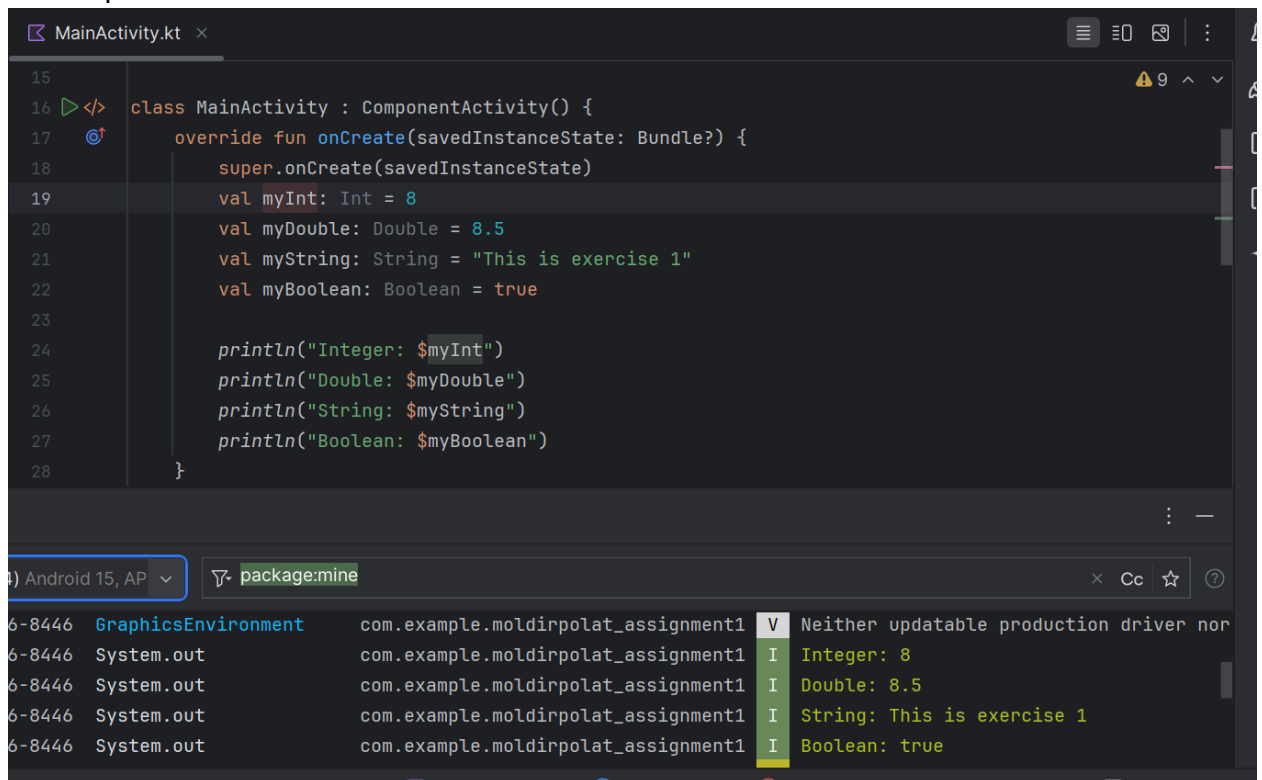# Assignment 1

Done by: Moldir Polat

Exercise 1: Kotlin Syntax Basics

1. **Variables and Data Types:**

   In this image I created variables of different types(integer, double, string, boolean) and printed them in the console.
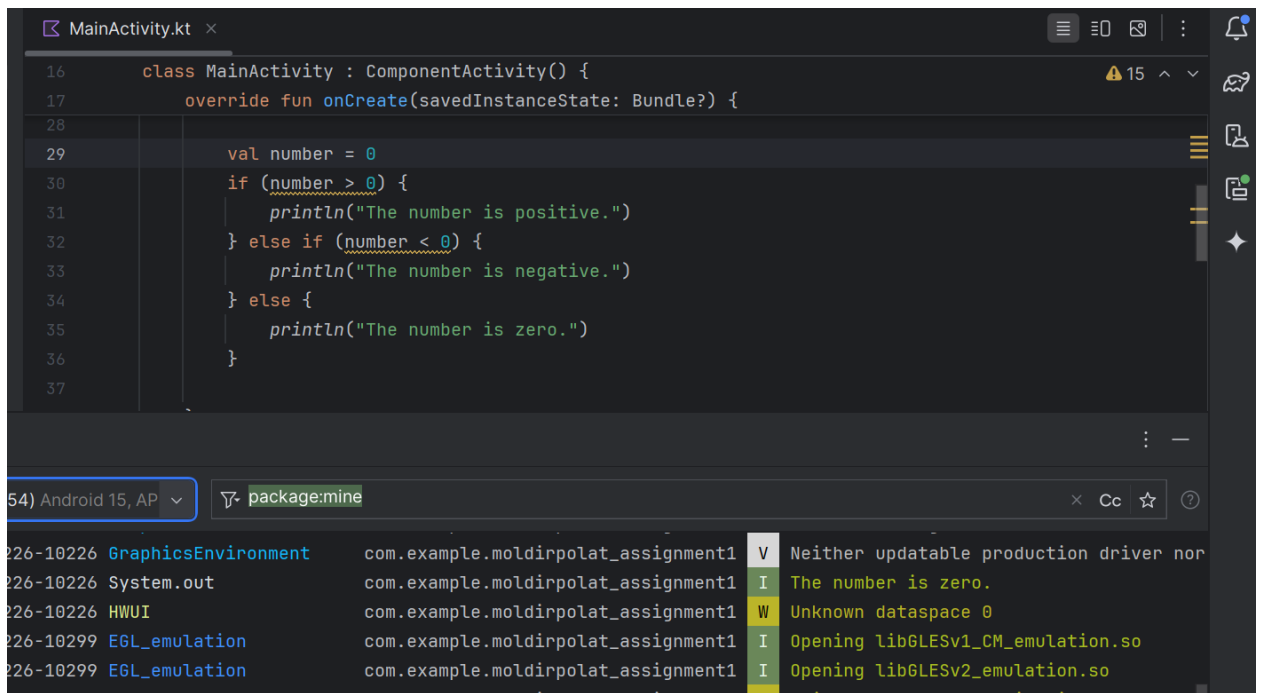
```kotlin
15
16   class MainActivity : ComponentActivity() {
17       override fun onCreate(savedInstanceState: Bundle?) {
18           super.onCreate(savedInstanceState)
19           val myInt: Int = 8
20           val myDouble: Double = 8.5
21           val myString: String = "This is exercise 1"
22           val myBoolean: Boolean = true
23
24           println("Integer: $myInt")
25           println("Double: $myDouble")
26           println("String: $myString")
27           println("Boolean: $myBoolean")
28       }
```

