

## LAB#02

# INTRODUCING ACTIVITY AND CREATE FIRST ANDROID APPLICATION

### Activity

Android's architecture encourages component reuse, enabling you to publish and share Activities, Services, and data with other applications, with access managed by the security restrictions you define. Activity is the base class for the visual, interactive components of your application; it is roughly equivalent to a Form in traditional desktop development.

### Create First Activity

- By default your project contains **activity\_main.xml** file and **MainActivity.Java** File.
- If you want to create another Activity, right click on res folder and choose New> Activity> Empty Activity. Name the activity.
- Go to res folder and click on activity\_first.xml.

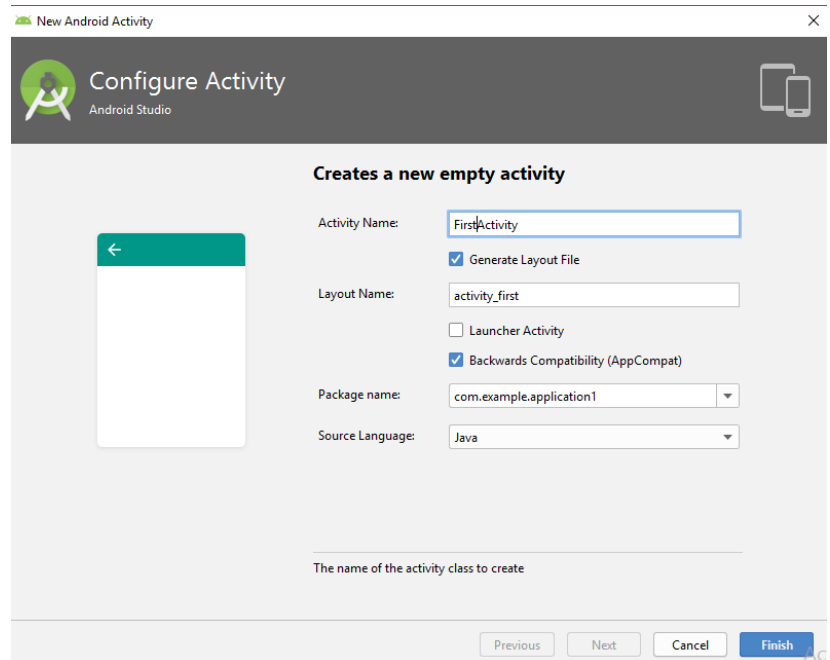


Fig. 1. Showing the configuration activity

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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"
android:background="@android:color/holo_green_light"
tools:context=".FirstActivity">
<TextView
    android:id="@+id/textView"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="First Program"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintHorizontal_bias="0.456"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent">
```

```

    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.467" />
<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:onClick="submit"
    android:text="submit"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintHorizontal_bias="0.458"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.595" />
</android.support.constraint.ConstraintLayout>

```

- Now add method to submit method to FirstActivity.java file.

```

package com.example.application1;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Toast;

public class FirstActivity extends AppCompatActivity {

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

    public void submit(View view) {

        Toast.makeText(this,"This is our First
Program",Toast.LENGTH_LONG).show();

