



# **Mobile Application Development**

## **LAB**

**Lab Record 1 - 4**

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# LAB NO: 1

## BASICS OF ANDROID MOBILE APPLICATION DEVELOPMENT TOOL

### Lab exercises

Develop an Android application for the following program

1. Create an Android application to show the demo of displaying text with justifying elements, changing text colors, fonts etc.
2. Find the "hello word" text in the XML document and modify the text.

Program note : I have consolidated these two questions into a single application

### XML Layout: Activity Main (`activity_main.xml`)

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="20dp"
    android:gravity="center">

    <TextView
        android:id="@+id/titleText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Sign in"
        android:textSize="28sp"
        android:textColor="#3F51B5"
        android:fontFamily="sans-serif-medium"
        android:layout_marginBottom="30dp" />

    <EditText
        android:id="@+id/emailInput"
```

```

        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Email ID"
        android:inputType="textEmailAddress"
        android:layout_marginBottom="15dp"/>

<EditText
    android:id="@+id/passwordInput"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter Password"
    android:inputType="textPassword"
    android:layout_marginBottom="25dp"/>

<Button
    android:id="@+id/signInButton"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Sign In"
    android:backgroundTint="#3F51B5"
    android:textColor="#FFFFFF"/>

</LinearLayout>

```

## Java Source: Main Activity (`MainActivity.java`)

```

package com.example.lab1;

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 androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText emailInput, passwordInput;
    private Button signInButton;

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

```

```

emailInput = findViewById(R.id.emailInput);
passwordInput = findViewById(R.id.passwordInput);
signInButton = findViewById(R.id.signInButton);

signInButton.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        String email = emailInput.getText().toString();
        String password = passwordInput.getText().toString();

        if (!email.isEmpty() && !password.isEmpty()) {

            Intent intent = new Intent(MainActivity.this,
DashboardActivity.class);
            intent.putExtra("USER_EMAIL", email);
            startActivity(intent);
        } else {
            Toast.makeText(MainActivity.this, "Please enter all
details", Toast.LENGTH_SHORT).show();
        }
    }
});
}

```

## XML Layout: Dashboard (activity\_dashboard.xml)

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="20dp"
    android:gravity="center_horizontal">

    <TextView
        android:id="@+id/welcomeText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Login Successful!"
        android:textSize="24sp"
        android:textColor="#4CAF50"

```

```

        android:textStyle="bold"
        android:layout_marginTop="50dp" />

<TextView
    android:id="@+id/displayEmail"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Email will appear here"
    android:textSize="18sp"
    android:layout_marginTop="10dp" />

</LinearLayout>

```

## Java Source: Dashboard Activity (`DashboardActivity.java`)

```

package com.example.lab1;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class DashboardActivity extends AppCompatActivity {

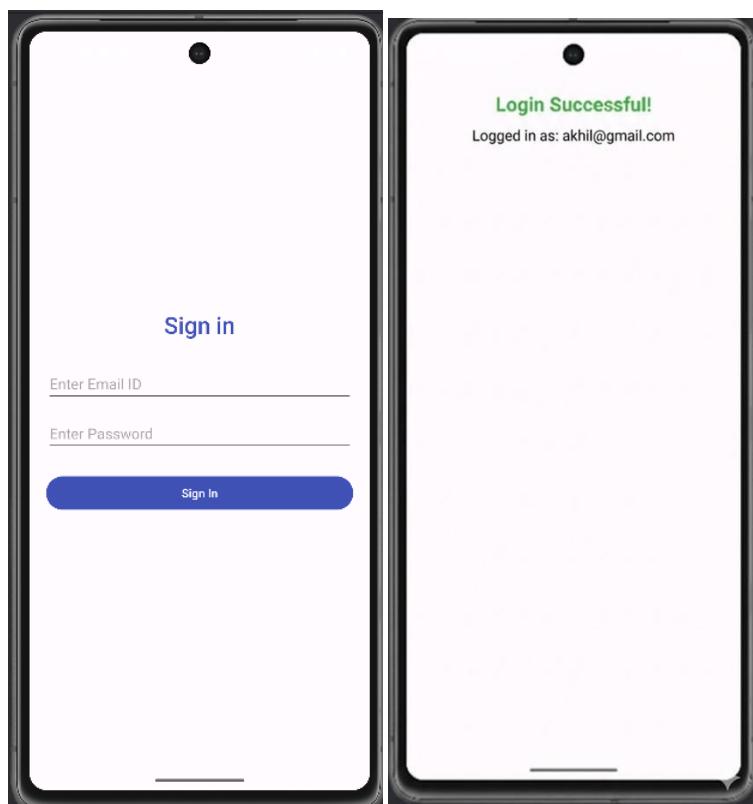
    private TextView displayEmail;

    @SuppressLint("MissingInflatedId")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_dashboard);

        displayEmail = findViewById(R.id.displayEmail);
        String email = getIntent().getStringExtra("USER_EMAIL");
        if (email != null) {
            displayEmail.setText("Logged in as: " + email);
        }
    }
}

```

## Images



# LAB NO: 2

## INTRODUCTION TO ACTIVITY AND LAYOUTS IN ANDROID

### Lab exercises

- 1.Create an app that illustrates that the activity lifecycle method being triggered by various action. Understand when onCreate(),onStart(),onResume event occur.
- 2.Create a Calculator app that does the function of multiplication, addition, division, subtraction but displays the result in the format of:-Num1 operator num2 = result. Back button on the next activity should get back to the calculator activity again.
- 3.Create the following given scenario using linear and relative layout concept.
- 4.Create an app such that when the user click on the given URL typed by the user, it visits the corresponding page.

