MAD LAB PROGRAMS:

PROGRAM 1: VISITING CARD

```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="#C6f7fd"
    android:paddingLeft="7sp"
    android:paddingTop="14sp"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView"
        android:layout_width="149dp"
        android:layout_height="80dp"
        android:fontFamily="cursive"
        android:paddingLeft="5sp"
        android:paddingTop="10sp"
        android:text="Welcome"
        android:textColor="@color/teal_700"
        android:textSize="40sp"
```

```xml
        android:textStyle="bold"

        app:layout_constraintBottom_toBottomOf="parent"

        app:layout_constraintEnd_toEndOf="parent"

        app:layout_constraintHorizontal_bias="0.232"

        app:layout_constraintStart_toStartOf="parent"

        app:layout_constraintTop_toTopOf="parent"

        app:layout_constraintVertical_bias="0.196" />

    <View

        android:id="@+id/divider"

        android:layout_width="380dp"

        android:layout_height="5dp"

        android:layout_marginStart="8dp"

        android:layout_marginEnd="8dp"

        android:background="@color/black"

        app:layout_constraintBottom_toBottomOf="parent"

        app:layout_constraintEnd_toEndOf="parent"

        app:layout_constraintHorizontal_bias="1.0"

        app:layout_constraintStart_toStartOf="parent"

        app:layout_constraintTop_toTopOf="parent"

        app:layout_constraintVertical_bias="0.282" />

    <TextView

        android:id="@+id/textView2"
```

```xml
        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_marginTop="20dp"

        android:fontFamily="serif"

        android:padding="5sp"

        android:text="Name:"

        android:textSize="22sp"

        android:textStyle="bold"

        app:layout_constraintEnd_toEndOf="parent"

        app:layout_constraintHorizontal_bias="0.112"

        app:layout_constraintStart_toStartOf="parent"

        app:layout_constraintTop_toBottomOf="@+id/divider" />

    <TextView

        android:id="@+id/textView3"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_marginStart="36dp"

        android:layout_marginTop="60dp"

        android:fontFamily="serif"

        android:text="Class:"

        android:textSize="22sp"

        android:textStyle="bold"

        app:layout_constraintStart_toStartOf="parent"
```

```xml
        app:layout_constraintTop_toBottomOf="@+id/textView2" />

    <TextView
        android:id="@+id/textView4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="120dp"
        android:layout_marginTop="20dp"
        android:fontFamily="sans-serif-smallcaps"
        android:padding="5sp"
        android:text="Shreesha"
        android:textSize="20sp"
        android:textStyle="bold|italic"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.014"
        app:layout_constraintStart_toEndOf="@+id/textView2"
        app:layout_constraintTop_toBottomOf="@+id/divider" />

    <TextView
        android:id="@+id/textView5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="64dp"
        android:fontFamily="sans-serif-smallcaps"
```

```xml
        android:padding="5sp"

        android:text="6B"

        android:textSize="20sp"

        android:textStyle="bold|italic"

        app:layout_constraintEnd_toEndOf="parent"

        app:layout_constraintStart_toEndOf="@+id/textView3"

        app:layout_constraintTop_toBottomOf="@+id/textView4" />


    <TextView

        android:id="@+id/textView6"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_marginStart="36dp"

        android:layout_marginTop="60dp"

        android:fontFamily="serif"

        android:text="Phone Number:"

        android:textSize="22sp"

        android:textStyle="bold"

        app:layout_constraintStart_toStartOf="parent"

        app:layout_constraintTop_toBottomOf="@+id/textView3" />


    <TextView

        android:id="@+id/textView7"

        android:layout_width="wrap_content"
```

```xml
        android:layout_height="wrap_content"

        android:layout_marginStart="24dp"

        android:layout_marginTop="60dp"

        android:fontFamily="sans-serif-smallcaps"

        android:padding="5sp"

        android:text="9119119110"

        android:textSize="20sp"

        android:textStyle="bold|italic"

        app:layout_constraintEnd_toEndOf="parent"

        app:layout_constraintHorizontal_bias="0.06"

        app:layout_constraintStart_toEndOf="@+id/textView6"

        app:layout_constraintTop_toBottomOf="@+id/textView5" />


    <Button

        android:id="@+id/button1"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:text="Click here"

        app:layout_constraintBottom_toBottomOf="parent"

        app:layout_constraintEnd_toEndOf="parent"

        app:layout_constraintStart_toStartOf="parent"

        app:layout_constraintTop_toBottomOf="@+id/divider"

        app:layout_constraintVertical_bias="0.792" />
```

```xml
<View
    android:id="@+id/divider2"
    android:layout_width="380dp"
    android:layout_height="5dp"
    android:layout_marginStart="8dp"
    android:layout_marginEnd="8dp"
    android:background="@color/black"
    app:layout_constraintBottom_toTopOf="@+id/button1"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.741"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/divider"
    app:layout_constraintVertical_bias="0.948" />

<ImageView
    android:id="@+id/imageView2"
    android:layout_width="168dp"
    android:layout_height="173dp"
    android:layout_marginStart="40dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintCircleRadius="30sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="1.0"
    app:layout_constraintStart_toEndOf="@+id/textView"
```

