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Various color codes used in Android are given in
https://m2.material.io/design/color/the-color-system.html#tools-for-picking-colors

- ➢ Start a new EmptyViewsActivity, name it CardViewExample
- ➢ Replace activity_main.xml with the following code

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.cardview.widget.CardView 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="wrap_content"
    android:id="@+id/main"
    tools:context=".MainActivity"
    android:layout_margin="8dp"
    app:cardCornerRadius="4dp">

    <androidx.constraintlayout.widget.ConstraintLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:padding="16dp">




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

This XML code defines a layout structure using a CardView which offers a way to display information inside cards that have a consistent look across the platform. It is often used to present a UI element that is elevated above other elements, giving a shadow effect that increases understanding of interaction. Inside this CardView, there is a ConstraintLayout, which is a highly flexible layout manager designed to facilitate complex layouts with flat view hierarchies (no nested view groups). Here's a breakdown of each component and attribute:

CardView Attributes

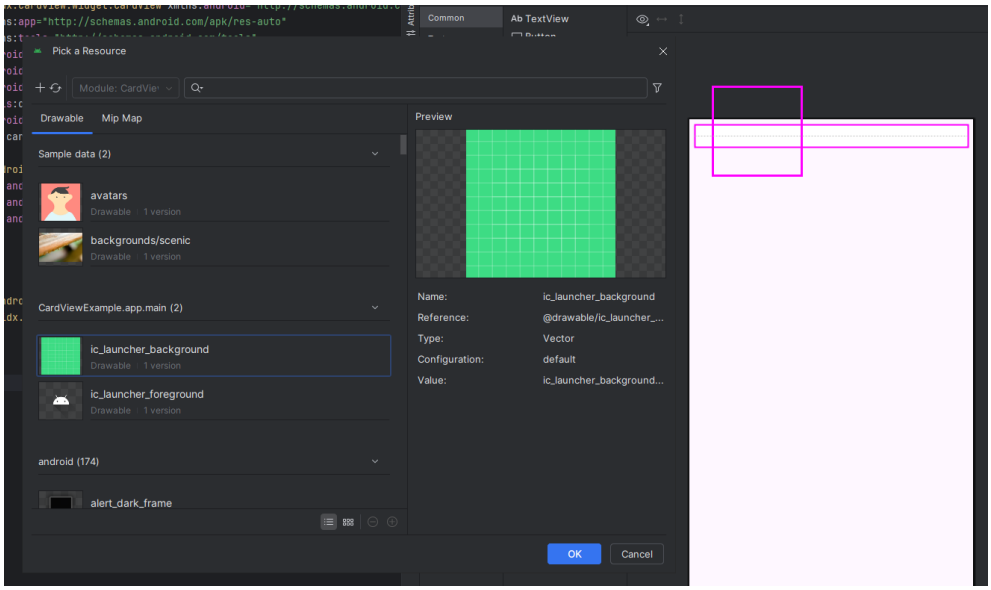
- **android:layout_width="match_parent"**: The CardView will match the width of its parent container.
- **android:layout_height="wrap_content"**: The height of the CardView is determined by the height of its children plus padding.
- **android:layout_margin="8dp"**: Adds an 8dp margin around the CardView, separating it from other UI elements.
- **app:cardCornerRadius="4dp"**: Defines the radius of the card's corners. A 4dp corner radius provides a subtle rounded corner.

ConstraintLayout Attributes

- **android:layout_width="match_parent"** and **android:layout_height="wrap_content"**: The ConstraintLayout will match the width of the CardView and wrap its content vertically. This setup is typical for layouts that need to adjust their size based on the content they contain.
- **android:padding="16dp"**: Applies padding inside the ConstraintLayout, ensuring that its children have a space offset from the edges of the ConstraintLayout.

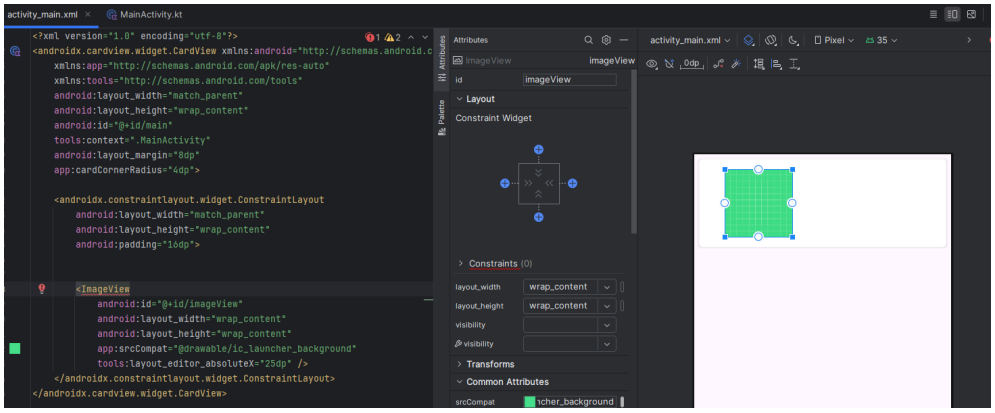
The ConstraintLayout serves as a container for other UI elements you might want to include such as ImageView, TextView, or any other widgets. It allows for flexible positioning and dimension adjustments of its child views relative to each other and to the parent layout.

