

Summer 2, 2019 - CS 4520/CS5520 – Mobile Application Development

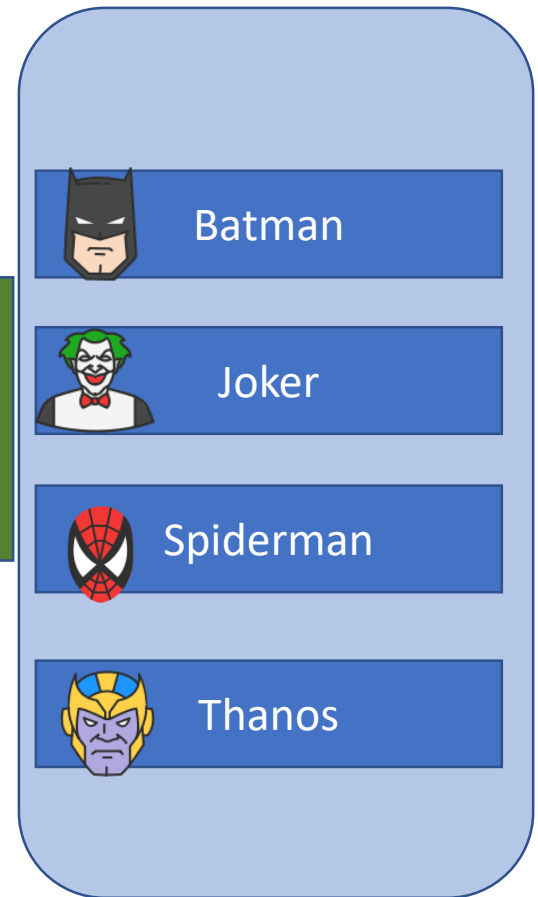
Pratheep Kumar Paranthaman, Ph.D.,

Optimization?

- Every time when a **VIEW** is created
 - **Inflating the layout row**
 - Finding the children of it
 - ImageView
 - TextView

???

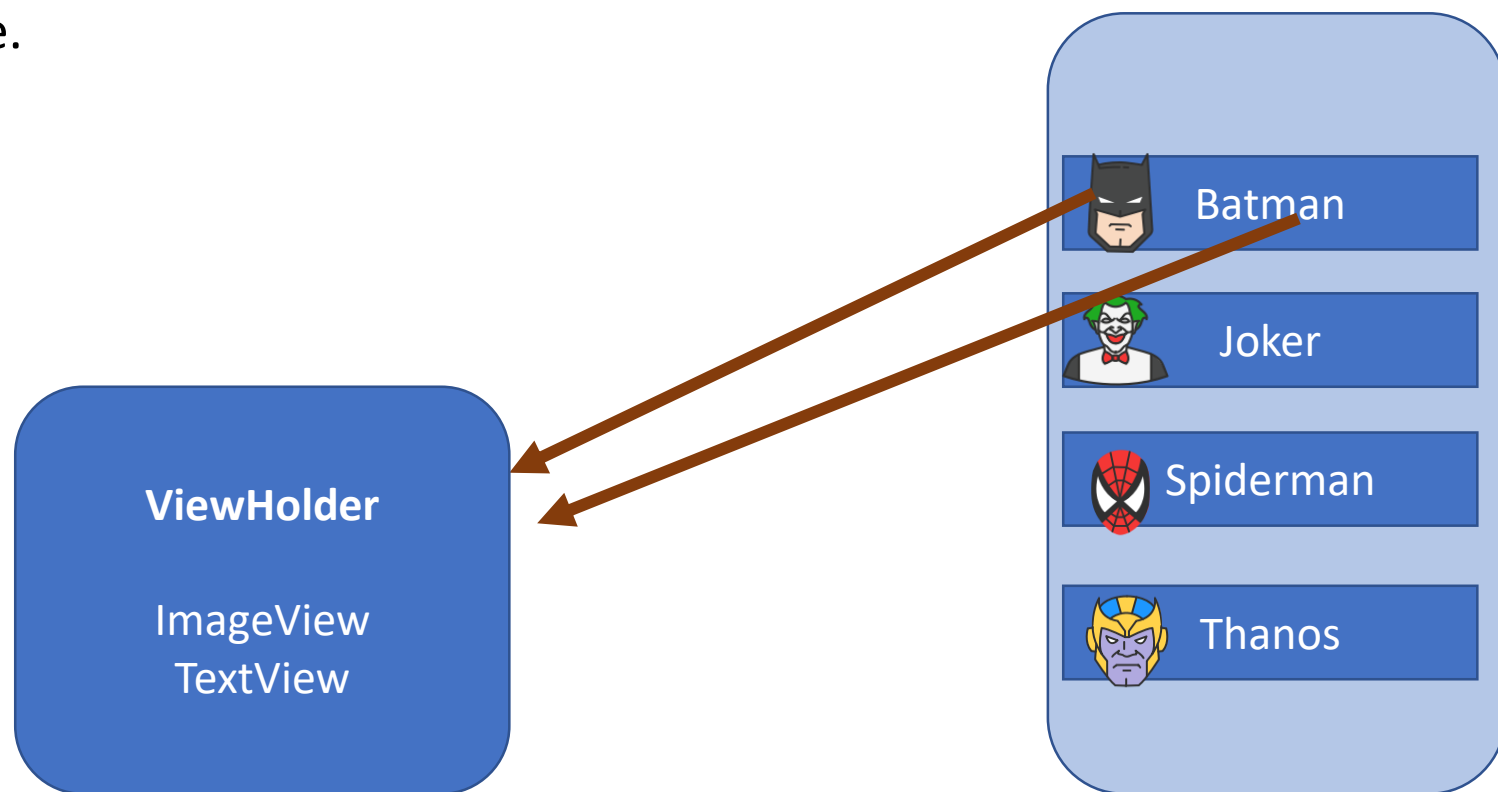
Fixed!

