Assignment №2

Create Basic Pages of Instagram in Android Studio

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Introduction

The goal of this assignment is to develop a simplified version of Instagram's core pages using Android Studio. Students will learn to implement layouts, navigation, and user interface elements similar to Instagram.

Project setup

The project was created using the Empty Activity from the tutorial for this task.

I used libraries and plugins:

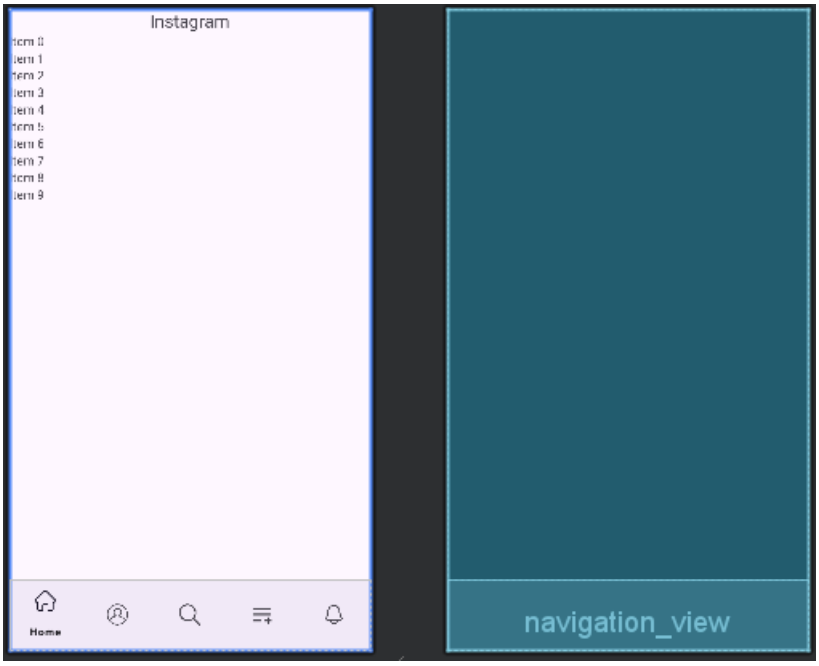
- androidx.navigation.safeargs
- androidx.navigation:navigation-compose:2.8.2
- androidx.navigation:navigation-fragment:2.8.2
- androidx.navigation:navigation-ui:2.8.2
- androidx.navigation:navigation-dynamic-features-fragment:2.8.2
- androidx.navigation:navigation-testing:2.8.2

This was necessary to fulfill the conditions of the Navigation item. Namely, the use of Fragments and NavComponent.

```
    plugins {
    alias(libs.plugins.android.application)
    alias(libs.plugins.kotlin.android)
    id("androidx.navigation.safeargs")
}
```

```
    dependencies {
    implementation(libs.androidx.navigation.ui.ktx)
    val nav_version = "2.8.2"
    // Jetpack Compose integration
    implementation("androidx.navigation:navigation-compose:$nav_version")

    // Views/Fragments integration
    implementation("androidx.navigation:navigation-fragment:$nav_version")
    implementation("androidx.navigation:navigation-ui:$nav_version")

    // Feature module support for Fragments
    implementation("androidx.navigation:navigation-dynamic-features-
fragment:$nav_version")

    // Testing Navigation
    androidTestImplementation("androidx.navigation:navigation-
testing:$nav_version")

    implementation("com.google.android.material:material:1.2.0")
    implementation("androidx.activity:activity:1.9.2")
```