Please note : All the questions have been consolidated into one program

### XML Layout : Activity Main (`activity_main.xml`)

```
<?xml version="1.0" encoding="utf-8"?>
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:fillViewport="true">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical"
        android:padding="16dp"
        android:layout_marginTop="24dp"
        android:gravity="center_horizontal">

        <TextView
```

```
    android:layout_width="114dp"
    android:layout_height="42dp"
    android:layout_marginBottom="12dp"
    android:text="Calculator"
    android:textColor="#3F51B5"
    android:textSize="22sp"
    android:textStyle="bold" />

<EditText
    android:id="@+id/num1"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter Number 1"
    android:inputType="numberDecimal"
    android:layout_marginBottom="8dp" />

<EditText
    android:id="@+id/num2"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter Number 2"
    android:inputType="numberDecimal"
    android:layout_marginBottom="12dp" />

<RadioGroup
    android:id="@+id/operatorGroup"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:gravity="center"
    android:layout_marginBottom="12dp">

    <RadioButton
        android:id="@+id/rbAdd"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="+" />

    <RadioButton
        android:id="@+id/rbSub"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="-" />

    <RadioButton
        android:id="@+id/rbMul"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

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

    <RadioButton
        android:id="@+id/rbDiv"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="/" />
    </RadioGroup>

    <Button
        android:id="@+id/btnResult"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="GET RESULT"
        android:backgroundTint="#FF5722"
        android:layout_marginBottom="12dp" />

    <TextView
        android:id="@+id/tvFinalResult"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Result: --"
        android:textSize="18sp"
        android:textStyle="italic"
        android:layout_marginBottom="20dp" />

    <View
        android:layout_width="match_parent"
        android:layout_height="2dp"
        android:background="#CCCCCC"
        android:layout_marginBottom="16dp" />

    <Button
        android:id="@+id/btnToLinear"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Linear Layout"
        android:layout_marginBottom="8dp" />

    <Button
        android:id="@+id/btnToRelative"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Relative Layout" />

</LinearLayout>

</ScrollView>
```

## Java Source: Main Activity (`MainActivity.java`)

```
package com.example.lab2_all_in_one;

import android.content.Intent;
import android.os.Bundle;
import android.widget.Button;
import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.TextView;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText n1, n2;
    private RadioGroup operatorGroup;
    private TextView tvFinalResult;
    private Button btnResult, btnToLinear, btnToRelative;

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

        Toast.makeText(this, "onCreate() triggered",
        Toast.LENGTH_SHORT).show();

        n1 = findViewById(R.id.num1);
        n2 = findViewById(R.id.num2);
        operatorGroup = findViewById(R.id.operatorGroup);
        tvFinalResult = findViewById(R.id.tvFinalResult);
        btnResult = findViewById(R.id.btnResult);
        btnToLinear = findViewById(R.id.btnToLinear);
        btnToRelative = findViewById(R.id.btnToRelative);

        btnResult.setOnClickListener(v -> {
            if (n1.getText().toString().isEmpty() ||
n2.getText().toString().isEmpty()) {
                Toast.makeText(this, "Enter both numbers",
                Toast.LENGTH_SHORT).show();
                return;
            }
        });
    }
}
```

```
        double val1 = Double.parseDouble(n1.getText().toString());
        double val2 = Double.parseDouble(n2.getText().toString());
        double res = 0;
        String symbol = "";

        int selectedId = operatorGroup.getCheckedRadioButtonId();

        if (selectedId == R.id.rbAdd) { res = val1 + val2; symbol = "+";
    }
        else if (selectedId == R.id.rbSub) { res = val1 - val2; symbol =
"-"; }
        else if (selectedId == R.id.rbMul) { res = val1 * val2; symbol =
"*"; }
        else if (selectedId == R.id.rbDiv) {
            if (val2 != 0) { res = val1 / val2; symbol = "/"; }
            else { Toast.makeText(this, "Cannot divide by zero",
Toast.LENGTH_SHORT).show(); return; }
        } else {
            Toast.makeText(this, "Select an operator",
Toast.LENGTH_SHORT).show();
            return;
        }

        tvFinalResult.setText(val1 + " " + symbol + " " + val2 + " = " +
res);
    });

        btnToLinear.setOnClickListener(v -> {
        Intent intent = new Intent(MainActivity.this,
LinearLayoutActivity.class);
        startActivity(intent);
    });

        btnToRelative.setOnClickListener(v -> {
        Intent intent = new Intent(MainActivity.this,
RelativeLayoutActivity.class);
        startActivity(intent);
    });
}

@Override
protected void onStart() {
    super.onStart();
    Toast.makeText(this, "onStart() triggered",
Toast.LENGTH_SHORT).show();
}

@Override
protected void onResume() {
    super.onResume();
```

```
        Toast.makeText(this, "onResume() triggered",
Toast.LENGTH_SHORT).show();
    }
}
```

## XML Layout : Activity Relative Layout

(activity\_relative\_layout.xml)

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
        android:id="@+id/mainRelative"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:background="#121212"
        android:paddingLeft="16dp"
        android:paddingRight="16dp"
        android:paddingBottom="16dp"
        android:paddingTop="120dp"> <TextView
    android:id="@+id/lblUrl"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Type URL here:"
    android:textColor="#FFFFFF"
    android:textSize="18sp" />

