UNIVERSITI MALAYSIA TERENGGANU

CSM3123 – NATIVE MOBILE PROGRAMMING

BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONORS

LAB 1

SEMESTER I 2024/2025

Prepared for:

DR. RABIEI B MAMAT

Prepared by:

MARLIANTI BT MUF PIARLIS (S66353)

```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);
        });
    }
}
```
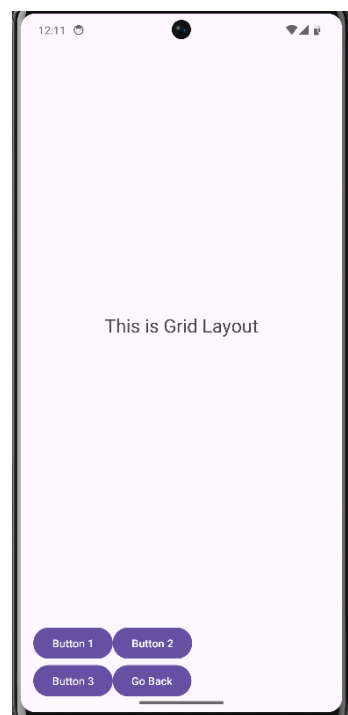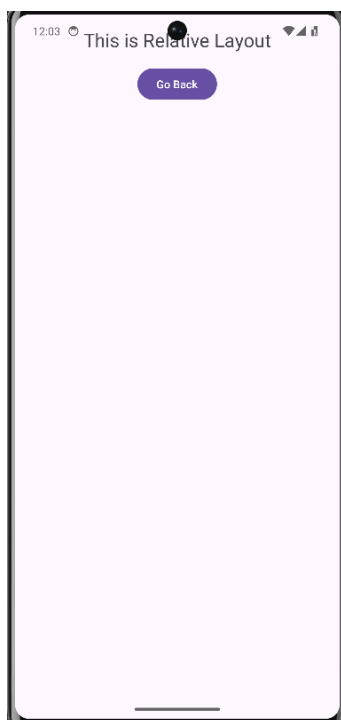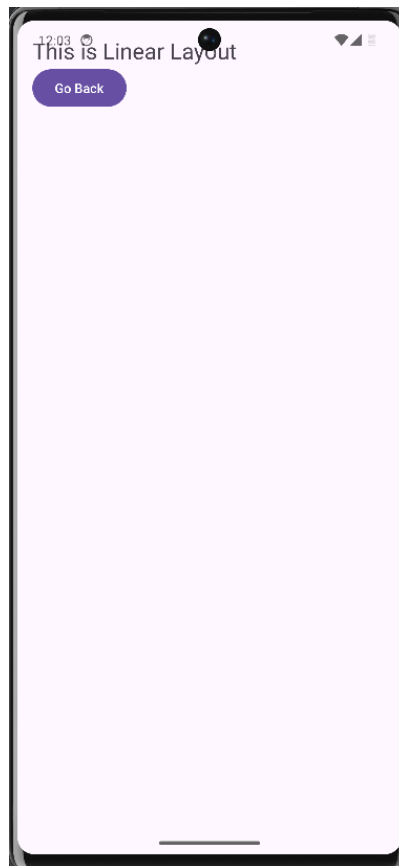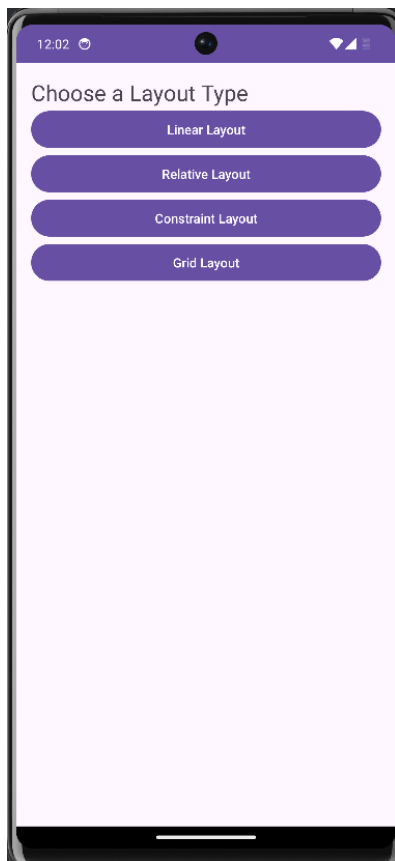
```xml
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp"
    android:fitsSystemWindows= "true" >

    <TextView
        android:id="@+id/relativeText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="This is Relative Layout"
        android:textSize="24sp"
        android:layout_centerHorizontal="true"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Go Back"
        android:onClick="finish"
        android:layout_below="@id/relativeText"
        android:layout_marginTop="16dp"
        android:layout_centerHorizontal="true"/>
</RelativeLayout>
```

```xml
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:padding="16dp">
    <TextView
        android:id="@+id/constraintText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="This is Constraint Layout"
        android:textSize="24sp"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Go Back"
        android:onClick="finish"
        app:layout_constraintTop_toBottomOf="@id/constraintText"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
```

```
        android:layout_marginTop="16dp"/>
</androidx.constraintlayout.widget.ConstraintLayout>
```

```xml
<GridLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:rowCount="2"
    android:columnCount="2"
    android:padding="16dp">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="This is Grid Layout"
        android:textSize="24sp"
        android:layout_gravity="center"
        android:layout_columnSpan="2"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button 1"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button 2"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button 3"/>
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Go Back"
        android:onClick="finish"/>
</GridLayout>
```

