE_LOCATION}, 101);
                }
                locationManager.requestLocationUpdates(
                    LocationManager.NETWORK_PROVIDER,
                    MIN_TIME_BW_UPDATES,
                    MIN_DISTANCE_CHANGE_FOR_UPDATES, this);

                Log.d("Network", "Network");
            }
        }
    } catch (Exception e) {
        Log.e("Network", "Network: " + e.getMessage());
    }
}

```

```

        //Toast.makeText(this, "Check the network", Toast.LENGTH_SHORT).show();
        if (locationManager != null) {
            location = locationManager

.getLastKnownLocation(LocationManager.NETWORK_PROVIDER);

            if (location != null) {
                latitude = location.getLatitude();
                longitude = location.getLongitude();
            }
        }
    }

    // if GPS Enabled get lat/long using GPS Services
    if (isGPSEnabled) {
        if (location == null) {
            //check the network permission

            if (ActivityCompat.checkSelfPermission(mContext,
Manifest.permission.ACCESS_FINE_LOCATION) !=
PackageManager.PERMISSION_GRANTED &&
ActivityCompat.checkSelfPermission(mContext,
Manifest.permission.ACCESS_COARSE_LOCATION) !=
PackageManager.PERMISSION_GRANTED) {
                ActivityCompat.requestPermissions((Activity) mContext, new
String[]{android.Manifest.permission.ACCESS_FINE_LOCATION,
Manifest.permission.ACCESS_COARSE_LOCATION}, 101);
            }
            locationManager.requestLocationUpdates(
                LocationManager.GPS_PROVIDER,
                MIN_TIME_BW_UPDATES,
                MIN_DISTANCE_CHANGE_FOR_UPDATES, this);

            Log.d("GPS Enabled", "GPS Enabled");
            // Toast.makeText(this, "Enable GPS", Toast.LENGTH_SHORT).show();
            if (locationManager != null) {
                location = locationManager

                .getLastKnownLocation(LocationManager.GPS_PROVIDER);

                if (location != null) {
                    latitude = location.getLatitude();
                    longitude = location.getLongitude();
                }
            }
        }
    }
}

```



```

    }

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

    return location;
}

/**
 * Stop using GPS listener
 * Calling this function will stop using GPS in your app
 * */

public void stopUsingGPS(){
    if(locationManager != null){
        locationManager.removeUpdates(GpsTracker.this);
    }
}

/**
 * Function to get latitude
 * */

public double getLatitude(){
    if(location != null){
        latitude = location.getLatitude();
    }

    // return latitude
    return latitude;
}

/**
 * Function to get longitude
 * */

public double getLongitude(){
    if(location != null){
        longitude = location.getLongitude();
    }

    // return longitude
    return longitude;
}

/**

```

```

* Function to check GPS/wifi enabled
* @return boolean
* */

public boolean canGetLocation() {
    return this.canGetLocation;
}

/**
* Function to show settings alert dialog
* On pressing Settings button will launch Settings Options
* */

public void showSettingsAlert(){
    AlertDialog.Builder alertDialog = new AlertDialog.Builder(mContext);

    // Setting Dialog Title
    alertDialog.setTitle("GPS is settings");

    // Setting Dialog Message
    alertDialog.setMessage("GPS is not enabled. Do you want to go to settings menu?");

    // On pressing Settings button
    alertDialog.setPositiveButton("Settings", new DialogInterface.OnClickListener()
    {
        public void onClick(DialogInterface dialog,int which) {
            Intent intent = new
            Intent(Settings.ACTION_LOCATION_SOURCE_SETTINGS);
            mContext.startActivity(intent);
        }
    });

    // on pressing cancel button
    alertDialog.setNegativeButton("Cancel", new DialogInterface.OnClickListener()
    {
        public void onClick(DialogInterface dialog, int which) {
            dialog.cancel();
        }
    });
    alertDialog.show();
}

@Override
public void onLocationChanged(Location location) {
}

```

```

@Override
public void onProviderDisabled(String provider) {
}

@Override
public void onProviderEnabled(String provider) {
}

@Override
public void onStatusChanged(String provider, int status, Bundle extras) {
}

