

LAB MANUAL (2020 - 21)

**Mobile Application Development (18CSMP68) Lab Manual**

# Programs PART A

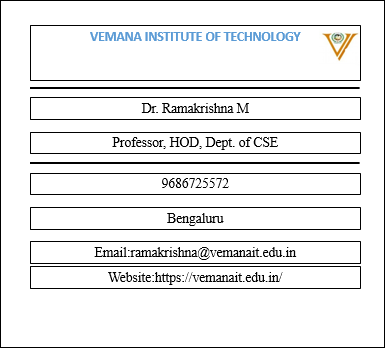
## Program 1

Create an application to design a Visiting Card. The Visiting card should have a company logo at the top right corner. The company name should be displayed in Capital letters, aligned to the center. Information like the name of the employee, job title, phone number, address, email, fax and the website address is to be displayed. Insert a horizontal line between the job title and the phone number.



* + 1. Create a New Android Project with Empty Activity.
    2. Open activity\_main.xml file from res layout folder change the layout to Relative layout
    3. Use View background property to draw the line
    4. Add Image to drawable folder and reference the image in the layout using @drawable/
    5. Use android:layout\_gravity/android:gravity properties to center the components.

## Design



**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">

<TextView

android:id="@+id/textView" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="152dp" android:layout\_marginBottom="599dp" android:gravity="center" android:text="Vemana Institute of Technology" android:textColor="#F00F" android:textSize="30dp" android:textStyle="bold" />

<ImageView

android:id="@+id/imageView2" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="18dp" android:layout\_marginBottom="572dp" app:srcCompat="@drawable/vemana" />

<View

android:id="@+id/view" android:layout\_width="wrap\_content" android:layout\_height="4dp" android:layout\_alignParentBottom="true" android:layout\_marginBottom="564dp" android:background="#4444" />

<TextView

android:id="@+id/textView2" android:layout\_width="342dp" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="40dp" android:layout\_marginBottom="502dp" android:text="Dr. Ramakrishna M" android:gravity="center" android:textSize="30dp" android:textStyle="bold" />

<TextView

android:id="@+id/textView3" android:layout\_width="347dp" android:layout\_height="wrap\_content"

android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="37dp" android:layout\_marginBottom="456dp" android:gravity="center" android:text="Professor, HOD, Dept. of CSE" android:textSize="20dp" android:textStyle="bold" />

<View

android:id="@+id/view1" android:layout\_width="wrap\_content" android:layout\_height="4dp" android:layout\_alignParentBottom="true" android:layout\_marginBottom="437dp" android:background="#4444" />

<TextView

android:id="@+id/textView4" android:layout\_width="347dp" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="39dp" android:layout\_marginBottom="389dp" android:gravity="center" android:text="9686725572" android:textSize="20dp" android:textStyle="bold" />

<TextView

android:id="@+id/textView5" android:layout\_width="344dp" android:layout\_height="38dp" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="40dp" android:layout\_marginBottom="332dp" android:gravity="center" android:text="Bengaluru" android:textSize="20dp" android:textStyle="bold" />

<TextView

android:id="@+id/textView6" android:layout\_width="382dp" android:layout\_height="49dp" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="11dp" android:layout\_marginBottom="268dp" android:gravity="center" android:text="[Email:ramakrishna@vemanait.edu.in](mailto:ramakrishna@vemanait.edu.in)" android:textSize="20dp" android:textStyle="bold" />

<TextView

android:id="@+id/textView7" android:layout\_width="382dp"

android:layout\_height="49dp" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="12dp" android:layout\_marginBottom="207dp" android:gravity="center" android:text="Website:https://vemanait.edu.in/" android:textSize="20dp" android:textStyle="bold" />

</RelativeLayout>

## MainActivity.java

**package** com.example.lab01;

**import** androidx.appcompat.app.AppCompatActivity;

**import** android.os.Bundle;

**public class** MainActivity **extends** AppCompatActivity { @Override

**protected void** onCreate(Bundle savedInstanceState) { **super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_main***);

}

}

## Sample Output

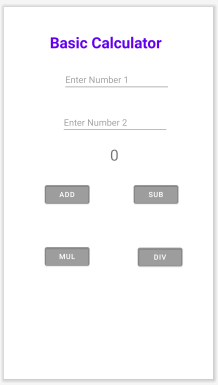


**Program 2**

Develop an Android application using controls like Button, TextView, EditText for designing a Calculator having basic functionality like Addition, Subtraction, Multiplication, and Division.

1. Create a New Android Project with Empty Activity.
2. Open activity\_main.xml file from res → layout folder
3. Create Layout as shown in design using Drag and Drop framework.
4. Add onClick attribute to all the buttons with value as the name of the method.
5. Open MainActivty.java file, Override onCreate() method and bring activity\_main.xml file on screen using setContentView() and bring the view references using findViewById() method.
6. Implement onClick methods for Add/Subtract/Multiply/Divide operation.

## Design



**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">

<TextView

android:layout\_width="246dp" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="75dp" android:layout\_marginBottom="642dp" android:text="Basic Calculator" android:textColor="@color/purple\_500" android:textSize="30dp" android:textStyle="bold" app:layout\_constraintBottom\_toBottomOf="parent" app:layout\_constraintLeft\_toLeftOf="parent" app:layout\_constraintRight\_toRightOf="parent" app:layout\_constraintTop\_toTopOf="parent" />

<EditText

android:id="@+id/number1" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="85dp" android:layout\_marginBottom="566dp" android:ems="10" android:inputType="textPersonName" android:hint="Enter Number 1" android:text="" />

<EditText

android:id="@+id/number2" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="88dp" android:layout\_marginBottom="482dp" android:ems="10"

android:hint="Enter Number 2" android:inputType="textPersonName" android:text="" />

<TextView

android:id="@+id/restv" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="186dp" android:layout\_marginBottom="421dp" android:text="0" android:textSize="30dp" />

<Button

android:id="@+id/button" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true"

android:layout\_marginEnd="243dp" android:layout\_marginBottom="339dp" android:onClick="performAdd" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:text="Add" />

<Button

android:id="@+id/button2" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="68dp" android:layout\_marginBottom="339dp" android:onClick="performSub" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:text="Sub" />

<Button

android:id="@+id/button3" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true"

android:layout\_alignParentBottom="true" android:layout\_marginEnd="243dp" android:layout\_marginBottom="217dp" android:onClick="performMul" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:text="Mul" />

<Button

android:id="@+id/button4" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="60dp" android:layout\_marginBottom="216dp" android:onClick="performDiv" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:text="Div" />

