**Practical 1**

**Aim: Introduction to Android and Create a “Custom Message” application. That will display “Custom Message” in the middle of the screen in the Black color with the yellow background.**

**Code:**

**Activity\_main.xml**

|  |
| --- |
| <?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="@android:color/holo\_orange\_light"  tools:context=".MainActivity"  android:background=”#99ccff”>   <**TextView  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:text="17IT024"  android:textSize="20sp"  android:textColor="#00000"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintLeft\_toLeftOf="parent"  app:layout\_constraintRight\_toRightOf="parent"  app:layout\_constraintTop\_toTopOf="parent"** />    </androidx.constraintlayout.widget.ConstraintLayout> |

**MainActivitiy.java**

|  |
| --- |
| **import** android.support.v7.app.AppCompatActivity;  **import** android.os.Bundle;  **public class** customMessage **extends** AppCompatActivity {  @Override  **protected void** onCreate(Bundle savedInstanceState) {  **super**.onCreate(savedInstanceState);  setContentView(R.layout.MainActivity);  }  } |

**OUTPUT:**



**Practical 2**

**Aim: Create an android application to calculate the sum of two numbers and gives result in Toast Message.**

**Code:**

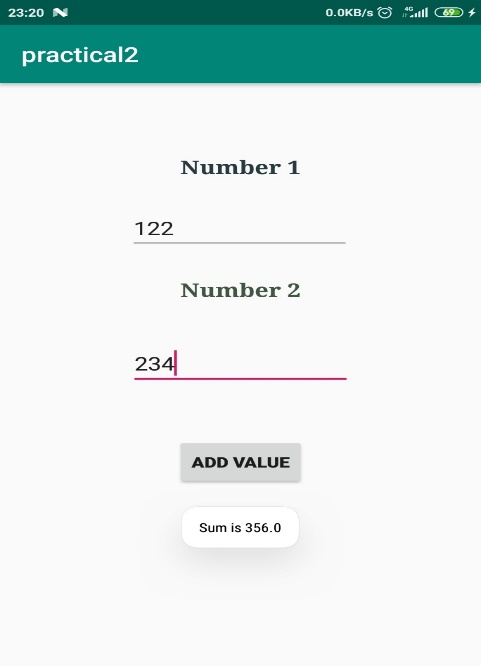
**Activity\_main.xml**

|  |
| --- |
| <?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">  <EditText  android:id="@+id/num2"  android:layout\_width="500px"  android:layout\_height="wrap\_content"  android:layout\_marginTop="36dp"  android:hint="Value 2"  android:inputType="number"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/textView3" />  <TextView  android:id="@+id/textView3"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginTop="24dp"  android:text="Number 2"  android:textColor="#D31B351C"  android:textSize="18sp"  android:textStyle="bold"  app:fontFamily="serif"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/num1" />  <TextView  android:id="@+id/textView"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginTop="68dp"  android:text="Number 1"  android:textColor="#DF0A2025"  android:textSize="18sp"  android:textStyle="bold"  app:fontFamily="serif"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent" />  <EditText  android:id="@+id/num1"  android:layout\_width="500px"  android:layout\_height="wrap\_content"  android:layout\_marginTop="24dp"  android:hint="Value 1"  android:inputType="number"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.497"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/textView" />  <Button  android:id="@+id/button"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginTop="48dp"  android:onClick="onClick"  android:text="Add Value"  android:textStyle="bold"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/num2" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**MainActivity.java**

|  |
| --- |
| package myapp.example.com.practical2;  import androidx.appcompat.app.AppCompatActivity;  import android.os.Bundle;  import android.view.View;  import android.widget.Button;  import android.widget.EditText;  import android.widget.Toast;  public class MainActivity extends AppCompatActivity {  Button button;  EditText num1,num2;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.activity\_main);  button = findViewById(R.id.button);  num1 = findViewById(R.id.num1);  num2 = findViewById(R.id.num2);  }  public void onClick(View V){  double a = Double.parseDouble(num1.getText().toString());  double b = Double.parseDouble(num2.getText().toString());    double sum = a + b ;  Toast.makeText(this,"Sum is "+sum,Toast.LENGTH\_SHORT).show();  //toast.show();  }  } |

**Output:**

****

**Practical 3**

**Aim: Create an application that will display Toast (Message) on a specific interval of time.**

**Code:**

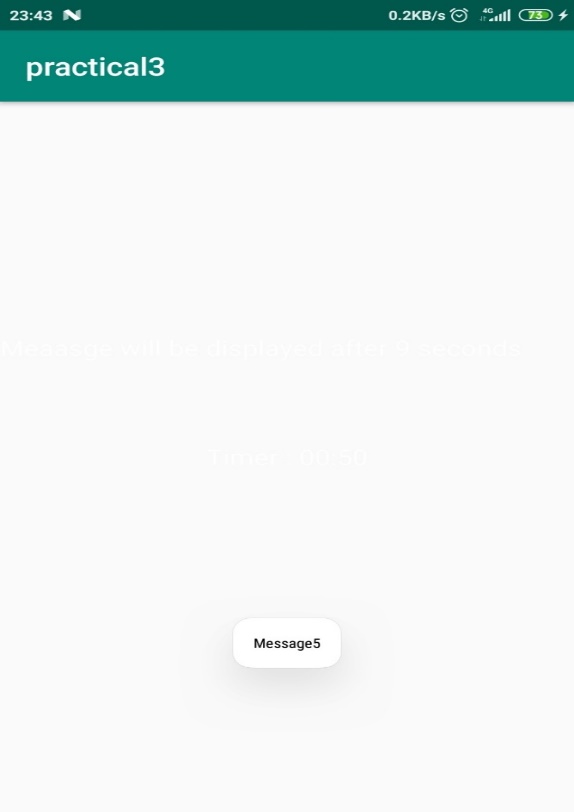
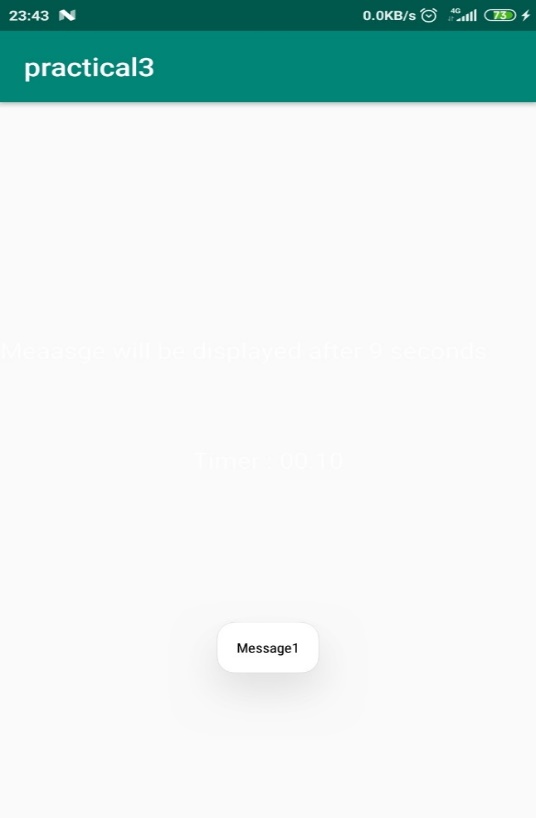
**Activity\_main.xml**

|  |
| --- |
| <?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/tv"  android:layout\_width="match\_parent"  android:layout\_height="wrap\_content"  android:textAppearance="@android:style/TextAppearance.DeviceDefault.Medium"  android:textColor="#fff"  android:textSize="20sp"  app:layout\_constraintBottom\_toTopOf="@+id/cnm"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.0"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  app:layout\_constraintVertical\_bias="0.744" />  <Chronometer  android:id="@+id/cnm"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_centerHorizontal="true"  android:layout\_centerVertical="true"  android:format="Timer : %s"  android:textColor="#fff"  android:textSize="20sp"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**MainActivity.java**

|  |
| --- |
| package myapp.example.com.practical3;  import androidx.appcompat.app.AppCompatActivity;  import android.os.Bundle;  import android.widget.Chronometer;  import android.widget.TextView;  import android.widget.Toast;  public class MainActivity extends AppCompatActivity {  Chronometer c;  int i=0;  int duration=10;  TextView tv;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.activity\_main);  c=(Chronometer)findViewById(R.id.cnm);  tv=(TextView)findViewById(R.id.tv);  c.start();  c.setOnChronometerTickListener(new Chronometer.OnChronometerTickListener() {  @Override  public void onChronometerTick(Chronometer arg0) {  tv.setText("Meaasge will be displayed after " + (duration - (i + 1)) + " seconds");  i++;  if (i >= duration)  {  Toast.makeText(getApplicationContext(),"Message"+(i/10), Toast.LENGTH\_LONG).show();  duration=duration+10;  }  }  });  }  } |

**Output:**

****

**Practical 4**

**Aim: Create a temperature converter Application. (Fahrenheit-Celsius).**

**Code:**

**Activity\_main.xml**

|  |
| --- |
| <?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/textView"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:text="Fahrenheit"  android:textColor="#BF0B3D1C"  android:textSize="24sp"  android:textStyle="bold"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.216"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  app:layout\_constraintVertical\_bias="0.309" />  <TextView  android:id="@+id/textView2"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:text="Celsius"  android:textColor="#BF0B3D1C"  android:textSize="24sp"  android:textStyle="bold"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.477"  app:layout\_constraintStart\_toEndOf="@+id/textView"  app:layout\_constraintTop\_toTopOf="parent"  app:layout\_constraintVertical\_bias="0.309" />  <EditText  android:id="@+id/fe"  android:layout\_width="180dp"  android:layout\_height="50dp"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.069"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/textView"  app:layout\_constraintVertical\_bias="0.078" />  <EditText  android:id="@+id/ce"  android:layout\_width="180dp"  android:layout\_height="50dp"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.542"  app:layout\_constraintStart\_toEndOf="@+id/fe"  app:layout\_constraintTop\_toBottomOf="@+id/textView2"  app:layout\_constraintVertical\_bias="0.078" />  <Button  android:id="@+id/convert"  android:layout\_width="188dp"  android:layout\_height="45dp"  android:background="#F0040904"  android:text="Convert"  android:textColor="#B4BFE9D2"  android:textStyle="bold"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.498"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  app:layout\_constraintVertical\_bias="0.576" />  <Spinner  android:id="@+id/spinner"  android:layout\_width="274dp"  android:layout\_height="44dp"  app:layout\_constraintBottom\_toTopOf="@+id/convert"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.496"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  app:layout\_constraintVertical\_bias="0.344" />  <TextView  android:id="@+id/textView3"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:text="Temperature in "  android:textColor="#BF0B3D1C"  android:textSize="24sp"  android:textStyle="bold"  app:layout\_constraintBottom\_toTopOf="@+id/spinner"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  app:layout\_constraintVertical\_bias="0.852" />  </androidx.constraintlayout.widget.ConstraintLayout> |