➢ Add an imageview



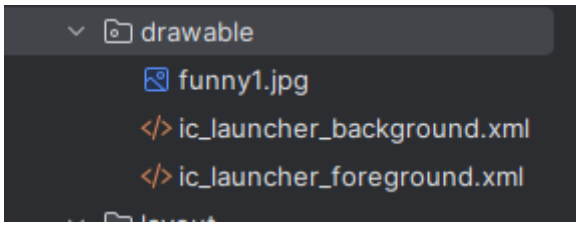
➢ Note that we use constrainf layout but the view is not constrained

This view is not constrained. It only has designtime positions, so it will jump to (0,0) at runtime unless you add the constraints



➢ Add two textview to the right one top of the other and define the constraints

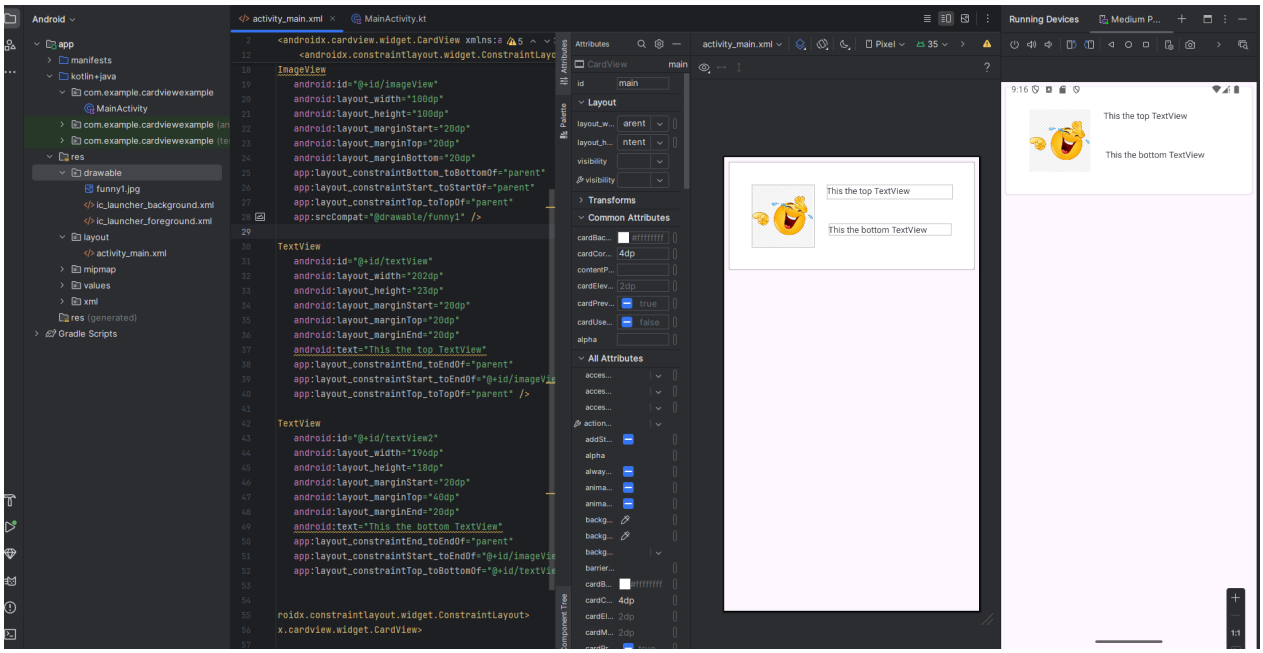
➢ Find an image from internet save it to your computer and drag it to drawable folder



➢ Modify the imageview

```
ImageView
    android:id="@+id/imageView"
    android:layout_width="100dp"
    android:layout_height="100dp"
    android:layout_marginStart="20dp"
    android:layout_marginTop="20dp"
    android:layout_marginBottom="20dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:srcCompat="@drawable/funny1" />
```

➢ Run the application and paste a screen capture of the code the preview and emulator



➢ Run your application and paste a screen capture of the xml code the preview and emulator

➢

It is on the next page.