</RelativeLayout>

## MainActivity.java

**package** edu.vemana;

**import** androidx.appcompat.app.AppCompatActivity;

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

**public class** MainActivity **extends** AppCompatActivity { EditText **ed1**,**ed2**;

TextView **tv**; @Override

**protected void** onCreate(Bundle savedInstanceState) { **super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_main***);

**ed1** = (EditText) findViewById(R.id.***number1***); **ed2** = (EditText) findViewById(R.id.***number2***); **tv** = (TextView) findViewById(R.id.***restv***);

}

**public void** performAdd(View v) {

try

{

**int** n1 = Integer.*parseInt*(**ed1**.getText().toString()); **int** n2 = Integer.*parseInt*(**ed2**.getText().toString()); **int** res = n1 + n2;

**tv**.setText(**""**+res);

}

**catch** (Exception e)

{

**tv**.setText(**"Error"**);

}

}

**public void** performSub(View v) {

try

{

**int** n1 = Integer.*parseInt*(**ed1**.getText().toString()); **int** n2 = Integer.*parseInt*(**ed2**.getText().toString()); **int** res = n1 - n2;

**tv**.setText(**""**+res);

}

**catch** (Exception e)

{

**tv**.setText(**"Error"**);

}

}

**public void** performMul(View v) {

try

{

**int** n1 = Integer.*parseInt*(**ed1**.getText().toString()); **int** n2 = Integer.*parseInt*(**ed2**.getText().toString()); **int** res = n1 \* n2;

**tv**.setText(**""**+res);

}

**catch** (Exception e)

{

**tv**.setText(**"Error"**);

}

}

**public void** performDiv(View v) {

try

{

**float** n1 = Float.*parseFloat*(**ed1**.getText().toString()); **float** n2 = Float.*parseFloat*(**ed2**.getText().toString()); **float** res = n1 / n2;

**tv**.setText(**""**+res);

}

**catch** (Exception e)

{

**tv**.setText(**"Error"**);

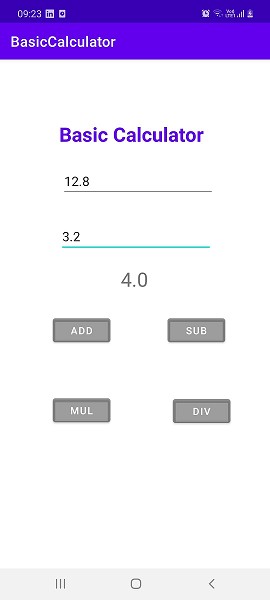
}

}

}

## Sample Output

Following output is captured when Div button is clicked.

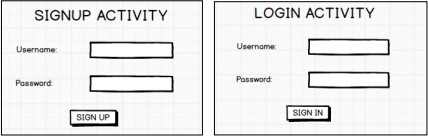


## Program 3

Create a SIGN Up activity with Username and Password. Validation of password should happen based on the following rules:

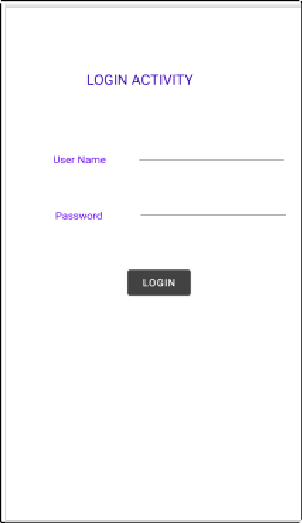
* Password should contain uppercase and lowercase letters.
* Password should contain letters and numbers.
* Password should contain special characters.
* Minimum length of the password (the default value is 8).

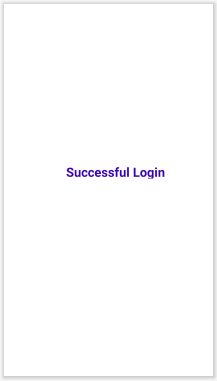
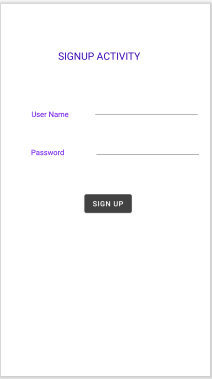
On successful SIGN UP proceed to the next Login activity. Here the user should SIGN IN using the Username and Password created during signup activity. If the Username and Password are matched then navigate to the next activity which displays a message saying “Successful Login” or else display a toast message saying “Login Failed”. The user is given only two attempts and after that display a toast message saying “Failed Login Attempts” and disable the SIGN IN button. Use Bundle to transfer information from one activity to another.



1. Create a New Android Project with Empty Activity.
2. Open activity\_main.xml file from res→ layout folder.
3. Create Signup Layout using Drag and Drop framework design the layout.
4. Create One more Empty Activity LoginActivity using Android Studio Create Activity Flow (Refer Android Studio Tutorial)
5. Open activity\_login.xml file from res→layout folder.
6. Create Login Layout using Drag and Drop framework.
7. Create One more Empty Activity HomePageActivity using Android Studio Create Activity Flow (Refer Android Studio Tutorial)
8. Open activity\_home\_page.xml file from res→layout folder.
9. Create Home Page Layout using Drag and Drop framework.
10. Implement onClick methods for SignUp button in MainActivity.
11. Implement onClick methods for SignIn button in LoginActivity.
12. Use Regular Expressions to validate password.

## Design





**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">

<TextView

android:layout\_width="197dp" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="102dp" android:layout\_marginBottom="616dp" android:text="SIGNUP ACTIVITY" android:textSize="20dp" android:textColor="@color/purple\_700" app:layout\_constraintBottom\_toBottomOf="parent" app:layout\_constraintLeft\_toLeftOf="parent" app:layout\_constraintRight\_toRightOf="parent" app:layout\_constraintTop\_toTopOf="parent" />

<TextView

android:id="@+id/textView" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="278dp" android:layout\_marginBottom="505dp" android:text="User Name" android:textColor="@color/purple\_500" android:textSize="15dp" />

<TextView

android:id="@+id/textView2" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="287dp" android:layout\_marginBottom="430dp" android:text="Password" android:textColor="@color/purple\_500" android:textSize="15dp" />

<EditText

android:id="@+id/emailTextId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="20dp" android:layout\_marginBottom="506dp" android:ems="10" android:inputType="textEmailAddress" />

<EditText

android:id="@+id/passwordTextId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="18dp" android:layout\_marginBottom="427dp" android:ems="10" android:inputType="textPassword" />

