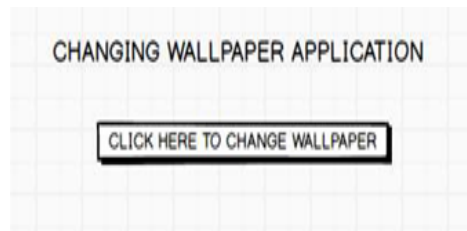


4. Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 seconds.



Wallpaper Changing Application

AndroidManifest.xml

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

    <uses-permission android:name="android.permission.SET_WALLPAPER">
    </uses-permission>

    <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.WallPaper">
        <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>
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center" tools:context=".MainActivity">

    <Button
        android:id="@+id/btn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="Change Wallpaper" />
</LinearLayout>
```

MainActivity.java

```
package com.example.wallpaper;

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.Timer;
import java.util.TimerTask;

public class MainActivity extends AppCompatActivity {

    int images[] = new int[]{
        R.drawable.i1, R.drawable.i2,
        R.drawable.i3
    };

    Button btn;
    int i=0;

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

```

super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);

btn = findViewById(R.id.btn);

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

    30000);
    new
    Timer().
    schedule
    (new
    ChangeWa
    llpaper(
    ),0,

    }
    });

}

class ChangeWallpaper extends TimerTask{
@Override
public void run() {

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

    try {wallpaperManager.setBitmap(

    BitmapFactory.decodeResource(getResources(),images[i]));
    i++;

    if(i==3){
    i=0;
    }

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

```

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.



Counter Application

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context=".MainActivity">

    <TextView
        android:id="@+id/counterValue"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:hint="Counter Value"
        android:textSize="40dp"
        android:gravity="center"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.334" />
```

<Button

```
    android:id="@+id/startBtn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Start"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.645" />
```

<Button

```
    android:id="@+id/stopBtn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Stop"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.781" />
```

<Switch

```
    android:id="@+id/switch1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginBottom="62dp"
    android:layout_marginEnd="177dp"
    android:layout_marginLeft="146dp"
    android:layout_marginRight="177dp"
    android:layout_marginStart="146dp"
    android:layout_marginTop="95dp" android:text="Switch"
    app:layout_constraintBottom_toTopOf="@+id/startBtn"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/counterValue" />
```

<TextView

```

        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="96dp"
        android:layout_marginEnd="61dp"
        android:layout_marginLeft="85dp"
        android:layout_marginRight="61dp"
        android:layout_marginStart="85dp"
        android:layout_marginTop="102dp"
        android:text="Counter Application"
        android:textSize="30dp"
        app:layout_constraintBottom_toTopOf="@+id/counterValue"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

```

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

MainActivity.java

```

package com.example.counter;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.os.Handler;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {

    private static final String TAG = "thread";

    Handler mainHandler = new Handler();

    int count=0;

    boolean running = false;

    Button startBtn,stopBtn;
    TextView counterVal;

    void startThread(){
        NewThread nObj = new NewThread();
        nObj.start();
    }

```

```

}

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

    setContentView(R.layout.activity_main);

    counterVal = findViewById(R.id.counterValue);

    startBtn = findViewById(R.id.startBtn);
    stopBtn = findViewById(R.id.stopBtn);
    startBtn.setOnClickListener(new View.OnClickListener() {

        @Override
        public void onClick(View v) {
            count=0;
            running=true;
            startThread();
        }
    });

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

            running=false;
        }
    });

}
class NewThread extends Thread{
    @Override
    public void run() {

        while(running){

            count++;
            mainHandler.post(new Runnable() {

                @Override
                public void run() {

                    counterVal.setText(String.valueOf(count));

                }
            });