```
) Android 15, AP  ⌄    ⏦ package:mine                                              ×  Cc  ☆  ⑦
6-8446  GraphicsEnvironment    com.example.moldirpolat_assignment1  V  Neither updatable production driver nor
6-8446  System.out             com.example.moldirpolat_assignment1  I  Integer: 8
6-8446  System.out             com.example.moldirpolat_assignment1  I  Double: 8.5
6-8446  System.out             com.example.moldirpolat_assignment1  I  String: This is exercise 1
6-8446  System.out             com.example.moldirpolat_assignment1  I  Boolean: true
```

Conditional Statements:

In this image I demonstrated the usage of conditional statement IF, it checks whether the NUMBER is positive or negative or zero.
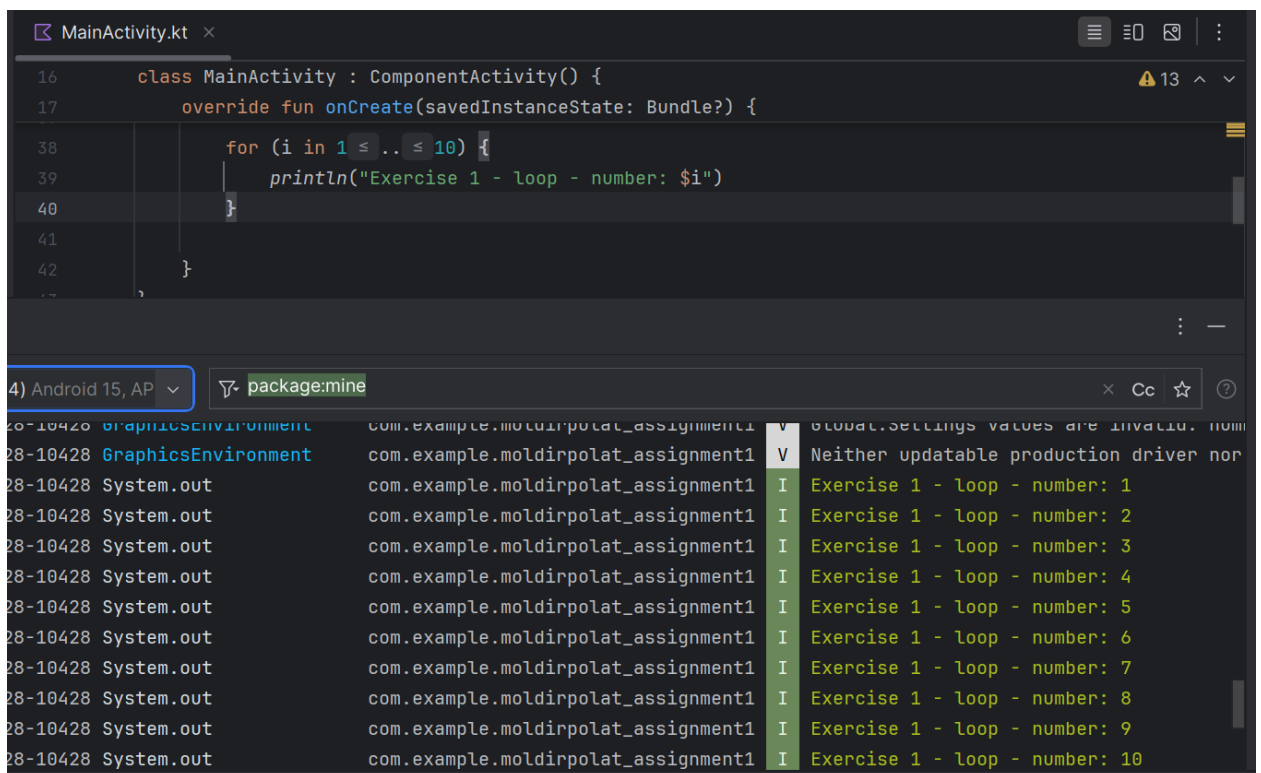
Loops:

In this image I showed the loop FOR usage printing all numbers from 1 to 10.

