

Program 2:

```
package com.example.simplecalculator;

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;

import java.util.regex.Pattern;


public class MainActivity extends AppCompatActivity implements View.OnClickListener {

    Button btnone, btntwo,btnthree,btnfour,btnfive,btnsix,btnseven,btneight,btnnine,btnzero;

    Button btnAdd, btnSub, btnMul, btnDiv;

    Button btnClear, btnEqual, btnDot;

    EditText txtResult;


    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);


        btnone=(Button) findViewById(R.id.btn_1);

        btnone.setOnClickListener(this);


        btntwo=(Button) findViewById(R.id.btn_2);

        btntwo.setOnClickListener(this);


        btnthree=(Button) findViewById(R.id.btn_3);

        btnthree.setOnClickListener(this);


        btnfour=(Button) findViewById(R.id.btn_4);

        btnfour.setOnClickListener(this);
```

```
btnfive=(Button) findViewById(R.id.btn_5);  
btnfive.setOnClickListener(this);
```

```
btnsix=(Button) findViewById(R.id.btn_6);  
btnsix.setOnClickListener(this);
```

```
btnseven=(Button) findViewById(R.id.btn_7);  
btnseven.setOnClickListener(this);
```

```
btneight=(Button) findViewById(R.id.btn_8);  
btneight.setOnClickListener(this);
```

```
btnnine=(Button) findViewById(R.id.btn_9);  
btnnine.setOnClickListener(this);
```

```
btnzero=(Button) findViewById(R.id.btn_0);  
btnzero.setOnClickListener(this);
```

```
btnAdd=(Button) findViewById(R.id.btn_plus);  
btnAdd.setOnClickListener(this);
```

```
btnSub=(Button) findViewById(R.id.btn_minus);  
btnSub.setOnClickListener(this);
```

```
btnMul=(Button) findViewById(R.id.btn_mul);  
btnMul.setOnClickListener(this);
```

```
btnDiv=(Button) findViewById(R.id.btn_div);  
btnDiv.setOnClickListener(this);
```

```
btnDot=(Button) findViewById(R.id.btn_dot);
```

```
btnDot.setOnClickListener(this);

btnClear=(Button) findViewById(R.id.btn_clear);
btnClear.setOnClickListener(this);

btnEqual=(Button) findViewById(R.id.btn_equals);
btnEqual.setOnClickListener(this);

txtResult=(EditText) findViewById(R.id.Edit_Txt);
txtResult.setText("");

}
```

```
@Override
```

```
public void onClick(View v) {
    if(v.equals(btnone))
        txtResult.append("1");
    if(v.equals(btntwo))
        txtResult.append("2");
    if(v.equals(btnthree))
        txtResult.append("3");
    if(v.equals(btnfour))
        txtResult.append("4");
    if(v.equals(btnfive))
        txtResult.append("5");
    if(v.equals(btnsix))
        txtResult.append("6");
    if(v.equals(btnseven))
        txtResult.append("7");
    if(v.equals(btneight))
        txtResult.append("8");
    if(v.equals(btnnine))
```

```

        txtResult.append("9");
    if(v.equals(btnzero))
        txtResult.append("0");
    if(v.equals(btnDot))
        txtResult.append(".");
    if(v.equals(btnAdd))
        txtResult.append("+");
    if(v.equals(btnSub))
        txtResult.append("-");
    if(v.equals(btnMul))
        txtResult.append("*");
    if(v.equals(btnDiv))
        txtResult.append("/");
    if(v.equals(btnClear))
        txtResult.setText("");
    if(v.equals(btnEqual))
    {
        try {
            String data = txtResult.getText().toString();
            if(data.contains("/")){
                divide(data);
            } else if(data.contains("*")){
                multiplication(data);
            } else if(data.contains("+")){
                addition(data);
            } else if(data.contains("-")){
                subtraction(data);
            }
        } catch(Exception e){
            displayInvalidMessage("Invalid Input");
        }
    }
}

