

# **COURSE OUTCOME-1**

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## PROGRAM 1

### AIM:

Design a Login Form with username and password using Linear Layout and toast valid credentials.

### PROGRAM CODE

MainActivity.java	<pre>package com.example.co1q1; import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.view.View; import android.widget.EditText; import android.widget.Toast; public class MainActivity extends AppCompatActivity {     EditText username,password;     @Override     protected void onCreate(Bundle savedInstanceState) {         super.onCreate(savedInstanceState);         setContentView(R.layout.activity_main);}     public void onSubmit(View view) {         username = findViewById(R.id.username);         password = findViewById(R.id.password);         if (username.getText().toString().equals("admin") &amp;&amp; password.getText().toString().equals("password")) {             Toast.makeText(this, "Authentication Successful", Toast.LENGTH_LONG).show();         } else {             Toast.makeText(this, "Authentication Failed", Toast.LENGTH_LONG).show();         } }} </pre>
activity_main.xml	<pre>&lt;?xml version="1.0" encoding="utf-8"?&gt; &lt;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"&gt; &lt;EditText     android:id="@+id/username" </pre>

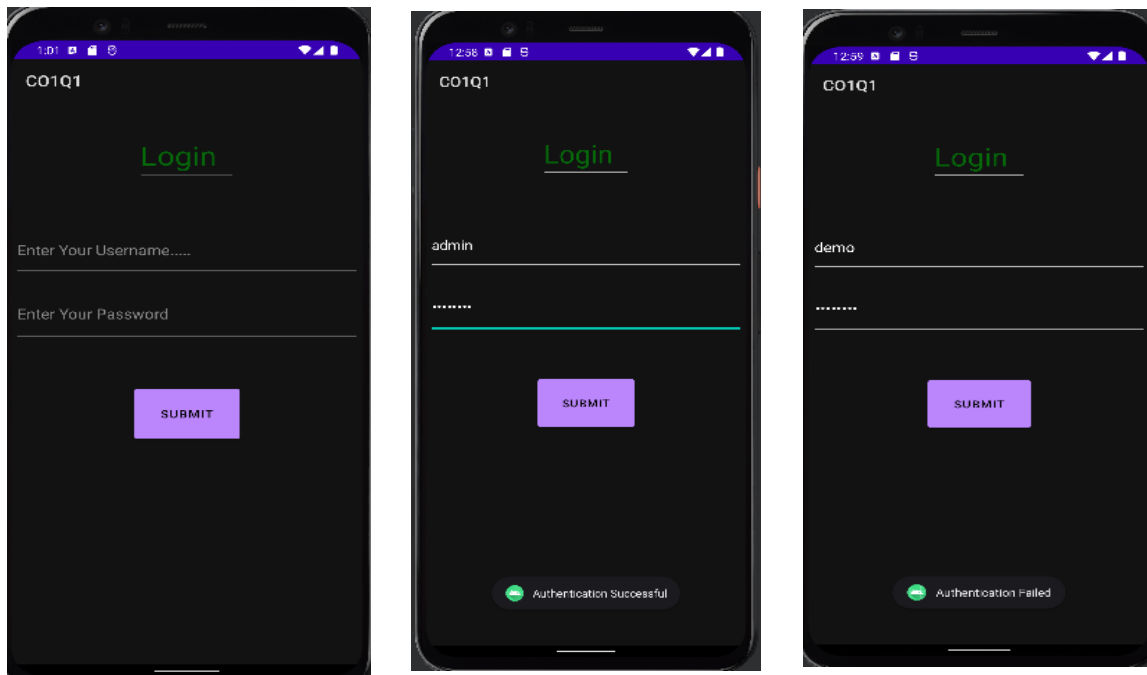
```

        android:layout_width="388dp"
        android:layout_height="68dp"
        android:ems="10"
        android:focusableInTouchMode="false"
        android:hint="Enter Your Username....."
        android:inputType="textPersonName"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.24" />
<EditText
    android:id="@+id/password"
    android:layout_width="387dp"
    android:layout_height="74dp"
    android:ems="10"
    android:hint="Enter Your Password"
    android:inputType="textPassword"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.363" />
<EditText
    android:id="@+id/editTextTextPersonName3"
    android:layout_width="110dp"
    android:layout_height="65dp"
    android:ems="10"
    android:inputType="textPersonName"
    android:text="Login"
    android:textColor="#066A0A"
    android:textSize="34sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.057" />
<Button
    android:id="@+id/submit"
    android:layout_width="119dp"
    android:layout_height="77dp"
    android:onClick="onSubmit"
    android:text="Submit"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"