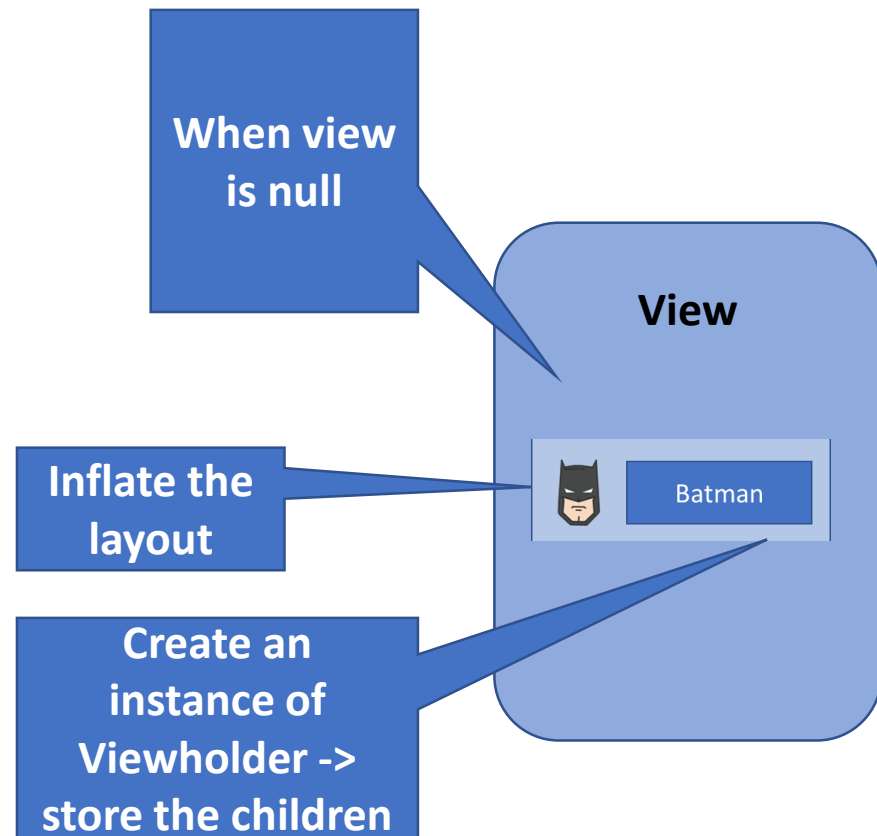
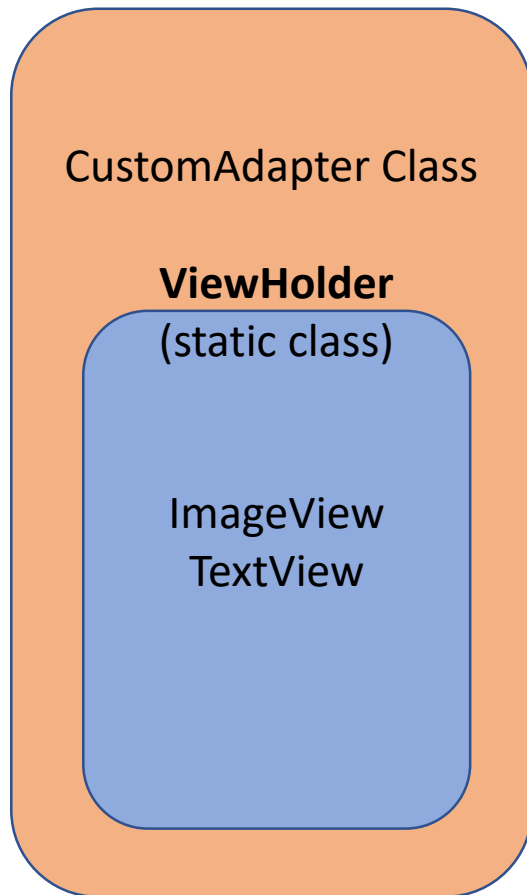


ViewHolder Pattern

Case 2 - ViewHolder Pattern

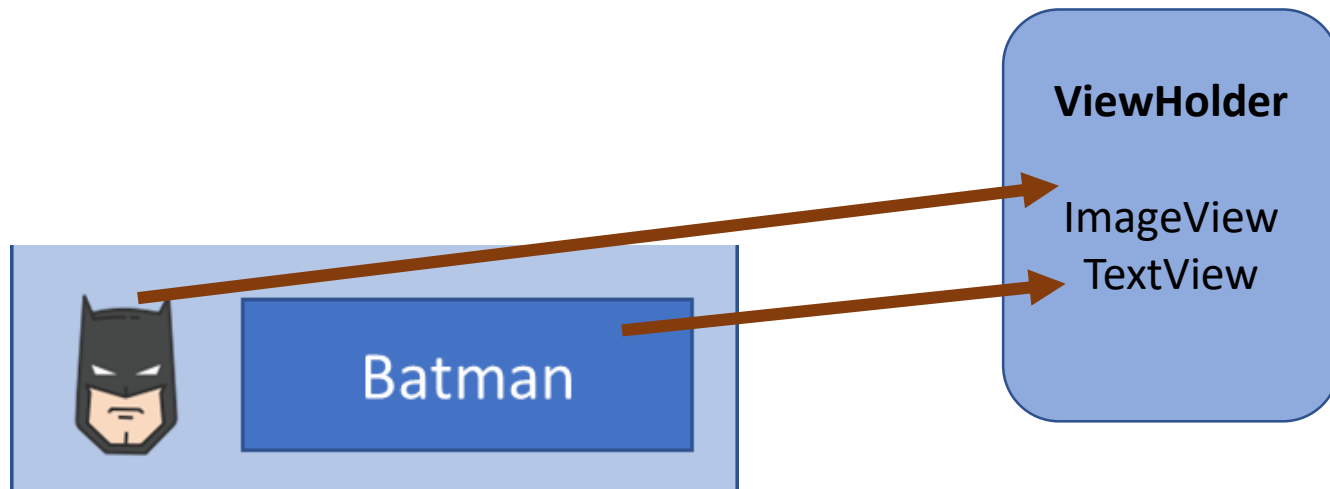
- Hold references to the view rather than **finding View By ID** every time.