<Button

android:id="@+id/signupButId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="154dp" android:layout\_marginBottom="315dp" android:onClick="signUp" android:backgroundTint="@color/cardview\_dark\_background" android:text="SIGN UP" />

</RelativeLayout>

## activity\_login\_activity.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">

<TextView

android:layout\_width="197dp" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="102dp" android:layout\_marginBottom="616dp" android:text="LOGIN ACTIVITY" android:textSize="20dp" android:textColor="@color/purple\_700" app:layout\_constraintBottom\_toBottomOf="parent" app:layout\_constraintLeft\_toLeftOf="parent" app:layout\_constraintRight\_toRightOf="parent" app:layout\_constraintTop\_toTopOf="parent" />

<TextView

android:id="@+id/textView" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="272dp" android:layout\_marginBottom="505dp" android:text="User Name" android:textColor="@color/purple\_500" android:textSize="15dp" />

<TextView

android:id="@+id/textView2" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="277dp" android:layout\_marginBottom="425dp" android:text="Password" android:textColor="@color/purple\_500" android:textSize="15dp" />

<EditText

android:id="@+id/emailTextId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="20dp" android:layout\_marginBottom="506dp" android:ems="10" android:inputType="textEmailAddress" />

<EditText

android:id="@+id/passwordTextId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="18dp" android:layout\_marginBottom="427dp"

android:ems="10" android:inputType="textPassword" />

<Button

android:id="@+id/loginButId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="154dp" android:layout\_marginBottom="315dp" android:onClick="login" android:backgroundTint="@color/cardview\_dark\_background" android:text="LOGIN" />

</RelativeLayout>

## activity\_home\_page.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=".HomePageActivity">

<TextView

android:id="@+id/textView3" android:layout\_width="221dp" android:layout\_height="30dp" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="68dp" android:layout\_marginBottom="388dp" android:text="Successful Login" android:textColor="@color/purple\_700" android:textSize="25dp" android:textStyle="bold" />

</RelativeLayout>

## MainActivity.java

**package** com.example.lab03;

**import** androidx.appcompat.app.AppCompatActivity;

**import** android.content.Intent; **import** android.os.Bundle; **import** android.view.View; **import** android.widget.Button; **import** android.widget.EditText; **import** android.widget.Toast; **import** java.util.regex.Pattern;

**public class** MainActivity **extends** AppCompatActivity {

**public** EditText **emailId**, **password**; **public** Button **signupBut**;

@Override

**protected void** onCreate(Bundle savedInstanceState) {

**super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_main***);

**emailId** = (EditText) findViewById(R.id.***emailTextId***); **password** = (EditText) findViewById(R.id.***passwordTextId***); **signupBut** = (Button)findViewById(R.id.***signupButId***);

}

**public void** signUp(View v)

{

String email = **emailId**.getText().toString(); String pass = **password**.getText().toString(); **if**(isPasswordValid(pass))

{

Intent intent = **new** Intent(MainActivity.**this**,LoginActivty.**class**); Bundle bun = **new** Bundle();

bun.putString(**"EMAIL"**,email); bun.putString(**"PASSWORD"**,pass); intent.putExtra(**"SIGNUPBUNDLE"**,bun); startActivity(intent);

}

else

{

Toast.*makeText*(**this**,**"Enter Proper Password"**,Toast.***LENGTH\_LONG***).show();

}

}

**private boolean** isPasswordValid(String pass)

{

Pattern lower = Pattern.*compile*(**"^.\*[a-z].\*$"**);

Pattern upper = Pattern.*compile*(**"^.\*[A-Z].\*$"**); Pattern digits = Pattern.*compile*(**"^.\*[0-9].\*$"**);

Pattern special = Pattern.*compile*(**"^.\*[^a-zA-Z0-9].\*$"**);

**if**(pass.length() < 8)

**return false**; **if**(!lower.matcher(pass).matches())

**return false**; **if**(!upper.matcher(pass).matches())

**return false**; **if**(!digits.matcher(pass).matches())

**return false**; **if**(!special.matcher(pass).matches())

return false;

return true;

}

}

## LoginActivity.java

**package** com.example.lab03;

**import** androidx.appcompat.app.AppCompatActivity;

**import** android.content.Intent; **import** android.os.Bundle; **import** android.view.View; **import** android.widget.Button; **import** android.widget.EditText; **import** android.widget.Toast;

**public class** LoginActivty **extends** AppCompatActivity {

**public** EditText **emailId**, **password**;

**public** Button **loginBut**;

**public** String **regEmail**,**regPass**; **int counter** = 2;

@Override

**protected void** onCreate(Bundle savedInstanceState) { **super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_login\_activty***); **emailId** = (EditText) findViewById(R.id.***emailTextId***); **password** = (EditText) findViewById(R.id.***passwordTextId***); **loginBut** = (Button)findViewById(R.id.***loginButId***); Intent intent = getIntent();

Bundle bun = intent.getBundleExtra(**"SIGNUPBUNDLE"**);

**regEmail** = bun.getString(**"EMAIL"**);

**regPass** = bun.getString(**"PASSWORD"**);

}

**public void** login(View v)

{

String email = **emailId**.getText().toString(); String pass = **password**.getText().toString(); **if**(**regEmail**.equals(email) && **regPass**.equals(pass))

{

Intent intent = **new** Intent(LoginActivty.**this**,HomePageActivity.**class**); startActivity(intent);

}

else

{

Toast.*makeText*(**this**,**"Login Failed"**,Toast.***LENGTH\_LONG***).show();

}

**counter**--; **if**(**counter** == 0)

{

Toast.*makeText*(**this**,**"Failed Login Attempts"**,Toast.***LENGTH\_LONG***).show(); **loginBut**.setEnabled(**false**);