➢

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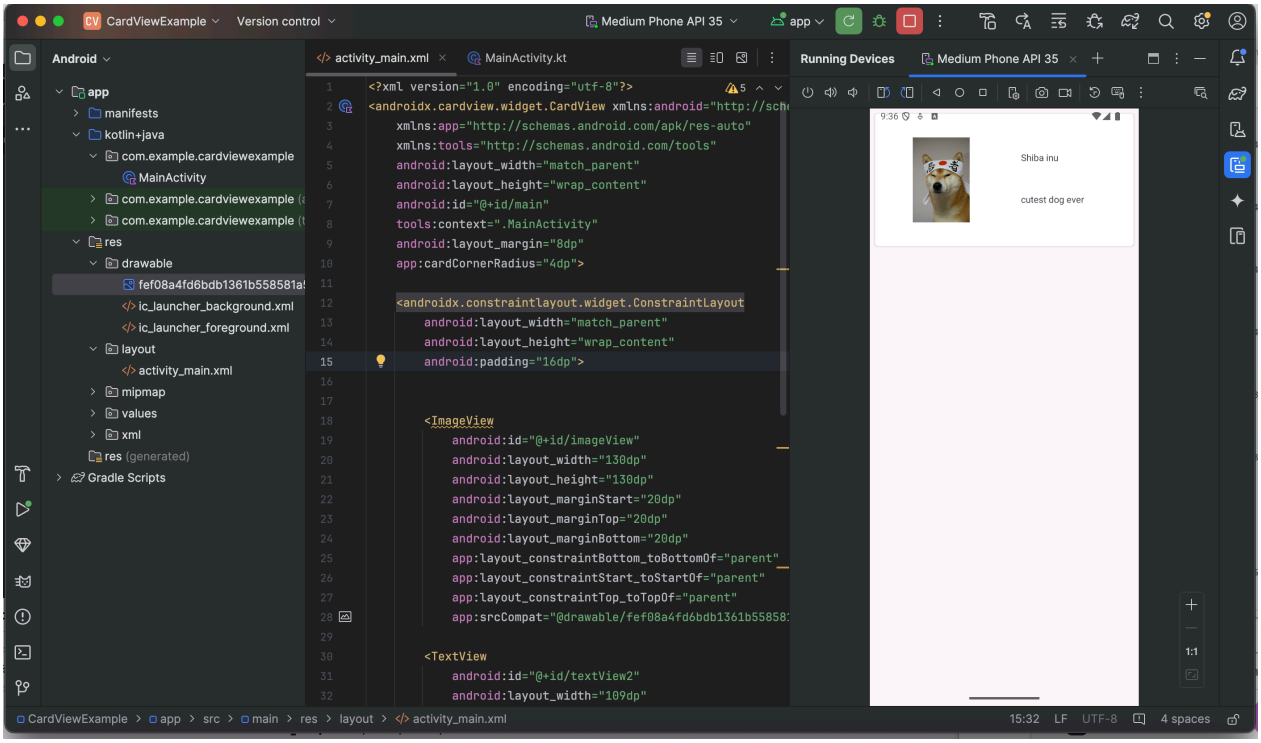
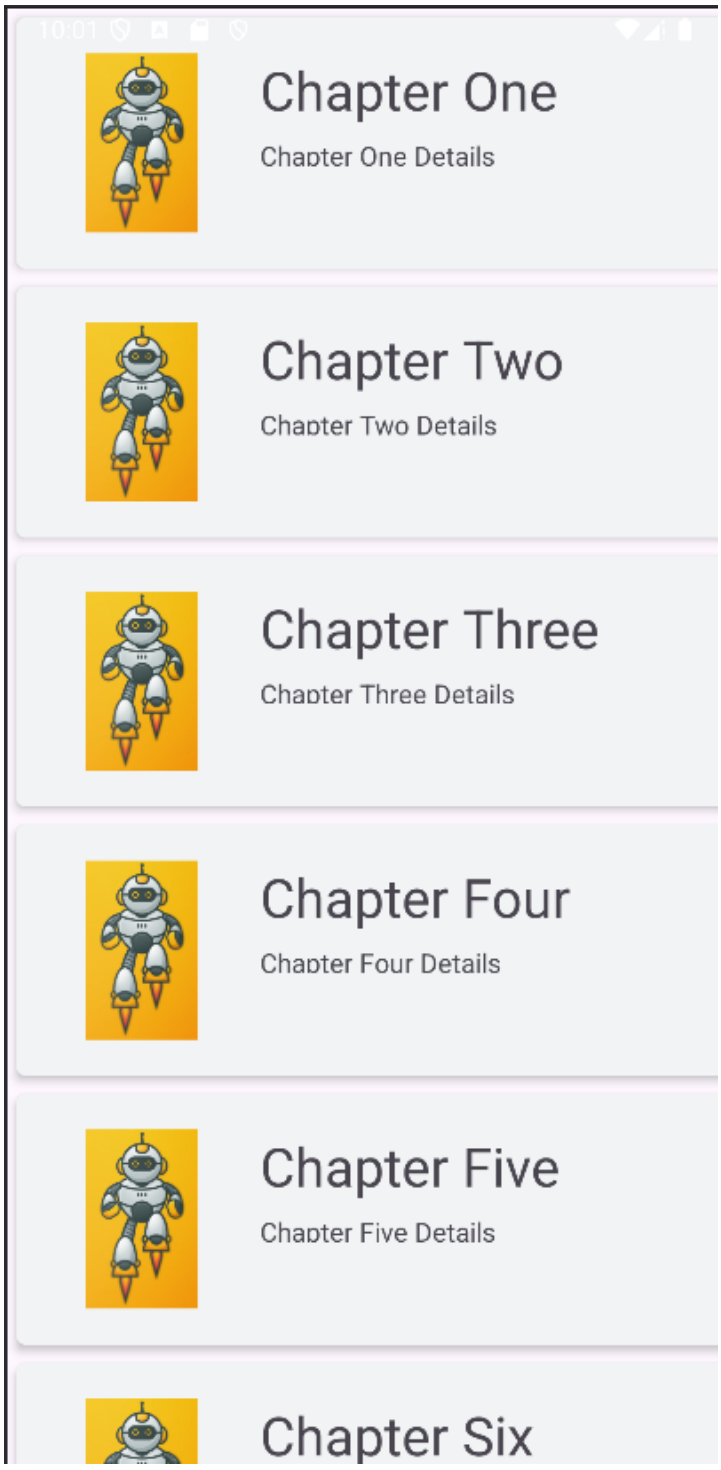

CardViewExample
Version control
Medium Phone API 35
app
Android
activity_main.xml
MainActivity.kt
app
manifests
kotlin+java
com.example.cardviewexample
MainActivity
res
drawable
ic_launcher_background.xml
ic_launcher_foreground.xml
layout
activity_main.xml
mipmap
values
xml
res (generated)
Gradle Scripts
<?xml version="1.0" encoding="utf-8"?>
<androidx.cardview.widget.CardView xmlns:android="http://sch
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:id="@+id/main"
tools:context=".MainActivity"
android:layout_margin="8dp"
app:cardCornerRadius="4dp">
<androidx.constraintlayout.widget.ConstraintLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:padding="16dp">
<ImageView
android:id="@+id/imageView"
android:layout_width="130dp"
android:layout_height="130dp"
android:layout_marginStart="20dp"
android:layout_marginTop="20dp"
android:layout_marginBottom="20dp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:srcCompat="@drawable/fef08a4fd6bdb1361b55858
<TextView
android:id="@+id/textView2"
android:layout_width="109dp"
Running Devices
Medium Phone API 35
Shiba inu
cutest dog ever
1:1
CardViewExample
app
src
main
res
layout
activity_main.xml
15:32
LF
UTF-8
4 spaces

➢ Start a new application In this application we will implement recycleradapter of cardviews



➢ activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://
schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <androidx.recyclerview.widget.RecyclerView
        android:id="@+id/recyclerView"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
```

➢ activity_main.kt

```
import android.os.Bundle
import androidx.appcompat.app.AppCompatActivity
import androidx.recyclerview.widget.LinearLayoutManager
import androidx.recyclerview.widget.RecyclerView

class MainActivity : AppCompatActivity() {

    private var layoutManager: RecyclerView.LayoutManager? = null
    private var adapter: RecyclerView.Adapter<RecyclerAdapter.ViewHolder>? =
null