Page design

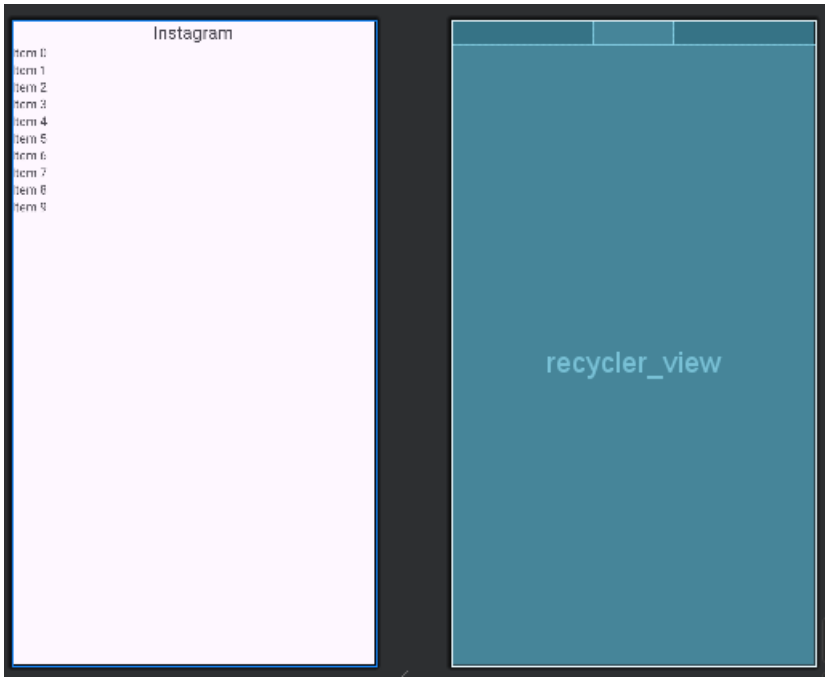


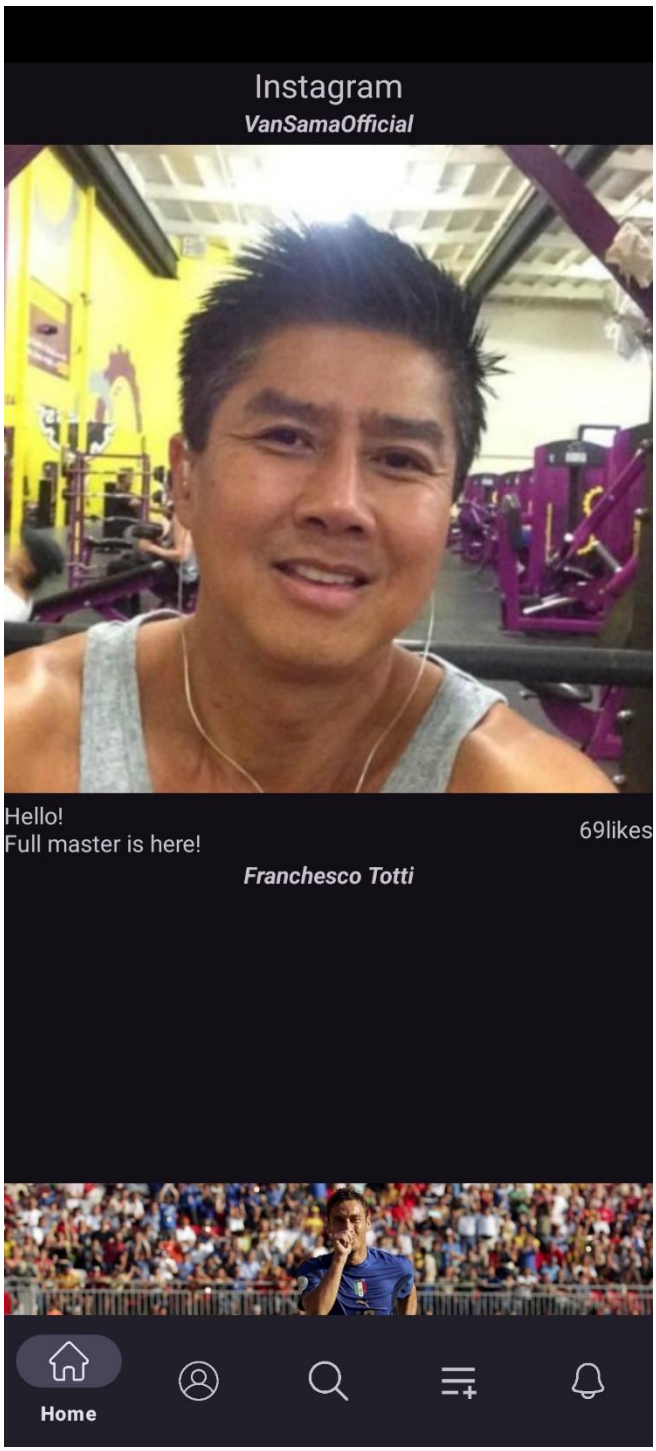
ActivityMain

This Activity contains only a fragment controller and a bottom navigation view. The contents of the fragment layout are controlled by the bottom menu. The fragment can be dynamically replaced.