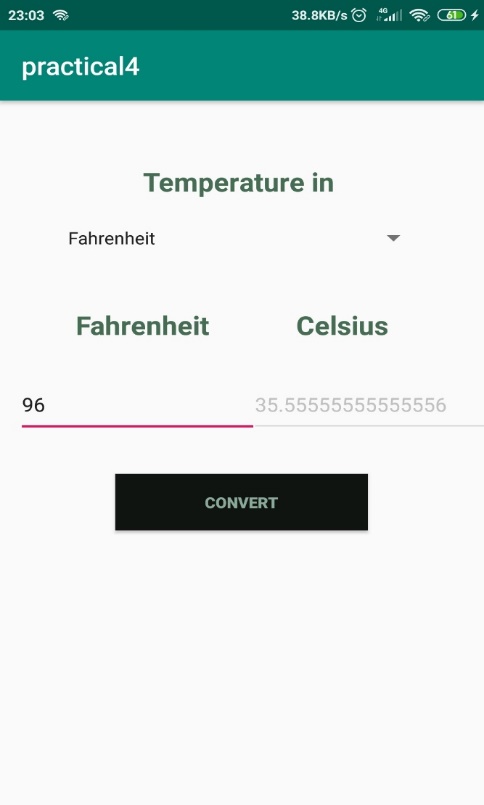
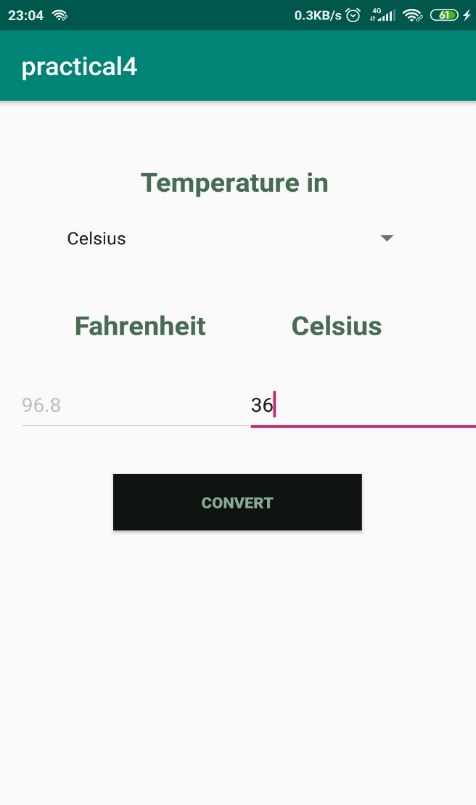
**Strings.xml**

|  |
| --- |
| <resources>  <string name="app\_name">practical4</string>  <string-array name="spinner">  <item>None</item>  <item>Fahrenheit</item>  <item>Celsius</item>  </string-array>  </resources> |

**Mainactivity.java**

|  |
| --- |
| package myapp.example.com.practical4;  import androidx.appcompat.app.AppCompatActivity;  import android.content.Intent;  import android.os.Bundle;  import android.view.View;  import android.widget.AdapterView;  import android.widget.ArrayAdapter;  import android.widget.Button;  import android.widget.EditText;  import android.widget.Spinner;  import android.widget.Toast;  public class MainActivity extends AppCompatActivity {  EditText fe,ce ;  Button convert ;  Spinner spinner ;  String text ;  Double fed,ced;  Double fece,cefe;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.activity\_main);  fe = findViewById(R.id.fe);  ce = findViewById(R.id.ce);  convert = findViewById(R.id.convert);  spinner = findViewById(R.id.spinner);  ArrayAdapter<CharSequence> adapter = ArrayAdapter.createFromResource(this,  R.array.spinner, android.R.layout.simple\_spinner\_item);  adapter.setDropDownViewResource(android.R.layout.simple\_spinner\_dropdown\_item);  spinner.setAdapter(adapter);  spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {  @Override  public void onItemSelected(AdapterView<?> parent, View view, int position, long id) {  text = spinner.getSelectedItem().toString() ;  if(text.equals("Fahrenheit")){  ce.setEnabled(false);  fe.setEnabled(true);  }else if(text.equals("Celsius")){  fe.setEnabled(false);  ce.setEnabled(true);  }else if(text.equals("None")){  fe.setEnabled(false);  ce.setEnabled(false);  }  }  @Override  public void onNothingSelected(AdapterView<?> parent) {  }  });  convert.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View v) {  if(text.equals("Fahrenheit")) {  fed = Double.parseDouble(fe.getText().toString());  fece = (fed - 32) \* 5 / 9;  ce.setText(fece.toString());  }else if(text.equals("Celsius")) {  ced = Double.parseDouble(ce.getText().toString());  cefe = ((ced \* 9) / 5) + 32;  fe.setText(cefe.toString());  }else if(text.equals("None")){  Toast.makeText(MainActivity.this,"Enter Value",Toast.LENGTH\_SHORT).show();  }  }  });  }  } |

**Output:**

****

**Practical 5**

**Aim: Create a login application with the following features:**

**1. Successful Login message in TextView with Green background if**

**Username & password is correct**

**2. Failure message in TextView with Red background if Username or**

**password is incorrect.**

**3. Disable Login Button after three wrong log in attempts.**

**4. Close application if the user selects Cancel Button.**

**Code:**

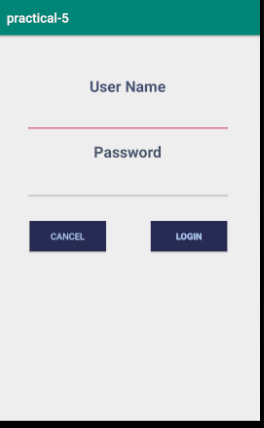
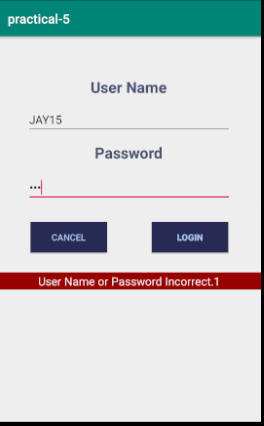
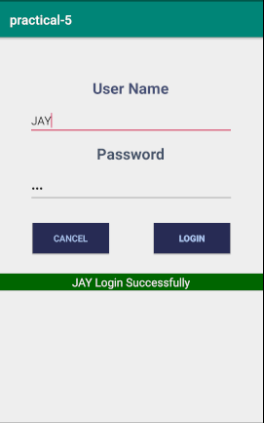
**Activity\_main.xml**

|  |
| --- |
| <?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="#32689ED8"  tools:context=".MainActivity">  <TextView  android:id="@+id/textView"  android:layout\_width="120dp"  android:layout\_height="40dp"  android:gravity="center"  android:text="User Name"  android:textColor="#BF0F1D4E"  android:textSize="24sp"  android:textStyle="bold"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.498"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  app:layout\_constraintVertical\_bias="0.105" />  <TextView  android:id="@+id/textView2"  android:layout\_width="120dp"  android:layout\_height="40dp"  android:gravity="center"  android:text="Password"  android:textColor="#C4132542"  android:textSize="24sp"  android:textStyle="bold"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.498"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/username"  app:layout\_constraintVertical\_bias="0.022" />  <EditText  android:id="@+id/username"  android:layout\_width="320dp"  android:layout\_height="45dp"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.498"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/textView"  app:layout\_constraintVertical\_bias="0.019" />  <Button  android:id="@+id/cancel"  android:layout\_width="120dp"  android:layout\_height="wrap\_content"  android:background="#DA0A0F41"  android:text="@android:string/cancel"  android:textColor="#AAC3F0"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.176"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/password"  app:layout\_constraintVertical\_bias="0.105" />  <Button  android:id="@+id/login"  android:layout\_width="120dp"  android:layout\_height="wrap\_content"  android:background="#DA0A0F41"  android:text="Login"  android:textColor="#AAC3F0"  android:textStyle="bold"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.827"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/password"  app:layout\_constraintVertical\_bias="0.105" />  <EditText  android:id="@+id/password"  android:layout\_width="320dp"  android:layout\_height="45dp"  android:layout\_marginTop="12dp"  android:ems="10"  android:inputType="textPassword"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.505"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/textView2"  app:layout\_constraintVertical\_bias="0.0" />  <TextView  android:id="@+id/message"  android:layout\_width="0dp"  android:layout\_height="27dp"  android:gravity="center"  android:textColor="#FAFCF7F7"  android:textSize="18sp"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/login"  app:layout\_constraintVertical\_bias="0.13" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**MainActivity.java**

|  |
| --- |
| package myapp.example.com.practical5;  import androidx.appcompat.app.AppCompatActivity;  import android.graphics.Color;  import android.graphics.ColorFilter;  import android.os.Bundle;  import android.provider.CalendarContract;  import android.view.View;  import android.widget.Button;  import android.widget.EditText;  import android.widget.TextView;  public class MainActivity extends AppCompatActivity {  EditText username,password;  TextView message;  Button cancel,login;  String user,pass;  int count = 1 ;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.activity\_main);  username = findViewById(R.id.username);  password = findViewById(R.id.password);  cancel = findViewById(R.id.cancel);  login = findViewById(R.id.login);  message = findViewById(R.id.message)  login.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View v) {  user = username.getText().toString();  pass = password.getText().toString();  if(user.equals("JAY") && pass.equals("JAY")){  message.setText(user+" Login Success Fully.");  message.setBackgroundColor(Color.parseColor("#006600"));  }else{  message.setText("User Name or Password Incorrect."+count);  message.setBackgroundColor(Color.parseColor("#990000"));  count = count + 1;  if (count==4){  login.setEnabled(false);  login.setBackgroundColor(Color.BLACK);  }  }  }  });  cancel.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View v) {  System.exit(0);  }  });  }  } |

