

Beginner Level for Android Development using Kotlin

Instructor: Ferry Yuwono

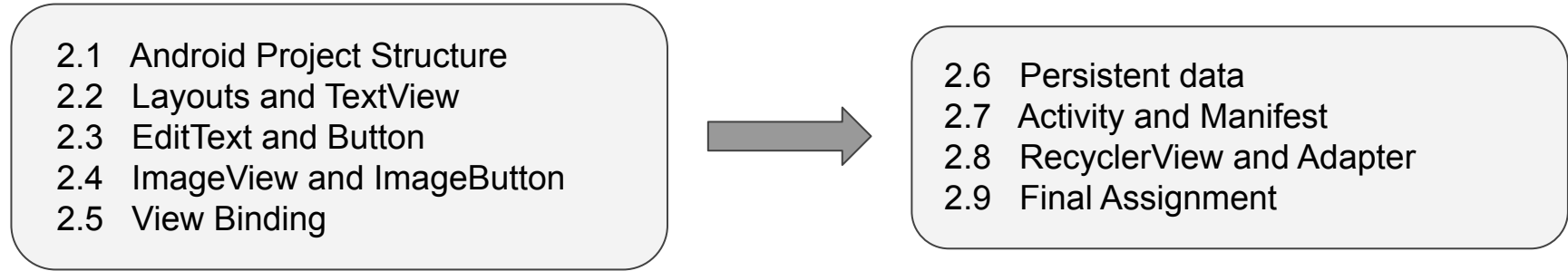


Module 2:

Develop Your First Android Application

Course Outline

Module 2: Develop Your First Android Application



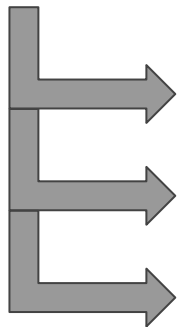
- 2.1 Android Project Structure
- 2.2 Layouts and TextView
- 2.3 EditText and Button
- 2.4 ImageView and ImageButton
- 2.5 View Binding

- 2.6 Persistent data
- 2.7 Activity and Manifest
- 2.8 RecyclerView and Adapter
- 2.9 Final Assignment

Course Outline

Repository

<https://github.com/ferryyuwono/android-beginner>



Demo Code

Exercise Code

Solution Code

2.01.01-Demo-ProjectStructure

2.02.01-Demo-LayoutsTextView

2.02.02-Exercise-LayoutsTextView

2.02.03-Solution-LayoutsTextView

2.03.01-Demo-EditTextButton

2.03.02-Exercise-EditTextButton

2.03.03-Solution-EditTextButton

2.04.01-Demo-ImageViewImageButton

2.04.02-Exercise-ImageViewImageBut...

2.04.03-Solution-ImageViewImageBut...

2.05.01-Demo-ViewBinding

2.06.01-Demo-PersistentData

2.06.02-Exercise-PersistentData

2.06.03-Solution-PersistentData

2.07.01-Demo-ActivityManifest

2.07.02-Exercise-ActivityManifest

2.07.03-Solution-ActivityManifest

2.08.01-Demo-RecyclerViewAdapter

2.08.02-Exercise-RecyclerViewAdapter

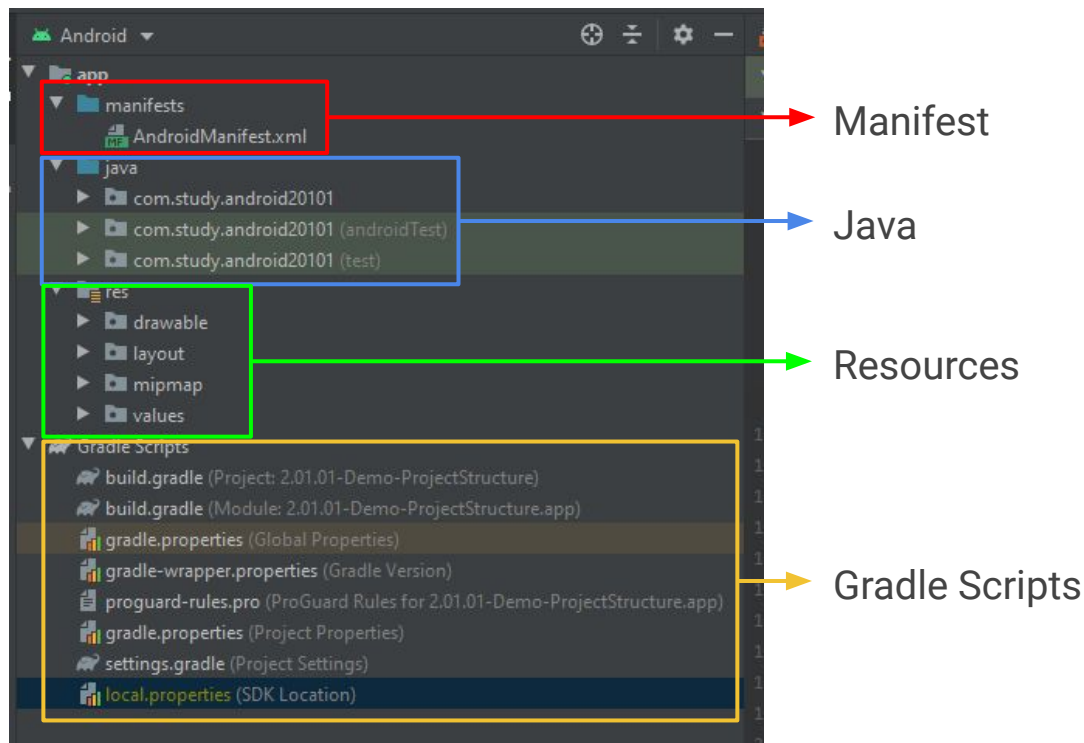
2.08.03-Solution-RecyclerViewAdapter

2.09.01-Exercise-FinalAssignment

2.09.02-Solution-FinalAssignment

2.1 Android Project Structure

<https://github.com/ferryyuwono/android-beginner/tree/main/2.01.01-Demo-ProjectStructure>



Java

```
data class PersonData(val firstName: String, val lastName: String, val age: Int)
```

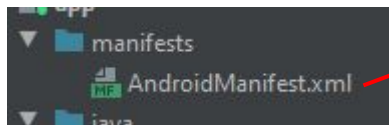
```
class Main2Activity : AppCompatActivity() {  
    override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        setContentView(R.layout.activity_main2)  
    }  
}
```

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

```
class ExampleUnitTest {  
    @Test  
    fun addition_isCorrect() {  
        assertEquals( expected: 4, actual: 2 + 2 )  
    }  
}
```

```
@RunWith(AndroidJUnit4::class)  
class ExampleInstrumentedTest {  
    @Test  
    fun useAppContext() {  
        // Context of the app under test.  
        val appContext = InstrumentationRegistry.getInstrumentation().targetContext  
        assertEquals( expected: "com.study.android20101", appContext.packageName )  
    }  
}
```

AndroidManifest



Application

Activity Main

Launcher

Activity Main 2

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.study.android20101">

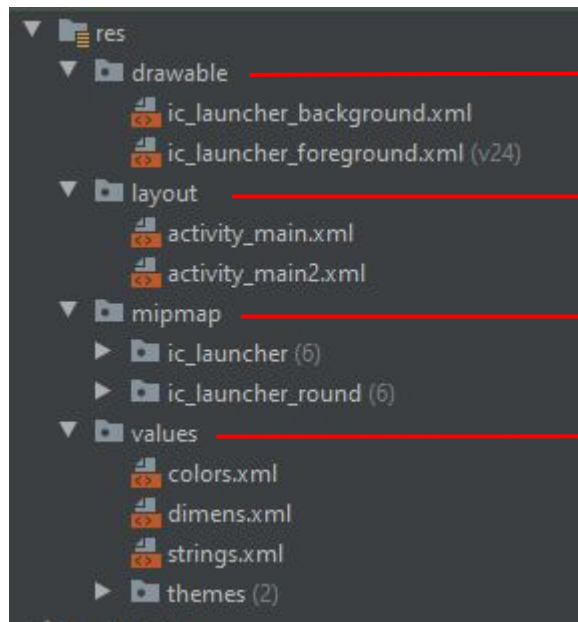
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.20101DemoProjectStructure">

        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>

        <activity android:name=".ui.Main2Activity" />
    </application>
</manifest>
```

Resources



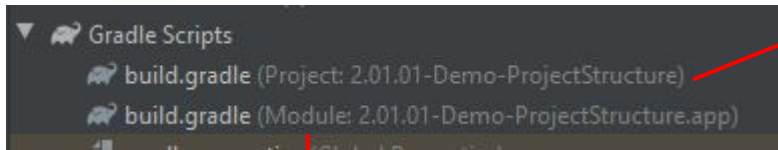
Drawable (image, vector, shape, selector, etc)

Layout (activity, layout, etc)

Mipmap (launcher icon)

Values (colors, dimensions, strings, themes, styles, etc)

Gradle Scripts



Project settings
(kotlin version, dependencies, repository, etc)

Module settings (app)
(plugins, app version, sdk, dependencies, etc)

```
plugins {
    id 'com.android.application'
    id 'kotlin-android'
}

android {
    compileSdkVersion 30
    buildToolsVersion "30.0.3"

    defaultConfig {
        applicationId "com.study.android20101"
        minSdkVersion 24
        targetSdkVersion 30
        versionCode 1
        versionName "1.0"

        testInstrumentationRunner "androidx.test.runner.AndroidJUnitRunner"
    }

    buildTypes {
        release {
            minifyEnabled false
            proguardFiles getDefaultProguardFile('proguard-android-optimize.txt'), 'proguard-rules.pro'
        }
    }

    compileOptions {
        sourceCompatibility JavaVersion.VERSION_1_8
        targetCompatibility JavaVersion.VERSION_1_8
    }

    kotlinOptions {
        jvmTarget = '1.8'
    }
}
```

```
dependencies {
    implementation "org.jetbrains.kotlin:kotlin-stdlib:$kotlin_version"
    implementation 'androidx.core:core-ktx:1.3.2'
    implementation 'androidx.appcompat:appcompat:1.2.0'
    implementation 'com.google.android.material:material:1.3.0'
    implementation 'androidx.constraintlayout:constraintlayout:2.0.4'
    testImplementation 'junit:junit:4.+'
    androidTestImplementation 'androidx.test.ext:junit:1.1.2'
    androidTestImplementation 'androidx.test.espresso:espresso-core:3.3.0'
}
```

```
// Top-level build file where you can add configuration options common to all sub-projects/modules.
buildscript {
    ext.kotlin_version = "1.4.21"
    repositories {
        google()
        jcenter()
    }
    dependencies {
        classpath "com.android.tools.build:gradle:4.1.3"
        classpath "org.jetbrains.kotlin:kotlin-gradle-plugin:$kotlin_version"

        // NOTE: Do not place your application dependencies here; they belong
        // in the individual module build.gradle files
    }
}

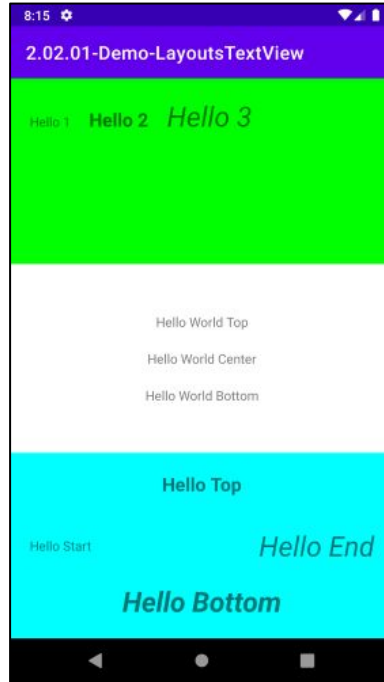
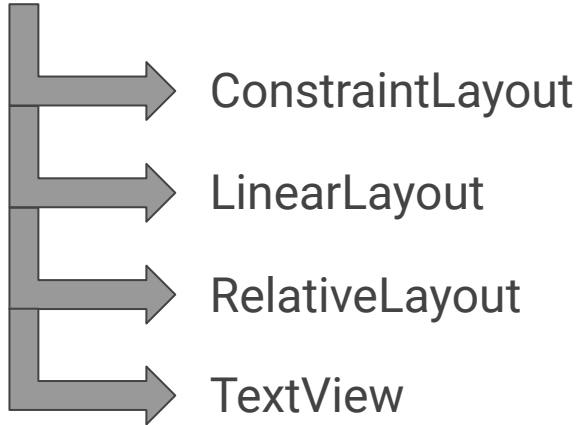
allprojects {
    repositories {
        google()
        jcenter()
    }
}