    }
}

```

## Lab Task

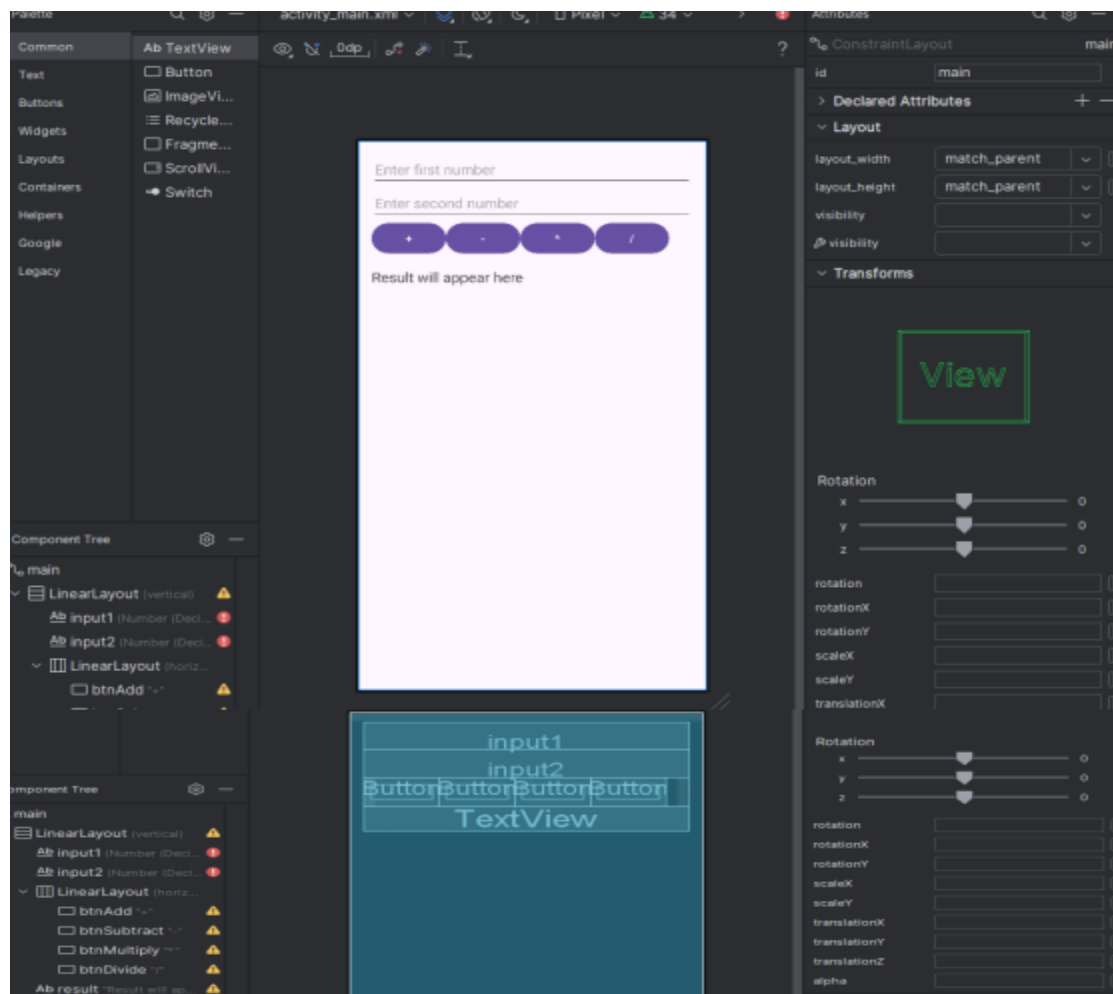
- 1) Create calculator in Android Studio.

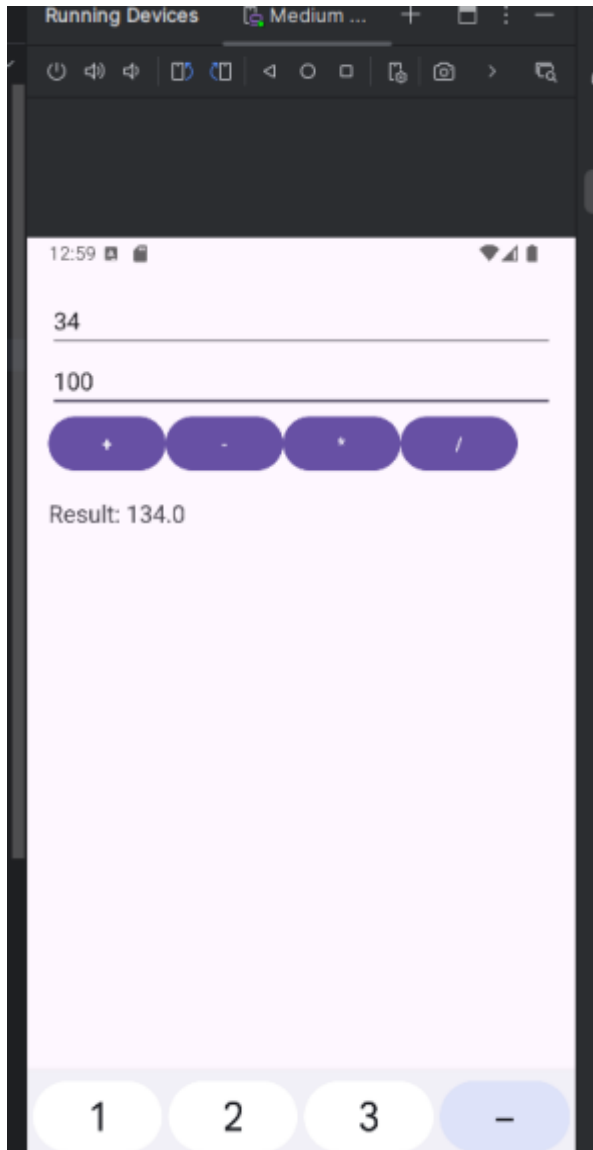
```
3      import android.os.Bundle;
4      import android.widget.Button;
5      import android.widget.EditText;
6      import android.widget.TextView;
7
8      import androidx.activity.EdgeToEdge;
9      import androidx.appcompat.app.AppCompatActivity;
10     import androidx.core.graphics.Insets;
11     import androidx.core.view.ViewCompat;
12     import androidx.core.view.WindowInsetsCompat;
13
14     <> public class MainActivity extends AppCompatActivity {
15
16         2 usages
17         EditText input1, input2;
18         4 usages
19         TextView result;
20         2 usages
21         Button btnAdd, btnSubtract, btnMultiply, btnDivide;
22
23     @Override
24     protected void onCreate(Bundle savedInstanceState) {
25         super.onCreate(savedInstanceState);
26         EdgeToEdge.enable(this);
27         setContentView(R.layout.activity_main);
28
29         // Set padding for edge-to-edge display
30         ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {
31             Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
32             v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);
33             return insets;
34         });
35
36         // Initialize calculator elements
37         input1 = findViewById(R.id.input1);
38         input2 = findViewById(R.id.input2);
39         result = findViewById(R.id.result);
40
41         btnAdd = findViewById(R.id.btnAdd);
42         btnSubtract = findViewById(R.id.btnSubtract);
43         btnMultiply = findViewById(R.id.btnMultiply);
44         btnDivide = findViewById(R.id.btnDivide);
45
46         btnAdd.setOnClickListener(v -> performOperation(operator: '+'));
47         btnSubtract.setOnClickListener(v -> performOperation(operator: '-'));
```