app:layout_constraintTop_toTopOf="parent"

app:layout_constraintVertical_bias="0.011"

app:srcCompat="@drawable/index" />

</androidx.constraintlayout.widget.ConstraintLayout>

PROGRAM 2: CALCUALOTOR

package com.example.calculator_b2;

import androidx.appcompat.app.AppCompatActivity;

```java
import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.TextView;


import java.text.DecimalFormat;

import java.util.Stack;


public class MainActivity extends AppCompatActivity {
    Button badd,bsub,bmul,bdiv,bper,b0,b1,b2,b3,b4,b5,b6,b7,b8,b9,bac,bpm,beq,bdec;

    TextView textView;

    Stack<Double> ns = new Stack<>();

    Stack<String> os = new Stack<>();

    boolean decFlag = false;

    StringBuffer sb = new StringBuffer();

    double op1, op2, res;

    String operand;

    DecimalFormat form = new DecimalFormat("#");


    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);

        badd = findViewById(R.id.btn_plus);

        bsub = findViewById(R.id.btn_minus);

        bmul = findViewById(R.id.btn_mul);
```

```java
bdiv = findViewById(R.id.btn_div);

bper = findViewById(R.id.btn_per);

bac = findViewById(R.id.btn_ac);

bpm = findViewById(R.id.btn_pm);

beq = findViewById(R.id.btn_eq);

bdec = findViewById(R.id.btn_dec);

b0 = findViewById(R.id.btn0);

b1 = findViewById(R.id.btn1);

b2 = findViewById(R.id.btn2);

b3 = findViewById(R.id.btn3);

b4 = findViewById(R.id.btn4);

b5 = findViewById(R.id.btn5);

b6 = findViewById(R.id.btn6);

b7 = findViewById(R.id.btn7);

b8 = findViewById(R.id.btn8);

b9 = findViewById(R.id.btn9);

textView = findViewById(R.id.txtView);


bpm.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        op1 = Double.parseDouble(textView.getText().toString());
        op1*=-1;
        textView.setText(String.valueOf(op1));
    }
});
```

```java
b0.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View view) {

        sb.append("0");

        textView.setText(sb.toString());

    }

});

b1.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View view) {

        sb.append("1");

        textView.setText(sb.toString());

    }

});

b2.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View view) {

        sb.append("2");

        textView.setText(sb.toString());

    }

});

b3.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View view) {

        sb.append("3");
```

```java
            textView.setText(sb.toString());

        }

    });

    b4.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            sb.append("4");

            textView.setText(sb.toString());

        }

    });

    b5.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            sb.append("5");

            textView.setText(sb.toString());

        }

    });

    b6.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            sb.append("6");

            textView.setText(sb.toString());

        }

    });

    b7.setOnClickListener(new View.OnClickListener() {

        @Override
```

```java
        public void onClick(View view) {

            sb.append("7");

            textView.setText(sb.toString());

        }

    });

    b8.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            sb.append("8");

            textView.setText(sb.toString());

        }

    });

    b9.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            sb.append("9");

            textView.setText(sb.toString());

        }

    });

    badd.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            op1 = Double.parseDouble(textView.getText().toString());

            ns.push(op1);

            os.push("+");

            textView.setText("");
```

```java
            sb.delete(0,sb.length());

            decFlag=false;

        }

    });
    bsub.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            op1 = Double.parseDouble(textView.getText().toString());

            ns.push(op1);

            os.push("-");

            textView.setText("");

            sb.delete(0,sb.length());

            decFlag=false;

        }

    });
    bmul.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            op1 = Double.parseDouble(textView.getText().toString());

            ns.push(op1);

            os.push("*");

            textView.setText("");

            sb.delete(0,sb.length());

            decFlag=false;

        }

    });
```

```java
bper.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View view) {

        op1 = Double.parseDouble(textView.getText().toString());

        ns.push(op1);

        os.push("%");

        textView.setText("");

        sb.delete(0,sb.length());

        decFlag=false;

    }

});

bdiv.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View view) {

        op1 = Double.parseDouble(textView.getText().toString());

        ns.push(op1);

        os.push("/");

        textView.setText("");

        sb.delete(0,sb.length());

        decFlag=false;

    }

});

bdec.setOnClickListener(new View.OnClickListener() {

    @Override

    public void onClick(View view) {

        if (!decFlag){
```

```java
                decFlag=true;

                sb.append(".");

                textView.setText(sb.toString());

            }

        }

    });

    beq.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            operand = os.pop();

            op2 = Double.parseDouble(textView.getText().toString());

            sb.delete(0,sb.length());

            op1 = ns.pop();

            switch (operand){

                case "+":

                    res = op1 + op2;

                    break;

                case "-":

                    res = op1 - op2;

                    break;

                case "/":

                    res = op1 / op2;

                    break;

                case "*":

                    res = op1 * op2;

                    break;
```

```java
                case "%":
                    res = op1 % op2;
                    break;
            }
            textView.setText(String.valueOf(Math.round(res * 100.0) / 100.0));
        }
    });
    bac.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            decFlag=false;
            operand = "";
            op1 = 0;
            op2 = 0;
            sb.delete(0,sb.length());
            while(!ns.empty()) ns.pop();
            while(!os.empty()) os.pop();
            textView.setText("");
        }
    });
}
}
```
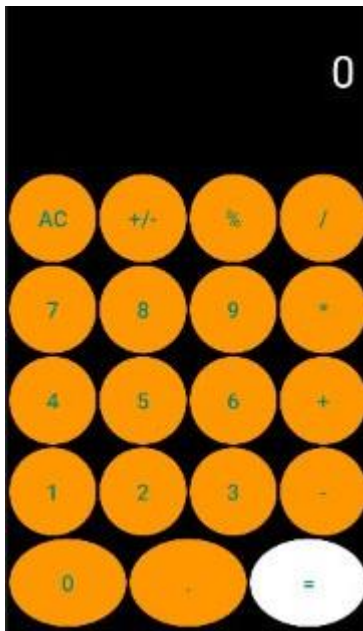