ViewHolder Pattern

- Create a static ViewHolder for all the items(Children) in your row



Creating an object to hold the children of your VIEW

ViewHolder Pattern

- When you store the Object
 - `setTag(object)`
- When you retrieve the object
 - `getTag()`



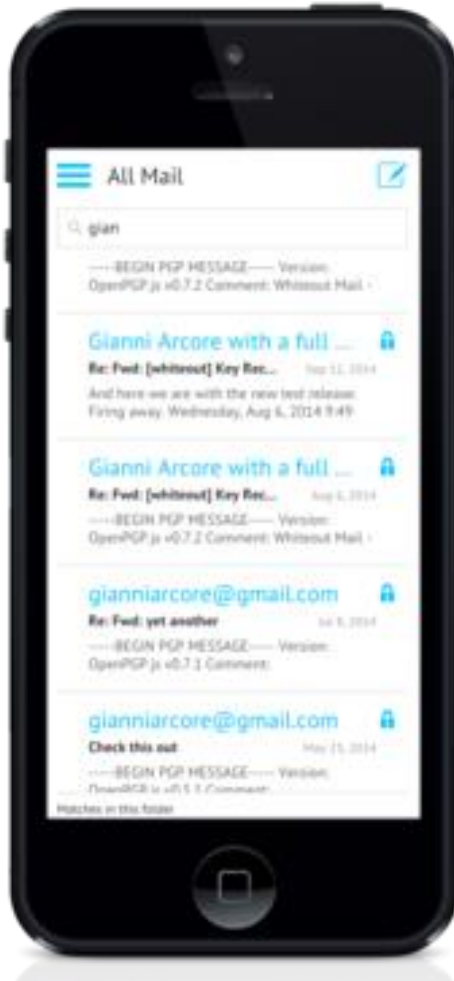
ViewHolder pattern avoids rebinding of the child view

Reference

- <https://www.youtube.com/watch?v=wDBM6wVEO70>

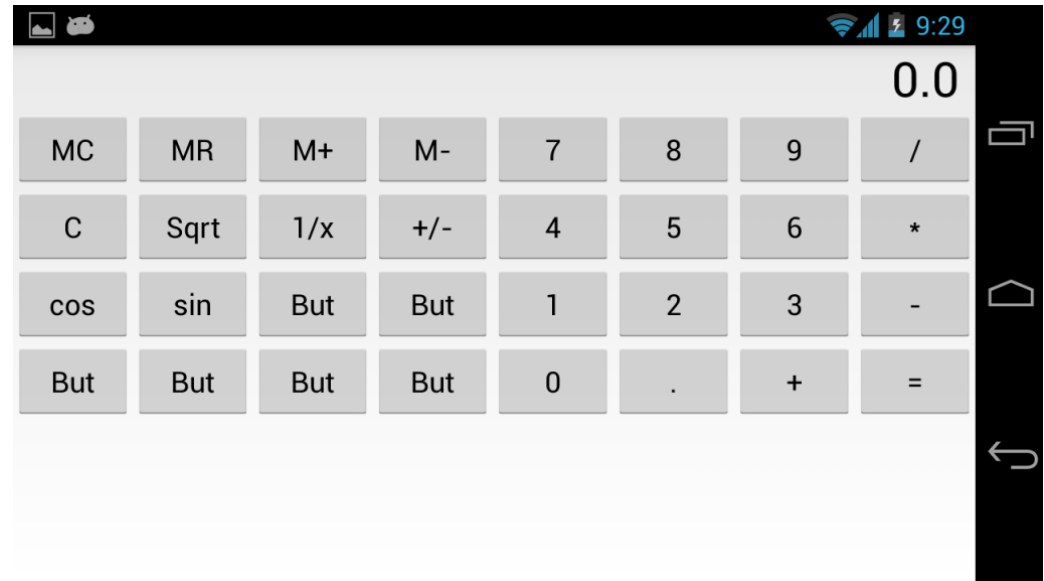
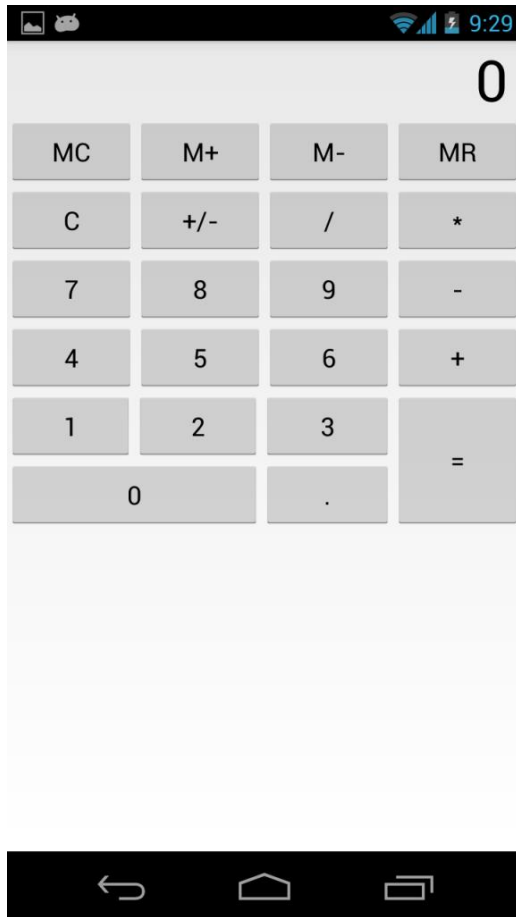
Fragments

