KAZAKH KBTU BRITISH
TECHNICAL
UNIVERSITY

Assignment №1

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Almaty, 2024

Exercise 1: Kotlin Syntax Basics

1. **Variables and Data Types:**
   - Create variables of different data types: `Int`, `Double`, `String`, `Boolean`.
   - Print the variables using `println`.

Conditional Statements:

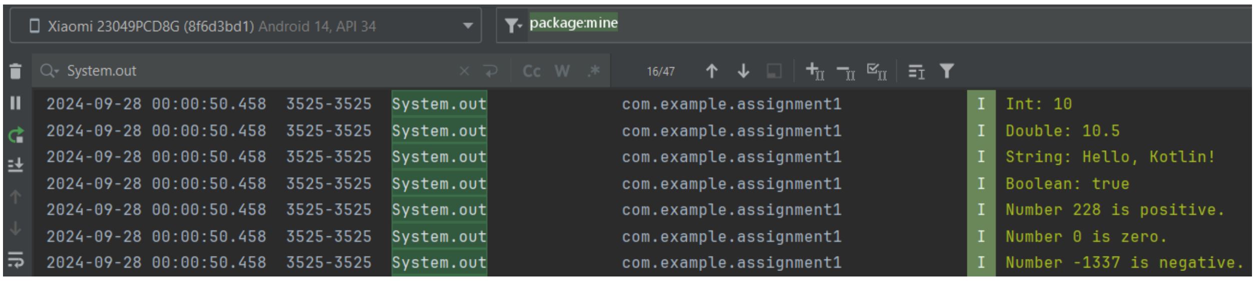
- Create a simple program that checks if a number is positive, negative, or zero.

Loops:

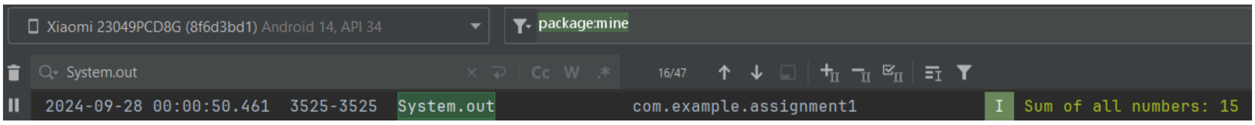
- Write a program that prints numbers from 1 to 10 using `for` and `while` loops

Collections:

- Create a list of numbers, iterate through the list, and print the sum of all numbers.



```
2024-09-28 00:00:50.458  3525-3525  System.out        com.example.assignment1     I  Int: 10
2024-09-28 00:00:50.458  3525-3525  System.out        com.example.assignment1     I  Double: 10.5
2024-09-28 00:00:50.458  3525-3525  System.out        com.example.assignment1     I  String: Hello, Kotlin!
2024-09-28 00:00:50.458  3525-3525  System.out        com.example.assignment1     I  Boolean: true
2024-09-28 00:00:50.458  3525-3525  System.out        com.example.assignment1     I  Number 228 is positive.
2024-09-28 00:00:50.458  3525-3525  System.out        com.example.assignment1     I  Number 0 is zero.
2024-09-28 00:00:50.458  3525-3525  System.out        com.example.assignment1     I  Number -1337 is negative.
```



```
2024-09-28 00:00:50.461  3525-3525  System.out        com.example.assignment1     I  Sum of all numbers: 15
```

Exercise 2: Kotlin OOP (Object-Oriented Programming)

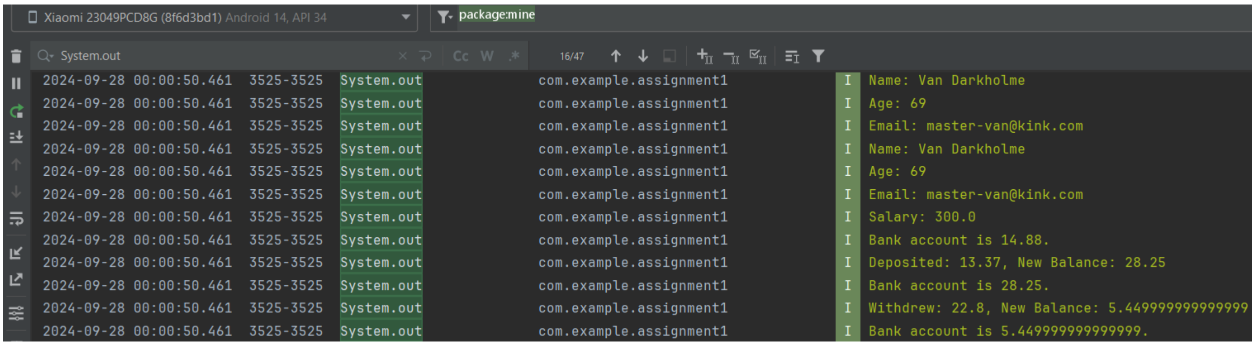
1. **Create a `Person` class:**
   - Define properties for `name`, `age`, and `email`.
   - Create a method to display the person's details.

Inheritance:

- Create a class `Employee` that inherits from the `Person` class.
- Add a property for `salary`.
- Override the `displayInfo` method to include the salary.

Encapsulation:

- Create a `BankAccount` class with a private property `balance`.
- Provide methods to `deposit` and `withdraw` money, ensuring the balance never goes negative.



```
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Name: Van Darkholme
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Age: 69
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Email: master-van@kink.com
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Name: Van Darkholme
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Age: 69
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Email: master-van@kink.com
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Salary: 300.0
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Bank account is 14.88.
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Deposited: 13.37, New Balance: 28.25
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Bank account is 28.25.
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Withdrew: 22.8, New Balance: 5.449999999999999
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Bank account is 5.449999999999999.
```

Exercise 3: Kotlin Functions

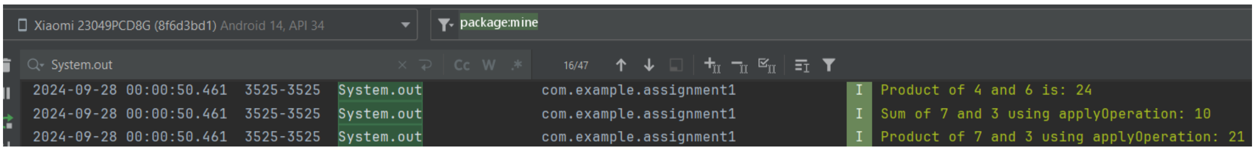
1. **Basic Function:**
   - Write a function that takes two integers as arguments and returns their sum