PROGRAM 3: SIGNUP ACTIVITY

```java
package com.example.signup_b2;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.text.TextUtils;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

import java.util.regex.Matcher;
```

```java
import java.util.regex.Pattern;


public class MainActivity extends AppCompatActivity implements
View.OnClickListener {

    EditText userName, password;

    Button signUpBtn;

    String name, pass;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);

        userName = findViewById(R.id.username);

        password = findViewById(R.id.password);

        signUpBtn = findViewById(R.id.btn);

        signUpBtn.setOnClickListener(this);

    }


    @Override

    public void onClick(View view) {

        if(validate()) {


            Intent intent = new Intent(this, LoginActivity.class);

//          name = userName.getText().toString();

//          pass = password.getText().toString();

            Bundle bundle = new Bundle();

            bundle.putString("name", name);

            bundle.putString("pass", pass);
```

```java
            intent.putExtras(bundle);

            startActivity(intent);

        }

        else {

            if(name.length()!=4)

                userName.setError("4 characters only, no Special Characters
allowed");

            if(pass.length()!=8)

                password.setError("8 characters");

        }

    }


    private boolean validate() {

        name = userName.getText().toString();

        pass = password.getText().toString();

        name = name.trim();

        pass=pass.trim();

        return ((validateUN()) && (validatePW()));

    }


    private boolean validatePW() {

        if(TextUtils.isEmpty(pass)){

            password.setError("Password cant be empty");

            return false;

        }

        else{

            String pattern = "[\\p{Alnum}\\{Punct}]{8}";
```

```java
            Pattern p= Pattern.compile(pattern);

            Matcher m =p.matcher(pass);

            return  m.matches();

        }

    }


    private boolean validateUN() {

        if(TextUtils.isEmpty(name)){

            password.setError("Name field cant be empty");

            return false;

        }

        else{

            String pattern = "\\p{Alpha}{4}";

            Pattern p= Pattern.compile(pattern);

            Matcher m =p.matcher(name);

            return  m.matches();

        }

    }


}


package com.example.signup_b2;


import androidx.appcompat.app.AppCompatActivity;


import android.content.Intent;
```

```java
import android.os.Bundle;

import android.text.TextUtils;

import android.view.View;

import android.webkit.CookieManager;

import android.webkit.WebView;

import android.widget.Button;

import android.widget.EditText;


public class LoginActivity extends AppCompatActivity implements
View.OnClickListener {


    EditText userName, password;

    Button signInBtn;

    String uname, upass, lname, lpass;

    int count = 3;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_login);

        userName = findViewById(R.id.username2);

        password = findViewById(R.id.password2);

        signInBtn = findViewById(R.id.btn2);

        signInBtn.setOnClickListener(this);

    }


    @Override

    public void onClick(View view) {
```

```java
        Intent intent = getIntent();

        Bundle bundle = intent.getExtras();

        uname = bundle.getString("name");

        upass = bundle.getString("pass");


        if(validate()) {

            WebView webView = new WebView(this);

            setContentView(webView);

            webView.loadUrl("https://google.com");

            CookieManager.getInstance().removeAllCookies(null);

            CookieManager.getInstance().flush();

        }
        else {

            if(count<=0){

                signInBtn.setEnabled(false);

                return;

            }

            if (uname.length() != lname.length()) userName.setError("Username is not there");

            if (upass.length() != lpass.length()) {

                count--;

                password.setError("Number of attempts left: " + count);

            }

        }

    }


    private boolean validate() {
```

```
        lname = userName.getText().toString();

        lpass = password.getText().toString();

        lname = lname.trim();

        lpass = lpass.trim();

        if(TextUtils.isEmpty(lname) || TextUtils.isEmpty(lpass)) return false;

        else if(TextUtils.equals(uname, lname) && TextUtils.equals(upass, lpass))
return true;

        else return false;

    }
}
```