**Output:**

**Practical 6**

**Aim: Create an application which turns ON or OFF Torch/Flashlight of Camera.**

**Code:**

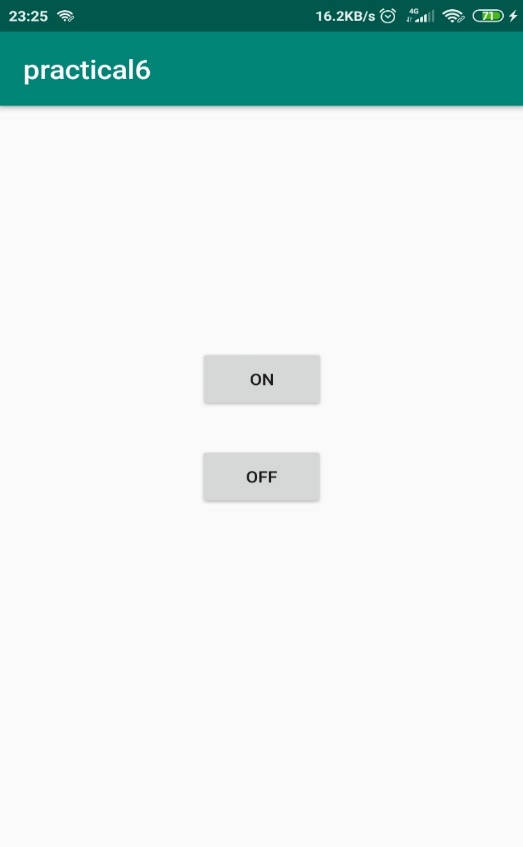
**Activity\_main.xml**

|  |
| --- |
| <?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">  <Button  android:id="@+id/on"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:text="ON"  app:layout\_constraintBottom\_toTopOf="@+id/off"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.501"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  app:layout\_constraintVertical\_bias="0.877" />  <Button  android:id="@+id/off"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:text="OFF"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**MainActivity.java**

|  |
| --- |
| package myapp.example.com.practical6;  import androidx.annotation.RequiresApi;  import androidx.appcompat.app.AppCompatActivity;  import android.content.Context;  import android.hardware.camera2.CameraAccessException;  import android.hardware.camera2.CameraManager;  import android.os.Build;  import android.os.Bundle;  import android.view.View;  import android.widget.Button;  public class MainActivity extends AppCompatActivity {  Button on,off;  @RequiresApi(api = Build.VERSION\_CODES.LOLLIPOP)  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.activity\_main);  on = findViewById(R.id.on);  off = findViewById(R.id.off);  final CameraManager camManager = (CameraManager) getSystemService(Context.CAMERA\_SERVICE);  final String[] cameraId = {null};  on.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View v) {  if (Build.VERSION.SDK\_INT >= Build.VERSION\_CODES.M) {  try {  cameraId[0] = camManager.getCameraIdList()[0];  camManager.setTorchMode(cameraId[0], true); //Turn ON  } catch (CameraAccessException e) {  e.printStackTrace();  }  }  }  });  off.setOnClickListener(new View.OnClickListener() {  @RequiresApi(api = Build.VERSION\_CODES.M)  @Override  public void onClick(View v) {  try {  camManager.setTorchMode(cameraId[0], false);  } catch (CameraAccessException e) {  e.printStackTrace();  }  }  });  }  } |

**Output:**

****

**Practical 7**

**Aim: Create an application that will change the color of the screen, based on selected**

**options from the menu.**

**Code:**

**Activity\_main.xml**

|  |
| --- |
| <?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:id="@+id/con" tools:context=".MainActivity">  <include layout="@layout/toolbar"  android:id="@+id/toolbar"></include>  <TextView  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:text="Hello World!"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintLeft\_toLeftOf="parent"  app:layout\_constraintRight\_toRightOf="parent"  app:layout\_constraintTop\_toTopOf="parent" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**Strings.xml**

|  |
| --- |
| <resources>  <string name="app\_name">practical7</string>  <string name="Red">Red</string>  <string name="Yellow">Yellow</string>  <string name="Blue">Blue</string> </resources> |

**Toolbar.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?> <androidx.appcompat.widget.Toolbar xmlns:android="http://schemas.android.com/apk/res/android"  android:layout\_width="match\_parent"  android:layout\_height="wrap\_content"> </androidx.appcompat.widget.Toolbar> |

**Menu.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?> <menu xmlns:android="http://schemas.android.com/apk/res/android">  <item  android:id="@+id/red"  android:title="@string/Red"></item>  <item  android:id="@+id/yellow"  android:title="@string/Yellow"></item>  <item  android:id="@+id/blue"  android:title="@string/Blue"></item>  </menu> |

**MainActivity.java**

|  |
| --- |
| package com.example.practical7;  import androidx.annotation.NonNull; import androidx.appcompat.app.AppCompatActivity; import androidx.appcompat.widget.Toolbar; import androidx.constraintlayout.widget.ConstraintLayout;  import android.graphics.Color; import android.os.Bundle; import android.view.Menu; import android.view.MenuInflater; import android.view.MenuItem;  public class MainActivity extends AppCompatActivity {   ConstraintLayout con ;   @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.*activity\_main*);   con = findViewById(R.id.*con*);   Toolbar toolbar = findViewById(R.id.*toolbar*);  setSupportActionBar(toolbar);  }   @Override  public boolean onCreateOptionsMenu(Menu menu) {  MenuInflater inflater = getMenuInflater();  inflater.inflate(R.menu.*menu*,menu);  return super.onCreateOptionsMenu(menu);  }   @Override  public boolean onOptionsItemSelected(@NonNull MenuItem item) {   switch (item.getItemId()){  case R.id.*red*:   con.setBackgroundColor(Color.*parseColor*("#ff4d4d"));  break;   case R.id.*yellow*:  con.setBackgroundColor(Color.*parseColor*("#ffff33"));  break;   case R.id.*blue*:  con.setBackgroundColor(Color.*parseColor*("#9999ff"));  break;   }  return super.onOptionsItemSelected(item);  } } |

**Output:**

****

**Practical 8**

**Aim: Create an application that will change the color of the screen, based on selected**

**options from the menu.**

**Code:**

**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"**>  <**Button  android:id="@+id/button1"  android:layout\_width="fill\_parent"  android:layout\_height="wrap\_content"  android:text="Fragment No.1"  android:onClick="selectFrag"** />  <**Button  android:id="@+id/button2"  android:layout\_width="fill\_parent"  android:layout\_height="wrap\_content"  android:onClick="selectFrag"  android:text="Fragment No.2"** />  <**fragment  android:name="com.example.dell.pra8.fragments.fragmentOne"  android:id="@+id/fragment\_place"  android:layout\_width="match\_parent"  android:layout\_height="match\_parent"**/> </**LinearLayout**> |

**MainActivity.java**

|  |
| --- |
| **package** com.example.pra8;  **import** android.app.Fragment; **import** android.app.FragmentManager; **import** android.app.FragmentTransaction; **import** android.support.v7.app.AppCompatActivity; **import** android.os.Bundle; **import** android.view.View; **import** com.example.dell.pra8.fragments.fragentTwo; **import** com.example.dell.pra8.fragments.fragmentOne;  **public class** MainActivity **extends** AppCompatActivity {   @Override  **protected void** onCreate(Bundle savedInstanceState) {  **super**.onCreate(savedInstanceState);  setContentView(R.layout.***activity\_main***);  }   **public void** selectFrag(View view) {  Fragment fr;   **if**(view == findViewById(R.id.***button2***)) {  fr = **new** fragentTwo();   }**else** {  fr = **new** fragmentOne();  }  FragmentManager fm = getFragmentManager();  FragmentTransaction fragmentTransaction = fm.beginTransaction();  fragmentTransaction.replace(R.id.***fragment\_place***, fr);  fragmentTransaction.commit();  } } |

**Output:**



**Practical 9**

**Aim: Create an application with the help of web view.**

**Code:**

**Activity\_main.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?> <RelativeLayout 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">  <WebView  android:id="@+id/webview"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"/> </RelativeLayout> |

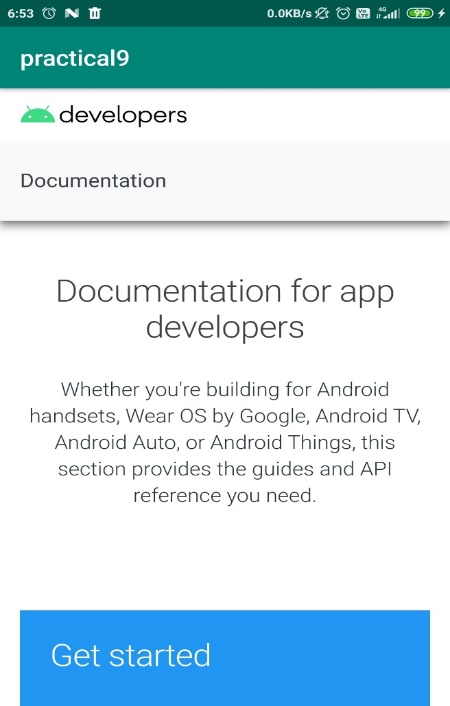
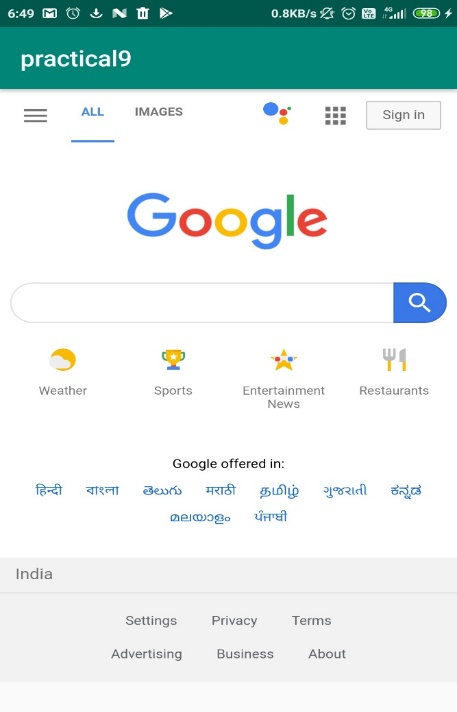
**AndroidMainfest.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?> <manifest xmlns:android="http://schemas.android.com/apk/res/android"  package="com.example.practical9">    <uses-permission android:name="android.permission.INTERNET"/>   <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>  </manifest> |