        }
    }

    try { Thread.sleep(1000);

```

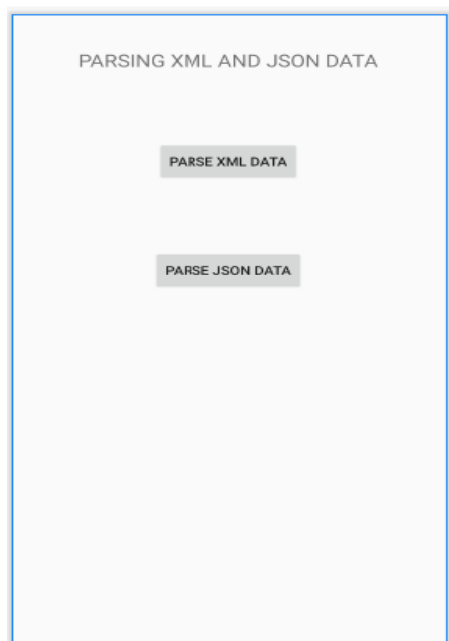
```
} catch (InterruptedException e) {  
    e.printStackTrace();  
}  
}  
}  
}  
}
```


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.



| PARSING XML AND JSON DATA | |
|---------------------------|-------------------|
| XML DATA | JSON Data |
| City_Name: Mysore | City_Name: Mysore |
| Latitude: 12.295 | Latitude: 12.295 |
| Longitude: 76.639 | Longitude: 76.639 |
| Temperature: 22 | Temperature: 22 |
| Humidity: 90% | Humidity: 90% |

Design



input.json

```
{
  "City": {
    "City-Name": "Bengaluru",
    "Longitude": "78",
    "Latitude": "13",
    "Temperature": "30",
    "Humidity": "90%"
  }
}
```

input.xml

```
<?xml version="1.0" ?>
```

```
<Records>
```

```
  <City id="1">
```

```
    <City-Name>Mangaluru</City-Name>
```

```
    <Longitude>78</Longitude>
```

```
    <Latitude>13</Latitude>
```

```
    <Temperature>30</Temperature>
```

```
    <Humidity>90%</Humidity>
```

```
  </City>
```

```
</Records>
```

activity_main.xml

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

```
<androidx.constraintlayout.widget.ConstraintLayout
```

```
xmlns:android="http://schemas.android.com/apk/res/android"
```

```
    xmlns:app="http://schemas.android.com/apk/res-auto"
```

```
    xmlns:tools="http://schemas.android.com/tools"
```

```
    android:layout_width="match_parent"
```

```
    android:layout_height="match_parent"
```

```
    tools:context=".MainActivity">
```

```
  <Button
```

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

```
    android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"
```

```
    android:text="Parse XML"
```

```
    app:layout_constraintBottom_toBottomOf="parent"
```

```
    app:layout_constraintEnd_toEndOf="parent"
```

```
    app:layout_constraintHorizontal_bias="0.498"
```

```
    app:layout_constraintStart_toStartOf="parent"
```

```
    app:layout_constraintTop_toTopOf="parent"
```

```
    app:layout_constraintVertical_bias="0.414" />
```

```
  <Button
```

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

```
    android:layout_width="wrap_content"
```

```

        android:layout_height="wrap_content"
        android:text="Parse JSON"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.664" />

```

```
<TextView
```

```

        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="144dp"
        android:layout_marginEnd="175dp"
        android:layout_marginLeft="177dp"
        android:layout_marginRight="175dp"
        android:layout_marginStart="177dp"
        android:layout_marginTop="120dp"
        android:text="Parse your Data"
        android:textSize="30dp"
        app:layout_constraintBottom_toTopOf="@+id/xmlBtn"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

```

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

activity_view.xml

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

```

<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".ViewActivity">

```

```
<TextView
```

```

        android:id="@+id/xmlPlaceholder"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"

```

```
        android:text="XML data"
        android:textSize="20dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.518" />
```

<TextView

```
        android:id="@+id/jsonPlaceholder"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="JSON data"
```

```
        android:textSize="20dp"
```

```
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.518" />
```

<TextView

```
        android:id="@+id/xmlHeading"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="XML Data"
        android:textColor="@color/teal_200"
        android:textSize="30dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.24" />
```

<TextView

```
        android:id="@+id/jsonHeading"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="JSON Data"
```

```

        android:textColor="@color/teal_200"
        android:textSize="30dp"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.24" />

```

```

<TextView

```

```

    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Parsed Data"
    android:textSize="30dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.089" />

```

```

</androidx.constraintlayout.widget.ConstraintLayout>

```

MainActivity.java

```

package com.example.dataparse;
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 {