```

	<pre>app:layout_constraintVertical_bias="0.561" /&gt; &lt;/androidx.constraintlayout.widget.ConstraintLayout&gt;</pre>
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## **OUTPUT**



**RESULT:** The above program is successfully executed and obtained the output.

## **PROGRAM 2**

**AIM:** Write a program that demonstrates Activity Lifecycle.

### **PROGRAM CODE**

MainActivity.java	<pre>package com.example.activitylifecycle; import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.util.Log; public class MainActivity extends AppCompatActivity {     @Override     protected void onCreate(Bundle savedInstanceState) {         super.onCreate(savedInstanceState);         setContentView(R.layout.activity_main);         Log.i("lifecycle", "onCreate invoked");}     @Override     protected void onStart() {         super.onStart();         Log.i("lifecycle", "onStart invoked");}     @Override     protected void onResume() {         super.onResume();         Log.i("lifecycle", "onResume invoked");}     @Override     protected void onPause() {         super.onPause();         Log.i("lifecycle", "onPause invoked");}     @Override     protected void onStop() {         super.onStop();         Log.i("lifecycle", "onStop invoked");}     @Override     protected void onDestroy() {         super.onDestroy();         Log.i("lifecycle", "onDestroy invoked");}}</pre>
activity_main.xml	<pre>&lt;?xml version="1.0" encoding="utf-8"?&gt; &lt;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"</pre>

	<pre>tools:context=".MainActivity"&gt; &lt;TextView     android:layout_width="wrap_content"     android:layout_height="wrap_content"     android:text="Hello World!"     app:layout_constraintBottom_toBottomOf="parent"     app:layout_constraintLeft_toLeftOf="parent"     app:layout_constraintRight_toRightOf="parent"     app:layout_constraintTop_toTopOf="parent" /&gt; &lt;/androidx.constraintlayout.widget.ConstraintLayout&gt;</pre>
--	---

## OUTPUT

```
Logcat
Emulator Pixel_5_API_29 Android 10.0.0 com.example.activitylifecycle (100) Info
(Landroid/graphics/Rect;Landroid/graphics/Rect;)Z (greylist, reflection, allowed)
2022-02-12 13:27:23.843 10024-10024/com.example.activitylifecycle W/tivitylifecycl: Accessing hidden method Landroid/view/ViewGroup;
->makeOptionalFitsSystemWindows()V (greylist, reflection, allowed)
2022-02-12 13:27:23.913 10024-10024/com.example.activitylifecycle I/lifecycle: onCreate invoked
2022-02-12 13:27:23.916 10024-10024/com.example.activitylifecycle I/lifecycle: onStart invoked
2022-02-12 13:27:23.918 10024-10024/com.example.activitylifecycle I/lifecycle: onResume invoked
2022-02-12 13:27:23.963 10024-10052/com.example.activitylifecycle W/OpenGLESRenderer: Failed to choose config with EGL_SWAP_BEHAVIOR_PRESERVED, retrying
without...
2022-02-12 13:27:23.987 10024-10052/com.example.activitylifecycle W/Gralloc3: mapper 3.x is not supported
2022-02-12 13:27:25.166 10024-10066/com.example.activitylifecycle I/tivitylifecycl: Waiting for a blocking GC Instrumentation
2022-02-12 13:27:25.184 10024-10066/com.example.activitylifecycle I/tivitylifecycl: WaitForGcToComplete blocked Instrumentation on Instrumentation for
18.460ms
2022-02-12 13:27:30.814 10024-10066/com.example.activitylifecycle W/tivitylifecycl: Suspending all threads took: 7.790ms
2022-02-12 13:27:30.844 10024-10066/com.example.activitylifecycle I/tivitylifecycl: WaitForGcToComplete blocked Instrumentation on None for 6.123ms
2022-02-12 13:27:30.978 10024-10066/com.example.activitylifecycle W/tivitylifecycl: Suspending all threads took: 6.384ms
2022-02-12 13:27:31.007 10024-10024/com.example.activitylifecycle I/lifecycle: onPause invoked
2022-02-12 13:27:31.127 10024-10066/com.example.activitylifecycle W/tivitylifecycl: Suspending all threads took: 29.188ms
2022-02-12 13:27:31.596 10024-10066/com.example.activitylifecycle W/tivitylifecycl: Suspending all threads took: 5.331ms
2022-02-12 13:27:31.642 10024-10024/com.example.activitylifecycle I/lifecycle: onStop invoked
2022-02-12 13:27:36.622 10024-10066/com.example.activitylifecycle I/tivitylifecycl: Waiting for a blocking GC Instrumentation
2022-02-12 13:27:36.632 10024-10066/com.example.activitylifecycle I/tivitylifecycl: WaitForGcToComplete blocked Instrumentation on Instrumentation for
10.136ms
2022-02-12 13:27:37.559 10024-10024/com.example.activitylifecycle I/lifecycle: onStart invoked
2022-02-12 13:27:37.560 10024-10024/com.example.activitylifecycle I/lifecycle: onResume invoked
```

