

“MOBILE APPLICATION DEVELOPMENT LAB MANUAL”

[18CSMP68]

As per VTU Revised Syllabus

Language Used: Kotlin

PREPARED BY:

Prof. DEEPAK P

Asst. Professor, Department of Computer Science & Engineering

NIEIT, Mysuru

Email: deepak@nieit.ac.in

PART A

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

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">

    <com.google.android.material.card.MaterialCardView
        android:layout_width="match_parent"
        android:layout_height="260dp"
        android:layout_margin="8dp"
        android:elevation="8dp"
        app:cardCornerRadius="8dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">

    <androidx.constraintlayout.widget.ConstraintLayout
        android:layout_width="match_parent"
```

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

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

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

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

```
    android:layout_height="100dp"
```

```
    android:orientation="horizontal"
```

```
    app:layout_constraintBottom_toTopOf="@+id/divider"
```

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

```
    app:layout_constraintHorizontal_bias="0.5"
```

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

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

```
<com.google.android.material.textview.MaterialTextView
```

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

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

```
    android:layout_height="32dp"
```

```
    android:text="@string/nieit"
```

```
    android:textSize="20sp"
```

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

```
    app:layout_constraintEnd_toStartOf="@+id/imageView"
```

```
    app:layout_constraintHorizontal_bias="0.5"
```

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

```
    app:layout_constraintTop_toTopOf="parent" />
```

```
<ImageView
```

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

```
    android:layout_width="100dp"
```

```
        android:layout_height="100dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toEndOf="@+id/materialTextView"
        app:layout_constraintTop_toTopOf="parent"
        tools:srcCompat="@tools:sample/avater"
        app:srcCompat="@drawable/nieit_logo1"/>
</androidx.constraintlayout.widget.ConstraintLayout>
```

```
<View
    android:id="@+id/divider"
    android:layout_width="match_parent"
    android:layout_height="2dp"
    android:background="?android:attr/listDivider"
    app:layout_constraintBottom_toTopOf="@+id/name"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/title_box" />
```

```
<com.google.android.material.textview.MaterialTextView
    android:id="@+id/name"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center"
    android:text="Deepak P"
    android:autoSizeMaxTextSize="30dp"
```

```
android:textSize="16sp"  
app:layout_constraintBottom_toTopOf="@+id/job_title"  
app:layout_constraintEnd_toEndOf="parent"  
app:layout_constraintHorizontal_bias="0.5"  
app:layout_constraintStart_toStartOf="parent"  
app:layout_constraintTop_toBottomOf="@+id/divider" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/job_title"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:gravity="center"  
    android:text="Assistant Professor-CSE"  
    android:textSize="16sp"  
    app:layout_constraintBottom_toTopOf="@+id/phone_number"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.5"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toBottomOf="@+id/name" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/phone_number"  
    android:layout_width="match_parent"  
    android:layout_height="wrap_content"  
    android:gravity="center"  
    android:text="Enter your mobile number"  
    android:textSize="16sp"  
    app:layout_constraintBottom_toTopOf="@+id/address"
```

```
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/job_title" />
```

```
<com.google.android.material.textview.MaterialTextView
    android:id="@+id/address"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center"
    android:text="Next to BEML, Koorgalli"
    android:textSize="16sp"
    app:layout_constraintBottom_toTopOf="@+id/email_etc"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/phone_number" />
```

```
<com.google.android.material.textview.MaterialTextView
    android:id="@+id/email_etc"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center"
    android:text="deepak@nieit.ac.in, www.nieit.ac.in, Fax"
    android:textSize="16sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
```

```

app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/address" />
</androidx.constraintlayout.widget.ConstraintLayout>
</com.google.android.material.card.MaterialCardView>

</androidx.constraintlayout.widget.ConstraintLayout>

```

Kotlin File

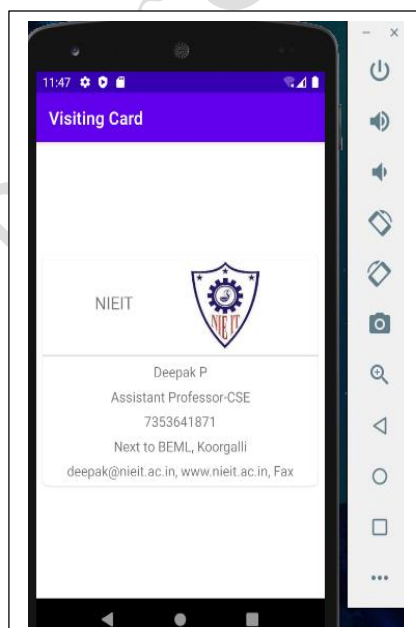
```

package `in`.edu.cambridge.visitingcard
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle

class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
    }
}

```

Output:



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

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">

    <LinearLayout

        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="vertical"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">

        <com.google.android.material.textview.MaterialTextView

            android:id="@+id/expression"
            android:layout_width="400dp"
            android:layout_height="100dp"
            android:textSize="20sp"
            android:gravity="center"/>
```


<LinearLayout

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
```

<com.google.android.material.textview.MaterialTextView

```
    android:id="@+id/result"
    android:layout_width="100dp"
    android:layout_height="100dp"
    android:gravity="center"
    android:textSize="24sp"/>
```

<com.google.android.material.textview.MaterialTextView

```
    android:id="@+id/clear"
    android:layout_width="400dp"
    android:layout_height="100dp"
    android:gravity="center"
    android:text="C"
    android:textSize="24sp" />
```

</LinearLayout>

<LinearLayout

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
    android:layout_height="100dp"
```

```
    android:gravity="center"
```

```
    android:text="1"
```

```
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
    android:layout_height="50dp"
```

```
    android:gravity="center"
```

```
    android:text="2"
```

```
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
    android:layout_height="50dp"
```

```
    android:gravity="center"
```

```
    android:text="3"
```

```
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
android:layout_height="50dp"  
android:gravity="center"  
android:text="/"   
android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout
```

```
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:orientation="horizontal">
```

```
<com.google.android.material.textview.MaterialTextView
```

```
    android:id="@+id/four"  
    android:layout_width="100dp"  
    android:layout_height="50dp"  
    android:gravity="center"  
    android:text="4"  
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView
```

```
    android:id="@+id/five"  
    android:layout_width="100dp"  
    android:layout_height="50dp"  
    android:gravity="center"  
    android:text="5"  
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
    android:layout_height="50dp"
```

```
    android:gravity="center"
```

```
    android:text="6"
```

```
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
    android:layout_height="50dp"
```

```
    android:gravity="center"
```

```
    android:text="*"
```

```
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout
```

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

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

```
    android:orientation="horizontal">
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
    android:layout_height="50dp"
```

```
    android:gravity="center"
```

```
android:text="7"  
android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/eight"  
    android:layout_width="100dp"  
    android:layout_height="50dp"  
    android:gravity="center"  
    android:text="8"  
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/nine"  
    android:layout_width="100dp"  
    android:layout_height="50dp"  
    android:gravity="center"  
    android:text="9"  
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/subtraction"  
    android:layout_width="100dp"  
    android:layout_height="50dp"  
    android:gravity="center"  
    android:text="-"  
    android:textSize="24sp" />
```

```
</LinearLayout>
```

<LinearLayout

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal">
```

<com.google.android.material.textview.MaterialTextView

```
    android:id="@+id/dot"
    android:layout_width="100dp"
    android:layout_height="100dp"
    android:gravity="center"
    android:text="."
    android:textSize="24sp" />
```

<com.google.android.material.textview.MaterialTextView

```
    android:id="@+id/zero"
    android:layout_width="100dp"
    android:layout_height="50dp"
    android:gravity="center"
    android:text="0"
    android:textSize="24sp" />
```

<com.google.android.material.textview.MaterialTextView

```
    android:id="@+id/equals"
    android:layout_width="100dp"
    android:layout_height="50dp"
    android:gravity="center"
    android:text="="
```

```
android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
    android:layout_height="50dp"
```

```
    android:gravity="center"
```

```
    android:text="+"
```

```
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
</LinearLayout>
```

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

Kotlin File:

```
package `in`.edu.cambridge.calculator
```

```
import androidx.appcompat.app.AppCompatActivity
```

```
import android.os.Bundle
```

```
import android.widget.TextView
```

```
import net.objecthunter.exp4j.ExpressionBuilder
```

```
class MainActivity : AppCompatActivity() {
```

```
    private lateinit var zero: TextView
```

```
    private lateinit var one: TextView
```

```
    private lateinit var two: TextView
```

```
    private lateinit var three: TextView
```

```
    private lateinit var four: TextView
```

```
private lateinit var five: TextView
private lateinit var six: TextView
private lateinit var seven: TextView
private lateinit var eight: TextView
private lateinit var nine: TextView
private lateinit var addition: TextView
private lateinit var subtraction: TextView
private lateinit var multiplication: TextView
private lateinit var division: TextView
private lateinit var equals : TextView
private lateinit var clear: TextView
private lateinit var dot: TextView
private lateinit var result : TextView
private lateinit var expression : TextView
```

```
override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_main)

    zero = findViewById(R.id.zero)
    one = findViewById(R.id.one)
    two = findViewById(R.id.two)
    three = findViewById(R.id.three)
    four = findViewById(R.id.four)
    five = findViewById(R.id.five)
    six = findViewById(R.id.six)
    seven = findViewById(R.id.seven)
    eight = findViewById(R.id.eight)
```



```
nine = findViewById(R.id.nine)
dot = findViewById(R.id.dot)
clear = findViewById(R.id.clear)
addition = findViewById(R.id.addition)
subtraction = findViewById(R.id.subtraction)
division = findViewById(R.id.division)
multiplication = findViewById(R.id.multiplication)
equals = findViewById(R.id.equals)
result = findViewById(R.id.result)
expression = findViewById(R.id.expression)
```

```
zero.setOnClickListener {
    pressButton("0", true)
}
```

```
one.setOnClickListener {
    pressButton("1", true)
}
```

```
two.setOnClickListener {
    pressButton("2", true)
}
```

```
three.setOnClickListener {
    pressButton("3", true)
}
```

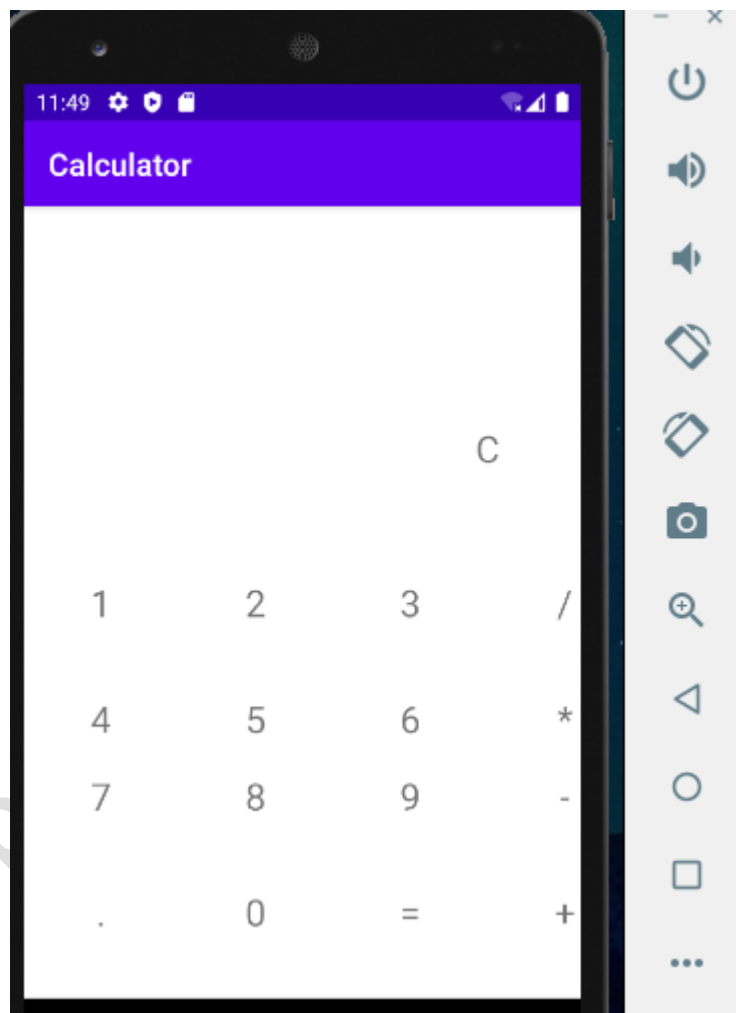
```
four.setOnClickListener {
    pressButton("4", true)
}
```

```
five.setOnClickListener {  
    pressButton("5", true)  
}  
six.setOnClickListener {  
    pressButton("6", true)  
}  
seven.setOnClickListener {  
    pressButton("7", true)  
}  
eight.setOnClickListener {  
    pressButton("8", true)  
}  
nine.setOnClickListener {  
    pressButton("9", true)  
}  
  
addition.setOnClickListener {  
    pressButton("+", true)  
}  
  
subtraction.setOnClickListener {  
    pressButton("-", true)  
}  
multiplication.setOnClickListener {  
    pressButton("*", true)  
}  
division.setOnClickListener {  
    pressButton("/", true)
```

```
}  
  
dot.setOnClickListener {  
    pressButton(".", true)  
}  
  
clear.setOnClickListener {  
    result.text = ""  
    expression.text = ""  
}  
  
equals.setOnClickListener {  
    val text = expression.text.toString()  
    val expression = ExpressionBuilder(text).build()  
    val expResult = expression.evaluate()  
    val longResult = expResult.toLong()  
    if (expResult == longResult.toDouble()) {  
        result.text = longResult.toString()  
    } else {  
        result.text = result.toString()  
    }  
}  
}  
  
fun pressButton(string: String, clear: Boolean) {  
    if(clear) {  
        result.text = ""  
        expression.append(string)  
    } else {  
        expression.append(result.text)  
        expression.append(string)  
        result.text = ""  
    }  
}
```

```
}  
}  
}
```

Output:



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

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

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

Activity_login.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=".LoginActivity">

    <com.google.android.material.textfield.TextInputLayout
        android:id="@+id/login_username_layout"
        style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
        android:layout_width="match_parent"
        android:layout_height="54dp"
        android:layout_marginStart="16dp"
        android:layout_marginTop="8dp"
        android:layout_marginEnd="16dp"
        android:layout_marginBottom="8dp"
```

```
app:layout_constraintBottom_toTopOf="@+id/login_password_layout"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.25"
app:layout_constraintVertical_chainStyle="packed">
```

```
<com.google.android.material.textfield.TextInputEditText
    android:id="@+id/login_username"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:hint="Username" />
</com.google.android.material.textfield.TextInputLayout>
```

```
<com.google.android.material.textfield.TextInputLayout
    android:id="@+id/login_password_layout"
    style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
    android:layout_width="match_parent"
    android:layout_height="54dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="8dp"
    android:layout_marginEnd="16dp"
    android:layout_marginBottom="8dp"
    app:enableIconCheckable="true"
    app:enableIconMode="password_toggle"
    app:layout_constraintBottom_toTopOf="@+id/loginButton"
    app:layout_constraintEnd_toEndOf="parent"
```

app:layout_constraintHorizontal_bias="0.5"

app:layout_constraintStart_toStartOf="parent"

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

<com.google.android.material.textfield.TextInputEditText

android:id="@+id/login_password"

android:layout_width="match_parent"

android:layout_height="match_parent"

android:hint="Password"

android:inputType="textPassword" />

</com.google.android.material.textfield.TextInputLayout>

<com.google.android.material.button.MaterialButton

android:id="@+id/loginButton"

android:layout_width="match_parent"

android:layout_height="54dp"

android:layout_marginStart="16dp"

android:layout_marginTop="8dp"

android:layout_marginEnd="16dp"

android:layout_marginBottom="8dp"

android:text="Login Up"

app:layout_constraintBottom_toTopOf="@+id/login_to_signup"

app:layout_constraintEnd_toEndOf="parent"

app:layout_constraintHorizontal_bias="0.5"

app:layout_constraintStart_toStartOf="parent"