    <EditText
        android:id="@+id/urlInput"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@id/lblUrl"
        android:layout_marginTop="10dp"
        android:background="@android:drawable/editbox_background"
        android:hint="e.g. google.com"
        android:inputType="textUri"
        android:padding="10dp" />

    <Button
        android:id="@+id/btnOk"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/urlInput"
```

```

        android:layout_alignParentEnd="true"
        android:layout_marginTop="10dp"
        android:text="OK" />

    <Button
        android:id="@+id btnCancel"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/urlInput"
        android:layout_toStartOf="@+id	btnOk"
        android:layout_marginTop="10dp"
        android:layout_marginEnd="5dp"
        android:text="Cancel" />

    <Button
        android:id="@+id(btnBackRelative"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:text="Back to Main" />

</RelativeLayout>

```

## Java Source: Relative Layout Activity

### (RelativeLayoutActivity.java)

```

package com.example.lab2_all_in_one;

import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.widget.Button;
import android.widget.EditText;
import androidx.appcompat.app.AppCompatActivity;

public class RelativeLayoutActivity extends AppCompatActivity {

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

        EditText urlInput = findViewById(R.id.urlInput);
        Button btnOk = findViewById(R.id.btnOk);
    }
}

```

```

        Button btnBack = findViewById(R.id.btnBackRelative);

        btnOk.setOnClickListener(v -> {
            String url = urlInput.getText().toString();
            if (!url.isEmpty()) {

                if (!url.startsWith("http://") &&
!url.startsWith("https://")) {
                    url = "https://" + url;
                }
                Intent browserIntent = new Intent(Intent.ACTION_VIEW,
Uri.parse(url));
                startActivity(browserIntent);
            }
        });

        btnBack.setOnClickListener(v -> finish());
    }
}

```

## XML Layout : Activity Linear Layout

(activity\_Linear\_layout.xml)

```

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:background="#000000">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:orientation="horizontal">

            <TextView android:layout_width="0dp"
        android:layout_height="match_parent" android:layout_weight="1"
        android:background="#990000" android:text="red"
        android:gravity="center_horizontal" android:textColor="#666666"/>
            <TextView android:layout_width="0dp"
        android:layout_height="match_parent" android:layout_weight="1"
        android:background="#008000" android:text="green"
        android:gravity="center_horizontal" android:textColor="#666666"/>
            <TextView android:layout_width="0dp"

```

```
    android:layout_height="match_parent" android:layout_weight="1"
    android:background="#0000FF" android:text="blue"
    android:gravity="center_horizontal" android:textColor="#666666"/>
        <TextView android:layout_width="0dp"
    android:layout_height="match_parent" android:layout_weight="1"
    android:background="#CCCC00" android:text="yellow"
    android:gravity="center_horizontal" android:textColor="#666666"/>
        </LinearLayout>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:orientation="vertical"
        android:padding="10dp">

        <TextView android:layout_width="wrap_content"
    android:layout_height="wrap_content" android:text="row one"
    android:textSize="30sp" android:textColor="#CCCCCC"/>
        <TextView android:layout_width="wrap_content"
    android:layout_height="wrap_content" android:text="row two"
    android:textSize="30sp" android:textColor="#CCCCCC"/>
        <TextView android:layout_width="wrap_content"
    android:layout_height="wrap_content" android:text="row three"
    android:textSize="30sp" android:textColor="#CCCCCC"/>
        <TextView android:layout_width="wrap_content"
    android:layout_height="wrap_content" android:text="row four"
    android:textSize="30sp" android:textColor="#CCCCCC"/>

        <Button
            android:id="@+id/btnBackLinear"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginTop="20dp"
            android:text="Back" />
    </LinearLayout>

</LinearLayout>
```

## Java Source : Linear Layout Activity

(LinearLayoutActivity.java)

```

package com.example.lab2_all_in_one;

import android.os.Bundle;
import android.widget.Button;
import androidx.appcompat.app.AppCompatActivity;

public class LinearLayoutActivity extends AppCompatActivity {

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

        Button btnBack = findViewById(R.id.btnBackLinear);

        btnBack.setOnClickListener(v -> finish());
    }
}

```

## Manifest : Android Manifest (AndroidManifest.xml)

```

<?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.Lab2_all_in_one">
        <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>
    </application>
</manifest>