PROGRAM 4: WALLPAPER

package com.example.wallpaper_b2;

import androidx.appcompat.app.AppCompatActivity;

import android.app.WallpaperManager;

import android.graphics.Bitmap;

import android.graphics.BitmapFactory;

import android.os.Bundle;

import android.os.Handler;

import android.os.Looper;

import android.text.BoringLayout;

import android.util.DisplayMetrics;

import android.view.View;

```java
import java.io.IOException;

public class MainActivity extends AppCompatActivity {

    Bitmap bitmap[], bm;
    DisplayMetrics displayMetrics;
    WallpaperManager wallpaperManager;

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

    public void changeEvent(View view) {
        new Thread(new Runnable() {
            @Override
            public void run() {
                bitmap = new Bitmap[]{
                        BitmapFactory.decodeResource(getResources(),
R.drawable.wp1),
                        BitmapFactory.decodeResource(getResources(),
R.drawable.wp2),
                        BitmapFactory.decodeResource(getResources(),
R.drawable.wp3),
```

```java
            BitmapFactory.decodeResource(getResources(),
R.drawable.wp4),

            BitmapFactory.decodeResource(getResources(), R.drawable.wp5)

        };

        displayMetrics = new DisplayMetrics();

        getWindowManager().getDefaultDisplay().getMetrics(displayMetrics);

        int width = displayMetrics.widthPixels;

        int height = displayMetrics.heightPixels;

        for( int i=0; i<bitmap.length; i++){

            bitmap[i]=Bitmap.createScaledBitmap(bitmap[i],width,height,false);

        }


        for(int i=0; i< bitmap.length;i++){

            bm = bitmap[i];

            try {

                Thread.sleep(5000);

            } catch (InterruptedException e) {

                e.printStackTrace();

            }


        Handler handler = new Handler(Looper.getMainLooper());

        wallpaperManager =
WallpaperManager.getInstance(getApplicationContext());

        handler.post(new Runnable() {

            @Override

            public void run() {
```

```
                    try {

                        wallpaperManager.setBitmap(bm);

                    } catch (IOException e) {

                        e.printStackTrace();

                    }

                }

            });

        }

    }

    }).start();


    }
}
```