Choose a Layout Type

Linear Layout

Relative Layout

Constraint Layout

Grid Layout

This is Linear Layout

Go Back

This is Relative Layout

Go Back

This is Constraint Layout

Go Back

This is Grid Layout

Button 1   Button 2

Button 3   Go Back

```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="16dp">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Choose a Layout Type"
        android:textSize="24sp"/>
    <Button
        android:id="@+id/linearLayoutButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Linear Layout"/>
    <Button
        android:id="@+id/relativeLayoutButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Relative Layout"/>
    <Button
        android:id="@+id/constraintLayoutButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Constraint Layout"/>
    <Button
        android:id="@+id/gridLayoutButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Grid Layout"/>
</LinearLayout>
```

```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);
```

```java
        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);
        });
    }
}
```

Exercise

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:padding="16dp">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="This is Linear Layout"
        android:textSize="24sp"
        android:layout_gravity="center"/>

    <EditText
```
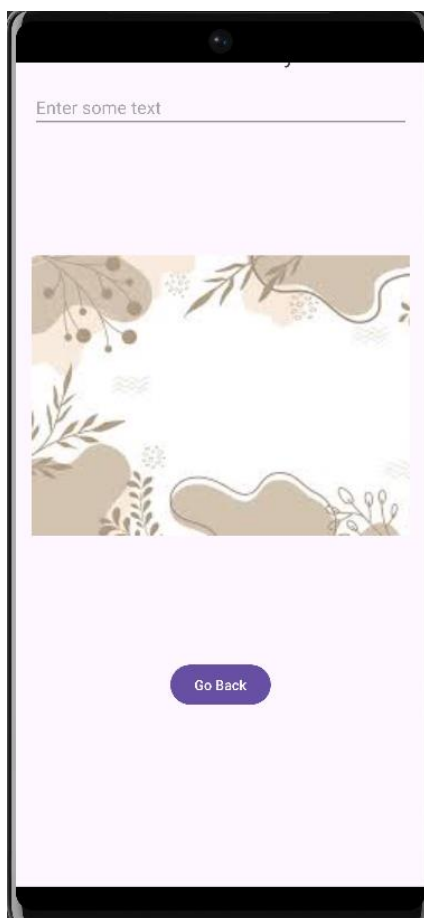
```
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Enter some text"
            android:layout_marginTop="16dp"/>

        <ImageView
            android:layout_width="500dp"
            android:layout_height="500dp"
            android:layout_marginTop="16dp"
            android:src="@drawable/background1"
            android:contentDescription="Sample Image"/>