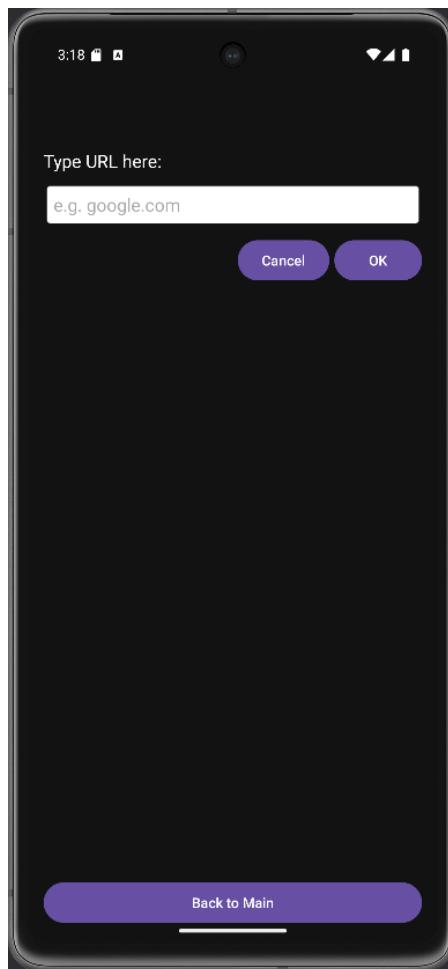
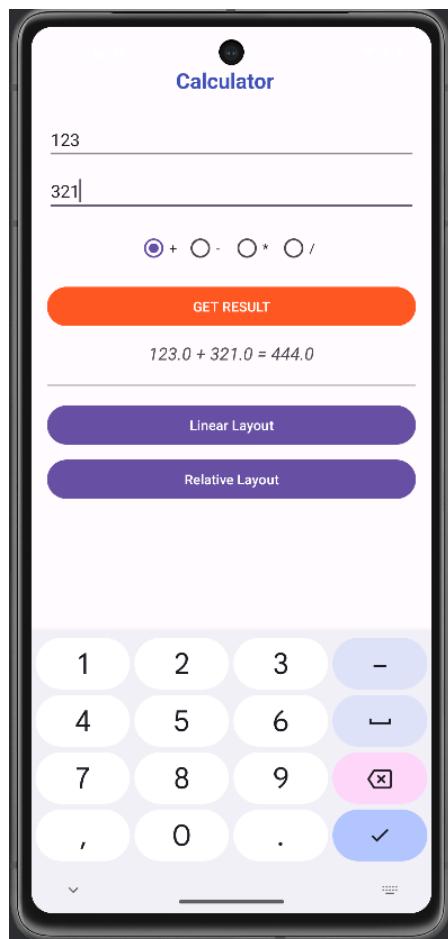
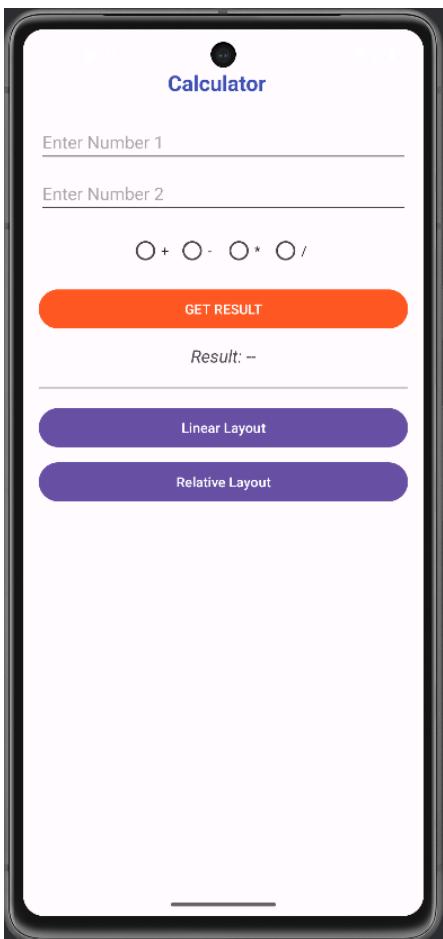
```

```
<activity android:name=".LinearLayoutActivity" />
<activity android:name=".RelativeLayoutActivity" />

</application>

</manifest>
```

## Images



# **LAB NO: 3**

## **ACTIVITY AND LAYOUT CONTINUED**

### **Lab Exercise:**

- 1.Using given scenario develop an application to perform following layout operations**
  - List view**
  - Grid view**
  - Tab layout**
  - Table layout**

**2. Write a program to list different sports, and when a sport is selected, display a message showing the selected sport.**

**3. Design an news application and Implement the navigation between sections like Top Stories, Sports, and Entertainment using tab layout.**

**Program : Please note, all the questions have been consolidated into one code**

### **XML Layout : Activity main(`activity_main.xml`)**

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center"
    android:padding="20dp"
    android:background="#121212">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="VIEWS"
        android:textColor="#FFFFFF"
        android:textSize="24sp"
        android:textStyle="bold"
        android:layout_marginBottom="30dp"/>

    <Button
        android:id="@+id/btnListView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="1. Sports List (ListView)"
        android:layout_marginBottom="10dp"/>

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

```

        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="2. Photo Gallery (GridView)"
        android:layout_marginBottom="10dp"/>
    <Button
        android:id="@+id(btnTabLayout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="3. News App (Tab Layout)"
        android:layout_marginBottom="10dp"/>
    <Button
        android:id="@+id	btnTableLayout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="4. Menu Options (Table Layout)"/>
</LinearLayout>

```

## Java Source : Main Activity (`MainActivity.java`)

```

package com.example.lab3;

import android.content.Intent;
import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;
import android.widget.Button;

public class MainActivity extends AppCompatActivity {

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

        Button btnListView = findViewById(R.id.btnListView);
        Button btnGridView = findViewById(R.id.btnGridView);
        Button btnTabLayout = findViewById(R.id.btnTabLayout);
        Button btnTableLayout = findViewById(R.id.btnTableLayout);

        btnListView.setOnClickListener(v -> startActivity(new
Intent(MainActivity.this, SportsActivity.class)));
        btnGridView.setOnClickListener(v -> startActivity(new
Intent(MainActivity.this, GalleryActivity.class)));
        btnTabLayout.setOnClickListener(v -> startActivity(new
Intent(MainActivity.this, NewsActivity.class)));
        btnTableLayout.setOnClickListener(v -> startActivity(new

```

```
Intent(MainActivity.this, MenuActivity.class)));
    }
}
```

## XML Layout : Activity List View (`activity_list_view.xml`)

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

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">

    <ListView
        android:id="@+id/simpleListView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:divider="#000"
        android:dividerHeight="1dp" />
</LinearLayout>
```