}

}

}

## HomePageActivity.java

**package** com.example.lab03;

**import** androidx.appcompat.app.AppCompatActivity;

**import** android.os.Bundle;

**public class** HomePageActivity **extends** AppCompatActivity { @Override

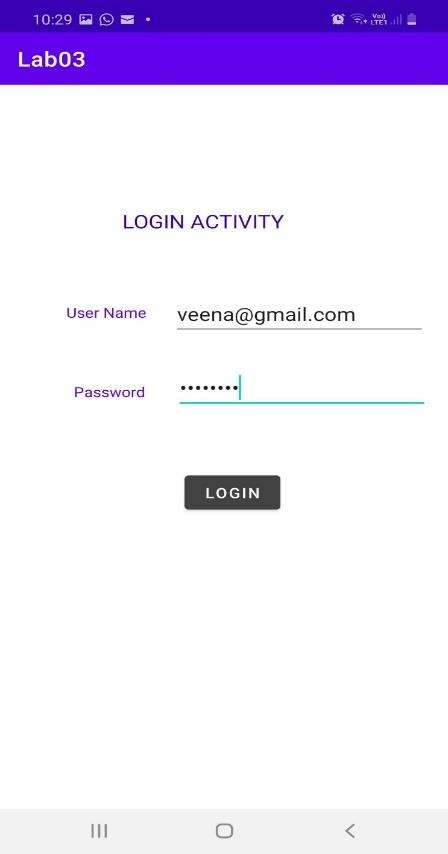
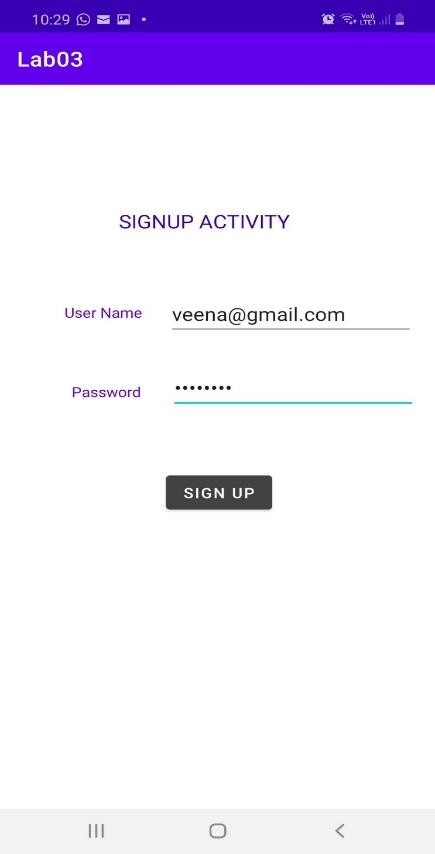
**protected void** onCreate(Bundle savedInstanceState) {

**super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_home\_page***);

}

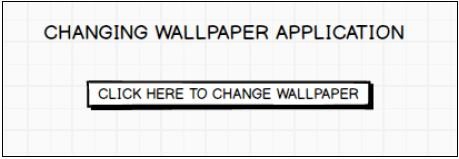
}

## Sample Output



**Program 4**

Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 seconds.



1. Create a New Android Project with Empty Activity.
2. Open activity\_main.xml file from res layout folder.
3. Create the layout
4. Add 3 or More images to drawable folder (res drawable)
5. Declare uses permission android.permission.SET\_WALLPAPPER in the AndroidManifest.xml file
6. Schedule Timer task to change the wallpaper on every 10 seconds interval.
7. Initialize and use WallpaperManager.setBitmap() method to change the wallpaper

## Design



**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">

<TextView

android:layout\_width="400dp" android:layout\_height="59dp" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="11dp" android:layout\_marginBottom="584dp" android:gravity="center" android:text="CHANGING WALLPAPER APPLICATION"

android:textColor="@color/purple\_700" android:textSize="20dp" android:textStyle="bold" app:layout\_constraintBottom\_toBottomOf="parent" app:layout\_constraintLeft\_toLeftOf="parent" app:layout\_constraintRight\_toRightOf="parent" app:layout\_constraintTop\_toTopOf="parent" />

<Button

android:id="@+id/changeButton" android:layout\_width="389dp"

android:layout\_height="38dp" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="7dp" android:layout\_marginBottom="420dp" android:backgroundTint="#a6767c" android:onClick="changewallpaper" android:text="CLICK HERE TO CHANGE WALLPAPER" />

</RelativeLayout>

## MainActivity.java

**package** com.example.lab04;

**import** androidx.appcompat.app.AppCompatActivity;

**import** android.app.WallpaperManager;

**import** android.graphics.Bitmap;

**import** android.graphics.drawable.BitmapDrawable; **import** android.graphics.drawable.Drawable; **import** android.os.Bundle;

**import** android.view.View; **import** android.widget.Button; **import** java.io.IOException; **import** java.util.Timer; **import** java.util.TimerTask;

**public class** MainActivity **extends** AppCompatActivity { Timer **timer**;

Drawable **drawable**; WallpaperManager **wpm**; **int count** = 1; @Override

**protected void** onCreate(Bundle savedInstanceState) { **super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_main***);

**timer** = **new** Timer();

**wpm** = WallpaperManager.*getInstance*(**this**);

}

**public void** changewallpaper(View v)

{

**timer**.schedule(**new** TimerTask(){

**public void** run()

{

System.***out***.println(**"count in run = "**+**count**); **if**(**count** == 1)

{

**drawable** = getResources().getDrawable(R.drawable.***one***);

**count** = 2;

}

**else if**(**count** == 2)

{

**drawable** = getResources().getDrawable(R.drawable.***two***);

**count** = 3;

}

**else if**(**count** == 3)

{

**drawable** = getResources().getDrawable(R.drawable.***three***);

**count** = 4;

}

**else if**(**count** == 4)

{

**drawable** = getResources().getDrawable(R.drawable.***four***);

**count** = 5;

}

**else if**(**count** == 5)

{

**drawable** = getResources().getDrawable(R.drawable.***five***);

**count** = 1;

}

System.***out***.println(**"count in run = "**+**count**); Bitmap bm = ((BitmapDrawable)**drawable**).getBitmap(); **try** {

*//wpm.clear();* **wpm**.setBitmap(bm); System.***out***.println(**count**);

System.***out***.println(**"New Wall paper done"**);

} **catch** (IOException e) { e.printStackTrace();

}

}

},0,10000); // Wall paper will change for every 10 sec

}

}

## AndroidManifest.xml

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

<manifest xmlns:android="<http://schemas.android.com/apk/res/android>" package="com.example.lab04">