**MainActivity.java**

|  |
| --- |
| package com.example.practical9;  import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.webkit.WebView; import android.webkit.WebViewClient;  public class MainActivity extends AppCompatActivity {  WebView webview;   @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.*activity\_main*);  webview = findViewById(R.id.*webview*);  webview.setWebViewClient(new WebViewClient());  webview.loadUrl("http://www.google.com");  }  @Override  public void onBackPressed() {  if (webview.canGoBack()){  webview.goBack();  }else {  super.onBackPressed();  }  } } |

**Output:**



**Practical 10**

**Aim: Create an application with the help of the database.**

**Code:**

**Activity\_main.xml**

|  |
| --- |
| <?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"  android:background="#fff"  >  <Button  android:id="@+id/button5"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginStart="161dp"  android:layout\_marginLeft="161dp"  android:layout\_marginTop="283dp"  android:layout\_marginEnd="162dp"  android:layout\_marginRight="162dp"  android:layout\_marginBottom="64dp"  android:background="#FFE5E5"  android:text="Insert"  android:textColor="#000"  app:layout\_constraintBottom\_toTopOf="@+id/button6"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent" />  <Button  android:id="@+id/button6"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginStart="161dp"  android:layout\_marginLeft="161dp"  android:layout\_marginTop="64dp"  android:layout\_marginEnd="162dp"  android:layout\_marginRight="162dp"  android:layout\_marginBottom="64dp"  android:background="#FFE5E5"  android:text="Delete"  android:textColor="#000"  app:layout\_constraintBottom\_toTopOf="@+id/button7"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/button5" />  <Button  android:id="@+id/button7"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginStart="161dp"  android:layout\_marginLeft="161dp"  android:layout\_marginTop="64dp"  android:layout\_marginEnd="162dp"  android:layout\_marginRight="162dp"  android:layout\_marginBottom="148dp"  android:background="#FFE5E5"  android:text="View All"  android:textColor="#000"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/button6" />  <TextView  android:id="@+id/textView3"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginStart="159dp"  android:layout\_marginLeft="159dp"  android:layout\_marginTop="95dp"  android:layout\_marginEnd="159dp"  android:layout\_marginRight="159dp"  android:layout\_marginBottom="144dp"  android:text="Database Data"  app:layout\_constraintBottom\_toTopOf="@+id/button5"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  android:textColor="#B53160"  android:textSize="30sp"  />  </androidx.constraintlayout.widget.ConstraintLayout> |

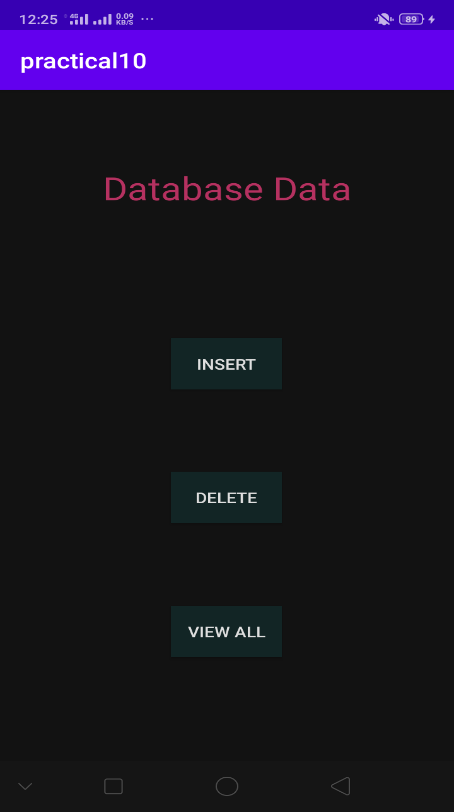
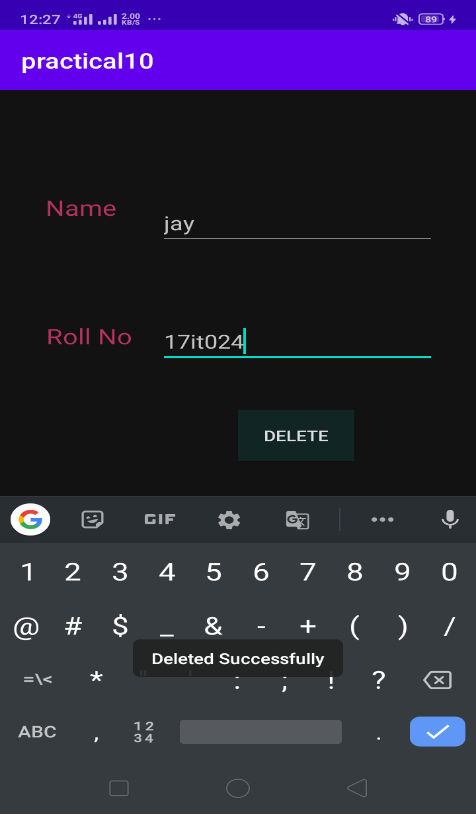
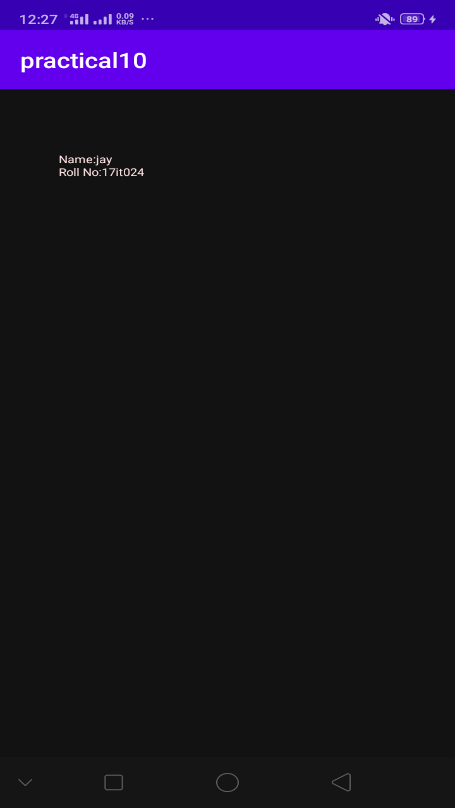
**Activit\_insert.xml**

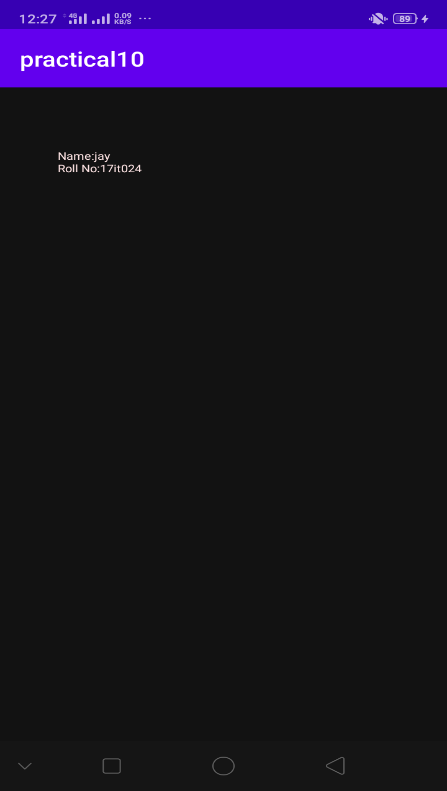
|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"  xmlns:app="http://schemas.android.com/apk/res-auto"  xmlns:tools="http://schemas.android.com/tools"  android:layout\_width="match\_parent"  android:layout\_height="match\_parent"  tools:context=".Insert"  android:background="#fff"  >  <EditText  android:id="@+id/editText"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginTop="156dp"  android:layout\_marginEnd="30dp"  android:layout\_marginRight="30dp"  android:layout\_marginBottom="60dp"  android:ems="10"  android:hint="Name"  android:inputType="textPersonName"  app:layout\_constraintBottom\_toTopOf="@+id/editText2"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintTop\_toTopOf="parent" />  <TextView  android:id="@+id/textView"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginStart="58dp"  android:layout\_marginLeft="58dp"  android:layout\_marginTop="96dp"  android:layout\_marginEnd="56dp"  android:layout\_marginRight="56dp"  android:text="Name"  android:textColor="#B53160"  android:textSize="20sp"  app:layout\_constraintEnd\_toStartOf="@+id/editText"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent" />  <EditText  android:id="@+id/editText2"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginTop="60dp"  android:layout\_marginEnd="30dp"  android:layout\_marginRight="30dp"  android:layout\_marginBottom="425dp"  android:ems="10"  android:hint="Roll No"  android:inputType="textPersonName"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/editText" />  <TextView  android:id="@+id/textView2"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginStart="58dp"  android:layout\_marginLeft="58dp"  android:layout\_marginTop="145dp"  android:layout\_marginEnd="20dp"  android:layout\_marginRight="20dp"  android:layout\_marginBottom="437dp"  android:text="Roll No"  android:textColor="#B53160"  android:textSize="20sp"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toStartOf="@+id/editText2"  app:layout\_constraintHorizontal\_bias="1.0"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/textView" />  <Button  android:id="@+id/button"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginStart="180dp"  android:layout\_marginLeft="180dp"  android:layout\_marginTop="58dp"  android:layout\_marginEnd="92dp"  android:layout\_marginRight="92dp"  android:layout\_marginBottom="299dp"  android:background="#FFE5E5"  android:text="Insert"  android:textColor="#000"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/editText2" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**activity\_delete.xml**

