COURSE OUTCOMES

Sl. No.	DESCRIPTION	Bloom's Level
C319.1	Illustrate basics of Android Application Development process by setting up Android development environment with necessary virtual devices using Android Virtual Device Manager.	CL3
C319.2	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
C319.3	Demonstrate various APIs and methods used for storing, sharing and retrieving data in Android applications.	CL3
C319.4	Examine the different permissions and Security Aspects available for Android applications and discuss its roles in different use cases.	CL3
C319.5	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**
C319.1	3	3	3	2	3			3	2			3	1	2	
C319.2	3	3	3	2	3			3	2			3	1	2	
C319.3	3	3	3	2	3			3	2			3	1	2	
C319.4	3	3	3	2	3			3	2			3	1	2	
C319.5	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

```
<?xmlversion="1.0"encoding="utf-8"?>
<RelativeLayoutxmlns: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:id="@+id/main"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:background="#A19C9C"
android:backgroundTint="#B3ACAC"
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="166dp"
android:layout_marginBottom="633dp"
android:text="SHAHID CHICKENS"
android:textAlignment="center"
android:textSize="24sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"/>

<ImageView android:id="@+id/imageView"
android:layout_width="114dp"
android:layout_height="113dp"
```

```
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="19dp"
android:layout_marginBottom="590dp"
app:srcCompat="@drawable/chickenlogo"/>

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

android:layout_alignParentBottom="true"
android:layout_marginEnd="167dp"
android:layout_marginBottom="564dp"
android:text="MAHAMMAD SHAHID P"
android:textSize="20sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"/>

<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="175dp"
android:layout_marginBottom="212dp"
android:text="CONTACT NO: 9964653074"
android:textSize="16sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"/>

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

```
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="150dp"
android:layout_marginBottom="346dp"
android:text="MANGALORE"
android:textSize="16sp"
 app:layout_constraintBottom_toBottomOf="parent"
 app:layout_constraintEnd_toEndOf="parent"
 app:layout_constraintStart_toStartOf="parent"
 app:layout_constraintTop_toTopOf="parent"/>

 <TextView
 android:layout_width="wrap_content"
 android:layout_height="wrap_content"
 android:layout_alignParentEnd="true"
 android:layout_alignParentBottom="true"
 android:layout_marginEnd="181dp"
 android:layout_marginBottom="507dp"
 android:text="KARNATAKA"
 android:textSize="20sp"
 app:layout_constraintBottom_toBottomOf="parent"
 app:layout_constraintEnd_toEndOf="parent"
 app:layout_constraintStart_toStartOf="parent"
 app:layout_constraintTop_toTopOf="parent"/>


 <TextView
 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="281dp"
 android:text="mail: shahid7@gmail.com"
 android:textSize="16sp"
 app:layout_constraintBottom_toBottomOf="parent"
```

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

<View
android:id="@+id/view"
android:layout_width="wrap_content"
android:layout_height="2dp"
android:layout_alignParentBottom="true"
android:layout_marginBottom="461dp"
android:background="#1B1A1A"/>

</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:


SHAHID
CHICKENS
MAHAMMAD SHAHID P
CONTACT NO:9964653074
MANGLORE
KARNATAKA
mail: shahid7@gmail.com

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:id="@+id/main"
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="144dp"
android:layout_marginBottom="649dp"
android:text="SIMPLE CALCULATOR"
android:textSize="16sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />

<TextView
android:id="@+id/result"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="213dp"
android:layout_marginBottom="406dp"
android:hint="0"
```

```
android:textSize="20sp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />

<EditText
android:id="@+id/num1"
android:layout_width="wrap_content"

android:layout_height="50dp"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="99dp"
android:layout_marginBottom="542dp"
android:ems="10"
android:hint="enter number 1"
android:inputType="text" />

<EditText
android:id="@+id/num2"
android:layout_width="wrap_content"
android:layout_height="50dp"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="105dp"
android:layout_marginBottom="471dp"
android:ems="10"
android:hint="enter number 2"
android:inputType="text" />

<Button
android:id="@+id/add
android:layout_width="wrap_content"
android:layout_height="50dp"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
```

```
android:layout_marginEnd="255dp"
android:layout_marginBottom="299dp"
android:onClick="addition"
android:text="add" />

<Button
android:id="@+id/div"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="85dp"
android:layout_marginBottom="182dp"
android:onClick="divide"
android:text="div" />

<Button
android:id="@+id/mul"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="251dp"
android:onClick="multiply"
android:layout_marginBottom="186dp"
android:text="mul" />

<Button
android:id="@+id/sub"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="74dp"
android:onClick="subtraction"
android:layout_marginBottom="299dp"
android:text="sub" />
```

```
</RelativeLayout>
```