Here I wrote the example of WHILE loop, also printing numbers from 1 to 10.

```
16        class MainActivity : ComponentActivity() {
17            override fun onCreate(savedInstanceState: Bundle?) {
41                var i = 1
42                while (i <= 10) {
43                    println("Exercise 1 - while -number: $i")
44                    i++
45                }
46
```

```
0560-10560 GraphicsEnvironment    com.example.moldirpolat_assignment1  V  Neither updatable production driver nor
0560-10560 System.out             com.example.moldirpolat_assignment1  I  Exercise 1 - while -number: 1
0560-10560 System.out             com.example.moldirpolat_assignment1  I  Exercise 1 - while -number: 2
0560-10560 System.out             com.example.moldirpolat_assignment1  I  Exercise 1 - while -number: 3
0560-10560 System.out             com.example.moldirpolat_assignment1  I  Exercise 1 - while -number: 4
0560-10560 System.out             com.example.moldirpolat_assignment1  I  Exercise 1 - while -number: 5
0560-10560 System.out             com.example.moldirpolat_assignment1  I  Exercise 1 - while -number: 6
0560-10560 System.out             com.example.moldirpolat_assignment1  I  Exercise 1 - while -number: 7
0560-10560 System.out             com.example.moldirpolat_assignment1  I  Exercise 1 - while -number: 8
0560-10560 System.out             com.example.moldirpolat_assignment1  I  Exercise 1 - while -number: 9
0560-10560 System.out             com.example.moldirpolat_assignment1  I  Exercise 1 - while -number: 10
```

Collections:

Here I created the list, found the SUM of all numbers of that list, for which I used for loop iteration.


```
16        class MainActivity : ComponentActivity() {
17            override fun onCreate(savedInstanceState: Bundle?) {
46                val numbers = listOf(1, 2, 3, 4, 5, 6, 7, 8)
47                var sum = 0
48                for (num in numbers) {
49                    sum += num
50                }
51                println("the sum of all numbers from 1 to 8: $sum")
52
53            }
54        }
55
56        @Composable
```

```
nvironment    com.example.moldirpolat_assignment1  V    angle_gl_driver_selection_pkgs=[]
nvironment    com.example.moldirpolat_assignment1  V    angle_gl_driver_selection_values=[]
nvironment    com.example.moldirpolat_assignment1  V  Global.Settings values are invalid: number of packages: 0, numbe
nvironment    com.example.moldirpolat_assignment1  V  Neither updatable production driver nor prerelease driver is sup
t             com.example.moldirpolat_assignment1  I  the sum of all numbers from 1 to 8: 36
              com.example.moldirpolat_assignment1  W  Unknown dataspace 0
tion          com.example.moldirpolat_assignment1  I  Opening libGLESv1_CM_emulation.so
```

Exercise 2: Kotlin OOP (Object-Oriented Programming)

1. **Create a Person class:**

I created Person class with name, age, and email. It has method to display the person's details.


```kotlin
40    class Person(
41        val name: String,
42        val age: Int,
43        val email: String
44    ) {
45        // Method to display the person's details
46        open fun displayInfo() {
47            println("Name: $name")
48            println("Age: $age")
49            println("Email: $email")
50        }
51    }
```

```
com...le.moldirpolat_assign1_exerc2  V    angle_gl_driver_selection_values=[]
com...le.moldirpolat_assign1_exerc2  V  Global.Settings values are invalid: number of packages: 0, number of va
com...le.moldirpolat_assign1_exerc2  V  Neither updatable production driver nor prerelease driver is supported.
com...le.moldirpolat_assign1_exerc2  I  Name: Moldir Polat
com...le.moldirpolat_assign1_exerc2  I  Age: 24
com...le.moldirpolat_assign1_exerc2  I  Email: m_polat@kbtu.kz
```

Inheritance:

I created Employee class which inherits all properties and methods from parent Person class, and there is additional property SALARY. Method displayInfo is overridden: we call parent classes' method and print salary at the end.


```kotlin
54
55    class Employee(
56        name: String,
57        age: Int,
58        email: String,
59        val salary: Double
60    ) : Person(name, age, email) {
61
62
63        override fun displayInfo() {
64            super.displayInfo()
65            println("Salary: $salary")
66        }
67    }
```

```
com...le.moldirpolat_assign1_exerc2  V  Global.Settings values are invalid: number of packages: 0, number of values
com...le.moldirpolat_assign1_exerc2  V  Neither updatable production driver nor prerelease driver is supported.
com...le.moldirpolat_assign1_exerc2  I  Name: Moldir Polat
com...le.moldirpolat_assign1_exerc2  I  Age: 24
com...le.moldirpolat_assign1_exerc2  I  Email: m_polat@kbtu.kz
com...le.moldirpolat_assign1_exerc2  I  Salary: 300000.0
com...le.moldirpolat_assign1_exerc2  W  Unknown dataspace 0
```

Encapsulation:

In this exercise I created BankAccount class with private property and controlled access methods deposit() and withdraw().

```kotlin
79      }
80      class BankAccount(
81          private var balance: Double = 0.0
82      ) {
83          fun deposit(amount: Double) {
84              if (amount > 0) {
85                  balance += amount
86                  println("Dear user, you deposited: $amount tenge")
87              } else {
88                  println("Dear user, deposit amount cannot be negative")
89              }
90          }
91
92          fun withdraw(amount: Double) {
93              if (amount > 0 && amount <= balance) {
94                  balance -= amount
95                  println("Dear, user, you withdrew: $amount tenge")
96              } else if (amount > balance) {
97                  println("Dear user, your balance is insufficient")
98              } else {
99                  println("Dear user, withdrawal amount cannot be negative")
100             }
101         }
102
```

ava > com > example > moldirpolat_assign1_exerc2 > MainActivity.kt > MainActivity > onCreate   33:35   LF UTF-8   4 spaces

Here I wrote the usage of previous class BankAccount.

```kotlin
16      class MainActivity : ComponentActivity() {
17          override fun onCreate(savedInstanceState: Bundle?) {
24              val account = BankAccount( balance: 200000.0)
25              account.displayBalance()
26
27              account.deposit( amount: 50000.0)
28              account.displayBalance()
29
30              account.withdraw( amount: 40000.0)
31              account.displayBalance()
32
33              account.withdraw( amount: 300000.0)
34              account.displayBalance()
35          }
```

```
tor-5554) Android 15, AP ∨    ▽ package:mine
com...le.moldirpolat_assign1_exerc2  I  Your balance is: 200000.0 tenge
com...le.moldirpolat_assign1_exerc2  I  Dear user, you deposited: 50000.0 tenge
com...le.moldirpolat_assign1_exerc2  I  Your balance is: 250000.0 tenge
com...le.moldirpolat_assign1_exerc2  I  Dear, user, you withdrew: 40000.0 tenge
com...le.moldirpolat_assign1_exerc2  I  Your balance is: 210000.0 tenge
com...le.moldirpolat_assign1_exerc2  I  Dear user, your balance is insufficient
com...le.moldirpolat_assign1_exerc2  I  Your balance is: 210000.0 tenge
```

Exercise 3: Kotlin Functions

1. **Basic Function:**

This function takes two integers as arguments and returns their sum.

```kotlin
fun GreetingPreview() {

}

fun sum(a: Int, b: Int): Int {
    return a + b
}
```

Usage example of SUM basic function.

```kotlin
package com.example.moldirpolat_exercise3

import ...

class MainActivity : ComponentActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        val result = sum( a: 58, b: 72)
        println("Sum: $result")
    }
}
```
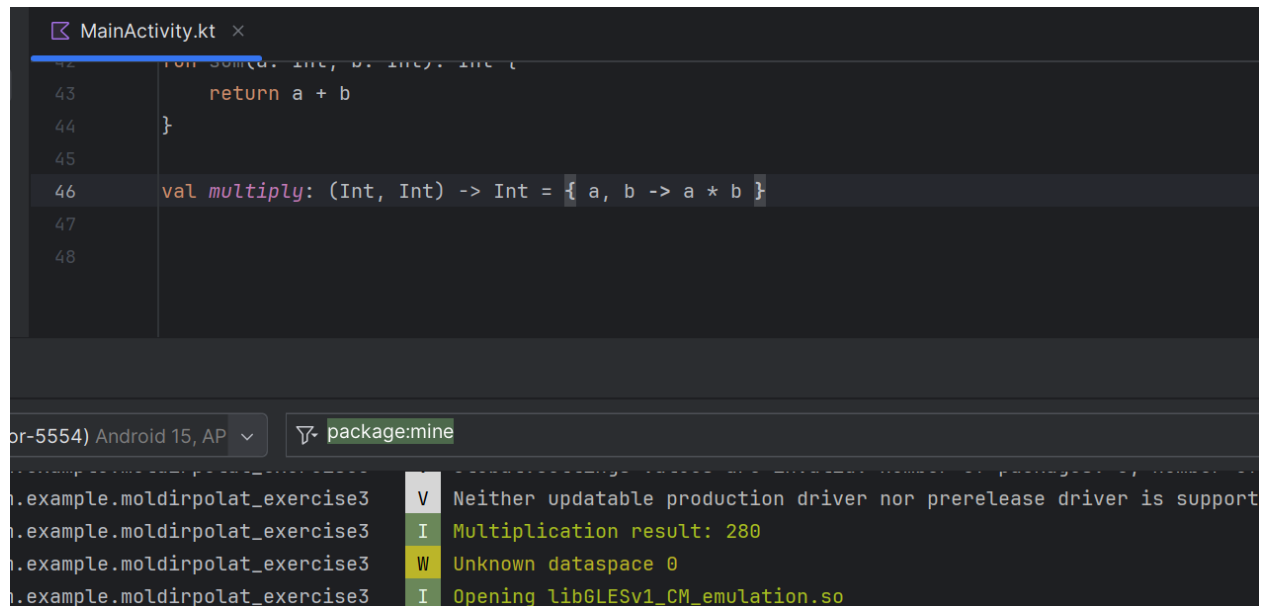
Lambda Functions:

There is a lambda function that multiplies two numbers and returns the result.
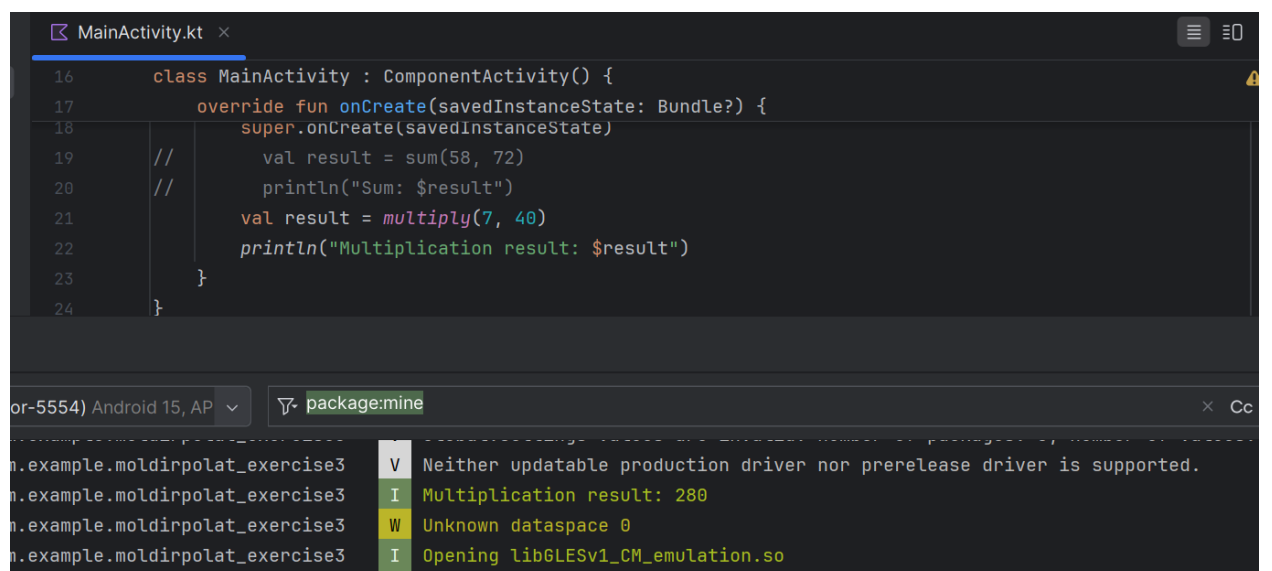
```kotlin
43          return a + b
44      }
45
46      val multiply: (Int, Int) -> Int = { a, b -> a * b }
47
48
```

```
.example.moldirpolat_exercise3    V  Neither updatable production driver nor prerelease driver is support
.example.moldirpolat_exercise3    I  Multiplication result: 280
.example.moldirpolat_exercise3    W  Unknown dataspace 0
.example.moldirpolat_exercise3    I  Opening libGLESv1_CM_emulation.so
```

Usage of LAMBDA function:

```kotlin
16      class MainActivity : ComponentActivity() {
17          override fun onCreate(savedInstanceState: Bundle?) {
18              super.onCreate(savedInstanceState)
19      //        val result = sum(58, 72)
20      //        println("Sum: $result")
21              val result = multiply(7, 40)
22              println("Multiplication result: $result")
23          }
24      }
```

```
.example.moldirpolat_exercise3    V  Neither updatable production driver nor prerelease driver is supported.
.example.moldirpolat_exercise3    I  Multiplication result: 280
.example.moldirpolat_exercise3    W  Unknown dataspace 0
.example.moldirpolat_exercise3    I  Opening libGLESv1_CM_emulation.so
```

Higher-Order Functions:

Higher-order function here takes a lambda function as a parameter and applies it to two integers.

```
59      val multiply: (Int, Int) -> Int = { a, b -> a * b }
60
61
62      fun executeFunction(a: Int, b: Int, function: (Int, Int) -> Int): Int {
63          return function(a, b)
64      }
65
66
```

```
-5554) Android 15, AP ∨    ▽ package:mine                                                      ×  Cc  ☆  ⊙

com.example.moldirpolat_exercise3    V    angle_gl_driver_selection_values=[]
com.example.moldirpolat_exercise3    V    Global.Settings values are invalid: number of packages: 0, number of values: 0
com.example.moldirpolat_exercise3    V    Neither updatable production driver nor prerelease driver is supported.
com.example.moldirpolat_exercise3    I    Result of function: 60
com.example.moldirpolat_exercise3    I    Sum is: 70
```

Usage of higher-order function(using lambda function and inline lambda directly)


```
16      class MainActivity : ComponentActivity() {
17          override fun onCreate(savedInstanceState: Bundle?) {
25
26              val result = executeFunction( a: 6,  b: 10, multiply) //using lambda function
27              println("Result of function: $result")
28
29
30              val sumResult = executeFunction( a: 20,  b: 50) { x, y -> x + y }//using inline lambda directly
31              println("Sum is: $sumResult")
32
33
```

```
-5554) Android 15, AP ∨    ▽ package:mine                                                      ×  Cc  ☆  ⊙

com.example.moldirpolat_exercise3    V    angle_gl_driver_selection_values=[]
com.example.moldirpolat_exercise3    V    Global.Settings values are invalid: number of packages: 0, number of values: 0
com.example.moldirpolat_exercise3    V    Neither updatable production driver nor prerelease driver is supported.
com.example.moldirpolat_exercise3    I    Result of function: 60
com.example.moldirpolat_exercise3    I    Sum is: 70
```