## Java Source : List View Activity (`ListViewActivity.java`)

```
package com.example.lab3;

import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import androidx.appcompat.app.AppCompatActivity;

public class ListViewActivity extends AppCompatActivity {
    String[] countries = {"American Samoa", "El Salvador", "Saint Helena",
    "Saint Kitts and Nevis", "Saint Lucia"};

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

        ListView listView = findViewById(R.id.simpleListView);
        ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
```

```

        android.R.layout.simple_list_item_1, countries);
listView.setAdapter(adapter);
}
}

```

## XML Layout : Activity Gallery (activity\_gallery.xml)

```

<GridView xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/gridView"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:numColumns="3"
    android:columnWidth="90dp"
    android:stretchMode="columnWidth"
    android:gravity="center"
    android:background="#ff5c00"
    android:padding="10dp" />

```

## Java Source : Gallery Activity (GalleryActivity.java)

```

package com.example.lab3;

import android.content.Context;
import android.os.Bundle;
import android.view.View;
import android.view.ViewGroup;
import android.widget.BaseAdapter;
import android.widget.GridView;
import android.widget.ImageView;
import androidx.appcompat.app.AppCompatActivity;

public class GalleryActivity extends AppCompatActivity {

    int[] images = {
        android.R.drawable.ic_menu_camera,
        android.R.drawable.ic_menu_gallery,
        android.R.drawable.ic_menu_call,
        android.R.drawable.ic_menu_manage,
        android.R.drawable.ic_menu_share,
        android.R.drawable.ic_menu_send
    };

    @Override

```

```
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_gallery);

    GridView gridView = findViewById(R.id.gridView);
    gridView.setAdapter(new ImageAdapter(this));
}

public class ImageAdapter extends BaseAdapter {
    private Context mContext;

    public ImageAdapter(Context c) {
        mContext = c;
    }

    @Override
    public int getCount() {
        return images.length;
    }

    @Override
    public Object getItem(int position) {
        return null;
    }

    @Override
    public long getItemId(int position) {
        return 0;
    }

    @Override
    public View getView(int position, View convertView, ViewGroup
parent) {
        ImageView imageView;
        if (convertView == null) {
            imageView = new ImageView(mContext);

            imageView.setLayoutParams(new GridView.LayoutParams(300,
300));
            imageView.setScaleType(ImageView.ScaleType.CENTER_CROP);
            imageView.setPadding(8, 8, 8, 8);
        } else {
            imageView = (ImageView) convertView;
        }

        imageView.setImageResource(images[position]);
        return imageView;
    }
}
```

```
        }
    }
}
```

## XML Layout : Activity Menu (`activity_menu.xml`)

```
<TableLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#121212"
    android:padding="10dp"
    android:stretchColumns="1"> <TextView android:text="File Menu"
    android:textColor="#FF9800" android:padding="10dp"/>

    <TableRow android:padding="5dp">
        <TextView android:text="Open..." android:textColor="#FFF" />
        <TextView android:text="Ctrl-O" android:textColor="#AAA"
    android:gravity="end" />
    </TableRow>

    <View android:layout_height="1dp" android:background="#444" />

    <TableRow android:padding="5dp">
        <TextView android:text="Save As..." android:textColor="#FFF" />
        <TextView android:text="Ctrl-Shift-S" android:textColor="#AAA"
    android:gravity="end" />
    </TableRow>

    <TableRow android:padding="5dp">
        <TextView android:text="Export..." android:textColor="#FFF" />
        <TextView android:text="Ctrl-E" android:textColor="#AAA"
    android:gravity="end" />
    </TableRow>
</TableLayout>
```

## Java Source : Main Activity (`MenuActivity.java`)

```
package com.example.lab3;

import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;

public class MenuActivity extends AppCompatActivity {
```

```

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    setContentView(R.layout.activity_menu);

}

```

## XML Layout : Activity News (activity\_news.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"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:paddingTop="24dp">

    <com.google.android.material.tabs.TabLayout
        android:id="@+id/tabLayout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="#212121"
        app:tabTextColor="#FFFFFF"
        app:tabSelectedTextColor="#FF9800"
        app:tabIndicatorColor="#FF9800"/>

    <androidx.viewpager2.widget.ViewPager2
        android:id="@+id/viewPager"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1" />
</LinearLayout>

```

## Java Source : News Activity (NewsActivity.java)

```

package com.example.lab3;

import android.os.Bundle;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.fragment.app.Fragment;

```

```

import androidx.viewpager2.adapter.FragmentStateAdapter;
import androidx.viewpager2.widget.ViewPager2;
import com.google.android.material.tabs.TabLayout;
import com.google.android.material.tabs.TabLayoutMediator;

public class NewsActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_news);

        TabLayout tabLayout = findViewById(R.id.tabLayout);
        ViewPager2 viewPager = findViewById(R.id.viewPager);

        viewPager.setAdapter(new FragmentStateAdapter(this) {
            @NonNull
            @Override
            public Fragment createFragment(int position) {
                return NewsFragment.newInstance(position);
            }

            @Override
            public int getItemCount() {
                return 3;
            }
        });

        new TabLayoutMediator(tabLayout, viewPager, (tab, position) -> {
            String[] titles = {"Top Stories", "Sports", "Entertainment"};
            tab.setText(titles[position]);
        }).attach();
    }
}

```

## Java Source : News Fragment ([NewsFragment.java](#))

```

package com.example.lab3;

import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;
import androidx.annotation.NonNull;
import androidx.annotation.Nullable;
import androidx.fragment.app.Fragment;

```