    Button xmlBtn,jsonBtn;

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

        xmlBtn = findViewById(R.id.xmlBtn);
        jsonBtn = findViewById(R.id.jsonBtn);

        xmlBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v)
            { Intent intent = new

```

```

Intent(MainActivity.this,ViewActivity.class);
            intent.putExtra("mode",1);
            startActivity(intent);
        }
    });

    jsonBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v)
        { Intent intent = new
Intent(MainActivity.this,ViewActivity.class);
            intent.putExtra("mode",2);
            startActivity(intent);
        }
    }
}
}

```

ViewActivity.java

```

package com.example.dataparse;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.util.Log;
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 javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;
import javax.xml.parsers.ParserConfigurationException;

public class ViewActivity extends AppCompatActivity {

```

```

    int mode;
    TextView
    xmlPlaceholder,jsonPlaceholder,xmlHeading,jsonHeading;

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

        mode = getIntent().getIntExtra("mode",0);

        xmlPlaceholder = findViewById(R.id.xmlPlaceholder);
        jsonPlaceholder = findViewById(R.id.jsonPlaceholder);
        xmlHeading = findViewById(R.id.xmlHeading); jsonHeading =
        findViewById(R.id.jsonHeading);

        if(mode==1){
            parseXML();
        }

        if(mode==2){
            parseJSON();
        }

        }

        // read the file --> inputStream

        // array = inputStream

        // String(array)

        public void parseJSON(){

        xmlPlaceholder.setText("");
        xmlHeading.setText("");

        String stringData=null; try {

        InputStream inputStream =
        getAssets().open("input.json");

        int size = inputStream.available();

        byte buffer[] = new byte[size];

        inputStream.read(buffer);

```

```

stringData = new String(buffer);

Log.e("data", "parseJSON: "+stringData );

JSONObject jsonObject = new

JSONObject(stringData);

Log.e("data", "parseJSON: "+(jsonObject));

Log.e("data", "parseJSON:

"+jsonObject.getClass().getName());

JSONObject cityObject =
jsonObject.getJSONObject("City");

String cityName = cityObject.getString("City-Name");
String longitude = cityObject.getString("Longitude");
String latitude = cityObject.getString("Latitude");
String temperature =cityObject.getString("Temperature");
String humidity = cityObject.getString("Humidity");
Log.e("data", "parseJSON: "+ cityName );
jsonPlaceholder.setText("City-Name - "+cityName+"\n\n");
jsonPlaceholder.append("Longitude - "+longitude+"\n\n");
jsonPlaceholder.append("Latitude - "+latitude+"\n\n");
jsonPlaceholder.append("Temperature - "+temperature+"\n\n");
jsonPlaceholder.append("Humidity - "+humidity+"\n\n");

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

public void parseXML(){

xmlPlaceholder.setText(" ");

jsonPlaceholder.setText(" ");

jsonHeading.setText(" ");

```



```

try {
    InputStream inputStream =
        getAssets().open("input.xml");

    DocumentBuilderFactory documentBuilderFactory =
        DocumentBuilderFactory.newInstance();

    DocumentBuilder documentBuilder =
        documentBuilderFactory.newDocumentBuilder();

    Document document =

    documentBuilder.parse(inputStream);

    NodeList cityList =
        document.getElementsByTagName("City");

    for(int i=0; i<cityList.getLength();i++){

        Node c = cityList.item(i);

        if(c.getNodeType() == Node.ELEMENT_NODE){
            Element city = (Element) c;

            // String id = city.getAttribute("id");
            // Log.e("data", "parseXML: "+id );

            NodeList cityDetailList =
                city.getChildNodes();

            for(int j=0;j<cityDetailList.getLength();j++) {

                Node n = cityDetailList.item(j);

                if (n.getNodeType() == Node.ELEMENT_NODE)
                {
                    Element cityDetail = (Element) n;

                    String tagValue = cityDetail.getTagName();
                    String value = cityDetail.getTextContent();

                    Log.e("data", "parseXML: " + value);

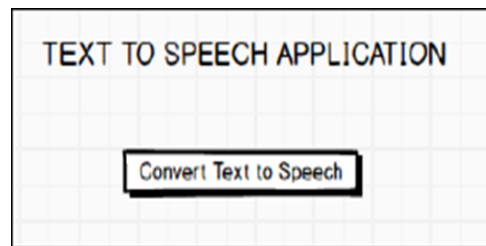
                    xmlPlaceholder.append(tagValue +" - "+value + "\n");
                    xmlPlaceholder.append("\n");

                }
            }
        }
    }
}

```

```
}  
}  
  
} catch (IOException e) {  
    e.printStackTrace();  
} catch (ParserConfigurationException e) {  
    e.printStackTrace();  
} catch (SAXException e) {  
    e.printStackTrace();  
}  
}  
}
```

. 7. Develop a simple application with one EditText 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



activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/enteredValue"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"
        android:hint="Enter your Text"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.223" />

    <Button
        android:id="@+id/speakBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Speak"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
```

```

        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.693" />
</androidx.constraintlayout.widget.ConstraintLayout>

```

MainActivity.java

```

package com.example.texttospeech;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

import java.util.Locale;

public class MainActivity extends AppCompatActivity {

    EditText enteredValue;
    Button speakBtn;

    TextToSpeech textToSpeech;

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

        speakBtn = findViewById(R.id.speakBtn);
        enteredValue = findViewById(R.id.enteredValue);

        textToSpeech = new TextToSpeech(MainActivity.this, new
TextToSpeech.OnInitListener() {
            @Override
            public void onInit(int status) {

                if(status == TextToSpeech.SUCCESS){

```

```

        textToSpeech.setLanguage(Locale.ENGLISH);
    }
    else{
        Log.e("failed", "onInit: Failed");
    }
}
});

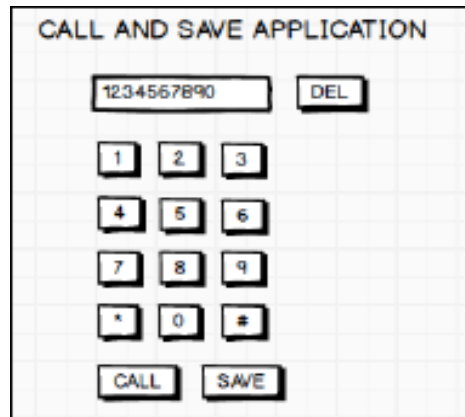
speakBtn.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {

        String text = enteredValue.getText().toString();
        textToSpeech.speak(text, TextToSpeech.QUEUE_FLUSH, null);

    }
});
}
}
}

```

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.



activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/btnSave"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="16dp"
        android:text="Save"
        app:layout_constraintEnd_toStartOf="@+id/btnCall"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/btnStar" />
```

```
<Button
```

```
android:id="@+id/btnCall"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="16dp"
android:text="Call"
app:layout_constraintEnd_toStartOf="@+id/btnRemove"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toEndOf="@+id/btnSave"
app:layout_constraintTop_toBottomOf="@+id/btn0" />
```

<Button

```
android:id="@+id/btnRemove"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="16dp"
android:text="X"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toEndOf="@+id/btnCall"
app:layout_constraintTop_toBottomOf="@+id/btnHash" />
```

<Button

```
android:id="@+id/btnStar"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="20dp" android:text="*"
app:layout_constraintEnd_toStartOf="@+id/btn0"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/btn7" />
```

<Button

```
android:id="@+id/btn0"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="20dp"
android:text="0"
app:layout_constraintEnd_toStartOf="@+id/btnHash"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toEndOf="@+id/btnStar"
app:layout_constraintTop_toBottomOf="@+id/btn8" />
```

<Button

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

```
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="20dp" android:text="#"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toEndOf="@+id/btn0"
app:layout_constraintTop_toBottomOf="@+id/btn9" />
```

<Button

```
android:id="@+id/btn7"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="27dp" android:text="7"
app:layout_constraintEnd_toStartOf="@+id/btn8"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/btn4" />
```

<Button

```
android:id="@+id/btn8"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="27dp" android:text="8"
app:layout_constraintEnd_toStartOf="@+id/btn9"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toEndOf="@+id/btn7"
app:layout_constraintTop_toBottomOf="@+id/btn5" />
```

<Button