```

45         btnMultiply.setOnClickListener(v -> performOperation( operator: '*'));
46         btnDivide.setOnClickListener(v -> performOperation( operator: '/'));
47     }
48
49     4 usages
50     private void performOperation(char operator) {
51         String num1Str = input1.getText().toString();
52         String num2Str = input2.getText().toString();
53
54         if (!num1Str.isEmpty() && !num2Str.isEmpty()) {
55             double num1 = Double.parseDouble(num1Str);
56             double num2 = Double.parseDouble(num2Str);
57             double resultValue = 0;
58
59             switch (operator) {
60                 case '+':
61                     resultValue = num1 + num2;
62                     break;
63                 case '-':
64                     resultValue = num1 - num2;
65                     break;
66                 case '*':
67                     resultValue = num1 * num2;
68                     break;
69                 case '/':
70                     if (num2 != 0) {
71                         resultValue = num1 / num2;
72                     } else {
73                         result.setText("Cannot divide by zero");
74                         return;
75                     }
76                 break;
77             }
78
79             result.setText("Result: " + resultValue);
80         } else {
81             result.setText("Please enter both numbers");
82         }
83     }

```



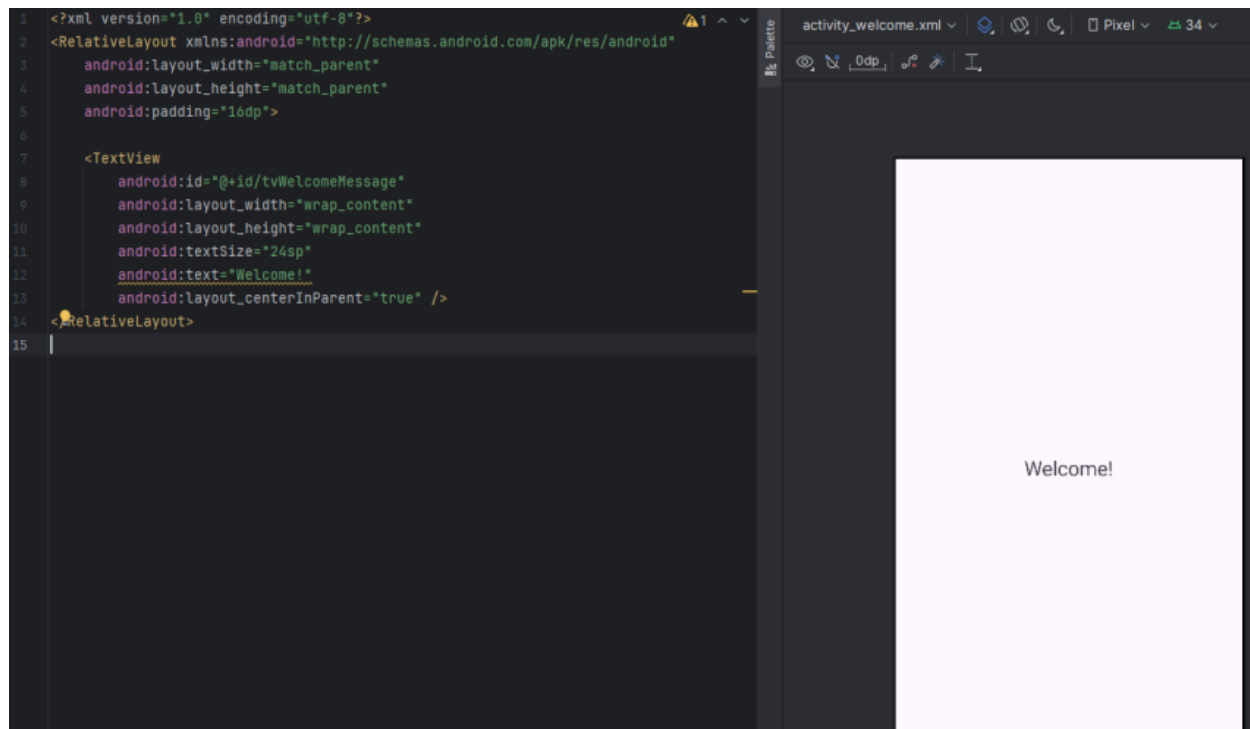
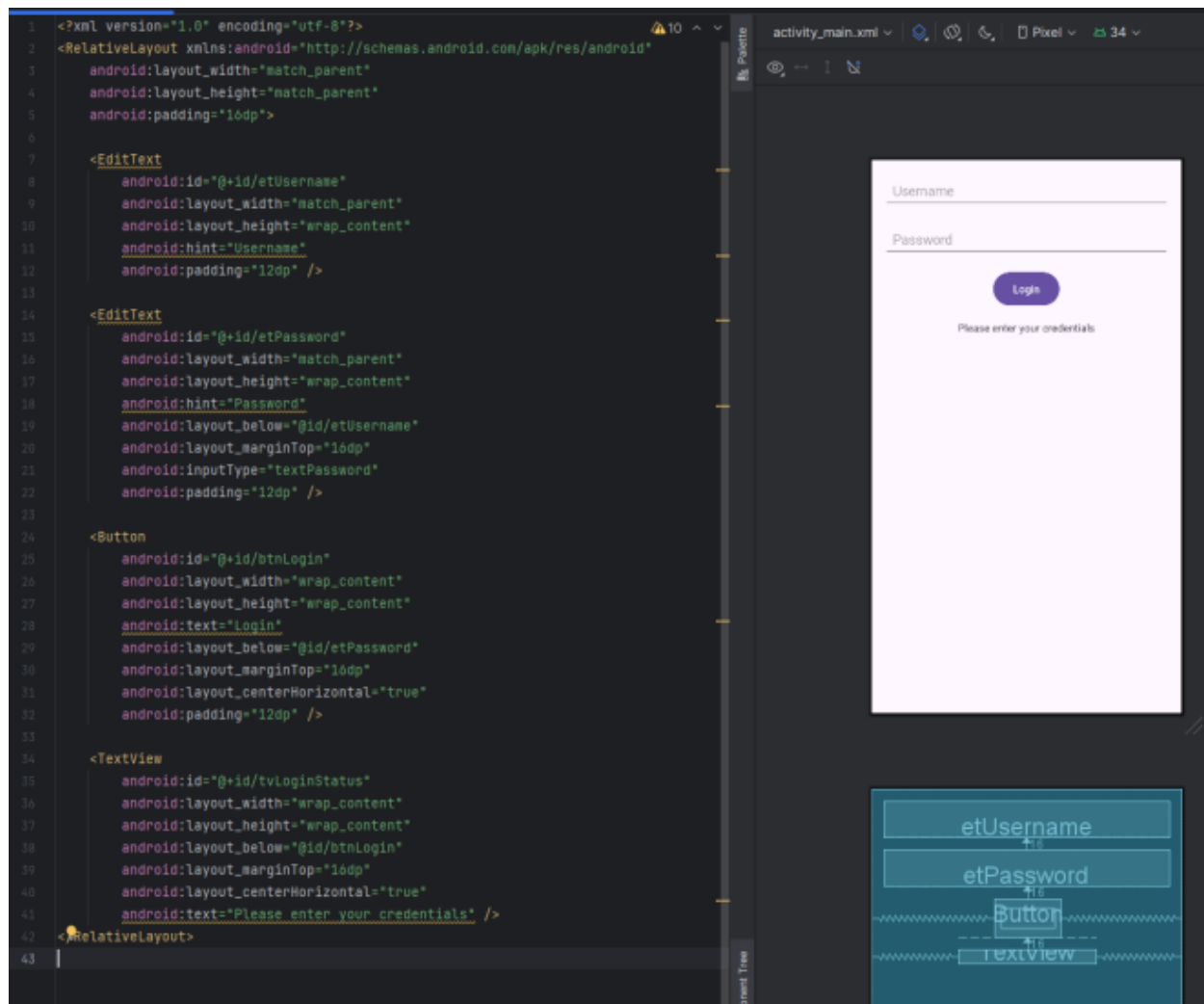


2) Create Login activity and navigate to next activity.