|  |
| --- |
| <?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=".Delete"  android:background="#fff"  >  <EditText  android:id="@+id/editText"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginTop="156dp"  android:layout\_marginEnd="30dp"  android:layout\_marginRight="30dp"  android:layout\_marginBottom="60dp"  android:ems="10"  android:hint="Name"  android:inputType="textPersonName"  app:layout\_constraintBottom\_toTopOf="@+id/editText2"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintTop\_toTopOf="parent" />  <TextView  android:id="@+id/textView"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginStart="58dp"  android:layout\_marginLeft="58dp"  android:layout\_marginTop="96dp"  android:layout\_marginEnd="56dp"  android:layout\_marginRight="56dp"  android:text="Name"  android:textColor="#B53160"  android:textSize="20sp"  app:layout\_constraintEnd\_toStartOf="@+id/editText"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent" />  <EditText  android:id="@+id/editText2"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginTop="60dp"  android:layout\_marginEnd="30dp"  android:layout\_marginRight="30dp"  android:layout\_marginBottom="425dp"  android:ems="10"  android:hint="Roll No"  android:inputType="textPersonName"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/editText" />  <TextView  android:id="@+id/textView2"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginStart="58dp"  android:layout\_marginLeft="58dp"  android:layout\_marginTop="145dp"  android:layout\_marginEnd="20dp"  android:layout\_marginRight="20dp"  android:layout\_marginBottom="437dp"  android:text="Roll No"  android:textColor="#B53160"  android:textSize="20sp"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toStartOf="@+id/editText2"  app:layout\_constraintHorizontal\_bias="1.0"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/textView" />  <Button  android:id="@+id/button"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginStart="180dp"  android:layout\_marginLeft="180dp"  android:layout\_marginTop="58dp"  android:layout\_marginEnd="92dp"  android:layout\_marginRight="92dp"  android:layout\_marginBottom="299dp"  android:background="#FFE5E5"  android:text="Delete"  android:textColor="#000"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/editText2" />  </androidx.constraintlayout.widget.ConstraintLayout>  **activity.viewa.xml:**  <?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=".Viewa"  android:background="#fff"  >  <TextView  android:id="@+id/textView4"  android:layout\_width="259dp"  android:layout\_height="498dp"  android:layout\_marginStart="48dp"  android:layout\_marginLeft="48dp"  android:layout\_marginTop="35dp"  android:layout\_marginEnd="56dp"  android:layout\_marginRight="56dp"  android:layout\_marginBottom="48dp"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  android:textSize="10sp"  android:textColor="#FFE5E5"  />  </androidx.constraintlayout.widget.ConstraintLayout>  **Mainactivit.java:**  package com.example.practical10;  import androidx.appcompat.app.AppCompatActivity;  import android.content.Context;  import android.content.Intent;  import android.database.sqlite.SQLiteDatabase;  import android.os.Bundle;  import android.provider.ContactsContract;  import android.view.View;  import android.widget.Button;  import android.database.Cursor;  public class MainActivity extends AppCompatActivity {  Button in,del,viewa;  SQLiteDatabase db;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate( savedInstanceState );  setContentView( R.layout.activity\_main );  in=findViewById(R.id.button5);  del=findViewById(R.id.button6);  viewa=findViewById(R.id.button7);  db=openOrCreateDatabase("myDb", Context.MODE\_PRIVATE,null);  db.execSQL("CREATE TABLE IF NOT EXISTS student(name VARCHAR,rollno VARCHAR);");  in.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View v) {  startActivity(new Intent(MainActivity.this, Insert.class));  }  });  del.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View v) {  startActivity(new Intent(MainActivity.this, Delete.class));  }  });  viewa.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View v) {  startActivity(new Intent(MainActivity.this,Viewa.class));  }  });  }  }  **Insert.java:**  package com.example.practical10;  import androidx.appcompat.app.AppCompatActivity;  import android.content.Context;  import android.database.SQLException;  import android.database.sqlite.SQLiteDatabase;  import android.os.Bundle;  import android.view.View;  import android.widget.EditText;  import android.widget.Toast;  import android.widget.Button;  public class Insert extends AppCompatActivity {  EditText name,rollno;  Button insert;  SQLiteDatabase db;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate( savedInstanceState );  setContentView( R.layout.activity\_insert );  name=findViewById(R.id.editText);  rollno=findViewById(R.id.editText2);  insert=findViewById(R.id.button);  db=openOrCreateDatabase("myDb", Context.MODE\_PRIVATE,null);  insert.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View v) {  if (name.getText().toString().trim().length()==0 || rollno.getText().toString().trim().length()==0){  Toast.makeText(getApplicationContext(),"Please Enter Details", Toast.LENGTH\_SHORT).show();  }  else  {  try{  db.execSQL("INSERT INTO student VALUES('"+name.getText()+"','"+rollno.getText()+"');");  Toast.makeText(getApplicationContext(),"Inserted Successfully",Toast.LENGTH\_SHORT).show();  }  catch (SQLException e){  Toast.makeText(getApplicationContext(),"Operation Not Successful",Toast.LENGTH\_SHORT).show();  }  }  }  });  }  }  **Delete.java:**  package com.example.practical10;  import androidx.appcompat.app.AppCompatActivity;  import android.content.Context;  import android.database.Cursor;  import android.database.sqlite.SQLiteDatabase;  import android.os.Bundle;  import android.view.View;  import android.widget.Button;  import android.widget.EditText;  import android.widget.Toast;  public class Delete extends AppCompatActivity {  EditText name,rollno;  Button delete;  SQLiteDatabase db;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate( savedInstanceState );  setContentView( R.layout.activity\_delete );  name=findViewById(R.id.editText);  rollno=findViewById(R.id.editText2);  delete=findViewById(R.id.button);  db=openOrCreateDatabase("myDb", Context.MODE\_PRIVATE,null);  delete.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View v) {  if (name.getText().toString().trim().length()==0 || rollno.getText().toString().trim().length()==0){  Toast.makeText(getApplicationContext(),"Please Enter Details", Toast.LENGTH\_SHORT).show();  }  Cursor c=db.rawQuery("SELECT \* FROM student WHERE name='"+name.getText()+"'", null);  if(c.moveToFirst())  {  db.execSQL("DELETE FROM student WHERE name='"+name.getText()+"'");  Toast.makeText(getApplicationContext(),"Deleted Successfully",Toast.LENGTH\_SHORT).show();  }  else  {  Toast.makeText(getApplicationContext(),"Operation Not Successful",Toast.LENGTH\_SHORT).show();  }  }  });  }  }  **Viewa.java:**  package com.example.practical10;  import androidx.appcompat.app.AppCompatActivity;  import android.content.Context;  import android.database.Cursor;  import android.database.sqlite.SQLiteDatabase;  import android.os.Bundle;  import android.widget.EditText;  import android.widget.TextView;  import android.widget.Toast;  public class Viewa extends AppCompatActivity {  TextView t1;  SQLiteDatabase db;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate( savedInstanceState );  setContentView( R.layout.activity\_viewa );  t1=findViewById(R.id.textView4);  db=openOrCreateDatabase("myDb", Context.MODE\_PRIVATE,null);  Cursor c=db.rawQuery("SELECT \* FROM student",null);  if (c.getCount()==0){  Toast.makeText(getApplicationContext(),"No Data Found",Toast.LENGTH\_SHORT).show();  }  StringBuffer result=new StringBuffer();  while (c.moveToNext()){  result.append("Name:"+c.getString(0)+"\n");  result.append("Roll No:"+c.getString(1)+"\n\n");  }  t1.setText(result.toString());  }  } |

**Output:**



**Practical 11**

**Aim: Creating an application that provides Single Sign-on (SSO) with Chrome Custom  
Tabs via the AppAuth library, and optionally push managed configuration to  
provide a user login hint.**

**CODE:**

**Activicty\_main.xml**

|  |
| --- |
| <?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">  <Button  android:id="@+id/signin"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:text="Sign In with Google"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent" />  </androidx.constraintlayout.widget.ConstraintLayout> |

**Mainactivity.java**

|  |
| --- |
| package com.example.practical11;  import androidx.appcompat.app.AppCompatActivity;  import android.content.Intent;  import android.os.Bundle;  import android.util.Log;  import android.view.View;  import android.widget.Button;  import com.google.android.gms.auth.api.signin.GoogleSignIn;  import com.google.android.gms.auth.api.signin.GoogleSignInAccount;  import com.google.android.gms.auth.api.signin.GoogleSignInClient;  import com.google.android.gms.auth.api.signin.GoogleSignInOptions;  import com.google.android.gms.common.api.ApiException;  import com.google.android.gms.tasks.Task;  public class MainActivity extends AppCompatActivity {  Button signin;  GoogleSignInClient mGoogleSignInClient;  int RC\_SIGN\_IN=0;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.activity\_main);  signin = findViewById(R.id.signin);  signin.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View view) {  switch (view.getId()) {  case R.id.signin:  signIn();  break;  // ...  }  }  });  GoogleSignInOptions gso = new GoogleSignInOptions.Builder(GoogleSignInOptions.DEFAULT\_SIGN\_IN)  .requestEmail()  .build();  mGoogleSignInClient = GoogleSignIn.getClient(this, gso);  }  private void signIn() {  Intent signInIntent = mGoogleSignInClient.getSignInIntent();  startActivityForResult(signInIntent, RC\_SIGN\_IN);  }  @Override  public void onActivityResult(int requestCode, int resultCode, Intent data) {  super.onActivityResult(requestCode, resultCode, data);  // Result returned from launching the Intent from GoogleSignInClient.getSignInIntent(...);  if (requestCode == RC\_SIGN\_IN) {  // The Task returned from this call is always completed, no need to attach  // a listener.  Task<GoogleSignInAccount> task = GoogleSignIn.getSignedInAccountFromIntent(data);  handleSignInResult(task);  }  }  private void handleSignInResult(Task<GoogleSignInAccount> completedTask) {  try {  GoogleSignInAccount account = completedTask.getResult(ApiException.class);  // Signed in successfully, show authenticated UI.  Intent intent = new Intent(MainActivity.this,secondActivity.class);  startActivity(intent);  } catch (ApiException e) {  // The ApiException status code indicates the detailed failure reason.  // Please refer to the GoogleSignInStatusCodes class reference for more information.  Log.w("Error", "signInResult:failed code=" + e.getStatusCode());  }  }  } |

