UNIVERSITI MALAYSIA TERENGGANU

FACULTY OF COMPUTER SCIENCE AND MATHEMATICS

_____

CSM3123 - NATIVE MOBILE PROGRAMMING

BANCHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONORS

LAB 2 (Task 1,2,3,4,5)

SEMESTER 5 2024/2025

_____

PREPARED FOR:

DR RABIEI B MAMAT

PREPARED BY:

NUR EZREENA SHUHADA BT EMRAN

S66467

Task 1 – LayoutExploration

MainActivity.java

```java
package com.example.layoutexploration;

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

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);
        Button linearLayoutButton =
                findViewById(R.id.linearLayoutButton);
        linearLayoutButton.setOnClickListener(v -> {
            Intent intent = new Intent(MainActivity.this,
                    LinearLayoutActivity.class);
            startActivity(intent);
        });
        Button relativeLayoutButton =
                findViewById(R.id.relativeLayoutButton);
        relativeLayoutButton.setOnClickListener(v -> {
            Intent intent = new Intent(MainActivity.this,
                    RelativeLayoutActivity.class);
            startActivity(intent);
        });
        Button constraintLayoutButton =
                findViewById(R.id.constraintLayoutButton);
        constraintLayoutButton.setOnClickListener(v -> {
            Intent intent = new Intent(MainActivity.this,
                    ConstraintLayoutActivity.class);
            startActivity(intent);
        });
        Button gridLayoutButton =
                findViewById(R.id.gridLayoutButton);
        gridLayoutButton.setOnClickListener(v -> {
            Intent intent = new Intent(MainActivity.this,
                    GridLayoutActivity.class);
            startActivity(intent);
        });
    }
```

```
}
```

Activity_main.xml

```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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical"
        android:padding="16dp">

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Choose a Layout Type"
            android:layout_gravity="center"
            android:textSize="24sp"
            android:padding="15dp"
            android:layout_marginVertical="30dp"/>

        <Button
            android:id="@+id/linearLayoutButton"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Linear Layout"
            android:backgroundTint="#FF5722"/>

        <Button
            android:id="@+id/relativeLayoutButton"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Relative Layout"
            android:backgroundTint="#2196F3"/>

        <Button
            android:id="@+id/constraintLayoutButton"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Constraint Layout"
            android:backgroundTint="#4CAF50"/>
```

```xml
    <Button
        android:id="@+id/gridLayoutButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Grid Layout"
        android:backgroundTint="#FFC107"/>

</LinearLayout>

<TextView
    android:id="@+id/copyrightTextView"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="© 2024 Ezreena"
    android:textSize="14sp"
    android:layout_marginBottom="16dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toEndOf="parent"/>

</androidx.constraintlayout.widget.ConstraintLayout>
```
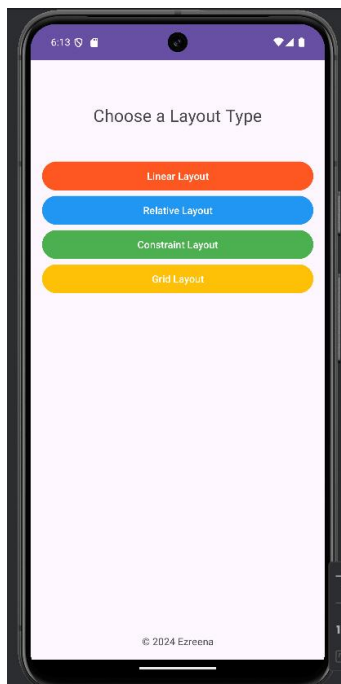
Output:

LinearLayout.java

```java
package com.example.layoutexploration;

import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.Spinner;
```

```java
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class LinearLayoutActivity extends AppCompatActivity {

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

        // Define options directly in code
        String[] options = {"FSKM", "FPSM", "FTKK", "FSSM"};
        ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
android.R.layout.simple_spinner_item, options);
        adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);

        // Reference to the Spinner and set the adapter
        Spinner optionsSpinner = findViewById(R.id.optionsSpinner);
        optionsSpinner.setAdapter(adapter);

        // Apply window insets to handle system bars and make the content display correctly
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {
            // Get the insets for system bars (status bar, navigation bar, etc.)
            Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
            // Set the padding to avoid overlapping with system bars
            v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);
            return insets.consumeSystemWindowInsets(); // Indicate that system bar insets have been
consumed
        });
    }
}
```