@Override
public IBinder onBind(Intent arg0) {
    return null;
}
}

```

These lines in manifest files

```

<uses-permission
android:name="android.permission.ACCESS_FINE_LOCATION" />
<uses-permission android:name="android.permission.
ACCESS_COARSE_LOCATION" />
<uses-permission android:name="android.permission.INTERNET"/>

```

Output :



Google Location

Latitude---13.3108998

Longitude---77.1317979

RETRIEVE LOCATION

8. Create an application that writes data to the SD card.

Xml file

```
<?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:background="#F1C2BE"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <TextView
        android:layout_width="fill_parent"
        android:layout_height="110dp"
        android:background="#E3A0B7"
        android:text="Reading and Writing to External Storage"
        android:textSize="24sp" />

    <EditText
        android:id="@+id/myInputText"
        android:layout_width="match_parent"
        android:layout_height="150dp"
        android:background="#D57696"
        android:ems="10"
        android:gravity="top | left"
        android:inputType="textMultiLine"
        android:lines="5"
        android:minLines="3">

        <requestFocus />
    </EditText>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:orientation="horizontal"
        android:weightSum="1.0">

        <Button
```

```
    android:id="@+id/saveExternalStorage"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_weight="0.5"
    android:text="SAVE"
    app:backgroundTint="#2C89D3" />
```

```
<Button
    android:id="@+id/getExternalStorage"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_weight="0.5"
    android:text="READ"
    app:backgroundTint="#2C89D3" />
```

```
</LinearLayout>
```

```
<TextView
    android:id="@+id/response"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:padding="25sp"
    android:text=""
    android:textAppearance="?android:attr/textAppearanceMedium" />
```

```
</LinearLayout>
```

Java File

```
package com.example.Inchara_lab8;

import androidx.appcompat.app.AppCompatActivity;

import android.content.SharedPreferences;
import android.os.Bundle;
import android.os.Environment;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
```

```

import android.widget.TextView;
import android.widget.Toast;

import java.io.BufferedReader;
import java.io.DataInputStream;
import java.io.File;
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.FileReader;
import java.io.FileWriter;
import java.io.IOException;
import java.io.InputStreamReader;

public class MainActivity extends AppCompatActivity {
    EditText inputText;
    TextView response;
    Button saveButton, readButton;

    private String filename = "SampleFile.txt";
    private String filepath = "MyFileStorage";
    File myExternalFile;
    String myData = "";

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

        inputText = (EditText) findViewById(R.id.myInputText);
        response = (TextView) findViewById(R.id.response);

        saveButton = (Button) findViewById(R.id.saveExternalStorage);

        saveButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                try {
                    FileOutputStream fos = new FileOutputStream(myExternalFile);
                    fos.write(inputText.getText().toString().getBytes());
                    fos.close();
                } catch (IOException e) {
                    e.printStackTrace();
                }
                inputText.setText("");
            }
        });
    }
}

```

```

        inputText.setFocusable(true);
        response.setText("SampleFile.txt saved to External Storage...");
    }
});

readButton = (Button) findViewById(R.id.getExternalStorage);

readButton.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        try {
            FileInputStream fis = new FileInputStream(myExternalFile);
            DataInputStream in = new DataInputStream(fis);
            BufferedReader br =
                new BufferedReader(new InputStreamReader(in));
            String strLine;
            while ((strLine = br.readLine()) != null) {
                myData = myData + strLine;
            }
            in.close();
        } catch (IOException e) {
            e.printStackTrace();
        }
        inputText.setText(myData);
        response.setText("SampleFile.txt data retrieved from Internal Storage...");
    }
});

if (!isExternalStorageAvailable() || isExternalStorageReadOnly()) {
    saveButton.setEnabled(false);
}
else {
    myExternalFile = new File(getExternalFilesDir(filepath), filename);
}

}

private static boolean isExternalStorageReadOnly() {
    String extStorageState = Environment.getExternalStorageState();
    if (Environment.MEDIA_MOUNTED_READ_ONLY.equals(extStorageState)) {
        return true;
    }
    return false;
}

```