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

<com.google.android.material.textview.MaterialTextView

```
android:id="@+id/login_to_signup"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="16dp"
android:layout_marginTop="16dp"
android:layout_marginEnd="16dp"
android:layout_marginBottom="8dp"
android:text="Sign Up"
android:textColor="@color/purple_500"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/logInButton" />
```

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

Activity_Signup.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=".SignupActivity">

<com.google.android.material.textfield.TextInputLayout
    android:id="@+id/signup_username_layout"
```



```
style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
android:layout_width="match_parent"
android:layout_height="54dp"
android:layout_marginStart="16dp"
android:layout_marginTop="8dp"
android:layout_marginEnd="16dp"
android:layout_marginBottom="8dp"
app:layout_constraintBottom_toTopOf="@+id/signUp_password_layout"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.25"
app:layout_constraintVertical_chainStyle="packed">
```

```
<com.google.android.material.textfield.TextInputEditText
    android:id="@+id/signUp_username"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:hint="Username" />
```

```
</com.google.android.material.textfield.TextInputLayout>
```

```
<com.google.android.material.textfield.TextInputLayout
    android:id="@+id/signUp_password_layout"
    style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
    android:layout_width="match_parent"
    android:layout_height="54dp"
    android:layout_marginStart="16dp"
```

```
android:layout_marginTop="8dp"
android:layout_marginEnd="16dp"
android:layout_marginBottom="8dp"
app:enableIconCheckable="true"
app:enableIconMode="password_toggle"
app:layout_constraintBottom_toTopOf="@+id/signupButton"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/signup_username_layout">
```

```
<com.google.android.material.textfield.TextInputEditText
    android:id="@+id/signup_password"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:hint="Password"
    android:inputType="textPassword" />
</com.google.android.material.textfield.TextInputLayout>
```

```
<com.google.android.material.button.MaterialButton
    android:id="@+id/signupButton"
    android:layout_width="match_parent"
    android:layout_height="54dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="8dp"
    android:layout_marginEnd="16dp"
    android:layout_marginBottom="8dp"
    android:text="Sign Up"
```

```
app:layout_constraintBottom_toTopOf="@+id/signup_to_login"  
app:layout_constraintEnd_toEndOf="parent"  
app:layout_constraintHorizontal_bias="0.5"  
app:layout_constraintStart_toStartOf="parent"  
app:layout_constraintTop_toBottomOf="@+id/signup_password_layout" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/signup_to_login"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_marginStart="16dp"  
    android:layout_marginTop="16dp"  
    android:layout_marginEnd="16dp"  
    android:layout_marginBottom="8dp"  
    android:text="Log In"  
    android:textColor="@color/purple_500"  
    app:layout_constraintBottom_toBottomOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.5"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toBottomOf="@+id/signupButton" />  
</androidx.constraintlayout.widget.ConstraintLayout>
```

Login_Activity.kt

```
package `in`.edu.cambridge.loginsignup
```

```
import `in`.edu.cambridge.loginsignup.data.AppDatabase
import android.content.Intent
import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
import android.widget.Toast
import androidx.room.Room
```

```
class LoginActivity : AppCompatActivity() {
```

```
    private lateinit var loginUsername: EditText
    private lateinit var loginPassword: EditText
    private lateinit var loginBtn: Button
    private lateinit var loginToSignup: TextView
```

```
    override fun onCreate(savedInstanceState: Bundle?) {
```

```
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_login)
        supportActionBar?.setTitle("Log In")

        loginUsername = findViewById(R.id.login_username)
        loginPassword = findViewById(R.id.login_password)
        loginToSignup = findViewById(R.id.login_to_signup)
        loginBtn = findViewById(R.id.loginButton)
```

```
val db = Room.databaseBuilder(  
    applicationContext,  
    AppDatabase::class.java, "app-database"  
)  
.allowMainThreadQueries().build()  
  
val userDao = db.userDao()  
  
loginBtn.setOnClickListener {  
  
    val tempUser = userDao.getUser(loginUsername.text.toString())  
  
    if(tempUser.password.equals(loginPassword.text.toString())){  
        Toast.makeText(baseContext,"Login Successful",Toast.LENGTH_SHORT).show()  
    }  
    else{  
        Toast.makeText(baseContext,"Invalid Username Or  
Password",Toast.LENGTH_SHORT).show()  
    }  
  
}  
  
loginToSignup.setOnClickListener {  
    val intent = Intent(this, SignupActivity::class.java)  
    startActivity(intent)  
}  
}
```

Signup_activity.kt

```
package `in`.edu.cambridge.loginsignup

import `in`.edu.cambridge.loginsignup.data.AppDatabase
import `in`.edu.cambridge.loginsignup.data.User
import android.content.Intent
import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity
import androidx.room.Room
import java.util.regex.Matcher
import java.util.regex.Pattern

class SignupActivity : AppCompatActivity() {

    private lateinit var signUpUsername: EditText
    private lateinit var signUpPassword: EditText
    private lateinit var signUpBtn: Button
    private lateinit var signUpToLogIn: TextView

    override fun onCreate(savedInstanceState: Bundle?) {

        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_signup)
        supportActionBar?.setTitle("Sign Up")
    }
}
```

```
signUpUsername = findViewById(R.id.signUp_username)
signUpPassword = findViewById(R.id.signUp_password)
signUpToLogIn = findViewById(R.id.signUp_to_logIn)
signUpBtn = findViewById(R.id.signUpButton)

val db = Room.databaseBuilder(
    applicationContext,
    AppDatabase::class.java, "app-database"
).allowMainThreadQueries().build()

val userDao = db.userDao()

signUpBtn.setOnClickListener {

    if(signUpPassword.text.toString().length<8 &&
!isValidPassword(signUpPassword.text.toString())){

        Toast.makeText(baseContext,"Invalid Password",
Toast.LENGTH_SHORT).show()

    }else{

        val newUser = User(signUpUsername.text.toString(),
signUpPassword.text.toString())

        userDao.insert(newUser)

        Toast.makeText(baseContext,"Sign Up Successful",
Toast.LENGTH_SHORT).show()

    }

}

signUpToLogIn.setOnClickListener{
```

```
        val intent = Intent(this, LoginActivity::class.java)

        startActivity(intent)

    }

}
```



```
fun isValidPassword(password: String?): Boolean {

    val pattern: Pattern

    val matcher: Matcher

    val PASSWORD_PATTERN = "^(?=.*[0-9])(?=.*[A-Z])(?=.*[@#$%^&+=!])(?!\\S+$).{4,}$"

    pattern = Pattern.compile(PASSWORD_PATTERN)

    matcher = pattern.matcher(password)

    return matcher.matches()

}
```



```
}
```

Database/Data Files:

AppDatabase.kt

```
package `in`.edu.cambridge.loginsignup.data

import androidx.room.Database
import androidx.room.RoomDatabase

@Database(entities = [User::class], version = 1)
abstract class AppDatabase : RoomDatabase() {