Fragments



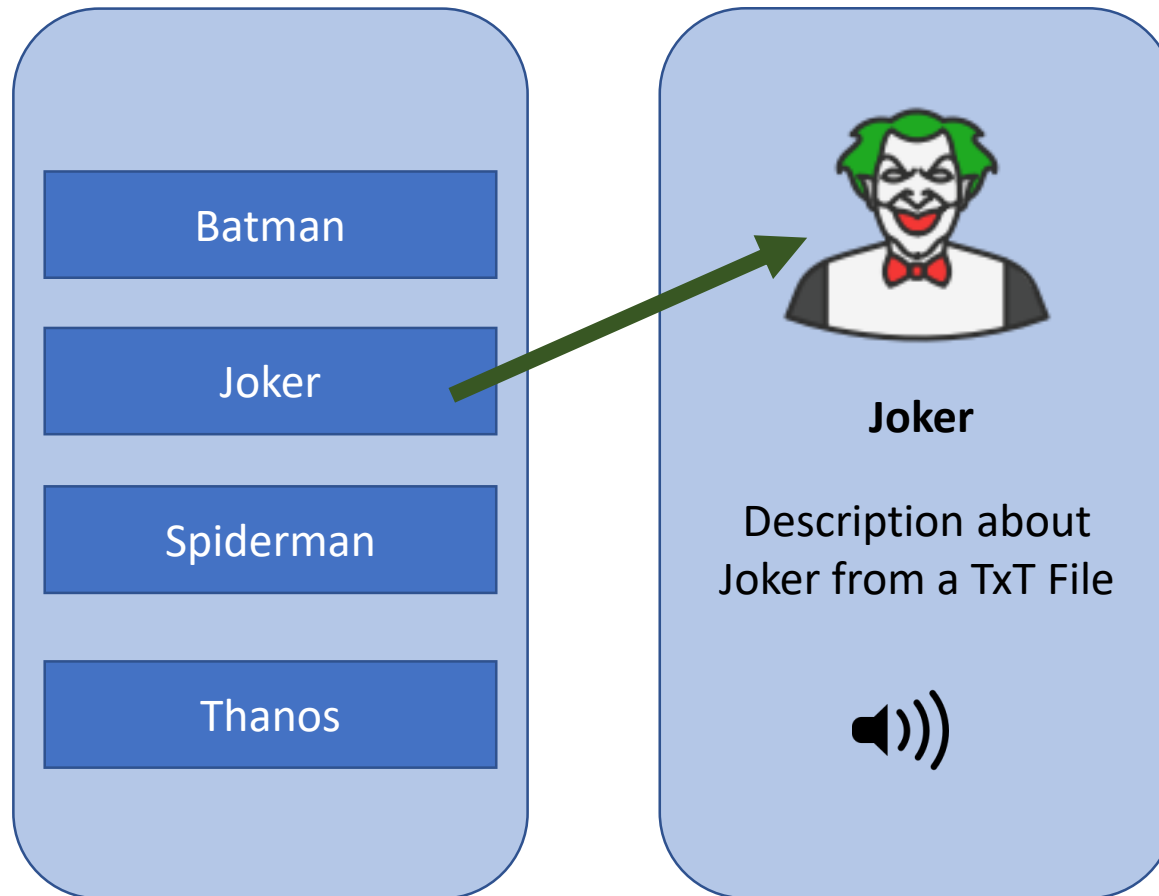
[blog.whiteout.io/2015/05/07/whiteout-mail-client-available-for-ios/index.html]

Fragments



[innovativenetsolutions.com/2013/01/calculator-app/]

What we know so far..





Batman

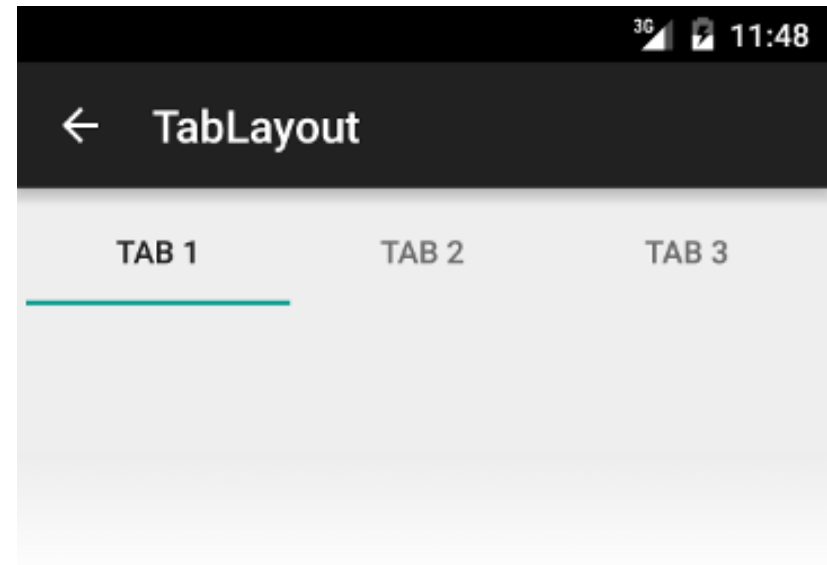
Joker

Spiderman

Thanos

Fragments

- What is a fragment?
 - “Mini-activities”
 - Portion in a UI, which can have a behaviour
 - Multiple fragments can be inserted in an activity



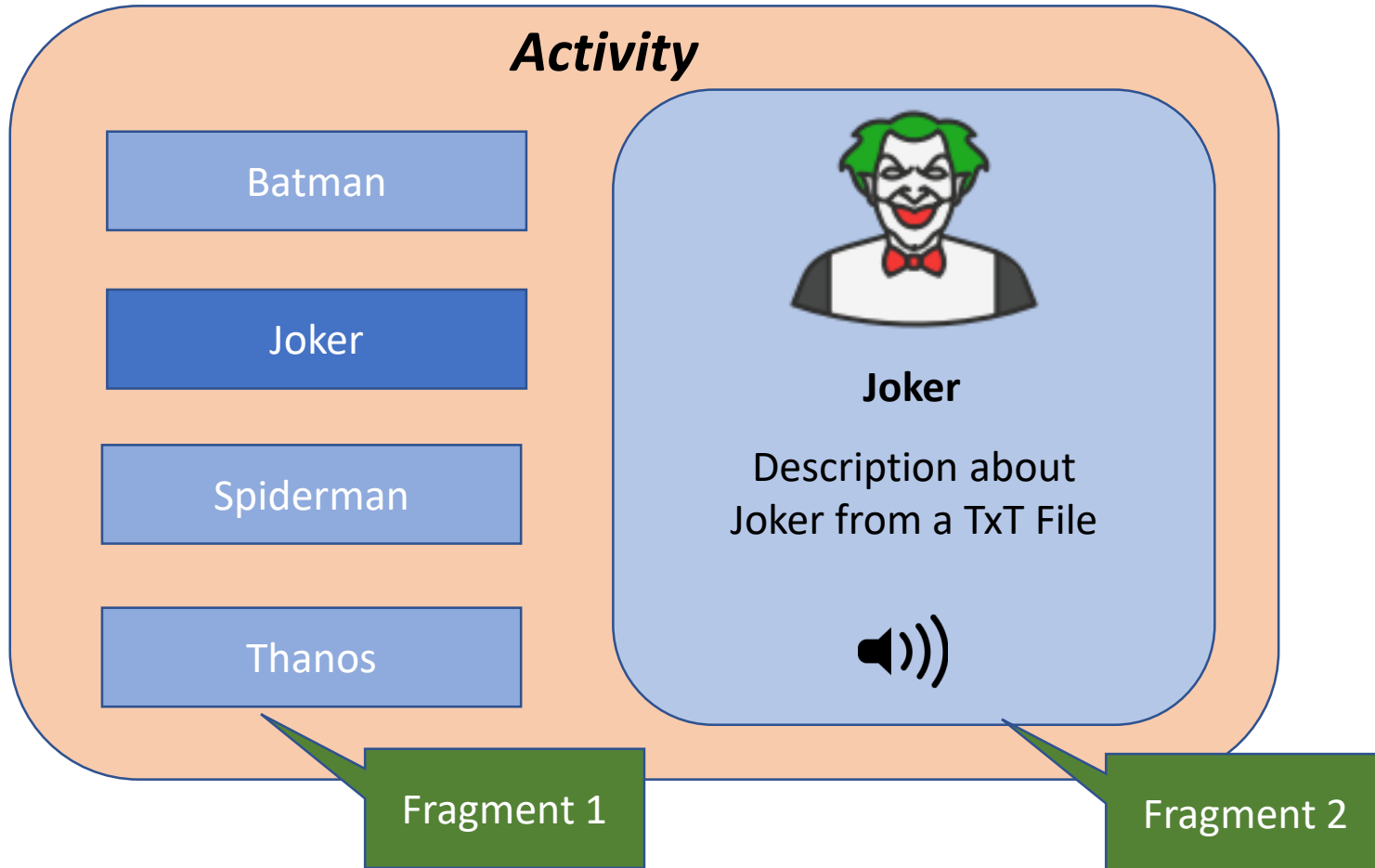
Why do we need Fragments?