```

public class NewsFragment extends Fragment {

    public static NewsFragment newInstance(int position) {
        NewsFragment fragment = new NewsFragment();
        Bundle args = new Bundle();
        args.putInt("pos", position);
        fragment.setArguments(args);
        return fragment;
    }

    @Nullable
    @Override
    public View onCreateView(@NonNull LayoutInflater inflater, @Nullable
    ViewGroup container, @Nullable Bundle savedInstanceState) {
        TextView textView = new TextView(getContext());
        int pos = getArguments().getInt("pos");
        String[] content = {"Welcome to Top Stories", "Latest Sports News",
    "Entertainment Updates"};
        textView.setText(content[pos]);
        textView.setGravity(android.view.Gravity.CENTER);
        textView.setTextSize(24);
        return textView;
    }
}

```

## XML Layout : Activity Sports (`activity_sports.xml`)

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:background="#121212"
    android:padding="16dp"
    android:gravity="center_horizontal">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Select a Sport"
        android:textColor="#FFB74D"
        android:textSize="22sp"
        android:textStyle="bold"
        android:layout_marginBottom="20dp" />

    <ListView

```

```

        android:id="@+id/sportsListView"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:divider="#444444"
        android:dividerHeight="1dp"
        android:background="@color/cardview_light_background"
        android:padding="8dp" />

    </LinearLayout>

```

## Java Source : Sports Activity (SportsActivity.java)

```

package com.example.lab3;

import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;

public class SportsActivity extends AppCompatActivity {
    String[] sports = {"Football", "Cricket", "Basketball", "Tennis",
        "Hockey", "Badminton", "Swimming", "Athletics"};

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

        ListView listView = findViewById(R.id.sportsListView);

        ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
            android.R.layout.simple_list_item_1, sports);

        listView.setAdapter(adapter);

        listView.setOnItemClickListener(new
        AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int
position, long id) {
                String selectedSport = sports[position];

```

```
        Toast.makeText(SportsActivity.this,
                      "You selected: " + selectedSport,
Toast.LENGTH_SHORT).show();
    }
});  
}  
}
```

## Manifest : Android Manifest (AndroidManifest.xml)

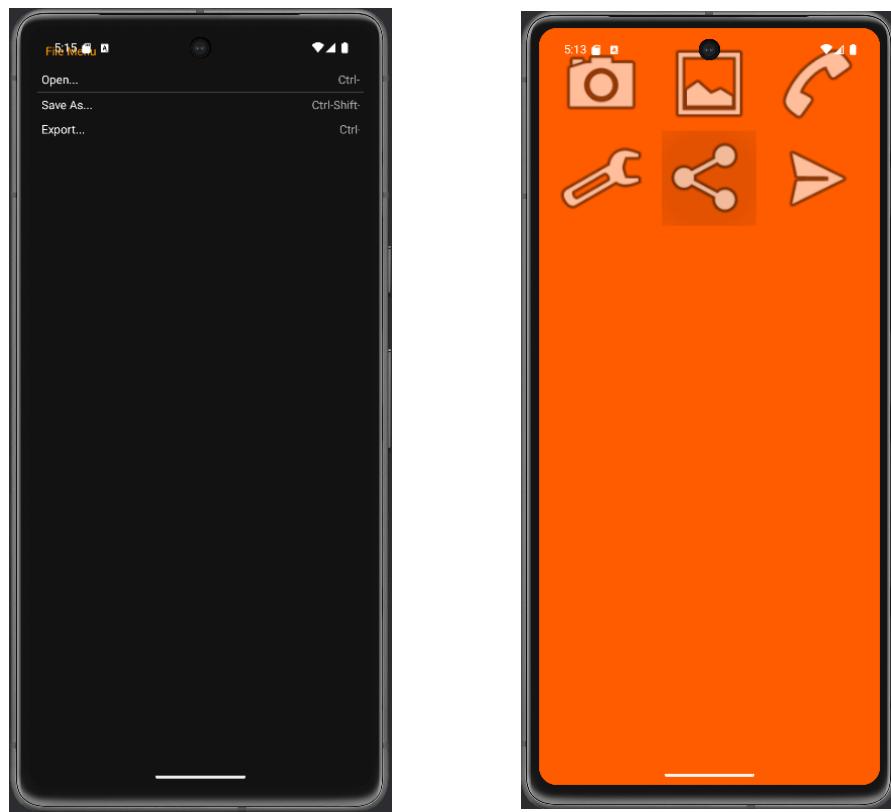
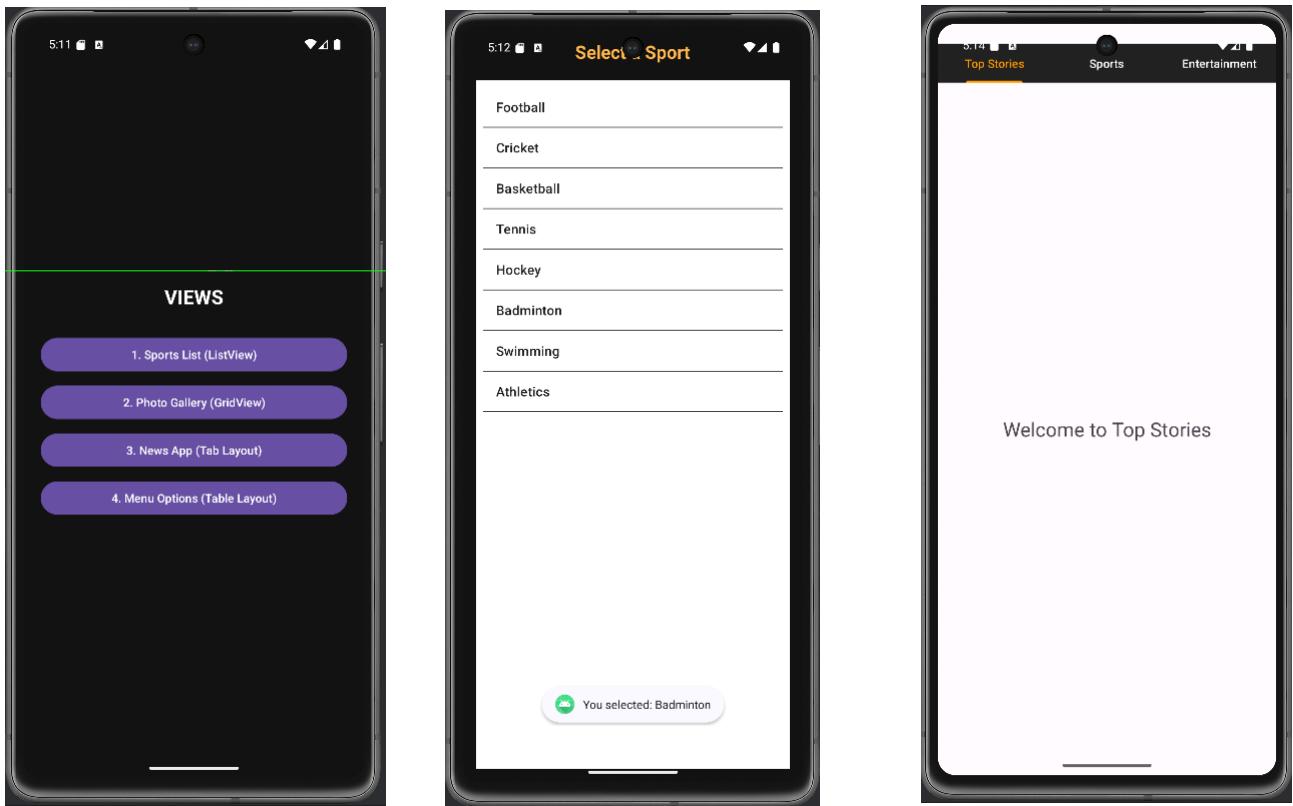
```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <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.Lab3">
        <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>

        <activity android:name=".SportsActivity" />
        <activity android:name=".GalleryActivity" />
        <activity android:name=".NewsActivity" />
        <activity android:name=".MenuActivity" />
    </application>
</manifest>
```