## RESULT:

The above program is successfully executed and obtained the output.

## PROGRAM 3

### AIM:

Implementing basic arithmetic operations of a simple calculator.

### PROGRAM CODE

MainActivity.java	<pre>package com.example.calculator; import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.view.View; import android.widget.EditText; public class MainActivity extends AppCompatActivity {     EditText num1,num2,result;     @Override     protected void onCreate(Bundle savedInstanceState) {         super.onCreate(savedInstanceState);         setContentView(R.layout.activity_main);}     public void onSum(View view){         num1=findViewById(R.id.number1);         num2=findViewById(R.id.number2);         result=findViewById(R.id.result);         result.setText("Sum="+String.valueOf(Integer.parseInt(num1.getText().toString())+Integer.parseInt(num2.getText().toString())));}     public void onSub(View view){         num1=findViewById(R.id.number1);         num2=findViewById(R.id.number2);         result=findViewById(R.id.result);         result.setText("Difference="+String.valueOf(Integer.parseInt(num1.getText().toString())-Integer.parseInt(num2.getText().toString())));}     public void onMul(View view){         num1=findViewById(R.id.number1);         num2=findViewById(R.id.number2);         result=findViewById(R.id.result);         result.setText("Multiplication="+String.valueOf(Integer.parseInt(num1.getText().toString())*Integer.parseInt(num2.getText().toString())));}     public void onDiv(View view){         num1=findViewById(R.id.number1);         num2=findViewById(R.id.number2);         result=findViewById(R.id.result);         result.setText("Division="+String.valueOf(Integer.parseInt(num1.getText().toString())/Integer.parseInt(num2.getText().toString())));} }</pre>
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activity_main.xml	<pre> &lt;?xml version="1.0" encoding="utf-8"?&gt; &lt;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"&gt; &lt;EditText     android:id="@+id/number1"     android:layout_width="259dp"     android:layout_height="56dp"     android:ems="10"     android:hint="Enter the Number"     android:inputType="textPersonName"     app:layout_constraintBottom_toBottomOf="parent"     app:layout_constraintEnd_toEndOf="parent"     app:layout_constraintHorizontal_bias="0.496"     app:layout_constraintStart_toStartOf="parent"     app:layout_constraintTop_toTopOf="parent"     app:layout_constraintVertical_bias="0.139" /&gt; &lt;EditText     android:id="@+id/result"     android:layout_width="259dp"     android:layout_height="56dp"     android:ems="10"     android:inputType="textPersonName"     android:text="0"     app:layout_constraintBottom_toBottomOf="parent"     app:layout_constraintEnd_toEndOf="parent"     app:layout_constraintHorizontal_bias="0.493"     app:layout_constraintStart_toStartOf="parent"     app:layout_constraintTop_toTopOf="parent"     app:layout_constraintVertical_bias="0.499" /&gt; &lt;EditText     android:id="@+id/number2"     android:layout_width="259dp"     android:layout_height="56dp"     android:ems="10"     android:hint="Enter the number"     android:inputType="textPersonName"     app:layout_constraintBottom_toBottomOf="parent"     app:layout_constraintEnd_toEndOf="parent"     app:layout_constraintHorizontal_bias="0.493"     app:layout_constraintStart_toStartOf="parent"     app:layout_constraintTop_toTopOf="parent"     app:layout_constraintVertical_bias="0.278" /&gt; </pre>
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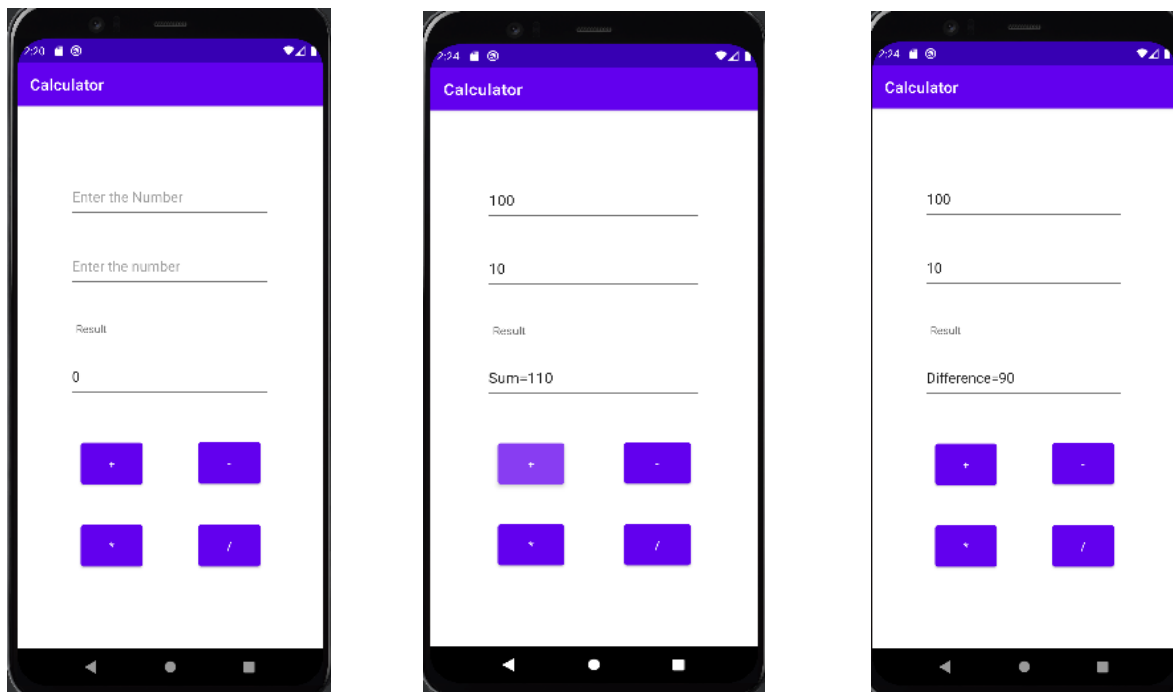
```

<TextView
    android:id="@+id/result_label"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Result"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.212"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.408" />
<Button
    android:id="@+id/button"
    android:layout_width="80dp"
    android:layout_height="65dp"
    android:onClick="onSum"
    android:text="+"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.259"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.676" />
<Button
    android:id="@+id/button5"
    android:layout_width="80dp"
    android:layout_height="65dp"
    android:onClick="onSub"
    android:text="-"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.743"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.675" />
<Button
    android:id="@+id/button6"
    android:layout_width="80dp"
    android:layout_height="65dp"
    android:onClick="onMul"
    android:text="*"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.259"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.843" />