```

private static boolean isExternalStorageAvailable() {
    String extStorageState = Environment.getExternalStorageState();
    if (Environment.MEDIA_MOUNTED.equals(extStorageState)) {
        return true;
    }
    return false;
}
}

```

Manifest file

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.mad_lab8">
    <uses-permission
android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>
    <uses-permission
android:name="android.permission.READ_EXTERNAL_STORAGE"/>

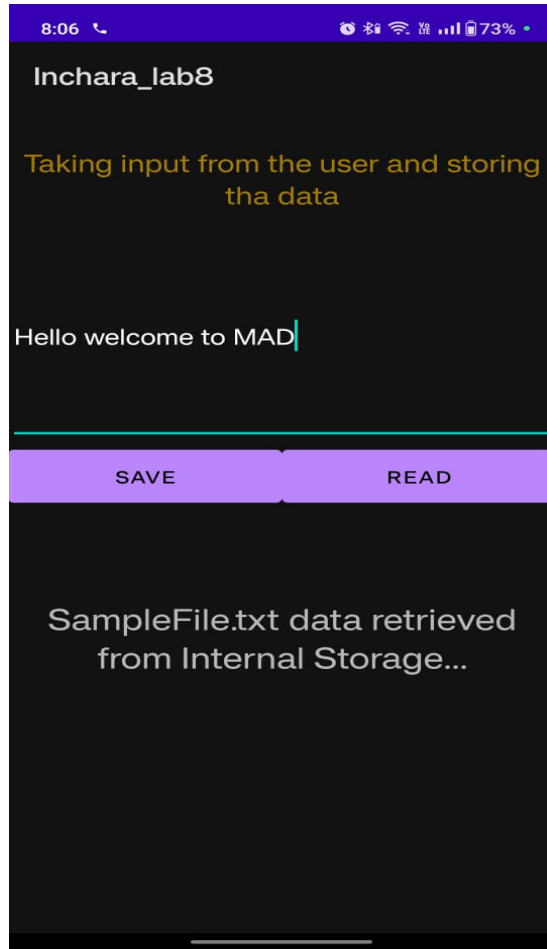
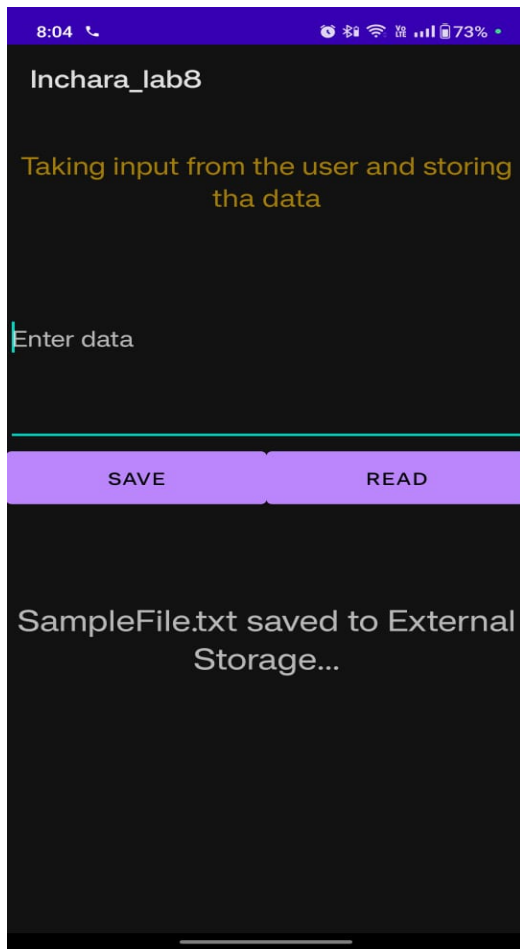
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.MAD_Lab8">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>

```

Output:



9. Implement an application that creates an alert upon receiving a message.

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"
    tools:context=".MainActivity"
    android:orientation="vertical">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Message!"
        android:textSize="30sp"/>

    <EditText
        android:id="@+id/editText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:singleLine="true"
        android:textSize="30sp"/>