- **Limitation of showing only single activity on screen**
- Modularize the UI
- Relieve the pressure of an activity
- Break an activity into composable pieces

Fragments

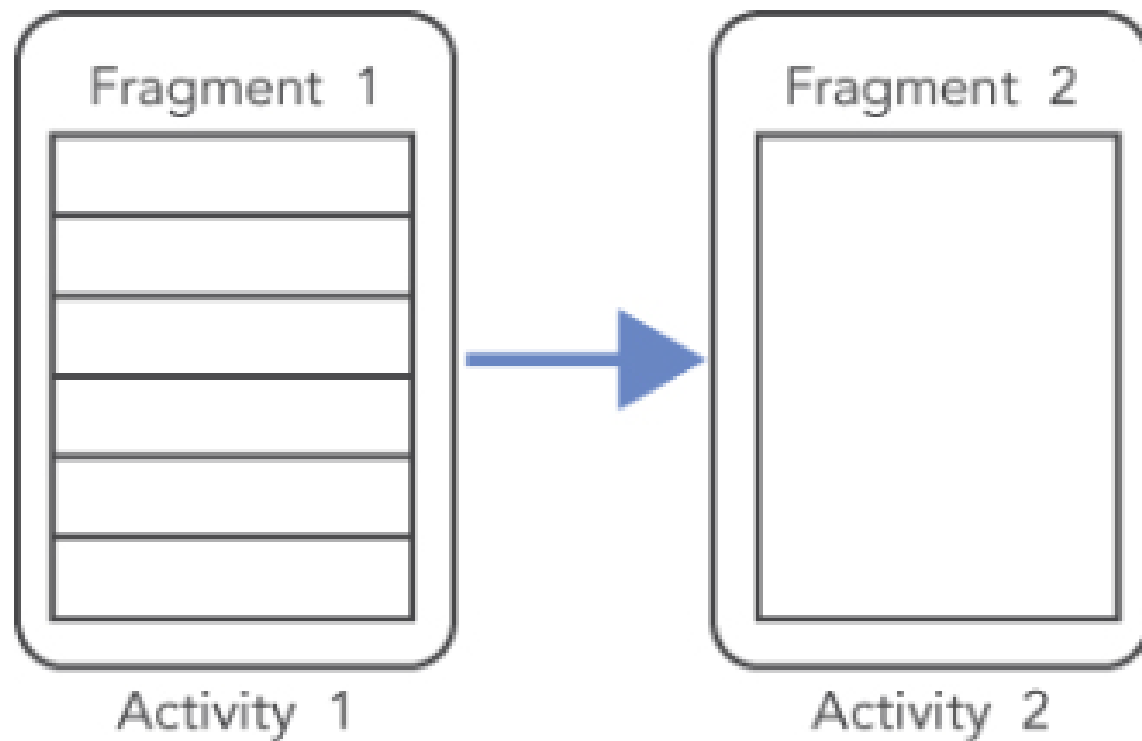
- Fragments are similar to activities - > “Mini-activity”
 - Behavior
 - Lifecycle
 - Layout

Fragments



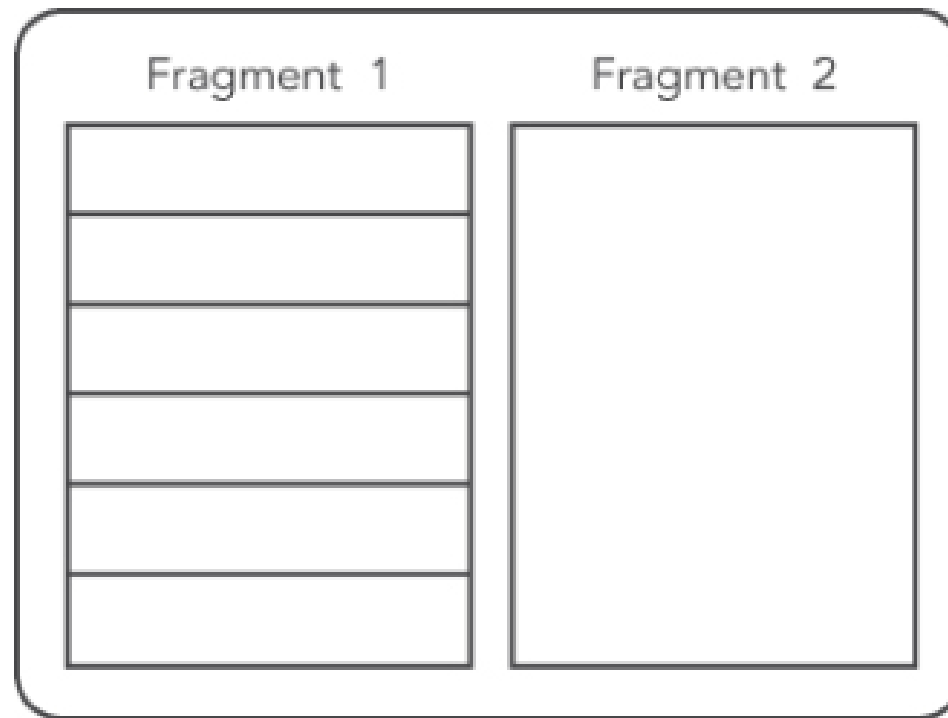
Fragments

Portrait Mode



Fragments

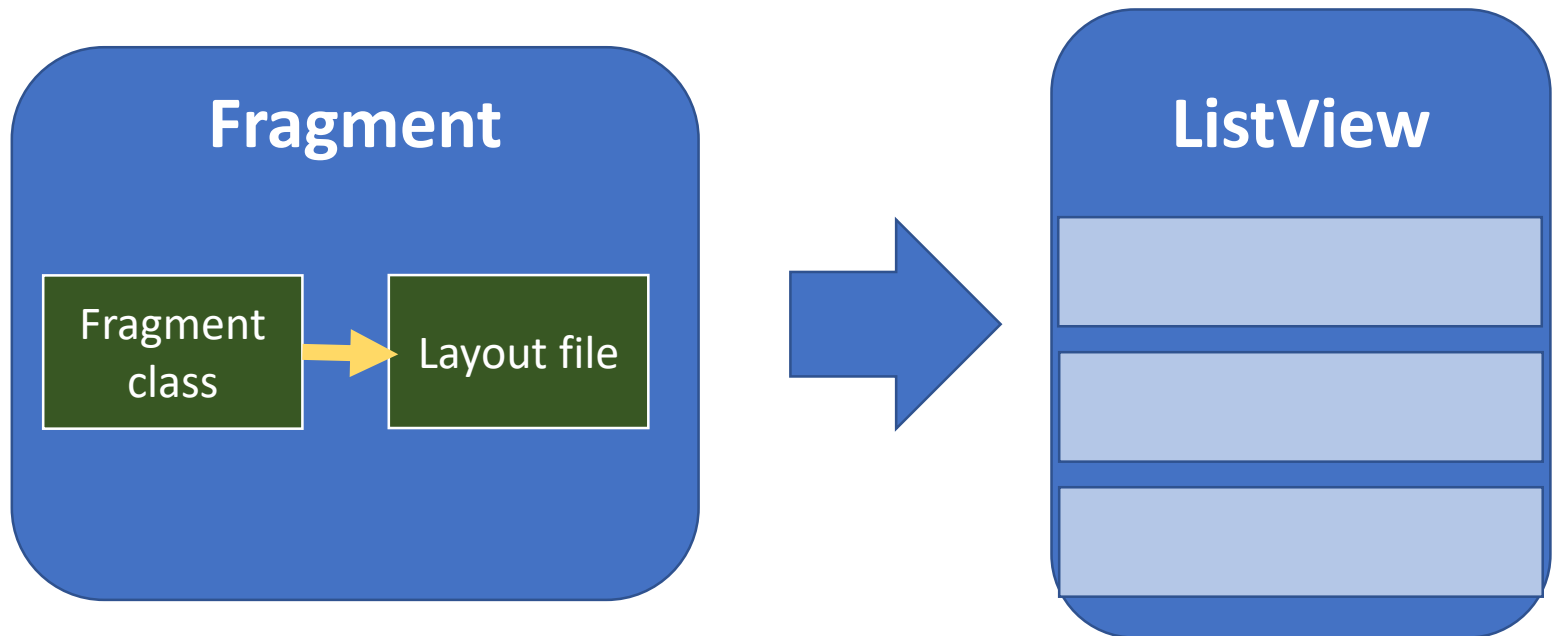
Landscape Mode



Activity 1

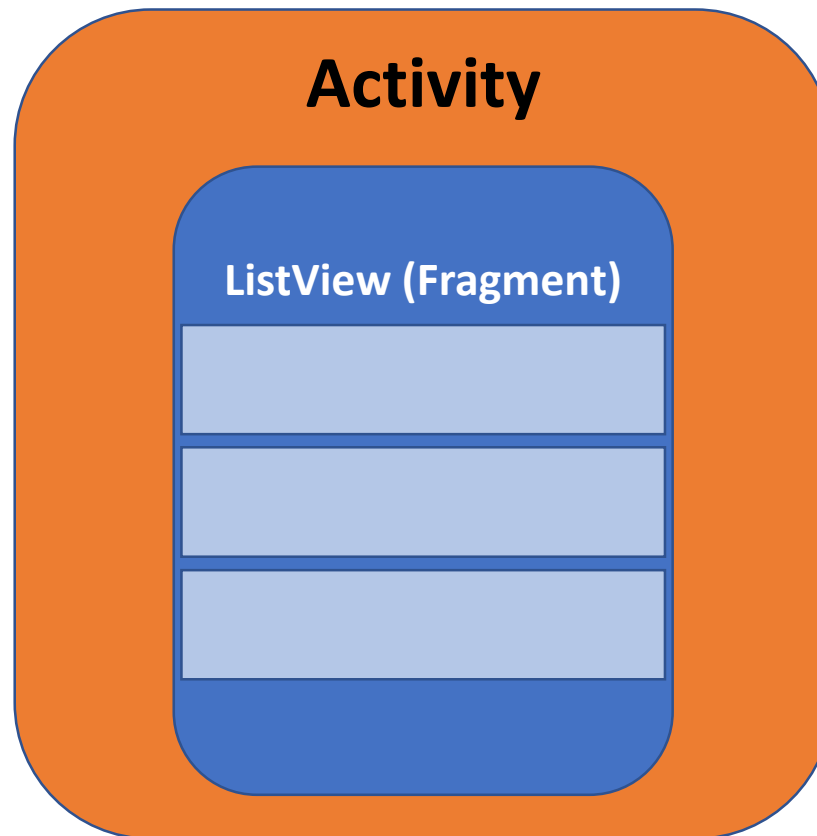
Fragments – how can we create fragments?