```

```
}
```

```
private void displayInvalidMessage(String mes) {  
    Toast.makeText(getBaseContext(),mes,Toast.LENGTH_LONG).show();  
  
}
```

```
private void subtraction(String data) {  
    String[] operands=data.split("-");  
    if(operands.length==2){  
        double operand1=Double.parseDouble(operands[0]);  
        double operand2=Double.parseDouble(operands[1]);  
        double result=operand1-operand2;  
        txtResult.setText(String.valueOf(result));  
    } else{  
        displayInvalidMessage("Invalid Input");  
    }  
}
```

```
private void addition(String data) {  
    String[] operands=data.split(Pattern.quote("+"));  
    if(operands.length==2){  
        double operand1=Double.parseDouble(operands[0]);  
        double operand2=Double.parseDouble(operands[1]);  
        double result=operand1+operand2;  
        txtResult.setText(String.valueOf(result));  
    } else{  
        displayInvalidMessage("Invalid Input");  
    }  
}
```

```
private void multiplication(String data) {  
    String[] operands=data.split(Pattern.quote("*"));  
    if(operands.length==2){  
        double operand1=Double.parseDouble(operands[0]);  
        double operand2=Double.parseDouble(operands[1]);  
        double result=operand1*operand2;  
        txtResult.setText(String.valueOf(result));  
    } else{  
        displayInvalidMessage("Invalid Input");  
    }  
}  
  
private void divide(String data) {  
    String[] operands=data.split("/");  
    if(operands.length==2){  
        double operand1=Double.parseDouble(operands[0]);  
        double operand2=Double.parseDouble(operands[1]);  
        double result=operand1/operand2;  
        txtResult.setText(String.valueOf(result));  
    } else{  
        displayInvalidMessage("Invalid Input");  
    }  
}  
}
```

Program 3:

MainActivity.java:

```
package com.example.signupandloginin;

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.Matcher;
import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity implements View.OnClickListener {
    EditText Signup_Username, Signup_Password;
    Button btnSignup;
    String regularExpression="^(?=.*[A-Z])(?=.*[a-z])(?=.*\\d)(?=.*[@$!]) [A-Za-z\\d@$!]{8,}$";

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

        Signup_Username=(EditText)findViewById(R.id.txt_username);
        Signup_Password=(EditText)findViewById(R.id.txt_password);
        btnSignup=(Button)findViewById(R.id.btn_signup);
        btnSignup.setOnClickListener(this);
    }

    @Override
    public void onClick(View v) {
        String username=Signup_Username.getText().toString();
        String password=Signup_Password.getText().toString();
```

```

        if(validatePassword(password)){
            Toast.makeText(getBaseContext(),"Valid Password", Toast.LENGTH_LONG).show();

            Bundle bundle=new Bundle();

            bundle.putString("User",username);

            bundle.putString("Pwd",password);

            Intent it=new Intent(this,Login.class);

            it.putExtra("data",bundle);

            startActivity(it);
        } else
        {
            Toast.makeText(getBaseContext(),"Invalid Password",Toast.LENGTH_LONG).show();
        }
    }
}

```

```

private boolean validatePassword(String password) {
    Pattern pattern=Pattern.compile(regularExpression);

    Matcher matcher=pattern.matcher(password);

    return matcher.matches();
}
}

```

LoginActivity.java:

```

package com.example.signupandloginin;

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 Login extends AppCompatActivity implements View.OnClickListener {

    EditText LoginUsername, LoginPassword;

```


Button btnLogin;

String user, pass;

int count=0;

@Override

```
protected void onCreate(Bundle savedInstanceState) {  
    super.onCreate(savedInstanceState);  
    setContentView(R.layout.activity_login);  
    LoginUsername=(EditText)findViewById(R.id.login_username);  
    LoginPassword=(EditText)findViewById(R.id.login_password);  
    btnLogin=(Button)findViewById(R.id.btn_login);  
    btnLogin.setOnClickListener(this);  
    Bundle bundle=getIntent().getBundleExtra("data");  
    user=bundle.getString("User");  
    pass=bundle.getString("Pwd");  
}
```

@Override

```
public void onClick(View v) {  
    String user1=LoginUsername.getText().toString();  
    String pass1=LoginPassword.getText().toString();  
    if(user.equals(user1)&& pass.equals(pass1))  
    {  
        Toast.makeText(this,"Login Successful",Toast.LENGTH_LONG).show();  
    }  
    else  
    {  
        count++;  
        if(count==3){  
            btnLogin.setEnabled(false);  
            Toast.makeText(this,"Failed Login Attempts",Toast.LENGTH_LONG).show();  
        }  
    }  
}
```

```
    }  
    else  
    {  
        Toast.makeText(this,"Login Failed" +count,Toast.LENGTH_LONG).show();  
    }  
}  
}  
}
```