Activity_linearlayout.xml

```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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <!-- LinearLayout Section (Vertical orientation) -->
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
```

```xml
android:orientation="vertical"
android:padding="16dp"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintEnd_toEndOf="parent">

<!-- Title TextView -->
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="LinearLayout Example"
    android:textSize="24sp"
    android:textStyle="bold"
    android:padding="8dp"
    android:layout_marginBottom="16dp"
    android:textColor="#3F51B5"/>

<!-- ImageView for Displaying an Icon or Image -->
<ImageView
    android:id="@+id/iconImageView"
    android:layout_width="100dp"
    android:layout_height="100dp"
    android:src="@drawable/waves"
    android:contentDescription="App Icon"
    android:layout_gravity="center"
    android:layout_marginBottom="16dp" />
<!-- EditText for Username -->

<EditText
    android:id="@+id/usernameEditText"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter your name"
    android:padding="10dp"
    android:background="@android:drawable/editbox_background"
    android:layout_marginBottom="16dp"  />

<!-- Spinner for Selecting Options -->
<Spinner
    android:id="@+id/optionsSpinner"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginBottom="16dp" />

<!-- Button to Submit the Form -->
<Button
    android:layout_width="wrap_content"
```

```
            android:layout_height="wrap_content"
            android:text="Submit"
            android:layout_gravity="center"
            android:textColor="#FFFFFF"
            android:layout_marginBottom="16dp"/>

    </LinearLayout>

    <!-- Copyright TextView Centered at the Bottom -->
    <TextView
        android:id="@+id/copyrightTextView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="© 2024 Ezreena"
        android:textSize="14sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        android:layout_marginBottom="16dp"/>

</androidx.constraintlayout.widget.ConstraintLayout>
```
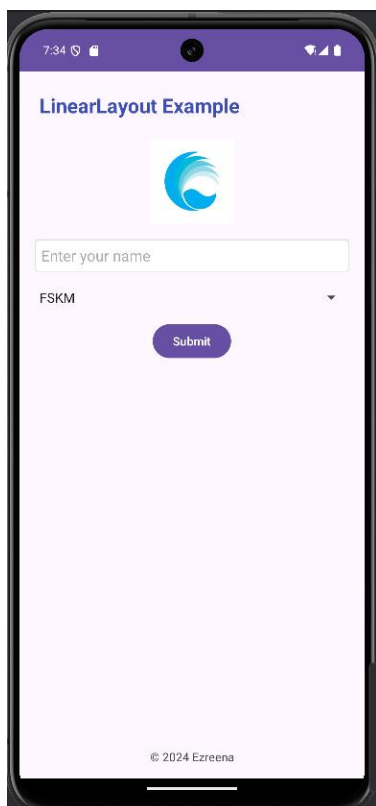
Output:

RelativeLayout.java

```java
package com.example.layoutexploration;

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 RelativeLayoutActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_relative_layout);
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {
            Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
            v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);
            return insets;
        });
    }
}
```

Activity_RelativeLayout.xml

```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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".RelativeLayoutActivity">

    <!-- RelativeLayout Section -->
    <RelativeLayout
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_marginBottom="16dp"
        android:layout_marginTop="16dp"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toTopOf="@+id/copyrightTextView"
        android:padding="16dp">

        <!-- Title TextView centered horizontally -->
        <TextView
            android:id="@+id/relativeText"
```

```xml
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Welcome to the App!"
        android:textSize="24sp"
        android:textStyle="bold"
        android:padding="8dp"
        android:textColor="#3F51B5"
        android:layout_centerHorizontal="true"/>

    <!-- EditText for name input -->
    <EditText
        android:id="@+id/editText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter your name"
        android:layout_below="@id/relativeText"
        android:layout_marginTop="20dp"
        android:padding="8dp"
        android:background="@android:drawable/editbox_background"/>

    <!-- Another EditText for email input -->
    <EditText
        android:id="@+id/emailEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter your email"
        android:layout_below="@id/editText"
        android:layout_marginTop="14dp"
        android:padding="8dp"
        android:inputType="textEmailAddress"
        android:background="@android:drawable/editbox_background"/>
    <!-- Submit Button centered horizontally -->
    <Button
        android:id="@+id/submitButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        android:layout_marginBottom="419dp"
        android:backgroundTint="#FF4081"
        android:text="Submit"
        android:textColor="#FFFFFF" />

</RelativeLayout>

<!-- Copyright Text centered at the bottom -->
<TextView
    android:id="@+id/copyrightTextView"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="© 2024 Ezreena"
    android:textSize="14sp"
```
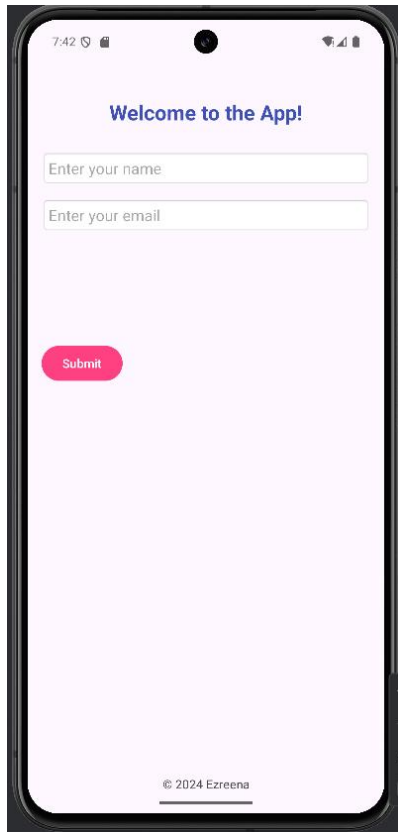
```
            app:layout_constraintBottom_toBottomOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintEnd_toEndOf="parent"/>
</androidx.constraintlayout.widget.ConstraintLayout>
```