```

3      import androidx.appcompat.app.AppCompatActivity;
4      import android.content.Intent;
5      import android.os.Bundle;
6      import android.view.View;
7      import android.widget.Button;
8      import android.widget.EditText;
9      import android.widget.TextView;
10     import android.widget.Toast;
11
12     <> public class MainActivity extends AppCompatActivity {
13
14         private EditText etUsername, etPassword;
15         private TextView tvLoginStatus;
16         private Button btnLogin;
17
18         @Override
19         protected void onCreate(Bundle savedInstanceState) {
20             super.onCreate(savedInstanceState);
21             setContentView(R.layout.activity_main);
22
23             // Initialize views
24             etUsername = findViewById(R.id.etUsername);
25             etPassword = findViewById(R.id.etPassword);
26             tvLoginStatus = findViewById(R.id.tvLoginStatus);
27             btnLogin = findViewById(R.id.btnLogin);
28
29             // Set login button click listener
30             btnLogin.setOnClickListener(new View.OnClickListener() {
31
32                 // Set login button click listener
33                 btnLogin.setOnClickListener(new View.OnClickListener() {
34                     @Override
35                     public void onClick(View view) {
36                         String username = etUsername.getText().toString().trim();
37                         String password = etPassword.getText().toString().trim();
38
39                         // Check if username and password fields are non-empty
40                         if (!username.isEmpty() && !password.isEmpty()) {
41                             // Navigate to WelcomeActivity
42                             Intent intent = new Intent( packageContext MainActivity.this, WelcomeActivity.class);
43                             intent.putExtra( name "USERNAME", username); // Pass username to WelcomeActivity
44                             startActivity(intent);
45                         } else {
46                             tvLoginStatus.setText("Login Failed. Fields cannot be empty.");
47                             Toast.makeText( context MainActivity.this, text "Please enter both username and password", Toast.LENGTH_SHORT).show();
48                         }
49                     }
50                 });
51             }
52         }
53     }

```





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

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.LoginActivity"
        tools:targetApi="31">

        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>

        <!-- Add WelcomeActivity here -->
        <activity
            android:name=".WelcomeActivity"
            android:exported="false" />
        </activity>
    </application>
</manifest>
```

6:13

Username

Password

Login

Please enter your credentials