<uses-permission android:name="android.permission.SET\_WALLPAPER"/>

<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.Lab04">

<activity android:name=".MainActivity">

<intent-filter>

<action android:name="android.intent.action.MAIN" />

<category android:name="android.intent.category.LAUNCHER" />

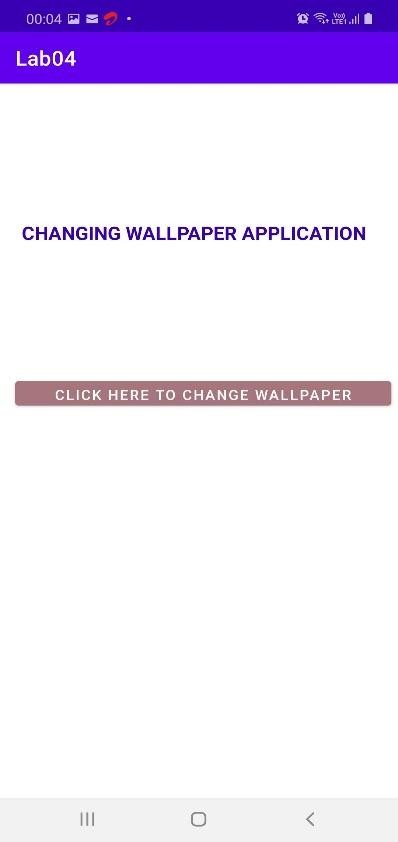
</intent-filter>

</**activity**>

</**application**>

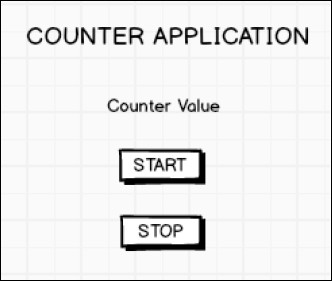
</**manifest**>

## Sample Output



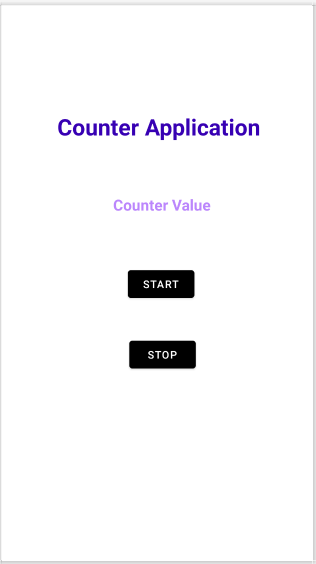
**Program 5**

Write a program to create an activity with two buttons START and STOP. On Pressing of the START button, the activity must start the counter by displaying the numbers from One and the counter must keep on counting until the STOP button is pressed. Display the counter value in a TextView control.



1. Create a New Android Project with Empty Activity.
2. Open activity\_main.xml file from res layout folder.
3. Create the layout design using Drag and Drop framework.
4. Create a Thread to start the counter logic.
5. Steps to Create a Thread
   * Create a class that extends Thread Class.
   * Override run method of Thread Class.
   * Use start() method of thread class to start the thread.
6. Create Handler class to receive message from child thread, Handler executes in Main Thread.
7. Steps to Create Handler
   * Create Object of type Handler.
   * Override handleMessage() of handler class.
8. Pass the counter value to be displayed to the handler.
9. Update the UI to display the counter value received from thread.

## Design



**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">

<TextView

android:layout\_width="398dp" android:layout\_height="61dp" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="5dp" android:layout\_marginBottom="542dp" android:gravity="center" android:text="Counter Application" android:textColor="@color/purple\_700" android:textSize="30dp" android:textStyle="bold"

app:layout\_constraintBottom\_toBottomOf="parent" app:layout\_constraintLeft\_toLeftOf="parent" app:layout\_constraintRight\_toRightOf="parent" app:layout\_constraintTop\_toTopOf="parent" />

<Button

android:id="@+id/startButId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="157dp" android:layout\_marginBottom="341dp" android:backgroundTint="@color/black"

android:onClick="startButClick" android:text="START" />

<Button

android:id="@+id/stopButId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="155dp" android:layout\_marginBottom="248dp" android:backgroundTint="@color/black" android:onClick="stopButClick" android:text="STOP" />

<TextView

android:id="@+id/counterTV" android:layout\_width="182dp" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="109dp" android:layout\_marginBottom="456dp" android:text="Counter Value" android:gravity="center" android:textColor="@color/purple\_200" android:textSize="20dp" android:textStyle="bold" />

</RelativeLayout>

## MainActivity.java

**package** com.example.lab05;

**import** androidx.appcompat.app.AppCompatActivity;

**import** android.os.Bundle; **import** android.os.Handler; **import** android.os.Message; **import** android.view.View; **import** android.widget.Button; **import** android.widget.TextView;

**public class** MainActivity **extends** AppCompatActivity { Button **startButId**,**stopButId**;

TextView **tv**;

**int countValue** = 0; **boolean flag** = **false**; @Override

**protected void** onCreate(Bundle savedInstanceState) { **super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_main***);

**startButId** = (Button)findViewById(R.id.***startButId***); **stopButId** = (Button)findViewById(R.id.***stopButId***); **tv** = (TextView) findViewById(R.id.***counterTV***);

}

**public void** startButClick(View v)

{

**countValue** = 0;

**flag** = **true**;

Thread countThread = **new** Thread(){

**public void** run()

{

while(flag)

{

**countValue**++; **handler**.sendEmptyMessage(**countValue**); **try** {

Thread.*sleep*(1000);

}

**catch**(Exception e) { }

}

}

};

countThread.start();

}

**public void** stopButClick(View v)

{

**flag** = **false**;

}

Handler **handler**=**new** Handler()

{

**public void** handleMessage(Message m)

{

**tv**.setText(String.*valueOf*(m.**what**));

}

};

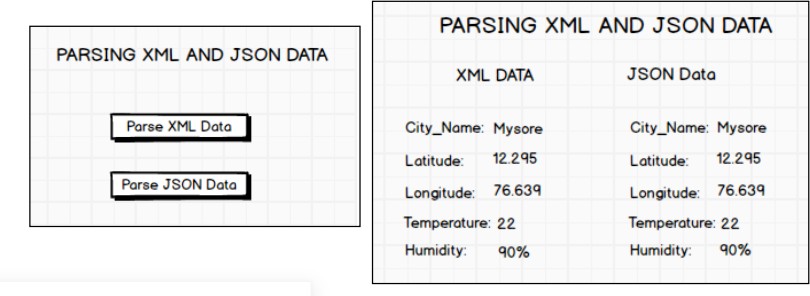
}

## Sample Output



**Program 6**

Create two files of XML and JSON type with values for City\_Name, Latitude, Longitude, Temperature, and Humidity. Develop an application to create an activity with two buttons to parse the XML and JSON files which when clicked should display the data in their respective layouts side by side.



