Program:1(Hello app)

XML code:

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

    <TextView
        android:text="Hello World"
        android:textSize="24sp"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" />

    <TextView
        android:text="Hello Flutter"
        android:textSize="24sp"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" />
</LinearLayout>
```

KT code:

```
package com.example.helloapp

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

class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
```

```
    }
}
```

Program:2(Counter app)

XML code:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/rootLayout"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:background="#FFFFFF"
    android:gravity="center"
    android:padding="16dp">

    <TextView
        android:id="@+id/textCountLabel"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/count_label"
        android:textSize="24sp" />

    <TextView
        android:id="@+id/textCount"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="0"
        android:textSize="48sp"
        android:textStyle="bold"
        android:layout_marginTop="10dp" />

    <LinearLayout
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:layout_marginTop="20dp">

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

    <Button
      android:id="@+id/btnDecrement"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="-"
      android:layout_marginStart="10dp" />

    <Button
      android:id="@+id/btnReset"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="@string/reset"
      android:layout_marginStart="10dp" />
  </LinearLayout>
</LinearLayout>
```

KT code:

```
package com.example.counterapp
import android.os.Bundle
import android.widget.Button
```

```
import android.widget.TextView
import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {
    private var count = 0

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        val countText = findViewById<TextView>(R.id.textCount)
        val btnIncrement = findViewById<Button>(R.id.btnIncrement)
        val btnDecrement = findViewById<Button>(R.id.btnDecrement)
        val btnReset = findViewById<Button>(R.id.btnReset)

        btnIncrement.setOnClickListener {
            count++
            countText.text = count.toString()
        }

        btnDecrement.setOnClickListener {
            count--
            countText.text = count.toString()
        }

        btnReset.setOnClickListener {
            count = 0
            countText.text = count.toString()
        }
    }
}
```

Program:3(Login app)

XML code

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

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

    <EditText
      android:id="@+id/usernameInput"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="@string/username"
      android:inputType="textPersonName" />

    <EditText
      android:id="@+id/passwordInput"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="@string/password"
      android:inputType="textPassword"
      android:layout_marginTop="10dp" />

    <Button
```

```
        android:id="@+id/loginButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/login"
        android:layout_marginTop="20dp" />

    <TextView
        android:id="@+id/messageText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=""
        android:textSize="18sp"
        android:textColor="#2196F3"
        android:layout_marginTop="20dp" />
  </LinearLayout>
</ScrollView>
```

KT code:

```
package com.example.loginapp

import android.os.Bundle
import android.widget.Button
import android.widget.EditText
import android.widget.TextView
import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {
  override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_main)
```

```
        val usernameInput = findViewById<EditText>(R.id.usernameInput)
        val passwordInput = findViewById<EditText>(R.id.passwordInput)
        val loginButton = findViewById<Button>(R.id.loginButton)
        val messageText = findViewById<TextView>(R.id.messageText)

        loginButton.setOnClickListener {
            val username = usernameInput.text.toString()
            val password = passwordInput.text.toString()

            messageText.text = if (username == "admin" && password == "1234") {
                getString(R.string.login_success)
            } else {
                getString(R.string.login_failed)
            }
        }
    }
}
```

Program:4(To-do-List app)

XML code

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

    <EditText
        android:id="@+id/taskInput"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
```

```
    android:hint="@string/enter_task"
    android:inputType="text"
    android:minHeight="48dp"
    android:textColorHint="#757575" />

  <Button
    android:id="@+id/addTaskButton"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/add_task"
    android:layout_gravity="end"
    android:layout_marginTop="8dp" />

  <TextView
    android:id="@+id/noTasksText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/no_tasks"
    android:layout_marginTop="16dp"
    android:textSize="16sp"
    android:textColor="#888888"
    android:visibility="gone" />

  <ListView
    android:id="@+id/taskListView"
    android:layout_width="match_parent"
    android:layout_height="0dp"
    android:layout_weight="1"
    android:dividerHeight="1dp" />
</LinearLayout>
```