Output:

Constraint.java

```java
package com.example.layoutexploration;

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 ConstraintLayoutActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_constraint_layout);
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {
            Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
```

```java
            v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);
            return insets;
        });
    }
}
```

Activity_ConstraintLayout.xml

```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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp"
    tools:context=".ConstraintLayoutActivity">

    <!-- "Go Back" Button positioned at the top-left beside the title -->
    <Button
        android:id="@+id/goBackButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:backgroundTint="#FF4081"
        android:onClick="finish"
        android:text="Go Back"
        android:textColor="#FFFFFF"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        android:layout_marginEnd="8dp"/>

    <!-- Title TextView centered horizontally and vertically -->

    <!-- EditText for user name input below the title TextView -->

    <TextView
        android:id="@+id/constraintText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="116dp"
        android:text="This is Constraint Layout"
        android:textColor="#3F51B5"
        android:textSize="24sp"
        android:textStyle="bold"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
```
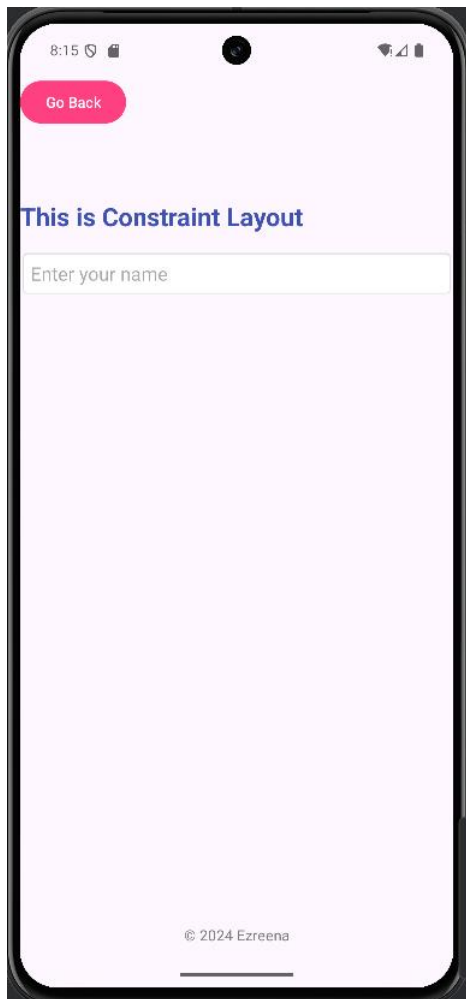
```xml
        app:layout_constraintVertical_bias="0.0" />

    <EditText
        android:id="@+id/nameEditText"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:hint="Enter your name"
        android:padding="10dp"
        android:background="@android:drawable/editbox_background"
        app:layout_constraintTop_toBottomOf="@id/constraintText"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        android:layout_marginTop="16dp"/>

    <!-- Copyright Text centered at the very bottom -->
    <TextView
        android:id="@+id/copyrightTextView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="© 2024 Ezreena"
        android:textSize="14sp"
        android:textColor="#808080"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        android:layout_marginBottom="16dp"/>

</androidx.constraintlayout.widget.ConstraintLayout>
```

Output:

GridLayout.java

```java
package com.example.layoutexploration;

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 GridLayoutActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_grid_layout);
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v, insets) -> {
            Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
            v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);
            return insets;
```

```
      });
  }
}
```