```

```
<Button
    android:id="@+id/button7"
    android:layout_width="80dp"
    android:layout_height="65dp"
    android:onClick="onDiv"
    android:text="/"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.743"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.843" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

## OUTPUT



**RESULT:** The above program is successfully executed and obtained the output.

## **PROGRAM 4**

### **AIM:**

Implement validations on various UI controls.

### **PROGRAM CODE:**

MainActivity.java	<pre>package com.example.validation; import androidx.appcompat.app.AppCompatActivity; import android.os.Bundle; import android.view.View; import android.widget.EditText; import android.widget.Toast; public class MainActivity extends AppCompatActivity {     EditText name,email,number,password,confirm_password;     @Override     protected void onCreate(Bundle savedInstanceState) {         super.onCreate(savedInstanceState);         setContentView(R.layout.activity_main);}     public boolean nameValidate(){         name=findViewById(R.id.name);         if (name.getText().toString().isEmpty()){             name.setError("Name field cannot be empty");             return false;}         else {    return true;} }     public boolean emailValidate(){         email=findViewById(R.id.email);         String email_pattern="[a-zA-Z0-9._-]+@[a-z]+\\.\\.[a-z]+";         if (email.getText().toString().isEmpty()){             email.setError("Email field cannot be Empty");             return false;}         else if(!email.getText().toString().matches(email_pattern)){             email.setError("Email is not Valid");             return false;}         else {return true;}}     public boolean numberValidate(){         number=findViewById(R.id.number);         if(number.getText().toString().isEmpty()){             number.setError("Mobile Number cannot be Empty");             return false;}         else if(number.getText().toString().length()!=10){             number.setError("Invalid Mobile Number");             return false;}</pre>
-------------------	---