## Images :



# LAB NO: 4

## INPUT CONTROLS IN ANDROID

### Lab exercises:

1. Develop a "Test App" that includes a layout with a Button and a ToggleButton. When each button is clicked, a custom Toast message should be displayed with different images as their content.
2. Create an app that contains a view with multiple buttons, each labeled with different Android versions. When a button is clicked, a Toast message should appear, displaying the corresponding Android version's name along with its associated icon.
3. Develop a view with a ToggleButton labeled "Current Mode" that has two states: "Wi-Fi" and "Mobile Data." Based on the state of the toggle button, an image corresponding to the selected mode should appear, and a Toast message should display the current mode. Additionally, when the user clicks the "Change Mode" button, the app should switch to the corresponding mode and update the image accordingly.
4. Create a "Food Ordering App" which lists food items with check boxes. Once the user checks /unchecks the item and click on the submit button display the items ordered along with cost of each item and total cost in a new activity. Once the user clicks on the submit button he/she should not be allowed to change the order i.e. he should not be allowed to change the state of the items checked.

Please note : All programs have been consolidated to on App

### XML Layout : Activity main (`activity_main.xml`)

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical"
        android:padding="24dp"
        android:gravity="center_horizontal"
        android:background="#FAFAFA">
```

```
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Lab 4 Experiments"
    android:textSize="22sp"
    android:textStyle="bold"
    android:textColor="#212121"
    android:layout_marginBottom="24dp" />

<Button
    android:id="@+id	btnTestApp"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Test App (Button + Toggle)"
    android:layout_marginBottom="12dp"
    android:elevation="4dp" />

<Button
    android:id="@+id	btnAndroidVersions"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Android Versions"
    android:layout_marginBottom="12dp"
    android:elevation="4dp" />

<Button
    android:id="@+id	btnModeSwitch"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Wi-Fi / Mobile Mode"
    android:layout_marginBottom="12dp"
    android:elevation="4dp" />

<Button
    android:id="@+id	btnFoodOrder"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Food Ordering App"
    android:elevation="4dp" />

</LinearLayout>
```

## XML Layout : Activity test app(`activity_test_app.xml`)

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center"
    android:orientation="vertical">

    <Button
        android:id="@+id	btnClick"
        android:text="Click Me"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"/>

    <ToggleButton
        android:id="@+id/toggleBtn"
        android:textOn="ON"
        android:textOff="OFF"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"/>
</LinearLayout>
```

## XML Layout : Custom Toast (`custom_toast.xml`)

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:padding="12dp"
    android:background="#444444"
    android:gravity="center">

    <ImageView
        android:id="@+id/toast_image"
        android:layout_width="48dp"
        android:layout_height="48dp"
        android:layout_marginBottom="8dp" />

    <TextView
        android:id="@+id/toast_text"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textColor="#FFFFFF"
        android:textSize="16sp"
```