KT code:

```
package com.example.todolistapp

import android.os.Bundle
import android.view.View
import android.widget.*
import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {
    private lateinit var taskList: ArrayList<String>
    private lateinit var adapter: ArrayAdapter<String>
    private lateinit var noTasksText: TextView  // Moved here

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        val taskInput = findViewById<EditText>(R.id.taskInput)
        val addTaskButton = findViewById<Button>(R.id.addTaskButton)
        val taskListView = findViewById<ListView>(R.id.taskListView)
        noTasksText = findViewById(R.id.noTasksText)  // Only initialized here

        taskList = arrayListOf()
        adapter = ArrayAdapter(this, android.R.layout.simple_list_item_1, taskList)
        taskListView.adapter = adapter

        updateEmptyView()

        addTaskButton.setOnClickListener {
            val task = taskInput.text.toString().trim()
            if (task.isNotEmpty()) {
```

```
            taskList.add(task)
            adapter.notifyDataSetChanged()
            taskInput.text.clear()
            updateEmptyView()
        }
    }

    taskListView.setOnItemClickListener { _, _, position, _ ->
        taskList.removeAt(position)
        adapter.notifyDataSetChanged()
        updateEmptyView()
    }
  }

  private fun updateEmptyView() {
    noTasksText.visibility = if (taskList.isEmpty()) View.VISIBLE else View.GONE
  }
}
```

Program:5(Calculator app)

XML code

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

  <TextView
    android:id="@+id/outputText"
    android:layout_width="match_parent"
```

```
    android:layout_height="100dp"
    android:gravity="end|bottom"
    android:text="0"
    android:textSize="48sp"
    android:textStyle="bold"
    android:background="#EEEEEE"
    android:padding="16dp" />

<!-- Calculator Buttons -->
<TableLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:stretchColumns="*"
    android:layout_marginTop="20dp">

    <TableRow>
        <Button android:id="@+id/btn7" android:text="7" />
        <Button android:id="@+id/btn8" android:text="8" />
        <Button android:id="@+id/btn9" android:text="9" />
        <Button android:id="@+id/btnDivide" android:text="/" />
    </TableRow>
    <TableRow>
        <Button android:id="@+id/btn4" android:text="4" />
        <Button android:id="@+id/btn5" android:text="5" />
        <Button android:id="@+id/btn6" android:text="6" />
        <Button android:id="@+id/btnMultiply" android:text="*" />
    </TableRow>
    <TableRow>
        <Button android:id="@+id/btn1" android:text="1" />
        <Button android:id="@+id/btn2" android:text="2" />
        <Button android:id="@+id/btn3" android:text="3" />
```

```
        <Button android:id="@+id/btnMinus" android:text="-" />
    </TableRow>
    <TableRow>
        <Button android:id="@+id/btnClear" android:text="C" />
        <Button android:id="@+id/btn0" android:text="0" />
        <Button android:id="@+id/btnEquals" android:text="=" />
        <Button android:id="@+id/btnPlus" android:text="+" />
    </TableRow>
  </TableLayout>
</LinearLayout>
```

KT code:

```
package com.example.calculatorapp

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

class MainActivity : AppCompatActivity() {
    private lateinit var outputText: TextView
    private var currentInput = ""
    private var num1 = ""
    private var operator = ""

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        outputText = findViewById(R.id.outputText)

        val buttons = listOf(
```

```
        R.id.btn0 to "0", R.id.btn1 to "1", R.id.btn2 to "2", R.id.btn3 to "3",
        R.id.btn4 to "4", R.id.btn5 to "5", R.id.btn6 to "6", R.id.btn7 to "7",
        R.id.btn8 to "8", R.id.btn9 to "9",
        R.id.btnPlus to "+", R.id.btnMinus to "-", R.id.btnMultiply to "*", R.id.btnDivide to "/"
    )

    buttons.forEach { (id, value) ->
        findViewById<Button>(id).setOnClickListener {
            handleInput(value)
        }
    }

    findViewById<Button>(R.id.btnClear).setOnClickListener {
        currentInput = ""
        num1 = ""
        operator = ""
        outputText.text = "0"
    }

    findViewById<Button>(R.id.btnEquals).setOnClickListener {
        calculateResult()
    }
}

private fun handleInput(value: String) {
    if (value in listOf("+", "-", "*", "/")) {
        if (num1.isEmpty()) {
            num1 = currentInput
            currentInput = ""
            operator = value
        }
```