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        layoutManager = LinearLayoutManager(this)
        var recyclerView = findViewById<RecyclerView>(R.id.recyclerView)
        recyclerView.layoutManager = layoutManager
        adapter = RecyclerAdapter()
        recyclerView.adapter = adapter
        }
}
```

➢ card_layout.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.cardview.widget.CardView xmlns:android="http://
schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:id="@+id/card_view"
    android:layout_margin="5dp"
    app:cardBackgroundColor="#F1F3F4"
    app:cardCornerRadius="5dp"
    app:cardElevation="3dp"
    app:contentPadding="4dp"
    >

    <androidx.constraintlayout.widget.ConstraintLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/relativeLayout"
        android:padding="16dp">

        <ImageView
            android:id="@+id/item_image"
            android:layout_width="100dp"
            android:layout_height="100dp"
            app:layout_constraintTop_toTopOf="parent"
            app:layout_constraintLeft_toLeftOf="parent"
            />

        <TextView
            android:id="@+id/item_title"
            android:layout_width="235dp"
            android:layout_height="39dp"
            app:layout_constraintTop_toTopOf="parent"
            app:layout_constraintLeft_toRightOf="@+id/item_image"
            android:layout_marginStart="16dp"
            android:textSize="30sp"
            />

        <TextView
            android:id="@+id/item_detail"
            android:layout_width="236dp"
            android:layout_height="16dp"
            android:layout_marginStart="16dp"
            android:layout_marginTop="8dp"
            app:layout_constraintTop_toBottomOf="@+id/item_title"
            app:layout_constraintLeft_toRightOf="@+id/item_image"
            android:textSize="15sp"
            />


    </androidx.constraintlayout.widget.ConstraintLayout>

</androidx.cardview.widget.CardView>
```