```
        android:gravity="center" />
</LinearLayout>
```

## XML Layout : Activity mode switch

(activity\_mode\_switch.xml)

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center"
    android:orientation="vertical"
    android:padding="20dp">

    <ToggleButton
        android:id="@+id/toggleMode"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textOn="Wi-Fi"
        android:textOff="Mobile Data" />

    <Button
        android:id="@+id/btnChange"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Change Mode"
        android:layout_marginTop="16dp" />

</LinearLayout>
```

## XML Layout : Activity food order

(activity\_food\_order.xml)

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="20dp">

    <CheckBox
        android:id="@+id/cbPizza"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Pizza - ₹100" />

    <CheckBox
        android:id="@+id/cbBurger"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Burger - ₹60" />

    <Button
        android:id="@+id	btnSubmit"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Submit Order"
        android:layout_marginTop="16dp" />

</LinearLayout>

```

## XML Layout : Activity Android Version

(activity\_android\_versions.xml)

```

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="20dp">

    <Button android:text="Android Oreo"
        android:id="@+id	btnOreo" />

```

```

        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>

    <Button android:text="Android Pie"
        android:id="@+id(btnPie"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>
</LinearLayout>

```

## Java Source : Main Activity (`MainActivity.java`)

```

package com.example.lab4_part2;

import android.content.Intent;
import android.os.Bundle;

import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class MainActivity extends AppCompatActivity {

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

        findViewById(R.id.btnTestApp)
            .setOnClickListener(v -> startActivity(
                new Intent(this, TestAppActivity.class)));

        findViewById(R.id.btnAndroidVersions)
            .setOnClickListener(v -> startActivity(
                new Intent(this, AndroidVersionActivity.class)));

        findViewById(R.id.btnModeSwitch)
            .setOnClickListener(v -> startActivity(
                new Intent(this, ModeSwitchActivity.class)));

        findViewById(R.id.btnFoodOrder)
            .setOnClickListener(v -> startActivity(
                new Intent(this, FoodOrderActivity.class)));
    }
}

```

```
}
```

## Java Source : Test App Activity (`TestAppActivity.java`)

```
package com.example.lab4_part2;

import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.widget.Button;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;
import android.widget.ToggleButton;

import androidx.appcompat.app.AppCompatActivity;

public class TestAppActivity extends AppCompatActivity {

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

        Button btn = findViewById(R.id.btnClick);
        ToggleButton toggle = findViewById(R.id.toggleBtn);

        btn.setOnClickListener(v -> showCustomToast(
            "Button Clicked",
            R.drawable.ic_launcher_background
        ));

        toggle.setOnCheckedChangeListener((b, isChecked) -> showCustomToast(
            isChecked ? "Toggle ON" : "Toggle OFF",
            R.drawable.ic_launcher_foreground
        ));
    }

    private void showCustomToast(String message, int imageRes) {
        LayoutInflater inflater = getLayoutInflater();
        View view = inflater.inflate(R.layout.custom_toast, null);

        ImageView image = view.findViewById(R.id.toast_image);
        TextView text = view.findViewById(R.id.toast_text);
    }
}
```

```

        image.setImageResource(imageRes);
        text.setText(message);

        Toast toast = new Toast(this);
        toast.setDuration(Toast.LENGTH_SHORT);
        toast.setView(view);
        toast.show();
    }
}

```

## Java Source : Mode Switch Activity

(ModeSwitchActivity.java)

```

package com.example.lab4_part2;

import android.os.Bundle;
import android.widget.Button;
import android.widget.Toast;
import android.widget.ToggleButton;

import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class ModeSwitchActivity extends AppCompatActivity {

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

        ToggleButton toggle = findViewById(R.id.toggleMode);
        Button btn = findViewById(R.id.btnChange);

        btn.setOnClickListener(v ->
            Toast.makeText(this,
                toggle.isChecked() ? "Wi-Fi Mode" : "Mobile Data
Mode",
                Toast.LENGTH_SHORT).show());
    }
}

```

## Java Source : Food Order Activity

(FoodOrderActivity.java)

```
package com.example.lab4_part2;

import android.os.Bundle;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.Toast;

import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class FoodOrderActivity extends AppCompatActivity {

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

        CheckBox pizza = findViewById(R.id.cbPizza);
        CheckBox burger = findViewById(R.id.cbBurger);
        Button submit = findViewById(R.id.btnSubmit);

        submit.setOnClickListener(v -> {
            int total = 0;
            String order = "";

            if (pizza.isChecked()) {
                total += 100;
                order += "Pizza ₹100\n";
                pizza.setEnabled(false);
            }
            if (burger.isChecked()) {
                total += 60;
                order += "Burger ₹60\n";
                burger.setEnabled(false);
            }

            Toast.makeText(this,
                    order + "Total: ₹" + total,
                    Toast.LENGTH_LONG).show();

            submit.setEnabled(false);
        });
    }
}
```

```
    });
}
}
```

## Java Source : Android Version Activity

(AndroidVersionActivity.java)

```
package com.example.lab4_part2;

import android.os.Bundle;
import android.widget.Toast;

import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class AndroidVersionActivity extends AppCompatActivity {

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

        findViewById(R.id.btnOreo)
            .setOnClickListener(v ->
                Toast.makeText(this,"Android Oreo",Toast.LENGTH_SHORT).show());

        findViewById(R.id.btnPie)
            .setOnClickListener(v ->
                Toast.makeText(this,"Android Pie",Toast.LENGTH_SHORT).show());
    }
}
```

Images:

