



**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**  
“Jnana Sangama”, Belagavi- 590 018



**MOBILE APPLICATION DEVELOPMENT LABORATORY**  
**(18CSMP68) MANUAL**  
**SEMESTER – VI**



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# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

"ವಿಜ್ಞಾನ ಸಂಗಮ" ಅಧಿನಿಯಮ ೧೯೯೪ರ ಅಡಿಯಲ್ಲಿ, ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ

"ಜ್ಞಾನ ಸಂಗಮ", ಬೆಳಗಾವಿ-೫೯೦೦೧೮, ಕರ್ನಾಟಕ, ಭಾರತ

## Visvesvaraya Technological University

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"Jnana Sangama" Belagavi-590018, Karnataka, India

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**Dr. A. S. Deshpande** B.E., M.Tech., Ph.D.

Registrar

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Fax: (0831) 2405467

Ref: VTU/BGM/BOS/A9/2020-21 / 6554

Date: 8 MAR 2021

### CIRCULAR

Subject: Minor Correction in 18CSMP68 regarding.

Reference: Chairperson BOS in CSE/ISE email dated 04.03.2021

Minor corrections in the descriptions (Instructions) section are made in the laboratory syllabus "MOBILE APPLICATION DEVELOPMENT" (18CSMP68) of 2018 scheme CSE and ISE programmes and the same is mentioned below-

#### Existing

1. The installation procedure of the Android Studio/Java software must be demonstrated and carried out in groups.
2. Students should use the latest version of Android Studio/Java/ Kotlin to execute these programs. Diagrams given are for representational purposes only; students are expected to improvise on them.

#### To read as

1. The installation procedure of the Android Studio/Java software must be demonstrated and carried out in groups.
2. Students should use the latest version of Android Studio/Java/ Kotlin to execute these programs. Diagrams given are for representational purposes only, students are expected to improvise on them.
3. **Part B programs should be developed as an application and are to be demonstrated as a mini project in a group by adding extra features or the students can also develop their application and demonstrate it as a mini-project. (Projects/programs are not limited to the list given in Part B).**

A syllabus copy is enclosed with this circular for reference to the concerned. Also, corrected CSE/ISE syllabus is made available @ <https://vtu.ac.in/b-e-scheme-syllabus/#menu0>.

All the Principals of Engineering Colleges are hereby requested to inform these corrections to the faculty who are handling this laboratory.

**Encl:** As mentioned above

Sd/-  
REGISTRAR

To,

- All the Principals of the Engineering Colleges under the ambit of VTU Belagavi

#### Copy to:

1. The Registrar(Evaluation) for information and needful
2. The Registrar's Office, VTU, Belagavi, for information.
3. The Special Officer, Academic Section, VTU Belagavi, for information.
4. The Special Officer CNC section to upload the circular on the VTU web portal.

REGISTRAR

**MOBILE APPLICATION DEVELOPMENT**  
(Effective from the academic year 2018 -2019)

**SEMESTER – VI**

<b>Course Code</b>	<b>18CSMP68</b>	<b>IA Marks</b>	<b>40</b>
<b>Number of Contact Hours/Week</b>	<b>0:0:2</b>	<b>Exam Marks</b>	<b>60</b>
<b>Total Number of Contact Hours</b>	<b>3 Hours/Week</b>	<b>Exam Hours</b>	<b>03</b>

**CREDITS – 02**

**Laboratory Objectives:** This laboratory (18CSMP68) will enable students to

- Learn and acquire the art of Android Programming.
- Configure Android studio to run the applications.
- Understand and implement Android's User interface functions.
- Create, modify and query on SQLite database.
- Inspect different methods of sharing data using services.

**Descriptions (if any):**

1. The installation procedure of the Android Studio/Java software must be demonstrated and carried out in groups.
2. Students should use the latest version of Android Studio/Java/ Kotlin to execute these programs. Diagrams given are for representational purposes only, students are expected to improvise on them.
3. Part B programs should be developed as an application and are to be demonstrated as a mini project in a group by adding extra features or the students can also develop their application and demonstrate it as a mini-project. (Projects/programs are not limited to the list given in Part B).

**Programs List:**

**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.

COMPANY NAME



Name

Job Title

Phone Number

Address


Email, website, fax details



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

	<p style="text-align: center;"><b>SIMPLE CALCULATOR</b></p> <p style="text-align: center;">Result</p> <p style="text-align: center;">Input &lt;Edit Text&gt;</p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="display: flex; gap: 5px;"> <div>7</div><div>8</div><div>9</div><div>/</div> </div> <div style="display: flex; gap: 5px;"> <div>4</div><div>5</div><div>6</div><div>*</div> </div> <div style="display: flex; gap: 5px;"> <div>1</div><div>2</div><div>3</div><div>-</div> </div> <div style="display: flex; gap: 5px;"> <div>.</div><div>0</div><div>=</div><div>+</div> </div> <div style="margin-top: 10px;">C</div> </div>
3	<p>Create a SIGN Up activity with Username and Password. Validation of password should happen based on the following rules:</p> <ul style="list-style-type: none"> <li>• Password should contain uppercase and lowercase letters.</li> <li>• Password should contain letters and numbers.</li> <li>• Password should contain special characters.</li> <li>• Minimum length of the password (the default value is 8).</li> </ul> <p>On successful <b>SIGN UP</b> proceed to the next Login activity. Here the user should <b>SIGN IN</b> 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.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>SIGNUP ACTIVITY</b></p> <p>Username: <input type="text"/></p> <p>Password: <input type="password"/></p> <p><b>SIGN UP</b></p> </div> <div style="text-align: center;"> <p><b>LOGIN ACTIVITY</b></p> <p>Username: <input type="text"/></p> <p>Password: <input type="password"/></p> <p><b>SIGN IN</b></p> </div> </div>
4	<p>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.</p> <p style="text-align: center;"><b>CHANGING WALLPAPER APPLICATION</b></p> <p style="text-align: center;"><b>CLICK HERE TO CHANGE WALLPAPER</b></p>
5	<p>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</p>

	<p>value in a TextViewcontrol.</p> <div>COUNTER APPLICATION</div> <div>Counter Value</div> <div>START</div> <div>STOP</div>																		
6	<p>Create two files of XML and JSON type with values for City_Name, Latitude, Longitude, Temperature,andHumidity. 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.</p> <div>PARSING XML AND JSON DATA</div> <table><tr><td>PARSING XML AND JSON DATA</td><td>XML DATA</td><td>JSON Data</td></tr><tr><td><div>Parse XML Data</div></td><td>City_Name: Mysore</td><td>City_Name: Mysore</td></tr><tr><td></td><td>Latitude: 12.295</td><td>Latitude: 12.295</td></tr><tr><td></td><td>Longitude: 76.639</td><td>Longitude: 76.639</td></tr><tr><td><div>Parse JSON Data</div></td><td>Temperature: 22</td><td>Temperature: 22</td></tr><tr><td></td><td>Humidity: 90%</td><td>Humidity: 90%</td></tr></table>	PARSING XML AND JSON DATA	XML DATA	JSON Data	<div>Parse XML Data</div>	City_Name: Mysore	City_Name: Mysore		Latitude: 12.295	Latitude: 12.295		Longitude: 76.639	Longitude: 76.639	<div>Parse JSON Data</div>	Temperature: 22	Temperature: 22		Humidity: 90%	Humidity: 90%
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	Longitude: 76.639	Longitude: 76.639																	
<div>Parse JSON Data</div>	Temperature: 22	Temperature: 22																	
	Humidity: 90%	Humidity: 90%																	
7	<p>Develop a simple application withoneEditTextso 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.</p> <div>TEXT TO SPEECH APPLICATION</div> <div>Convert Text to Speech</div>																		
8	<p>Create an activity like a phone dialer withCALLand 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.</p>																		

	<p align="center"><b>CALL AND SAVE APPLICATION</b></p> <div> <div>1234567890</div> <div>DEL</div> </div> <div> <div>1</div> <div>2</div> <div>3</div> </div> <div> <div>4</div> <div>5</div> <div>6</div> </div> <div> <div>7</div> <div>8</div> <div>9</div> </div> <div> <div>*</div> <div>0</div> <div>#</div> </div> <div> <div>CALL</div> <div>SAVE</div> </div>
<b>PART - B</b>	
<b>1</b>	<p>Write a program to enter Medicine Name, Date and Time of the Day as input from the user and store it in the SQLite database. Input for Time of the Day should be either Morning or Afternoon or Evening or Night. Trigger an alarm based on the Date and Time of the Day and display the Medicine Name.</p> <p align="center"><b>MEDICINE DATABASE</b></p> <div> <div>Medicine Name:</div> <div></div> </div> <div> <div>Date:</div> <div></div> </div> <div> <div>Time of the Day:</div> <div></div> </div> <div> <div>Insert</div> </div>
<b>2</b>	<p>Develop a content provider application with an activity called "Meeting Schedule" which takes Date, Time and Meeting Agenda as input from the user and store this information into the SQLite database. Create another application with an activity called "Meeting Info" having DatePicker control, which on the selection of a date should display the Meeting Agenda information for that particular date, else it should display a toast message saying "No Meeting on this Date".</p>

	<div> <h3>MEETING INFO</h3> </div> <div> <p>Pick a date to get meeting info: <input type="text" value="11"/> </p> </div> <div> <h3>MEETING SCHEDULE</h3> </div> <div> <p>Date: <input type="text"/></p> </div> <div> <p>Time: <input type="text"/></p> </div> <div> <p>Meeting Agenda: <input type="text"/></p> </div> <div> <p><input type="button" value="Add Meeting Agenda"/></p> </div> <div> <p><input type="button" value="Search"/></p> </div> <div> </div>
3	<p>Create an application to receive an incoming SMS which is notified to the user. On clicking this SMS notification, the message content and the number should be displayed on the screen. Use appropriate emulator control to send the SMS message to your application.</p> <div> <h3>SMS APPLICATION</h3> </div> <div> <p>Display SMS Number</p> </div> <div> <p>Display SMS Message</p> </div>
4	<p>Write a program to create an activity having a Text box, and also Save, Open and Create buttons. The user has to write some text in the Text box. On pressing the Create button the text should be saved as a text file in Mksdcard. On subsequent changes to the text, the Save button should be pressed to store the latest content to the same file. On pressing the Open button, it should display the contents from the previously stored files in the Text box. If the user tries to save the contents in the Textbox to a file without creating it, then a toast message has to be displayed saying "First Create a File".</p> <div> <h3>FILE APPLICATION</h3> </div> <div> <p><input type="button" value="Create"/></p> </div> <div> <p><input type="button" value="Open"/></p> </div> <div> <input type="text"/> </div> <div> <p><input type="button" value="Save"/></p> </div>
5	<p>Create an application to demonstrate a basic media player that allows the user to Forward, Backward, Play and Pause an audio. Also, make use of the indicator in the seek bar to move the audio forward or backward as required.</p>

	<p style="text-align: center;"><b>MEDIA PLAYER APPLICATION</b></p> <p style="text-align: center;">Audio Name</p> 
6	<p>Develop an application to demonstrate the use of Asynchronous tasks in android. The asynchronous task should implement the functionality of a simple moving banner. On pressing the <b>Start Task</b> button, the banner message should scroll from right to left. On pressing the <b>Stop Task</b> button, the banner message should stop. Let the banner message be "Demonstration of Asynchronous Task".</p> <p style="text-align: center;"><b>ASYNCHRONOUS TASK</b></p> <p style="text-align: center;"> <input type="button" value="Start Task"/>  <input type="button" value="End Task"/> </p>
7	<p>Develop an application that makes use of the clipboard framework for copying and pasting of the text. The activity consists of two EditText controls and two Buttons to trigger the copy and paste functionality.</p> <p style="text-align: center;"><b>CLIPBOARD ACTIVITY</b></p> 
8	<p>Create an AIDL service that calculates Car Loan EMI. The formula to calculate EMI is</p> $E = P * (r(1+r)^n)/((1+r)^n-1)$ <p>where</p> <ul style="list-style-type: none"> <li>E = The EMI payable on the car loan amount</li> <li>P = The Car loan Principal Amount</li> <li>r = The interest rate value computed on a monthly basis</li> <li>n = The loan tenure in the form of months</li> </ul> <p>The down payment amount has to be deducted from the principal amount paid towards buying the Car. Develop an application that makes use of this AIDL service to calculate the EMI. This application should have four EditText to read the PrincipalAmount, Down Payment, Interest Rate, Loan Term (in months) and a button named as "Calculate Monthly EMI". On click of this button, the result should be shown in a TextView. Also, calculate the EMI by varying the Loan Term and Interest Rate values.</p>



## CAR EMI CALCULATOR

Principal Amount:

Down Payment:

Interest Rate:

Loan Term (in months):

EMI: Result

Calculate Monthly EMI

**Laboratory Outcomes:** After studying these laboratory programs, students will be able to

- Create, test and debug Android application by setting up Android development environment.
- Implement adaptive, responsive user interfaces that work across a wide range of devices.
- Infer long running tasks and background work in Android applications.
- Demonstrate methods in storing, sharing and retrieving data in Android applications.
- Infer the role of permissions and security for Android applications.

### Procedure to Conduct Practical Examination

- Experiment distribution
  - For laboratories having only one part: Students are allowed to pick one experiment from the lot with equal opportunity.
  - For laboratories having PART A and PART B: Students are allowed to pick one experiment from PART A and one experiment from PART B, with equal opportunity.
- Change of experiment is allowed only once and marks allotted for procedure to be made zero of the changed part only.
- Marks Distribution (Course to change in accordance with university regulations)
  - For laboratories having only one part – Procedure + Execution + Viva-Voce: 15+70+15= 100 Marks
  - For laboratories having PART A and PART B
    - i. Part A – Procedure + Execution + Viva = 6 + 28 + 6 = 40 Marks
    - ii. Part B – Procedure + Execution + Viva = 9 + 42 + 9 = 60 Marks

### Text Books:

1. Google Developer Training, "Android Developer Fundamentals Course – Concept Reference", Google Developer Training Team, 2017.  
<https://www.gitbook.com/book/google-developer-training/android-developer-fundamentals-course-concepts/details>  
 (Download pdf file from the above link)

### Reference Books:

1. Erik Hellman, "Android Programming – Pushing the Limits", 1<sup>st</sup> Edition, Wiley India Pvt Ltd, 2014. ISBN-13: 978-8126547197
2. Dawn Griffiths and David Griffiths, "Head First Android Development", 1<sup>st</sup> Edition, O'Reilly SPD Publishers, 2015. ISBN-13: 978-9352131341
3. Bill Phillips, Chris Stewart and Kristin Marsicano, "Android Programming: The Big Nerd Ranch Guide", 3<sup>rd</sup> Edition, Big Nerd Ranch Guides, 2017. ISBN-13: 978-0134706054

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

/\* XML Code \*/

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="339dp"
        android:layout_height="87dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="34dp"
        android:layout_marginRight="34dp"
        android:layout_marginBottom="567dp"
        android:text="Adichunchanagiri Institute of Technology"
        android:textAppearance="@style/TextAppearance.AppCompat.Body1"
        android:textColor="#2D46D5"
        android:textSize="24sp"
        android:textStyle="bold"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintHorizontal_bias="0.564"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.396" />

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="320dp"
        android:layout_height="169dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="38dp"
        android:layout_marginRight="38dp"
        android:layout_marginBottom="388dp"
        app:srcCompat="@drawable/ait" />
```

```
<TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="124dp"
    android:layout_marginRight="124dp"
    android:layout_marginBottom="326dp"
    android:text="ADARSH M J"
    android:textColor="#673AB7"
    android:textSize="30sp"
    android:textStyle="bold" />

<TextView
    android:id="@+id/textView3"
    android:layout_width="183dp"
    android:layout_height="65dp"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="120dp"
    android:layout_marginRight="120dp"
    android:layout_marginBottom="232dp"
    android:text="Asst. Professor"
    android:textColor="#E91E63"
    android:textSize="24sp" />

<TextView
    android:id="@+id/textView4"
    android:layout_width="397dp"
    android:layout_height="77dp"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="-49dp"
    android:layout_marginRight="-49dp"
    android:layout_marginBottom="148dp"
    android:text="Dept. of Computer Science and Engineering"
    android:textColor="#0F29B8"
    android:textSize="24sp"
    android:textStyle="italic" />

<TextView
    android:id="@+id/textView5"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="91dp"
    android:layout_marginRight="91dp"
    android:layout_marginBottom="83dp"
    android:text="A I T, Chikkamagaluru"
```

```
android:textColor="#0E2AC5"  
android:textSize="24sp" />
```

```
</RelativeLayout>
```

```
/* Java Code */
```

```
import androidx.appcompat.app.AppCompatActivity;  
import android.os.Bundle;  
  
public class MainActivity extends AppCompatActivity {  
  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
    }  
}
```

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.**

/\* XML code \*/

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

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"

        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="174dp"
        android:layout_height="79dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="115dp"
        android:layout_marginRight="115dp"
        android:layout_marginBottom="616dp"
        android:text="Calculator"
        android:textSize="30sp"
        android:textStyle="bold" />

    <EditText
        android:id="@+id/editText1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="115dp"
        android:layout_marginBottom="547dp"
        android:ems="10"
        android:hint="ENTER THE FIRST NO"
        android:inputType="text"
        android:text="" />

    <EditText
        android:id="@+id/editText2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
```

```
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="111dp"
        android:layout_marginBottom="455dp"
        android:ems="10"
        android:hint="ENTER THE SECOND NO"
        android:inputType="text"
        android:text="" />
<TextView
    android:id="@+id/textView1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="203dp"
    android:layout_marginBottom="350dp"
    android:text="0"
    android:textSize="40dp" />

<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="271dp"
    android:layout_marginRight="271dp"
    android:layout_marginBottom="295dp"
    android:onClick="doAdd"
    android:text="ADD" />

<Button
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="79dp"
    android:layout_marginRight="79dp"
    android:layout_marginBottom="288dp"
    android:onClick="doSub"
    android:text="SUB" />

<Button
    android:id="@+id/button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="270dp"
    android:layout_marginRight="270dp"
    android:layout_marginBottom="180dp"
    android:onClick="doMul"
```

```
        android:text="MUL" />

<Button
    android:id="@+id/button4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="74dp"
    android:layout_marginRight="74dp"
    android:layout_marginBottom="173dp"
    android:onClick="doDiv"
    android:text="DIV" />

</RelativeLayout>

/* Java Code */

import androidx.appcompat.app.AppCompatActivity;

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

import static android.icu.lang.UCharacter.GraphemeClusterBreak.V;

public class MainActivity extends AppCompatActivity {
    EditText e1, e2;
    TextView tv1;

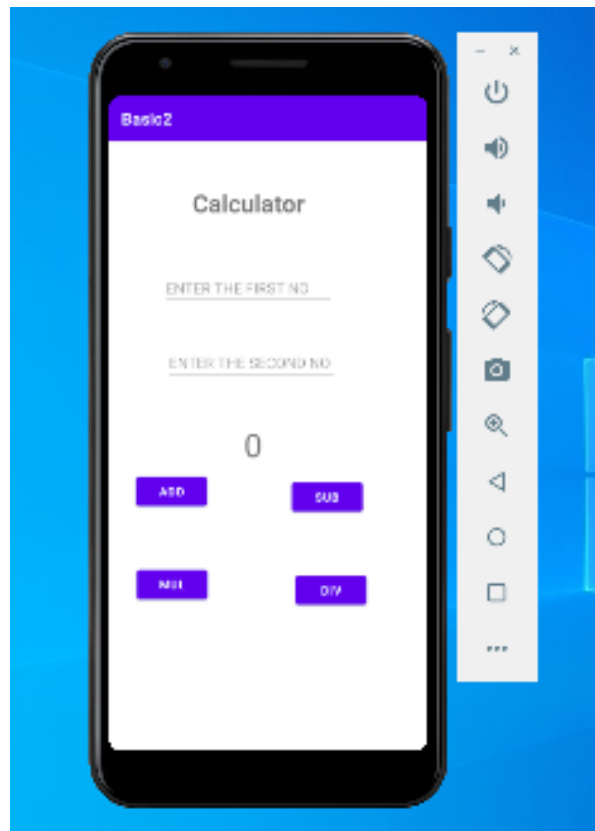
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1 = findViewById(R.id.editText1);
        e2 = findViewById(R.id.editText2);
        tv1 = findViewById(R.id.textView1);
    }

    public void doAdd (View V) {
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        int result = a1 + a2;
        tv1.setText("" + result);
    }

    public void doSub (View V) {
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        int result = a1 - a2;
```

```
        tv1.setText("" + result);
    }
    public void doMul (View V) {
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        int result = a1 * a2;
        tv1.setText("" + result);
    }
    public void doDiv (View V) {
        int a1 = Integer.parseInt(e1.getText().toString());
        int a2 = Integer.parseInt(e2.getText().toString());
        int result = a1 / a2;
        tv1.setText("" + result);
    }
}
```

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.**

*/\* Signup Activity XML code \*/*

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="171dp"
        android:layout_marginBottom="489dp"
        android:text="SIGN UP"
        android:textSize="30sp"
        android:textStyle="bold"
        tools:layout_editor_absoluteX="142dp"
        tools:layout_editor_absoluteY="107dp" />

    <EditText
        android:id="@+id/emailEditText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="109dp"
        android:layout_marginBottom="392dp"
        android:ems="10"
        android:hint="USERNAME"
        android:inputType="textEmailAddress"
        android:textSize="24sp" />
```

```

<EditText
    android:id="@+id/passwordEditText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="105dp"
    android:layout_marginBottom="285dp"
    android:ems="10"
    android:hint="Password"
    android:inputType="textPassword"
    android:textSize="24sp" />

<Button
    android:id="@+id/signUpBtn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="192dp"
    android:layout_marginBottom="180dp"
    android:text="Sign Up" />
</RelativeLayout>

/* Signup activity java code */

import androidx.appcompat.app.AppCompatActivity;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import android.content.Intent;
import android.os.Bundle;
import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity {
    EditText emailEditText, passwordEditText;
    Button signUpBtn;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        emailEditText = findViewById(R.id.emailEditText);
        passwordEditText = findViewById(R.id.passwordEditText);
        signUpBtn = findViewById(R.id.signUpBtn);
        signUpBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String email = emailEditText.getText().toString();
                String password = passwordEditText.getText().toString();
                if (!isValidPassword(password)) {
                    Toast.makeText(MainActivity.this, "Password doesn't match
rules", Toast.LENGTH_SHORT).show();

```

```

        return;
    }
    Intent intent = new Intent(MainActivity .this, LoginActivity.class);
    intent.putExtra("email", email);
    intent.putExtra("password", password);
    startActivity(intent);
}
});
}
Pattern lowerCase = Pattern.compile("^[a-z].*$");
Pattern upperCase = Pattern.compile("^[A-Z].*$");
Pattern number = Pattern.compile("^[0-9].*$");
Pattern specialCharacter = Pattern.compile("^[^a-zA-Z0-9].*$");
private Boolean isValidPassword(String password) {
// Checks if password length is less than 8
    if (password.length() < 8) {
        return false;
    }
// Returns false if password doesn't contain a Lower case character
    if (!lowerCase.matcher(password).matches()) {
        return false;
    }
// Returns false if password doesn't contain an upper case character
    if (!upperCase.matcher(password).matches()) {
        return false;
    }
// Returns false if password doesn't contain a number
    if (!number.matcher(password).matches()) {
        return false;
    }
// Returns false if password doesn't contain a special character
    if (!specialCharacter.matcher(password).matches()) {
        return false;
    }
    return true;
} }

```

/\* Login Activity XML code \*/

```

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

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"

```

```
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="202dp"
        android:layout_marginBottom="516dp"
        android:text="LOGIN"
        android:textSize="30sp"
        android:textStyle="bold" />

<EditText
    android:id="@+id/emailEditText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="129dp"
    android:layout_marginBottom="399dp"
    android:ems="10"
    android:hint="USERNAME"
    android:inputType="textEmailAddress" />

<EditText
    android:id="@+id/passwordEditText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="127dp"
    android:layout_marginBottom="304dp"
    android:ems="10"
    android:hint="Password"
    android:inputType="textPassword" />

<Button
    android:id="@+id/loginBtn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="184dp"
    android:layout_marginBottom="207dp"
    android:text="login" />
</RelativeLayout>
```

/\* Login Activity Java code \*/

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

public class LoginActivity extends AppCompatActivity {
```

```

EditText emailEditText, passwordEditText;
Button loginBtn;
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_login);
    emailEditText = findViewById(R.id.emailEditText);
    passwordEditText = findViewById(R.id.passwordEditText);
    loginBtn = findViewById(R.id.loginBtn);
    String registeredEmail = getIntent().getStringExtra("email");
    String registeredPassword = getIntent().getStringExtra("password");
    loginBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            String email = emailEditText.getText().toString();
            String password = passwordEditText.getText().toString();
            if (registeredEmail.equals(email) &&
                registeredPassword.equals(password)) {
                Intent intent = new Intent(LoginActivity.this, LoginSuccess
                    .class);
                startActivity(intent);
            } else {
                Toast.makeText(LoginActivity.this, "Invalid Credentials",
                    Toast.LENGTH_SHORT).show();
            }
        }
    });
}
}

```

/\* Login Success XML code \*/

```

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

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="65dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="72dp"
        android:layout_marginBottom="418dp"
        android:text="LOGIN SUCCESSFUL"
        android:textSize="30sp"
        android:textStyle="bold" />
</RelativeLayout>

```

/\* Login Success Java code \*/

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

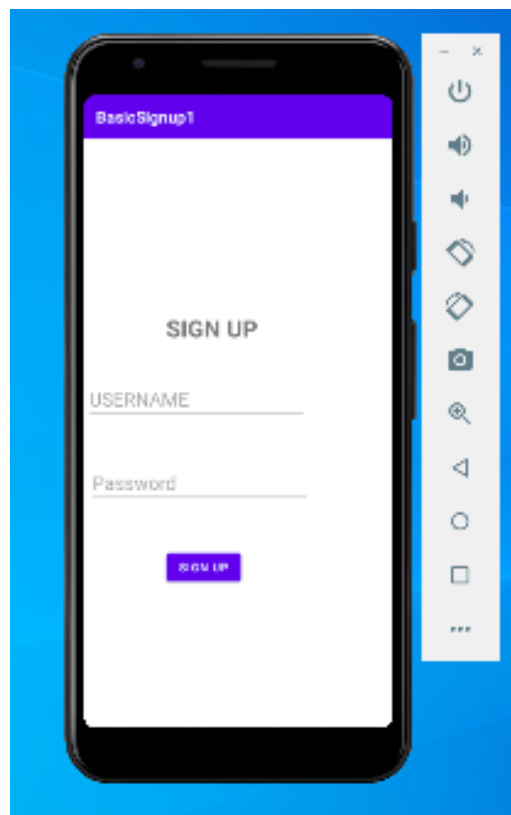
import android.os.Bundle;

public class LoginSuccess extends AppCompatActivity {

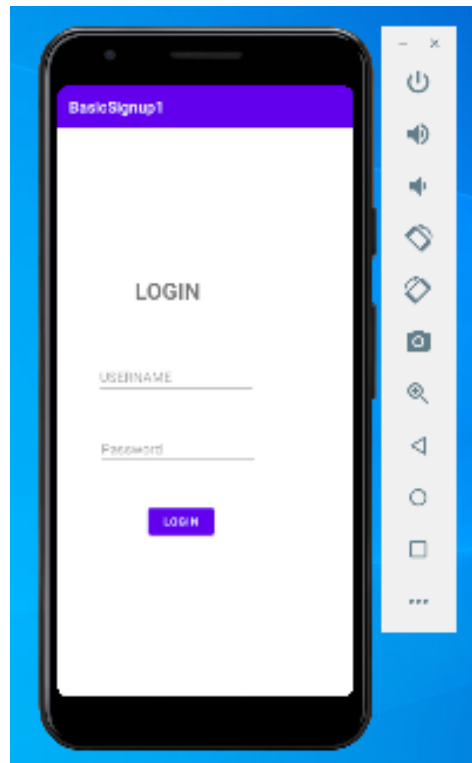
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_login_success);
    }
}
```

OUTPUT

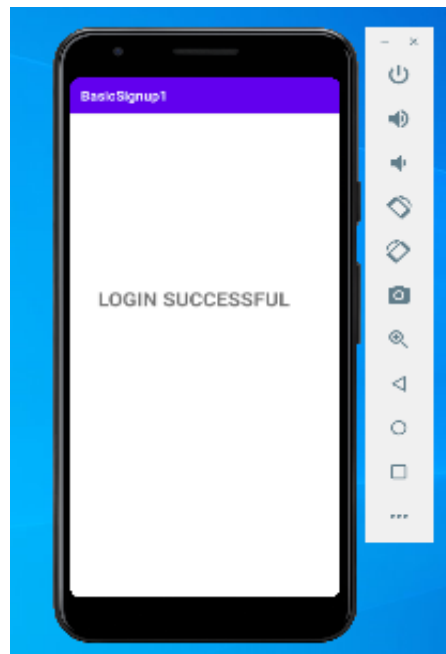
**SIGNUP PAGE**



## LOGIN PAGE



## LOGIN SUCCESS PAGE



**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.**

/\* XML Code \*/

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

    <TextView
        android:layout_width="400dp"
        android:layout_height="72dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginTop="44dp"
        android:layout_marginEnd="-41dp"
        android:layout_marginRight="-41dp"
        android:layout_marginBottom="593dp"
        android:text="CHANGING WALLPAPER APPLICATION"
        android:textColor="@color/purple_500"
        android:textSize="18sp"
        android:textStyle="bold"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.496"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toBottomOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="58dp"
        android:layout_marginRight="58dp"
        android:layout_marginBottom="415dp"
        android:text="CLICK HERE TO CHANGE WALLPAPER"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />

</RelativeLayout>
```



/\* Java Code \*/

```
import androidx.appcompat.app.AppCompatActivity;
import android.app.WallpaperManager;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.graphics.drawable.AnimationDrawable;
import android.graphics.drawable.BitmapDrawable;
import android.graphics.drawable.Drawable;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import java.io.IOException;
import java.util.Timer;
import java.util.TimerTask;

public class MainActivity extends AppCompatActivity {
    Button changewallpaper;
    Timer mytimer;
    Drawable drawable;
    WallpaperManager wpm;
    int prev=1;

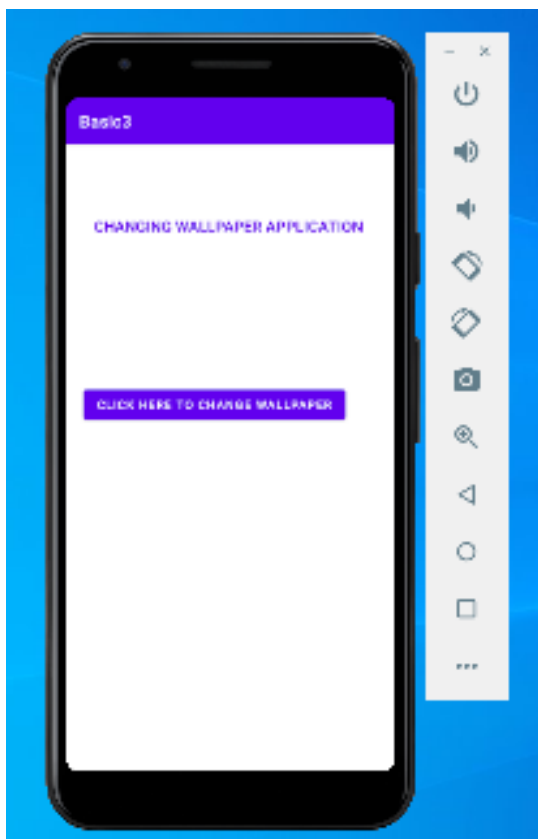
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        mytimer = new Timer();
        wpm = WallpaperManager.getInstance(this);

        changewallpaper = findViewById(R.id.button);
        changewallpaper.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                setWallpaper();
            }
        });
    }

    private void setWallpaper() {
        mytimer.schedule(new TimerTask() {
            @Override
            public void run() {
                if(prev ==1) {
                    drawable = getResources().getDrawable(R.drawable.one);
                    prev=2;
                }
                else if (prev ==2) {
                    drawable = getResources().getDrawable(R.drawable.three);
                    prev = 1;
                }
            }
        }, 0, 1000);
    }
}
```

```
        Bitmap wallpaper = ((BitmapDrawable)drawable).getBitmap();
        try {
            wpm.setImageBitmap(wallpaper);
        } catch (IOException e) {
            e.printStackTrace();
        }
    }, 0, 30000);
}
```

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.**

/\* XML Code \*/

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="377dp"
        android:layout_height="85dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="-9dp"
        android:layout_marginBottom="497dp"
        android:text="COUNTER APPLICATION"
        android:textSize="24sp"
        android:textStyle="bold" />

    <Button
        android:id="@+id/btn_start"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="162dp"
        android:layout_marginBottom="406dp"
        android:text="start" />

    <Button
        android:id="@+id/btn_stop"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="140dp"
        android:layout_marginBottom="195dp"
        android:text="STOP" />

    <TextView
        android:id="@+id/textView1"
        android:layout_width="203dp"
        android:layout_height="57dp"
```

```
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="33dp"
    android:layout_marginBottom="291dp"

    android:text=""
    android:textSize="24sp"
    android:textStyle="bold" />
```

```
</RelativeLayout>
```

```
/* Java Code */
```

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

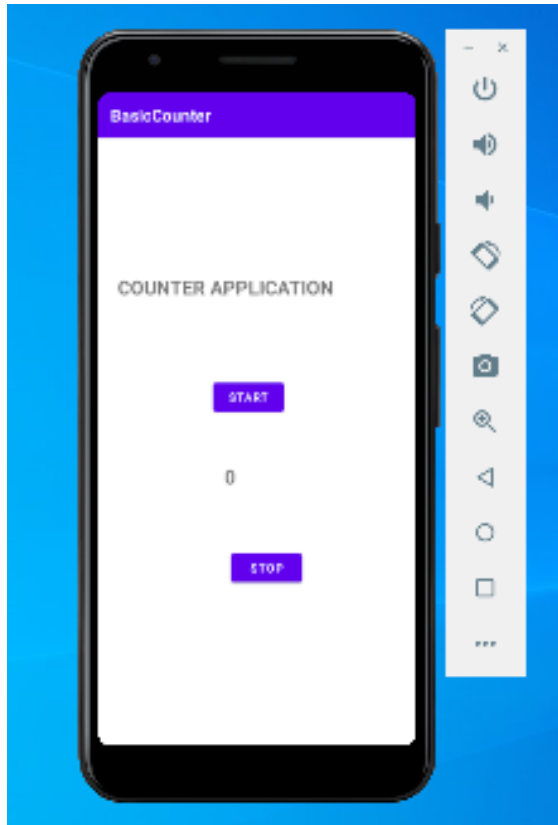
public class MainActivity extends AppCompatActivity {

    Button btnstart, btnstop;
    TextView txtcounter;
    int i = 1;
    Handler customHandler = new Handler();
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        txtcounter = findViewById(R.id.textView1);
        btnstart = findViewById(R.id.btn_start);
        btnstop = findViewById(R.id.btn_stop);
        btnstart.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                customHandler.postDelayed(updateTimerThread, 0);
            }
        });
        btnstop.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                customHandler.removeCallbacks(updateTimerThread);
            }
        });
    }
    private final Runnable updateTimerThread = new Runnable() {
        @Override
        public void run() {

            txtcounter.setText(""+i);
            customHandler.postDelayed(this, 1000);
            i++;
        }
    }
}
```

```
    }  
};  
}
```

## 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.**

/\* XML Code \*/

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

    <TextView
        android:layout_width="368dp"
        android:layout_height="86dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="3dp"
        android:layout_marginBottom="502dp"
        android:text="PARSING XML and JSON DATA"
        android:textSize="24sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/parseXmlBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="257dp"
        android:layout_marginBottom="315dp"
        android:text="XML"
        android:textSize="24sp" />

    <Button
        android:id="@+id/parseJsonBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="70dp"
        android:layout_marginBottom="311dp"
        android:text="JSON"
        android:textSize="24sp" />

    <TextView
        android:id="@+id/displayTextView"
```

```
    android:layout_width="338dp"
    android:layout_height="289dp"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="14dp"
    android:layout_marginBottom="15dp"
    android:text="" />
```

```
</RelativeLayout>
```

```
/* Java Code */
```

```
import androidx.appcompat.app.AppCompatActivity;
import android.util.Log;
import android.util.Xml;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
import org.json.JSONArray;
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 org.xmlpull.v1.XmlPullParser;
import org.xmlpull.v1.XmlPullParserException;
import java.io.IOException;
import java.io.InputStream;
import java.nio.charset.StandardCharsets;
import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;
import javax.xml.parsers.ParserConfigurationException;
import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

    Button parseXmlBtn, parseJsonBtn;
    TextView displayTextView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        parseJsonBtn = findViewById(R.id.parseJsonBtn);
        parseXmlBtn = findViewById(R.id.parseXmlBtn);
        displayTextView = findViewById(R.id.displayTextView);
        parseXmlBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                try {
                    InputStream is = getAssets().open("city.xml");
```

```

        DocumentBuilderFactory documentBuilderFactory =
            DocumentBuilderFactory.newInstance();
        DocumentBuilder documentBuilder =
            documentBuilderFactory.newDocumentBuilder();
        Document document = documentBuilder.parse(is);
        StringBuilder stringBuilder = new StringBuilder();
        stringBuilder.append("XML Data");
        stringBuilder.append("\n-----");
        NodeList nodeList = document.getElementsByTagName("place");
        for (int i = 0; i < nodeList.getLength(); i++) {
            Node node = nodeList.item(i);
            if (node.getNodeType() == Node.ELEMENT_NODE) {
                Element element = (Element) node;
                stringBuilder.append("\nName: ").append(getValue("name", element));
                stringBuilder.append("\nLatitude: ").append(getValue("lat", element));
                stringBuilder.append("\nLongitude: ").append(getValue("long", element));
                stringBuilder.append("\nTemperature: ").append(getValue("temperature",
                    element));
                stringBuilder.append("\nHumidity: ").append(getValue("humidity", element));
                stringBuilder.append("\n-----");
            }
        }
        displayTextView.setText(stringBuilder.toString());
    } catch (Exception e) {
        e.printStackTrace();
        Toast.makeText(MainActivity.this, "Error Parsing XML",
            Toast.LENGTH_SHORT).show();
    }
}

});
parseJsonBtn.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        String json;
        StringBuilder stringBuilder = new StringBuilder();
        try {
            InputStream is = getAssets().open("city.json");
            int size = is.available();
            byte[] buffer = new byte[size];
            is.read(buffer);
            json = new String(buffer, StandardCharsets.UTF_8);
            JSONArray jsonArray = new JSONArray(json);
            stringBuilder.append("JSON Data");
            stringBuilder.append("\n-----");
            for (int i = 0; i < jsonArray.length(); i++) {
                JSONObject jsonObject = jsonArray.getJSONObject(i);
                stringBuilder.append("\nName: ").append(jsonObject.getString("name"));
                stringBuilder.append("\nLatitude: ").append(jsonObject.getString("lat"));
                stringBuilder.append("\nLongitude: ").append(jsonObject.getString("long"));

                stringBuilder.append("\nTemperature: ").append(jsonObject.getString("temperature"));
                stringBuilder.append("\nHumidity: ").append(jsonObject.getString("humidity"));
                stringBuilder.append("\n-----");
            }
            displayTextView.setText(stringBuilder.toString());
        }
    }
});

```



```
        is.close();
    } catch (IOException | JSONException e) {
        e.printStackTrace();
        Toast.makeText(MainActivity.this, "Error in parsing JSON data
from!", Toast.LENGTH_SHORT).show();
    }
});
}
private String getValue(String tag, Element element) {
    return
element.getElementsByTagName(tag).item(0).getChildNodes().item(0).getNodeValue();
}
}
```

#### *city.xml file*

```
<?xml version = "1.0"?>
<records>
    <place>
        <name>Mysore</name>
        <lat>12.295</lat>
        <long>76.639</long>
        <temperature>22</temperature>
        <humidity>90</humidity>
    </place>
    <place>

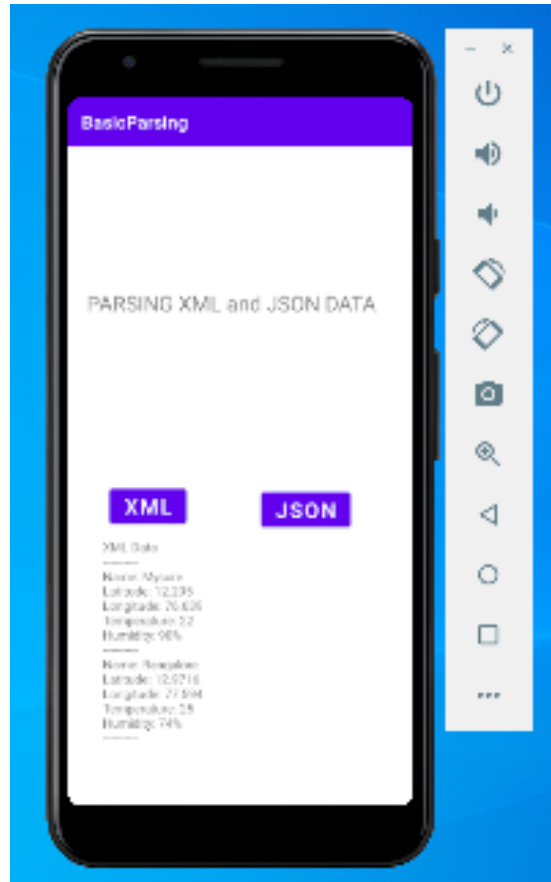
        <name>Bangalore</name>
        <lat>12.9716</lat>
        <long>77.594</long>
        <temperature>25</temperature>
        <humidity>74</humidity>
    </place>
```

#### *City.json file*

```
[{
    "name": "Hassan",
    "lat": "12.295",
    "long": "76.639",
    "temperature": "22",
    "humidity": "92%"
},
{
    "name": "Mandya",
    "lat": "12.9716",
    "long": "77.5946",
    "temperature": "25",
    "humidity": "74%"
}
```

```
}  
]
```

OUTPUT



**6. 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.**

/\* XML Code \*/

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="298dp"
        android:layout_height="105dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="57dp"
        android:layout_marginBottom="517dp"
        android:text="TEXT TO SPEECH CONVERTER"
        android:textSize="30sp"
        android:textStyle="bold" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="164dp"
        android:layout_marginBottom="346dp"
        android:onClick="convert"
        android:text="CONVERT" />

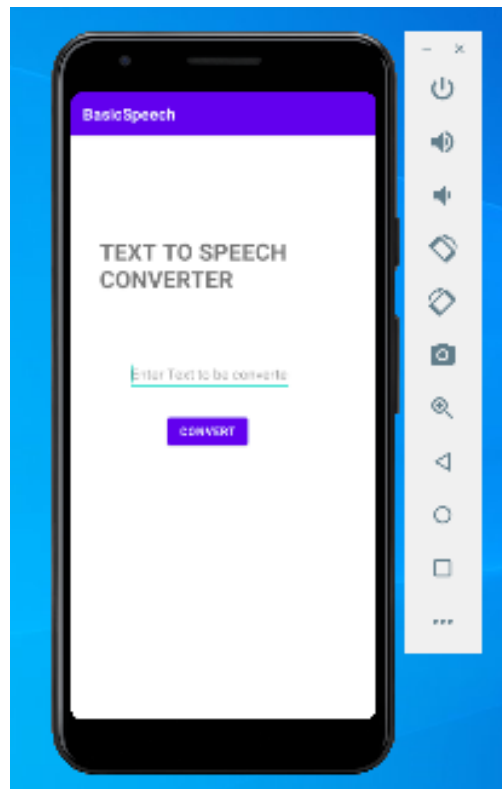
    <EditText
        android:id="@+id/editText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="108dp"
        android:layout_marginBottom="421dp"
        android:ems="10"
        android:hint="Enter Text to be converted"
        android:inputType="textPersonName"
        android:text="" />
</RelativeLayout>
```

/\* Java Code \*/

```
import androidx.appcompat.app.AppCompatActivity;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;
import java.util.Locale;
import android.os.Bundle;

public class MainActivity extends AppCompatActivity{
    TextToSpeech t1;
    EditText e1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1 = (EditText)findViewById(R.id.editText);
        t1 = new TextToSpeech(getApplicationContext(), new
TextToSpeech.OnInitListener() {
            @Override
            public void onInit(int status) {
                if (status!=TextToSpeech.ERROR){
                    t1.setLanguage(Locale.UK);
                }
            }
        });
    }
    public void convert(View view){
        String tospeak = e1.getText().toString();
        Toast.makeText(getApplicationContext(),tospeak,Toast.LENGTH_LONG).show();
        t1.speak(tospeak,TextToSpeech.QUEUE_FLUSH,null);
    }
}
```

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.**

/\* XML Code \*/

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

    <Button
        android:id="@+id/callBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="268dp"
        android:layout_marginBottom="79dp"
        android:text="CALL" />

    <Button
        android:id="@+id/saveBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="84dp"
        android:layout_marginBottom="77dp"
        android:text="SAVE" />

    <Button
        android:id="@+id/button15"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="41dp"
        android:layout_marginBottom="152dp"
        android:onClick="inputNumber"
        android:text="#" />

    <Button
        android:id="@+id/button14"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="159dp"
        android:layout_marginBottom="159dp"
        android:onClick="inputNumber"
```

```
android:text="*" />
```

```
<Button
```

```
    android:id="@+id/button12"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_alignParentEnd="true"  
    android:layout_alignParentBottom="true"  
    android:layout_marginEnd="44dp"  
    android:layout_marginBottom="250dp"  
    android:onClick="inputNumber"  
    android:text="8" />
```

```
<Button
```

```
    android:id="@+id/button11"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_alignParentEnd="true"  
    android:layout_alignParentBottom="true"  
    android:layout_marginEnd="163dp"  
    android:layout_marginBottom="267dp"  
    android:onClick="inputNumber"  
    android:text="7" />
```

```
<Button
```

```
    android:id="@+id/button10"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_alignParentEnd="true"  
    android:layout_alignParentBottom="true"  
    android:layout_marginEnd="319dp"  
    android:layout_marginBottom="262dp"  
    android:onClick="inputNumber"  
    android:text="6" />
```

```
<Button
```

```
    android:id="@+id/button13"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_alignParentEnd="true"  
    android:layout_alignParentBottom="true"  
    android:layout_marginEnd="316dp"  
    android:layout_marginBottom="157dp"  
    android:onClick="inputNumber"  
    android:text="9" />
```

```
<Button
```

```
    android:id="@+id/button9"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:layout_alignParentEnd="true"  
    android:layout_alignParentBottom="true"  
    android:layout_marginEnd="45dp"  
    android:layout_marginBottom="345dp"  
    android:onClick="inputNumber"
```

```
        android:text="5" />

<Button
    android:id="@+id/button8"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="165dp"
    android:layout_marginBottom="350dp"
    android:onClick="inputNumber"
    android:text="4" />

<Button
    android:id="@+id/button7"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_marginBottom="360dp"
    android:onClick="inputNumber"
    android:text="0" />

<Button
    android:id="@+id/button6"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_marginBottom="358dp"
    android:onClick="inputNumber"
    android:text="3" />

<EditText
    android:id="@+id/phoneNumberEditText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="171dp"
    android:layout_marginBottom="548dp"
    android:ems="10"
    android:inputType="phone"
    android:textSize="24sp" />

<Button
    android:id="@+id/clearBtn"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="47dp"
    android:layout_marginBottom="537dp"
    android:text="CLEAR" />

<Button
    android:id="@+id/button2"
```



```

        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_marginBottom="448dp"
        android:onClick="inputNumber"
        android:text="0" />

<Button
    android:id="@+id/button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="168dp"
    android:layout_marginBottom="448dp"
    android:onClick="inputNumber"
    android:text="1" />

<Button
    android:id="@+id/button4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="49dp"
    android:layout_marginBottom="450dp"
    android:onClick="inputNumber"
    android:text="2" />
</RelativeLayout>

```

/\* Java Code \*/

```

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;
import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

    EditText phoneNumberEditText;
    Button clearBtn, callBtn, saveBtn;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        phoneNumberEditText = findViewById(R.id.phoneNumberEditText);
        clearBtn = findViewById(R.id.clearBtn);
        callBtn = findViewById(R.id.callBtn);
    }
}

```

```
saveBtn = findViewById(R.id.saveBtn);
clearBtn.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        phoneNumberEditText.setText("");
    }
});
callBtn.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        String phoneNumber = phoneNumberEditText.getText().toString();
        Intent intent = new Intent(Intent.ACTION_DIAL);
        intent.setData(Uri.parse("tel:" + phoneNumber));
        startActivity(intent);
    }
});
saveBtn.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        String phoneNumber = phoneNumberEditText.getText().toString();
        Intent intent = new Intent(Intent.ACTION_INSERT);
        intent.setType(ContactsContract.Contacts.CONTENT_TYPE);
        intent.putExtra(ContactsContract.Intents.Insert.PHONE, phoneNumber);
        startActivity(intent);
    }
});
}
public void inputNumber(View v) {
    Button btn = (Button)v;
    String digit = btn.getText().toString();
    String phoneNumber = phoneNumberEditText.getText().toString();
    phoneNumberEditText.setText(phoneNumber + digit);
}
}
```

## OUTPUT