```

else{
    return true;}}
public boolean validatePassword(){
    password=findViewById(R.id.password);
    String password_pattern= "^" +
        //"(?=.*[0-9])" +    //at least 1 digit
        //"(?=.*[a-z])" +    //at least 1 lower case letter
        //"(?=.*[A-Z])" +    //at least 1 upper case letter
        "(?=.*[a-zA-Z])" +    //any letter
        "(?=.*[@#$%^&+=])" + //at least 1 special character
        "(?=\s+$)" +         //no white spaces
        ".{4,}" +            //at least 4 characters
        "$";

    if (password.getText().toString().isEmpty()){
        password.setError("Password Cannot be empty");
        return false;}
    else if(!password.getText().toString().matches(password_pattern)){
        password.setError("Entered Password is Weak");
        return false;}
    else{return true;}}
public boolean validateConfirmPassword(){
    confirm_password=findViewById(R.id.confirm_password);
    password=findViewById(R.id.password);
    if(confirm_password.getText().toString().isEmpty()){
        confirm_password.setError("This field Cannot be Empty");
        return false;}
    else
    if(!confirm_password.getText().toString().equals(password.getText().toString())){
        confirm_password.setError("Confirm Password should be same as Password");
        return false;}
    else {
        return true;}
    }
    public void onSubmit(View view){
    if(nameValidate()&&emailValidate()&&numberValidate()&&validatePassword()&&validateConfirmPassword()){
        Toast.makeText(this,"Registration Successful",Toast.LENGTH_LONG).show();
    }
    }
}

```

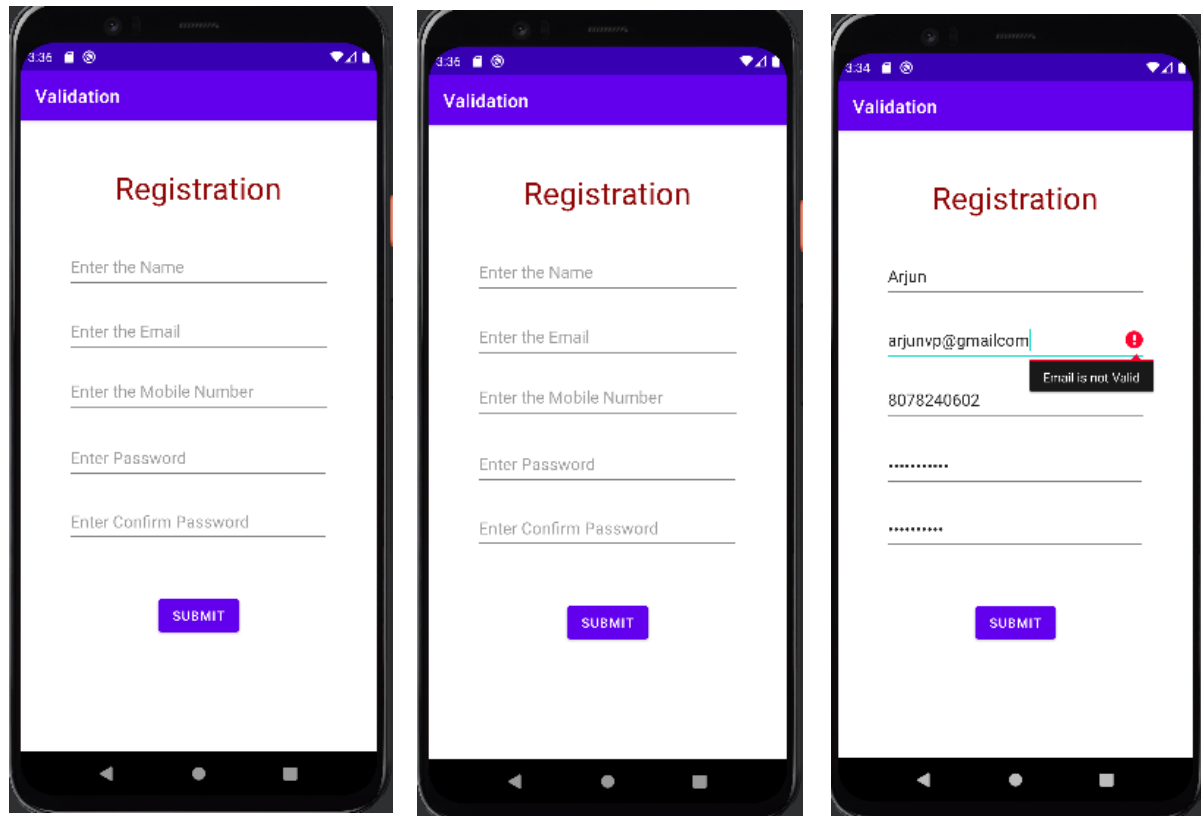
activity_main. xml	<pre> &lt;?xml version="1.0" encoding="utf-8"?&gt; &lt;androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android" xmlns:app="http://schemas.android.com/apk/res-auto" xmlns:tools="http://schemas.android.com/tools" android:id="@+id/on" android:layout_width="match_parent" android:layout_height="match_parent" tools:context=".MainActivity"&gt; &lt;TextView     android:id="@+id/textView"     android:layout_width="wrap_content"     android:layout_height="wrap_content"     android:text="Registration"     android:textColor="#910707"     android:textSize="34sp"     app:layout_constraintBottom_toBottomOf="parent"     app:layout_constraintEnd_toEndOf="parent"     app:layout_constraintHorizontal_bias="0.497"     app:layout_constraintStart_toStartOf="parent"     app:layout_constraintTop_toTopOf="parent"     app:layout_constraintVertical_bias="0.078" /&gt; &lt;EditText     android:id="@+id/name"     android:layout_width="291dp"     android:layout_height="51dp"     android:ems="10"     android:hint="Enter the Name"     android:inputType="textPersonName"     app:layout_constraintBottom_toBottomOf="parent"     app:layout_constraintEnd_toEndOf="parent"     app:layout_constraintStart_toStartOf="parent"     app:layout_constraintTop_toTopOf="parent" &lt;EditText     android:id="@+id/email"     android:layout_width="291dp"     android:layout_height="51dp"     android:ems="10"     android:hint="Enter the Email"     android:inputType="textPersonName"     app:layout_constraintBottom_toBottomOf="parent"     app:layout_constraintEnd_toEndOf="parent"     app:layout_constraintStart_toStartOf="parent"     app:layout_constraintVertical_bias="0.32" /&gt; &lt;EditText     android:id="@+id/number"     android:layout_width="291dp" </pre>
-----------------------	---