MainActivity.java

```
package com.example.calci2;

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


public class MainActivity extends AppCompatActivity {
EditText num1,num2;
TextView  result;
Button add,sub,mul,div;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
}
public void addition(View view){
num1=findViewById(R.id.num1);
num2=findViewById(R.id.num2);
result=findViewById(R.id.result);
float
res=(Float.parseFloat(num1.getText().toString()))+(Float.parseFloat(num2.getText().toString()));
result.setText(""+res);
}

public void subtraction(View view){
num1 = findViewById(R.id.num1);
num2 = findViewById(R.id.num2);
result = findViewById(R.id.result);
```

```
float res = (Float.parseFloat(num1.getText().toString())) -
(Float.parseFloat((num2.getText().toString())));
result.setText(" " + res);
}

public void multiply(View view){
num1=findViewById(R.id.num1);
num2=findViewById(R.id.num2);
result=findViewById(R.id.result);
float res=(Float.parseFloat(num1.getText().toString()))*Float.parseFloat((num2.getText().toString()));
result.setText(" "+res);
}

public void divide(View view) {
num1 = findViewById(R.id.num1);
num2 = findViewById(R.id.num2);
result = findViewById(R.id.result);
float secnum=(Float.parseFloat(num2.getText().toString()));
if (secnum!=0) {
float res =
(Float.parseFloat(num1.getText().toString()))/(Float.parseFloat((num2.getText().toString())));
result.setText(" "+res);
}
else{
Toast.makeText(this, "Denominator is zero", Toast.LENGTH_SHORT).show();
}
}
}
```

OUTPUT:


1:43
SIMPLE CALCULATOR
enter number 1
enter number 2
0
add
sub
mul
div

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:


8:59
SIGN IN PAGE
shahid7@gmail.com
.....
sign in


8:59
LOG IN PAGE
shahid7@gmail.com
.....
log in

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

<?xmlversion="1.0"encoding="utf-8"?>

<RelativeLayoutxmlns: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:id="@+id/main"

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="165dp"

android:layout_marginBottom="564dp"

android:text="Wallpaperapp"

android:textSize="24sp"

app:layout_constraintBottom_toBottomOf="parent"

app:layout_constraintEnd_toEndOf="parent"

app:layout_constraintStart_toStartOf="parent"

app:layout_constraintTop_toTopOf="parent"/>

```
<Button
android:id="@+id/btn"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentEnd="true"
android:layout_alignParentBottom="true"
android:layout_marginEnd="156dp"
android:layout_marginBottom="399dp"
android:text="change"
android:textSize="24sp"/>
</RelativeLayout>
```

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() {

         @SuppressLint("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"
```

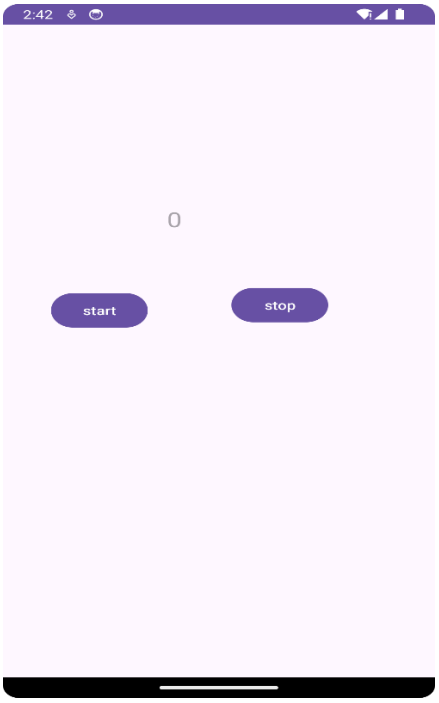
```
        android:text="Stop" />