1. Create a New Android Project with Empty Activity.
2. Open activity\_main.xml file from reslayout folder.
3. Create the layout design using Drag and Drop framework.
4. Create assets folder (Refer Section Android Studio Tutorial)
5. Create **input.xml** file inside assets folder and paste the below Xml Data

<?xml version="1.0"?>

<records>

<employee>

<city\_name>Mysore</city\_name>

<Latitude>12.295</Latitude>

<Longitude>76.639</Longitude>

<Temperature>22</Temperature>

<Humidity>90%</Humidity>

</employee>

</records>

1. Create input.json file inside assets folder and paste the below Json Data

{

"employee": { "city\_name": "Mysore", "Latitude": "12.295",

"Longitude": "76.639",

"Temperature": 22,

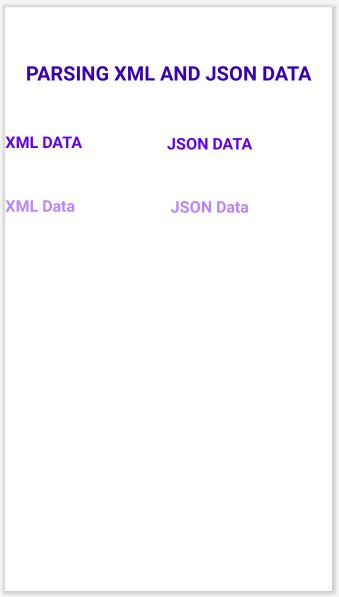
"Humidity": "90%"

}

}

1. Read the XML and Json Data in the files and display on screen.

## Design





**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">

<TextView

android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="0dp" android:layout\_marginBottom="575dp" android:text="PARSING XML AND JSON DATA" android:textColor="@color/purple\_700" android:textSize="25dp" android:gravity="center" android:textStyle="bold"

app:layout\_constraintBottom\_toBottomOf="parent" app:layout\_constraintLeft\_toLeftOf="parent" app:layout\_constraintRight\_toRightOf="parent"

app:layout\_constraintTop\_toTopOf="parent" />

<Button

android:id="@+id/button2" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="126dp" android:layout\_marginBottom="457dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="xml"

android:text="Parse XML Data" />

<Button

android:id="@+id/button" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="123dp" android:layout\_marginBottom="328dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="json"

android:text="Parse JSON Data" />

</RelativeLayout>

## MainActivity.java

**package** com.example.lab06;

**import** androidx.appcompat.app.AppCompatActivity;

**import** android.content.Intent; **import** android.os.Bundle; **import** android.view.View;

**public class** MainActivity **extends** AppCompatActivity { @Override

**protected void** onCreate(Bundle savedInstanceState) { **super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_main***);

}

**public void** xml(View view)

{

Intent intent = **new** Intent(getApplicationContext(),ParseActivity.**class**); intent.putExtra(**"FILE"**,**"XML"**);

startActivity(intent);

}

**public void** json(View view)

{

Intent intent = **new** Intent(getApplicationContext(),ParseActivity.**class**); intent.putExtra(**"FILE"**,**"JSON"**);

startActivity(intent);

}

}

## activity\_parse.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=".ParseActivity">

<TextView

android:id="@+id/textView" android:layout\_width="match\_parent" android:layout\_height="44dp" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="0dp" android:layout\_marginBottom="628dp" android:text="PARSING XML AND JSON DATA" android:textColor="@color/purple\_700" android:textSize="25dp" android:gravity="center" android:textStyle="bold" />

<TextView

android:id="@+id/textView2" android:layout\_width="133dp" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="278dp" android:layout\_marginBottom="550dp" android:text="XML DATA" android:textColor="@color/purple\_500" android:textSize="20dp" android:textStyle="bold" />

<TextView

android:id="@+id/xmlTVId" android:layout\_width="200dp" android:layout\_height="219dp" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="211dp" android:layout\_marginBottom="278dp" android:text="XML Data" android:textColor="@color/purple\_200" android:textSize="20dp" android:textStyle="bold" />

<TextView

android:id="@+id/textView4" android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="100dp" android:layout\_marginBottom="548dp" android:text="JSON DATA" android:textColor="@color/purple\_500" android:textSize="20dp" android:textStyle="bold" />

<TextView

android:id="@+id/jsonTVId" android:layout\_width="198dp" android:layout\_height="223dp" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="5dp" android:layout\_marginBottom="273dp" android:text="JSON Data" android:textColor="@color/purple\_200" android:textSize="20dp" android:textStyle="bold" />

</RelativeLayout>

## ParseActivity.java

**package** com.example.lab06;

**import** androidx.appcompat.app.AppCompatActivity;

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

**import** org.json.JSONObject; **import** org.w3c.dom.Document; **import** org.w3c.dom.Element; **import** org.w3c.dom.Node; **import** org.w3c.dom.NodeList;

**import** java.io.InputStream;

**import** javax.xml.parsers.DocumentBuilder;

**import** javax.xml.parsers.DocumentBuilderFactory;

**public class** ParseActivity **extends** AppCompatActivity { TextView **xmlTV**, **jsonTV**;

@Override

**protected void** onCreate(Bundle savedInstanceState) { **super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_parse***);

Intent intent = getIntent();

String mode = intent.getStringExtra(**"FILE"**); **xmlTV** = (TextView)findViewById(R.id.***xmlTVId***); **jsonTV** = (TextView)findViewById(R.id.***jsonTVId***); **if**(mode.equals(**"XML"**))

parseXML();

**else if**(mode.equals(**"JSON"**))

parseJSON();

}

**public void** parseXML()

{

try {

InputStream is = getAssets().open(**"input.xml"**);

DocumentBuilderFactory dbFactory = DocumentBuilderFactory.*newInstance*(); DocumentBuilder dBuilder = dbFactory.newDocumentBuilder();

Document doc = dBuilder.parse(is); Element element=doc.getDocumentElement(); element.normalize();

NodeList nList = doc.getElementsByTagName(**"employee"**);

**for** (**int** i = 0; i<nList.getLength(); i++) { Node node = nList.item(i);

**if** (node.getNodeType() == Node.***ELEMENT\_NODE***)

{

element2)+**"\n"**);

element2)+**"\n"**);

element2)+**"\n"**);

}

}

}

Element element2 = (Element) node;

**xmlTV**.setText(**"City Name : "** + *getValue*(**"city\_name"**,

**xmlTV**.append(**"Latitude : "** + *getValue*(**"Latitude"**, element2)+**"\n"**);

**xmlTV**.append(**"Longitude : "** + *getValue*(**"Longitude"**, **xmlTV**.append(**"Temperature : "** + *getValue*(**"Temperature"**, **xmlTV**.append(**"Humidity : "** + *getValue*(**"Humidity"**, element2)+**"\n"**);

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

}

}

**private static** String getValue(String tag, Element element) {

NodeList nodeList = element.getElementsByTagName(tag).item(0).getChildNodes(); Node node = nodeList.item(0);