        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Go Back"
            android:onClick="finish"
            android:layout_gravity="center"
            android:layout_marginTop="16dp"/>
</LinearLayout>
```
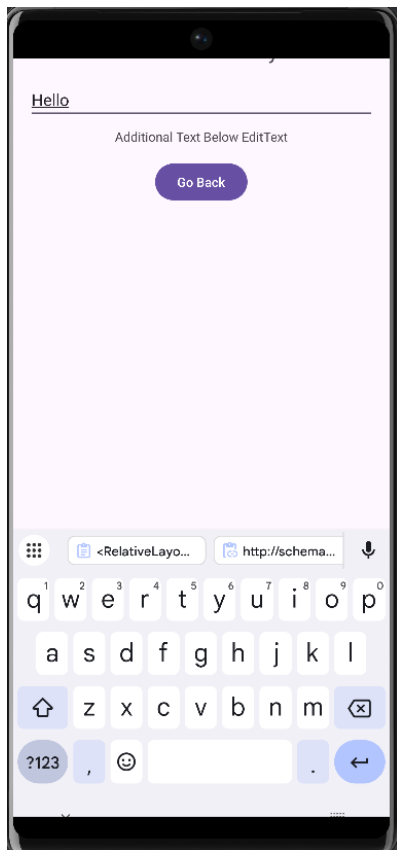
```xml
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp">

    <TextView
        android:id="@+id/relativeText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="This is Relative Layout"
        android:textSize="24sp"
        android:layout_centerHorizontal="true"/>

    <EditText
        android:id="@+id/relativeEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@id/relativeText"
        android:layout_marginTop="16dp"
        android:hint="Enter text here"/>

    <TextView
        android:id="@+id/additionalText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Additional Text Below EditText"
        android:layout_below="@id/relativeEditText"
        android:layout_marginTop="8dp"
        android:layout_centerHorizontal="true"/>

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Go Back"
        android:onClick="finish"
        android:layout_below="@id/additionalText"
        android:layout_marginTop="16dp"
        android:layout_centerHorizontal="true"/>
</RelativeLayout>
```

Hello

Additional Text Below EditText

Go Back

Grid Layout

```xml
<GridLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:rowCount="3"
    android:columnCount="2"
    android:padding="16dp">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="This is Grid Layout"
        android:textSize="24sp"
        android:layout_gravity="center"
        android:layout_columnSpan="2"/>

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button 1"/>

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button 2"/>

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button 3"/>

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button 4"/>

    <ImageView
        android:layout_width="100dp"
        android:layout_height="100dp"
        android:src="@drawable/sample_image"
        android:contentDescription="Sample Image"
        android:layout_gravity="center"/>

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Go Back"
        android:onClick="finish"/>
</GridLayout>
```
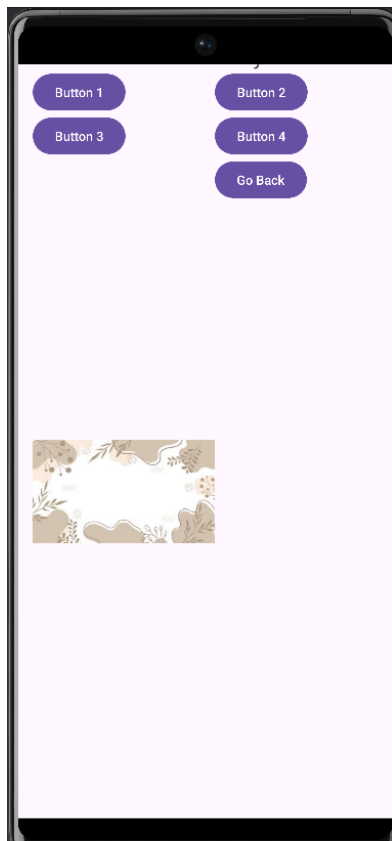
Button 1   Button 2
Button 3   Button 4
            Go Back

TASK 2

```java
package com.example.controlexperiment;

import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.Spinner;
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 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);
        // 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);
        // Button click listener
        button.setOnClickListener(v -> {
            String input = editText.getText().toString();
            boolean isChecked = checkBox.isChecked();
            int selectedId = radioGroup.getCheckedRadioButtonId();
            RadioButton selectedRadioButton =
                findViewById(selectedId);
            String selectedRadioText = selectedRadioButton != null ?
                selectedRadioButton.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();
        });
    }
}
```
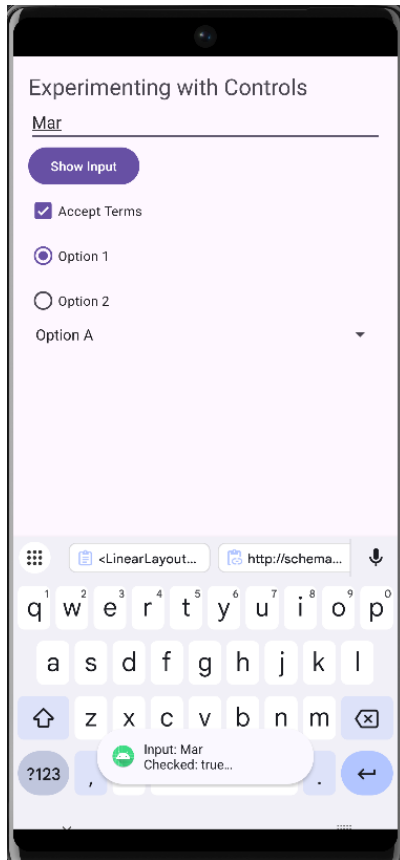
```xml
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Experimenting with Controls"
        android:textSize="24sp"/>
    <EditText
        android:id="@+id/editText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter text"/>
    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Show Input"/>
    <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="Option 1"/>
        <RadioButton
            android:id="@+id/radioOption2"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Option 2"/>
    </RadioGroup>
    <Spinner
        android:id="@+id/spinner"
```

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>
</LinearLayout>
```