- Create a Fragment class
- Create a layout file for Fragment and attach it to corresponding class



Displaying a Fragment

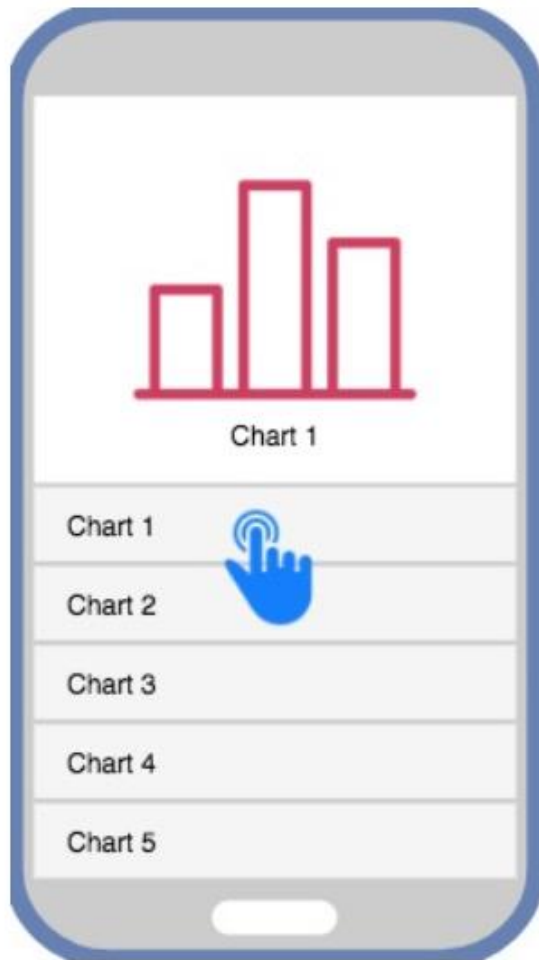
If you have to display a Fragment then you need to tie it with an activity



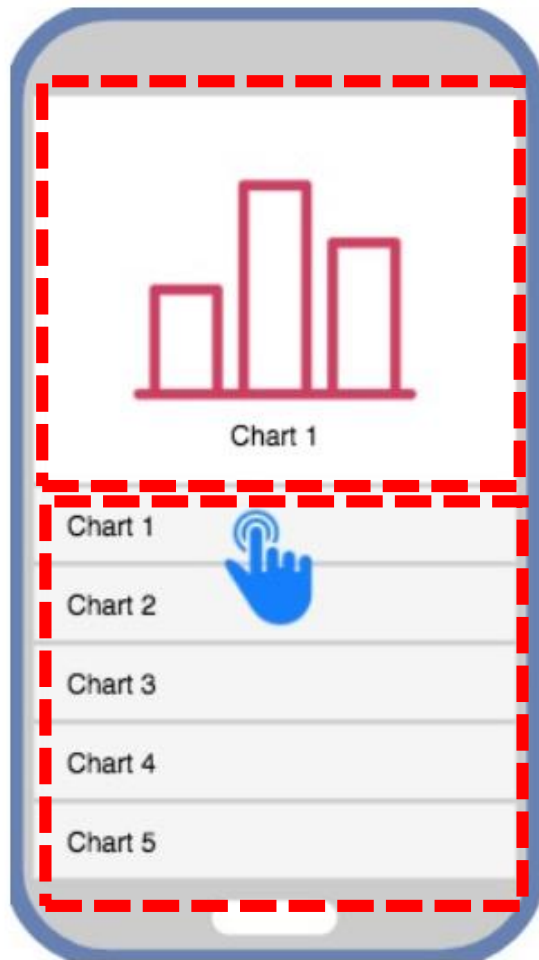


Fragments

Displaying a Fragment



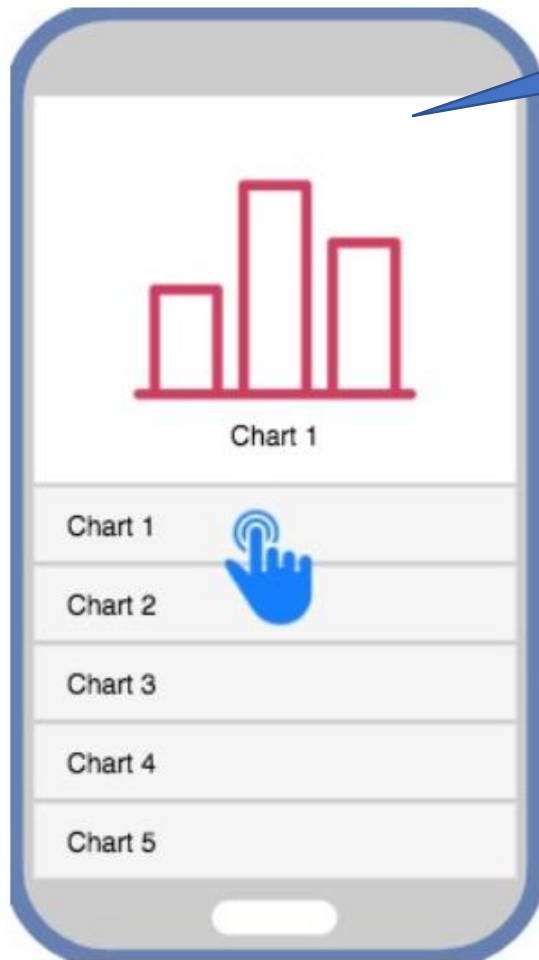
Displaying a Fragment



[studytonight.com/android/fragments-in-android]