```

        android:layout_height="51dp"
        android:ems="10"
        android:hint="Enter the Mobile Number"
        android:inputType="textPersonName"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.423" />
    <EditText
        android:id="@+id/password"
        android:layout_width="289dp"
        android:layout_height="50dp"
        android:ems="10"
        android:hint="Enter Password"
        android:inputType="textPassword"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.491"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.537" />
    <EditText
        android:id="@+id/confirm_password"
        android:layout_width="289dp"
        android:layout_height="50dp"
        android:ems="10"
        android:hint="Enter Confirm Password"
        android:inputType="textPassword"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.491"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.646" />
    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:onClick="onSubmit"
        android:text="Submit"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.805" />
</androidx.constraintlayout.widget.ConstraintLayout>

```

## **OUTPUT**



The image displays three sequential screenshots of a mobile application's registration form, titled "Validation" and "Registration".

**Screenshot 1 (Left):** Shows the initial registration form with the following fields: "Enter the Name", "Enter the Email", "Enter the Mobile Number", "Enter Password", and "Enter Confirm Password". A purple "SUBMIT" button is at the bottom.

**Screenshot 2 (Middle):** Shows the same form with the "Enter the Email" field filled with "arjunvp@gmailcom". A red exclamation mark icon is visible next to the email field, indicating a validation error.

**Screenshot 3 (Right):** Shows the form with the "Enter the Email" field filled with "arjunvp@gmailcom" and the "Enter the Mobile Number" field filled with "8078240602". A red exclamation mark icon is visible next to the email field, and a black tooltip with the text "Email is not Valid" is displayed next to the email field. The "SUBMIT" button is at the bottom.

## **RESULT:**

The above program is successfully executed and obtained the output.