Lambda Functions:

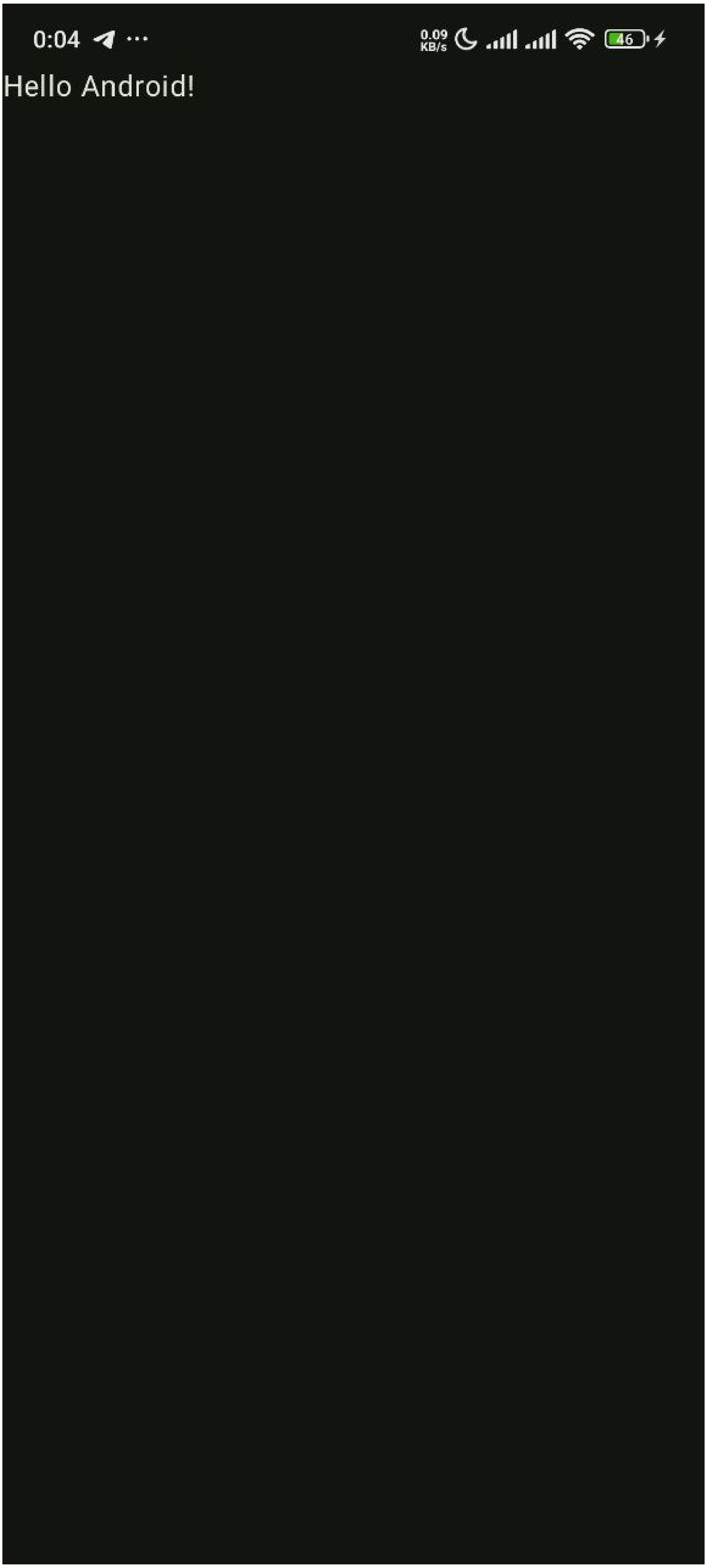
- Create a lambda function that multiplies two numbers and returns the result

Higher-Order Functions:

- Write a function that takes a lambda function as a parameter and applies it to two integers.



```
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Product of 4 and 6 is: 24
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Sum of 7 and 3 using applyOperation: 10
2024-09-28 00:00:50.461  3525-3525  System.out              com.example.assignment1              I  Product of 7 and 3 using applyOperation: 21
```



Hello Android!

Link to source code on GitHub:

https://github.com/BauyrzhanAzimkhanov/Mobile-programming-MSc/tree/master/Assignment1

Exercise 4: Android Layout in Kotlin (Instagram-like Layout)

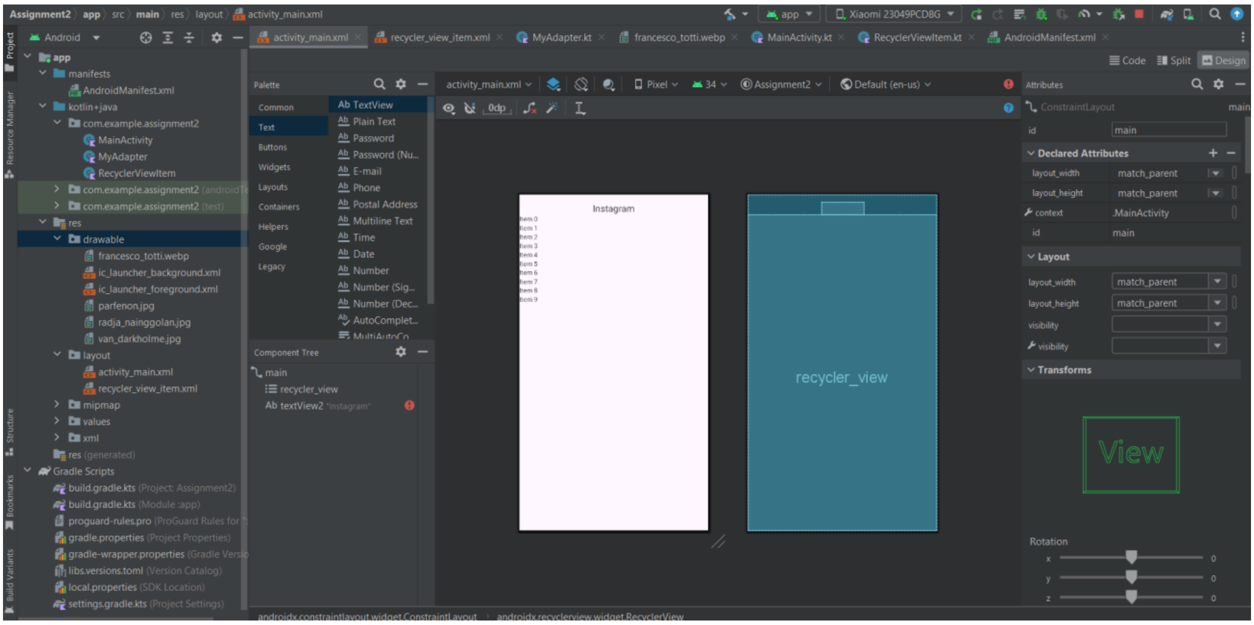
1. **Set Up the Android Project:**
   - Create a new Android project in Android Studio.
   - Ensure you have a Kotlin-based project.
2. **Design the Layout:**
   - Create a new XML layout file (`activity_main.xml`) for a simple Instagram-like user interface.
   - Include elements like `ImageView`, `TextView`, and `RecyclerView` for the feed

Create the RecyclerView Adapter:

- Set up the RecyclerView to display a feed of posts with `ImageView` for the picture and `TextView` for the caption.

MainActivity Setup:

- Initialize the `RecyclerView` in `MainActivity` and populate it with sample data

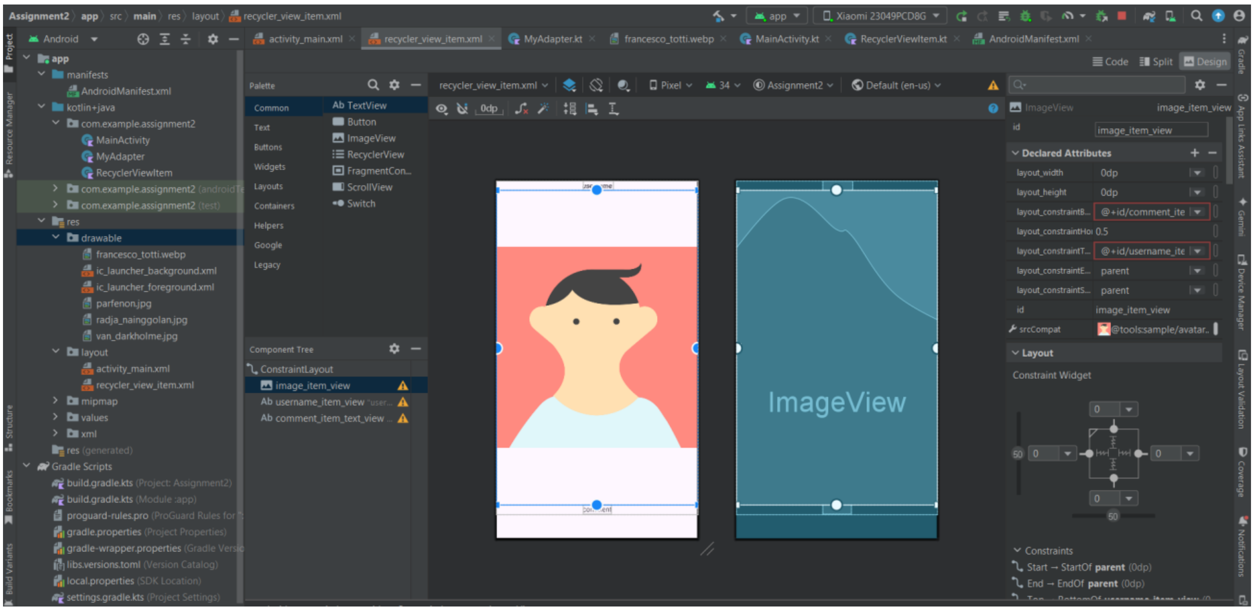


Assignment2 › app › src › main › res › layout › activity_main.xml

Component Tree:
- main
  - recycler_view
  - textView2 "Instagram"

Attributes: ConstraintLayout main
- id: main
- Declared Attributes:
  - layout_width: match_parent
  - layout_height: match_parent
  - context: .MainActivity
  - id: main
- Layout:
  - layout_width: match_parent
  - layout_height: match_parent

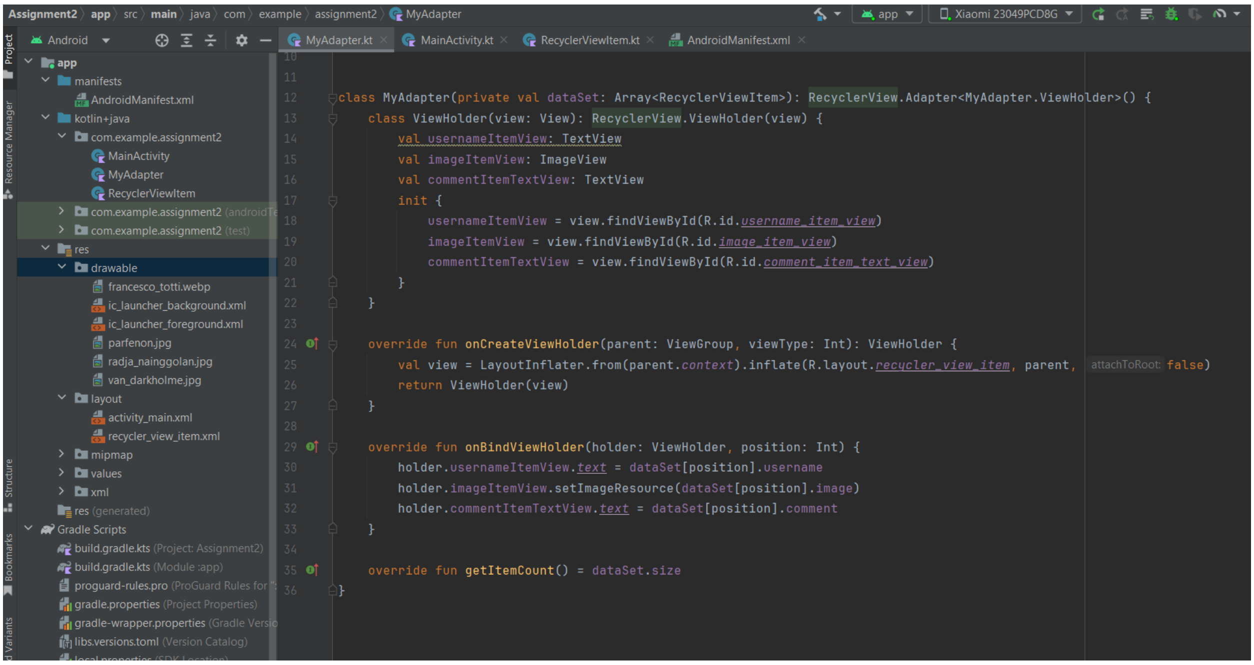
androidx.constraintlayout.widget.ConstraintLayout › androidx.recyclerview.widget.RecyclerView



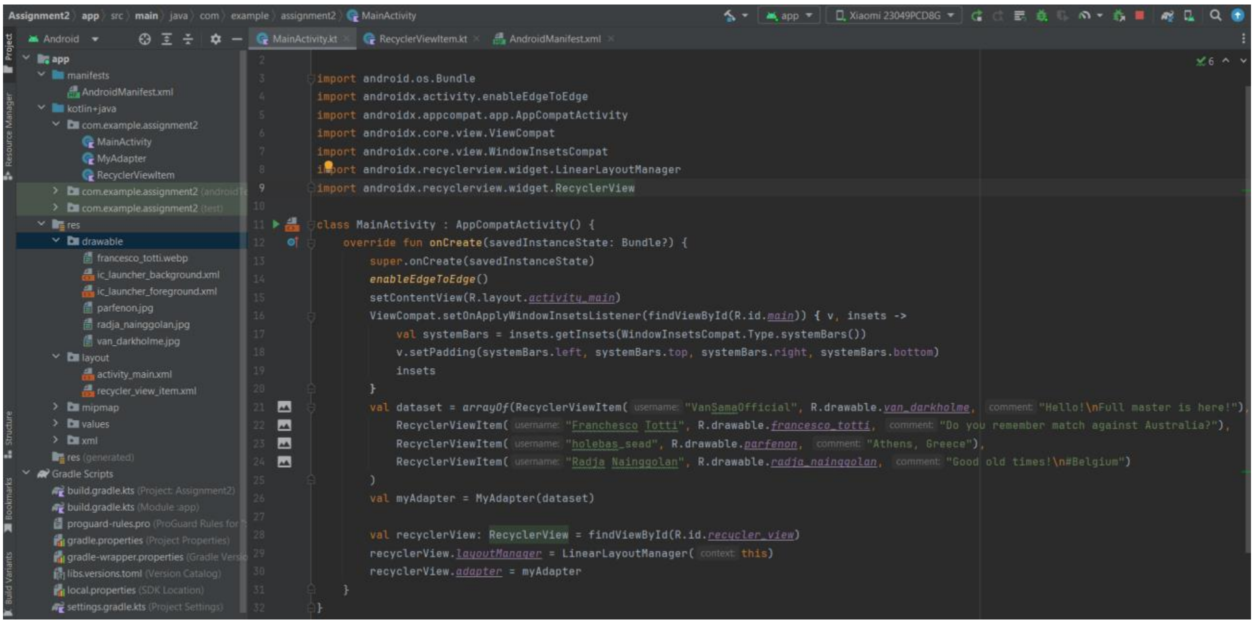
Assignment2 › app › src › main › res › layout › recycler_view_item.xml

Component Tree:
- ConstraintLayout
  - image_item_view
  - Ab username_item_view "user...
  - Ab comment_item_text_view ...

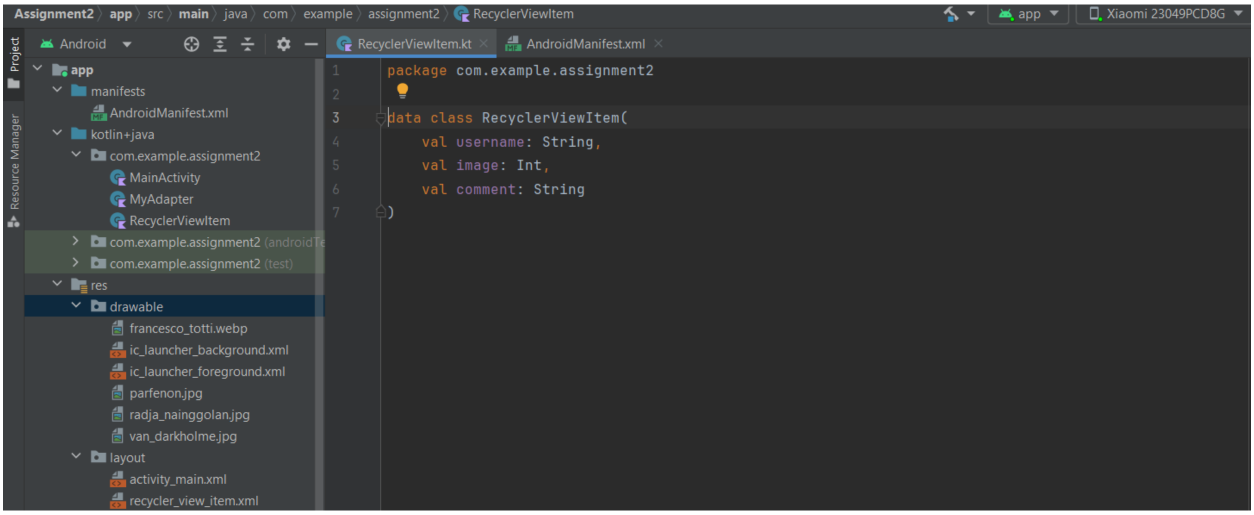
Attributes: ImageView image_item_view
- id: image_item_view
- Declared Attributes:
  - layout_width: 0dp
  - layout_height: 0dp
  - layout_constraintB...: @+id/comment_ite
  - layout_constraintHo: 0.5
  - layout_constraintT...: @+id/username_ite
  - layout_constraintE...: parent
  - layout_constraintS...: parent
  - id: image_item_view
  - srcCompat: @tools:sample/avatar..
- Constraints:
  - Start → StartOf parent (0dp)
  - End → EndOf parent (0dp)


Assignment2 〉 app 〉 src 〉 main 〉 java 〉 com 〉 example 〉 assignment2 〉 MyAdapter
MyAdapter.kt
MainActivity.kt
RecyclerViewItem.kt
AndroidManifest.xml

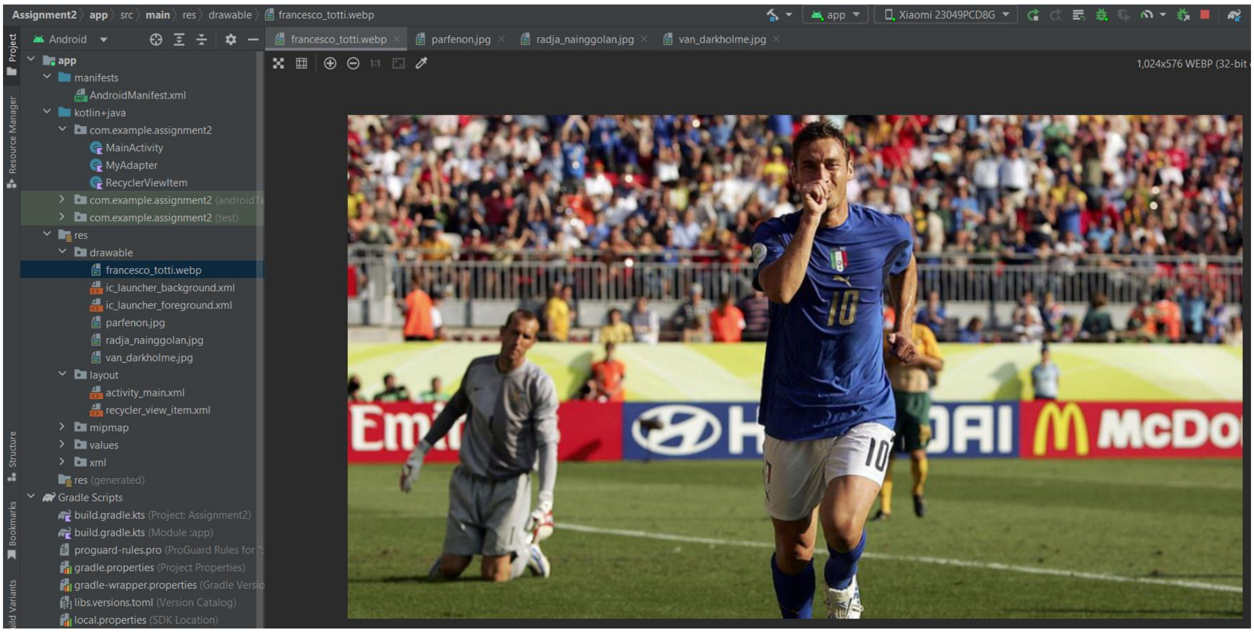
```kotlin
class MyAdapter(private val dataSet: Array<RecyclerViewItem>): RecyclerView.Adapter<MyAdapter.ViewHolder>() {
    class ViewHolder(view: View): RecyclerView.ViewHolder(view) {
        val usernameItemView: TextView
        val imageItemView: ImageView
        val commentItemTextView: TextView
        init {
            usernameItemView = view.findViewById(R.id.username_item_view)
            imageItemView = view.findViewById(R.id.image_item_view)
            commentItemTextView = view.findViewById(R.id.comment_item_text_view)
        }
    }

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

    override fun onBindViewHolder(holder: ViewHolder, position: Int) {
        holder.usernameItemView.text = dataSet[position].username
        holder.imageItemView.setImageResource(dataSet[position].image)
        holder.commentItemTextView.text = dataSet[position].comment
    }

    override fun getItemCount() = dataSet.size
}
```


Assignment2 〉 app 〉 src 〉 main 〉 java 〉 com 〉 example 〉 assignment2 〉 MainActivity
MainActivity.kt
RecyclerViewItem.kt
AndroidManifest.xml

```kotlin
import android.os.Bundle
import androidx.activity.enableEdgeToEdge
import androidx.appcompat.app.AppCompatActivity
import androidx.core.view.ViewCompat
import androidx.core.view.WindowInsetsCompat
import androidx.recyclerview.widget.LinearLayoutManager
import androidx.recyclerview.widget.RecyclerView

class MainActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        enableEdgeToEdge()
        setContentView(R.layout.activity_main)
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main)) { v, insets ->
            val systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars())
            v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom)
            insets
        }
        val dataset = arrayOf(RecyclerViewItem( username: "VanSamaOfficial", R.drawable.van_darkholme, comment: "Hello!\nFull master is here!"),
            RecyclerViewItem( username: "Franchesco Totti", R.drawable.francesco_totti, comment: "Do you remember match against Australia?"),
            RecyclerViewItem( username: "holebas_sead", R.drawable.parfenon, comment: "Athens, Greece"),
            RecyclerViewItem( username: "Radja Nainggolan", R.drawable.radja_nainggolan, comment: "Good old times!\n#Belgium")
        )
        val myAdapter = MyAdapter(dataset)

        val recyclerView: RecyclerView = findViewById(R.id.recycler_view)
        recyclerView.layoutManager = LinearLayoutManager( context: this)
        recyclerView.adapter = myAdapter
    }
}
```


Assignment2 〉 app 〉 src 〉 main 〉 java 〉 com 〉 example 〉 assignment2 〉 RecyclerViewItem
RecyclerViewItem.kt
AndroidManifest.xml

```kotlin
package com.example.assignment2

data class RecyclerViewItem(
    val username: String,
    val image: Int,
    val comment: String
)
```

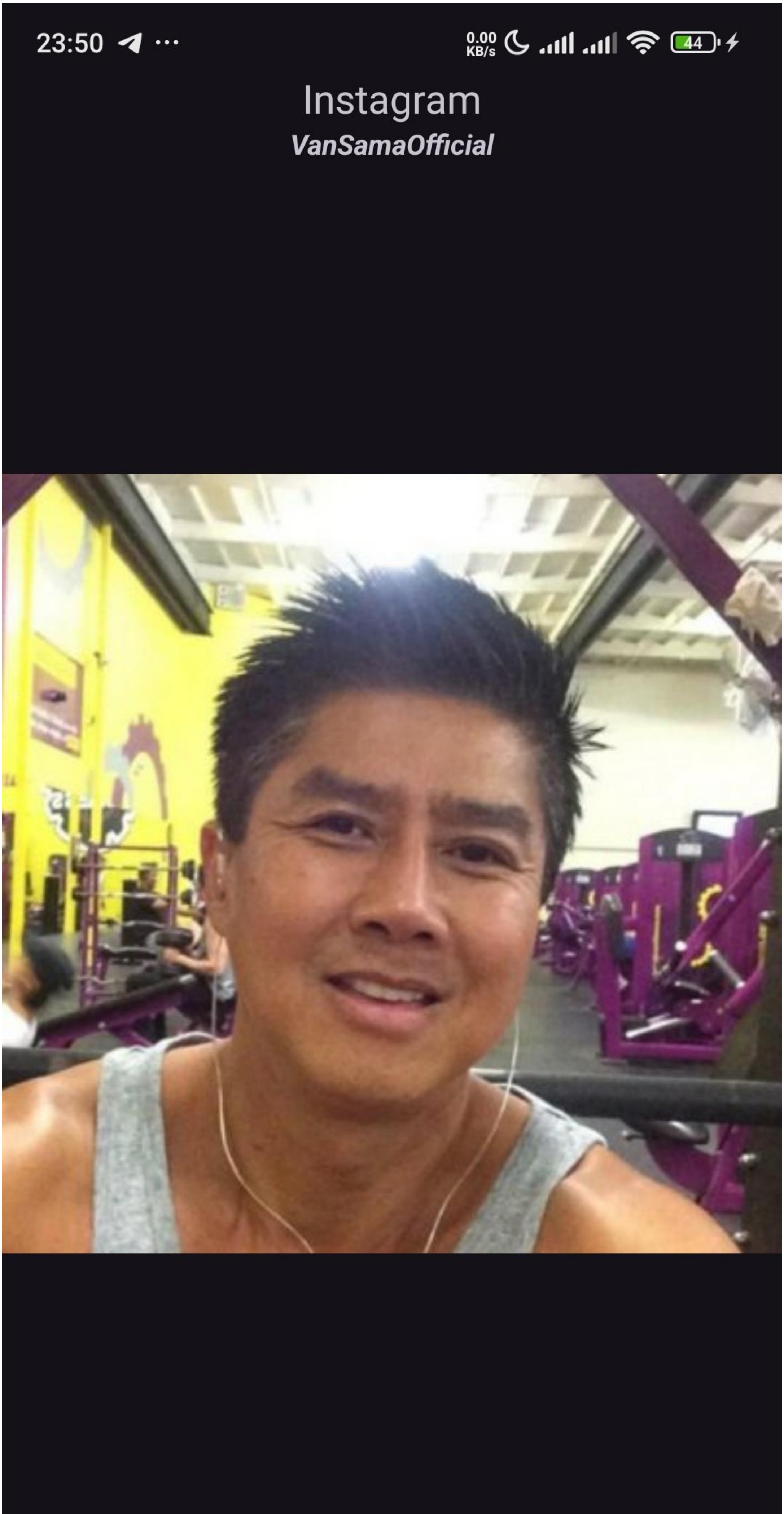


Assignment2 〉 app 〉 src 〉 main 〉 res 〉 drawable 〉 francesco_totti.webp

francesco_totti.webp | parfenon.jpg | radja_nainggolan.jpg | van_darkholme.jpg

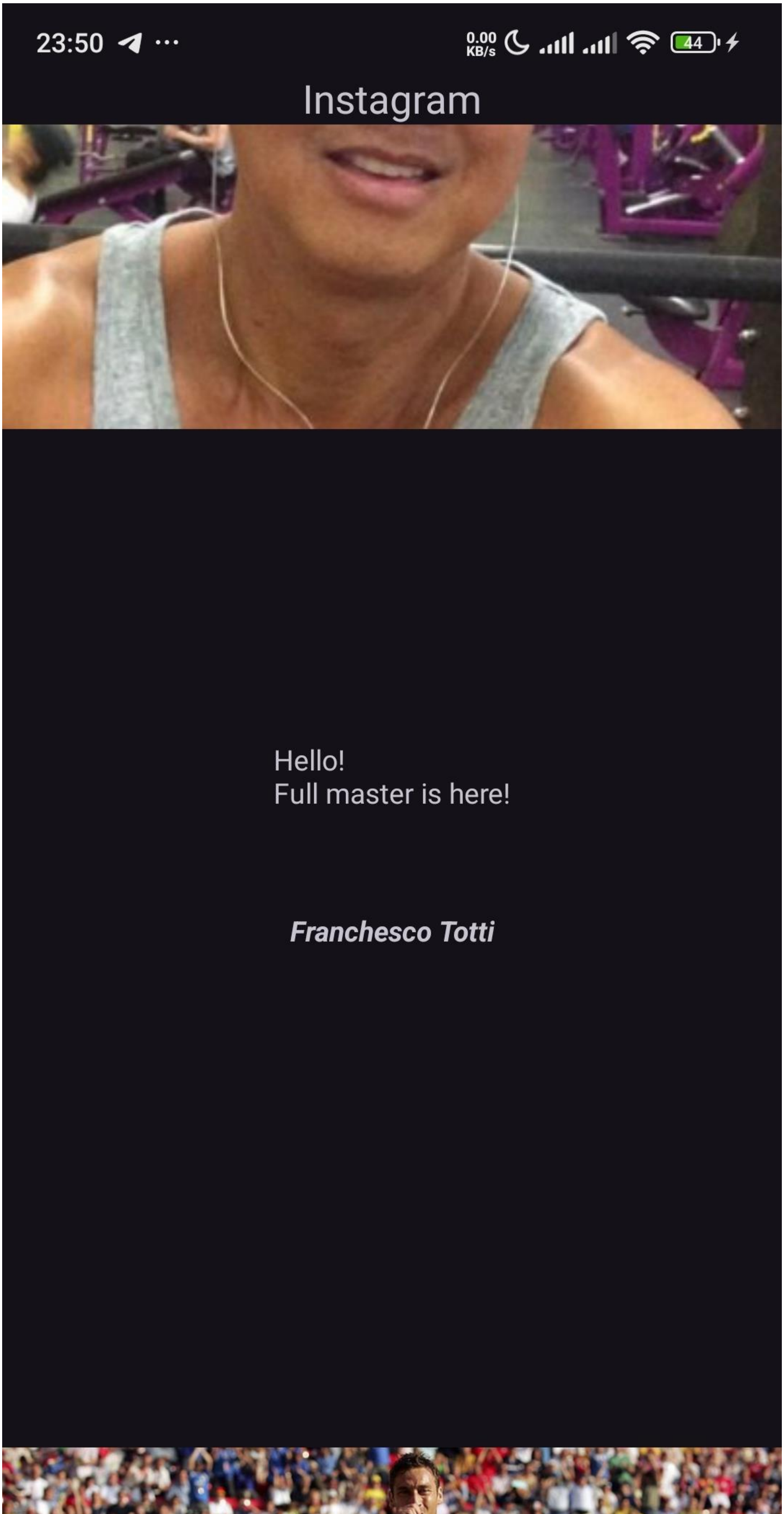
1,024x576 WEBP (32-bit c

```
app
  manifests
    AndroidManifest.xml
  kotlin+java
    com.example.assignment2
      MainActivity
      MyAdapter
      RecyclerViewItem
    com.example.assignment2 (androidTe
    com.example.assignment2 (test)
  res
    drawable
      francesco_totti.webp
      ic_launcher_background.xml
      ic_launcher_foreground.xml
      parfenon.jpg
      radja_nainggolan.jpg
      van_darkholme.jpg
    layout
      activity_main.xml
      recycler_view_item.xml
    mipmap
    values
    xml
  res (generated)
Gradle Scripts
  build.gradle.kts (Project: Assignment2)
  build.gradle.kts (Module :app)
  proguard-rules.pro (ProGuard Rules for ":
  gradle.properties (Project Properties)
  gradle-wrapper.properties (Gradle Versio
  libs.versions.toml (Version Catalog)
  local.properties (SDK Location)
```



Instagram

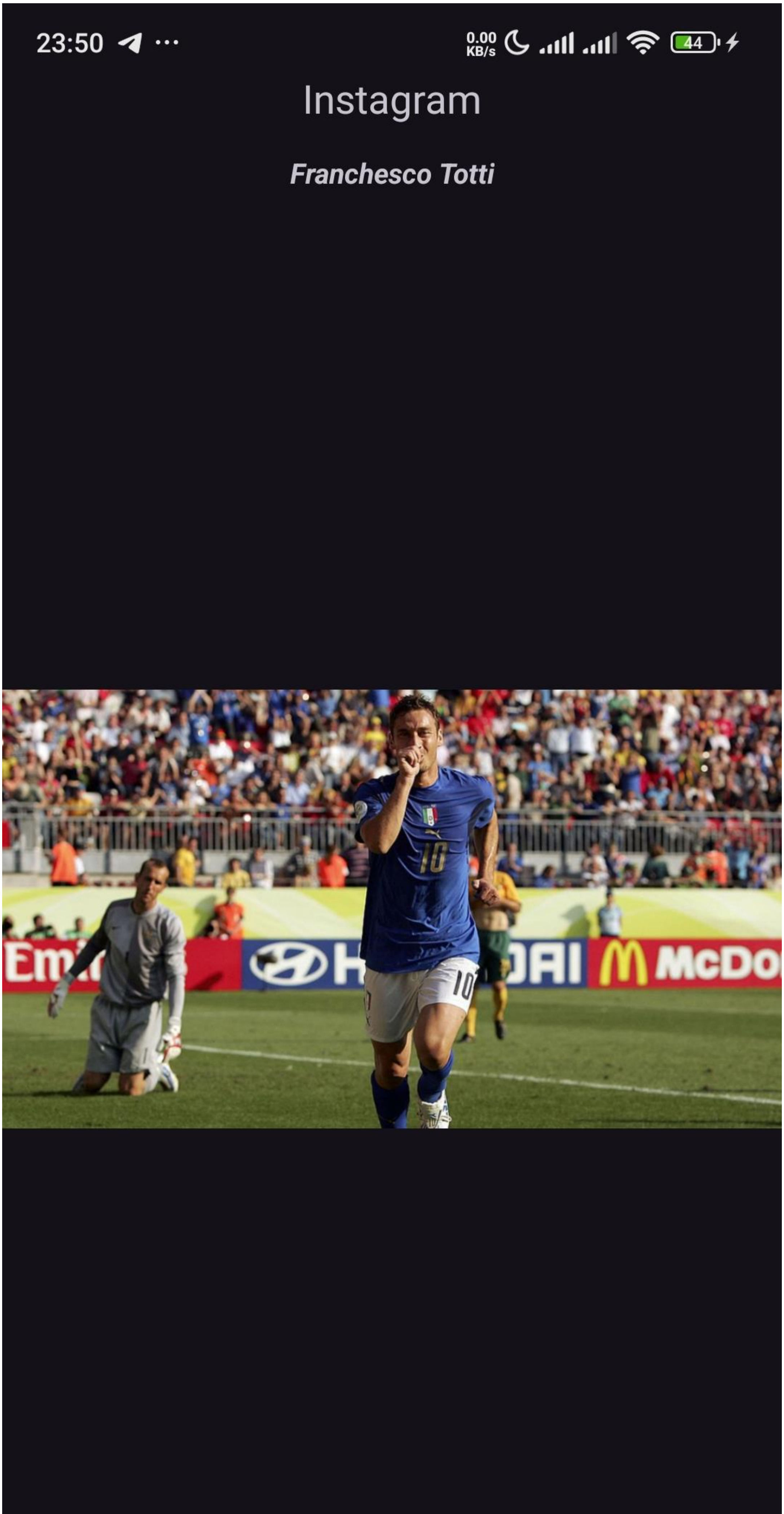
VanSamaOfficial



Instagram

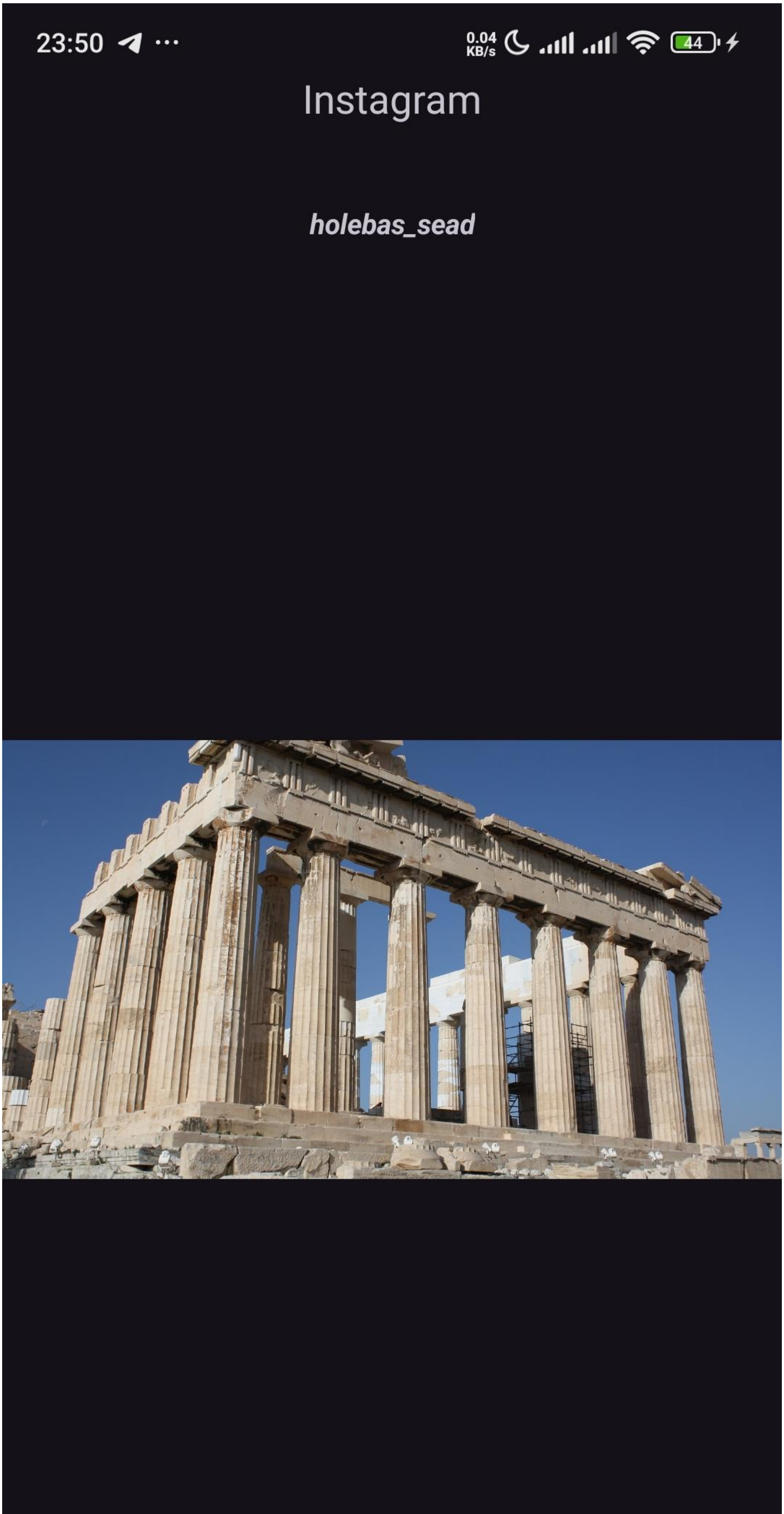
Hello!
Full master is here!

Franchesco Totti



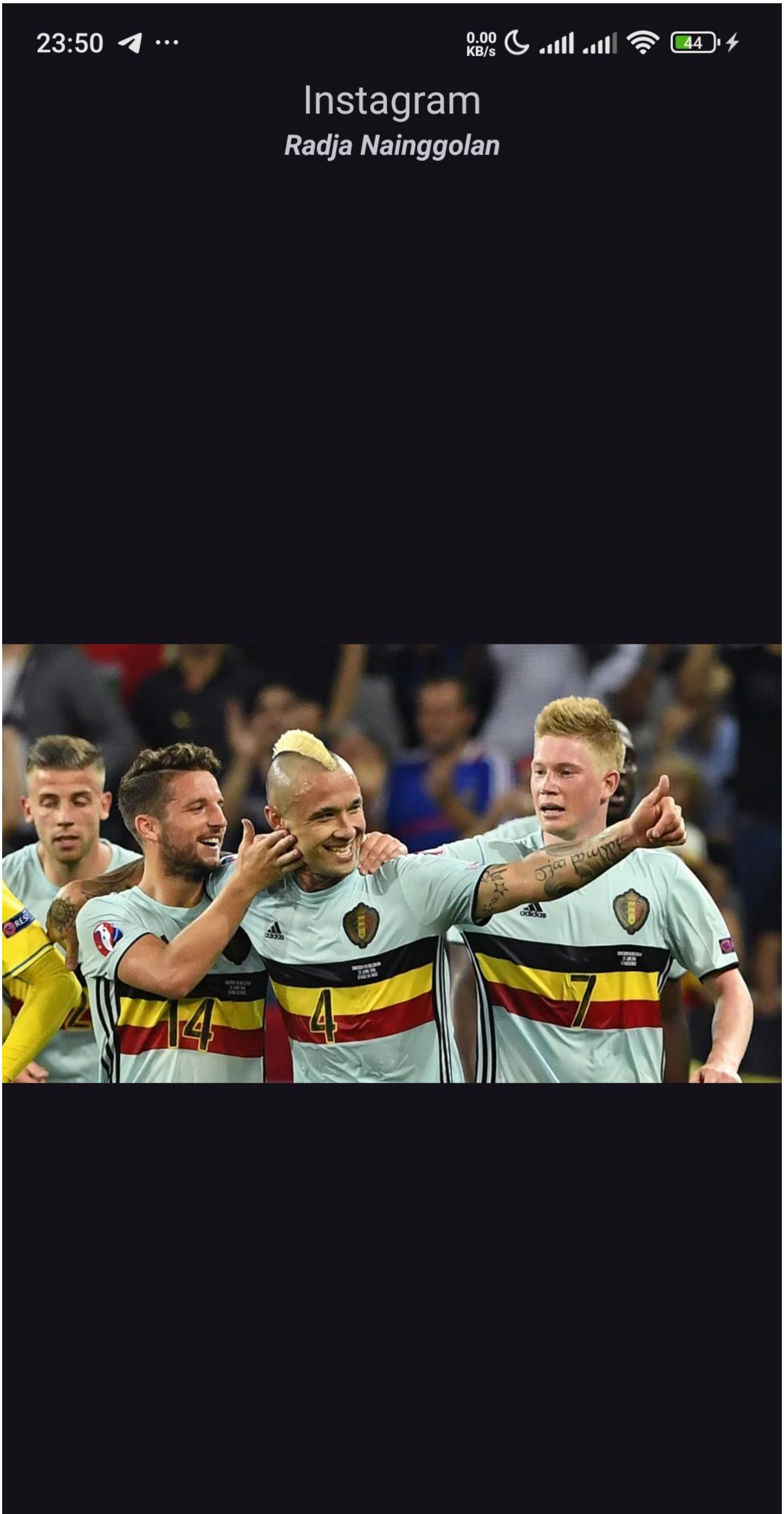
Instagram

Franchesco Totti



Instagram

holebas_sead



Instagram

Radja Nainggolan

Link to source code on GitHub:

https://github.com/BauyrzhanAzimkhanov/Mobile-programming-MSc/tree/master/Assignment2