task clean(type: Delete) {
    delete rootProject.buildDir
}
```

2.2.1 [Demo] Layouts and TextView

<https://github.com/ferryyuwono/android-beginner/tree/main/2.02.01-Demo-LayoutsTextView>

File: [activity_main.xml](#)



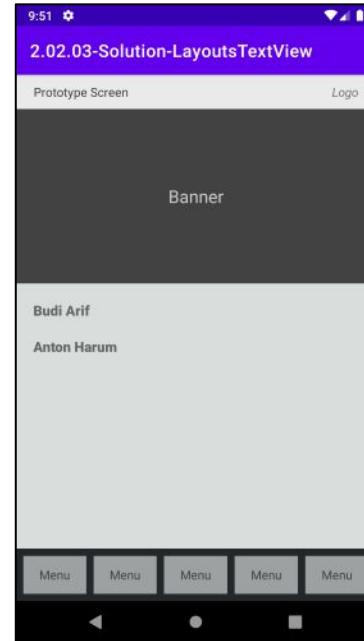
2.2.2 [Exercise] Layouts and TextView

<https://github.com/ferryyuwono/android-beginner/tree/main/2.02.02-Exercise-LayoutsTextView>

File: [activity_main.xml](#), [strings.xml](#), [colors.xml](#)

- Extract resource to strings
- Extract resource to colors
- Style Layout and Textview
- LinearLayout weight

Expected Result



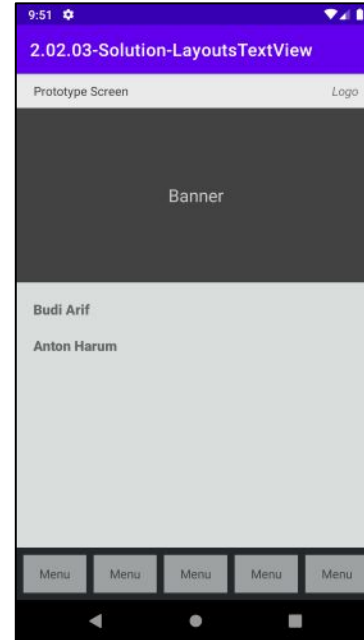
2.2.3 [Solution] Layouts and TextView

<https://github.com/ferryyuwono/android-beginner/tree/main/2.02.03-Solution-LayoutsTextView>

File: [activity_main.xml](#), [strings.xml](#), [colors.xml](#)

- Extract resource to strings
- Extract resource to colors
- Style Layout and Textview
- LinearLayout weight

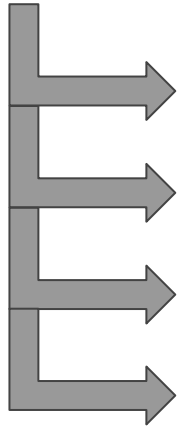
Expected Result



2.3.1 [Demo] EditText and Button

<https://github.com/ferryyuwono/android-beginner/tree/main/2.03.01-Demo-EditTextButton>

File: [activity_main.xml](#), [MainActivity.kt](#)

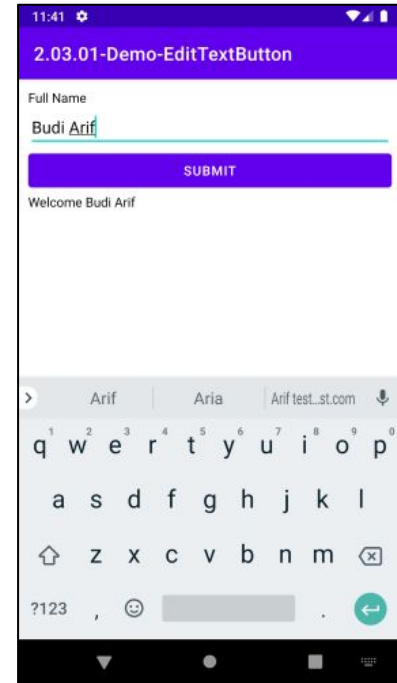
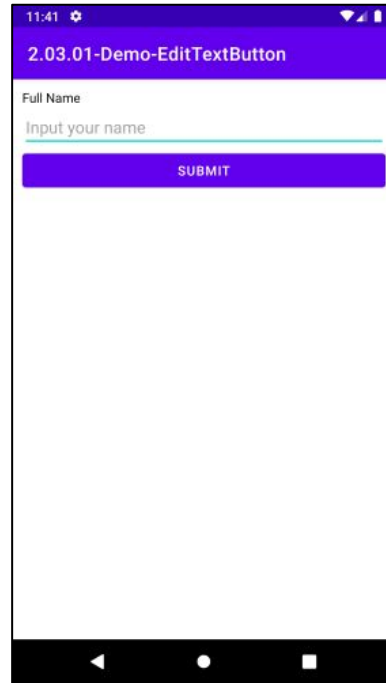


EditText

Button

OnClick Event Handler

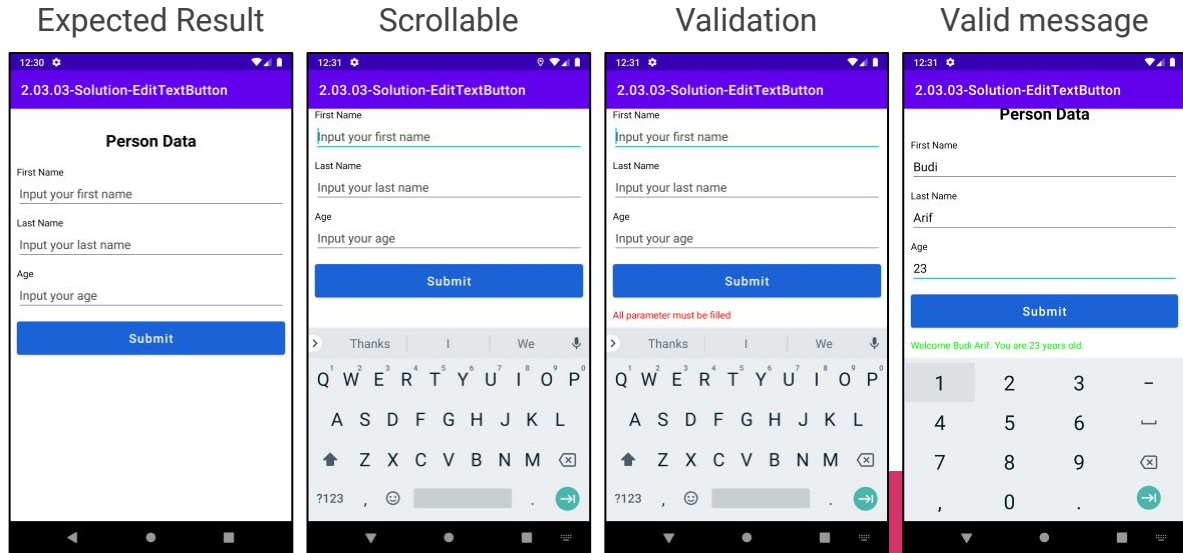
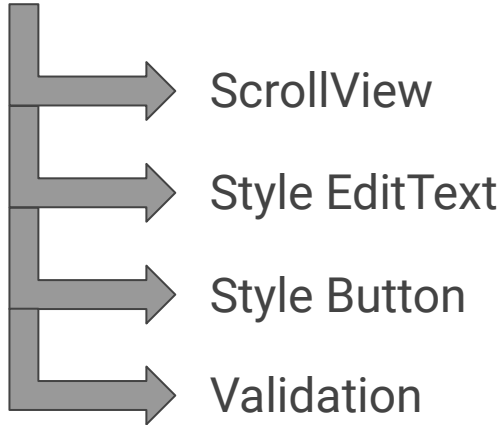
Tools Attribute



2.3.2 [Exercise] EditText and Button

<https://github.com/ferryyuwono/android-beginner/tree/main/2.03.02-Exercise-EditTextButton>

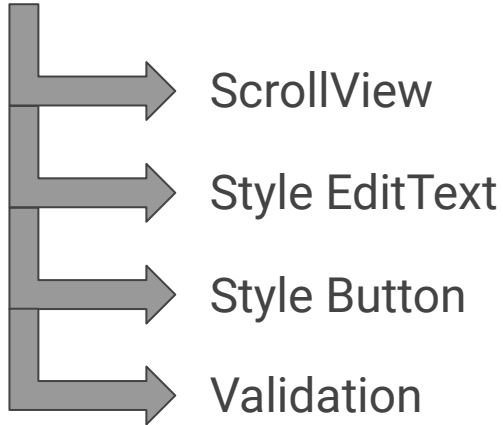
File: [activity_main.xml](#), [MainActivity.kt](#)



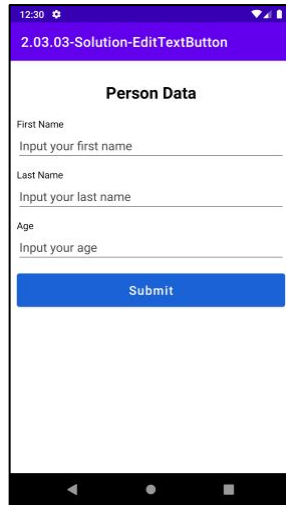
2.3.3 [Solution] EditText and Button

<https://github.com/ferryyuwono/android-beginner/tree/main/2.03.03-Solution-EditTextButton>

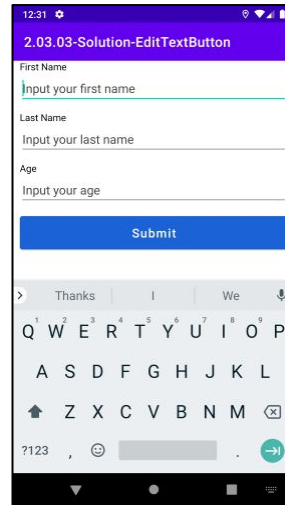
File: [activity_main.xml](#), [MainActivity.kt](#)



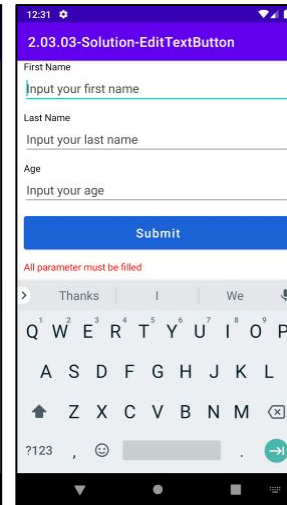
Expected Result



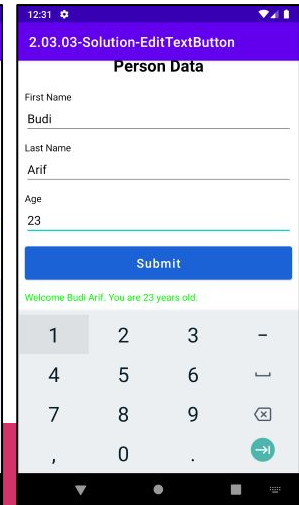
Scrollable



Validation



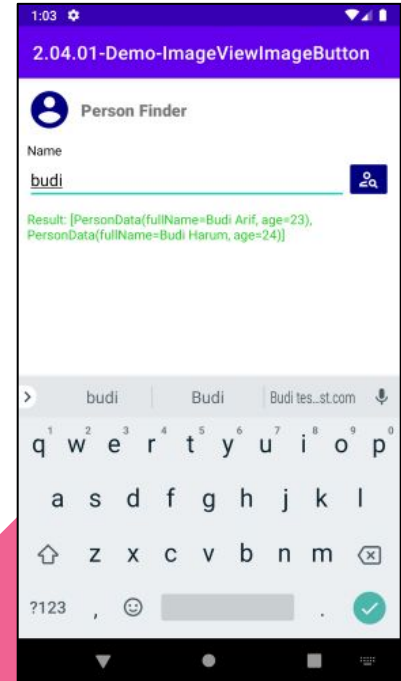
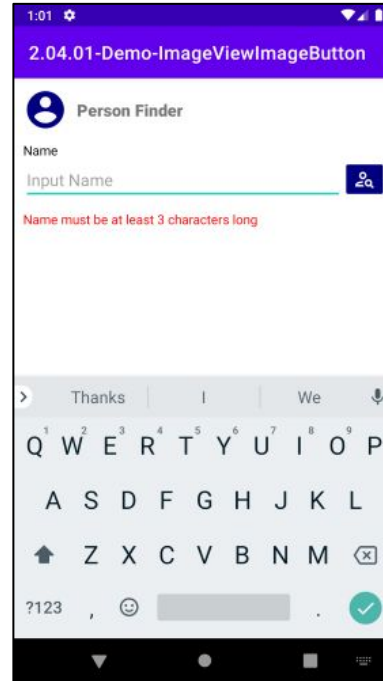
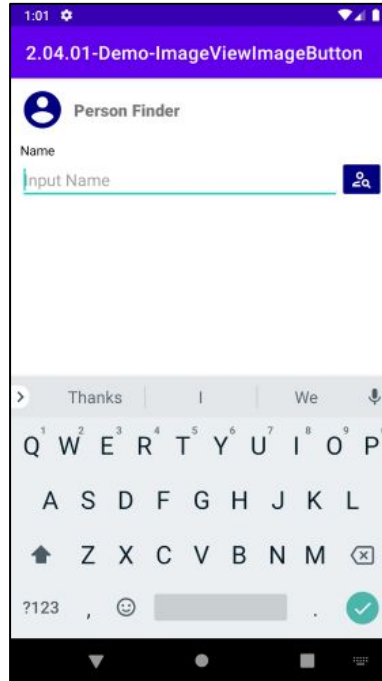
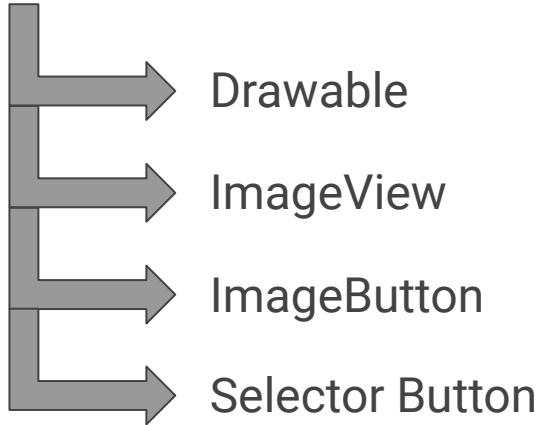
Valid message



2.4.1 [Demo] Image and ImageButton

<https://github.com/ferryyuwono/android-beginner/tree/main/2.04.01-Demo-ImageViewImageButton>

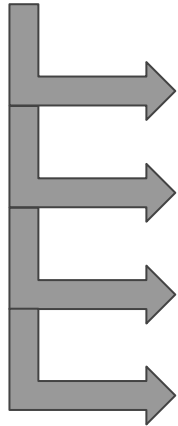
File: [activity_main.xml](#), [MainActivity.kt](#), [selector_button_search.xml](#)



2.4.2 [Exercise] ImageView and ImageButton

<https://github.com/ferryyuwono/android-beginner/tree/main/2.04.02-Exercise-ImageViewImageButton>

File: [activity_main.xml](#), [MainActivity.kt](#), [shape_person_background.xml](#), [selector_checkbox_favorite.xml](#)



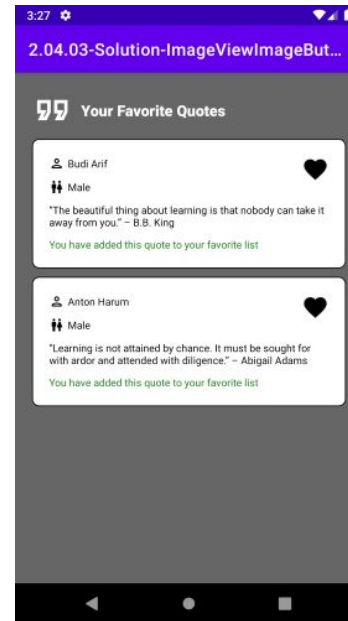
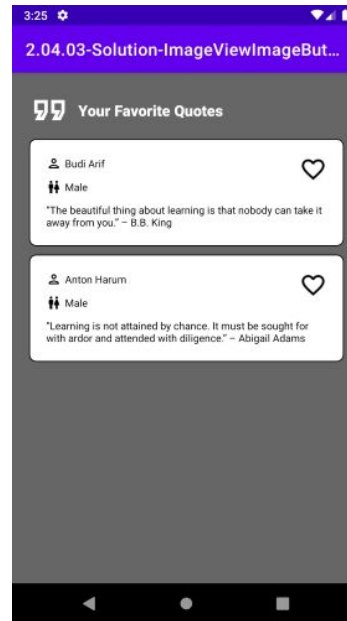
Shape

CheckBox

Selector CheckBox

Visibility

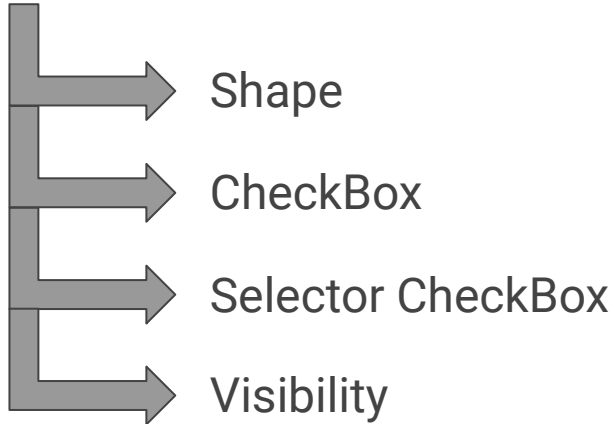
Expected Result



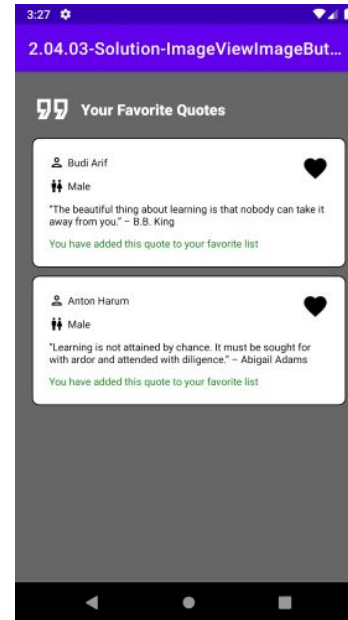
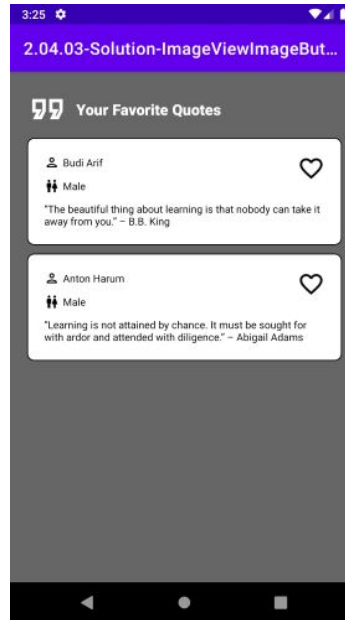
2.4.3 [Solution] ImageView and ImageButton

<https://github.com/ferryyuwono/android-beginner/tree/main/2.04.03-Solution-ImageViewImageButton>

File: [activity_main.xml](#), [MainActivity.kt](#), [shape_person_background.xml](#), [selector_checkbox_favorite.xml](#)



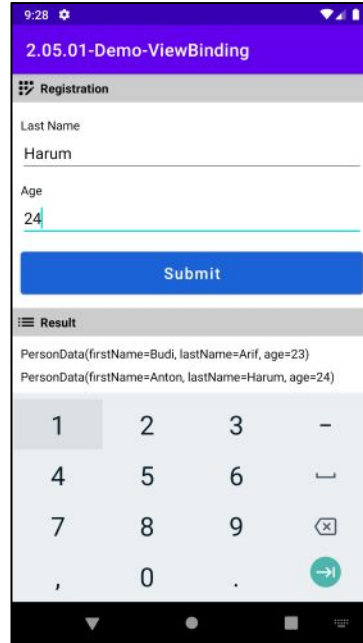
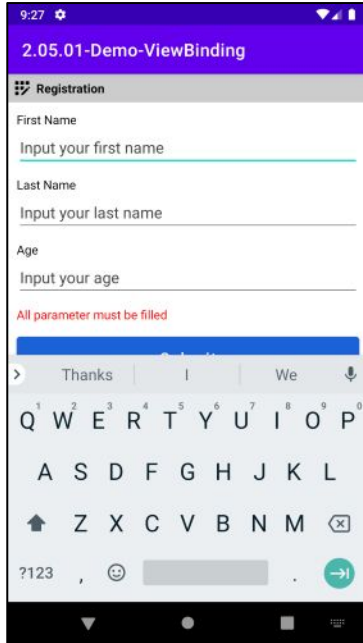
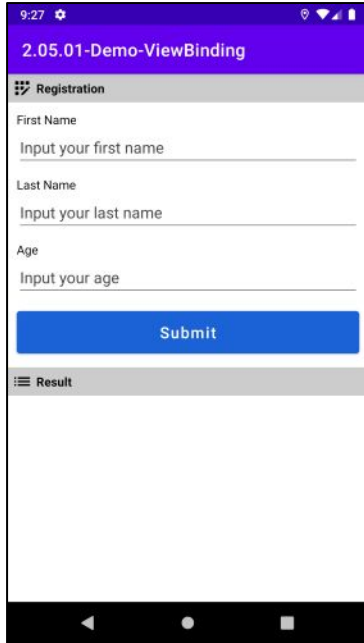
Expected Result




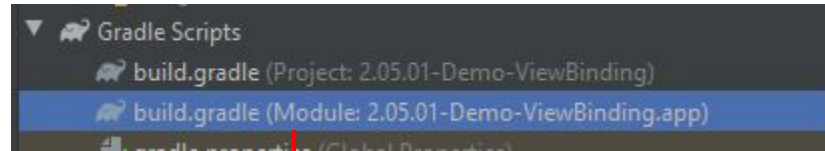
2.5.1 [Demo] View Binding

<https://github.com/ferryyuwono/android-beginner/tree/main/2.05.01-Demo-ViewBinding>


File: [build.gradle](#), [activity_main.xml](#), [MainActivity.kt](#)



2.5.1 [Demo] View Binding

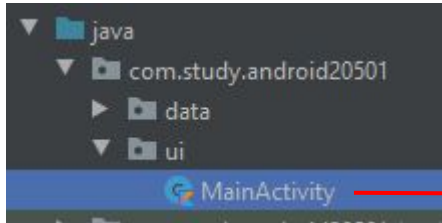


```
//Enable ViewBinding Feature
buildFeatures {
    viewBinding true
}
```




Gradle files have changed since last project sync. A project sync may be necessary for the IDE to work properly. [Sync Now](#)

2.5.1 [Demo] View Binding



```
private lateinit var binding: ActivityMainBinding

override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    binding = ActivityMainBinding.inflate(layoutInflater)
    setContentView(binding.root)
}
```

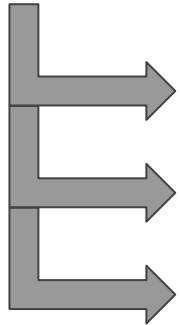


```
//No need to use findViewById
//val firstName = findViewById<EditText>(R.id.editTextFirstName).text
//val lastName = findViewById<EditText>(R.id.editTextLastName).text
//val age = findViewById<EditText>(R.id.editTextAge).text
val firstName = binding.editTextFirstName.text
val lastName = binding.editTextLastName.text
val age = binding.editTextAge.text
```

2.6.1 [Demo] Persistent Data

<https://github.com/ferryyuwono/android-beginner/tree/main/2.06.01-Demo-PersistentData>

File: [activity_main.xml](#), [MainActivity.kt](#)



Shared Preferences

Get Persistent Data

Save Persistent Data

First Run

Screenshot of the app during the first run. The app title is "2.06.01-Demo-PersistentData". The screen shows a "Person Data" form with two input fields: "Major" (with placeholder "Input your major") and "Full Name" (with placeholder "Input your full name"). Below the inputs is a blue "Add" button. At the bottom, there is a section titled "Available Data" which is currently empty.

Save Major

Screenshot of the app after saving the major. The "Major" field now contains "Computer Science". The "Full Name" field still has the placeholder "Input your full name". The blue "Add" button is present. The "Available Data" section at the bottom now displays the text: "PersonData(major=Computer Science, fullName=Budi Arif)".

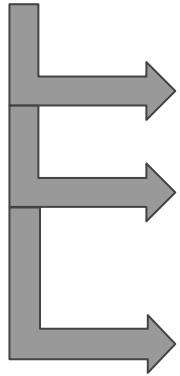
Second Run

Screenshot of the app during the second run. The "Major" field contains "Computer Science" and the "Full Name" field has the placeholder "Input your full name". The blue "Add" button is present. The "Available Data" section at the bottom displays the text: "PersonData(major=Computer Science, fullName=Budi Arif)".

2.6.2 [Exercise] Persistent Data

<https://github.com/ferryyuwono/android-beginner/tree/main/2.06.02-Exercise-PersistentData>

File: [build.gradle](#), [activity_main.xml](#), [MainActivity.kt](#)

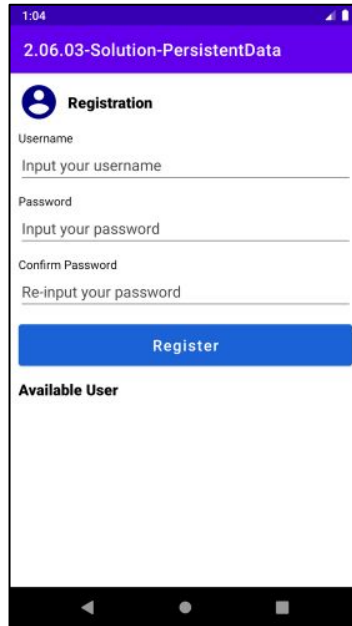


EditText Password

Module
Dependencies

Gson

First Run



1:04

2.06.03-Solution-PersistentData

Registration

Username
Input your username

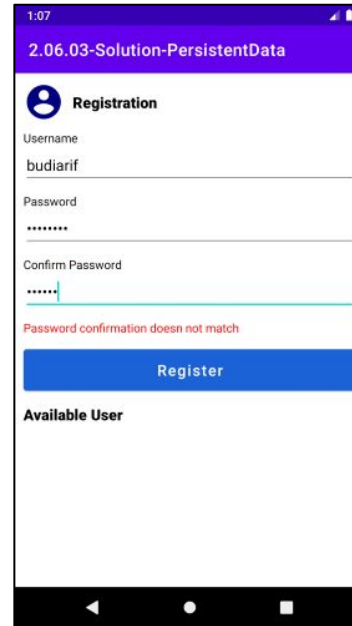
Password
Input your password

Confirm Password
Re-input your password

Register

Available User

Validation



1:07

2.06.03-Solution-PersistentData

Registration

Username
budiarif

Password

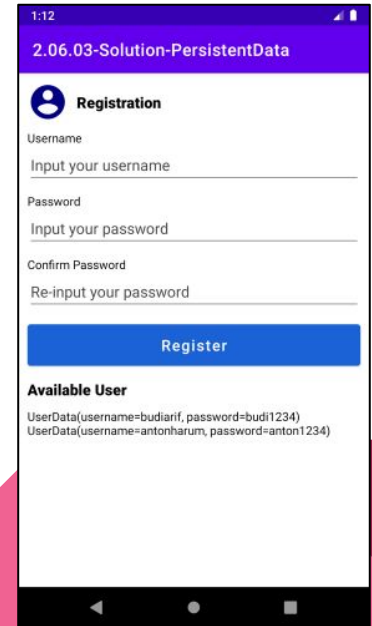
Confirm Password

Password confirmation doesn't match

Register

Available User

Add data & Second Run



1:12

2.06.03-Solution-PersistentData

Registration

Username
Input your username

Password
Input your password

Confirm Password
Re-input your password

Register

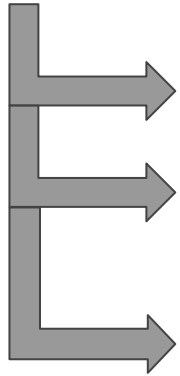
Available User

UserData(username=budiarif, password=budi1234)
UserData(username=antonharum, password=anton1234)

2.6.3 [Solution] Persistent Data

<https://github.com/ferryyuwono/android-beginner/tree/main/2.06.03-Solution-PersistentData>

File: [build.gradle](#), [activity_main.xml](#), [MainActivity.kt](#)



EditText Password

Module
Dependencies

Gson

First Run

A screenshot of an Android app titled "2.06.03-Solution-PersistentData" during its first run. The screen shows a "Registration" form with fields for Username, Password, and Confirm Password. The Username field contains "budiarif". The Password field contains "budi1234". The Confirm Password field contains "budi1234". A blue "Register" button is at the bottom. Below the button, the text "Available User" is displayed.

Validation

A screenshot of the app during validation. The Username field contains "budiarif". The Password field contains "budi1234". The Confirm Password field contains "budi1234". A red error message "Password confirmation doesn't match" is displayed below the Confirm Password field. The blue "Register" button is at the bottom. Below the button, the text "Available User" is displayed.

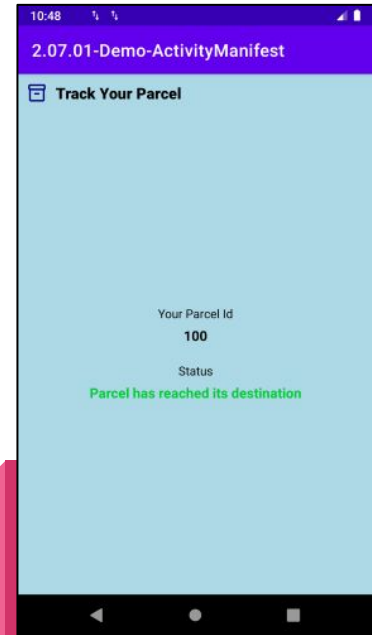
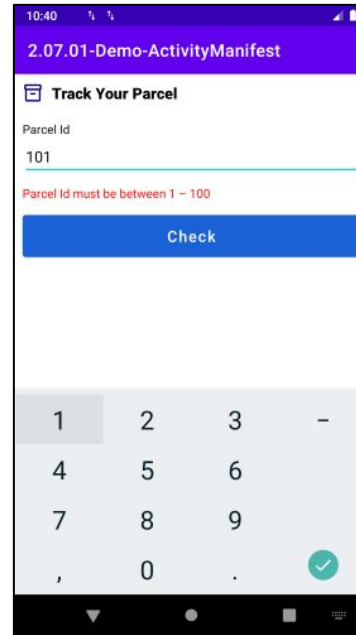
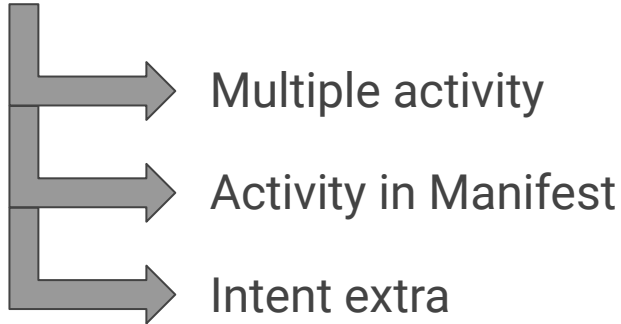
Add data & Second Run

A screenshot of the app after adding data and running again. The Username field contains "budiarif". The Password field contains "budi1234". The Confirm Password field contains "budi1234". The blue "Register" button is at the bottom. Below the button, the text "Available User" is displayed. Below "Available User", the text "UserData(username=budiarif, password=budi1234)" and "UserData(username=antonharum, password=anton1234)" are displayed.

2.7.1 [Demo] Activity and Manifest

<https://github.com/ferryyuwono/android-beginner/tree/main/2.07.01-Demo-ActivityManifest>

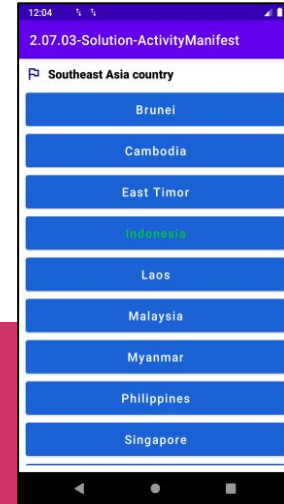
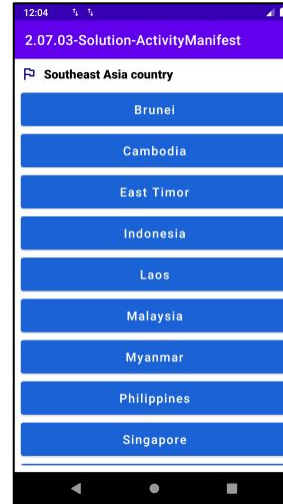
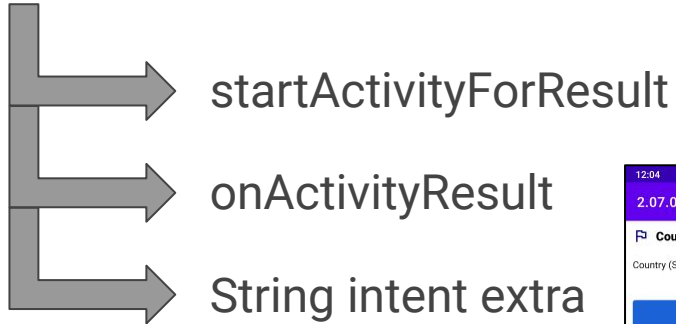
File: [activity_main.xml](#), [MainActivity.kt](#), [activity_status.xml](#), [StatusActivity.kt](#), [AndroidManifest.xml](#)



2.7.2 [Exercise] Activity and Manifest

<https://github.com/ferryyuwono/android-beginner/tree/main/2.07.02-Exercise-ActivityManifest>

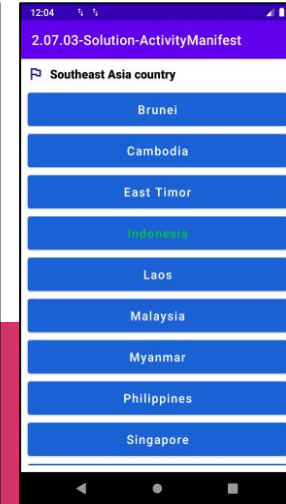
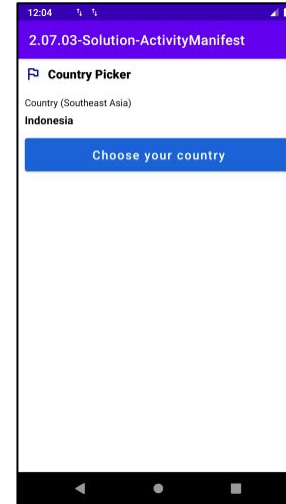
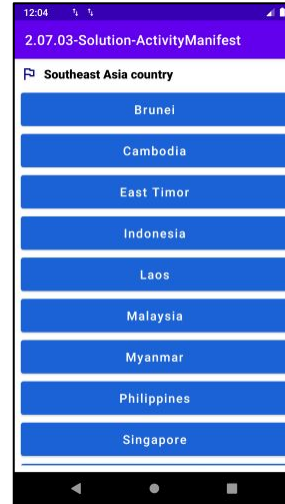
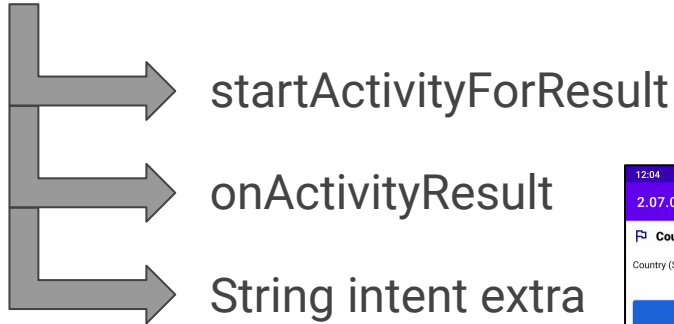
File: [activity_main.xml](#), [MainActivity.kt](#), [activity_country.xml](#), [CountryActivity.kt](#), [AndroidManifest.xml](#)



2.7.3 [Solution] Activity and Manifest

<https://github.com/ferryyuwono/android-beginner/tree/main/2.07.03-Solution-ActivityManifest>

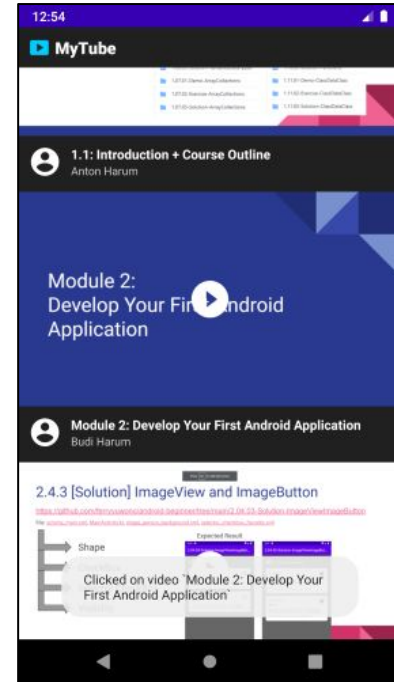
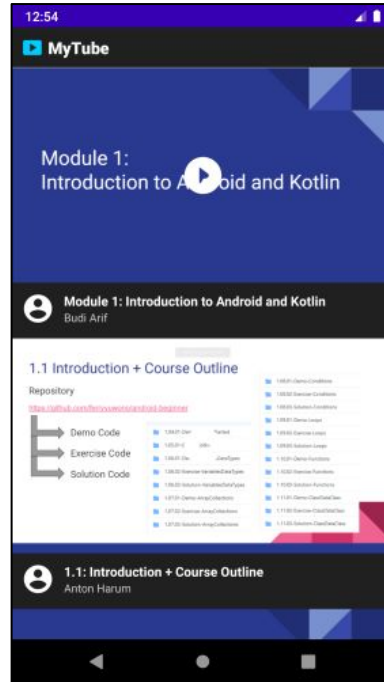
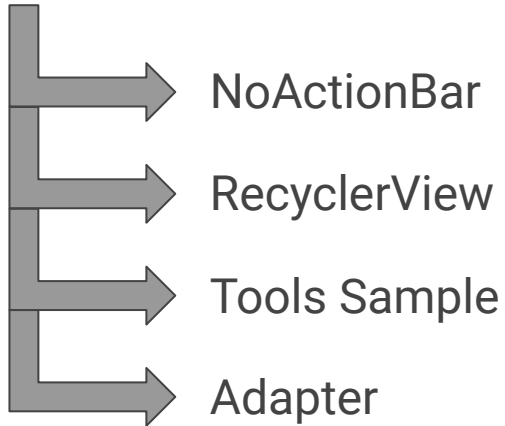
File: [activity_main.xml](#), [MainActivity.kt](#), [activity_country.xml](#), [CountryActivity.kt](#), [AndroidManifest.xml](#)



2.8.1 [Demo] RecyclerView and Adapter

<https://github.com/ferryyuwono/android-beginner/tree/main/2.08.01-Demo-RecyclerViewAdapter>

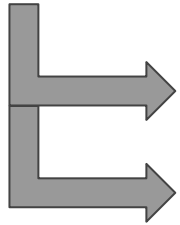
File: [build.gradle](#), [themes.xml](#), [activity_main.xml](#), [MainActivity.kt](#), [item_video.xml](#), [VideoAdapter.kt](#), [VideoViewHolder.kt](#)



2.8.2 [Exercise] RecyclerView and Adapter

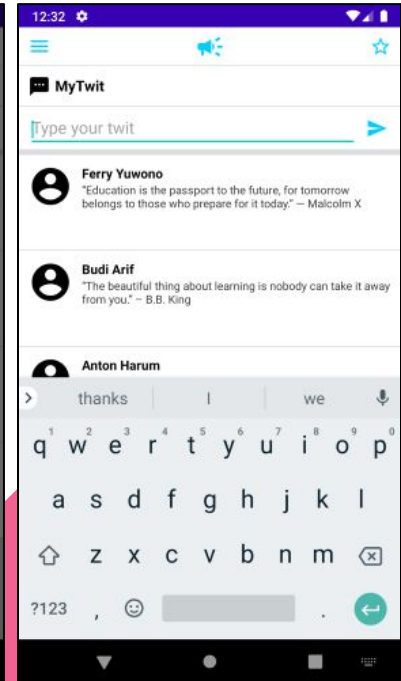
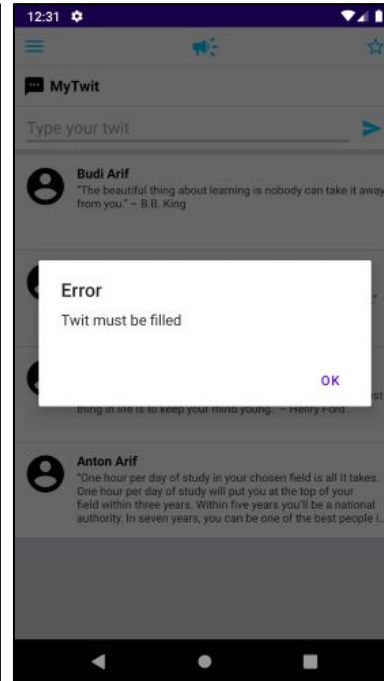
<https://github.com/ferryyuwono/android-beginner/tree/main/2.08.02-Exercise-RecyclerViewAdapter>

File: [build.gradle](#), [activity_main.xml](#), [MainActivity.kt](#), [item_twit.xml](#), [TwitAdapter.kt](#), [TwitViewHolder.kt](#)



Add Data Adapter

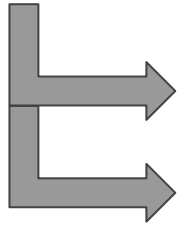
Alert Dialog



2.8.3 [Solution] RecyclerView and Adapter

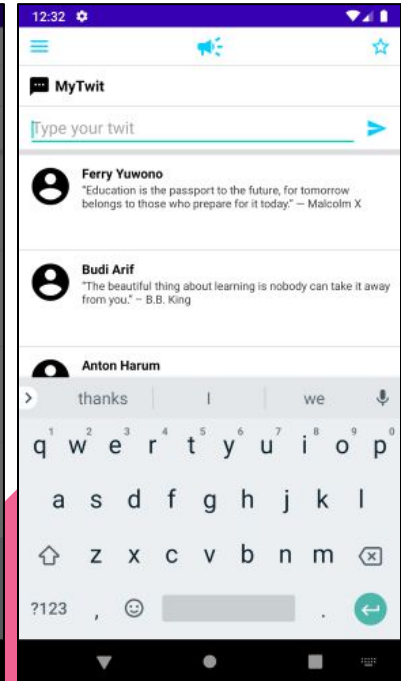
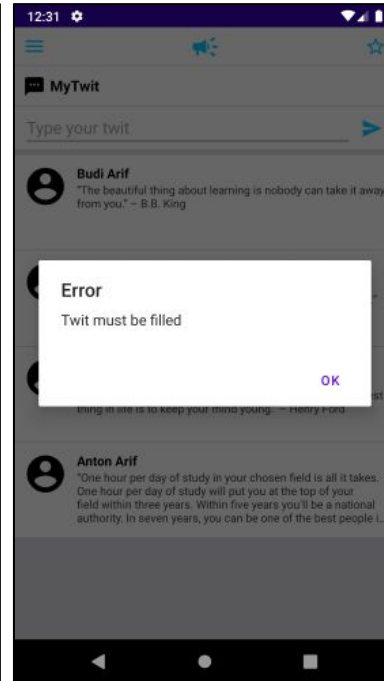
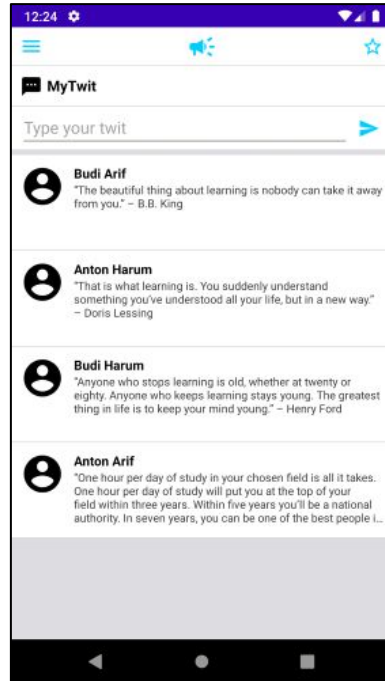
<https://github.com/ferryyuwono/android-beginner/tree/main/2.08.03-Solution-RecyclerViewAdapter>

File: [build.gradle](#), [activity_main.xml](#), [MainActivity.kt](#), [item_twit.xml](#), [TwitAdapter.kt](#), [TwitViewHolder.kt](#)



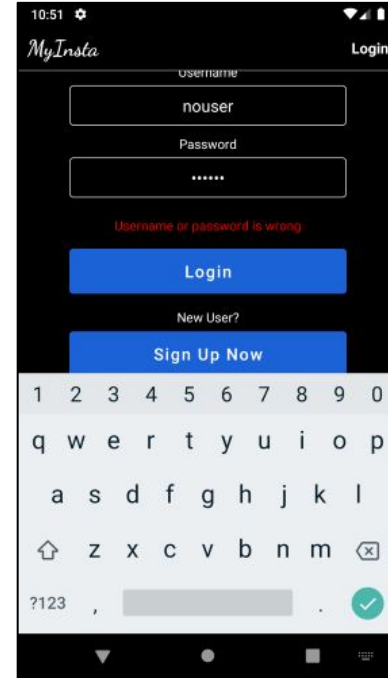
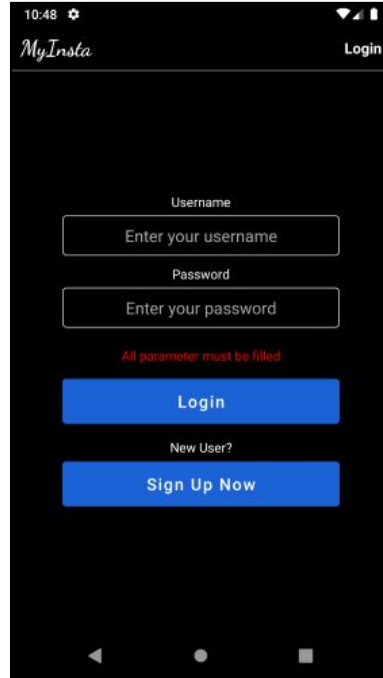
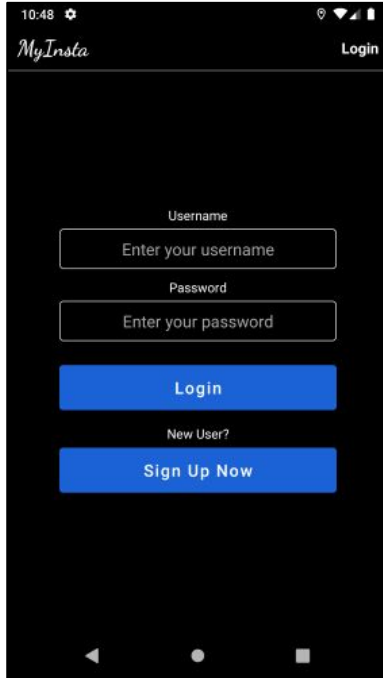
Add Data Adapter

Alert Dialog






2.8.1 [Exercise] Final Assignment


<https://github.com/ferryyuwono/android-beginner/tree/main/2.09.01-Exercise-FinalAssignment>



2.8.1 [Exercise] Final Assignment

10:51   

MyInsta Sign Up






First Name

Last Name

Username

Password

Sign Up

10:51   

MyInsta Sign Up

Last Name

Username

Password

Sign Up

Sign Up Success. Please login to continue

OK




1

q w e r t y u i o p

a s d f g h j k l

⬇ z x c v b n m ⬇

?123 , . →

10:52   

MyInsta Sign Up

Last Name

Username

Password

Sorry, that username already exists

Sign Up

1 2 3 4 5 6 7 8 9 0

q w e r t y u i o p

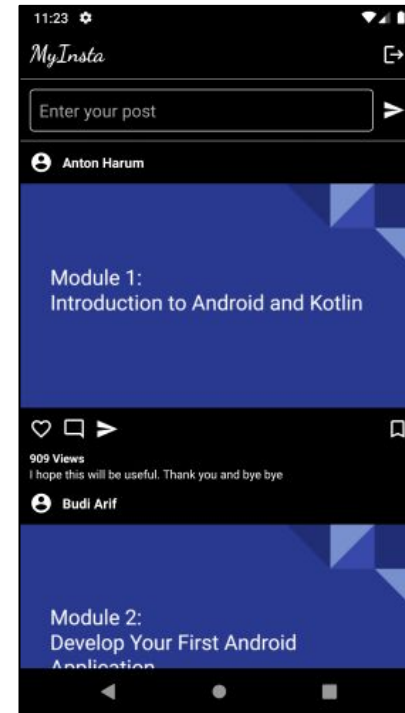
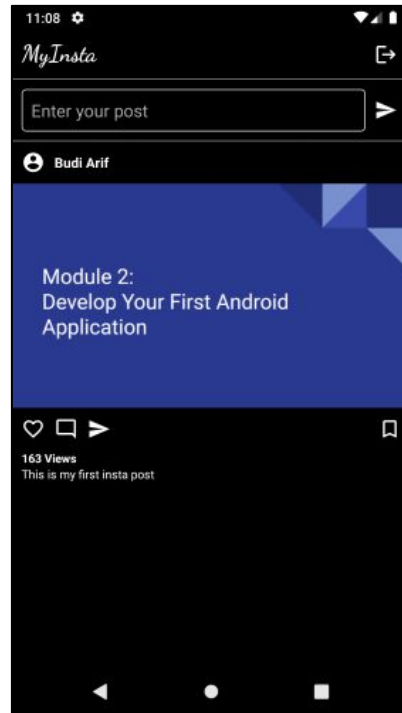
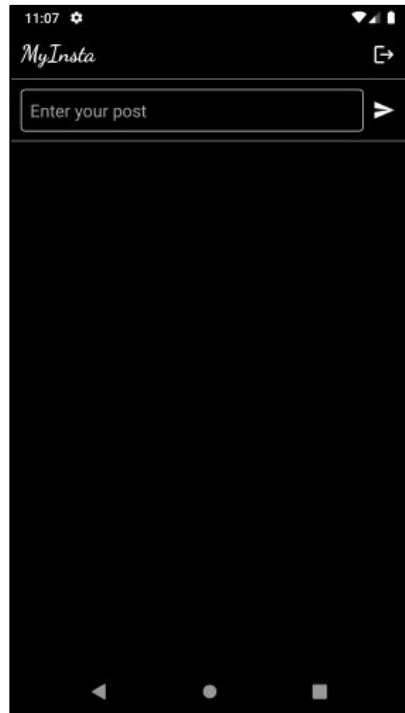
a s d f g h j k l


⬇ z x c v b n m ⬇

?123 , . →

2.8.2 [Solution] Final Assignment

<https://github.com/ferryyuwono/android-beginner/tree/main/2.09.02-Solution-FinalAssignment>





End of Module 2:
Good Job and Keep Learning!