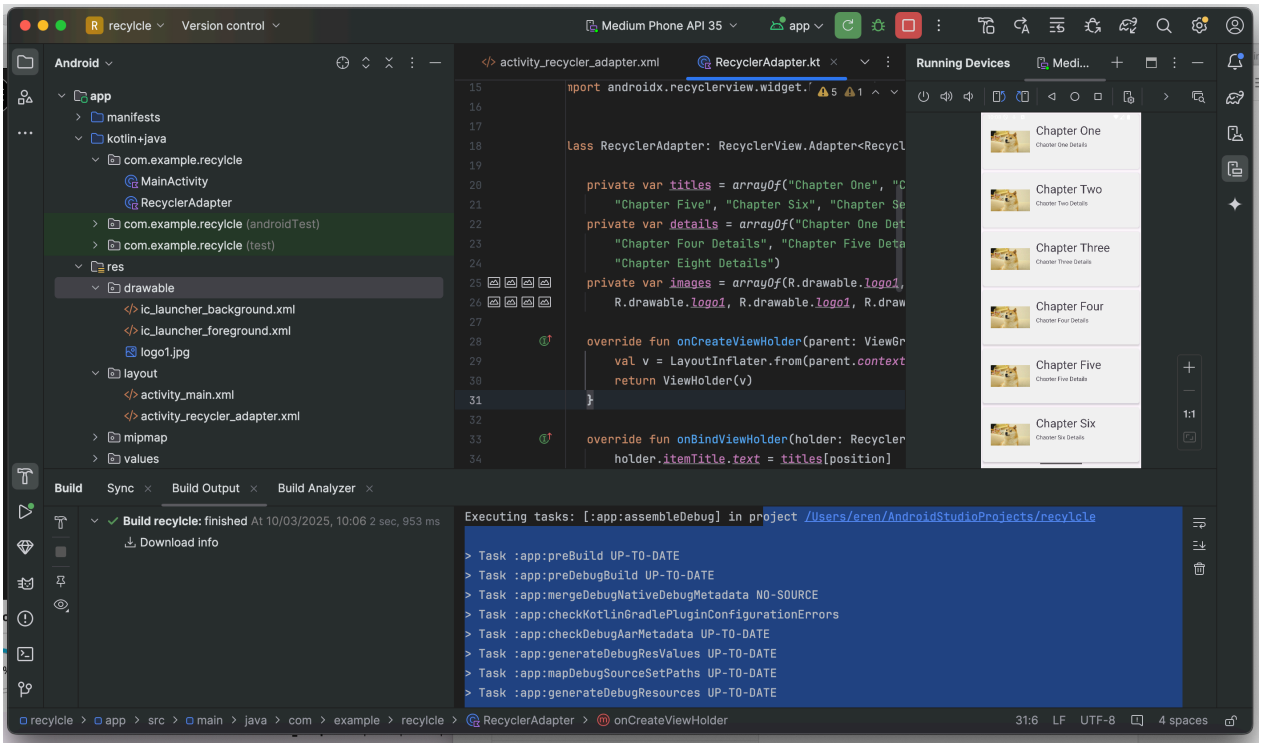
➢ RecyclerAdapter.kt

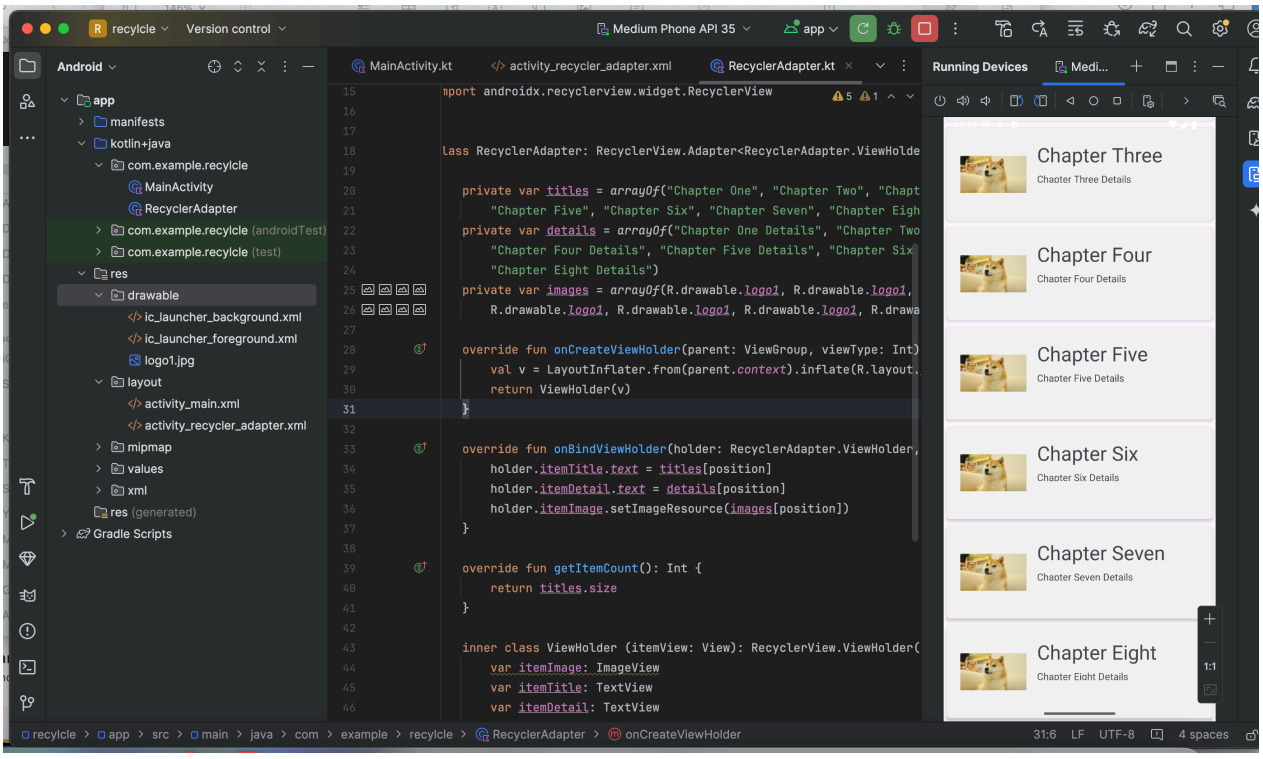
```
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import android.widget.ImageView
import android.widget.TextView
import android.widget.Toast
import androidx.recyclerview.widget.RecyclerView

class RecyclerAdapter:
RecyclerView.Adapter<RecyclerAdapter.ViewHolder>(){

    private var titles = arrayOf("Chapter One", "Chapter Two", "Chapter
Three", "Chapter Four",
        "Chapter Five", "Chapter Six", "Chapter Seven", "Chapter Eight")
    private var details = arrayOf("Chapter One Details", "Chapter Two
Details", "Chapter Three Details",
        "Chapter Four Details", "Chapter Five Details", "Chapter Six
Details", "Chapter Seven Details",
        "Chapter Eight Details")
    private var images = arrayOf(R.drawable.logo1, R.drawable.logo1,
R.drawable.logo1, R.drawable.logo1,
        R.drawable.logo1, R.drawable.logo1, R.drawable.logo1,
R.drawable.logo1)

    override fun onCreateViewHolder(parent: ViewGroup, viewType: Int):
RecyclerAdapter.ViewHolder {
        val v =
LayoutInflater.from(parent.context).inflate(R.layout.card_layout,
parent, false)
        return ViewHolder(v)
    }

    override fun onBindViewHolder(holder: RecyclerAdapter.ViewHolder,
position: Int) {
        holder.itemTitle.text = titles[position]
        holder.itemDetail.text = details[position]
        holder.itemImage.setImageResource(images[position])
    }

    override fun getItemCount(): Int {
        return titles.size
    }

    inner class ViewHolder (itemView: View):
RecyclerView.ViewHolder(itemView) {
        var itemImage: ImageView
        var itemTitle: TextView
        var itemDetail: TextView

        init {
            itemImage = itemView.findViewById(R.id.item_image)
            itemTitle = itemView.findViewById(R.id.item_title)
            itemDetail = itemView.findViewById(R.id.item_detail)

            itemView.setOnClickListener {
                val position: Int = adapterPosition
                Toast.makeText(itemView.context, "you clicked on $
{titles[position]}", Toast.LENGTH_LONG).show()
            }
```

```
            }
        }
}
```

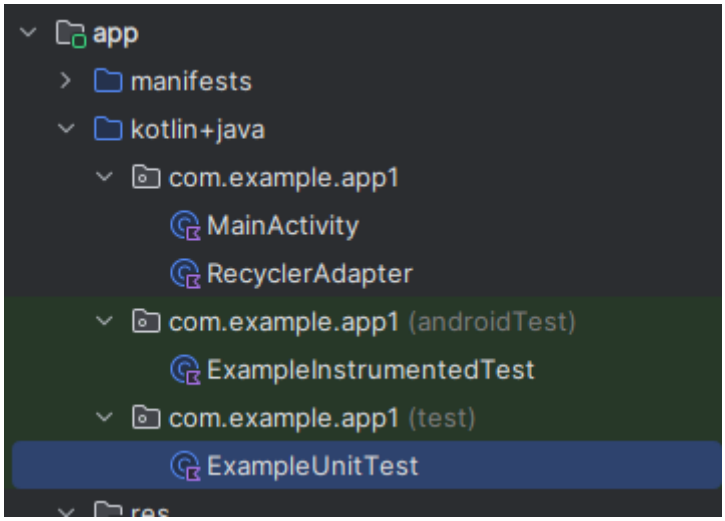
➢ Add an image to drawable define it in layout file