```
        } else {
            currentInput += value
            outputText.text = currentInput
        }
    }

    private fun calculateResult() {
        if (num1.isNotEmpty() && operator.isNotEmpty() && currentInput.isNotEmpty()) {
            val result = try {
                val n1 = num1.toDouble()
                val n2 = currentInput.toDouble()
                when (operator) {
                    "+" -> n1 + n2
                    "-" -> n1 - n2
                    "*" -> n1 * n2
                    "/" -> if (n2 != 0.0) n1 / n2 else Double.NaN
                    else -> 0.0
                }
            } catch (e: Exception) {
                Double.NaN
            }

            val output = if (result.isNaN()) "Error" else result.toString()
            outputText.text = output
            currentInput = output
            num1 = ""
            operator = ""
        }
    }
}
```

Program:6(Weather app)

XML code

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

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

    <EditText
      android:id="@+id/cityInput"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="@string/enter_city"
      android:inputType="text" />

    <Button
      android:id="@+id/getWeatherButton"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="@string/get_weather"
      android:layout_marginTop="16dp" />

    <ProgressBar
      android:id="@+id/progressBar"
      android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:visibility="gone"
        android:layout_gravity="center"
        android:layout_marginTop="24dp" />

    <TextView
        android:id="@+id/resultText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text=""
        android:textSize="18sp"
        android:layout_marginTop="24dp"
        android:textColor="#333" />
  </LinearLayout>
</ScrollView>
```

KT code:

```
package com.example.weatherapp

import android.os.Bundle
import android.view.View
import android.widget.*
import androidx.appcompat.app.AppCompatActivity
import org.json.JSONObject
import java.net.URL
import kotlin.concurrent.thread

class MainActivity : AppCompatActivity() {
  private val apiKey = "0d175c0f6bc75fd7e08f75ec3f551616"

  override fun onCreate(savedInstanceState: Bundle?) {
```

```
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_main)

    val cityInput = findViewById<EditText>(R.id.cityInput)
    val getWeatherButton = findViewById<Button>(R.id.getWeatherButton)
    val resultText = findViewById<TextView>(R.id.resultText)
    val progressBar = findViewById<ProgressBar>(R.id.progressBar)

    getWeatherButton.setOnClickListener {
      val city = cityInput.text.toString().trim()
      if (city.isNotEmpty()) {
        progressBar.visibility = View.VISIBLE
        resultText.text = ""

        thread {
          try {
            val response = URL(

"https://api.openweathermap.org/data/2.5/weather?q=$city&appid=$apiKey&units=metric"
            ).readText()

            val data = JSONObject(response)
            val name = data.getString("name")
            val weather = data.getJSONArray("weather").getJSONObject(0).getString("main")
            val temp = data.getJSONObject("main").getDouble("temp")

            runOnUiThread {
              progressBar.visibility = View.GONE
              resultText.text = "City: $name\nWeather: $weather\nTemperature: $temp°C"
            }
          } catch (e: Exception) {
```

```
                runOnUiThread {
                    progressBar.visibility = View.GONE
                    resultText.text = getString(R.string.error_msg)
                }
            }
        }
    } else {
        Toast.makeText(this, R.string.enter_city, Toast.LENGTH_SHORT).show()
    }
  }
}
```

Extra:

```
<uses-permission android:name="android.permission.INTERNET" />
```

[***AndroidManifest.xml (add Internet permission)***

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

  <!-- Required permission -->
  <uses-permission android:name="android.permission.INTERNET" />