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="30dp"
        android:layout_gravity="center"
        android:text="notify"
        android:textSize="30sp"
    />

</LinearLayout>
```

MainActivity.java

```
package com.example.administrator.expg09;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.app.Notification;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.Intent;
```

```

import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

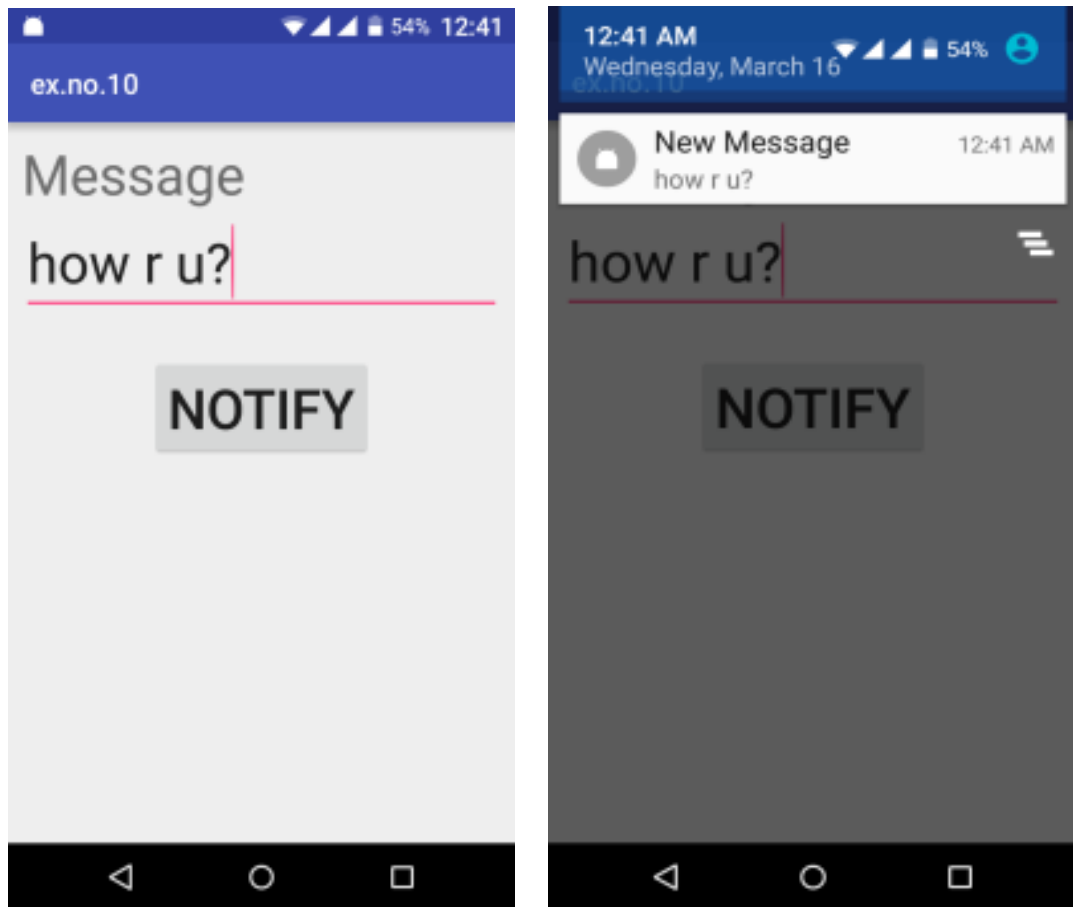
public class MainActivity extends AppCompatActivity{

    Button notify;
    EditText e;

    @Override
    protected void onCreate(Bundle savedInstanceState){
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        notify=(Button) findViewById(R.id.button);
        e=(EditText)findViewById(R.id.editText);
        notify.setOnClickListener(new View.OnClickListener(){
            @Override
            public void onClick(View view){
                Intent intent = new Intent(MainActivity.this,
                PendingIntent pending =
                PendingIntent.getActivity(MainActivity.this,0,intent,0);
                Notification noti= new Notification.Builder(
                    MainActivity.this).setContentTitle("New Message").
                NotificationManager manager=(NotificationManager)
                noti.flags |=Notification.FLAG_AUTO_CANCEL;
                manager.notify(0,noti);
            }
        });
    }
}

```

Output:



10. Devise a mobile application that creates alarm clock.

XML file

```
<?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:orientation="vertical"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <TimePicker
        android:id="@+id/timePicker"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center" />

    <ToggleButton
        android:id="@+id/toggleButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_margin="20dp"
        android:checked="false"
        android:onClick="OnToggleClicked" />

</LinearLayout>
```

Java file

```
package com.example.inchara_lab10;

import androidx.appcompat.app.AppCompatActivity;

import android.app.AlarmManager;
import android.app.PendingIntent;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.TimePicker;
import android.widget.Toast;
import android.widget.ToggleButton;
```

```

import java.util.Calendar;

public class MainActivity extends AppCompatActivity {
    TimePicker alarmTimePicker;
    PendingIntent pendingIntent;
    AlarmManager alarmManager;

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

        alarmTimePicker = (TimePicker) findViewById(R.id.timePicker);
        alarmManager = (AlarmManager) getSystemService(ALARM_SERVICE);
    }

    public void OnToggleClicked(View view) {
        long time;
        if (((ToggleButton) view).isChecked()){
            Toast.makeText(MainActivity.this, "ALARM ON",
            Toast.LENGTH_SHORT).show();
            Calendar calendar = Calendar.getInstance();
            calendar.set(Calendar.HOURL_OF_DAY,alarmTimePicker.getCurrentHour());
            calendar.set(Calendar.MINUTE,alarmTimePicker.getCurrentMinute());
            Intent intent = new Intent(this, AlarmReceiver.class);
            pendingIntent=PendingIntent.getBroadcast(this, 0, intent,0);

            time=(calendar.getTimeInMillis())-(calendar.getTimeInMillis()%60000));
            // the operating system for some the time is measured in milliseconds
            if(System.currentTimeMillis())>time){
                if (calendar.AM_PM == 0)
                    time = time + (1000*60*60*12);
                else
                    time = time + (1000*60*60*24);
            }
            alarmManager.setRepeating(AlarmManager.RTC_WAKEUP, time,10000,
pendingIntent);
        }
        else{
            alarmManager.cancel(pendingIntent);
            Toast.makeText(MainActivity.this, "ALARM
OFF",Toast.LENGTH_SHORT).show();
        }
    }
}

```

```
}  
}
```

Alaram reaciver java file

```
package com.example.madlabprogram10;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.app.AlarmManager;  
import android.app.PendingIntent;  
import android.content.Intent;  
import android.os.Bundle;  
import android.view.View;  
import android.widget.TimePicker;  
import android.widget.Toast;  
import android.widget.ToggleButton;  
  
import java.util.Calendar;  
  
public class MainActivity extends AppCompatActivity {  
    TimePicker alarmTimePicker;  
    PendingIntent pendingIntent;  
    AlarmManager alarmManager;  
  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
  
        alarmTimePicker = (TimePicker) findViewById(R.id.timePicker);  
        alarmManager = (AlarmManager) getSystemService(ALARM_SERVICE);  
    }  
  
    public void OnToggleClicked(View view) {  
        long time;  
        if (((ToggleButton) view).isChecked()){  
            Toast.makeText(MainActivity.this, "ALARM ON",  
            Toast.LENGTH_SHORT).show();  
            Calendar calendar = Calendar.getInstance();  
            calendar.set(Calendar.HOURL_OF_DAY,alarmTimePicker.getCurrentHour());  
            calendar.set(Calendar.MINUTE,alarmTimePicker.getCurrentMinute());  
            Intent intent = new Intent(this, AlarmReceiver.class);
```



```

pendingIntent=PendingIntent.getBroadcast(this, 0, intent,0);