Program 4:

```
package com.example.prg4;

import androidx.appcompat.app.AppCompatActivity;
import android.app.WallpaperManager;
import android.graphics.BitmapFactory;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import java.io.IOException;
import java.util.Random;
import java.util.Timer;
import java.util.TimerTask;

public class MainActivity extends AppCompatActivity implements View.OnClickListener {

    Button btn;

    boolean running;

    int[] ia=new
int[]{R.drawable.img1,R.drawable.img2,R.drawable.img3,R.drawable.img4,R.drawable.img5};

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);

        btn=(Button)findViewById(R.id.btn_wall);

        btn.setOnClickListener(this);

    }

    @Override

    public void onClick(View v) {

        if(!running){

            new Timer().schedule(new MyTimer(),0,3000);

            running=true;

        }

    }

}
```

```
}
```

```
private class MyTimer extends TimerTask {
```

```
    @Override
```

```
    public void run() {
```

```
        try {
```

```
            WallpaperManager wallpaperManager=WallpaperManager.getInstance(getBaseContext());
```

```
            Random random = new Random();
```

```
            wallpaperManager.setBitmap(BitmapFactory.decodeResource(getResources(),ia[random.nextInt(5)]))
```

```
        ;
```

```
        }catch(IOException e){}
```

```
    }
```

```
}
```

```
}
```

Program 5:

```
package com.example.counter;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.os.Handler;
import android.os.Looper;
import android.os.Message;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity implements View.OnClickListener {

    Button buttonStart, buttonStop;
    TextView counterValue;
    public int counter=0;
    public boolean running=false;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        buttonStart=(Button)findViewById(R.id.btn_start);
        buttonStart.setOnClickListener(this);
        buttonStop=(Button)findViewById(R.id.btn_stop);
        buttonStop.setOnClickListener(this);
        counterValue=(TextView)findViewById(R.id.txt_value);
    }

    @Override
    public void onClick(View v) {
        if(v.equals(buttonStart)){
            counterStart();
        }
    }
}
```

```

    } else if(v.equals(buttonStop)) {
        counterStop();
    }

}

private void counterStop() {
    this.running=false;
    //buttonStart.setEnabled(true);
    //buttonStop.setEnabled(false);
}

private void counterStart() {
    counter=0;
    running=true;
    System.out.println("Start ->"+Thread.currentThread().getName());
    new MyCounter().start();
    //buttonStart.setEnabled(false);
    //buttonStop.setEnabled(true);

}

Handler handler = new Handler(Looper.getMainLooper())
{
    public void handleMessage(Message mes){
        counterValue.setText(String.valueOf(mes.what));
    }
};

class MyCounter extends Thread{
    public void run()

```

```
{  
    System.out.println("MyCounter ->" + Thread.currentThread().getName());  
    while(running){  
        counter++;  
        handler.sendMessage(counter);  
        try{  
            Thread.sleep(1000);  
        } catch(Exception e){}  
    }  
}  
}  
}
```

Program 6:

MainActivity.java:

```
package com.computerlabspace.parsexmlndjson_program6;

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

public class MainActivity extends AppCompatActivity implements View.OnClickListener {

    Button parseXMLBtn, parseJSONBtn;

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

        parseXMLBtn = (Button) findViewById(R.id.main_parse_xml_btn_id);
        parseJSONBtn = (Button) findViewById(R.id.main_parse_json_id);
        parseXMLBtn.setOnClickListener(this);
        parseJSONBtn.setOnClickListener(this);
    }

    @Override
    public void onClick(View view) {
        if(view.equals(parseXMLBtn)) {
            // Intent will act like a broadcaster
            Intent intent = new Intent(this, ViewDataActivity.class);
            intent.putExtra("dataType", "xml");
            startActivity(intent);
        } else if(view.equals(parseJSONBtn)) {
            Intent intent = new Intent(this, ViewDataActivity.class);
```



```

        intent.putExtra("dataType", "json");
        startActivity(intent);
    }
}
}