    abstract fun userDao(): UserDao

}
```


User.kt

```
package `in`.edu.cambridge.loginsignup.data
```

```
import androidx.room.Entity
```

```
import androidx.room.PrimaryKey
```

```
@Entity
```

```
data class User(
```

```
    @PrimaryKey val username: String,
```

```
    val password: String?
```

```
)
```

UserDao.kt

```
package `in`.edu.cambridge.loginsignup.data
```

```
import androidx.room.Dao
```

```
import androidx.room.Delete
```

```
import androidx.room.Insert
```

```
import androidx.room.Query
```

```
@Dao
```

```
interface UserDao {
```

```
    @Query("SELECT * FROM user WHERE username == :username")
```

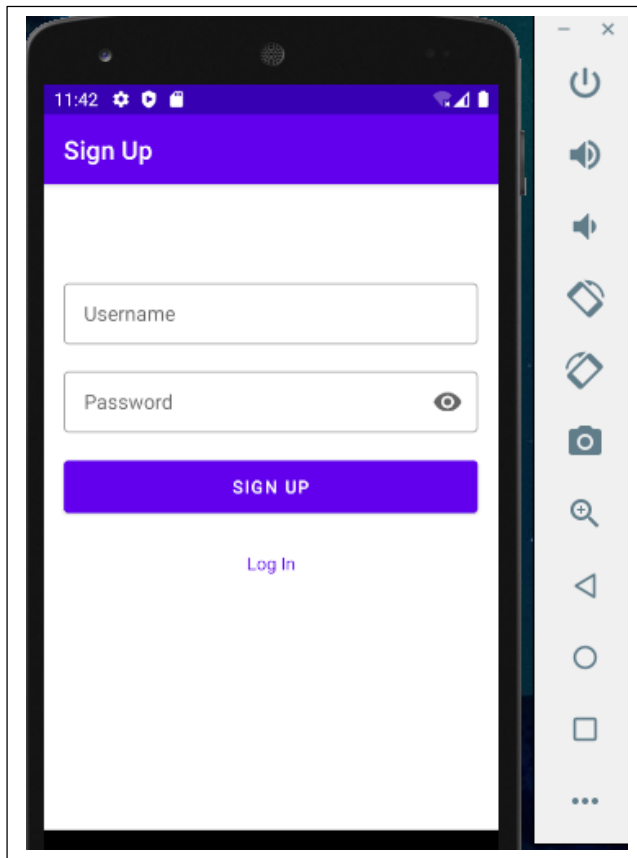
```
    fun getUser(username: String): User
```

```
    @Insert
```

```
    fun insert(user: User)
```

```
}
```

Output:



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.

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">
```

```
<com.google.android.material.button.MaterialButton  
    android:id="@+id/change_wallpaper"  
    android:layout_width="wrap_content"  
    android:layout_height="54dp"  
    android:text="Change Wallpaper"  
    app:layout_constraintBottom_toBottomOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.5"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toTopOf="parent" />
```

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

MainActivity.kt

```
//@file:Suppress("DEPRECATION")  
  
package `in`.edu.cambridge.wallpaper  
import android.app.WallpaperManager  
import android.graphics.Bitmap  
import android.graphics.BitmapFactory  
import android.os.Bundle  
import android.os.Handler  
import android.os.HandlerThread  
import android.widget.Button  
import android.widget.Toast  
import androidx.appcompat.app.AppCompatActivity
```

```
class MainActivity : AppCompatActivity() {

    var myWallpaperList =
        arrayOf(R.drawable.wallpaper1,R.drawable.wallpaper2,R.drawable.wallpaper3,R.drawable.wallpaper4,R.drawable.wallpaper5)

    private lateinit var changeWallpaper:Button

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        changeWallpaper = findViewById(R.id.change_wallpaper)
        changeWallpaper.setOnClickListener { setWallpaper() }
    }

    // @Suppress("DEPRECATION")
    fun setWallpaper() {
        Toast.makeText(this, "Setting Wallpaper please wait.",
            Toast.LENGTH_SHORT).show()

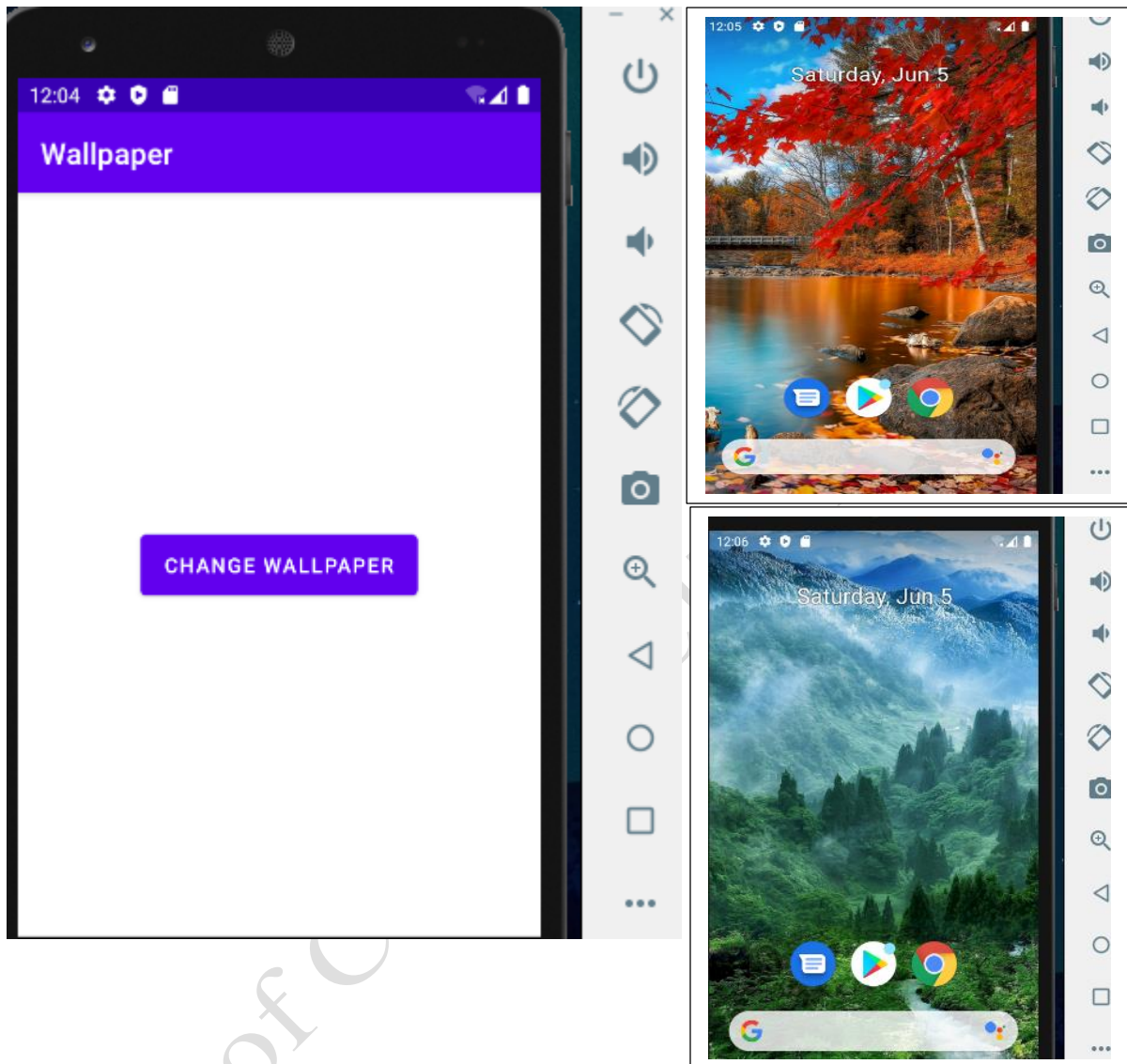
        // @Suppress("DEPRECATION", "TrailingComma")
        @Suppress("DEPRECATION")
        Handler().postDelayed({
            for(i in myWallpaperList) {
                val bitmap: Bitmap = BitmapFactory.decodeResource(resources, i)
                val wallpaperManager = WallpaperManager.getInstance(baseContext)
                wallpaperManager.setBitmap(bitmap)
            }
        }, 1000)
    }
}
```

```
    }  
    }, 2000)  
}  
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>  
  
<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
    package="in.edu.cambridge.wallpaper">  
  
    <uses-permission android:name="android.permission.SET_WALLPAPER" />  
  
    <application  
        android:allowBackup="true"  
        android:icon="@mipmap/ic_launcher"  
        android:label="@string/app_name"  
        android:roundIcon="@mipmap/ic_launcher_round"  
        android:supportsRtl="true"  
        android:theme="@style/Theme.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>
```

Output:



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.

Activitymain.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">

    <com.google.android.material.textview.MaterialTextView
        android:id="@+id/counter_value"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="8dp"
        android:layout_marginBottom="8dp"
        android:text="Counter Value"
        android:textSize="24sp"
        app:layout_constraintBottom_toTopOf="@+id/start_counter"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">
```

```
app:layout_constraintVertical_bias="0.25"
```

```
app:layout_constraintVertical_chainStyle="packed" />
```

```
<com.google.android.material.button.MaterialButton
```

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

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

```
    android:layout_height="54dp"
```

```
    android:layout_marginTop="8dp"
```

```
    android:layout_marginBottom="8dp"
```

```
    android:text="Start"
```

```
    app:layout_constraintBottom_toTopOf="@+id/stop_counter"
```

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

```
    app:layout_constraintHorizontal_bias="0.5"
```

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

```
    app:layout_constraintTop_toBottomOf="@+id/counter_value" />
```

```
<com.google.android.material.button.MaterialButton
```

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

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

```
    android:layout_height="54dp"
```

```
    android:layout_marginTop="8dp"
```

```
    android:layout_marginBottom="8dp"
```

```
    android:text="Stop"
```

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

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

```
    app:layout_constraintHorizontal_bias="0.5"
```

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



```
app:layout_constraintTop_toBottomOf="@+id/start_counter" />
```

```
<com.google.android.material.button.MaterialButton  
    android:id="@+id/reset_counter"  
    android:layout_width="wrap_content"  
    android:layout_height="54dp"  
    android:layout_marginTop="8dp"  
    android:layout_marginBottom="8dp"  
    android:text="Reset"  
    app:layout_constraintBottom_toBottomOf="parent"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.5"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toBottomOf="@+id/start_counter" />  
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.kt

```
package `in`.edu.cambridge.counter  
  
import androidx.appcompat.app.AppCompatActivity  
import android.os.Bundle  
import android.widget.Button  
import android.widget.TextView  
import android.os.CountDownTimer  
//import android.view.View  
  
class MainActivity : AppCompatActivity() {  
    private lateinit var counterValue:TextView
```

```
private lateinit var startCounter : Button  
private lateinit var stopCounter : Button  
private lateinit var resetCounter : Button
```

```
val timer = MyCounter(10000000, 10)  
var countervalue : Int = 0  
override fun onCreate(savedInstanceState: Bundle?) {  
    super.onCreate(savedInstanceState)  
    setContentView(R.layout.activity_main)
```

```
    counterValue = findViewById(R.id.counter_value)  
    startCounter = findViewById(R.id.start_counter)
```

```
    startCounter.setOnClickListener {  
        timer.start()  
        startCounter.isEnabled=false  
    }
```

```
    stopCounter = findViewById(R.id.stop_counter)  
    stopCounter.setOnClickListener {  
        timer.cancel()  
        startCounter.isEnabled=true  
    }
```

```
    resetCounter = findViewById(R.id.reset_counter)  
    resetCounter.setOnClickListener {
```

```
        countervalue = 0  
        counterValue.text = (countervalue).toString()
```

```

    }

    /*fun reset(view : View){

        val count = 0

        var text = count.toString()

    }*/

}

inner class MyCounter(millisInFuture: Long, countDownInterval: Long) :
    CountDownTimer(millisInFuture, countDownInterval) {

        override fun onFinish() {

        }

        override fun onTick(millisUntilFinished: Long) {

            countervalue++

            counterValue.text = (countervalue).toString()

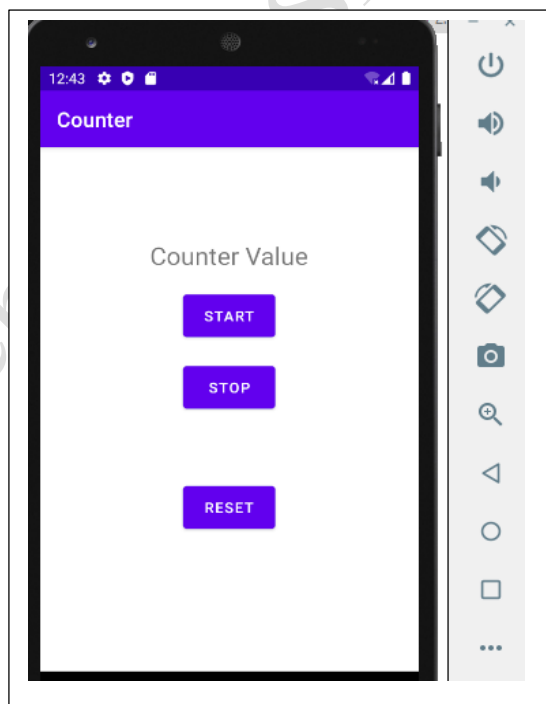
        }

    }

}

```

Output:



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.

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">

    <com.google.android.material.button.MaterialButton
        android:id="@+id/parse_xml"
        android:layout_width="wrap_content"
        android:layout_height="54dp"
        android:layout_marginBottom="8dp"
        android:text="Parse XML Data"
        app:layout_constraintBottom_toTopOf="@+id/parse_json"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.24000001"
        app:layout_constraintVertical_chainStyle="packed" />
```

```
<com.google.android.material.button.MaterialButton  
    android:id="@+id/parse_json"  
    android:layout_width="wrap_content"  
    android:layout_height="54dp"  
    android:layout_marginBottom="8dp"  
    android:text="Parse JSON Data"  
    app:layout_constraintBottom_toTopOf="@+id/data_type"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.5"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toBottomOf="@+id/parse_xml" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/data_type"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_marginTop="24dp"  
    android:layout_marginBottom="16dp"  
    android:text=""  
    android:textSize="24sp"  
    app:layout_constraintBottom_toTopOf="@+id/city_name"  
    app:layout_constraintEnd_toEndOf="parent"  
    app:layout_constraintHorizontal_bias="0.5"  
    app:layout_constraintStart_toStartOf="parent"  
    app:layout_constraintTop_toBottomOf="@+id/parse_json" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/city_name"
```

```
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="8dp"
android:layout_marginBottom="8dp"
android:text="City Name :"
android:textSize="24sp"
app:layout_constraintBottom_toTopOf="@+id/latitude"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/data_type" />
```

```
<com.google.android.material.textview.MaterialTextView
```

```
    android:id="@+id/latitude"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="8dp"
    android:layout_marginBottom="8dp"
    android:text="Latitude :"
    android:textSize="24sp"
    app:layout_constraintBottom_toTopOf="@+id/longitude"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/city_name" />
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="8dp"
android:layout_marginBottom="8dp"
android:text="Longitude :"
android:textSize="24sp"
app:layout_constraintBottom_toTopOf="@+id/temperature"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/latitude" />
```

```
<com.google.android.material.textview.MaterialTextView
```

```
    android:id="@+id/temperature"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="8dp"
    android:layout_marginBottom="8dp"
    android:text="Temperature :"
    android:textSize="24sp"
    app:layout_constraintBottom_toTopOf="@+id/humidity"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/longitude" />
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="8dp"
android:layout_marginBottom="8dp"
android:text="Humidity :"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/temperature"/>
```

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

MainActivity.kt

```
package `in`.edu.cambridge.parsingxmlandjson
```

```
import androidx.appcompat.app.AppCompatActivity
```

```
import android.os.Bundle
```

```
import android.widget.Button
```

```
import android.widget.TextView
```

```
import org.json.JSONObject
```

```
import java.io.IOException
```

```
import java.nio.charset.Charset
```

```
import javax.xml.parsers.DocumentBuilderFactory
```

```
import android.annotation.SuppressLint as SuppressLint1
```



```
class MainActivity : AppCompatActivity() {  
    private lateinit var parseXMLBtn: Button  
    private lateinit var parseJSONBtn: Button  
  
    private lateinit var datatype : TextView  
    private lateinit var cityName: TextView  
    private lateinit var latitude: TextView  
    private lateinit var longitude: TextView  
    private lateinit var temperature: TextView  
    private lateinit var humidity: TextView  
  
    override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.activity_main)  
  
        parseXMLBtn = findViewById(R.id.parse_xml)  
        parseXMLBtn.setOnClickListener { parseXML() }  
        parseJSONBtn = findViewById(R.id.parse_json)  
        parseJSONBtn.setOnClickListener { parseJSON() }  
        parseXMLBtn.setOnClickListener { parseXML() }  
  
        datatype = findViewById(R.id.data_type)  
        cityName = findViewById(R.id.city_name)  
        latitude = findViewById(R.id.latitude)  
        longitude = findViewById(R.id.longitude)  
        temperature = findViewById(R.id.temperature)  
        humidity = findViewById(R.id.humidity)
```

```
}
```

```
@SuppressWarnings("SetTextI18n")
```

```
fun parseXML(){
```

```
    datatype.text = "XML Data"
```

```
    try {
```

```
        val iStream = assets.open("myxml.xml")
```

```
        val builderFactory = DocumentBuilderFactory.newInstance()
```

```
        var docBuilder = builderFactory.newDocumentBuilder()
```

```
        var doc = docBuilder.parse(iStream)
```

```
        cityName.text = "City Name : " +  
doc.getElementsByTagName("City_Name").item(0).getFirstChild().getNodeValue()
```

```
        latitude.text = "Latitude : " +  
doc.getElementsByTagName("Latitude").item(0).getFirstChild().getNodeValue()
```

```
        longitude.text = "Longitude : " +  
doc.getElementsByTagName("Longitude").item(0).getFirstChild().getNodeValue()
```

```
        temperature.text = "Temperature : " +  
doc.getElementsByTagName("Temperature").item(0).getFirstChild().getNodeValue()
```

```
        humidity.text = "Humidity : " +  
doc.getElementsByTagName("Humidity").item(0).getFirstChild().getNodeValue()
```

```
    }
```

```
    catch (ex: IOException) {
```

```
    }
```

```
}
```

```
@SuppressWarnings("SetTextI18n")
```

```
fun parseJSON(){
```

```
    datatype.text = "JSON Data"
```

```
val obj = JSONObject(loadJSONFromAsset())

cityName.text = "City Name : " + obj.getString("City Name")

latitude.text = "Latitude : " + obj.getString("Latitude")

longitude.text = "Longitude : " + obj.getString("Longitude")

temperature.text = "Temperature : " + obj.getString("Temperature")

humidity.text = "Humidity : " + obj.getString("Humidity")

}

private fun loadJSONFromAsset(): String {
    val json: String?
    try {
        val inputStream = assets.open("myjson.json")
        val size = inputStream.available()
        val buffer = ByteArray(size)
        val charset: Charset = Charsets.UTF_8
        inputStream.read(buffer)
        inputStream.close()
        json = String(buffer, charset)
    }
    catch (ex: IOException) {
        ex.printStackTrace()
        return ""
    }
    return json
}
```

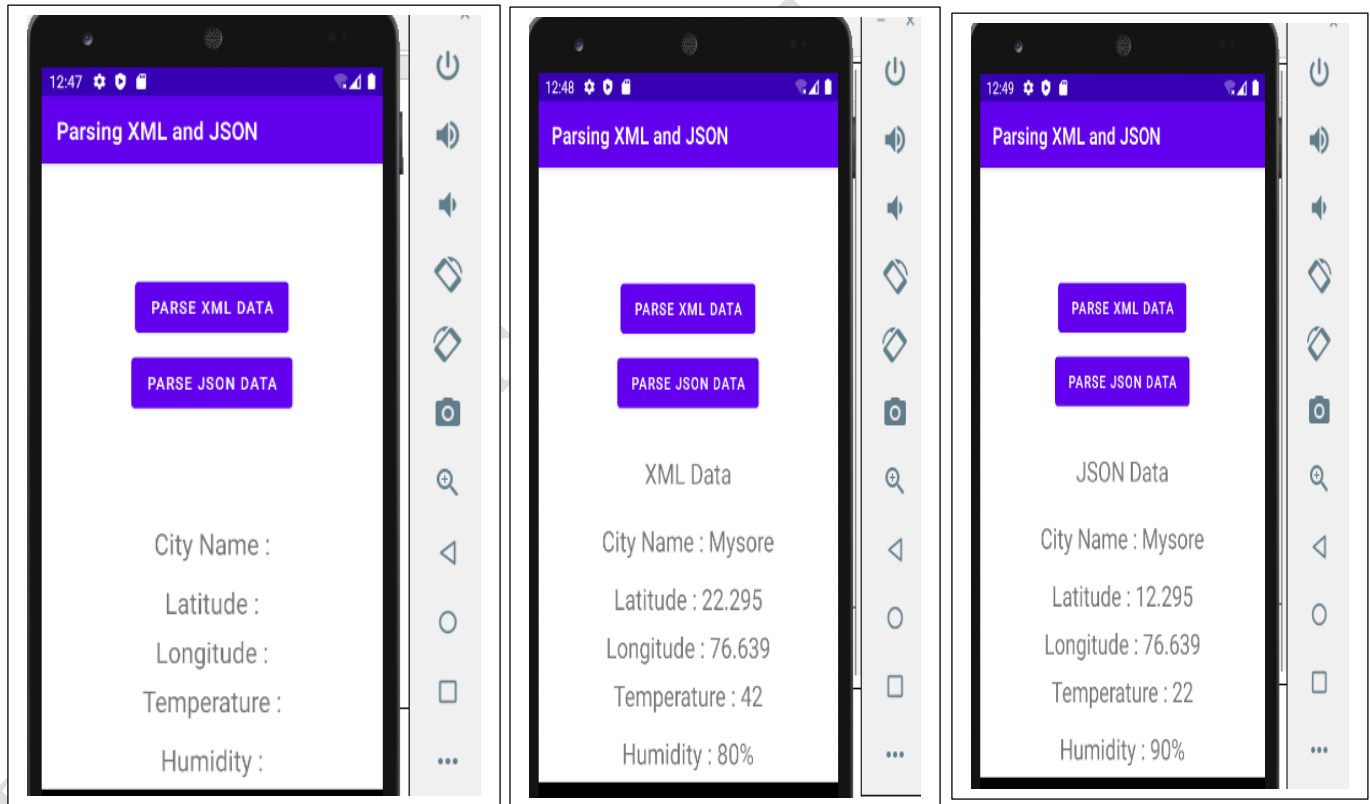
Assets File: Myjson.json

```
{  
  "City Name": "Mysore",  
  "Latitude" : "12.295",  
  "Longitude" : "76.639",  
  "Temperature" : "22",  
  "Humidity" : "90%"  
}
```

Myxml.xml

```
<data>  
  <City_Name>Mysore</City_Name>  
  <Latitude>22.295</Latitude>  
  <Longitude>76.639</Longitude>  
  <Temperature>42</Temperature>  
  <Humidity>80%</Humidity>  
</data>
```

Output:



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

Activitymain.xml

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

    <ScrollView
        android:layout_width="match_parent"
        android:layout_height="wrap_content">

        <LinearLayout
            android:orientation="vertical"
            android:layout_width="match_parent"
            android:layout_height="wrap_content">

            <EditText
                android:id="@+id/edTv"
                android:hint="Enter Text"
                android:textSize="19sp"
                android:textStyle="bold"
                android:layout_margin="15dp"
                android:padding="15dp"
```

```
android:textColor="@color/purple_500"  
android:layout_width="match_parent"  
android:layout_height="wrap_content"/>
```

<TextView

```
android:text="Pitch"  
android:textColor="@color/purple_500"  
android:textStyle="bold"  
android:textSize="18sp"  
android:layout_margin="10dp"  
android:layout_width="wrap_content"  
android:layout_height="wrap_content"/>
```

<SeekBar

```
android:id="@+id/seekBar_pitch"  
android:progress="50"  
android:layout_width="200dp"  
android:layout_height="wrap_content"/>
```

<TextView

```
android:text="Speed"  
android:textColor="@color/purple_500"  
android:textStyle="bold"  
android:textSize="18sp"  
android:layout_margin="10dp"  
android:layout_width="wrap_content"  
android:layout_height="wrap_content"/>
```

<SeekBar

```
android:id="@+id/seekBar_speed"  
android:progress="50"  
android:layout_width="200dp"
```

```
android:layout_height="wrap_content"/>
```

```
<Button
```

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

```
    android:text="Convert text to speech!"
```

```
    android:textSize="19sp"
```

```
    android:textStyle="bold"
```

```
    android:textAllCaps="false"
```

```
    android:layout_gravity="center"
```

```
    android:layout_margin="20dp"
```

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

```
    android:layout_height="wrap_content"/>
```

```
</LinearLayout>
```

```
</ScrollView>
```

```
</LinearLayout>
```

MainActivity.kt

```
package `in`.edu.cambridge.texttospeech
```

```
import androidx.appcompat.app.AppCompatActivity
```

```
import android.os.Bundle
```

```
import android.speech.tts.TextToSpeech
```

```
import android.util.Log
```

```
import android.widget.Button
```

```
import android.widget.EditText
```

```
import android.widget.SeekBar
```

```
import java.util.*
```

```
class MainActivity : AppCompatActivity() {  
    private lateinit var speakBtn:Button  
    private lateinit var userText:EditText  
    private lateinit var seekBerPitch:SeekBar  
    private lateinit var seekBerSpeed:SeekBar  
    private lateinit var mTTs :TextToSpeech  
    //private lateinit var btnClear :Button  
  
    override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.activity_main)  
  
        /**set find view Id*/  
        speakBtn = findViewById(R.id.btnSpeak)  
        userText = findViewById(R.id.edTv)  
        seekBerPitch = findViewById(R.id.seekBar_pitch)  
        seekBerSpeed = findViewById(R.id.seekBar_speed)  
  
        mTTs = TextToSpeech(this){status->  
            if (status == TextToSpeech.SUCCESS){  
                val result = mTTs.setLanguage(Locale.ENGLISH)  
                if (result == TextToSpeech.LANG_MISSING_DATA  
                    || result == TextToSpeech.LANG_NOT_SUPPORTED){  
                    Log.e("TTs", "Language is not Supported")  
                }  
            }  
        }  
    }  
}
```



```
    }else{  
        speakBtn.isEnabled = true  
    }  
}  
else{  
    Log.e("TTs","Initialization failed")  
}  
}  
speakBtn.setOnClickListener { speak() }  
}
```

```
@Suppress("DEPRECATION")  
private fun speak() {  
    val text = userText.text.toString()  
    var pitch = seekBerPitch.progress.toFloat()/50  
    if (pitch<0.1) pitch = 0.1f  
    var speed = seekBerSpeed.progress.toFloat()/50  
    if (speed<0.1) speed = 0.1f  
    mTTs.setPitch(pitch)  
    mTTs.setSpeechRate(speed)  
    mTTs.speak(text,TextToSpeech.QUEUE_FLUSH,null)  
}
```

```
override fun onDestroy() {  
    if (mTTs != null){
```

```
mTTs.stop()
mTTs.shutdown()
}
super.onDestroy()
}

}
```

Androidmanifest.xml

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

    <queries>
        <intent>
            <action android:name="android.intent.action.TTS_SERVICE" />
        </intent>
    </queries>

    <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.TextToSpeech">
        <activity android:name=".MainActivity">
            <intent-filter>
```

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

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

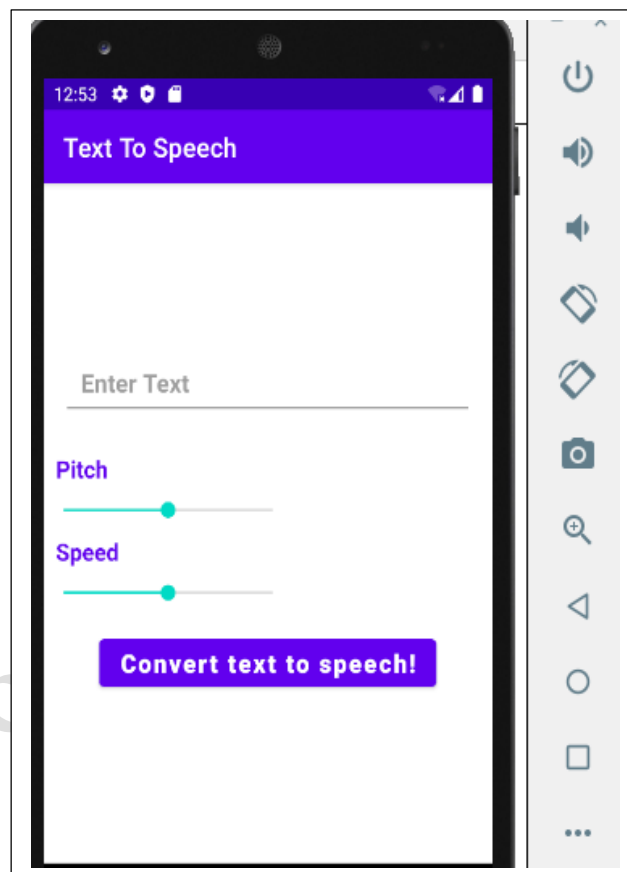
```
</intent-filter>
```

```
</activity>
```

```
</application>
```

```
</manifest>
```

Output:



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.

Activitymain.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">

<LinearLayout

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:orientation="vertical"

    app:layout_constraintBottom_toBottomOf="parent"

    app:layout_constraintEnd_toEndOf="parent"

    app:layout_constraintHorizontal_bias="0.5"

    app:layout_constraintStart_toStartOf="parent"

    app:layout_constraintTop_toTopOf="parent">

<LinearLayout

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:orientation="horizontal">
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/contact"  
    android:layout_width="200dp"  
    android:layout_height="100dp"  
    android:gravity="center"  
    android:textSize="24sp"/>
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/clear"  
    android:layout_width="100dp"  
    android:layout_height="100dp"  
    android:gravity="center"  
    android:text="X"  
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:orientation="horizontal">
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/one"  
    android:layout_width="100dp"  
    android:layout_height="100dp"  
    android:gravity="center"
```

```
android:text="1"  
android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/two"  
    android:layout_width="100dp"  
    android:layout_height="100dp"  
    android:gravity="center"  
    android:text="2"  
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/three"  
    android:layout_width="100dp"  
    android:layout_height="100dp"  
    android:gravity="center"  
    android:text="3"  
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:orientation="horizontal">
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/four"
```

```
android:layout_width="100dp"  
android:layout_height="100dp"  
android:gravity="center"  
android:text="4"  
android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/five"  
    android:layout_width="100dp"  
    android:layout_height="100dp"  
    android:gravity="center"  
    android:text="5"  
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/six"  
    android:layout_width="100dp"  
    android:layout_height="100dp"  
    android:gravity="center"  
    android:text="6"  
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:orientation="horizontal">
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
    android:layout_height="100dp"
```

```
    android:gravity="center"
```

```
    android:text="7"
```

```
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
    android:layout_height="100dp"
```

```
    android:gravity="center"
```

```
    android:text="8"
```

```
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView
```

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

```
    android:layout_width="100dp"
```

```
    android:layout_height="100dp"
```

```
    android:gravity="center"
```

```
    android:text="9"
```

```
    android:textSize="24sp" />
```

```
</LinearLayout>
```

```
<LinearLayout
```



```
android:layout_width="wrap_content"  
android:layout_height="wrap_content"  
android:orientation="horizontal">
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/star"  
    android:layout_width="100dp"  
    android:layout_height="100dp"  
    android:gravity="center"  
    android:text="*"   
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/zero"  
    android:layout_width="100dp"  
    android:layout_height="100dp"  
    android:gravity="center"  
    android:text="0"   
    android:textSize="24sp" />
```

```
<com.google.android.material.textview.MaterialTextView  
    android:id="@+id/hash"  
    android:layout_width="100dp"  
    android:layout_height="100dp"  
    android:gravity="center"  
    android:text="#"   
    android:textSize="24sp" />
```

</LinearLayout>

<LinearLayout

android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:orientation="horizontal">

<com.google.android.material.button.MaterialButton

android:id="@+id/call"
android:layout_width="134dp"
android:layout_height="54dp"
android:layout_margin="8dp"
android:text="Call"/>

<com.google.android.material.button.MaterialButton

android:id="@+id/save"
android:layout_width="134dp"
android:layout_height="54dp"
android:layout_margin="8dp"
android:text="Save"/>

</LinearLayout>

</LinearLayout>

</androidx.constraintlayout.widget.ConstraintLayout>

MainActivity.kt

```
package `in`.edu.cambridge.phonedialer

import android.content.Intent
import android.net.Uri
import android.os.Bundle
import android.provider.ContactsContract
import android.widget.Button
import android.widget.TextView
import androidx.appcompat.app.AppCompatActivity
```

```
class MainActivity : AppCompatActivity() {
```

```
    private lateinit var saveBtn: Button
```

```
    private lateinit var callBtn: Button
```

```
    private lateinit var zero: TextView
```

```
    private lateinit var one: TextView
```

```
    private lateinit var two: TextView
```

```
    private lateinit var three: TextView
```

```
    private lateinit var four: TextView
```

```
    private lateinit var five: TextView
```

```
    private lateinit var six: TextView
```

```
    private lateinit var seven: TextView
```

```
    private lateinit var eight: TextView
```

```
    private lateinit var nine: TextView
```

```
    private lateinit var star: TextView
```

```
    private lateinit var hash: TextView
```

```
    private lateinit var clear: TextView
```

```
private lateinit var contact: TextView
```

```
override fun onCreate(savedInstanceState: Bundle?) {
```

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

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

```
    saveBtn = findViewById(R.id.save)
```

```
    callBtn = findViewById(R.id.call)
```

```
    zero = findViewById(R.id.zero)
```

```
    one = findViewById(R.id.one)
```

```
    two = findViewById(R.id.two)
```

```
    three = findViewById(R.id.three)
```

```
    four = findViewById(R.id.four)
```

```
    five = findViewById(R.id.five)
```

```
    six = findViewById(R.id.six)
```

```
    seven = findViewById(R.id.seven)
```

```
    eight = findViewById(R.id.eight)
```

```
    nine = findViewById(R.id.nine)
```

```
    star = findViewById(R.id.star)
```

```
    hash = findViewById(R.id.hash)
```

```
    clear = findViewById(R.id.clear)
```

```
    contact = findViewById(R.id.contact)
```

```
    zero.setOnClickListener {
```

```
        pressButton("0", true)
```

```
}
```

```
one.setOnClickListener {  
    pressButton("1", true)  
}
```

```
two.setOnClickListener {  
    pressButton("2", true)  
}
```

```
three.setOnClickListener {  
    pressButton("3", true)  
}
```

```
four.setOnClickListener {  
    pressButton("4", true)  
}
```

```
five.setOnClickListener {  
    pressButton("5", true)  
}
```

```
six.setOnClickListener {  
    pressButton("6", true)  
}
```

```
seven.setOnClickListener {  
    pressButton("7", true)  
}
```

```
}
```

```
eight.setOnClickListener {  
    pressButton("8", true)  
}
```

```
nine.setOnClickListener {  
    pressButton("9", true)  
}
```

```
star.setOnClickListener {  
    pressButton("*", true)  
}
```

```
hash.setOnClickListener {  
    pressButton("#", true)  
}
```

```
clear.setOnClickListener {  
    contact.text = ""  
}
```

```
callBtn.setOnClickListener {  
    val intent = Intent(Intent.ACTION_CALL, Uri.parse("tel:" + "${contact.text}"))  
    startActivity(intent)  
}
```

```
saveBtn.setOnClickListener {  
    val intent = Intent(  
        ContactsContract.Intents.SHOW_OR_CREATE_CONTACT,  
        Uri.parse("tel:" + contact.text))  
    intent.putExtra(ContactsContract.Intents.EXTRA_FORCE_CREATE, true)  
    startActivity(intent)  
}  
  
}  
  
fun pressButton(string: String, clear: Boolean) {  
    if (!clear) {  
        contact.text = ""  
    } else {  
        contact.append(string)  
    }  
}  
  
}
```

Androidmanifest.xml

```
<?xml version="1.0" encoding="utf-8"?>  
<manifest xmlns:android="http://schemas.android.com/apk/res/android"  
    package="in.edu.cambridge.phonedialer">  
    <uses-permission android:name="android.permission.CALL_PHONE" />  
    <uses-permission android:name="android.permission.WRITE_CONTACTS" />  
    <uses-permission android:name="android.permission.READ_CONTACTS" />
```

<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.PhoneDialer">

<activity android:name=".MainActivity">

<intent-filter>

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

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

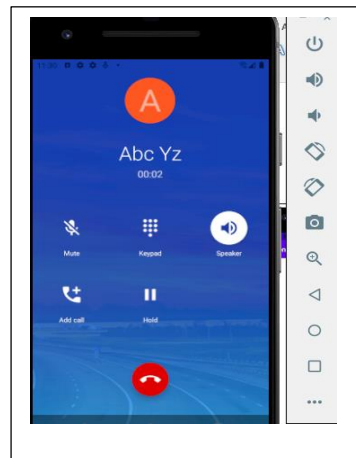
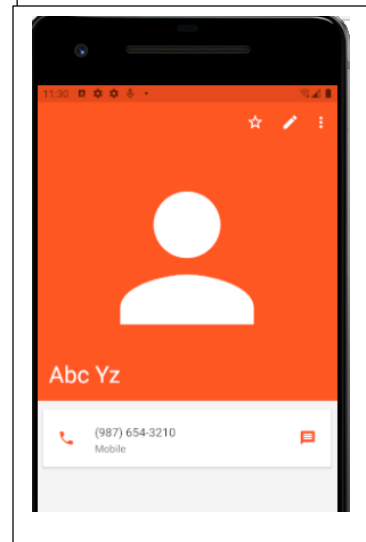
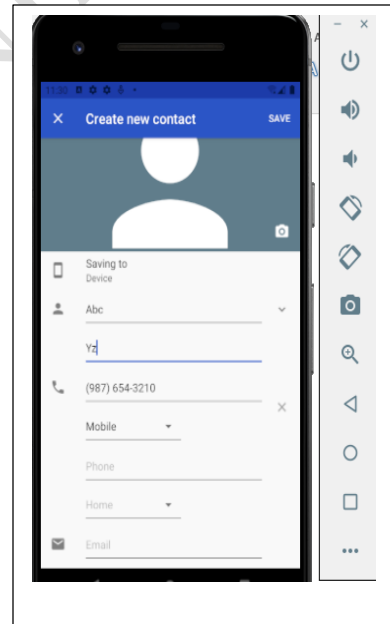
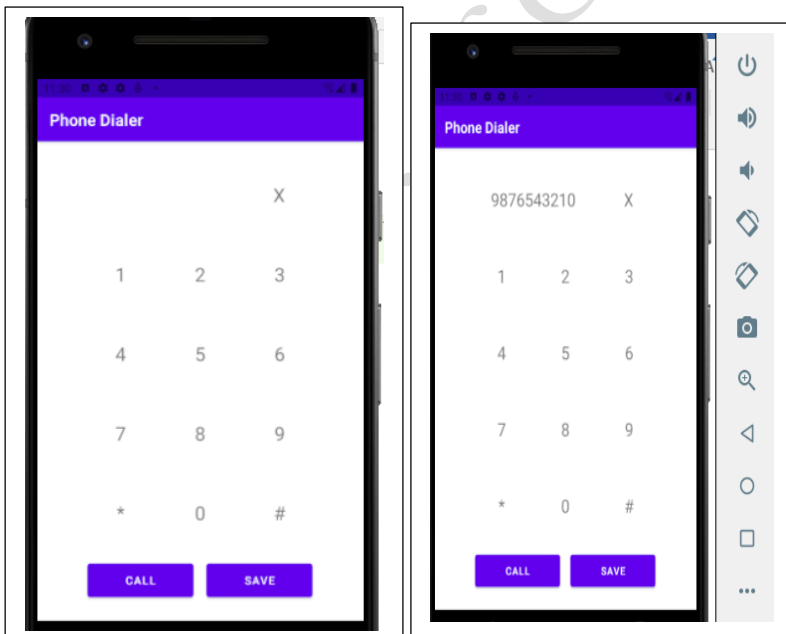
</intent-filter>

</activity>

</application>

</manifest>

Output:





“In order to be irreplaceable, one must
always be different”