**Activity\_second.xml**

|  |
| --- |
| <?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=".secondActivity">  <ImageView  android:id="@+id/imageView"  android:layout\_width="200dp"  android:layout\_height="200dp"  android:layout\_marginTop="124dp"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.498"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  app:srcCompat="@drawable/ic\_launcher\_background"  tools:ignore="VectorDrawableCompat" />  <TextView  android:id="@+id/name"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginTop="36dp"  android:text="Name"  android:textColor="#040B39"  android:textSize="18sp"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/imageView" />  <TextView  android:id="@+id/email"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:layout\_marginTop="40dp"  android:text="Email Address"  android:textColor="#040B39"  android:textSize="18sp"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/name" />  <Button  android:id="@+id/signout"  android:layout\_width="wrap\_content"  android:layout\_height="wrap\_content"  android:text="sign out"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.498"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toBottomOf="@+id/email"  app:layout\_constraintVertical\_bias="0.389" />  </androidx.constraintlayout.widget.ConstraintLayout> |

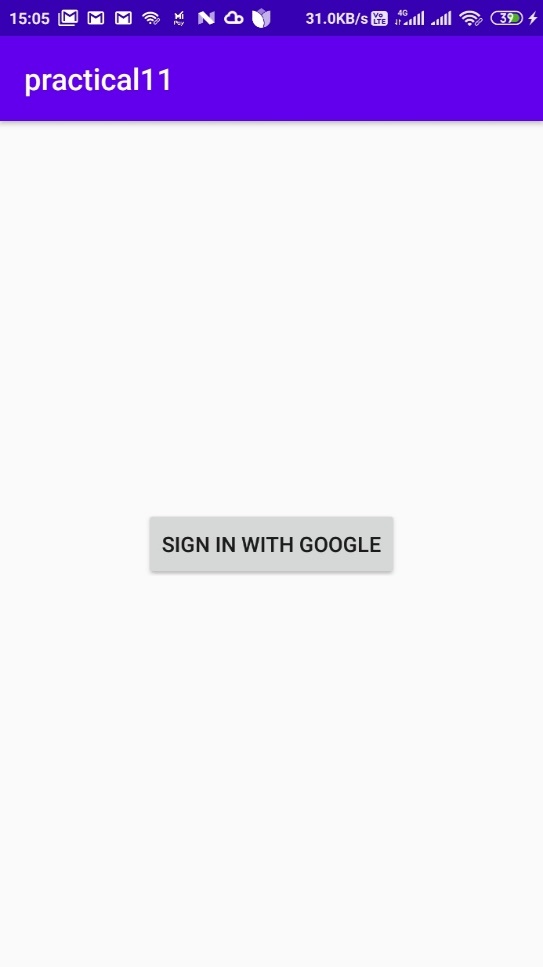
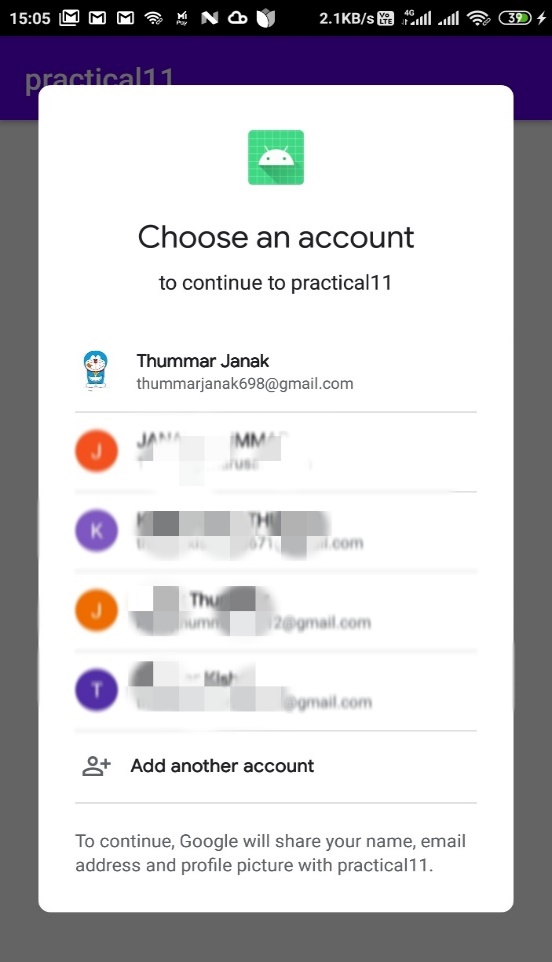
**Secondactivicty.java**

|  |
| --- |
| package myapp.janak.com.practical11;  import androidx.annotation.NonNull;  import androidx.appcompat.app.AppCompatActivity;  import android.net.Uri;  import android.os.Bundle;  import android.view.View;  import android.widget.Button;  import android.widget.ImageView;  import android.widget.TextView;  import android.widget.Toast;  import com.bumptech.glide.Glide;  import com.google.android.gms.auth.api.signin.GoogleSignIn;  import com.google.android.gms.auth.api.signin.GoogleSignInAccount;  import com.google.android.gms.auth.api.signin.GoogleSignInClient;  import com.google.android.gms.auth.api.signin.GoogleSignInOptions;  import com.google.android.gms.tasks.OnCompleteListener;  import com.google.android.gms.tasks.Task;  public class secondActivity extends AppCompatActivity {  TextView name,email;  ImageView imageView;  GoogleSignInClient mGoogleSignInClient;  Button signout;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.activity\_second);  name = findViewById(R.id.name);  email = findViewById(R.id.email);  imageView = findViewById(R.id.imageView);  signout = findViewById(R.id.signout);  GoogleSignInOptions gso = new GoogleSignInOptions.Builder(GoogleSignInOptions.DEFAULT\_SIGN\_IN)  .requestEmail()  .build();  signout.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View view) {  switch (view.getId()) {  // ...  case R.id.signout:  signOut();  break;  // ...  }  }  });  GoogleSignInAccount acct = GoogleSignIn.getLastSignedInAccount(this);  if (acct != null) {  String personName = acct.getDisplayName();  String personEmail = acct.getEmail();  Uri personPhoto = acct.getPhotoUrl();  name.setText(personName);  email.setText(personEmail);  Glide.with(this).load(String.valueOf(personPhoto)).into(imageView);  }  }  private void signOut() {  mGoogleSignInClient.signOut()  .addOnCompleteListener(this, new OnCompleteListener<Void>() {  @Override  public void onComplete(@NonNull Task<Void> task) {  Toast.makeText(secondActivity.this,"SignOut",Toast.LENGTH\_LONG).show();  finish();  }  });  }  } |

**Androidmanifest.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <manifest xmlns:android="http://schemas.android.com/apk/res/android"  package="com.example.practical11">  <uses-permission android:name="android.permission.INTERNET"/>  <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=".secondActivity"></activity>  <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**

** **

**Practical 12**

**Aim: Create an application to handle support voice interaction.**

**Code:**

**Activity\_main.xml**

|  |
| --- |
| <?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:orientation="vertical">  <TextView  android:id="@+id/txvResult"  android:layout\_width="match\_parent"  android:layout\_height="wrap\_content"  android:layout\_alignParentTop="true"  android:layout\_alignParentBottom="true"  android:layout\_centerHorizontal="true"  android:textColor="#000"  android:textSize="26sp"  android:textStyle="normal"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.0"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  app:layout\_constraintVertical\_bias="0.103" />  <ImageView  android:id="@+id/btnSpeak"  android:layout\_width="100dp"  android:layout\_height="100dp"  android:layout\_alignParentTop="true"  android:layout\_alignParentBottom="true"  android:layout\_centerHorizontal="true"  android:gravity="center"  android:onClick="getSpeechInput"  android:src="@drawable/ic\_mic"  app:layout\_constraintBottom\_toBottomOf="parent"  app:layout\_constraintEnd\_toEndOf="parent"  app:layout\_constraintHorizontal\_bias="0.498"  app:layout\_constraintStart\_toStartOf="parent"  app:layout\_constraintTop\_toTopOf="parent"  app:layout\_constraintVertical\_bias="0.908" />  </androidx.constraintlayout.widget.ConstraintLayout> |

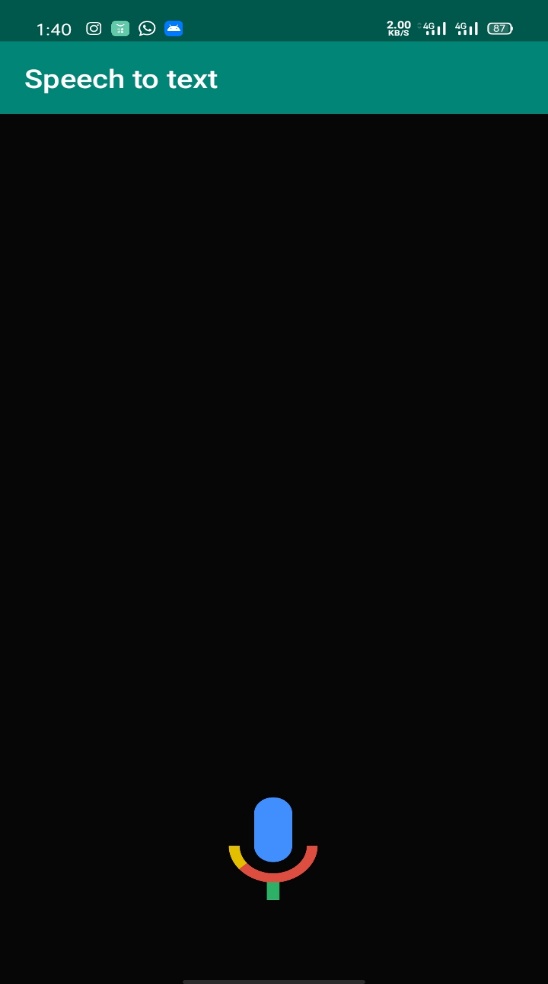
**AndroidMainfest.xml**

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

**MainActivity.java**

|  |
| --- |
| package com.example.speechtotext;  import androidx.appcompat.app.AppCompatActivity;  import android.os.Bundle;  import android.content.Intent;  import android.os.Bundle;  import android.speech.RecognizerIntent;  import android.view.View;  import android.widget.TextView;  import android.widget.Toast;  import java.util.ArrayList;  import java.util.Locale;  public class MainActivity extends AppCompatActivity {  TextView txvResult;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate( savedInstanceState );  setContentView( R.layout.activity\_main );  txvResult = findViewById( R.id.txvResult );  }  public void getSpeechInput(View view) {  Intent intent = new Intent(RecognizerIntent.ACTION\_RECOGNIZE\_SPEECH);  intent.putExtra(RecognizerIntent.EXTRA\_LANGUAGE\_MODEL, RecognizerIntent.LANGUAGE\_MODEL\_FREE\_FORM);  intent.putExtra(RecognizerIntent.EXTRA\_LANGUAGE, Locale.getDefault());  if (intent.resolveActivity(getPackageManager()) != null) {  startActivityForResult(intent, 10);  } else {  Toast.makeText(this, "Your Device Don't Support Speech Input", Toast.LENGTH\_SHORT).show();  }  }  @Override  protected void onActivityResult(int requestCode, int resultCode, Intent data) {  super.onActivityResult(requestCode, resultCode, data);  switch (requestCode) {  case 10:  if (resultCode == RESULT\_OK && data != null) {  ArrayList<String> result = data.getStringArrayListExtra(RecognizerIntent.EXTRA\_RESULTS);  txvResult.setText(result.get(0));  }  break;  }  }  } |

**Output:**

  ****

**Practical 13**

**Aim: Create an application to play video using the YouTube API in PIP mode.**

**Code:**

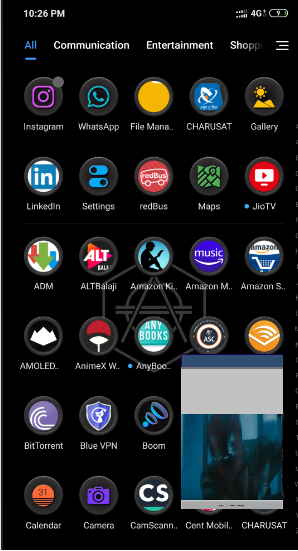
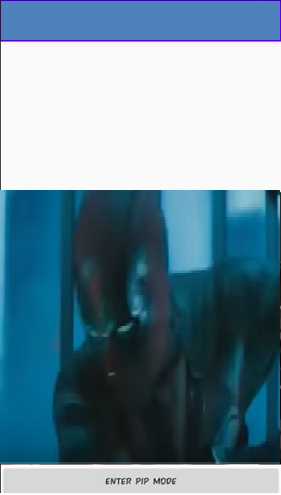
**Activity\_main.xml**

|  |
| --- |
| <?xml version="1.0" encoding="utf-8"?>  <RelativeLayout  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">  <VideoView  android:layout\_width="match\_parent"  android:layout\_height="match\_parent"  android:id="@+id/video"  android:layout\_above="@id/pipbtn"/>  <Button  android:layout\_width="match\_parent"  android:layout\_height="wrap\_content"  android:text="Enter PIP mode"  android:layout\_alignParentBottom="true"  android:id="@+id/pipbtn"/>  </RelativeLayout> |

**Mainactivity.java**

|  |
| --- |
| package com.example.practical13;  import androidx.appcompat.app.AppCompatActivity;  import android.app.ActionBar;  import android.app.Notification;  import android.app.PictureInPictureParams;  import android.drm.DrmStore;  import android.graphics.Point;  import android.net.Uri;  import android.os.Build;  import android.os.Bundle;  import android.util.Rational;  import android.view.Display;  import android.view.View;  import android.widget.Button;  import android.widget.MediaController;  import android.widget.VideoView;  public class MainActivity extends AppCompatActivity {  Button pipbtn;  String path = "/storage/DCIM/Camera/movie.mp4";  ActionBar actionBar;  VideoView video;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.activity\_main);  video = (VideoView)findViewById(R.id.video);  actionBar = getActionBar();  MediaController mediaController= new MediaController(this);  mediaController.setAnchorView(video);  video.setMediaController(mediaController);  video.setVideoURI(Uri.parse(path));  video.requestFocus();  video.start();  pipbtn = (Button)findViewById(R.id.pipbtn);  pipbtn.setOnClickListener(new View.OnClickListener() {  @Override  public void onClick(View view) {  Display display = getWindowManager().getDefaultDisplay();  Point point = new Point();  display.getSize(point);  int width = point.x;  int height = point.y;  Rational ratio = null;  if (Build.VERSION.SDK\_INT >= Build.VERSION\_CODES.LOLLIPOP) {  ratio = new Rational(width,height);  }  PictureInPictureParams.Builder pip\_builder = null;  if (Build.VERSION.SDK\_INT >= Build.VERSION\_CODES.O) {  pip\_builder = new PictureInPictureParams.Builder();  }  if (Build.VERSION.SDK\_INT >= Build.VERSION\_CODES.O) {  pip\_builder.setAspectRatio(ratio).build();  }  pipbtn.setVisibility(View.INVISIBLE);  if (Build.VERSION.SDK\_INT >= Build.VERSION\_CODES.O) {  enterPictureInPictureMode(pip\_builder.build());  }  }  });  }  } |

**OUTPUT:**



**Practical 14**

**Aim: Create an application that uses the end-to-end process of training a machine  
learning model that can recognize handwritten characters images with TensorFlow and  
deploy it to an Android app.**

**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:padding="16dp"  tools:context=".MainActivity">  <TableLayout  android:layout\_width="match\_parent"  android:layout\_height="wrap\_content">  <TextView  style="@style/ResultText"  android:text="@string/prediction"/>  <TextView  android:id="@+id/tv\_prediction"  style="@style/ResultText"  android:textSize="24sp"  android:textColor="@android:color/black"  android:text="@string/empty"  tools:text="1"/>  <TableRow>  <TextView  style="@style/ResultText"  android:text="@string/probability"/>  <TextView  style="@style/ResultText"  android:text="@string/timecost"/>  </TableRow>  <TableRow>  <TextView  android:id="@+id/tv\_probability"  style="@style/ResultText"  android:textColor="@android:color/black"  android:text="@string/empty"  tools:text="0.9"/>  <TextView  android:id="@+id/tv\_timecost"  style="@style/ResultText"  android:textColor="@android:color/black"  android:text="@string/empty"  tools:text="10ms"/>  </TableRow>  </TableLayout>  <com.nex3z.fingerpaintview.FingerPaintView  android:id="@+id/fpv\_paint"  android:layout\_width="200dp"  android:layout\_height="200dp"  android:layout\_gravity="center"  android:layout\_marginTop="16dp"  android:foreground="@drawable/shape\_rect\_border"/>  <LinearLayout  android:layout\_width="match\_parent"  android:layout\_height="wrap\_content"  android:layout\_marginTop="16dp"  android:orientation="horizontal">  <Button  android:id="@+id/btn\_detect"  android:layout\_width="match\_parent"  android:layout\_height="wrap\_content"  android:layout\_weight="1"  android:text="@string/detect"/>  <Button  android:id="@+id/btn\_clear"  android:layout\_width="match\_parent"  android:layout\_height="wrap\_content"  android:layout\_weight="1"  android:text="@string/clear"/>  </LinearLayout>  </LinearLayout> |

**MainActivity.java**

|  |
| --- |
| package com.example.practical14;  import android.graphics.Bitmap;  import android.os.Bundle;  import android.util.Log;  import android.widget.TextView;  import android.widget.Toast;  import com.nex3z.fingerpaintview.FingerPaintView;  import java.io.IOException;  import androidx.appcompat.app.AppCompatActivity;  import butterknife.BindView;  import butterknife.ButterKnife;  import butterknife.OnClick;  public class MainActivity extends AppCompatActivity {  private static final String LOG\_TAG = "lele";  @BindView(R.id.fpv\_paint) FingerPaintView mFpvPaint;  @BindView(R.id.tv\_prediction) TextView mTvPrediction;  @BindView(R.id.tv\_probability) TextView mTvProbability;  @BindView(R.id.tv\_timecost) TextView mTvTimeCost;  private Classifier mClassifier;  @Override  protected void onCreate(Bundle savedInstanceState) {  super.onCreate(savedInstanceState);  setContentView(R.layout.activity\_main);  ButterKnife.bind(this);  init();  }  @OnClick(R.id.btn\_detect)  void onDetectClick() {  if (mClassifier == null) {  Log.e(LOG\_TAG, "onDetectClick(): Classifier is not initialized");  return;  } else if (mFpvPaint.isEmpty()) {  Toast.makeText(this, R.string.please\_write\_a\_digit, Toast.LENGTH\_SHORT).show();  return;  }  Bitmap image = mFpvPaint.exportToBitmap(  Classifier.IMG\_WIDTH, Classifier.IMG\_HEIGHT);  Result result = mClassifier.classify(image);  renderResult(result);  }  @OnClick(R.id.btn\_clear)  void onClearClick() {  mFpvPaint.clear();  mTvPrediction.setText(R.string.empty);  mTvProbability.setText(R.string.empty);  mTvTimeCost.setText(R.string.empty);  }  private void init() {  try {  mClassifier = new Classifier(MainActivity.this);  } catch (IOException e) {  Toast.makeText(this, e.getMessage().toString(), Toast.LENGTH\_LONG).show();  Log.e(LOG\_TAG, "init(): Failed to create Classifier", e);  }  }  private void renderResult(Result result) {  mTvPrediction.setText(String.valueOf(result.getNumber()));  mTvProbability.setText(String.valueOf(result.getProbability()));  mTvTimeCost.setText(String.format(getString(R.string.timecost\_value),  result.getTimeCost()));  }  } |