PROGRAM 5: COUNTER

package com.example.counter_b2;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.os.Handler;

import android.os.Looper;

```java
import android.view.View;

import android.widget.TextView;


public class MainActivity extends AppCompatActivity {


    int count=0;

    volatile boolean isStopped = true;

    TextView textView;


    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);

        textView = findViewById(R.id.textView2);

    }


    public void startCount(View view) {

        isStopped = false;

        count = 0;

        new Thread(new Runnable() {

            @Override

            public void run() {

                while(!isStopped){

                    try{

                        Thread.sleep(1000);

                    }catch(InterruptedException e){
```

```java
                e.printStackTrace();
            }
            count++;
            Handler handler = new Handler(Looper.getMainLooper());
            handler.post(new Runnable() {
                @Override
                public void run() {
                    textView.setText(String.valueOf(count));
                }
            });
        }
    }
}).start();
}

public void stopCount(View view) {
    isStopped = true;
}
}
```

PROGRAM 6:XML PARSER AND JSON DATA

 package com.example.parser_b2;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.TextView;

import com.android.volley.Request;

import com.android.volley.RequestQueue;

import com.android.volley.Response;

```java
import com.android.volley.VolleyError;

import com.android.volley.toolbox.JsonObjectRequest;

import com.android.volley.toolbox.Volley;


import org.json.JSONArray;

import org.json.JSONException;

import org.json.JSONObject;

import org.xmlpull.v1.XmlPullParser;

import org.xmlpull.v1.XmlPullParserException;

import org.xmlpull.v1.XmlPullParserFactory;


import java.io.IOException;

import java.io.InputStream;

import java.util.ArrayList;


public class MainActivity extends AppCompatActivity {

    Button jsonBtn, xmlBtn;

    TextView jsonTV, xmlTV;


    XmlPullParserFactory pullParserFactory;

    XmlPullParser parser;

    InputStream is;


    RequestQueue requestQueue;

    @Override
```

```java
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    xmlBtn = findViewById(R.id.XMLbutton);
    jsonBtn = findViewById(R.id.JSONbutton);
    xmlTV = findViewById(R.id.XMLTextView);
    jsonTV = findViewById(R.id.JSONTextView);

    xmlBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            parseXMLFile();
        }
    });

    jsonBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            parseJSONFile();
        }
    });
    requestQueue = Volley.newRequestQueue(this);
}

private void parseJSONFile() {
    StringBuilder sb = new StringBuilder();
```

```java
        String url = "https://api.npoint.io/332dbe8ec2cb456b9757";

        JsonObjectRequest request = new
JsonObjectRequest(Request.Method.GET, url, null, new
Response.Listener<JSONObject>() {

            @Override

            public void onResponse(JSONObject response) {

                try {

                    JSONArray jsonArray = response.getJSONArray("cities");

                    for (int i=0; i< jsonArray.length();i++){

                        JSONObject city = jsonArray.getJSONObject(i);

                        sb.append("City Name:
").append(city.getString("cityName")).append("\n").

                            append("Latitude:
").append(city.getString("latitude")).append("\n").

                            append("Longitude:
").append(city.getString("longitude")).append("\n").

                            append("Temperature:
").append(city.getString("temperature")).append("\n").

                            append("Humidity:
").append(city.getString("humidity")).append("\n");

                    }

                    jsonTV.setText(sb.toString());

                } catch (JSONException e) {

                    e.printStackTrace();

                }

            }

        }, new Response.ErrorListener() {

            @Override
```

```java
        public void onErrorResponse(VolleyError error) {
            jsonTV.setText("Error Displaying");

        }
    });
    requestQueue.add(request);

}


private void parseXMLFile() {
    try{
        pullParserFactory = XmlPullParserFactory.newInstance();

        parser = pullParserFactory.newPullParser();

        parser.setFeature(XmlPullParser.FEATURE_PROCESS_NAMESPACES,
false);

        is= getAssets().open("cities.xml");

        parser.setInput(is, null);

        parseXMLData(parser);
    } catch (XmlPullParserException e) {
        e.printStackTrace();
    } catch (IOException e) {
        e.printStackTrace();
    }



}


private void parseXMLData(XmlPullParser parser) {
    ArrayList<City> cities = new ArrayList<>();
```

```java
City cur_city = null;
String ele_name = null;
try{
    int event_type = parser.getEventType();
    while(event_type!=XmlPullParser.END_DOCUMENT){
        if(event_type==XmlPullParser.START_TAG){
            ele_name = parser.getName();
            if(ele_name.equals("city")){
                cur_city = new City();
                cities.add(cur_city);
            }
            else if(ele_name.equals("name")){
                cur_city.cityName= parser.nextText();
            }
            else if(ele_name.equals("latitude")){
                cur_city.latitude= parser.nextText();
            }
            else if(ele_name.equals("longitude")){
                cur_city.longitude= parser.nextText();
            }
            else if(ele_name.equals("temperature")){
                cur_city.temperature= parser.nextText();
            }
            else if(ele_name.equals("humidity")){
                cur_city.humidity= parser.nextText();
            }
```

```java
                }
                event_type =parser.next();
            }
        }catch (XmlPullParserException e){
            e.printStackTrace();
        } catch (IOException e) {
            e.printStackTrace();
        }
        printXMLData(cities);
    }


    private void printXMLData(ArrayList<City> cities) {
        StringBuilder sb = new StringBuilder();
        for(City city:cities){
            sb.append("City Name: ").append(city.cityName).append("\n").
                append("Latitude: ").append(city.latitude).append("\n").
                append("Longitude: ").append(city.longitude).append("\n").
                append("Temperature: ").append(city.temperature).append("\n").
                append("Humidity: ").append(city.humidity).append("\n");
        }
        xmlTV.setText(sb.toString());
    }
}


public class City {
    public String cityName, latitude, longitude, temperature, humidity;
```