Activity_GridLayout.xml

```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:id="@+id/main"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".GridLayoutActivity">

  <GridLayout
    android:layout_width="match_parent"
    android:layout_height="0dp"
    android:layout_marginTop="16dp"
    android:rowCount="3"
    android:columnCount="2"
    android:padding="16dp"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintBottom_toTopOf="@id/copyrightTextView">

    <!-- TextView with added padding -->
    <TextView
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="This is Grid Layout"
      android:textSize="24sp"
      android:layout_gravity="start|top"
      android:layout_columnSpan="2"
      android:padding="16dp" />

    <!-- Centered Button 1 -->
    <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Button 1"
      android:layout_gravity="center"
      android:layout_row="1"
      android:layout_column="0" />

    <!-- Centered Button 2 -->
    <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Button 2"
```

```xml
        android:layout_gravity="center"
        android:layout_row="1"
        android:layout_column="1" />

    <!-- Centered Button 3 -->
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button 3"
        android:layout_gravity="center"
        android:layout_row="2"
        android:layout_column="0" />

    <!-- Go Back Button -->
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Go Back"
        android:onClick="finish"
        android:layout_gravity="center"
        android:layout_row="2"
        android:layout_column="1" />
  </GridLayout>

  <TextView
      android:id="@+id/copyrightTextView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="© 2024 Ezreena"
      android:textSize="14sp"
      android:layout_marginBottom="16dp"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintEnd_toEndOf="parent"/>
</androidx.constraintlayout.widget.ConstraintLayout>
```
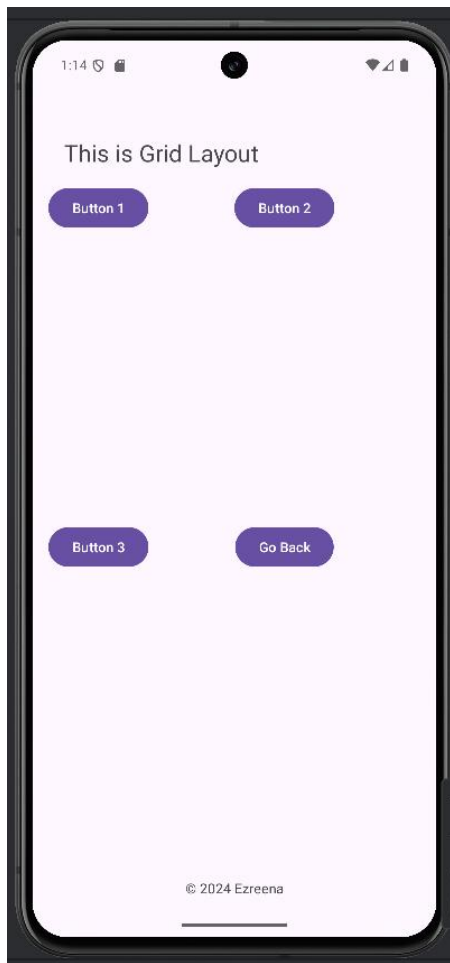
Output:

Task 2 – ControlExperiment

MainActivity.java

```
package com.example.controlexperiment;

import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.Spinner;
import android.widget.Switch;
import android.widget.Button;
import android.widget.Toast;
import android.widget.ImageButton;
import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

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

        // Initialize UI elements
        EditText editText = findViewById(R.id.editText);
        Button button = findViewById(R.id.button);
        CheckBox checkBox = findViewById(R.id.checkBox);
        RadioGroup radioGroup = findViewById(R.id.radioGroup);
        Spinner spinner = findViewById(R.id.spinner);
        Switch switchControl = findViewById(R.id.switchControl);
        ImageButton imageButton = findViewById(R.id.imageButton);

        // Set up spinner data
        String[] options = {"Option A", "Option B", "Option C"};
        ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
                android.R.layout.simple_spinner_item, options);
        adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
        spinner.setAdapter(adapter);

        // Set Switch listener
        switchControl.setOnCheckedChangeListener((buttonView, isChecked) -> {
            String status = isChecked ? "Enabled" : "Disabled";
            Toast.makeText(MainActivity.this, "Switch is " + status, Toast.LENGTH_SHORT).show();
        });

        // Set ImageButton listener
        imageButton.setOnClickListener(v ->
            Toast.makeText(MainActivity.this, "Camera Button Clicked", Toast.LENGTH_SHORT).show()
        );

        // Button click listener with data validation
```

```java
        button.setOnClickListener(v -> {
            String input = editText.getText().toString();

            // Data validation with AlertDialog
            if (input.isEmpty()) {
                new AlertDialog.Builder(this)
                        .setTitle("Input Required")
                        .setMessage("Please enter some text before proceeding.")
                        .setPositiveButton("OK", (dialog, which) -> dialog.dismiss())
                        .show();
                return;
            }

            boolean isChecked = checkBox.isChecked();
            int selectedId = radioGroup.getCheckedRadioButtonId();
            String selectedRadioText = selectedId != -1 ?
                ((RadioButton) findViewById(selectedId)).getText().toString() : "None";
            String selectedSpinner = spinner.getSelectedItem().toString();

            // Show a Toast message with the collected input
            Toast.makeText(this, "Input: " + input + "\nChecked: " + isChecked +
                    "\nSelected Radio: " + selectedRadioText +
                    "\nSelected Spinner: " + selectedSpinner, Toast.LENGTH_LONG).show();
        });
    }
}
```

Activity_main.xml

```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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical"
        android:padding="16dp"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent">

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

