



MOBILE APPLICATION DEVELOPMENT (18CSMP68)

LABORATORY MANUAL

VI Semester B.E.
(Academic Year: 2022-23)



Prepared By

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DEPARTMENT OF INFORMATION SCIENCE AND
ENGINEERING

SAHYADRI

College of Engineering & Management
Adyar, Mangaluru - 575007



STUDENT DETAILS

NAME	
USN	
BATCH	
SECTION	

STAFF DETAILS

NAME OF THE FACULTY	
NAME OF THE INSTRUCTOR	

EVALUATION

	MAXIMUM MARKS	MARKS OBTAINED
WEEKLY EVALUATION*	25	
LAB CIE	15	
TOTAL		

*OBE Sheet Evaluation

Signature of the Faculty

DEPARTMENT OF INFORMATION SCIENCE AND
ENGINEERING

SAHYADRI

College of Engineering & Management
Adyar, Mangaluru - 575007



Vision

To be a premier institution in Technology and Management by fostering excellence in education, innovation, incubation and values to inspire and empower the young minds.

Mission

M1. Creating an academic ambience to impart holistic education focusing on individual growth, integrity, ethical values and social responsibility.

M2. Develop skill based learning through industry-institution interaction to enhance competency and promote entrepreneurship.

M3. Fostering innovation and creativity through competitive environment with state-of-the-art infrastructure.

DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

Vision

To be a center of excellence in Information Science and Engineering through the interactive teaching-learning process, research, and innovation.

Mission

M1. Creating competitive ambience to enhance the innovative and experiential learning process through state of the art infrastructure.

M2. Grooming young minds through industry-institute interactions to solve societal issues and inculcate affinity towards research and entrepreneurship.

M3. Promoting teamwork and leadership qualities through inter-disciplinary activities in diversified areas of information science and engineering.

Program Educational Objectives (PEOs):

PEO1: Possess theoretical and practical knowledge to identify, scrutinize, formulate and solve challenging problems related to dynamically evolving information science.

PEO2: Inculcate core competency, professionalism and ethics to cater industrial needs and to solve societal problems.

PEO3: Engage in Lifelong learning and stay intact to the transformation in technologies and pursue research.

Program Outcomes:

PO1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs):

PSO1: Exhibit competency and skills in distributed computing, information security, cyber security, data analytics, and machine learning.

PSO2: Able to provide sustainable solution to implement and validate information science projects.

COURSE OUTCOMES:

Sl. No.	DESCRIPTION	Bloom's Level
C324.1	Create and debug various Android Applications by setting up Android development environment with necessary virtual devices using Android Virtual Device Manager.	CL6
C324.2	Demonstrate adaptive, responsive user interfaces that work across a wide range of devices and analyse the various APIs used in developing responsive Android Applications	CL3
C324.3	Demonstrate various APIs and methods used for storing, sharing and retrieving data in Android applications.	CL3
C324.4	Examine the different permissions and Security Aspects available for Android applications and discuss its roles in different use cases.	CL3
C324.5	Design, implement and demonstrate a mini project using Android Development Tool Kit and Compile the working with well document using modern tool.	CL6

CO-PO-PSO MAPPING:

CO No.	Programme Outcomes (PO)												Programme Specific Outcome (PSO)		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
C324.1	3	3	3	2	3			3	2			3	1	2	
C324.2	3	3	3	2	3			3	2			3	1	2	
C324.3	3	3	3	2	3			3	2			3	1	2	
C324.4	3	3	3	2	3			3	2			3	1	2	
C324.5	3	3	3	2	3	2	1	3	2	2	1	3	2	2	

Experiment Details

Experiment No.	Experiment Name
1	Visiting Card Application
2	Simple Calculator Application
3	Sign-up and Log-in Application
4	Wallpaper Application
5	Counter Application
6	Parser Application
7	Text to Speech Application
8	Call and Save Application

Experiment-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.