➢ Paste a printscreen of your emulator





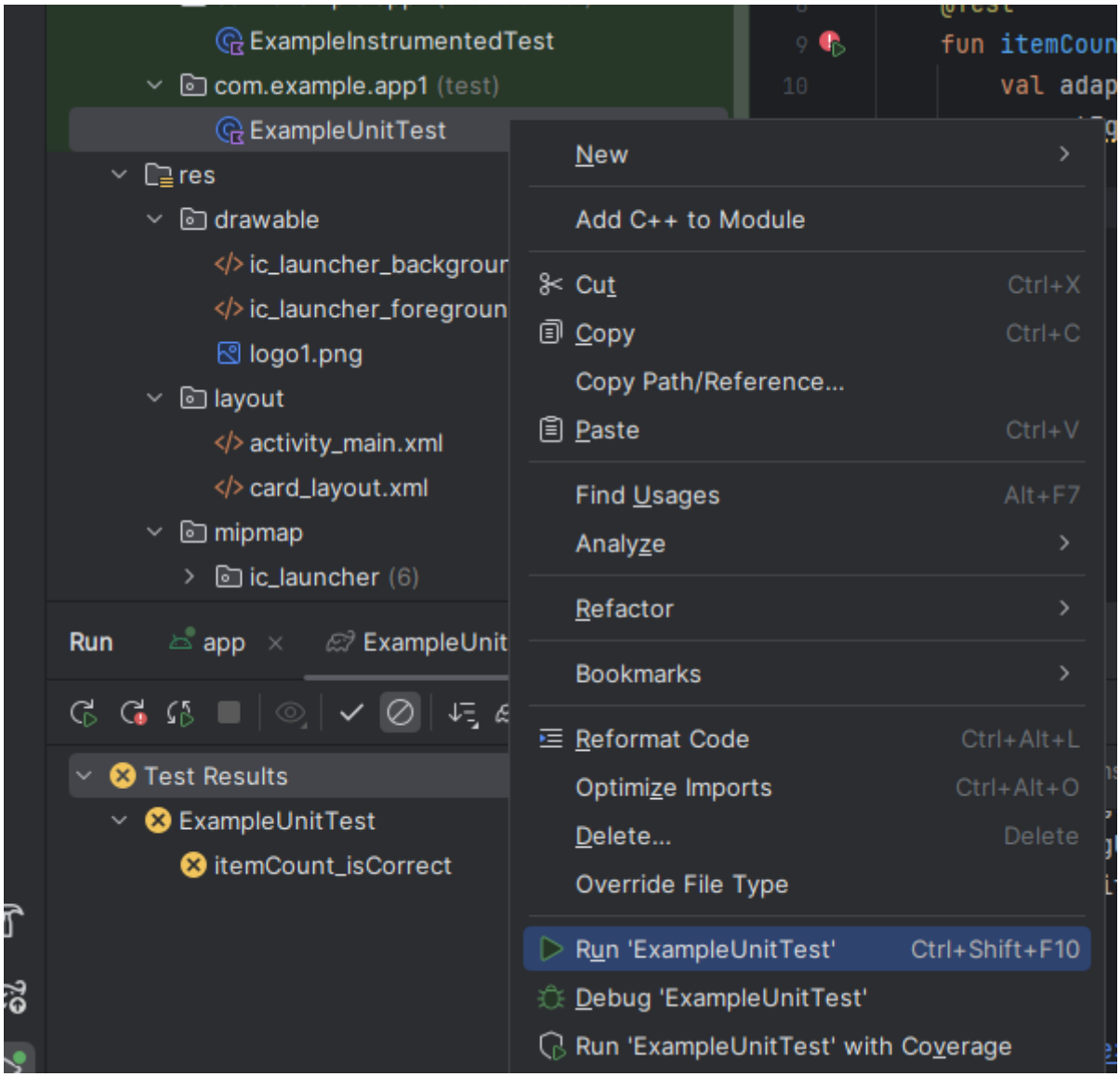
➢ Unit test



Open ExampleUnitTest and paste the following code

```
package com.example.app1

import org.junit.Test

import org.junit.Assert.*

class ExampleUnitTest {
    @Test
    fun itemCount_isCorrect() {
        val adapter = RecyclerAdapter()
        assertEquals(8, adapter.itemCount)
    }
}
```

right click on it and run



Run to check expected value passes the test

Change the expected value and see it gives an error

```
assertEquals(8, adapter.itemCount)
```

Paste the print screen of the error

Executing tasks: [:app:testDebugUnitTest, --tests, com.example.recylcle.ExampleUnitTest.itemCount_isCorrect] in project /Users/eren/AndroidStudioProjects/recylcle