Step 5

```
package com.example.controlexperiment;

import android.os.Bundle;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.SeekBar;
import android.widget.Spinner;
import android.widget.Switch;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
```

```java
@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);
    SeekBar seekBar = findViewById(R.id.seekBar);
    Switch switchButton = findViewById(R.id.switchButton);

    // 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);

    // Button click listener with validation
    button.setOnClickListener(v -> {
        String input = editText.getText().toString().trim();

        // Validate EditText input
        if (input.isEmpty()) {
            editText.setError("Input cannot be empty");
            return;
        }

        boolean isChecked = checkBox.isChecked();
        int selectedId = radioGroup.getCheckedRadioButtonId();
        RadioButton selectedRadioButton = findViewById(selectedId);
        String selectedRadioText = selectedRadioButton != null ?
                selectedRadioButton.getText().toString() : "None";
        String selectedSpinner = spinner.getSelectedItem().toString();
        int seekBarValue = seekBar.getProgress();
        boolean isSwitchOn = switchButton.isChecked();

        // Show a Toast message with the collected input
        Toast.makeText(this, "Input: " + input + "\nChecked: " + isChecked +
                "\nSelected Radio: " + selectedRadioText +
                "\nSelected Spinner: " + selectedSpinner +
                "\nSeekBar Value: " + seekBarValue +
                "\nSwitch: " + (isSwitchOn ? "On" : "Off"),
            Toast.LENGTH_LONG).show();
    });

    // Toggle visibility of button based on switch state
    switchButton.setOnCheckedChangeListener((buttonView, isChecked) -> {
```

```java
        button.setVisibility(isChecked ? View.VISIBLE : View.GONE);
    });
  }
}
```

```xml
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   android:padding="16dp">

   <TextView
      android:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Experimenting with Controls"
      android:textSize="24sp"
      app:layout_constraintTop_toTopOf="parent"
      app:layout_constraintStart_toStartOf="parent"/>

   <EditText
      android:id="@+id/editText"
      android:layout_width="0dp"
      android:layout_height="wrap_content"
      android:hint="Enter text"
      app:layout_constraintTop_toBottomOf="@id/textView"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintEnd_toEndOf="parent"/>

   <Button
      android:id="@+id/button"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Show Input"
      android:visibility="gone"
   app:layout_constraintTop_toBottomOf="@id/editText"
   app:layout_constraintStart_toStartOf="parent"/>

   <CheckBox
      android:id="@+id/checkBox"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Accept Terms"
      app:layout_constraintTop_toBottomOf="@id/button"
      app:layout_constraintStart_toStartOf="parent"/>

   <RadioGroup
      android:id="@+id/radioGroup"
      android:layout_width="match_parent"
```
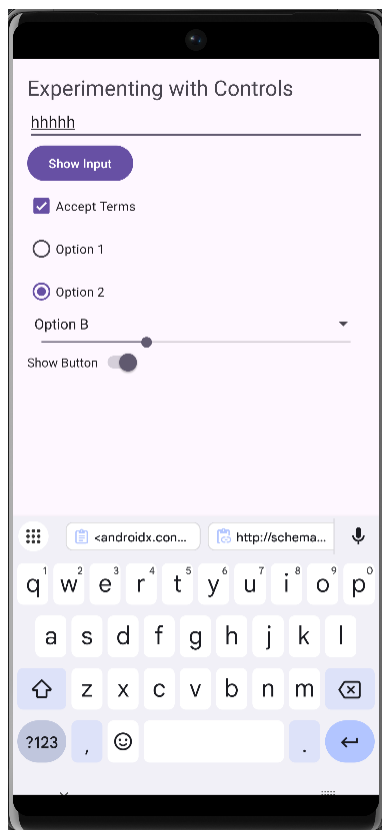
```xml
        android:layout_height="wrap_content"
        app:layout_constraintTop_toBottomOf="@id/checkBox"
        app:layout_constraintStart_toStartOf="parent">
        <RadioButton
            android:id="@+id/radioOption1"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Option 1"/>
        <RadioButton
            android:id="@+id/radioOption2"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Option 2"/>
    </RadioGroup>

    <Spinner
        android:id="@+id/spinner"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        app:layout_constraintTop_toBottomOf="@id/radioGroup"
        app:layout_constraintStart_toStartOf="parent"/>

    <SeekBar
        android:id="@+id/seekBar"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:max="100"
        app:layout_constraintTop_toBottomOf="@id/spinner"
        app:layout_constraintStart_toStartOf="parent"/>

    <Switch
        android:id="@+id/switchButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Show Button"
        app:layout_constraintTop_toBottomOf="@id/seekBar"
        app:layout_constraintStart_toStartOf="parent"/>
</androidx.constraintlayout.widget.ConstraintLayout>
```

TASK 3

```xml
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:orientation="vertical"
    android:padding="16dp"
    android:fitsSystemWindows = "true">

    <com.google.android.material.tabs.TabLayout
        android:id="@+id/tabLayout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>
    <androidx.fragment.app.FragmentContainerView
        android:id="@+id/fragmentContainer"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent" />

</LinearLayout>
```

```xml
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:gravity="center"
    android:orientation="vertical">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="This is the First Fragment"
        android:textSize="24sp"/>

    <androidx.fragment.app.FragmentContainerView
        android:id="@+id/fragmentContainer"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent" />
</LinearLayout>
```

```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:gravity="center"
    android:padding="16dp">

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

```xml
        android:layout_height="wrap_content"
        android:text="Welcome to the Second Fragment"
        android:textSize="18sp" />

    <ImageView
        android:layout_width="100dp"
        android:layout_height="100dp"
        android:src="@drawable/background1" />
</LinearLayout>
```

```java
package com.example.segmentedcontrolexperiment;

import android.os.Bundle;
import android.widget.TableLayout;

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


import com.google.android.material.tabs.TabLayout;

public class MainActivity extends AppCompatActivity {

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

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

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

        if(savedInstanceState == null){
            getSupportFragmentManager().beginTransaction().replace(R.id.fragmentContainer, new
FirstFragment()).commit();
        }

        tabLayout.addOnTabSelectedListener(new TabLayout.OnTabSelectedListener(){
            @Override
            public void onTabSelected(TabLayout.Tab tab){
                Fragment fragment = null;
                switch (tab.getPosition()){
                    case 0:
```

```java
                fragment = new FirstFragment();
                break;
              case 1:
                fragment = new SecondFragment();
                break;
          }
          if (fragment != null){
            getSupportFragmentManager()
                  .beginTransaction()
                  .replace(R.id.fragmentContainer, fragment)
                  .commit();

          }
        }

      public void onTabUnselected(TabLayout.Tab tab){}

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

}
```
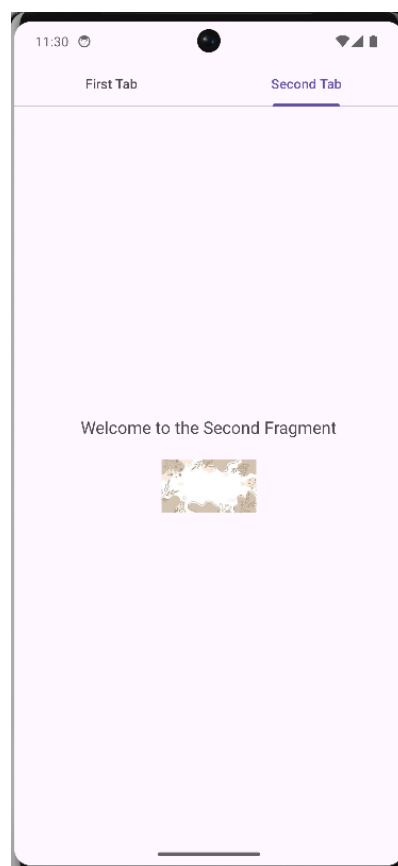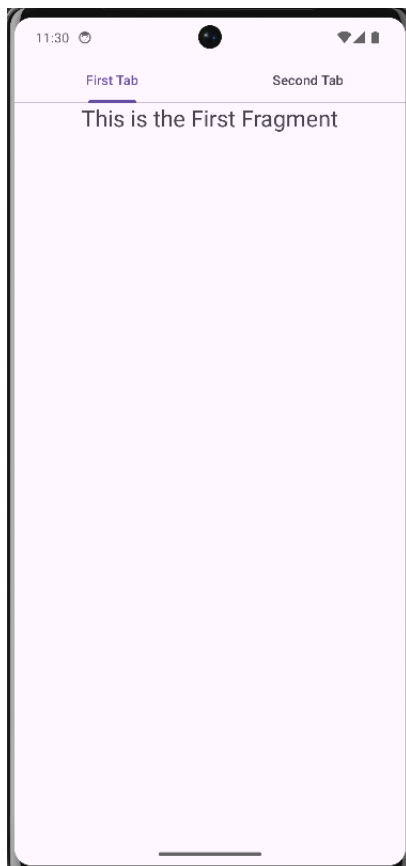
TASK 4

```xml
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/layout"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="@drawable/background1">
    <Button
        android:id="@+id/imageButton"
        android:layout_width="80dp"
        android:layout_height="80dp"
        android:layout_centerInParent="true"
        android:background="@drawable/play_button"
        android:text="Image Button"
        android:textColor="@android:color/white"
        android:padding="16dp"/>
    <Button
        android:id="@+id/switchBackgroundButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/imageButton"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="16dp"
        android:text="Switch Background"/>
</RelativeLayout>
```

```java
package com.example.imageexperiment;

import android.os.Bundle;
import android.widget.Button;
import android.widget.RelativeLayout;

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 {

    private RelativeLayout layout;
    private boolean isBackgroundOne =true;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        //EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);
```
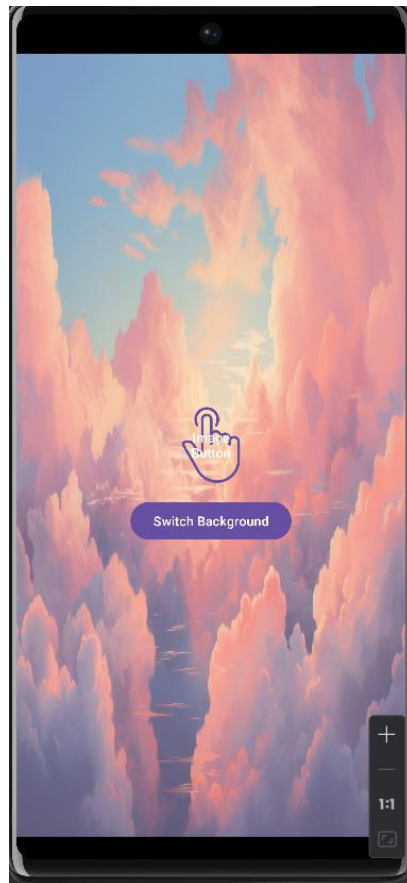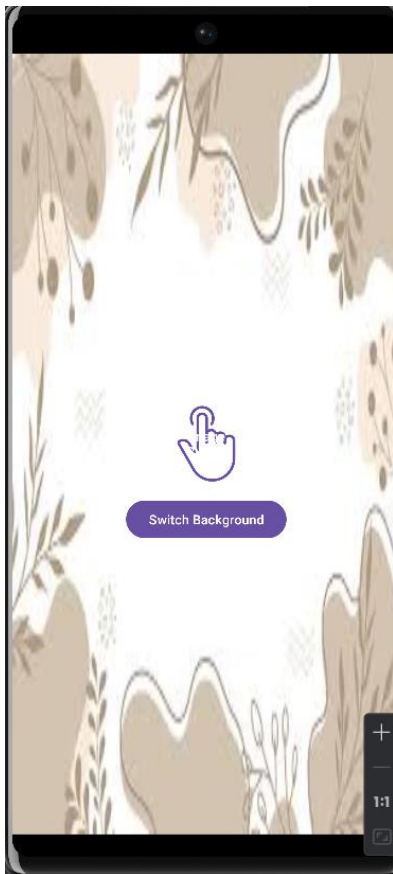
```
        layout = findViewById(R.id.layout);
        Button button = findViewById(R.id.imageButton);
        Button switchBackgroundButton = findViewById(R.id.switchBackgroundButton);
        switchBackgroundButton.setOnClickListener(v -> {
            if (isBackgroundOne){
                layout.setBackgroundResource(R.drawable.background2);
            }
            else {
                layout.setBackgroundResource(R.drawable.background1);
            }
            isBackgroundOne = !isBackgroundOne;
        });
    }
}
```

When button is clicked, it will change the background

```java
package com.example.menuexperiment;

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 android.widget.Toast;
import androidx.appcompat.widget.Toolbar;


import androidx.activity.EdgeToEdge;
import androidx.annotation.NonNull;
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 {

    private TextView textView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

        Toolbar toolbar = findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);
        textView = findViewById(R.id.textView);
        registerForContextMenu(textView);
    }

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

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

```java
        }
    }

    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
    public boolean onContextItemSelected(MenuItem item){
        if(item.getItemId() == R.id.action_settings){
            textView.setText("Setting selected from context menu");
            return true;
        }
        else if (item.getItemId() == R.id.action_about){
            textView.setText("About selected from context menu");
            return true;
        }

        else {
            return super.onContextItemSelected(item);
        }

    }
}
```

```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="never" />

    <item
        android:id="@+id/action_about"
        android:title="About"
        android:orderInCategory="100"
        app:showAsAction="never" />
</menu>
```
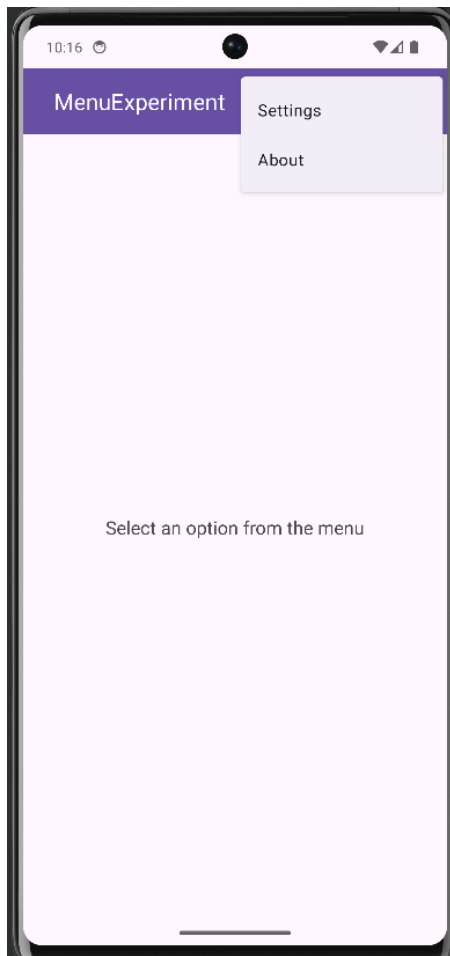
```xml
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    android:fitsSystemWindows="true">

    <androidx.appcompat.widget.Toolbar
        android:id="@+id/toolbar"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="?attr/colorPrimary"
        app:layout_constraintTop_toTopOf="parent"
        app:titleMarginStart="30dp"
        android:theme="@style/ThemeOverlay.AppCompat.Dark.ActionBar"
        app:popupTheme="@style/ThemeOverlay.AppCompat.Light"
        />


    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Select an option from the menu"
        android:textSize="18sp"
        app:layout_constraintTop_toBottomOf="@id/toolbar"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />

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

```
package com.example.menuexperiment;

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 android.widget.Toast;
import androidx.appcompat.widget.Toolbar;


import androidx.activity.EdgeToEdge;
import androidx.annotation.NonNull;
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 {

    private TextView textView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

        Toolbar toolbar = findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);
        textView = findViewById(R.id.textView);
        registerForContextMenu(textView);
    }

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

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

        else if(item.getItemId() == R.id.action_contactUs) {
```

```java
            textView.setText("Contact Us selected");
            return true;
        }
        else{
            return super.onOptionsItemSelected(item);


        }
    }

    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
    public boolean onContextItemSelected(MenuItem item){
        if(item.getItemId() == R.id.action_settings){
            textView.setText("Setting selected from context menu");
            return true;
        }
        else if (item.getItemId() == R.id.action_about){
            textView.setText("About selected from context menu");
            return true;
        }

        else {
            return super.onContextItemSelected(item);
        }

    }
}
```

```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:icon="@drawable/baseline_settings_24"
        android:orderInCategory="100"
        app:showAsAction="never" />

    <item
        android:id="@+id/action_about"
        android:title="About"
        android:icon="@drawable/about"
        android:orderInCategory="100"
        app:showAsAction="never">
```
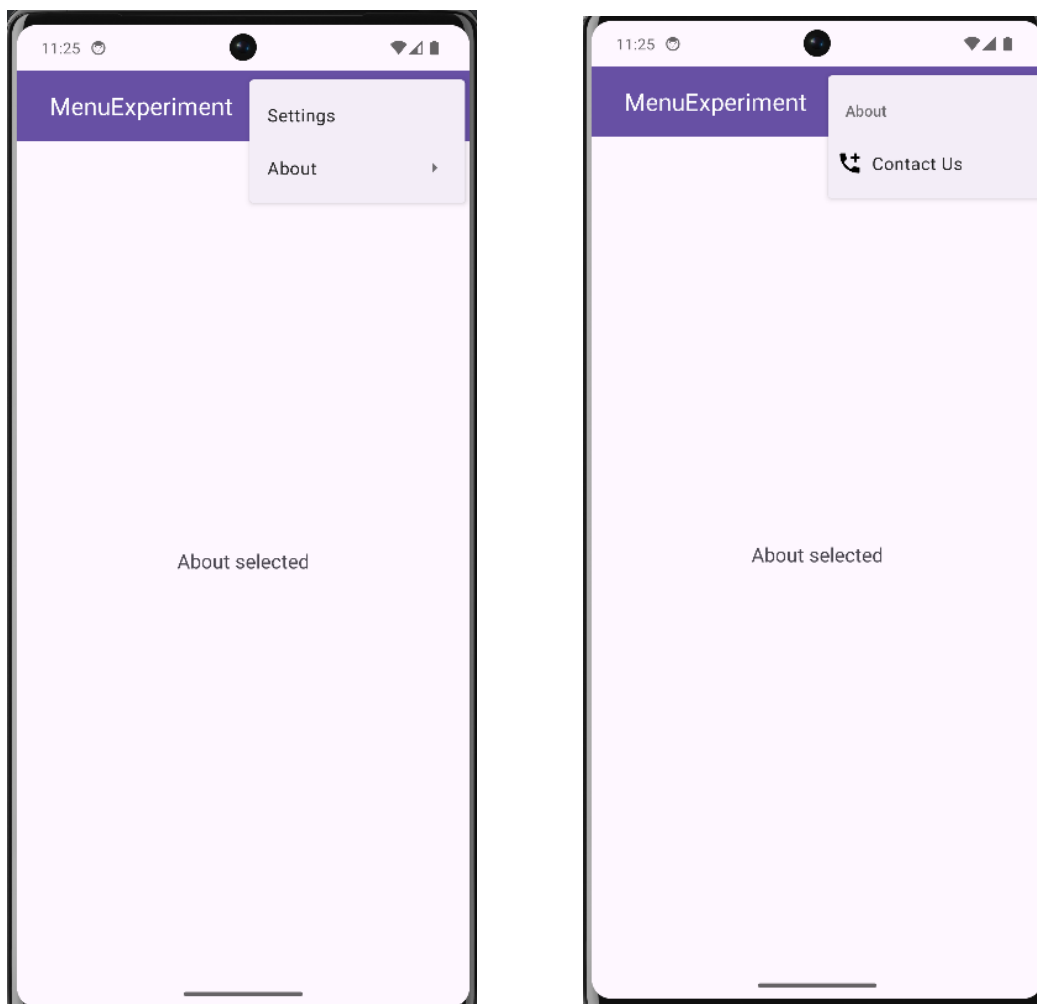
```
    <menu>
      <item
          android:id="@+id/action_contactUs"
          android:title="Contact Us"
          android:icon="@drawable/contactus"
          android:orderInCategory="100"
          app:showAsAction="never"
          />
    </menu>

</item>
</menu>
```

The left in About has sub menu indicate to Contact us and help

GITHUB LINK: https://github.com/Marlianti01/NATIVE-PROGRAMMING.git