```

ViewActivity.java:

```

package com.computerlabspace.parsexmlndjson_program6;

import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.util.JsonReader;
import android.widget.TextView;
import org.json.JSONException;
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 org.xml.sax.SAXException;
import java.io.IOException;
import java.io.InputStream;
import java.io.InputStreamReader;
import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;
import javax.xml.parsers.ParserConfigurationException;

```

```

public class ViewDataActivity extends AppCompatActivity {

```

```

    TextView xmlContentTextView, jsonContentTextView;

```

```

    @Override

```

```

protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_view_data);
    xmlContentTextView = (TextView) findViewById(R.id.view_xml_content_id);
    jsonContentTextView = (TextView) findViewById(R.id.view_json_content_id);
    Intent intent = getIntent();
    String dataType = intent.getStringExtra("dataType");
    if(dataType.equals("xml")) {
        xmlContentTextView.setText("Test xml parsed content");
        parseXML();
    } else if(dataType.equals("json")) {
        jsonContentTextView.setText("Test json parsed content");
        parseJSON();
    }
}

```

```

public void parseXML() {
    InputStream inputStream = null;
    try {
        inputStream = getAssets().open("weather.xml");
        JsonReader reader = new JsonReader(new InputStreamReader(inputStream));
        DocumentBuilderFactory dbf = DocumentBuilderFactory.newInstance();
        DocumentBuilder db = dbf.newDocumentBuilder();
        Document doc = db.parse(inputStream);
        doc.normalize();
        NodeList nodeList = doc.getElementsByTagName("weather");
        for(int i=0; i<nodeList.getLength();i++) {
            Node node = nodeList.item(i);
            if(node.getNodeType() == Node.ELEMENT_NODE) {
                Element element = (Element) node;
                xmlContentTextView.setText("City_Name:
"+element.getElementsByTagName("city_name").item(0).getTextContent() + "\n");
            }
        }
    } catch (Exception e) {
        e.printStackTrace();
    }
}

```

```

        xmlContentView.append("Latitude:
"+element.getElementsByTagName("latitude").item(0).getTextContent() + "\n");

        xmlContentView.append("Longitude:
"+element.getElementsByTagName("longitude").item(0).getTextContent() + "\n");

        xmlContentView.append("Temperature:
"+element.getElementsByTagName("temperature").item(0).getTextContent() + "\n");

        xmlContentView.append("Humidity:
"+element.getElementsByTagName("humidity").item(0).getTextContent());
    }
}

} catch (IOException e) {
    e.printStackTrace();
} catch (ParserConfigurationException e) {
    e.printStackTrace();
} catch (SAXException e) {
    e.printStackTrace();
} finally {
    if(inputStream != null) {
        try {
            inputStream.close();
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}
}
}

```

```

public void parseJSON() {
    try (InputStream inputStream = getAssets().open("weather.json")) {
        byte[] data = new byte[inputStream.available()];
        inputStream.read(data);

        String jsonString = new String(data);
        JSONObject jsonObject = new JSONObject(jsonString);
        JSONObject weather = jsonObject.getJSONObject("weather");
    }
}

```

```
        jsonContentView.setText("City_Name: "+weather.getString("city_name") + "\n");
        jsonContentView.append("Latitude: "+weather.getString("latitude") + "\n");
        jsonContentView.append("Longitude: "+weather.getString("longitude") + "\n");
        jsonContentView.append("Temperature: "+weather.getString("temperature") + "\n");
        jsonContentView.append("Humidity: "+weather.getString("humidity") + "\n");
    } catch (IOException e) {
        e.printStackTrace();
    } catch (JSONException e) {
        e.printStackTrace();
    }
}
```

Program 7:

```
package com.example.program7;
```

```
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<AppCompatActivity> extends AppCompatActivity implements  
View.OnClickListener, TextToSpeech.OnInitListener {
```

```
    Button btnSpeak;
```

```
    EditText txtSpeak;
```

```
    TextToSpeech textToSpeech;
```

```
    @Override
```