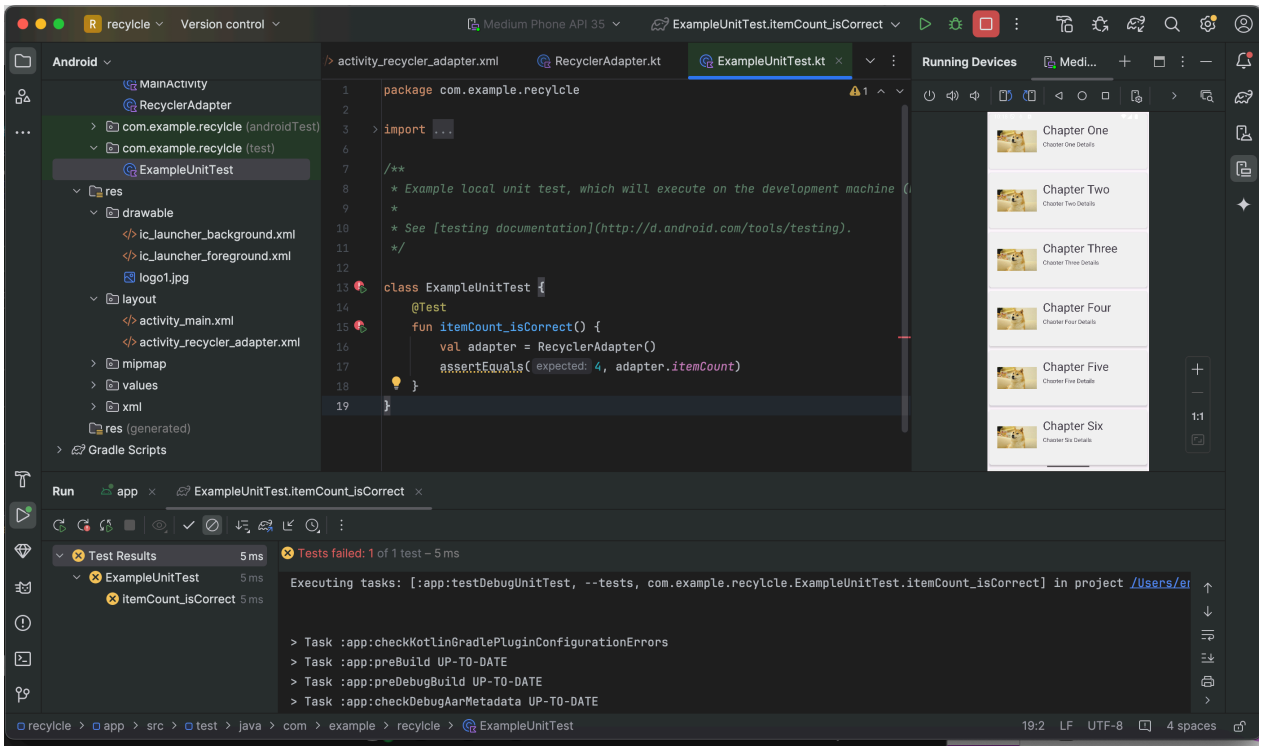
> Task :app:checkKotlinGradlePluginConfigurationErrors
> Task :app:preBuild UP-TO-DATE
> Task :app:preDebugBuild UP-TO-DATE
> Task :app:checkDebugAarMetadata UP-TO-DATE
> Task :app:generateDebugResValues UP-TO-DATE
> Task :app:mapDebugSourceSetPaths UP-TO-DATE
> Task :app:generateDebugResources UP-TO-DATE
> Task :app:mergeDebugResources UP-TO-DATE
> Task :app:packageDebugResources UP-TO-DATE
> Task :app:parseDebugLocalResources UP-TO-DATE
> Task :app:createDebugCompatibleScreenManifests UP-TO-DATE
> Task :app:extractDeepLinksDebug UP-TO-DATE
> Task :app:processDebugMainManifest UP-TO-DATE
> Task :app:processDebugManifest UP-TO-DATE
> Task :app:processDebugManifestForPackage UP-TO-DATE
> Task :app:processDebugResources UP-TO-DATE
> Task :app:compileDebugKotlin UP-TO-DATE
> Task :app:javaPreCompileDebug UP-TO-DATE
> Task :app:compileDebugJavaWithJavac NO-SOURCE
> Task :app:bundleDebugClassesToRuntimeJar UP-TO-DATE
> Task :app:bundleDebugClassesToCompileJar UP-TO-DATE
> Task :app:preDebugUnitTestBuild UP-TO-DATE
> Task :app:javaPreCompileDebugUnitTest UP-TO-DATE
> Task :app:processDebugJavaRes UP-TO-DATE
> Task :app:compileDebugUnitTestKotlin
> Task :app:compileDebugUnitTestJavaWithJavac NO-SOURCE
> Task :app:processDebugUnitTestJavaRes UP-TO-DATE
> Task :app:testDebugUnitTest FAILED