Program:

activity_main.xml

```
<?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"
    android:background="@color/white"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView"
        android:layout_width="285dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="126dp"
        android:layout_marginBottom="579dp"
        android:text="SCEM Mangalore"
        android:textSize="36sp" />

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="77dp"
        android:layout_height="87dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="17dp"
        android:layout_marginBottom="618dp"
        app:srcCompat="@drawable/logo" />
```

```
<View
    android:id="@+id/view"
    android:layout_width="wrap_content"
    android:layout_height="12dp"
    android:background="#4444"
    android:layout_alignParentBottom="true"
    android:layout_marginBottom="479dp" />
```

```
<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="112dp"
    android:layout_marginBottom="419dp"
    android:text="Mr. Ganaraj K"
    android:textAlignment="center"
    android:textSize="30sp"
    android:textStyle="bold" />
```

```
<TextView
    android:id="@+id/textView3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="112dp"
    android:layout_marginBottom="355dp"
    android:text="Asst. Professor-ISE"
    android:textSize="24sp" />
```

```
<TextView
    android:id="@+id/textView4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
```

```
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="60dp"
android:layout_marginBottom="295dp"
android:text="Address: SCEM Mangalore"
android:textSize="24sp" />
```

```
<TextView
```

```
android:id="@+id/textView5"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="143dp"
android:layout_marginBottom="237dp"
android:text="Ph: 8086714071"
android:textSize="24sp" />
```

```
<TextView
```

```
android:id="@+id/textView6"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="89dp"
android:layout_marginBottom="194dp"
android:text="Email: kganaraj09@gmail.com"
android:textSize="18sp" />
```

```
</RelativeLayout>
```

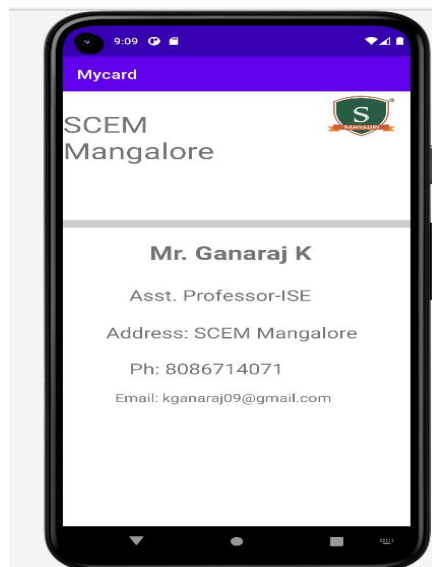
MainActivity.java

```
package com.example.expt1;
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:



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

Program:

activity_main.xml

```
<?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"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="179dp"
    android:layout_marginBottom="652dp"
    android:text="SimpleCalci"
    android:textSize="24sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
```

<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="138dp"
    android:layout_marginBottom="540dp"
    android:ems="10"
    android:hint="Enter Number-1"
    android:inputType="textPersonName"
    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="135dp"
```

```

        android:hint="Enter Number-2"

        android:layout_marginBottom="469dp"

        android:ems="10"

        android:inputType="textPersonName"

        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="233dp"

        android:layout_marginBottom="374dp"

        android:text="0"

        android:textSize="30sp" />
<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="103dp"

        android:onClick="div"

        android:layout_marginBottom="208dp"

        android:text="DIV" />
<Button

        android:id="@+id/button2"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_alignParentEnd="true"

```

```

        android:layout_alignParentBottom="true"

        android:layout_marginEnd="291dp"

        android:onClick="mul"

        android:layout_marginBottom="208dp"

        android:text="MUL" />
<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="101dp"

    android:layout_marginBottom="324dp"

    android:onClick="sub"

    android:text="SUB" />

```

```

<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="293dp"

    android:layout_marginBottom="322dp"

    android:onClick="add"

    android:text="ADD" />

```

```

</RelativeLayout>

```

MainActivity.java

```

package com.example.simplecalciapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

```

```

import android.view.View;

import android.widget.EditText;

import android.widget.TextView;

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 add(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 sub(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 mul(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 div(View V){

        float a1 = Integer.parseInt(e1.getText().toString());

        float a2 = Integer.parseInt(e2.getText().toString());

        float result = a1/a2;

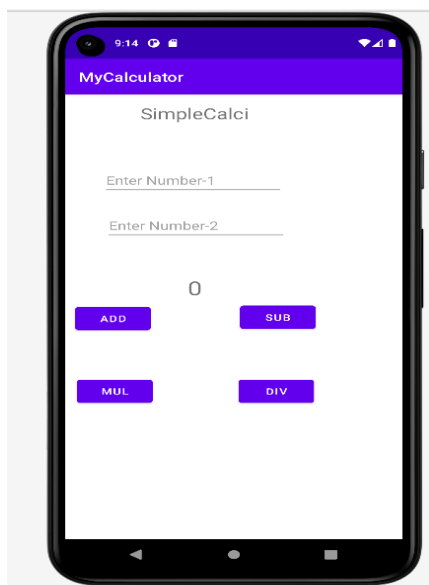
        tv1.setText(""+result);

    }

}

```

OUTPUT:



Experiment-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.

Program:

activity_main.xml

```
<?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="160dp"
        android:layout_height="42dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="112dp"
        android:layout_marginBottom="573dp"
        android:text="Sign Up"
        android:textSize="28dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <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="29dp"

android:layout_marginBottom="431dp"

android:ems="10"

android:hint="Email ID"

android:inputType="textEmailAddress"

android:textSize="28dp" />
```

<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="34dp"

android:layout_marginBottom="345dp"

android:ems="10"

android:hint="Password"

android:inputType="textPassword"

android:textSize="28dp" />
```

<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="106dp"

android:layout_marginBottom="226dp"

android:text="Sign Up"

android:textSize="28dp" />
```

</RelativeLayout>

MainActivity.java

```
package com.example.loginapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.Toast;

import java.util.regex.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 Does not match the rules",

Toast.LENGTH_LONG).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) {

    if (password.length() < 8) {

        return false;

    }

    if (!lowercase.matcher(password).matches()) {

        return false;

    }

    if (!uppercase.matcher(password).matches()) {

        return false;

    }

    if (!number.matcher(password).matches()) {

        return false;

    }

    if (!specialCharacter.matcher(password).matches()) {

        return false;

    }

    return true;

}

}

```

activity_login.xml

```
<?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/textView"

        android:layout_width="210dp"

        android:layout_height="54dp"

        android:layout_alignParentEnd="true"

        android:layout_alignParentBottom="true"

        android:layout_marginEnd="120dp"

        android:layout_marginBottom="576dp"

        android:text="Login Activity"

        android:textSize="28dp" />

    <EditText

        android:id="@+id/emailEditText"

        android:layout_width="222dp"

        android:layout_height="80dp"

        android:layout_alignParentEnd="true"

        android:layout_alignParentBottom="true"

        android:layout_marginEnd="108dp"

        android:layout_marginBottom="424dp"

        android:ems="10"

        android:hint="Email ID"

        android:inputType="textEmailAddress"

        android:textSize="28dp" />

    <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="40dp"

        android:layout_marginBottom="299dp"

        android:ems="10"

        android:hint="Password"

        android:inputType="textPassword"

        android:textSize="28dp" />

<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="173dp"

        android:layout_marginBottom="189dp"

        android:text="login"

        android:textSize="26dp" />

```

</RelativeLayout>

LoginActivity.java

```

package com.example.loginapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

```

```

import android.widget.Toast;

public class LoginActivity extends AppCompatActivity {

    EditText emailEditText, passwordEditText;

    Button loginBtn;

    int counter=2;

    @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,LoginSuccessActivity.class);

                    startActivity(intent);

                }

                else{

                    Toast.makeText(LoginActivity.this,"Invalid
Credentials",Toast.LENGTH_LONG).show();

                }

                counter--;

                if (counter==0)

                {

```

```

        Toast.makeText(getBaseContext(),"FAILED LOGIN
        ATTEMPTS",Toast.LENGTH_LONG).show();

        loginBtn.setEnabled(false);

    }

}

});

}

}

```

activity_login_success.xml

```

<?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=".LoginSuccessActivity">

    <TextView

        android:id="@+id/textView2"

        android:layout_width="297dp"

        android:layout_height="190dp"

        android:layout_alignParentEnd="true"

        android:layout_alignParentBottom="true"

        android:layout_marginEnd="42dp"

        android:layout_marginBottom="400dp"

        android:text="Login Successful"

        android:textSize="38dp" />

    </RelativeLayout>

```

LoginSuccessActivity.java

```

package com.example.loginapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

```

```

public class LoginSuccessActivity extends AppCompatActivity {

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

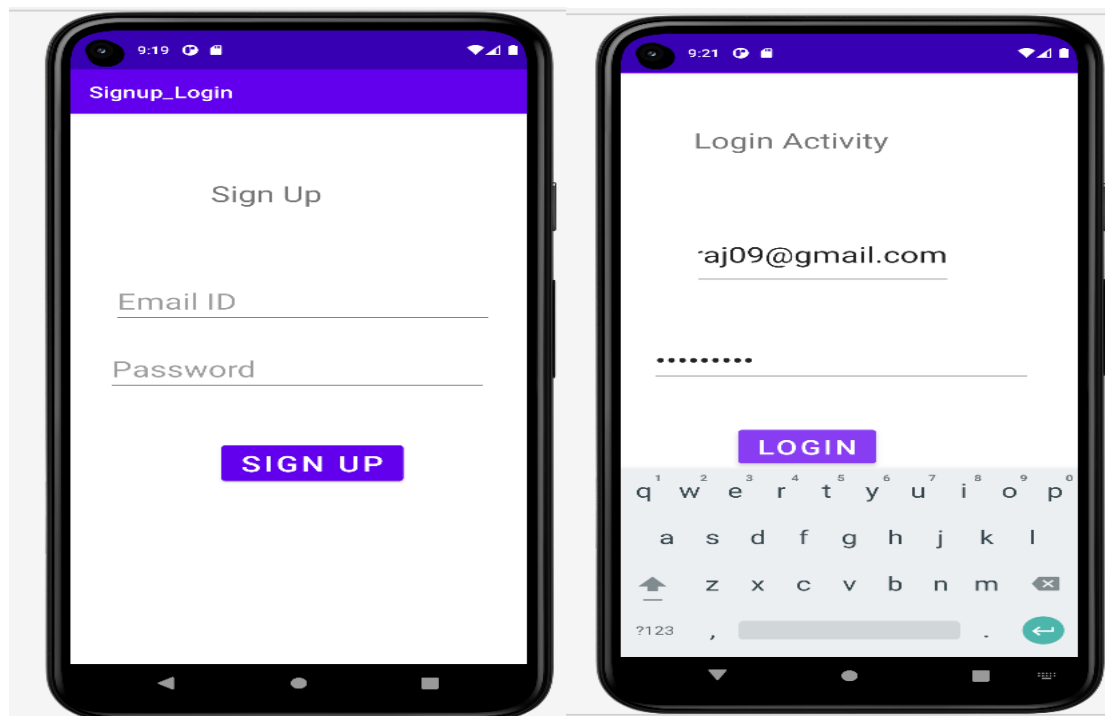
        setContentView(R.layout.activity_login_success);

    }

}

```

OUTPUT:



Experiment-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.

Pre-requisite: 3. Store 5 images of your choice with filenames one, two, three, four and five with jpeg or png file format in res/drawable folder

Program:

activity_main.xml

```

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

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

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

```

```

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

android:layout_width="match_parent"

android:layout_height="match_parent"

android:orientation="vertical"

android:gravity="center"

tools:context=".MainActivity">

<Button

android:layout_width="match_parent"

android:layout_height="wrap_content"

android:text="Click here to Change Wallpaper"

android:id="@+id/btn1"/>

</LinearLayout>

```

MainActivity.java

```

package com.example.wallpapperapp;

import android.annotation.SuppressLint;

import android.app.WallpaperManager;

import android.graphics.Bitmap;

import android.graphics.drawable.BitmapDrawable;

import android.graphics.drawable.Drawable;

import android.os.Bundle;

import android.widget.Button;

import androidx.appcompat.app.AppCompatActivity;

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.btn1); changewallpaper.setOnClickListener(view ->
setWallpaper());

}

private void setWallpaper() {

mytimer.schedule(new TimerTask() {

@SuppressWarnings("UseCompatLoadingForDrawables")

@Override

public void run() {

if(prev==1) {

drawable = getResources().getDrawable(R.drawable.one);

prev = 2;

}

else if(prev==2) {

drawable = getResources().getDrawable(R.drawable.two);

prev=3;

}

```

else if(prev==3) {

    drawable = getResources().getDrawable(R.drawable.three);

    prev=4;

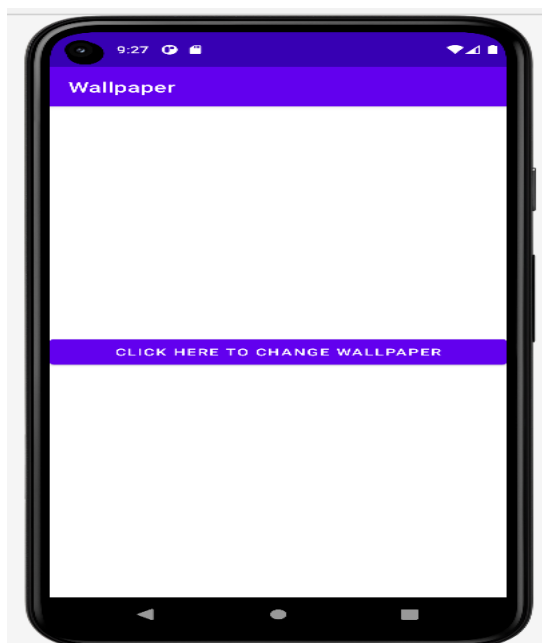
}

else if(prev==4) {

    drawable = getResources().getDrawable(R.drawable.four);
    prev=5;
}
else if(prev==5) {
    drawable = getResources().getDrawable(R.drawable.five);
    prev=1;
}
Bitmap wallpaper = ((BitmapDrawable)drawable).getBitmap();
try {
    wpm.setBitmap(wallpaper);
} catch (IOException e) {
    e.printStackTrace();
}
}
},0,30000); } }

```

OUTPUT:



Once user clicks on the button the wallpaper of the device changes.

Experiment-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

Program:

activity_main.xml

```
<?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="378dp"

        android:layout_height="68dp"

        android:layout_alignParentEnd="true"

        android:layout_alignParentBottom="true"

        android:layout_marginEnd="18dp"

        android:layout_marginBottom="602dp"

        android:text="Counter Application"

        android:textSize="38dp"

        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="121dp"

    android:layout_height="32dp"

    android:layout_alignParentEnd="true"

    android:layout_alignParentBottom="true"

    android:layout_marginEnd="145dp"

    android:layout_marginBottom="478dp"

    android:text="Counter Value" />
```

<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="297dp"

    android:layout_marginBottom="295dp"

    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="74dp"

    android:layout_marginBottom="292dp"
```

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

```
</RelativeLayout>
```

MainActivity.java

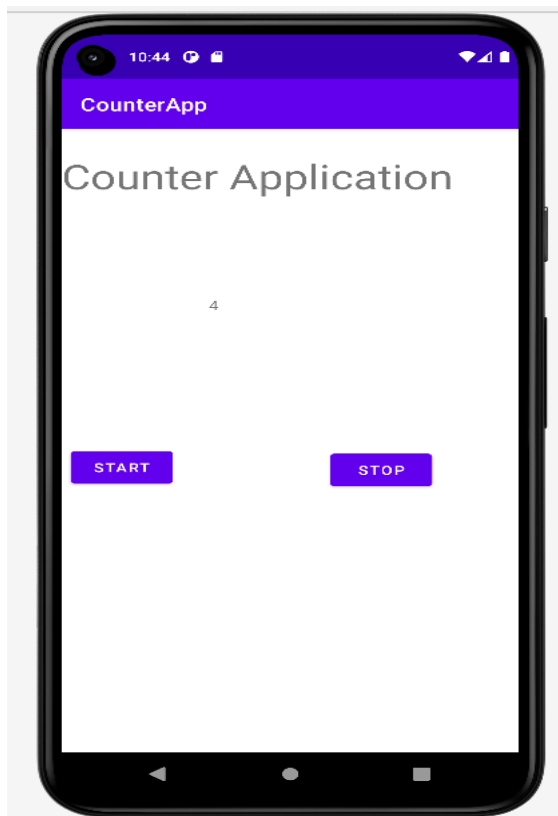
```
package com.example.counterapp;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
public class MainActivity extends AppCompatActivity {
    Button btnstart, btnstop;
    TextView txtcounter;
    int i=1;
    Handler customHandler=new Handler();
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btnstart=findViewById(R.id.btn_start);
        btnstop=findViewById(R.id.btn_stop);
        txtcounter=findViewById(R.id.textView);
        btnstart.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                customHandler.postDelayed(updateTimerThread,0);
            }
        });
        btnstop.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                customHandler.removeCallbacks(updateTimerThread);
            }
        });
    }
    private final Runnable updateTimerThread=new Runnable() {
        @Override
```

```

public void run() {
    txtcounter.setText(""+i);
    customHandler.postDelayed(this,1000);
    i++;
}
};
}

```

OUTPUT:



Experiment-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.

Pre-requisite:

1. Create a folder named assets in the following path ParserApplication\app\src\main. So that main folder will have assets, java, res folders and manifest file.
2. Now in assets folder create two files city.json and city.xml with the following contents

Program:

city.json

```
[  
  
  {  
  
    "name": "Hassan",  
  
    "lat": "12.295",  
  
    "long": "76.6",  
  
    "temperature": "29",  
  
    "humidity": "85% "  
  
  },  
  
  {  
  
    "name": "ckm",  
  
    "lat": "18.295",  
  
    "long": "79.6",  
  
    "temperature": "25",  
  
    "humidity": "80% "  
  
  }  
  
]
```

city.xml

```
<?xml version="1.0"?>  
  
<records>  
  
  <place>  
  
    <name>Mysuru</name>  
  
    <lat>12.295</lat>  
  
    <long>76.89</long>  
  
    <temperature>34</temperature>  
  
    <humidity>90%</humidity>
```

</place>

<place>

<name>bengaluru</name>

<lat>18.295</lat>

<long>79.89</long>

<temperature>32</temperature>

<humidity>80%</humidity>

</place>

</records>

activity_main.xml

<?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"

android:layout_alignParentEnd="true"

android:layout_alignParentBottom="true"

android:layout_marginEnd="173dp"

android:layout_marginBottom="638dp"

android:text="Parser"

android:textSize="36sp"


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

```
app:layout_constraintLeft_toLeftOf="parent"
```

```
app:layout_constraintRight_toRightOf="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_alignParentBottom="true"
```

```
android:layout_marginEnd="256dp"
```

```
android:onClick="parsexml"
```

```
android:layout_marginBottom="516dp"
```

```
android:text="XML Parser" />
```

```
<Button
```

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

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

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

```
android:layout_alignParentEnd="true"
```

```
android:layout_alignParentBottom="true"
```

```
android:layout_marginEnd="18dp"
```

```
android:onClick="parsejson"
```

```
android:layout_marginBottom="515dp"
```

```
android:text="JSON Parser" />
```

```
<TextView
```

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

```
android:layout_width="292dp"

android:layout_height="265dp"

android:layout_alignParentEnd="true"

android:layout_alignParentBottom="true"

android:layout_marginEnd="63dp"

android:layout_marginBottom="141dp"

android:textAlignment="center" />
```

</RelativeLayout>

MainActivity.java

```
package com.example.parser_app;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.TextView;
import android.widget.Toast;
import org.json.JSONArray;
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 java.io.InputStream;
import java.nio.charset.StandardCharsets;
import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;

public class MainActivity extends AppCompatActivity {
    TextView display;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        display = findViewById(R.id.display);
    }
}
```

```

public void parsexml(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("\nlat: ").append(getValue("lat", element));
                stringBuilder.append("\nLong: ").append(getValue("long", element));
                stringBuilder.append("\nTemperature: ").append(getValue("temperature", element));
                stringBuilder.append("\nHumidity: ").append(getValue("humidity", element));
                stringBuilder.append("\n-----");
            }
        }
        display.setText(stringBuilder.toString());
    }catch (Exception e){
        e.printStackTrace();
        Toast.makeText(MainActivity.this,"Error in reading XML", Toast.LENGTH_LONG).show();
    }
}

public void parsejson(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);
    }
}

```

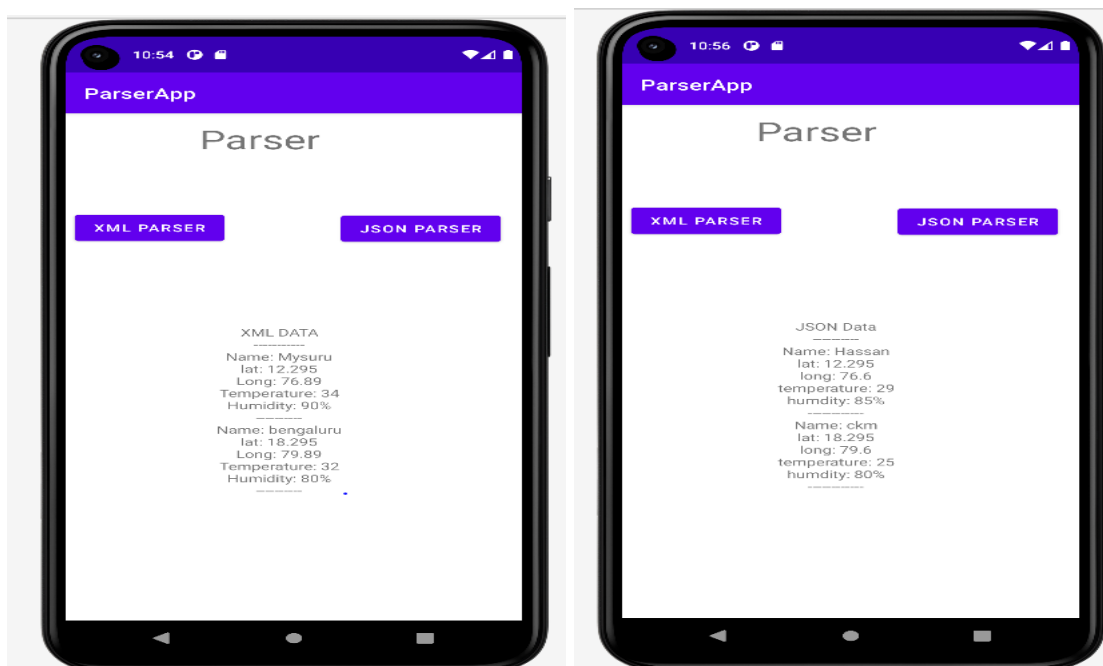
```

        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("\nlat: ").append(jsonObject.getString("lat"));
            stringBuilder.append("\nlong: ").append(jsonObject.getString("long"));
            stringBuilder.append("\ntemperature: ").append(jsonObject.getString("temperature"));
            stringBuilder.append("\nhumidity: ").append(jsonObject.getString("humidity"));
            stringBuilder.append("\n-----");
        }
        display.setText(stringBuilder.toString());
        is.close();
    }
    catch (Exception e){
        e.printStackTrace();
        Toast.makeText(MainActivity.this,"Error in reading JSON file",
        Toast.LENGTH_LONG).show();
    }
}

private String getValue(String tag, Element element){
    return element.getElementsByTagName(tag).item(0).getChildNodes().item(0).getNodeValue();
}
}

```

OUTPUT:



Experiment-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.

Program:

activity_main.xml

```
<?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"

        android:layout_alignParentEnd="true"

        android:layout_alignParentBottom="true"

        android:layout_marginEnd="122dp"

        android:layout_marginBottom="611dp"

        android:text="Text2Speech"

        android:textSize="30sp"

        app:layout_constraintBottom_toBottomOf="parent"

        app:layout_constraintLeft_toLeftOf="parent"

        app:layout_constraintRight_toRightOf="parent"

        app:layout_constraintTop_toTopOf="parent" />

    <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="101dp"

android:layout_marginBottom="510dp"

android:ems="10"

android:hint="Enter the text"

android:inputType="textPersonName"

android:text="" />
```

<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="158dp"

android:onClick="convert"

android:layout_marginBottom="372dp"