```xml
        android:text="Experimenting with Controls"
        android:textSize="24sp"/>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <EditText
            android:id="@+id/editText"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:hint="Enter text"/>

        <ImageButton
            android:id="@+id/imageButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:src="@android:drawable/ic_menu_camera"
            android:contentDescription="Camera Button" />

    </LinearLayout>

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Submit"/>

    <CheckBox
        android:id="@+id/checkBox"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Accept Terms"/>

    <RadioGroup
        android:id="@+id/radioGroup"
        android:layout_width="match_parent"
        android:layout_height="wrap_content">
        <RadioButton
            android:id="@+id/radioOption1"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Male"/>
        <RadioButton
            android:id="@+id/radioOption2"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Female"/>
    </RadioGroup>
```

```
        <Spinner
            android:id="@+id/spinner"
            android:paddingTop="25dp"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"/>

        <Switch
            android:id="@+id/switchControl"
            android:paddingTop="30dp"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Enable Feature" />

    </LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```
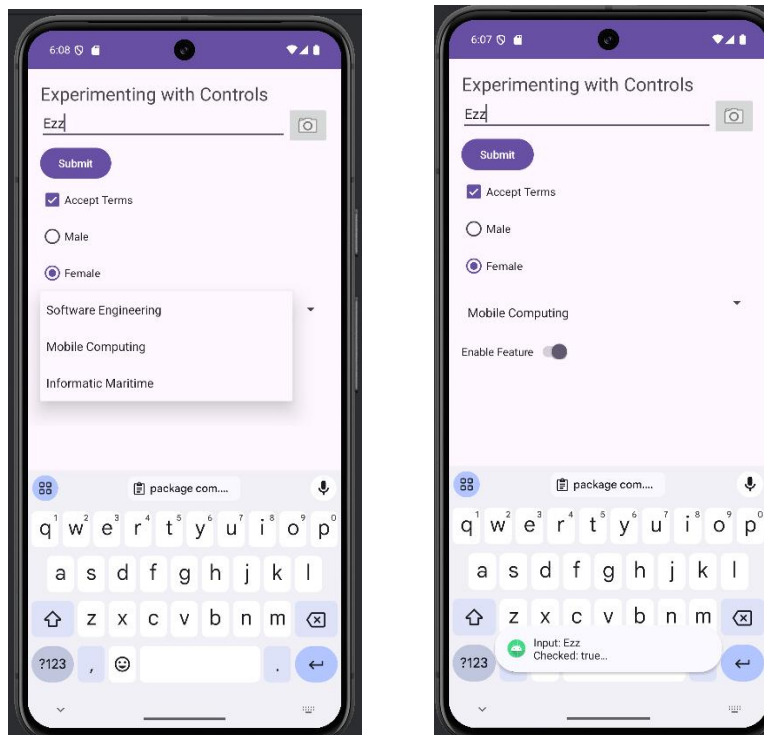
Output:

Task 3 – SegmentedControlExperiment

MainActivity.java

```java
package com.example.segmentedcontrolexperiment;

import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;
import com.google.android.material.tabs.TabLayout;
import androidx.fragment.app.Fragment;
import androidx.fragment.app.FragmentContainerView;

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

        TabLayout tabLayout = findViewById(R.id.tabLayout);
        FragmentContainerView fragmentContainer = findViewById(R.id.fragmentContainer);

        // Add tabs
        tabLayout.addTab(tabLayout.newTab().setText("First Tab"));
        tabLayout.addTab(tabLayout.newTab().setText("Second Tab"));

        // Load the first fragment by default
        if (savedInstanceState == null) {
            getSupportFragmentManager().beginTransaction()
                    .replace(R.id.fragmentContainer, new FirstFragment())
                    .commit();
        }

        // Set a listener for tab selection
        tabLayout.addOnTabSelectedListener(new TabLayout.OnTabSelectedListener() {
            @Override
            public void onTabSelected(TabLayout.Tab tab) {
                Fragment fragment = null;
                switch (tab.getPosition()) {
                    case 0:
                        fragment = new FirstFragment();
                        break;
                    case 1:
                        fragment = new SecondFragment();
                        break;
                }
                if (fragment != null) {
                    getSupportFragmentManager().beginTransaction()
                            .replace(R.id.fragmentContainer, fragment)
                            .commit();
                }
            }

            @Override
            public void onTabUnselected(TabLayout.Tab tab) {}

            @Override
            public void onTabReselected(TabLayout.Tab tab) {}
        });
    }
```

```
}
```

Activity_main.xml

```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="16dp">

    <!-- TabLayout for tabs -->
    <com.google.android.material.tabs.TabLayout
        android:id="@+id/tabLayout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />

    <!-- FragmentContainerView for fragments -->
    <androidx.fragment.app.FragmentContainerView
        android:id="@+id/fragmentContainer"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1" />
</LinearLayout>
```

FirstFragment.java

```java
package com.example.segmentedcontrolexperiment;

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

public class FirstFragment extends Fragment {

    private TextView textView;
    private ImageButton imageLogo;
    private Button buttonChange;

    @Nullable
    @Override
    public View onCreateView(@NonNull LayoutInflater inflater,
                    @Nullable ViewGroup container,
                    @Nullable Bundle savedInstanceState) {
        // Inflate the fragment's layout
```

```java
        View rootView = inflater.inflate(R.layout.fragment_first, container, false);

        // Find views by their ID
        textView = rootView.findViewById(R.id.textView);
        imageLogo = rootView.findViewById(R.id.imageLogo);
        buttonChange = rootView.findViewById(R.id.buttonChange);

        // Set an OnClickListener for the button to change text and hide the image
        if (textView != null && imageLogo != null && buttonChange != null) {
            buttonChange.setOnClickListener(v -> {
                // Change the text of the TextView and center it
                textView.setText("HELLO EVERYONE ITS ME NATIVE PROGRAMMING");
                textView.setGravity(View.TEXT_ALIGNMENT_CENTER);

                // Hide the image
                imageLogo.setVisibility(View.GONE);
            });
        }

        return rootView;
    }
}
```

Fragment_first.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".FirstFragment">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:gravity="center"
        android:orientation="vertical">

        <TextView
            android:id="@+id/textView"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:textStyle="bold"
            android:text="Welcome to IT WORLD !"
            android:textSize="24sp"
            android:gravity="center" /> <!-- Ensure text will center within the TextView -->

        <ImageButton
            android:id="@+id/imageLogo"
            android:layout_width="250dp"
            android:layout_height="250dp"
            android:layout_margin="10dp"
            android:src="@drawable/wallpaper" />
```
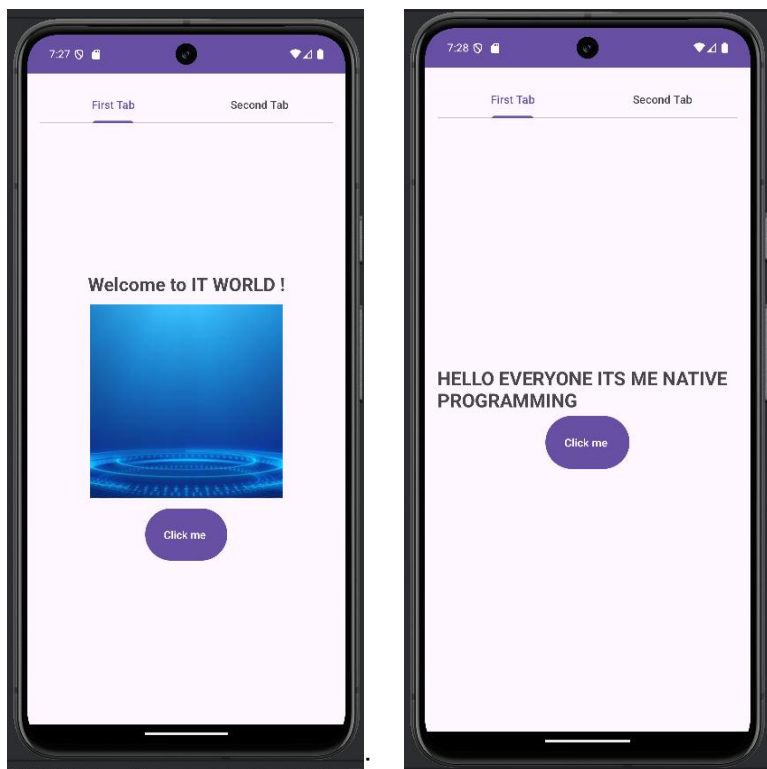
```
        <!-- Button to trigger text change and image hide -->
        <Button
            android:id="@+id/buttonChange"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:padding="24dp"
            android:text="Click me " />
    </LinearLayout>

</FrameLayout>
```

Output

SecondFragment.java

```
package com.example.segmentedcontrolexperiment;

import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.TextView;
import androidx.annotation.NonNull;
import androidx.annotation.Nullable;
```

```java
import androidx.fragment.app.Fragment;

public class SecondFragment extends Fragment {

    private EditText inputField;
    private Button submitButton;
    private TextView displayText;
    private ImageView headerImage;

    @Nullable
    @Override
    public View onCreateView(@NonNull LayoutInflater inflater,
                    @Nullable ViewGroup container,
                    @Nullable Bundle savedInstanceState) {
        View rootView = inflater.inflate(R.layout.fragment_second, container, false);

        // Initialize views
        inputField = rootView.findViewById(R.id.inputField);
        submitButton = rootView.findViewById(R.id.submitButton);
        displayText = rootView.findViewById(R.id.displayText);
        headerImage = rootView.findViewById(R.id.headerImage);