}

PROGRAM 7: TEXT TO SPEECH

package com.example.texttospeech_b2;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Context;

import android.media.AudioManager;

import android.os.Bundle;

import android.speech.tts.TextToSpeech;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.SeekBar;

import java.util.Locale;

public class MainActivity extends AppCompatActivity {

    Button speakBtn, volUp, volDown;

    SeekBar pitchSB, speedSB;

    EditText speechText;

    TextToSpeech textToSpeech;

    AudioManager audioManager;

```java
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
//      getActionBar().hide();


        speakBtn = findViewById(R.id.button);
        pitchSB = findViewById(R.id.seekPitch);
        speedSB = findViewById(R.id.seekSpeed);
        speechText = findViewById(R.id.editText);
        volUp = findViewById(R.id.volumeUp);
        volDown = findViewById(R.id.volumeDown);
        audioManager = (AudioManager)
getApplicationContext().getSystemService(Context.AUDIO_SERVICE);
        textToSpeech = new TextToSpeech(this, new
TextToSpeech.OnInitListener() {
            @Override
            public void onInit(int i) {
                if(i == TextToSpeech.SUCCESS){
                    int avail = textToSpeech.isLanguageAvailable(Locale.UK);
                    if(avail!=TextToSpeech.LANG_NOT_SUPPORTED){
                        speakBtn.setEnabled(true);
                    }
                    else {
                        speakBtn.setEnabled(false);
                    }
```

```java
            }

        }

    });

    speakBtn.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            speak();

        }

    });

    volUp.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            audioManager.adjustVolume(AudioManager.ADJUST_RAISE,
AudioManager.FLAG_PLAY_SOUND);

        }

    });

    volDown.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            audioManager.adjustVolume(AudioManager.ADJUST_LOWER,
AudioManager.FLAG_PLAY_SOUND);

        }

    });

}

private void speak() {

    String speech = speechText.getText().toString();
```

```
        float picth = pitchSB.getProgress()/50;

        float speed = speedSB.getProgress()/50;


        if(picth<0.1) picth=0.1f;

        if(speed<0.1) speed=0.1f;


        textToSpeech.setPitch(picth);

        textToSpeech.setSpeechRate(speed);


        textToSpeech.speak(speech, TextToSpeech.QUEUE_FLUSH, null, null);
    }


    @Override
    protected void onDestroy() {
        if(textToSpeech!=null){
            textToSpeech.stop();
            textToSpeech.shutdown();
        }
        super.onDestroy();
    }
}
```

PROGRAM 8: CALL AND SAVE

package com.example.callandsave_b2;

```java
import androidx.appcompat.app.AppCompatActivity;

import androidx.core.app.ActivityCompat;

import androidx.core.content.ContextCompat;


import android.Manifest;

import android.app.Activity;

import android.content.Context;

import android.content.Intent;

import android.content.pm.PackageManager;

import android.net.Uri;

import android.os.Bundle;

import android.provider.ContactsContract;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.ImageButton;

import android.widget.Toast;


public class MainActivity extends AppCompatActivity {

    ImageButton imageButton;

    EditText editText;

    Button b0,b1,b2,b3,b4,b5,b6,b7,b8,b9,bsave,bhash,bstar,bcall;

    StringBuilder sb = new StringBuilder();

    String phoneNumber;

    @Override
```

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

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);


        imageButton = findViewById(R.id.imageButton);

        bsave = findViewById(R.id.save);

        bhash = findViewById(R.id.hash);

        bcall = findViewById(R.id.callBtn);

        bstar = findViewById(R.id.asterisk);

        b0 = findViewById(R.id.no0);

        b1 = findViewById(R.id.no1);

        b2 = findViewById(R.id.no2);

        b3 = findViewById(R.id.no3);

        b4 = findViewById(R.id.no4);

        b5 = findViewById(R.id.no5);

        b6 = findViewById(R.id.no6);

        b7 = findViewById(R.id.no7);

        b8 = findViewById(R.id.no8);

        b9 = findViewById(R.id.no9);

        editText = findViewById(R.id.number);


        if(ContextCompat.checkSelfPermission(MainActivity.this,
Manifest.permission.CALL_PHONE)!=
PackageManager.PERMISSION_GRANTED){

            ActivityCompat.requestPermissions(MainActivity.this, new
String[]{Manifest.permission.CALL_PHONE},PackageManager.PERMISSION_GR
ANTED);
```

```java
        }
        b0.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                sb.append("0");
                editText.setText(sb.toString());
            }
        });
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                sb.append("1");
                editText.setText(sb.toString());
            }
        });
        b2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                sb.append("2");
                editText.setText(sb.toString());
            }
        });
        b3.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                sb.append("3");
```

```java
            editText.setText(sb.toString());

        }

    });
    b4.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            sb.append("4");

            editText.setText(sb.toString());

        }

    });
    b5.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            sb.append("5");

            editText.setText(sb.toString());

        }

    });
    b6.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            sb.append("6");

            editText.setText(sb.toString());

        }

    });
    b7.setOnClickListener(new View.OnClickListener() {

        @Override
```

```java
            public void onClick(View view) {

                sb.append("7");

                editText.setText(sb.toString());

            }

        });

        b8.setOnClickListener(new View.OnClickListener() {

            @Override

            public void onClick(View view) {

                sb.append("8");

                editText.setText(sb.toString());

            }

        });

        b9.setOnClickListener(new View.OnClickListener() {

            @Override

            public void onClick(View view) {

                sb.append("9");

                editText.setText(sb.toString());

            }

        });

        bcall.setOnClickListener(new View.OnClickListener() {

            @Override

            public void onClick(View view) {

                if(validate()){

                    startActivity(new Intent(Intent.ACTION_CALL, Uri.parse("tel:"+
editText.getText().toString())));

                }

            }
```

```java
        });
        bsave.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                if(validate()){
                    Intent intent = new Intent(ContactsContract.Intents.Insert.ACTION);
                    intent.setType(ContactsContract.RawContacts.CONTENT_TYPE);

intent.putExtra(ContactsContract.Intents.Insert.PHONE,editText.getText().toString());
                    startActivity(intent);
                }
            }
        });
        bstar.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                sb.append("*");
                editText.setText(sb.toString());
            }
        });
        bhash.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                sb.append("#");
                editText.setText(sb.toString());
            }
```

```java
    });
    imageButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            if(validate()){
                sb = new StringBuilder(phoneNumber);
                if(sb.length()==1){
                    sb.deleteCharAt(0);
                }
                else {
                    sb.deleteCharAt(sb.length()-1);
                }
                editText.setText(sb.toString());
            }
        }
    });
}


private boolean validate() {
    phoneNumber = editText.getText().toString().trim();
    if(phoneNumber.isEmpty()){
        Toast.makeText(MainActivity.this,"Phone Number field can't be empty",Toast.LENGTH_SHORT);
        return false;
    }
    else {
        editText.setText(phoneNumber);
```

```
            return true;
        }
    }
}
```