Module-5

Event Handling

In Android app development using Java, event handling is crucial for responding to user interactions and system events. There are several approaches to handle events in Android, and three common ones are:

**Inline Event Handling:**

This approach involves defining event handling logic directly in the XML layout file or within the Java code.

In XML, you can specify the event handler using attributes like android:onClick for buttons. In Java, you can use setOnClickListener or similar methods.

**Example (XML):**

<Button

android:id="@+id/myButton"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Click me"

android:onClick="onButtonClick" />

**Example (Java):**

public void onButtonClick(View view) {

}

This approach is simple and suitable for small projects or when the logic is straightforward.

**Anonymous Inner Classes:**

This approach involves using anonymous inner classes to define event handlers. It is often used when you want to handle events programmatically without defining separate methods.

Example (Java):

Button myButton = findViewById(R.id.myButton);

myButton.setOnClickListener(new View.OnClickListener() {

@Override

public void onClick(View view) {

}});

This approach is more flexible than inline event handling and allows for dynamic event handling logic.

**Implementing Interfaces:**

Android components like Activity or Fragment can implement specific interfaces to handle events. For example, OnClickListener for click events.

**Example (Java):**

public class MyActivity extends AppCompatActivity implements View.OnClickListener {

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

Button myButton = findViewById(R.id.myButton);

myButton.setOnClickListener(this);

}

@Override

public void onClick(View view) {

}}

This approach is suitable for handling multiple events within the same class and provides a clean structure for event handling logic.

These approaches offer different levels of abstraction and flexibility, allowing developers to choose the one that best fits the complexity and requirements of their Android application.

**activity\_main.xml**

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

**<RelativeLayout 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=".MainActivity"**

**android:gravity="center"**

**android:background="#F4B5B5">**

**<EditText**

**android:id="@+id/name"**

**android:layout\_width="match\_parent"**

**android:layout\_height="wrap\_content"**

**android:layout\_alignParentStart="true"**

**android:layout\_marginStart="6dp"**

**android:layout\_marginTop="50sp"**

**android:hint="Enter your name"**

**android:textAlignment="center"**

**android:textColor="@color/black"**

**android:textColorHint="@color/black"**

**android:textStyle="bold" />**

**<Button**

**android:id="@+id/btn"**

**android:layout\_width="match\_parent"**

**android:layout\_height="wrap\_content"**

**android:layout\_below="@id/name"**

**android:layout\_marginTop="17dp"**

**android:onClick="submitName"**

**android:textSize="22sp"**

**android:textColor="@color/black"**

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

**<TextView**

**android:id="@+id/welcome"**

**android:layout\_width="wrap\_content"**

**android:layout\_height="wrap\_content"**

**android:layout\_below="@id/btn"**

**android:hint="Msg' ll be displayed here!"**

**android:textSize="20sp"**

**android:layout\_centerHorizontal="true"**

**android:textColorHint="#100F0F"**

**android:textColor="@color/black"**

**android:textStyle="bold"/>**

**<TextView**

**android:id="@+id/dec"**

**android:layout\_width="wrap\_content"**

**android:layout\_height="wrap\_content"**

**android:layout\_above="@id/name"**

**android:layout\_centerHorizontal="true"**

**android:layout\_marginBottom="50dp"**

**android:text="Onclick Event Handling"**

**android:textColor="@color/black"**

**android:textSize="30sp"/>**

**</RelativeLayout>**

**Mainactivity.java (OnClickListener)**

**package com.example.eventhandling1;**

**import androidx.appcompat.app.AppCompatActivity;**

**import android.os.Bundle;**

**import android.view.View;**

**import android.widget.Button;**

**import android.widget.EditText;**

**import android.widget.TextView;**

**public class MainActivity extends AppCompatActivity {**

**EditText name;**

**Button btn;**

**TextView welcome;**

**@Override**

**protected void onCreate(Bundle savedInstanceState) {**

**super.onCreate(savedInstanceState);**

**setContentView(R.layout.activity\_main);**

**name = findViewById(R.id.name);**

**btn = findViewById(R.id.btn);**

**welcome = findViewById(R.id.welcome);**

**}**

**public void submitName(View view) {**

**String userName = name.getText().toString().trim();**

**if (!userName.isEmpty()) {**

**String welcomeMessage = "Welcome, " + userName + "!";**

**welcome.setText(welcomeMessage);**

**} else {**

**welcome.setText("Enter Name.");**

**}}}**

**Mainactivity.java (Inner Class):**

**package com.example.eventhandling2;**

**import androidx.appcompat.app.AppCompatActivity;**

**import android.os.Bundle;**

**import android.os.Bundle;**

**import android.view.View;**

**import android.widget.Button;**

**import android.widget.EditText;**

**import android.widget.TextView;**

**import androidx.appcompat.app.AppCompatActivity;**

**public class aMainActivity extends AppCompatActivity implements View.OnClickListener {**

**EditText name;**

**Button btn;**

**TextView welcome;**

**@Override**

**protected void onCreate(Bundle savedInstanceState) {**

**super.onCreate(savedInstanceState);**

**setContentView(R.layout.activity\_main);**

**name = findViewById(R.id.name);**

**btn = findViewById(R.id.btn);**

**welcome = findViewById(R.id.welcome);**

**btn.setOnClickListener(this);**

**}**

**@Override**

**public void onClick(View v) {**

**if (v.getId() == R.id.btn) {**

**handleButtonClick();**

**} }**

**private void handleButtonClick() {**

**String userName = name.getText().toString().trim();**

**if (!userName.isEmpty()) {**

**String welcomeMessage = "Welcome, " + userName + "!";**

**welcome.setText(welcomeMessage);**

**} else {**

**welcome.setText("Please enter your name.");**

**}}}**

**Mainactivity.java (Implementing Class):**

**package com.example.eventhandling3;**

**import androidx.appcompat.app.AppCompatActivity;**

**import android.os.Bundle;**

**import android.os.Bundle;**

**import android.view.View;**

**import android.widget.Button;**

**import android.widget.EditText;**

**import android.widget.TextView;**

**import androidx.appcompat.app.AppCompatActivity;**

**public class MainActivity extends AppCompatActivity implements View.OnClickListener {**

**EditText name;**

**Button btn;**

**TextView welcome;**

**@Override**

**protected void onCreate(Bundle savedInstanceState) {**

**super.onCreate(savedInstanceState);**

**setContentView(R.layout.activity\_main);**

**name = findViewById(R.id.name);**

**btn = findViewById(R.id.btn);**

**welcome = findViewById(R.id.welcome);**

**btn.setOnClickListener(this);**

**}**

**@Override**

**public void onClick(View v) {**

**if (v.getId() == R.id.btn) {**

**handleButtonClick();**

**} }**

**private void handleButtonClick() {**

**String userName = name.getText().toString().trim();**

**if (!userName.isEmpty()) {**

**String welcomeMessage = "Welcome, " + userName + "!";**

**welcome.setText(welcomeMessage);**

**} else {**

**welcome.setText("Please enter your name.");**

**}}}**

**Result:**

Successfully designed Apps for exploring different types of Event Handling Approaches.

Module-6

Simple Calculator

**activity\_main.xml**

**<LinearLayout**

**xmlns:android="http://schemas.android.com/apk/res/android"**

**xmlns:app="http://schemas.android.com/apk/res-auto"**

**xmlns:tools="http://schemas.android.com/tools"**

**android:layout\_width="match\_parent"**

**android:layout\_height="match\_parent"**

**android:orientation="vertical"**

**tools:context=".MainActivity"**

**android:background="#87E2F5">**

**<TextView**

**android:layout\_width="match\_parent"**

**android:layout\_height="wrap\_content"**

**android:text="Calculator"**

**android:textSize="35sp"**

**android:textStyle="bold"**

**android:layout\_marginTop="100sp"**

**android:textColor="#F23D3D"**

**android:gravity="center"**

**android:background="#E6DC70"**

**/>**

**<EditText**

**android:id="@+id/n1"**

**android:layout\_width="match\_parent"**

**android:layout\_height="wrap\_content"**

**android:layout\_marginTop="15sp"**

**android:textAlignment="center"**

**android:textColor="#FF5722"**

**android:inputType="numberDecimal"**

**android:textColorHint="@color/black"**

**android:hint="Enter first number" />**

**<EditText**

**android:id="@+id/n2"**

**android:layout\_width="match\_parent"**

**android:layout\_height="wrap\_content"**

**android:inputType="numberDecimal"**

**android:textAlignment="center"**

**android:textColorHint="@color/black"**

**android:layout\_marginTop="15sp"**

**android:textColor="#FF5722"**

**android:hint="Enter second number" />**

**<LinearLayout**

**android:layout\_width="match\_parent"**

**android:layout\_height="wrap\_content"**

**android:orientation="horizontal">**

**<Button**

**android:id="@+id/a"**

**android:layout\_width="0sp"**

**android:layout\_height="wrap\_content"**

**android:layout\_marginTop="15sp"**

**android:layout\_weight="2"**

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

**<Button**

**android:id="@+id/s"**

**android:layout\_width="0sp"**

**android:layout\_marginTop="15sp"**

**android:layout\_height="wrap\_content"**

**android:layout\_weight="2"**

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

**<Button**

**android:id="@+id/m"**

**android:layout\_width="0sp"**

**android:layout\_marginTop="15sp"**

**android:layout\_height="wrap\_content"**

**android:layout\_weight="2"**

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

**<Button**

**android:id="@+id/d"**

**android:layout\_width="0sp"**

**android:layout\_height="wrap\_content"**

**android:layout\_marginTop="15sp"**

**android:layout\_weight="2"**

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

**</LinearLayout>**

**<TextView**

**android:id="@+id/r"**

**android:layout\_width="match\_parent"**

**android:layout\_height="wrap\_content"**

**android:hint="Result"**

**android:background="#E6DC70"**

**android:layout\_marginTop="25sp"**

**android:textAlignment="center"**

**android:textColorHint="@color/black"**

**android:textSize="30sp"**

**android:textColor="#F23D3D" />**

**</LinearLayout>**

**Mainactivity.java**

**package com.example.calci535;**

**import androidx.appcompat.app.AppCompatActivity;**

**import android.os.Bundle;**

**import android.view.View;**

**import android.widget.Button;**

**import android.widget.EditText;**

**import android.widget.TextView;**

**import android.widget.Toast;**

**public class MainActivity extends AppCompatActivity {**

**EditText number1, number2;**

**Button addButton, subtractButton, multiplyButton, divideButton;**

**TextView result;**

**@Override**

**protected void onCreate(Bundle savedInstanceState) {**

**super.onCreate(savedInstanceState);**

**setContentView(R.layout.activity\_main);**

**number1 = findViewById(R.id.n1);**

**number2 = findViewById(R.id.n2);**

**addButton = findViewById(R.id.a);**

**subtractButton = findViewById(R.id.s);**

**multiplyButton = findViewById(R.id.m);**

**divideButton = findViewById(R.id.d);**

**result = findViewById(R.id.r);**

**addButton.setOnClickListener(new View.OnClickListener() {**

**@Override**

**public void onClick(View v) {**

**if (validateInput()) {**

**double num1 = Double.parseDouble(number1.getText().toString());**

**double num2 = Double.parseDouble(number2.getText().toString());**

**double res = num1 + num2;**

**result.setText("Result: " + res);**

**} } });**

**subtractButton.setOnClickListener(new View.OnClickListener() {**

**@Override**

**public void onClick(View v) {**

**if (validateInput()) {**

**double num1 = Double.parseDouble(number1.getText().toString());**

**double num2 = Double.parseDouble(number2.getText().toString());**

**double res = num1 - num2;**

**result.setText("Result: " + res);**

**} } });**

**multiplyButton.setOnClickListener(new View.OnClickListener() {**

**@Override**

**public void onClick(View v) {**

**if (validateInput()) {**

**double num1 = Double.parseDouble(number1.getText().toString());**

**double num2 = Double.parseDouble(number2.getText().toString());**

**double res = num1 \* num2;**

**result.setText("Result: " + res);**

**} } });**

**divideButton.setOnClickListener(new View.OnClickListener() {**

**@Override**

**public void onClick(View v) {**

**if (validateInput() && !number2.getText().toString().equals("0")) {**

**double num1 = Double.parseDouble(number1.getText().toString());**

**double num2 = Double.parseDouble(number2.getText().toString());**

**double res = num1 / num2;**

**result.setText("Result: " + res);**

**} else {**

**Toast.makeText(MainActivity.this, "Please enter a non-zero value for number2", Toast.LENGTH\_SHORT).show();**

**} } }); }**

**private boolean validateInput() {**

**String num1Str = number1.getText().toString();**

**String num2Str = number2.getText().toString();**

**if (num1Str.isEmpty() || num2Str.isEmpty()) {**

**Toast.makeText(this, "Please enter both values", Toast.LENGTH\_SHORT).show();**

**return false;**

**}**

**return true;**

**}}**

**Result:**

A Simple Calculator using Android Studio is successfully designed.