**return** node.getNodeValue();

}

**public void** parseJSON()

{

try {

InputStream inputStream=getAssets().open(**"input.json"**); **byte**[] data=**new byte**[inputStream.available()]; inputStream.read(data);

String readData=**new** String(data);

JSONObject jsonObject=**new** JSONObject(readData);

JSONObject jsonObject1=jsonObject.getJSONObject(**"employee"**); **jsonTV**.setText(**"City Name:"**+jsonObject1.getString(**"city\_name"**)+**"\n"**); **jsonTV**.append(**"Latitude:"**+jsonObject1.getString(**"Latitude"**)+**"\n"**); **jsonTV**.append(**"Longitude"**+jsonObject1.getString(**"Longitude"**)+**"\n"**); **jsonTV**.append(**"Temperature:"**+jsonObject1.getInt(**"Temperature"**)+**"\n"**); **jsonTV**.append(**"Humidity"**+jsonObject1.getString(**"Humidity"**)+**"\n"**);

}

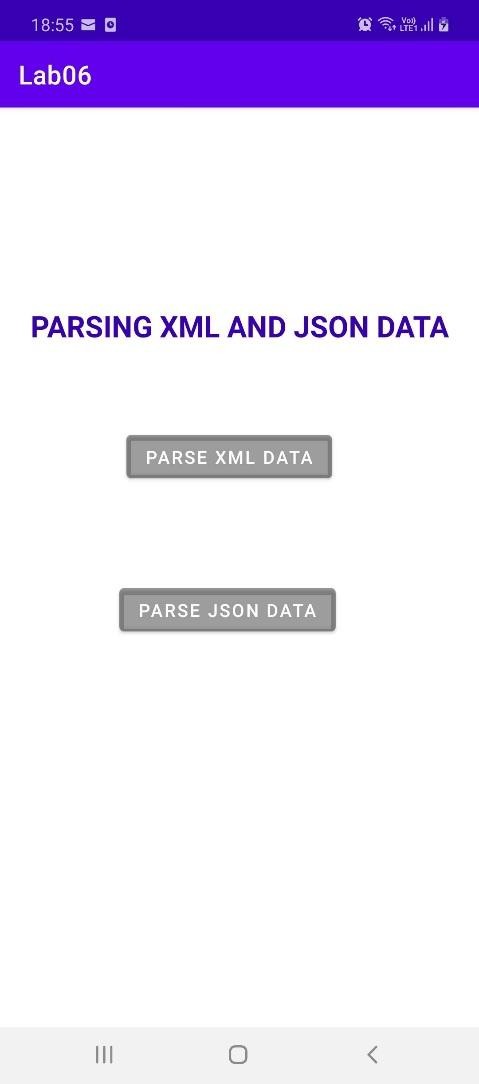
**catch** (Exception e) { e.printStackTrace();

}

}

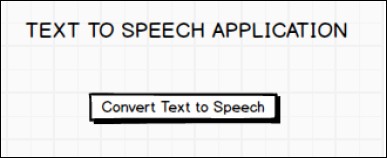
}

## Sample Output



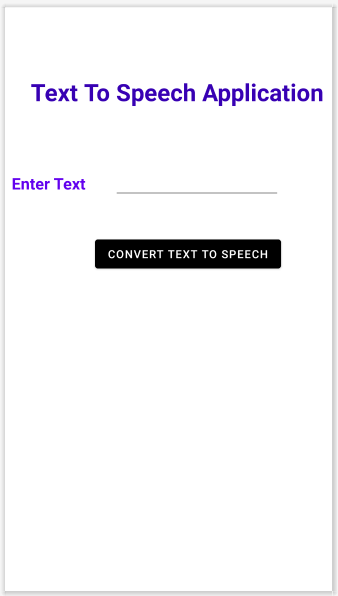
**Program 7**

Develop a simple application with one Edit Text so that the user can write some text in it. Create a button called “Convert Text to Speech” that converts the user input text into voice.



1. Create a New Android Project with Empty Activity.
2. Open activity\_main.xml file from reslayout folder.
3. Create the layout design using Drag and Drop framework.
4. Initialize TextToSpeech Engine and the Language to Speak using setLanguage() method
5. Use Speak() method to speak the text passed to it.

## Design



**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">

<TextView

android:layout\_width="match\_parent" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="-22dp" android:layout\_marginBottom="606dp" android:text="Text To Speech Application" android:textColor="@color/purple\_700" android:textSize="30dp" android:textStyle="bold" android:gravity="center" app:layout\_constraintBottom\_toBottomOf="parent" app:layout\_constraintLeft\_toLeftOf="parent" app:layout\_constraintRight\_toRightOf="parent" app:layout\_constraintTop\_toTopOf="parent" />

<TextView

android:id="@+id/textView" android:layout\_width="112dp" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="291dp" android:layout\_marginBottom="498dp" android:text="Enter Text" android:textColor="@color/purple\_500" android:textSize="20dp" android:textStyle="bold" />

<EditText

android:id="@+id/textId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="65dp" android:layout\_marginBottom="491dp" android:ems="10" android:inputType="textPersonName" android:text="" />

<Button

android:id="@+id/butId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="64dp"

android:layout\_marginBottom="399dp" android:onClick="convert" android:backgroundTint="@color/black" android:text="Convert text to Speech" />

</RelativeLayout>

## MainActivity.java

**package** com.example.lab07;

**import** androidx.appcompat.app.AppCompatActivity;

**import** android.os.Bundle;

**import** android.speech.tts.TextToSpeech;

**import** android.view.View; **import** android.widget.Button; **import** android.widget.EditText; **import** android.widget.Toast;

**import** java.util.Locale;

**public class** MainActivity **extends** AppCompatActivity { EditText **textBox**;

Button **but**; TextToSpeech **tts**;

@Override

**protected void** onCreate(Bundle savedInstanceState) { **super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_main***);

**textBox** = (EditText)findViewById(R.id.***textId***);

**but** = (Button)findViewById(R.id.***butId***);

**tts** = **new** TextToSpeech(getApplicationContext(), **new**

TextToSpeech.OnInitListener() {

@Override

**public void** onInit(**int** status) {

**tts**.setLanguage(Locale.***UK***);

}

});

}

**public void** convert(View v)

{

String text = **textBox**.getText().toString(); **if**(text == **null** || text.equals(**""**))

{

Toast.*makeText*(**this**,**"Enter Text"**,Toast.***LENGTH\_LONG***).show();