Exercise 4: Android Layout in Kotlin (Instagram-like Layout)
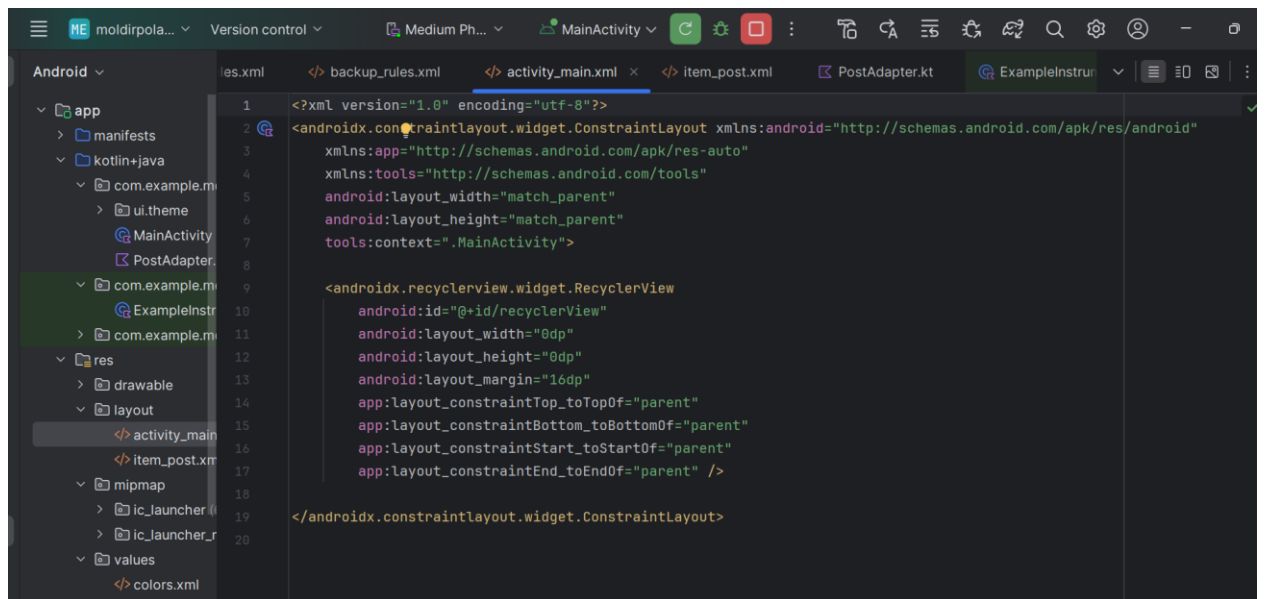
1. **Set Up the Android Project:**

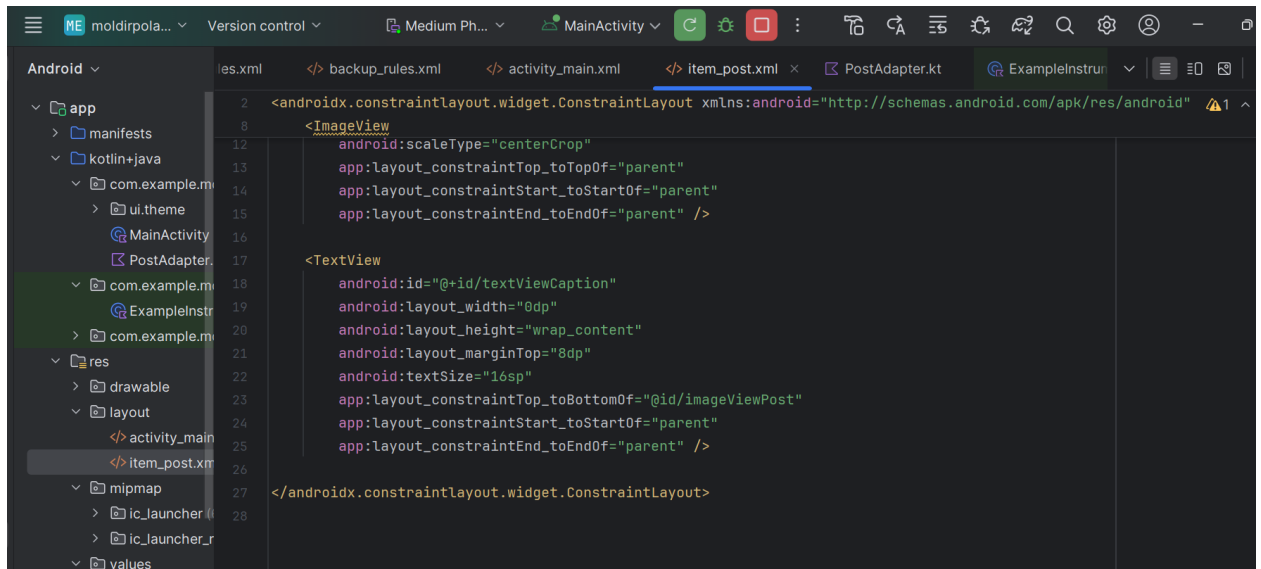   At first I created Android Kotlin-based project empty and it prints: Hello, Docker!
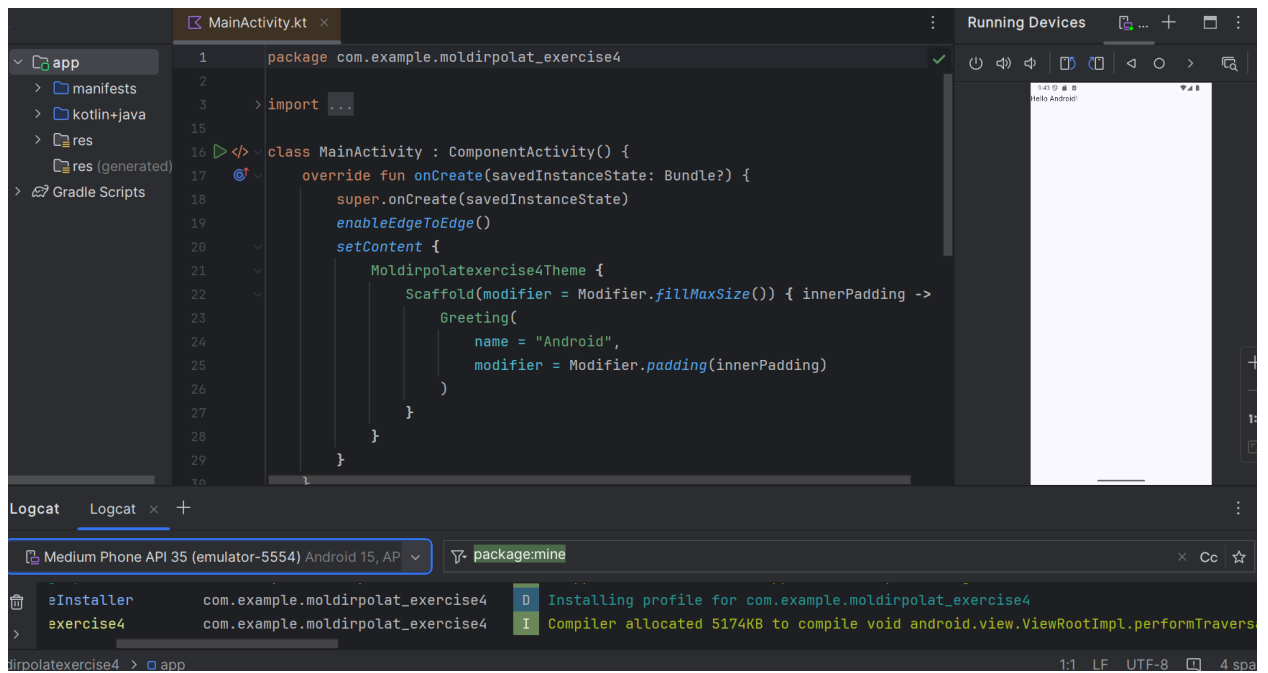
2. **Design the Layout:**

activity_main.xml

I added a RecyclerView for the feed, where each item will contain an ImageView for the post image and a TextView for the caption.

Then created new XML layout for individual post in the feed. It defines how each post will look like (image+caption).

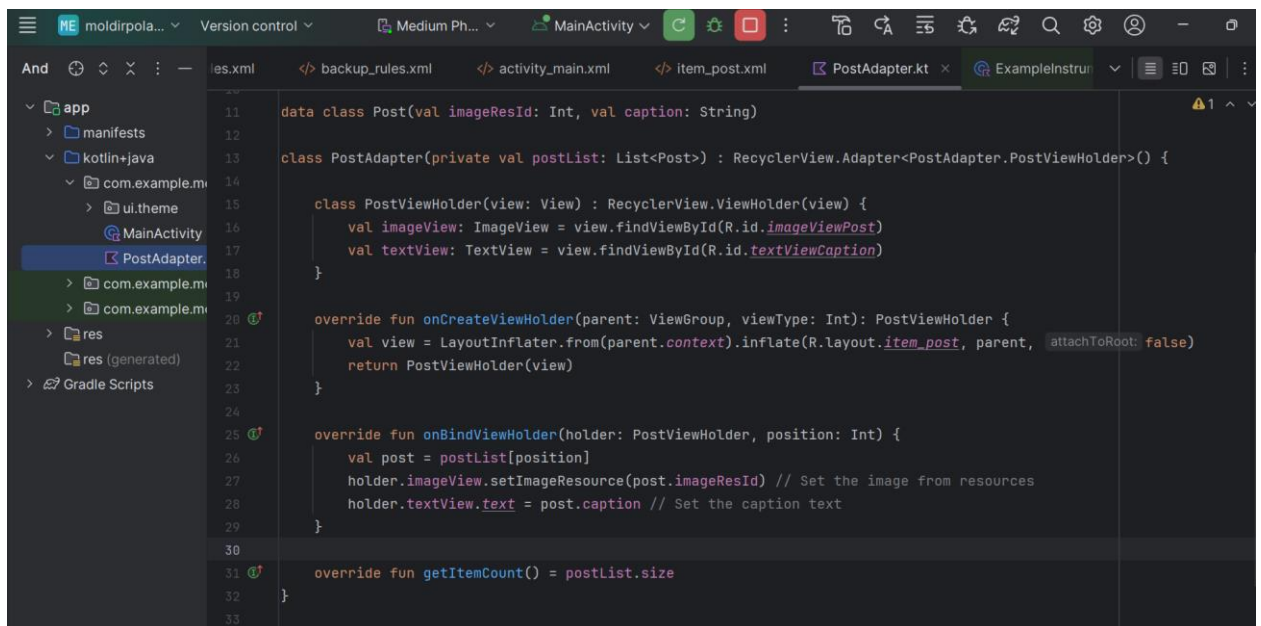## Create the RecyclerView Adapter:

Now I need an adapter to bind data to the ResyclerView – PostAdapter.kt class file.
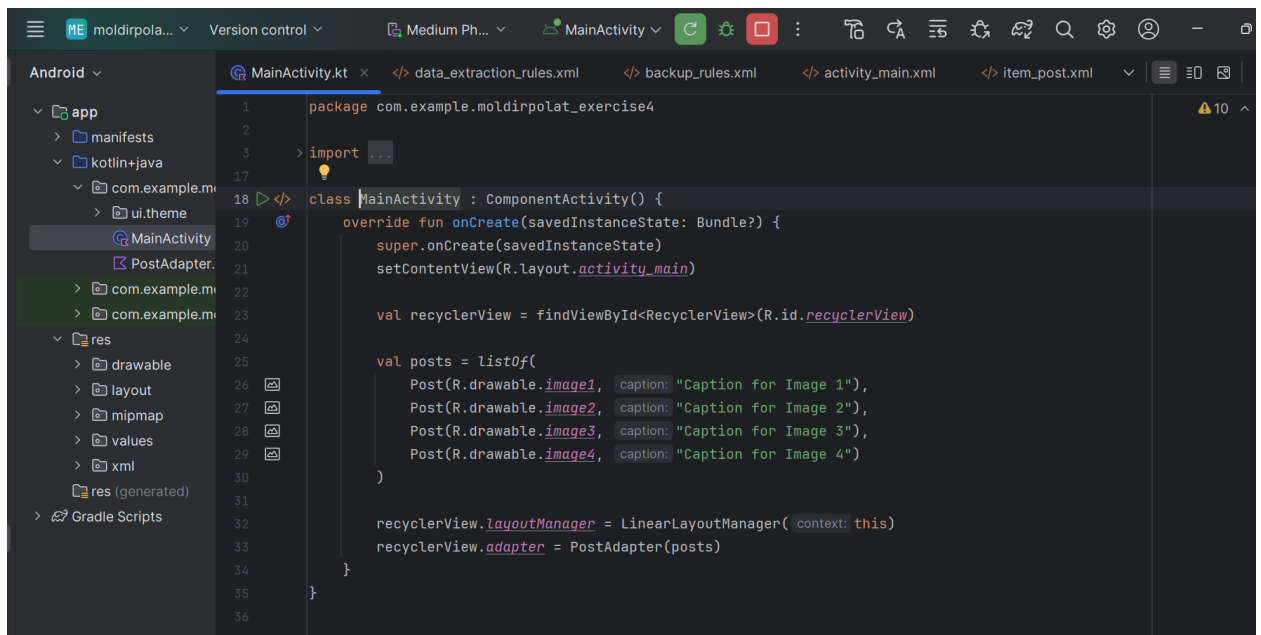
Post class - a simple data class that holds the image ID and caption.

PostAdapter - a RecyclerView.Adapter that binds the data to the views in item_post.xml.
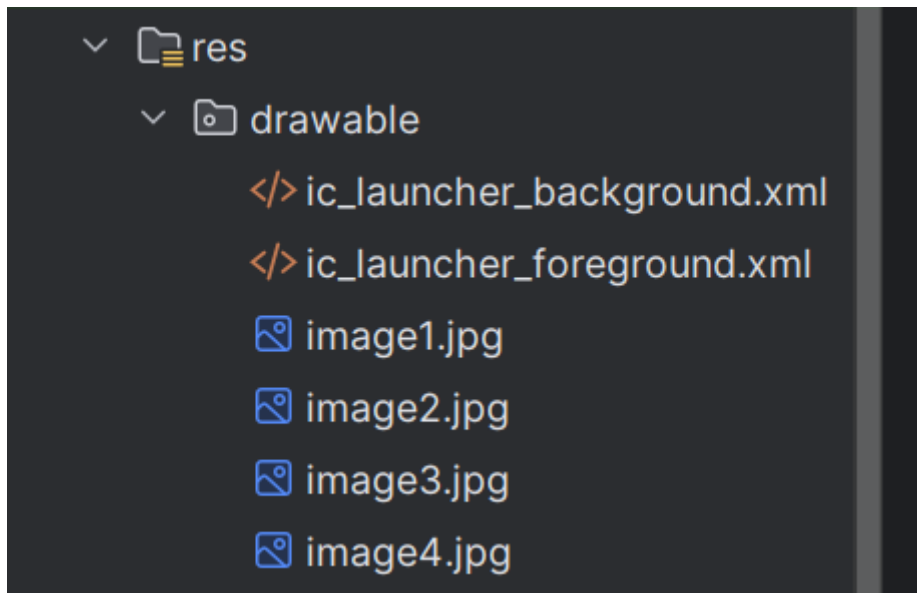

MainActivity Setup:

In MainActivity.kt file I initialize the RecyclerView and populate it with some sample data.

```
package com.example.moldirpolat_exercise4

import ...

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

        val recyclerView = findViewById<RecyclerView>(R.id.recyclerView)

        val posts = listOf(
            Post(R.drawable.image1, caption: "Caption for Image 1"),
            Post(R.drawable.image2, caption: "Caption for Image 2"),
            Post(R.drawable.image3, caption: "Caption for Image 3"),
            Post(R.drawable.image4, caption: "Caption for Image 4")
        )

        recyclerView.layoutManager = LinearLayoutManager( context: this)
        recyclerView.adapter = PostAdapter(posts)
    }
}
```

res/drawable has some images.

The final result:

Caption for Image 1

Caption for Image 2

Caption for Image 3