Inside **each fragment** I used ConstraintLayout.

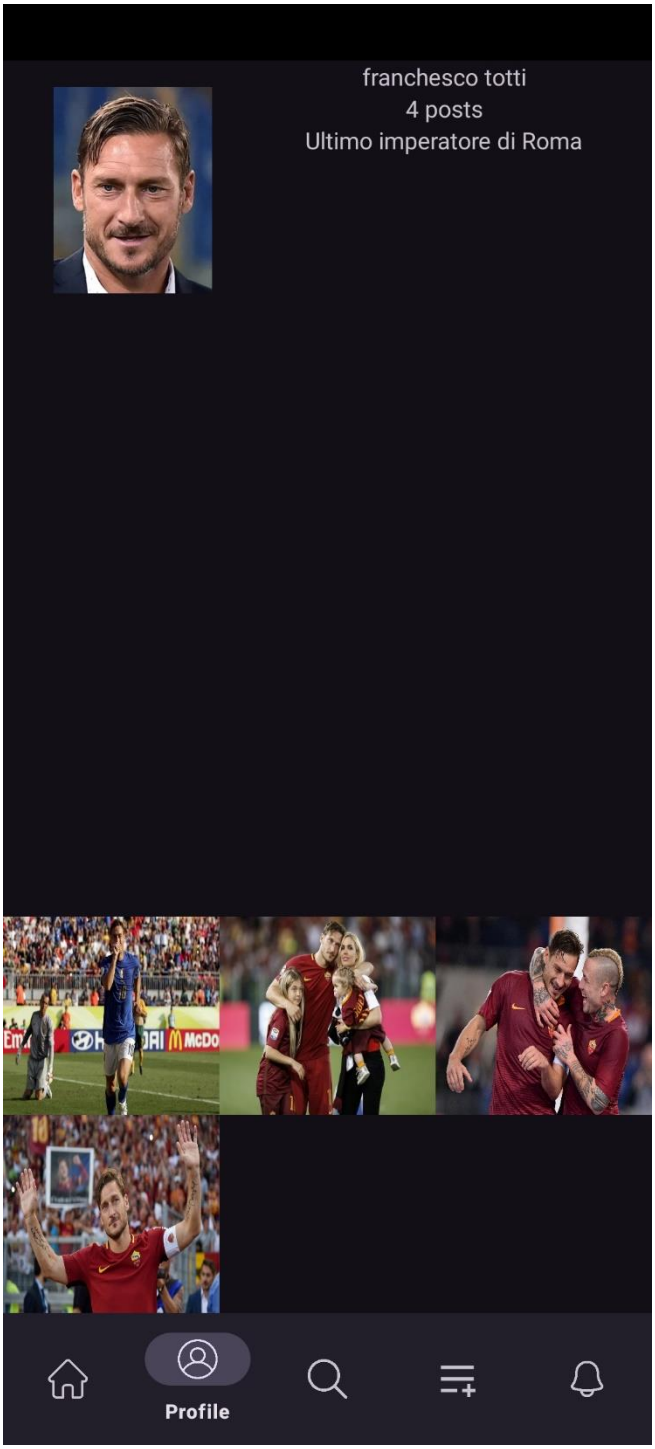
Home Feed





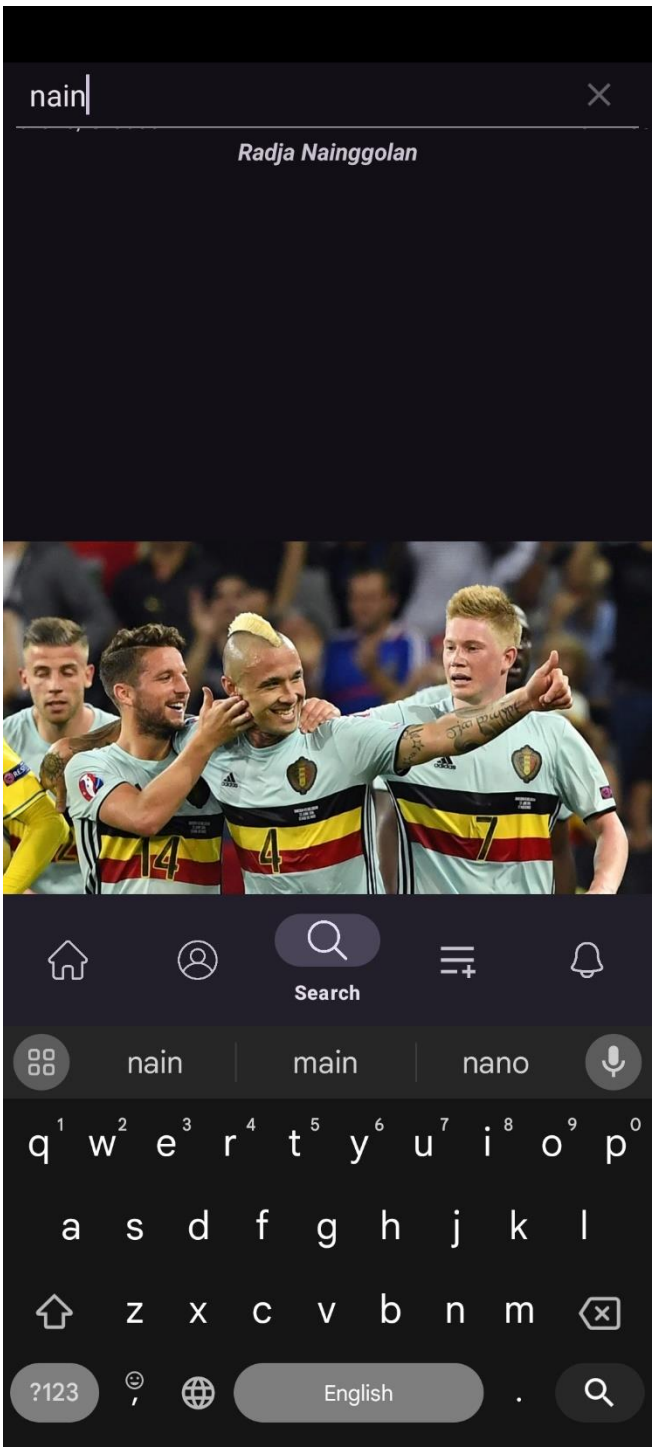
The simplest fragment with text and recyclerview. Almost the same code from previous assignment.

Profile Page



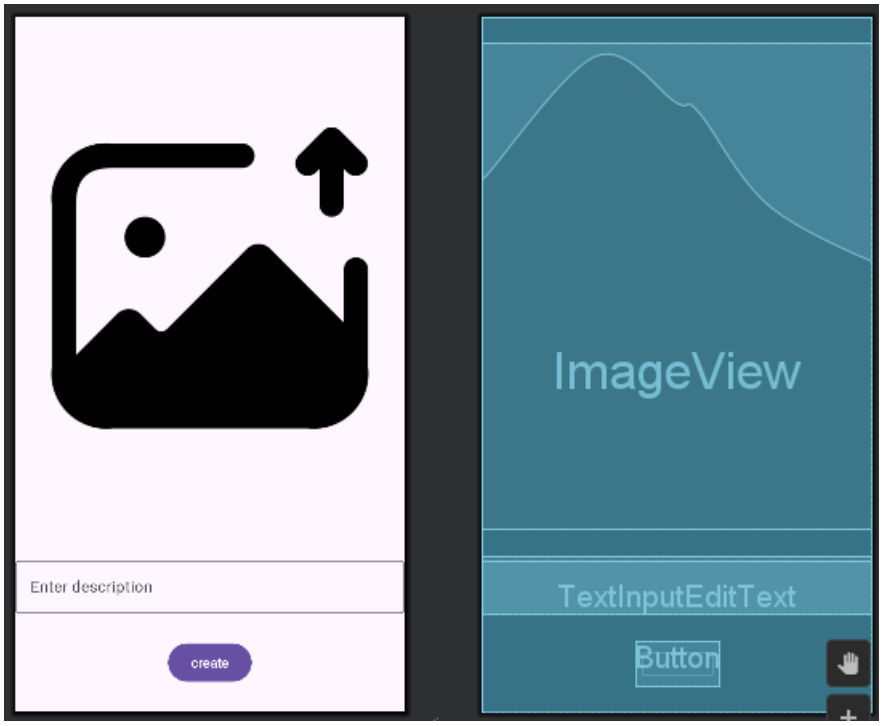
The simplest fragment with text, image and GirdView.

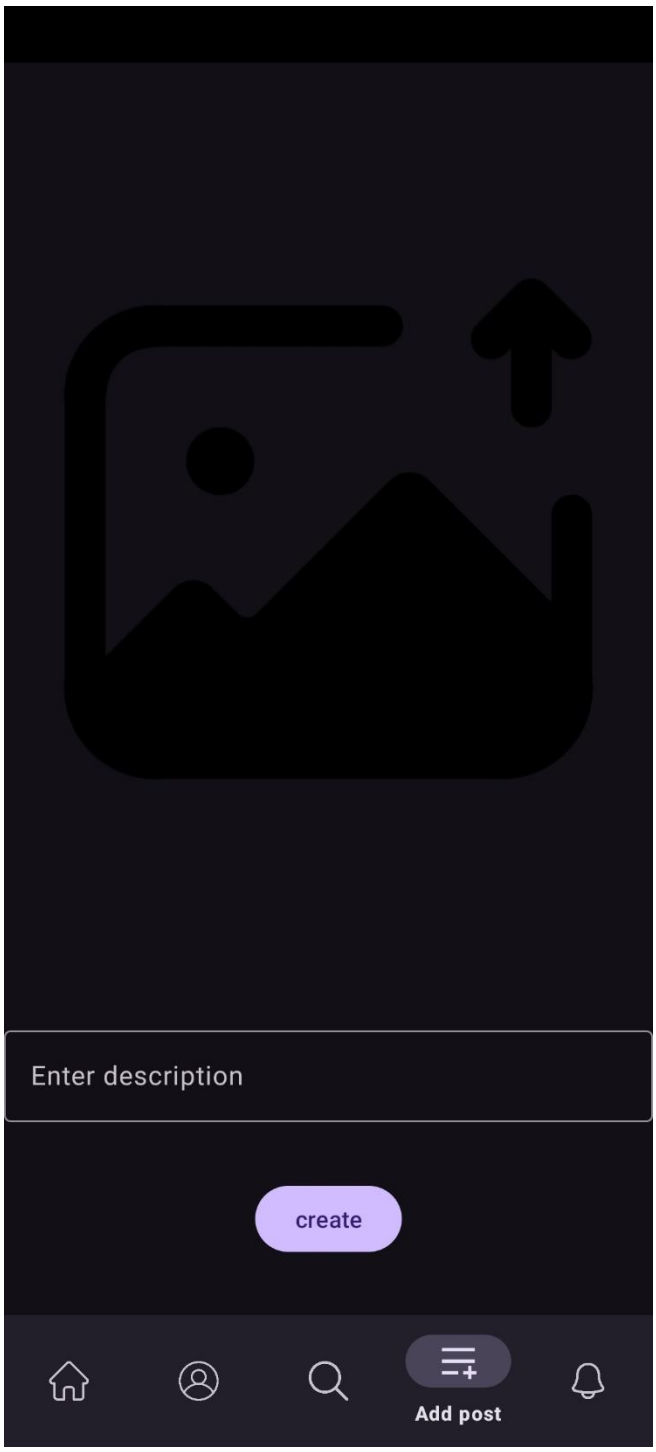
Search Page



The simplest fragment with text and recyclerview. Almost the same as HomeFeedFragment.

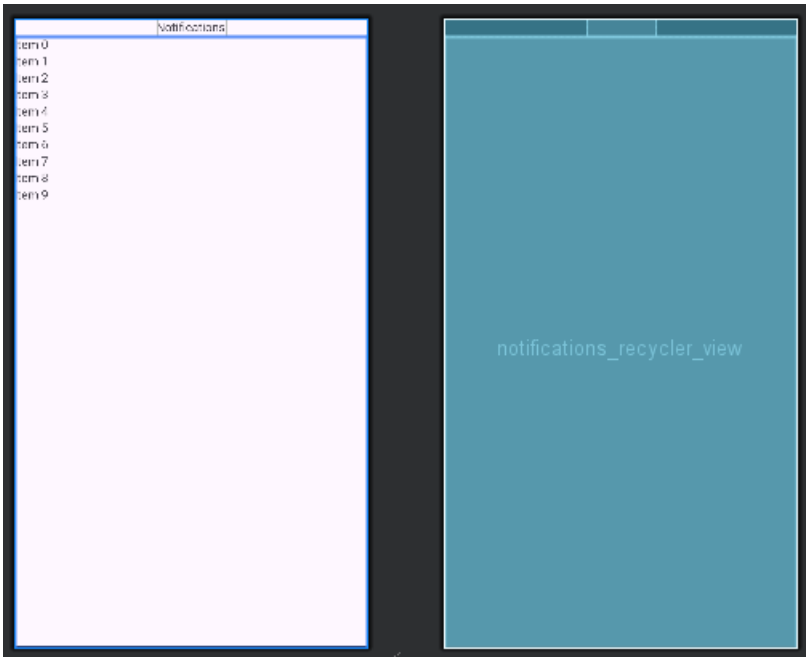
Add Post Page

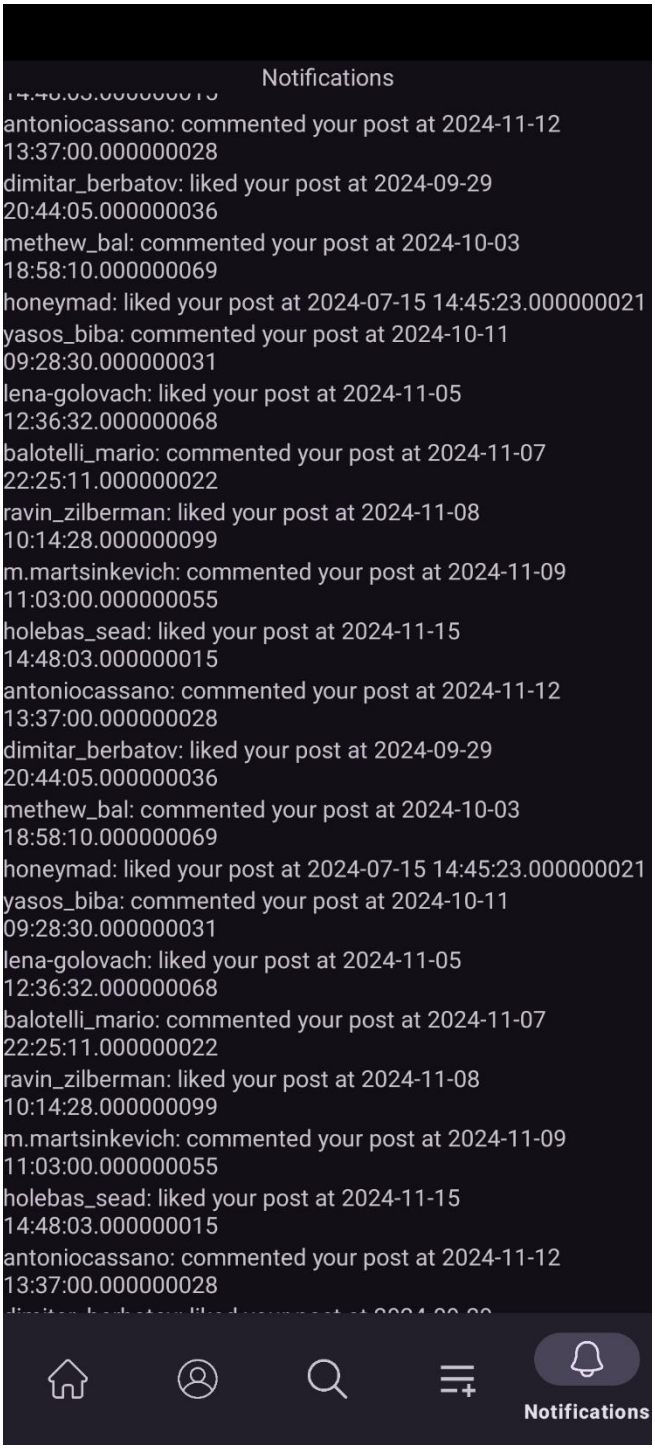




The simplest fragment with text, button and image.

Notifications Page





The simplest fragment with text and recyclerview.

Navigation

Navigation is implemented using FragmentContainerView (inside MainActivity), NavComponent and navigation graph (navigation/navigation_graph.xml). In FragmentContainerView instances of Fragment class can dynamically replace each other. These replacements are handled by NavController and described in the navigation graph.

Using Actions and Argument (navigation_graph.xml - declaration, RecyclerViewAdapter - logic and implementation) I switched the fragment and passed data to them accordingly.

I used NavComponent because of the requirements of this assignment. I used NavComponent because of the requirements of this task. However, it allows you to navigate between Views and Activities while maintaining state, context, etc.

```
     <fragment
    android:id="@+id/home_feed_menu"
    android:name="com.example.assignment2.HomeFeedFragment"
    android:label="HomeFeedFragment"
    tools:layout="@layout/fragment_home_feed">
    <action
        android:id="@+id/action_home_feed_menu_to_profile_menu"
        app:destination="@+id/profile_menu">
        <argument
            android:name="username"
            app:argType="string"/>
    </action>
</fragment>
```

User Interaction

The interaction is implemented via setOnClickListener. They are found in MainActivity, RecyclerViewAdapter and other script files.

They were mainly used to set values for UI elements or switch fragments.

```
     private fun bottomNavItemChangeListener(navigationView:
BottomNavigationView, navigationController: NavController) {
    navigationView.setOnItemSelectedListener { item ->
        if (item.itemId != navigationView.selectedItemId) {
            navigationController.popBackStack(item.itemId, inclusive = true,
saveState = false)
            navigationController.navigate(item.itemId)
        }
        true
    }
}
```

ActivityMain

```
holder.usernameItemView.setOnClickListener {
    try {
        val transitionToProfileMenuAction =
HomeFeedFragmentDirections.actionHomeFeedMenuToProfileMenu(username)
        navigationController.navigate(transitionToProfileMenuAction)
    }
    catch (exception: Exception) {
        println("Transited from wrong origin - HomeFeedFragment: $exception")
    }
    try {
        val transitionToProfileMenuAction =
SearchFragmentDirections.actionSearchMenuToProfileMenu(initialDataSet[positio
n].username)
        navigationController.navigate(transitionToProfileMenuAction)
    }
    catch (exception: Exception) {
        println("Transited from wrong origin - SearchFragment: $exception")
    }
}
holder.likesItemTextView.setOnClickListener {
    initialDataSet[position].likes++
    likesItemTextViewText = initialDataSet[position].likes.toString() +
"likes"
    holder.likesItemTextView.text = likesItemTextViewText
}
```

RecyclerViewAdapter

Challenges and Solutions

The ***biggest problem*** was the **lack of time** to write documentation/report.

It was also difficult to find information about some errors when building the project.

Conclusion

Key learnings from the assignment

This assignment highlighted the importance of using the technologies covered in the lectures to write modern Android applications.

Importance of UI/UX in mobile app development

We cannot underestimate their importance because users will not use your product even if it works perfectly if you have a terrible user interface and even worse UX.

References

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- https://www.geeksforgeeks.org/bottom-navigation-bar-in-android/
- https://medium.com/@everydayprogrammer/implement-android-photo-picker-in-android-studio-3562a85c85f1
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- https://www.geeksforgeeks.org/android-gridview-in-kotlin/
- https://www.geeksforgeeks.org/how-to-implement-android-searchview-with-example/
- https://developer.android.com/reference/
- https://kotlinlang.org/docs/home.html

Link to my GitHub repository (screenshots included):

- **https://github.com/BauyrzhanAzimkhanov/Mobile-programming-MSc.git**

Logs

```
2024-10-19 00:43:57.718  8628-
8628  System.out              com.example.assignment2              I  Transited
from wrong origin - SearchFragment: java.lang.IllegalArgumentException:
Navigation action/destination
com.example.assignment2:id/action_search_menu_to_profile_menu cannot be found
from the current destination Destination(com.example.assignment2:id/profile_menu)
label=ProfileFragment class=com.example.assignment2.ProfileFragment



2024-10-19 00:44:03.472  8628-
8628  System.out              com.example.assignment2              I  Transited
from wrong origin - HomeFeedFragment: java.lang.IllegalArgumentException:
Navigation action/destination
com.example.assignment2:id/action_home_feed_menu_to_profile_menu cannot be found
from the current destination Destination(com.example.assignment2:id/search_menu)
label=SearchFragment class=com.example.assignment2.SearchFragment
```