**Classifier.java**

|  |
| --- |
| package com.example.practical14;  import android.app.Activity;  import android.content.res.AssetFileDescriptor;  import android.graphics.Bitmap;  import android.os.SystemClock;  import android.util.Log;  import org.tensorflow.lite.Interpreter;  import java.io.FileInputStream;  import java.io.IOException;  import java.nio.ByteBuffer;  import java.nio.ByteOrder;  import java.nio.MappedByteBuffer;  import java.nio.channels.FileChannel;  import java.util.Arrays;  public class Classifier {  private static final String LOG\_TAG = Classifier.class.getSimpleName();  private static final String MODEL\_NAME = "mnist.tflite";  private static final int BATCH\_SIZE = 1;  public static final int IMG\_HEIGHT = 28;  public static final int IMG\_WIDTH = 28;  private static final int NUM\_CHANNEL = 1;  private static final int NUM\_CLASSES = 10;  private final Interpreter.Options options = new Interpreter.Options();  private final Interpreter mInterpreter;  private final ByteBuffer mImageData;  private final int[] mImagePixels = new int[IMG\_HEIGHT \* IMG\_WIDTH];  private final float[][] mResult = new float[1][NUM\_CLASSES];  public Classifier(MainActivity activity) throws IOException {  mInterpreter = new Interpreter(loadModelFile(activity), options);  mImageData = ByteBuffer.allocateDirect(  4 \* BATCH\_SIZE \* IMG\_HEIGHT \* IMG\_WIDTH \* NUM\_CHANNEL);  mImageData.order(ByteOrder.nativeOrder());  }  public Result classify(Bitmap bitmap) {  convertBitmapToByteBuffer(bitmap);  long startTime = SystemClock.uptimeMillis();  mInterpreter.run(mImageData, mResult);  long endTime = SystemClock.uptimeMillis();  long timeCost = endTime - startTime;  Log.v(LOG\_TAG, "classify(): result = " + Arrays.toString(mResult[0])  + ", timeCost = " + timeCost);  return new Result(mResult[0], timeCost);  }  private MappedByteBuffer loadModelFile(Activity activity) throws IOException {  AssetFileDescriptor fileDescriptor = activity.getAssets().openFd(MODEL\_NAME);  FileInputStream inputStream = new FileInputStream(fileDescriptor.getFileDescriptor());  FileChannel fileChannel = inputStream.getChannel();  long startOffset = fileDescriptor.getStartOffset();  long declaredLength = fileDescriptor.getDeclaredLength();  return fileChannel.map(FileChannel.MapMode.READ\_ONLY, startOffset, declaredLength);  }  private void convertBitmapToByteBuffer(Bitmap bitmap) {  if (mImageData == null) {  return;  }  mImageData.rewind();  bitmap.getPixels(mImagePixels, 0, bitmap.getWidth(), 0, 0,  bitmap.getWidth(), bitmap.getHeight());  int pixel = 0;  for (int i = 0; i < IMG\_WIDTH; ++i) {  for (int j = 0; j < IMG\_HEIGHT; ++j) {  int value = mImagePixels[pixel++];  mImageData.putFloat(convertPixel(value));  }  }  }  private static float convertPixel(int color) {  return (255 - (((color >> 16) & 0xFF) \* 0.299f  + ((color >> 8) & 0xFF) \* 0.587f  + (color & 0xFF) \* 0.114f)) / 255.0f;  }  } |

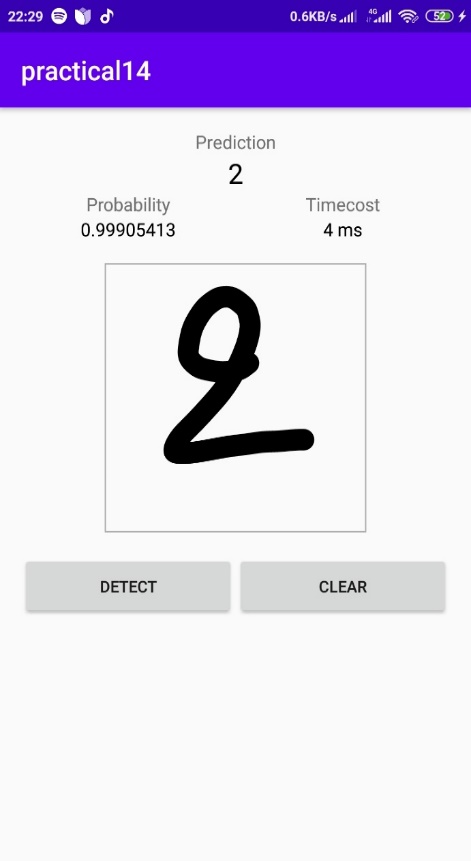
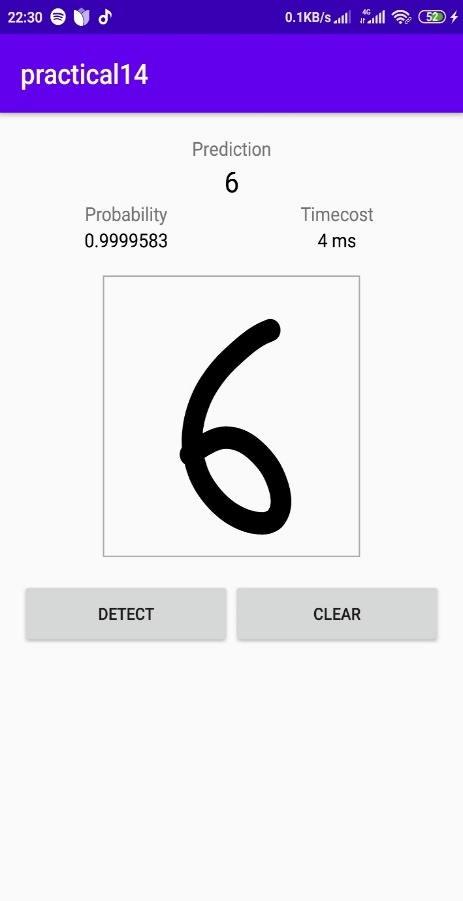
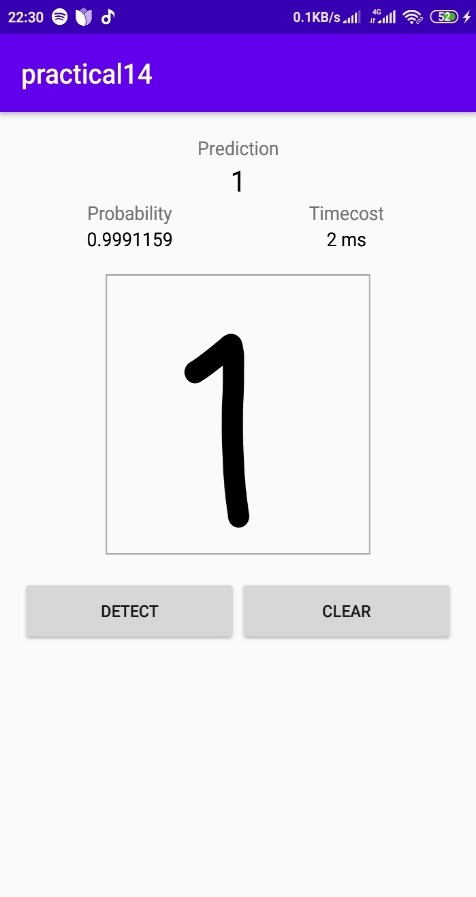
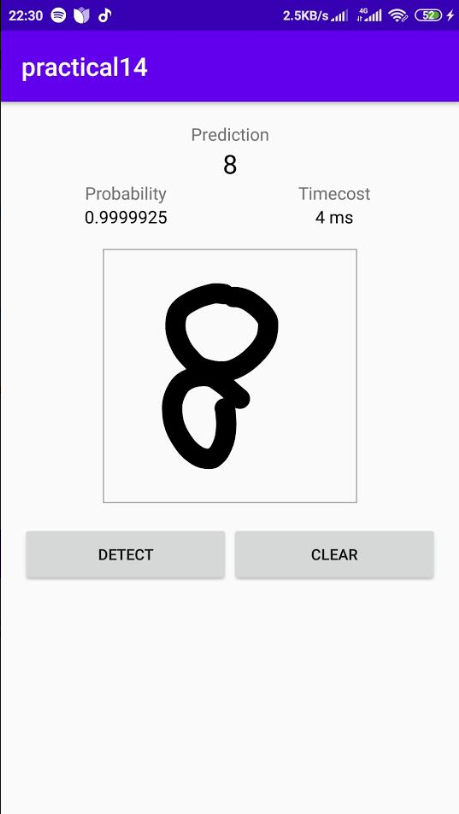
**Result.java**

|  |
| --- |
| package com.example.practical14;  public class Result {  private final int mNumber;  private final float mProbability;  private final long mTimeCost;  public Result(float[] probs, long timeCost) {  mNumber = argmax(probs);  mProbability = probs[mNumber];  mTimeCost = timeCost;  }  public int getNumber() {  return mNumber;  }  public float getProbability() {  return mProbability;  }  public long getTimeCost() {  return mTimeCost;  }  private static int argmax(float[] probs) {  int maxIdx = -1;  float maxProb = 0.0f;  for (int i = 0; i < probs.length; i++) {  if (probs[i] > maxProb) {  maxProb = probs[i];  maxIdx = i;  }  }  return maxIdx;  }  } |

**App.gradle**

|  |
| --- |
| apply plugin: 'com.android.application'  android {  compileSdkVersion 28  defaultConfig {  applicationId "com.example.practical14"  minSdkVersion 15  targetSdkVersion 28  versionCode 1  versionName "1.0.0"  testInstrumentationRunner "android.support.test.runner.AndroidJUnitRunner"  }  buildTypes {  release {  minifyEnabled false  proguardFiles getDefaultProguardFile('proguard-android.txt'), 'proguard-rules.pro'  }  }  aaptOptions {  noCompress "tflite"  noCompress "lite"  }  compileOptions {  sourceCompatibility JavaVersion.VERSION\_1\_8  targetCompatibility JavaVersion.VERSION\_1\_8  }  }  dependencies {  implementation fileTree(dir: 'libs', include: ['\*.jar'])  implementation 'com.android.support:appcompat-v7:28.0.0'  implementation 'com.android.support:support-v4:28.0.0'    implementation 'com.nex3z:finger-paint-view:0.1.0'  implementation 'org.tensorflow:tensorflow-lite:1.13.1'  implementation 'com.jakewharton:butterknife:10.0.0'  annotationProcessor 'com.jakewharton:butterknife-compiler:10.0.0'  testImplementation 'junit:junit:4.12'  androidTestImplementation 'com.android.support.test:runner:1.0.2'  androidTestImplementation 'com.android.support.test.espresso:espresso-core:3.0.2'  } |

**OUTPUT:**

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**GitHub Link for Project Reference**

<https://github.com/jvd2010/WCMC/blob/master/WCMC-project-master.zip>