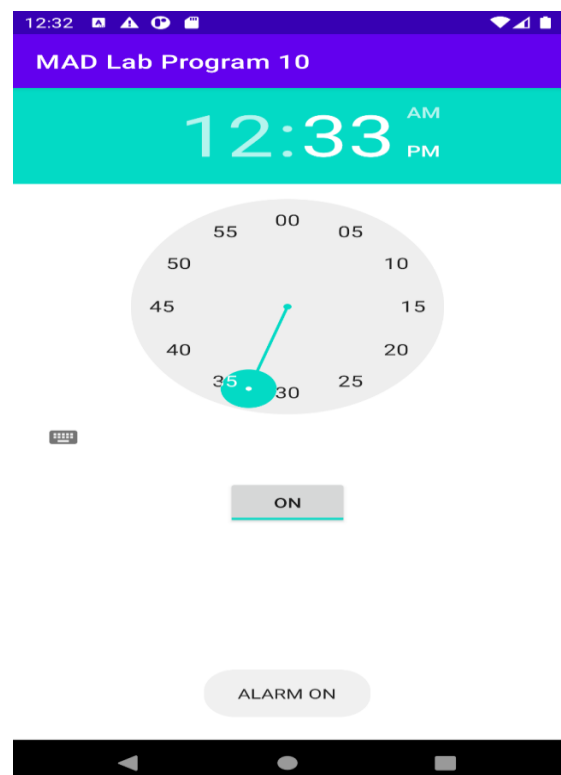
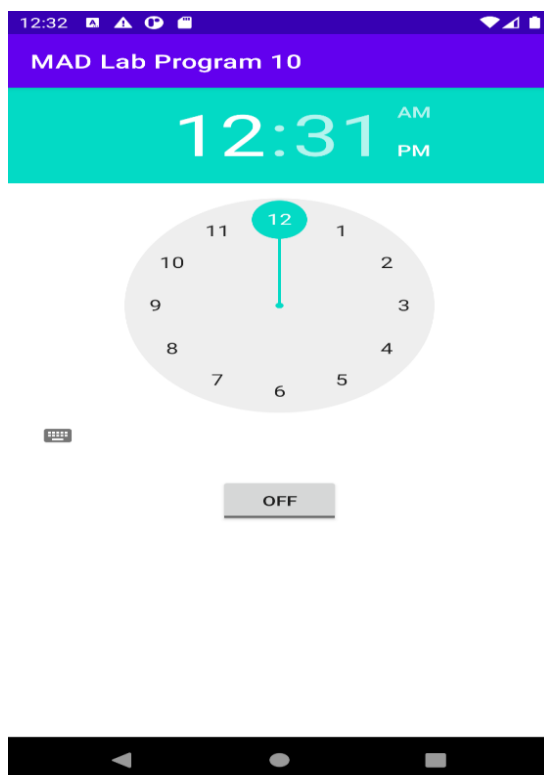
time=(calendar.getTimeInMillis()-(calendar.getTimeInMillis()%60000));
// the operating system for some the time is measured in milliseconds
if(System.currentTimeMillis()>time){
    if (calendar.AM_PM == 0)
        time = time + (1000*60*60*12);
    else
        time = time + (1000*60*60*24);
}
alarmManager.setRepeating(AlarmManager.RTC_WAKEUP, time,10000,
pendingIntent);

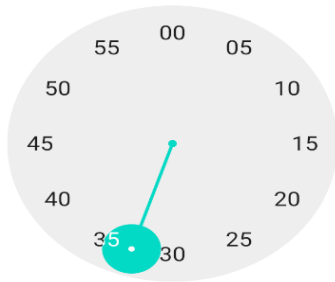
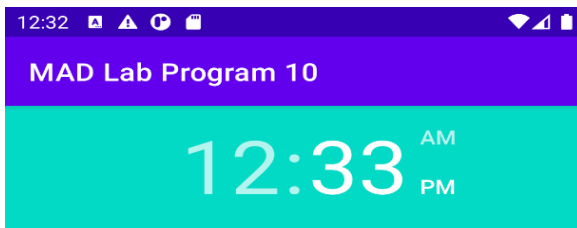
}
else{
    alarmManager.cancel(pendingIntent);
    Toast.makeText(MainActivity.this, "ALARM
OFF",Toast.LENGTH_SHORT).show();
}

}
}

```

Output





OFF