        // Set an OnClickListener for the submit button
        submitButton.setOnClickListener(v -> {
            String userInput = inputField.getText().toString();
            if (!userInput.isEmpty()) {
                // Display the entered text in displayText and make it visible
                displayText.setText(" " + userInput);
                displayText.setVisibility(View.VISIBLE);
            } else {
                // Prompt the user to enter something if the field is empty
                displayText.setText("Please enter something!");
                displayText.setVisibility(View.VISIBLE);
            }
        });

        return rootView;
    }
}
```

Fragment_second.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".SecondFragment">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:gravity="center"
```

```xml
        android:orientation="vertical"
        android:padding="16dp">

        <!-- Display an Image at the top -->
        <ImageView
            android:id="@+id/headerImage"
            android:layout_width="200dp"
            android:layout_height="200dp"
            android:src="@drawable/wallpaper" />

        <!-- Welcome Message -->
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Welcome to the Second Fragment"
            android:textSize="20sp"
            android:textStyle="bold"
            android:layout_marginTop="16dp"
            android:gravity="center" />

        <!-- User Input Field -->
        <EditText
            android:id="@+id/inputField"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Type something here"
            android:layout_marginTop="16dp" />

        <!-- Submit Button -->
        <Button
            android:id="@+id/submitButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Submit"
            android:layout_marginTop="16dp" />

        <!-- Displayed TextView after submitting -->
        <TextView
            android:id="@+id/displayText"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:textSize="18sp"
            android:layout_marginTop="16dp"
            android:visibility="gone" />
    </LinearLayout>
</FrameLayout>
```
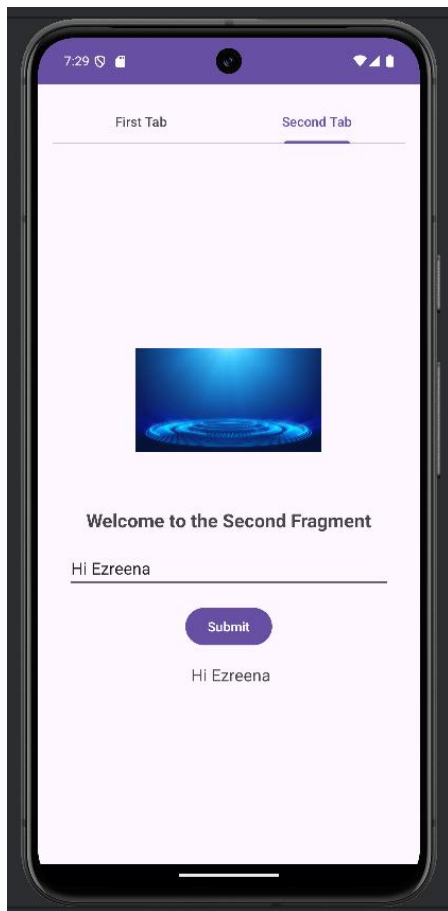
Output:

Task 4 -ImageExperiment

MainActivity.java

```java
package com.example.imageexperiment;

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

public class MainActivity extends AppCompatActivity {
    private RelativeLayout layout;
    private boolean isBackgroundOne = true;

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

        // Corrected ID reference for RelativeLayout
        layout = findViewById(R.id.relativeLayout);

        Button switchBackgroundButton = findViewById(R.id.switchBackgroundButton);
        switchBackgroundButton.setOnClickListener(v -> {
            if (isBackgroundOne) {
                layout.setBackgroundResource(R.drawable.background2); // Second
background image
            } else {
                layout.setBackgroundResource(R.drawable.background1); // First background
image
            }
            isBackgroundOne = !isBackgroundOne; // Toggle background state
        });
    }
}
```