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

```
        super.onCreate(savedInstanceState);
```

```
        setContentView(R.layout.activity_main);
```

```
        txtSpeak=(EditText)findViewById(R.id.edt_txt);
```

```
        btnSpeak=(Button)findViewById(R.id.btn_speech);
```

```
        btnSpeak.setOnClickListener(this);
```

```
        textToSpeech=new TextToSpeech(getBaseContext(),this);
```

```
        textToSpeech.setLanguage(Locale.ENGLISH);
```

```
    }
```

```
    @Override
```

```
public void onClick(View v) {  
    String text=txtSpeak.getText().toString();  
    textToSpeech.speak(text,TextToSpeech.QUEUE_FLUSH,null);  
  
}  
  
@Override  
public void onInit(int status) {  
    if(status!=TextToSpeech.ERROR){  
        Toast.makeText(getBaseContext(),"Success",Toast.LENGTH_LONG).show();  
    }  
}  
}
```

Program 8:

```
package com.computerlabspace.callandsave_program_8;

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 implements View.OnClickListener {

    Button oneBtn, twoBtn, threeBtn, fourBtn, fiveBtn;
    Button sixBtn, sevenBtn, eightBtn, nineBtn, zeroBtn;
    Button starBtn, hashBtn;
    Button delBtn, callBtn, saveBtn;
    EditText phoneNumber;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        oneBtn = (Button) findViewById(R.id.one_btn_id);
        oneBtn.setOnClickListener(this);

        twoBtn = (Button) findViewById(R.id.two_btn_id);
        twoBtn.setOnClickListener(this);

        threeBtn = (Button) findViewById(R.id.three_btn_id);
        threeBtn.setOnClickListener(this);

        fourBtn = (Button) findViewById(R.id.four_btn_id);
```

```
fourBtn.setOnClickListener(this);
```

```
fiveBtn = (Button) findViewById(R.id.five_btn_id);
```

```
fiveBtn.setOnClickListener(this);
```

```
sixBtn = (Button) findViewById(R.id.six_btn_id);
```

```
sixBtn.setOnClickListener(this);
```

```
sevenBtn = (Button) findViewById(R.id.seven_btn_id);
```

```
sevenBtn.setOnClickListener(this);
```

```
eightBtn = (Button) findViewById(R.id.eight_btn_id);
```

```
eightBtn.setOnClickListener(this);
```

```
nineBtn = (Button) findViewById(R.id.nine_btn_id);
```

```
nineBtn.setOnClickListener(this);
```

```
zeroBtn = (Button) findViewById(R.id.zero_btn_id);
```

```
zeroBtn.setOnClickListener(this);
```

```
delBtn = (Button) findViewById(R.id.delete_btn_id);
```

```
delBtn.setOnClickListener(this);
```

```
callBtn = (Button) findViewById(R.id.call_btn_id);
```

```
callBtn.setOnClickListener(this);
```

```
saveBtn = (Button) findViewById(R.id.save_btn_id);
```

```
saveBtn.setOnClickListener(this);
```

```
starBtn = (Button) findViewById(R.id.star_btn_id);
```

```
starBtn.setOnClickListener(this);
```



```

hashBtn = (Button) findViewById(R.id.hash_btn_id);
hashBtn.setOnClickListener(this);

phoneNumber = findViewById(R.id.phone_number_id);
phoneNumber.setText("");
}

@Override
public void onClick(View view) {
    Button btn = (Button)view;
    if(view.equals(delBtn)) {
        String phoneNum = phoneNumber.getText().toString();
        if (phoneNum.length() > 0) {
            phoneNumber.setText(phoneNum.substring(0, phoneNum.length()-1));
        } else {
            phoneNumber.setText("");
        }
        phoneNumber.setSelection(phoneNumber.getText().toString().length());
    } else if(view.equals(callBtn)) {
        System.out.print("Call Button Pressed");
        String phoneNum = phoneNumber.getText().toString();
        Intent intent = new Intent(Intent.ACTION_DIAL);
        intent.setData(Uri.parse("tel:"+phoneNum));
        startActivity(intent);
    } else if(view.equals(saveBtn)) {
        System.out.print("Save Button Pressed");
        String phoneNum = phoneNumber.getText().toString();
        Intent intent = new Intent(ContactsContract.Intents.Insert.ACTION);
        intent.setType(ContactsContract.RawContacts.CONTENT_TYPE);
        intent.putExtra(ContactsContract.Intents.Insert.NAME, "Unknown");
        intent.putExtra(ContactsContract.Intents.Insert.PHONE, phoneNum);
        startActivity(intent);
    }
}

```

```
    } else {  
        phoneNumber.append(btn.getText());  
    }  
}  
}
```