  <application
    android:allowBackup="true"
    android:dataExtractionRules="@xml/data_extraction_rules"
    android:fullBackupContent="@xml/backup_rules"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:roundIcon="@mipmap/ic_launcher_round"
    android:supportsRtl="true"
```

```
    android:theme="@style/Theme.Weatherapp"
    tools:targetApi="31">
    <activity
      android:name=".MainActivity"
      android:exported="true">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

        <category android:name="android.intent.category.LAUNCHER" />
      </intent-filter>
    </activity>
  </application>
</manifest>
]
```

Program:7(Stop watch app)

XML code

```
<?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:background="#FFFFFF"
  android:gravity="center"
  android:orientation="vertical"
  android:padding="24dp">

  <TextView
    android:id="@+id/timeText"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="00:00:00.00"
    android:textSize="40sp"
```

```
    android:textStyle="bold"
    android:layout_marginBottom="24dp" />

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

    <Button
      android:id="@+id/startButton"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="@string/start" />

    <Button
      android:id="@+id/stopButton"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="@string/stop"
      android:layout_marginStart="20dp" />

    <Button
      android:id="@+id/resetButton"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="@string/reset"
      android:layout_marginStart="20dp" />
  </LinearLayout>
</LinearLayout>
```

KT code:

```
package com.example.stopwatchapp

import android.os.Bundle
import android.os.Handler
import android.os.Looper
import android.widget.Button
import android.widget.TextView
import androidx.appcompat.app.AppCompatActivity
import java.util.Locale

class MainActivity : AppCompatActivity() {

    private lateinit var timeText: TextView
    private lateinit var startButton: Button
    private lateinit var stopButton: Button
    private lateinit var resetButton: Button

    private var isRunning = false
    private var stopwatchTime: Long = 0L
    private var startTime: Long = 0L

    private val handler = Handler(Looper.getMainLooper())
    private val updateTask = object : Runnable {
        override fun run() {
            val elapsed = System.currentTimeMillis() - startTime + stopwatchTime
            timeText.text = formatTime(elapsed)
            if (isRunning) handler.postDelayed(this, 10)
        }
    }
```

```
override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_main)

    timeText = findViewById(R.id.timeText)
    startButton = findViewById(R.id.startButton)
    stopButton = findViewById(R.id.stopButton)
    resetButton = findViewById(R.id.resetButton)

    startButton.setOnClickListener {
        if (!isRunning) {
            startTime = System.currentTimeMillis()
            handler.post(updateTask)
            isRunning = true
        }
    }

    stopButton.setOnClickListener {
        if (isRunning) {
            stopwatchTime += System.currentTimeMillis() - startTime
            handler.removeCallbacks(updateTask)
            isRunning = false
        }
    }

    resetButton.setOnClickListener {
        stopwatchTime = 0L
        isRunning = false
        handler.removeCallbacks(updateTask)
        timeText.text = formatTime(0L)
    }
```

```
    }

    private fun formatTime(ms: Long): String {
        val hours = ms / (1000 * 60 * 60)
        val minutes = (ms / (1000 * 60)) % 60
        val seconds = (ms / 1000) % 60
        val milliseconds = (ms % 1000) / 10
        return String.format(Locale.getDefault(), "%02d:%02d:%02d.%02d", hours, minutes, seconds, milliseconds)
    }
}
```

Program:8(Navigation app)

XML code

Android version of Program 8: Navigation App using only:

- activity_main.xml (Home screen)
- MainActivity.kt (handles navigation)
- second_activity.xml (Details screen layout)
- SecondActivity.kt (target screen)

activity_main.xml (Home Screen)

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

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

```
    android:layout_height="wrap_content"
    android:text="@string/welcome_home"
    android:textSize="20sp"
    android:layout_marginBottom="20dp" />

  <Button
    android:id="@+id/btnNavigate"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/go_to_details" />
</LinearLayout>
```

second_activity.xml (Details Screen)

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

  <TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="@string/details_screen"
    android:textSize="20sp" />
</LinearLayout>
```

KT code:

MainActivity.kt

```
package com.example.navigationapp

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

class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        val btnNavigate = findViewById<Button>(R.id.btnNavigate)
        btnNavigate.setOnClickListener {
            val intent = Intent(this, SecondActivity::class.java)
            startActivity(intent)
        }
    }
}
```

SecondActivity.kt

```
package com.example.navigationapp

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

class SecondActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.second_activity)
```

```
    }
}
```

Add this to AndroidManifest.xml inside the <application> tag to register the second activity:

```
<activity android:name=".SecondActivity" />
```

[

AndroidManifest.xml

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

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

        <!-- Main (launcher) activity -->
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
```

```
        <!-- Second activity -->
        <activity android:name=".SecondActivity" />
    </application>
</manifest>
]
```

Program:9(E -Commerce app)

XML code

Android version of Program 9: E-commerce App implemented using:

- activity_main.xml — product grid (home screen)
- product_detail.xml — product detail screen
- MainActivity.kt — displays list of products
- ProductDetailActivity.kt — displays selected product details

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<GridView xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/gridView"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#FFFFFF"
    android:numColumns="2"
    android:horizontalSpacing="10dp"
    android:verticalSpacing="10dp"
    android:padding="10dp" />
```

product_detail.xml

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

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

  <ImageView
    android:id="@+id/detailImage"
    android:layout_width="match_parent"
    android:layout_height="200dp"
    android:contentDescription="@string/product_image"
    android:scaleType="centerCrop" />

  <TextView
    android:id="@+id/detailName"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:textSize="24sp"
    android:textStyle="bold"
    android:layout_marginTop="16dp" />

  <TextView
    android:id="@+id/detailPrice"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:textSize="20sp"
    android:textColor="#555555"
    android:layout_marginTop="10dp" />

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

```
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/add_to_cart"
        android:layout_marginTop="20dp" />
  </LinearLayout>
</ScrollView>
```

KT code:

MainActivity.kt

```
package com.example.ecommerceapp

import android.content.Intent
import android.os.Bundle
import android.widget.AdapterView
import android.widget.GridView
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {

  private val productList = listOf(
    Product("Smartphone", R.drawable.ic_launcher_foreground, 699.99),
    Product("Headphones", R.drawable.ic_launcher_foreground, 129.99),
    Product("Sneakers", R.drawable.ic_launcher_foreground, 89.99),
    Product("Smartwatch", R.drawable.ic_launcher_foreground, 199.99),
    Product("Backpack", R.drawable.ic_launcher_foreground, 49.99),
    Product("Perfume", R.drawable.ic_launcher_foreground, 39.99)
  )

  override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_main)
```

```
        val gridView = findViewById<GridView>(R.id.gridView)
        gridView.adapter = ProductAdapter(this, productList)

        gridView.onItemClickListener = AdapterView.OnItemClickListener { _, _, position, _ ->
            val product = productList[position]
            val intent = Intent(this, ProductDetailActivity::class.java)
            intent.putExtra("name", product.name)
            intent.putExtra("price", product.price)
            intent.putExtra("image", product.imageResId)
            startActivity(intent)
        }
    }
}
```

ProductDetailActivity.kt

```
package com.example.ecommerceapp

import android.os.Bundle
import android.widget.Button
import android.widget.ImageView
import android.widget.TextView
import android.widget.Toast
import androidx.appcompat.app.AppCompatActivity
import java.util.Locale

class ProductDetailActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.product_detail)

        val name = intent.getStringExtra("name")
```

```
        val price = intent.getDoubleExtra("price", 0.0)
        val image = intent.getIntExtra("image", R.drawable.ic_launcher_foreground)

        val detailImage = findViewById<ImageView>(R.id.detailImage)
        val detailName = findViewById<TextView>(R.id.detailName)
        val detailPrice = findViewById<TextView>(R.id.detailPrice)
        val addToCartButton = findViewById<Button>(R.id.addToCartButton)

        detailImage.setImageResource(image)
        detailName.text = name

        val priceFormatted = String.format(Locale.getDefault(), "%.2f", price)
        detailPrice.text = getString(R.string.product_price, priceFormatted)

        addToCartButton.setOnClickListener {
            Toast.makeText(this, getString(R.string.added_to_cart, name), Toast.LENGTH_SHORT).show()
        }
    }
}
```

Product.kt (Model class)

```
package com.example.ecommerceapp

data class Product(
    val name: String,
    val imageResId: Int,
    val price: Double
)
```

ProductAdapter.kt (Adapter for grid)

```
package com.example.ecommerceapp

import android.content.Context
```

```
import android.view.View
import android.view.ViewGroup
import android.widget.*
import android.view.LayoutInflater

class ProductAdapter(private val context: Context, private val products: List<Product>) :
BaseAdapter() {
  override fun getCount(): Int = products.size
  override fun getItem(position: Int): Any = products[position]
  override fun getItemId(position: Int): Long = position.toLong()

  override fun getView(position: Int, convertView: View?, parent: ViewGroup): View {
    val view = convertView ?: LayoutInflater.from(context).inflate(android.R.layout.simple_list_item_1,
parent, false)
    val textView = view.findViewById<TextView>(android.R.id.text1)
    textView.text = products[position].name
    return view
  }
}
```

AndroidManifest.xml (Add this inside <application>)

```
<activity android:name=".ProductDetailActivity" />
```

Program:10(Animated logo app)

XML code

```
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
  android:background="#FFFFFF"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:gravity="center">
```

```
    <ImageView
        android:id="@+id/logoImage"
        android:layout_width="100dp"
        android:layout_height="100dp"
        android:layout_gravity="center"
        android:alpha="0.0"
        android:scaleX="0.1"
        android:scaleY="0.1"
        android:scaleType="centerInside"
        android:contentDescription="@string/logo"
        android:src="@drawable/logo" />
</FrameLayout>
```

KT code:

```
package com.example.animatedlogoapp

import android.os.Bundle
import android.os.Handler
import android.os.Looper
import android.view.animation.AccelerateDecelerateInterpolator
import android.widget.ImageView
import androidx.appcompat.app.AppCompatActivity

class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        val logoImage = findViewById<ImageView>(R.id.logoImage)

        Handler(Looper.getMainLooper()).postDelayed({
```

```
        logoImage.animate()
            .alpha(1f)
            .scaleX(2f)
            .scaleY(2f)
            .setDuration(2000)
            .setInterpolator(AccelerateDecelerateInterpolator())
            .start()
      }, 500)
   }
}
```

Logo Image

Place your logo image in:

app/src/main/res/drawable/logo.png

Program:11(Expenses tracker app)

XML code

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

   <EditText
      android:id="@+id/descInput"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="@string/enter_description"
      android:inputType="text" />
```

```
    <EditText
        android:id="@+id/amountInput"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="@string/enter_amount"
        android:inputType="numberDecimal"
        android:layout_marginTop="8dp" />

    <Button
        android:id="@+id/addExpenseButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/add_expense"
        android:layout_marginTop="12dp"
        android:layout_gravity="end" />

    <ListView
        android:id="@+id/expenseListView"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:dividerHeight="1dp"
        android:layout_marginTop="16dp" />
</LinearLayout>
```

KT code:

```
package com.example.expensetrackerapp

import android.os.Bundle
import android.widget.*
import androidx.appcompat.app.AppCompatActivity
```

```
import java.util.Locale

class MainActivity : AppCompatActivity() {

    private lateinit var expenseList: ArrayList<String>
    private lateinit var adapter: ArrayAdapter<String>

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        val descInput = findViewById<EditText>(R.id.descInput)
        val amountInput = findViewById<EditText>(R.id.amountInput)
        val addButton = findViewById<Button>(R.id.addExpenseButton)
        val listView = findViewById<ListView>(R.id.expenseListView)

        expenseList = ArrayList()
        adapter = ArrayAdapter(this, android.R.layout.simple_list_item_1, expenseList)
        listView.adapter = adapter

        addButton.setOnClickListener {
            val desc = descInput.text.toString().trim()
            val amountText = amountInput.text.toString().trim()

            if (desc.isNotEmpty() && amountText.isNotEmpty()) {
                val formatted = String.format(
                    Locale.getDefault(),
                    getString(R.string.expense_item_format),
                    desc,
                    amountText.toDouble()
                )
```

```
            expenseList.add(formatted)
            adapter.notifyDataSetChanged()

            descInput.text.clear()
            amountInput.text.clear()
        } else {
            Toast.makeText(this, getString(R.string.enter_all_fields), Toast.LENGTH_SHORT).show()
        }
    }

    listView.setOnItemClickListener { _, _, position, _ ->
        expenseList.removeAt(position)
        adapter.notifyDataSetChanged()
    }
  }
}
```

Program:12(Quiz app)

XML code

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

  <TextView
    android:id="@+id/questionText"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:textSize="20sp"
```

```
    android:textColor="#000000"
    android:textStyle="bold"
    android:text="Question" />

<Button
    android:id="@+id/optionA"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Option A"
    android:layout_marginTop="16dp" />

<Button
    android:id="@+id/optionB"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Option B"
    android:layout_marginTop="8dp" />

<Button
    android:id="@+id/optionC"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Option C"
    android:layout_marginTop="8dp" />

<Button
    android:id="@+id/optionD"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Option D"
    android:layout_marginTop="8dp" />
```

```
    <TextView
        android:id="@+id/scoreText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=""
        android:textSize="16sp"
        android:textColor="#008000"
        android:layout_marginTop="24dp" />
</LinearLayout>
```

KT code:

```
package com.example.quizapp

import android.os.Bundle
import android.widget.*
import androidx.appcompat.app.AppCompatActivity

data class Question(
    val text: String,
    val options: List<String>,
    val correctIndex: Int
)

class MainActivity : AppCompatActivity() {

    private lateinit var questionText: TextView
    private lateinit var optionButtons: List<Button>
    private lateinit var scoreText: TextView

    private val questions = listOf(
```

```
    Question("What is the capital of France?", listOf("Berlin", "Madrid", "Paris", "Rome"), 2),
    Question("Which language is used for Android development?", listOf("Swift", "Kotlin", "JavaScript", "Ruby"), 1),
    Question("Flutter uses which language?", listOf("Java", "Dart", "Python", "C#"), 1)
  )

  private var currentIndex = 0
  private var score = 0

  override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_main)

    questionText = findViewById(R.id.questionText)
    scoreText = findViewById(R.id.scoreText)
    optionButtons = listOf(
      findViewById(R.id.optionA),
      findViewById(R.id.optionB),
      findViewById(R.id.optionC),
      findViewById(R.id.optionD)
    )

    loadQuestion()

    optionButtons.forEachIndexed { index, button ->
      button.setOnClickListener {
        checkAnswer(index)
      }
    }
  }
```

```
    private fun loadQuestion() {
        if (currentIndex < questions.size) {
            val q = questions[currentIndex]
            questionText.text = q.text
            optionButtons.forEachIndexed { i, btn -> btn.text = q.options[i] }
        } else {
            questionText.text = getString(R.string.quiz_complete)
            scoreText.text = getString(R.string.final_score, score, questions.size)
            optionButtons.forEach { it.isEnabled = false }
        }
    }

    private fun checkAnswer(selectedIndex: Int) {
        if (questions[currentIndex].correctIndex == selectedIndex) {
            score++
        }
        currentIndex++
        loadQuestion()
    }
}
```