```
android:id="@+id/btn9"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="27dp"
android:text="9"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toEndOf="@+id/btn8"
app:layout_constraintTop_toBottomOf="@+id/btn6" />
```

<Button

```
android:id="@+id/btn4"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
```



```
android:layout_marginTop="28dp" android:text="4"
app:layout_constraintEnd_toStartOf="@+id/btn5"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/btn1" />
```

<Button

```
android:id="@+id/btn5"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="28dp" android:text="5"
app:layout_constraintEnd_toStartOf="@+id/btn6"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toEndOf="@+id/btn4"
app:layout_constraintTop_toBottomOf="@+id/btn2" />
```

<Button

```
android:id="@+id/btn6"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="28dp" android:text="6"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toEndOf="@+id/btn5"
app:layout_constraintTop_toBottomOf="@+id/btn3" />
```

<Button

```
android:id="@+id/btn2"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="108dp"
android:text="2"
app:layout_constraintEnd_toStartOf="@+id/btn3"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toEndOf="@+id/btn1"
app:layout_constraintTop_toBottomOf="@+id/display" />
```

<Button

```
android:id="@+id/btn3"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="108dp"
```

```
    android:text="3"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toEndOf="@+id/btn2"
    app:layout_constraintTop_toBottomOf="@+id/display" />
```

<Button

```
    android:id="@+id/btn1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="108dp"
    android:text="1"
    app:layout_constraintEnd_toStartOf="@+id/btn2"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/display" />
```

<EditText

```
    android:id="@+id/display"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="phone"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.195" />
```

</androidx.constraintlayout.widget.ConstraintLayout>

MainActivity.java

```
package com.example.phonedailer;
```

```
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 display;
```

```
Button btn1,btn2, btn3,btn4, btn5,btn6, btn7,btn8,
btn9,btn0; Button btnCall,btnSave,btnStar,btnHash,btnRemove;
```

```
@Override
```

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

```
btn0 = findViewById(R.id.btn0);
btn1 = findViewById(R.id.btn1);
btn2 = findViewById(R.id.btn2);
btn3 = findViewById(R.id.btn3);
btn4 = findViewById(R.id.btn4);
btn6 = findViewById(R.id.btn6);
btn7 = findViewById(R.id.btn7);
btn8 = findViewById(R.id.btn8);
btn9 = findViewById(R.id.btn9);
```

```
btnCall = findViewById(R.id.btnCall);
btnSave = findViewById(R.id.btnSave);
btnRemove = findViewById(R.id.btnRemove);
btnStar = findViewById(R.id.btnStar);
btnHash = findViewById(R.id.btnHash);
```

```
display = findViewById(R.id.display);
```

```
btn0.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        display.append("0");
    }
});
```

```
btn1.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        display.append("1");  
    }  
});
```

```
btn2.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        display.append("2");  
    }  
});  
btn5 =  
    findViewById(R.id.btn5);
```

```
btn3.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        display.append("3");  
    }  
});
```

```
btn4.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        display.append("4");  
    }  
});
```

```
btn5.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        display.append("5");  
    }  
});
```

```
btn6.setOnClickListener(new View.OnClickListener() {
```

```
        @Override
        public void onClick(View v) {
            display.append("6");
        }
    });

    btn7.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("7");
        }
    });

    btn8.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("8");
        }
    });

    btn9.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("9");
        }
    });

    btnStar.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("*");
        }
    });

    btnHash.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            display.append("#");
        }
    });
});
```

```
btnCall.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {

        String data = display.getText().toString();

        Intent intent = new Intent(Intent.ACTION_DIAL);

        intent.setData(Uri.parse("tel:"+data));

        startActivity(intent);

    }
});

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

        String data = display.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, data);

        startActivity(intent);

    }
});

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

        String data = display.getText().toString();
```

```
1);  
  
        if(data.length()>0){  
            String val = data.substring(0,data.length()-  
                display.setText(val);  
        }  
        else{  
            display.setText("");  
        }  
  
    }  
    });  
    }  
}
```