Activitiy_main.xml

```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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <RelativeLayout
        android:id="@+id/relativeLayout"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:background="@drawable/background1"
        app:layout_constraintBottom_toBottomOf="parent"
```
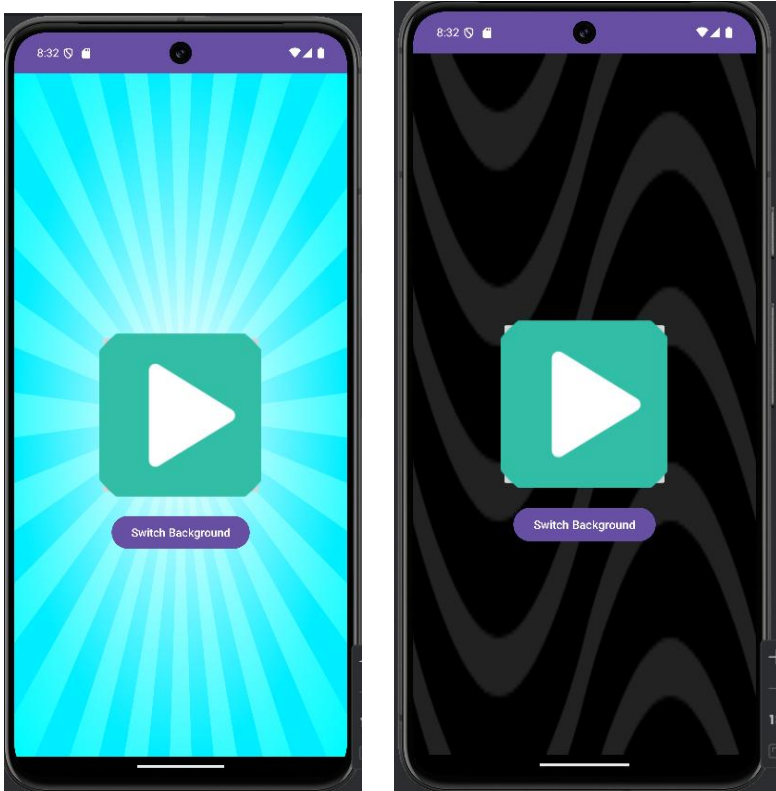
```
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent">

    <!-- Image Button -->
    <ImageButton
        android:id="@+id/imageButton"
        android:layout_width="200dp"
        android:layout_height="200dp"
        android:layout_centerInParent="true"
        android:src="@drawable/button" />

    <!-- Centered Switch Background Button Below ImageButton -->
    <Button
        android:id="@+id/switchBackgroundButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/imageButton"
        android:layout_marginTop="20dp"
        android:layout_centerHorizontal="true"
        android:text="Switch Background" />
</RelativeLayout>

    </androidx.constraintlayout.widget.ConstraintLayout>
```

Output:

Task 5 – MenuExperiment

MainActivity.java

```java
package com.example.menuexperiment;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.ContextMenu;
import android.view.Menu;
import android.view.MenuItem;
import android.view.View;
import android.widget.TextView;
import com.example.menuexperiment.R;

public class MainActivity extends AppCompatActivity {
    private TextView textView;

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

        textView = findViewById(R.id.inputField);
        registerForContextMenu(textView); // Register context menu
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        getMenuInflater().inflate(R.menu.main_menu, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        int id = item.getItemId();

        if (id == R.id.action_settings) {
            textView.setText("Settings selected");
            return true;
        } else if (id == R.id.action_about) {
            textView.setText("About selected");
            return true;
        } else {
            return super.onOptionsItemSelected(item);
        }
    }

    @Override
    public void onCreateContextMenu(ContextMenu menu, View v,
                        ContextMenu.ContextMenuInfo menuInfo) {
        super.onCreateContextMenu(menu, v, menuInfo);
        getMenuInflater().inflate(R.menu.main_menu, menu);
        menu.setHeaderTitle("Choose an option");
    }

    @Override
```

```java
    public boolean onContextItemSelected(MenuItem item) {
        int id = item.getItemId();

        if (id == R.id.action_settings) {
            textView.setText("Settings selected from context menu");
            return true;
        } else if (id == R.id.action_about) {
            textView.setText("About selected from context menu");
            return true;
        } else {
            return super.onContextItemSelected(item);
        }
    }
}
```

activity_main.xml

```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"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical"
        android:gravity="center"
        android:padding="16dp">

        <!-- Display an Image at the top -->
        <ImageView
            android:id="@+id/headerImage"
            android:layout_width="200dp"
            android:layout_height="200dp"
            android:src="@drawable/speaker" />

        <!-- Welcome Message -->
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Welcome to  Ezreena Application !"
            android:textSize="20sp"
            android:textStyle="bold"
            android:layout_marginTop="16dp"
            android:gravity="center" />

        <!-- User Input Field -->
        <EditText
            android:id="@+id/inputField"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Type something here"
```

```
                        android:layout_marginTop="16dp" />

        <!-- Submit Button -->
        <Button
            android:id="@+id/submitButton"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Submit"
            android:layout_marginTop="16dp" />

        <!-- Displayed TextView after submitting -->
        <TextView
            android:id="@+id/displayText"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:textSize="18sp"
            android:layout_marginTop="16dp"
            android:visibility="gone" />
    </LinearLayout>

</androidx.constraintlayout.widget.ConstraintLayout>
```

Main_menu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:android="http://schemas.android.com/apk/res/android">
    <item
        android:id="@+id/action_settings"
        android:title="Settings"
        android:orderInCategory="100"
        app:showAsAction="ifRoom" />
    <item
        android:id="@+id/action_about"
        android:title="About"
        android:orderInCategory="100"
        app:showAsAction="ifRoom" />
</menu>
```