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

</RelativeLayout>

MainActivity.java

```
package com.example.textspeechapp;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.speech.tts.TextToSpeech;

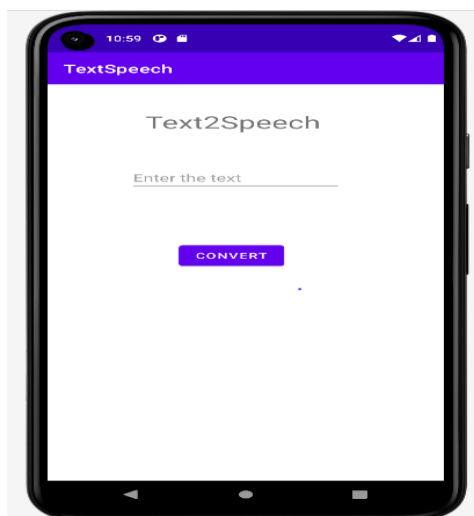
import android.view.View;
```

```

import android.widget.EditText;
import java.util.Locale;
public class MainActivity extends AppCompatActivity {
    TextToSpeech t1;
    EditText e1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1 = 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 V){
        String tospeak = e1.getText().toString();
        t1.speak(tospeak,TextToSpeech.QUEUE_FLUSH,null);
    }
}

```

OUTPUT:



Experiment-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.

Program:

activity_main.xml

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

<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"

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

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

    android:layout_width="match_parent"

    android:layout_height="match_parent"

    tools:context=".MainActivity">

    <EditText

        android:id="@+id/phoneNumberEditText"

        android:layout_width="0dp"

        android:layout_height="wrap_content"

        android:layout_margin="16dp"

        android:layout_marginTop="24dp"

        android:inputType="phone"

        android:textSize="24sp"

        app:layout_constraintEnd_toStartOf="@+id/clearBtn"

        app:layout_constraintHorizontal_bias="0.5"

        app:layout_constraintStart_toStartOf="parent"

        app:layout_constraintTop_toTopOf="parent" />

    <Button

        android:id="@+id/clearBtn"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_margin="16dp"

        android:text="Clear"
```



```

app:layout_constraintBottom_toBottomOf="@+id/phoneNumberEditText"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.5"
app:layout_constraintStart_toEndOf="@+id/phoneNumberEditText"
app:layout_constraintTop_toTopOf="@+id/phoneNumberEditText" />
<TableLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="32dp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@id/phoneNumberEditText">
    <TableRow
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:gravity="center_horizontal">
        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_margin="8dp"
            android:onClick="inputNumber"
            android:text="7" />
        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_margin="8dp"
            android:onClick="inputNumber"
            android:text="8" />
        <Button
            android:layout_width="wrap_content"

```

```

        android:layout_height="wrap_content"

        android:layout_margin="8dp"

        android:onClick="inputNumber"

        android:text="9" />
</TableRow>
<TableRow
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center_horizontal">
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="8dp"
        android:onClick="inputNumber"
        android:text="4" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="8dp"
        android:onClick="inputNumber"
        android:text="5" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="8dp"
        android:onClick="inputNumber"
        android:text="6" />
</TableRow>
<TableRow
    android:layout_width="match_parent"

```

```

        android:layout_height="match_parent"
        android:gravity="center_horizontal">
        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_margin="8dp"
            android:onClick="inputNumber"
            android:text="1" />
        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_margin="8dp"
            android:onClick="inputNumber"
            android:text="2" />
        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_margin="8dp"
            android:onClick="inputNumber"
            android:text="3" />
    </TableRow>
    <TableRow
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:gravity="center_horizontal">
        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_margin="8dp"
            android:onClick="inputNumber"

```

```

        android:text="*" />

<Button

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:layout_margin="8dp"

    android:onClick="inputNumber"

    android:text="0" />

<Button

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:layout_margin="8dp"

    android:onClick="inputNumber"

    android:text="#" />

</TableRow>

<TableRow

    android:layout_width="match_parent"

    android:layout_height="match_parent"

    android:gravity="center_horizontal">

    <Button

        android:id="@+id/callBtn"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_margin="8dp"

        android:text="Call" />

    <Button

        android:id="@+id/saveBtn"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_margin="8dp"

        android:text="Save" />

```

</TableRow>

</TableLayout>

</androidx.constraintlayout.widget.ConstraintLayout>

MainActivity.java

```
package com.example.callingapp;
```

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

```
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:

