### Simple Android News App - Three Fragment Case Study

In this case study, we'll create a simple **News App** using three fragments to showcase different categories of news such as **Latest News**, **Sports News**, and **Technology News**. We'll use **ViewPager2** and **TabLayout** for fragment navigation. This example will focus on fragment management, RecyclerView usage, and passing data between fragments.

#### Features:

1. **Three Tabs**: Latest, Sports, and Technology news.
2. Each tab contains a **RecyclerView** displaying a list of news articles.
3. Each news item can be clicked to view details.

#### Tech Stack:

* **Language**: Kotlin
* **Android Version**: Android 5.0 (Lollipop) or higher
* **Libraries**: ViewPager2, TabLayout, RecyclerView

### 1. App Architecture:

* **MainActivity**: Hosts the ViewPager2 and TabLayout.
* **Fragments**: Three fragments for Latest News, Sports News, and Technology News.
* **Adapter**: A RecyclerView adapter to display news in each fragment.
* **Model**: A News data model.

### 2. Dependencies

Add the following dependencies in your build.gradle:

gradle

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dependencies {

implementation "androidx.recyclerview:recyclerview:1.2.1"

implementation "androidx.viewpager2:viewpager2:1.0.0"

implementation "com.google.android.material:material:1.4.0"

}

### 3. Layout for MainActivity (XML)

We’ll use TabLayout and ViewPager2 to switch between the three fragments.

xml

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<!-- res/layout/activity\_main.xml --><LinearLayout

xmlns:android="http://schemas.android.com/apk/res/android"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical">

<com.google.android.material.tabs.TabLayout

android:id="@+id/tabLayout"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"/>

<androidx.viewpager2.widget.ViewPager2

android:id="@+id/viewPager"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"/>

</LinearLayout>

### 4. MainActivity (Kotlin)

In the MainActivity, we’ll set up TabLayout and ViewPager2 with a FragmentPagerAdapter.

kotlin

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package com.example.newsapp

import android.os.Bundleimport androidx.appcompat.app.AppCompatActivityimport com.google.android.material.tabs.TabLayoutimport com.google.android.material.tabs.TabLayoutMediatorimport androidx.viewpager2.widget.ViewPager2

class MainActivity : AppCompatActivity() {

override fun onCreate(savedInstanceState: Bundle?) {

super.onCreate(savedInstanceState)

setContentView(R.layout.activity\_main)

val tabLayout = findViewById<TabLayout>(R.id.tabLayout)

val viewPager = findViewById<ViewPager2>(R.id.viewPager)

val adapter = NewsPagerAdapter(this)

viewPager.adapter = adapter

TabLayoutMediator(tabLayout, viewPager) { tab, position ->

when (position) {

0 -> tab.text = "Latest"

1 -> tab.text = "Sports"

2 -> tab.text = "Technology"

}

}.attach()

}

}

### 5. FragmentPagerAdapter (Kotlin)

We'll create a FragmentPagerAdapter that returns the appropriate fragment based on the selected tab.

kotlin

Copy code

package com.example.newsapp

import androidx.fragment.app.Fragmentimport androidx.fragment.app.FragmentActivityimport androidx.viewpager2.adapter.FragmentStateAdapter

class NewsPagerAdapter(fragmentActivity: FragmentActivity) : FragmentStateAdapter(fragmentActivity) {

override fun getItemCount(): Int = 3

override fun createFragment(position: Int): Fragment {

return when (position) {

0 -> LatestNewsFragment()

1 -> SportsNewsFragment()

2 -> TechnologyNewsFragment()

else -> LatestNewsFragment()

}

}

}

### 6. News Model (Kotlin)

Create a simple data class to represent news items.

kotlin

Copy code

package com.example.newsapp

data class NewsItem(val title: String, val description: String)

### 7. RecyclerView Adapter (Kotlin)

This adapter will bind the news items to the RecyclerView in each fragment.

kotlin

Copy code

package com.example.newsapp

import android.view.LayoutInflaterimport android.view.Viewimport android.view.ViewGroupimport android.widget.TextViewimport androidx.recyclerview.widget.RecyclerView

class NewsAdapter(private val newsList: List<NewsItem>, private val onItemClick: (NewsItem) -> Unit) :

RecyclerView.Adapter<NewsAdapter.NewsViewHolder>() {

class NewsViewHolder(itemView: View) : RecyclerView.ViewHolder(itemView) {

val titleTextView: TextView = itemView.findViewById(R.id.news\_title)

val descriptionTextView: TextView = itemView.findViewById(R.id.news\_description)

}

override fun onCreateViewHolder(parent: ViewGroup, viewType: Int): NewsViewHolder {

val view = LayoutInflater.from(parent.context).inflate(R.layout.news\_item, parent, false)

return NewsViewHolder(view)

}

override fun onBindViewHolder(holder: NewsViewHolder, position: Int) {

val newsItem = newsList[position]

holder.titleTextView.text = newsItem.title

holder.descriptionTextView.text = newsItem.description

holder.itemView.setOnClickListener { onItemClick(newsItem) }

}

override fun getItemCount(): Int = newsList.size

}

### 8. Fragment Layout (XML)

Each fragment will use a RecyclerView to display the news.

xml

Copy code

<!-- res/layout/fragment\_news.xml --><LinearLayout

xmlns:android="http://schemas.android.com/apk/res/android"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical">

<androidx.recyclerview.widget.RecyclerView

android:id="@+id/newsRecyclerView"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"/></LinearLayout>

### 9. News Item Layout (XML)

Each news item will have a title and a description.

xml

Copy code

<!-- res/layout/news\_item.xml --><LinearLayout

xmlns:android="http://schemas.android.com/apk/res/android"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:orientation="vertical"

android:padding="16dp">

<TextView

android:id="@+id/news\_title"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:textStyle="bold"

android:textSize="18sp"/>

<TextView

android:id="@+id/news\_description"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:textSize="14sp"

android:layout\_marginTop="4dp"/>

</LinearLayout>

### 10. Fragment for Latest News (Kotlin)

Each fragment (Latest, Sports, Technology) will use a RecyclerView to show news. Here’s how to implement the LatestNewsFragment:

kotlin

Copy code

package com.example.newsapp

import android.os.Bundleimport android.view.LayoutInflaterimport android.view.Viewimport android.view.ViewGroupimport android.widget.Toastimport androidx.fragment.app.Fragmentimport androidx.recyclerview.widget.LinearLayoutManagerimport androidx.recyclerview.widget.RecyclerView

class LatestNewsFragment : Fragment() {

override fun onCreateView(

inflater: LayoutInflater, container: ViewGroup?,

savedInstanceState: Bundle?

): View? {

val view = inflater.inflate(R.layout.fragment\_news, container, false)

val newsRecyclerView = view.findViewById<RecyclerView>(R.id.newsRecyclerView)

val newsList = listOf(

NewsItem("Breaking: Major Event", "Description of the major event."),

NewsItem("Latest Update on the Economy", "Economy news update."),

// Add more news items

)

val adapter = NewsAdapter(newsList) { newsItem ->

Toast.makeText(requireContext(), "Clicked: ${newsItem.title}", Toast.LENGTH\_SHORT).show()

}

newsRecyclerView.layoutManager = LinearLayoutManager(requireContext())

newsRecyclerView.adapter = adapter

return view

}

}

Repeat similar code for **SportsNewsFragment** and **TechnologyNewsFragment** by changing the newsList with sports and technology news, respectively.

### 11. Running the App

When you run the app, you should see three tabs at the top of the screen: **Latest**, **Sports**, and **Technology**. Each tab will display different news articles, and when an article is clicked, a toast message will appear showing the title.

This case study covers:

* Using **Fragments** with **TabLayout** and **ViewPager2**.
* Using **RecyclerView** to display a list of items.
* Passing data between fragments and handling item clicks.