}

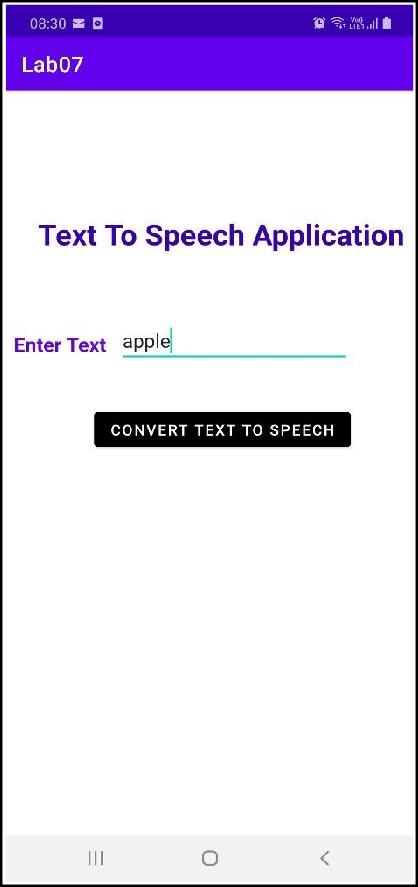
else

**tts**.speak(text,TextToSpeech.***QUEUE\_FLUSH***,**null**);

}

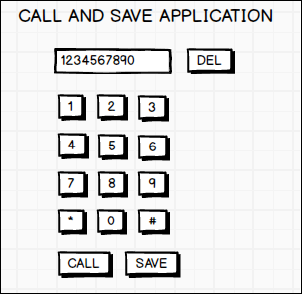
}

## Sample Output



**Program 8**

Create an activity like a phone dialer with CALL and SAVE buttons. On pressing the CALL button, it must call the phone number and on pressing the SAVE button it must save the number to the phone contacts.



1. Create a New Android Project with Empty Activity.
2. Open activity\_main.xml file from res→ layout folder
3. Create the layout design using Drag and Drop framework.
4. Use ACTION\_DIAL intent name and pass the “tel:<phone-number> as URI in intent data and start the call activity.
5. Use ACTION\_INSERT intent name and pass the “Telephone Number” as intent data and start Contacts Save Activity.

## Design

**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">

<TextView

android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="109dp" android:layout\_marginBottom="605dp" android:text="PHONE DIALER" android:textSize="30dp" android:textStyle="bold" app:layout\_constraintBottom\_toBottomOf="parent" app:layout\_constraintLeft\_toLeftOf="parent" app:layout\_constraintRight\_toRightOf="parent" app:layout\_constraintTop\_toTopOf="parent" />

<EditText

android:id="@+id/phoneTextId" android:layout\_width="227dp" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="160dp" android:layout\_marginBottom="513dp" android:ems="10" android:inputType="textPersonName" android:text="" />

<Button

android:id="@+id/deleteBtnId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="34dp" android:layout\_marginBottom="519dp" android:onClick="delete" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:text="DELETE" />

<Button

android:id="@+id/button" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="294dp" android:layout\_marginBottom="418dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="1" />

<Button

android:id="@+id/button2" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="165dp" android:layout\_marginBottom="417dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="2" />

<Button

android:id="@+id/button3" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="36dp" android:layout\_marginBottom="417dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="3" />

<Button

android:id="@+id/button4" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="290dp" android:layout\_marginBottom="326dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="4" />

<Button

android:id="@+id/button6" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="162dp" android:layout\_marginBottom="330dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="5" />

<Button

android:id="@+id/button7" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="33dp" android:layout\_marginBottom="328dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="6" />

<Button

android:id="@+id/button5" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="287dp" android:layout\_marginBottom="230dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="7" />

<Button

android:id="@+id/button8" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="159dp" android:layout\_marginBottom="231dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="8" />

<Button

android:id="@+id/button9" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="31dp" android:layout\_marginBottom="234dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="9" />

<Button

android:id="@+id/button13" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="286dp" android:layout\_marginBottom="140dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="\*" />

<Button

android:id="@+id/button14" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="158dp" android:layout\_marginBottom="143dp" android:backgroundTint="@color/cardview\_shadow\_start\_color"

android:onClick="inputNumber" android:text="0" />

<Button

android:id="@+id/button15" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="32dp" android:layout\_marginBottom="142dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="inputNumber"

android:text="#" />

<Button

android:id="@+id/callBtnId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="286dp" android:layout\_marginBottom="58dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="call"

android:text="CALL" />

<Button

android:id="@+id/saveBtnId" android:layout\_width="wrap\_content" android:layout\_height="wrap\_content" android:layout\_alignParentEnd="true" android:layout\_alignParentBottom="true" android:layout\_marginEnd="26dp" android:layout\_marginBottom="60dp" android:backgroundTint="@color/cardview\_shadow\_start\_color" android:onClick="save"

android:text="SAVE" />

</RelativeLayout>

## MainActivity.java

**package** com.example.lab08;

**import** androidx.appcompat.app.AppCompatActivity;

**import** android.content.Intent; **import** android.net.Uri; **import** android.os.Bundle;

**import** android.provider.ContactsContract;

**import** android.view.View; **import** android.widget.Button; **import** android.widget.EditText;

**public class** MainActivity **extends** AppCompatActivity { EditText **phoneNoText**;

@Override

**protected void** onCreate(Bundle savedInstanceState) { **super**.onCreate(savedInstanceState); setContentView(R.layout.***activity\_main***);

**phoneNoText** = (EditText)findViewById(R.id.***phoneTextId***);

}

**public void** delete(View v)

{

String phoneNo = **phoneNoText**.getText().toString(); **if**(phoneNo.equals(**""**))

{

**phoneNoText**.setText(**""**);

}

else

{

**phoneNoText**.setText(phoneNo.substring(0,phoneNo.length()-1));

}

}

**public void** call(View v)

{

String phoneNo = **phoneNoText**.getText().toString(); Intent callIntent = **new** Intent(Intent.***ACTION\_DIAL***); callIntent.setData(Uri.*parse*(**"tel:"**+phoneNo)); startActivity(callIntent);

}

**public void** save(View v)

{

String phoneNo = **phoneNoText**.getText().toString(); Intent saveIntent = **new** Intent(Intent.***ACTION\_INSERT***);

saveIntent.setType(ContactsContract.Contacts.***CONTENT\_TYPE***); saveIntent.putExtra(ContactsContract.Intents.Insert.***PHONE***,phoneNo); startActivity(saveIntent);

}

**public void** inputNumber(View v)

{

Button but = (Button)v;

String digit = but.getText().toString();

String phoneNo = **phoneNoText**.getText().toString(); **phoneNoText**.setText(phoneNo+digit);

}

}

## Sample Output