</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>
```

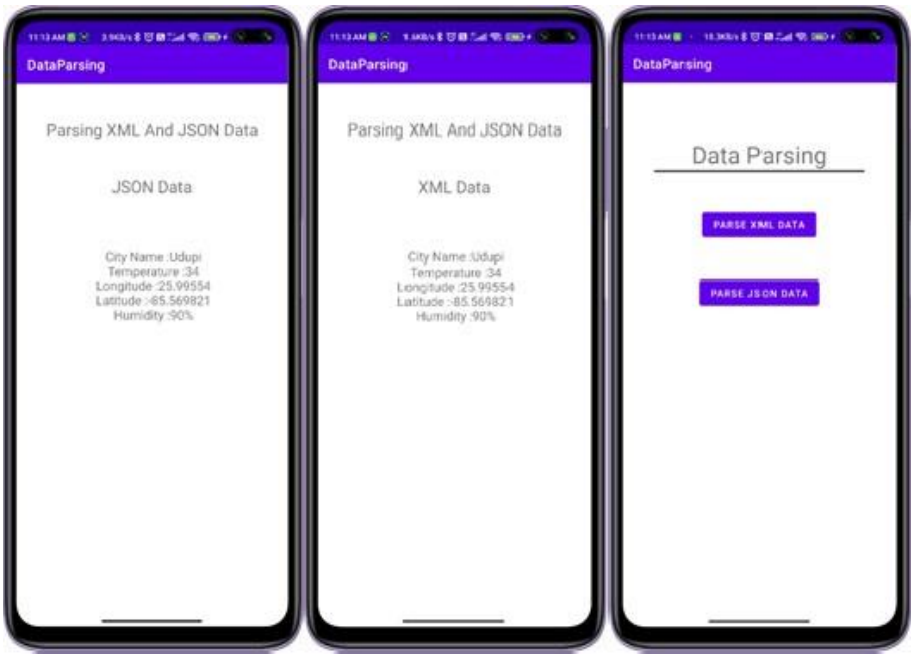
MainActivity.java

```
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("\nhumdity: ").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"
```

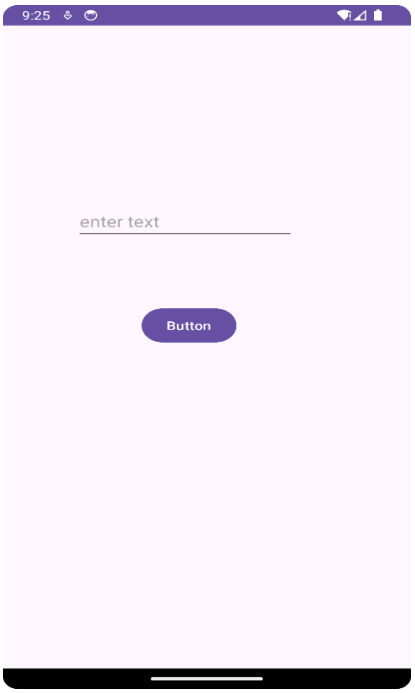
```
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="101dp"
        android:layout_marginBottom="510dp"
        android:ems="10"
        android:hint="Enter the text"
        android:inputType="textPersonName"
        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 dialler 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();
if (phoneNumber.length( )>10)
   Toast.makeText(MainActivity.this, “Input Only 10 Digits”, Toast.LENGTH_LONG).show();
else
    phoneNumberEditText.setText(phoneNumber + digit);
  }

}
```

OUTPUT:


PhoneApp
PHONE DIALER
9777777777
DELETE
1
2
3
4
5
6
7
8
9
*
0
#
CALL
SAVE