Expected :4
Actual   :8
<Click to see difference>

java.lang.AssertionError: expected:<4> but was:<8>
	at org.junit.Assert.fail(Assert.java:89)
	at org.junit.Assert.failNotEquals(Assert.java:835)
	at org.junit.Assert.assertEquals(Assert.java:120)
	at org.junit.Assert.assertEquals(Assert.java:146)
	at com.example.recylcle.ExampleUnitTest.itemCount_isCorrect(ExampleUnitTest.kt:17)
	at java.base/jdk.internal.reflect.DirectMethodHandleAccessor.invoke(Unknown Source)
	at java.base/java.lang.reflect.Method.invoke(Unknown Source)
	at org.junit.runners.model.FrameworkMethod$1.runReflectiveCall(FrameworkMethod.java:59)
	at org.junit.internal.runners.model.ReflectiveCallable.run(ReflectiveCallable.java:12)
	at org.junit.runners.model.FrameworkMethod.invokeExplosively(FrameworkMethod.java:56)
	at org.junit.internal.runners.statements.InvokeMethod.evaluate(InvokeMethod.java:17)
	at org.junit.runners.ParentRunner$3.evaluate(ParentRunner.java:306)
	at org.junit.runners.BlockJUnit4ClassRunner$1.evaluate(BlockJUnit4ClassRunner.java:100)
	at org.junit.runners.ParentRunner.runLeaf(ParentRunner.java:366)
	at org.junit.runners.BlockJUnit4ClassRunner.runChild(BlockJUnit4ClassRunner.java:103)

```
	at org.junit.runners.BlockJUnit4ClassRunner.runChild(BlockJUnit4ClassRunner.java:63)
	at org.junit.runners.ParentRunner$4.run(ParentRunner.java:331)
	at org.junit.runners.ParentRunner$1.schedule(ParentRunner.java:79)
	at org.junit.runners.ParentRunner.runChildren(ParentRunner.java:329)
	at org.junit.runners.ParentRunner.access$100(ParentRunner.java:66)
	at org.junit.runners.ParentRunner$2.evaluate(ParentRunner.java:293)
	at org.junit.runners.ParentRunner$3.evaluate(ParentRunner.java:306)
	at org.junit.runners.ParentRunner.run(ParentRunner.java:413)
	at
org.gradle.api.internal.tasks.testing.junit.JUnitTestClassExecutor.runTestClass(JUnitTestClassExecutor.java:
112)
	at
org.gradle.api.internal.tasks.testing.junit.JUnitTestClassExecutor.execute(JUnitTestClassExecutor.java:58)
	at
org.gradle.api.internal.tasks.testing.junit.JUnitTestClassExecutor.execute(JUnitTestClassExecutor.java:40)
	at
org.gradle.api.internal.tasks.testing.junit.AbstractJUnitTestClassProcessor.processTestClass(AbstractJUnitT
estClassProcessor.java:54)
	at
org.gradle.api.internal.tasks.testing.SuiteTestClassProcessor.processTestClass(SuiteTestClassProcessor.java
:53)
	at java.base/jdk.internal.reflect.DirectMethodHandleAccessor.invoke(Unknown Source)
	at java.base/java.lang.reflect.Method.invoke(Unknown Source)
	at org.gradle.internal.dispatch.ReflectionDispatch.dispatch(ReflectionDispatch.java:36)
	at org.gradle.internal.dispatch.ReflectionDispatch.dispatch(ReflectionDispatch.java:24)
	at
org.gradle.internal.dispatch.ContextClassLoaderDispatch.dispatch(ContextClassLoaderDispatch.java:33)
	at
org.gradle.internal.dispatch.ProxyDispatchAdapter$DispatchingInvocationHandler.invoke(ProxyDispatchA
dapter.java:92)
	at jdk.proxy1/jdk.proxy1.$Proxy4.processTestClass(Unknown Source)
	at org.gradle.api.internal.tasks.testing.worker.TestWorker$2.run(TestWorker.java:183)
	at
org.gradle.api.internal.tasks.testing.worker.TestWorker.executeAndMaintainThreadName(TestWorker.java
:132)
	at org.gradle.api.internal.tasks.testing.worker.TestWorker.execute(TestWorker.java:103)
	at org.gradle.api.internal.tasks.testing.worker.TestWorker.execute(TestWorker.java:63)
	at
org.gradle.process.internal.worker.child.ActionExecutionWorker.execute(ActionExecutionWorker.java:56)
	at
org.gradle.process.internal.worker.child.SystemApplicationClassLoaderWorker.call(SystemApplicationClas
sLoaderWorker.java:121)
	at
org.gradle.process.internal.worker.child.SystemApplicationClassLoaderWorker.call(SystemApplicationClas
sLoaderWorker.java:71)
	at worker.org.gradle.process.internal.worker.GradleWorkerMain.run(GradleWorkerMain.java:69)
	at
worker.org.gradle.process.internal.worker.GradleWorkerMain.main(GradleWorkerMain.java:74)
```

```
ExampleUnitTest > itemCount_isCorrect FAILED
    java.lang.AssertionError at ExampleUnitTest.kt:17
1 test completed, 1 failed
FAILURE: Build failed with an exception.
* What went wrong:
Execution failed for task ':app:testDebugUnitTest'.
> There were failing tests. See the report at: file:///Users/eren/AndroidStudioProjects/recylcle/app/
build/reports/tests/testDebugUnitTest/index.html
* Try:
> Run with --scan to get full insights.
BUILD FAILED in 895ms
23 actionable tasks: 3 executed, 20 up-to-date
10:18:44: Execution finished ':app:testDebugUnitTest --tests
"com.example.recylcle.ExampleUnitTest.itemCount_isCorrect"'.
```



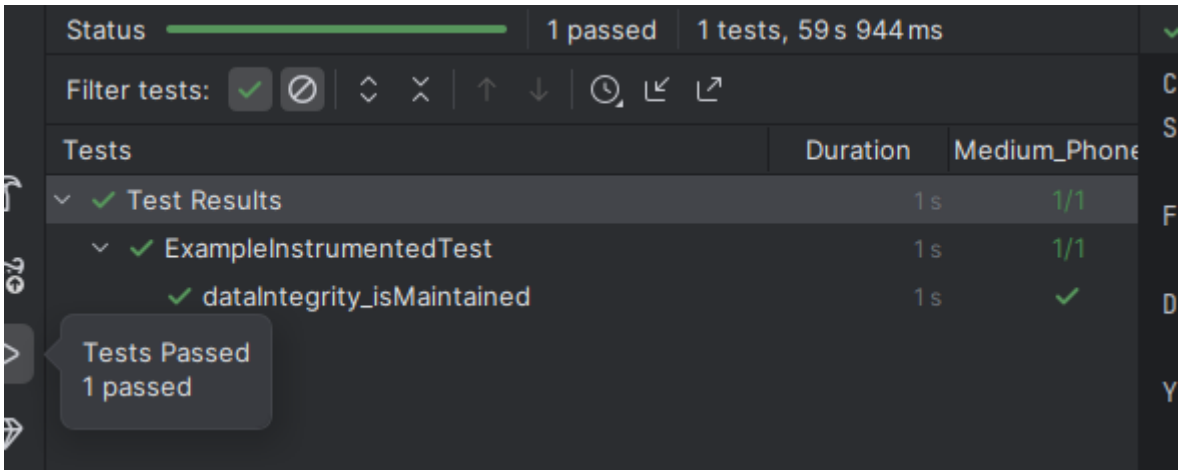

```
@Test
fun dataIntegrity_isMaintained() {
    val activityScenario = ActivityScenario.launch(MainActivity::class.java)
    activityScenario.onActivity { activity ->
        val recyclerView =
activity.findViewById<RecyclerView>(R.id.recyclerView)
        val adapter = recyclerView.adapter as RecyclerAdapter
        val expectedTitle = "Chapter Three"
        val actualTitle = adapter.titles[2] // Accessing directly from the
```

```
adapter's data array
        assertEquals("Data mismatch in adapter", expectedTitle, actualTitle)
    }
}
```

Open ExampleInstrumentedTest and paste the following code

```
@Test
fun dataIntegrity_isMaintained() {
    val activityScenario = ActivityScenario.launch(MainActivity::class.java)
    activityScenario.onActivity { activity ->
        val recyclerView =
activity.findViewById<RecyclerView>(R.id.recyclerView)
        val adapter = recyclerView.adapter as RecyclerAdapter
        val expectedTitle = "Chapter Three"
        val actualTitle = adapter.titles[2] // Accessing directly from the
adapter's data array
        assertEquals("Data mismatch in adapter", expectedTitle, actualTitle)
    }
}
```

Right click and run



RESULT OF THIS IS ON THE NEXT PAGE.

Paste print screen of the test result here