Displaying a Fragment

Contained within an activity



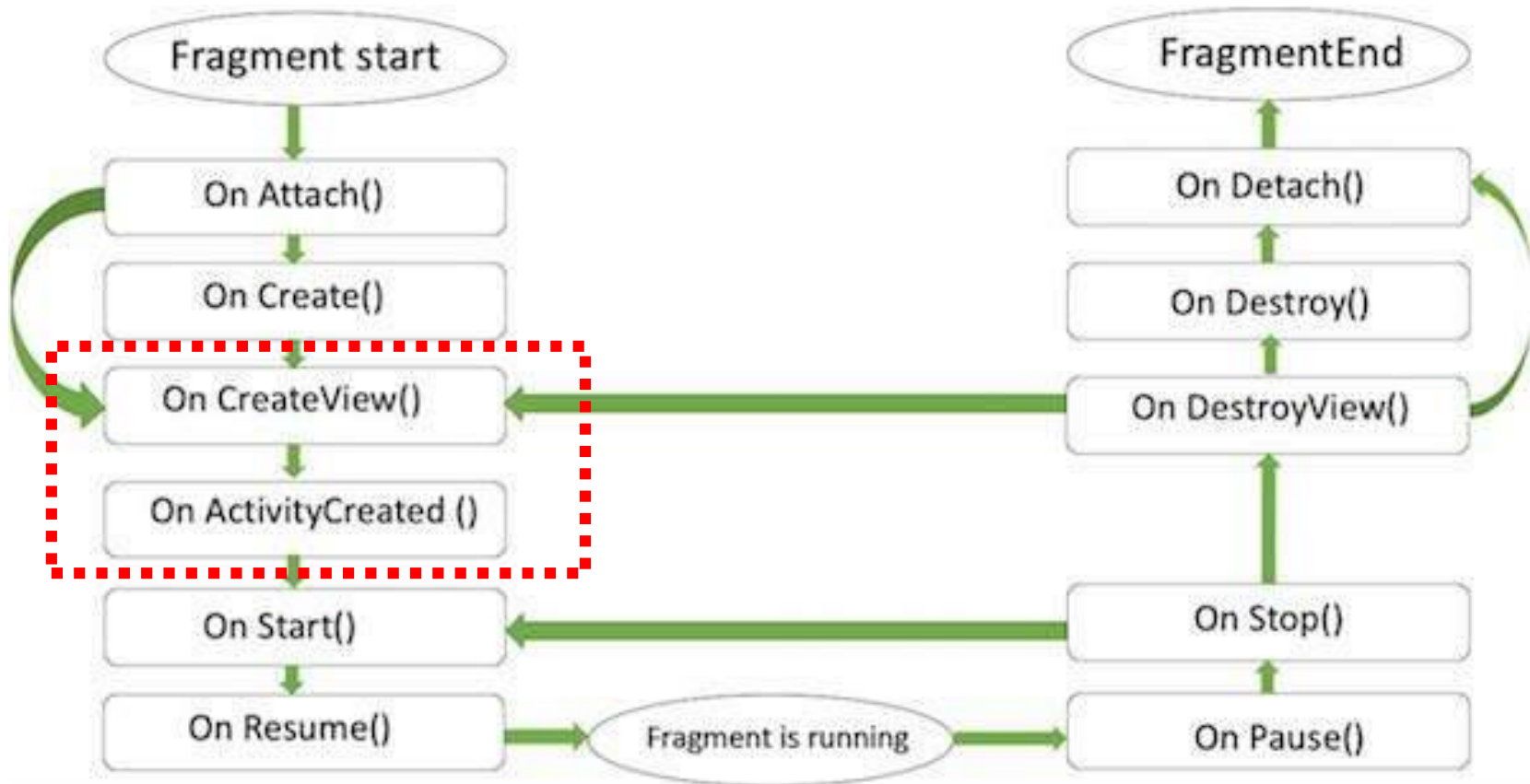
Fragment A -
To display the Chart based on the selection in Fragment B

Fragment B -
Displaying the List of options, on which you can click and see the related chart in Fragment A

Fragments

- Fragments are similar to activities - > “Mini-activity”
 - **Behavior**
 - **Layout**
 - Lifecycle

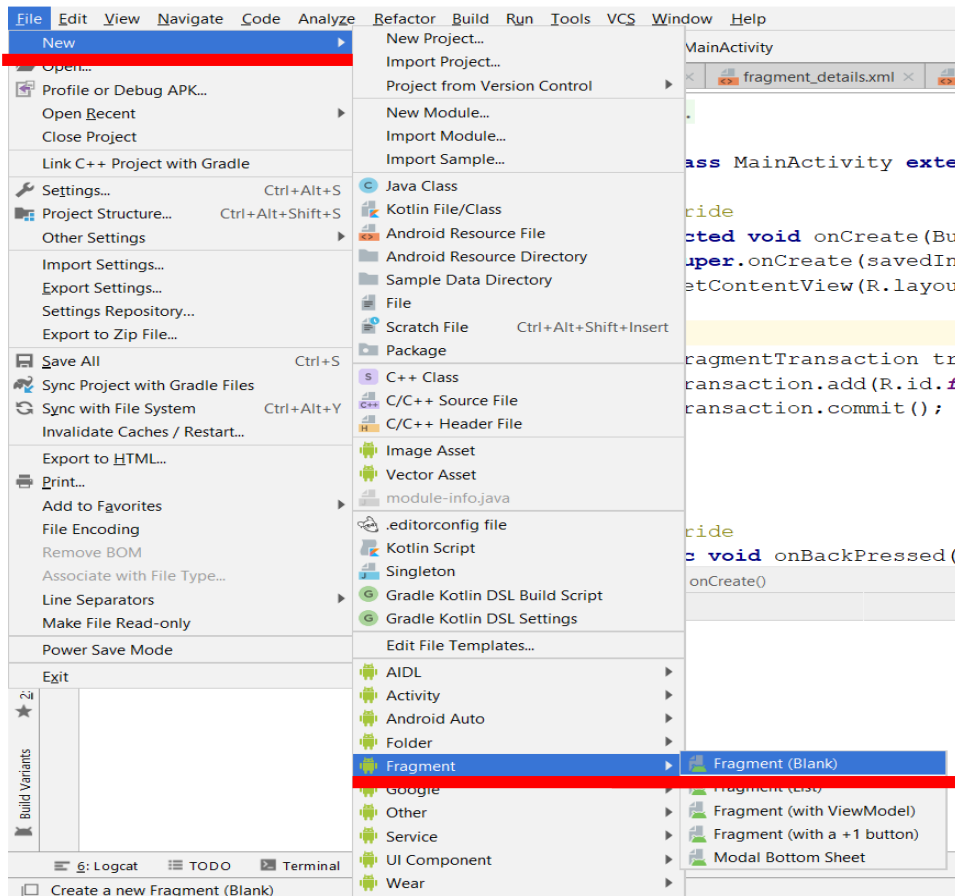
Fragment Lifecycle



[stackoverflow.com/questions/51614834/what-is-lifecycle-of-dialogfragment]

Creating fragments

Creating Fragments



It's similar to creating activity

1. Create an empty fragment and attach Layout with it.
2. Define the looks of your fragment in the fragment layout file

Creating Fragments

Layout XML associated with fragment

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/a
    xmlns:tools="http://schemas.android.com/tools"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainFragment">

    <ListView
        android:id="@+id/fragmentMainListView"
        android:layout_width="match_parent"
        android:layout_height="match_parent">

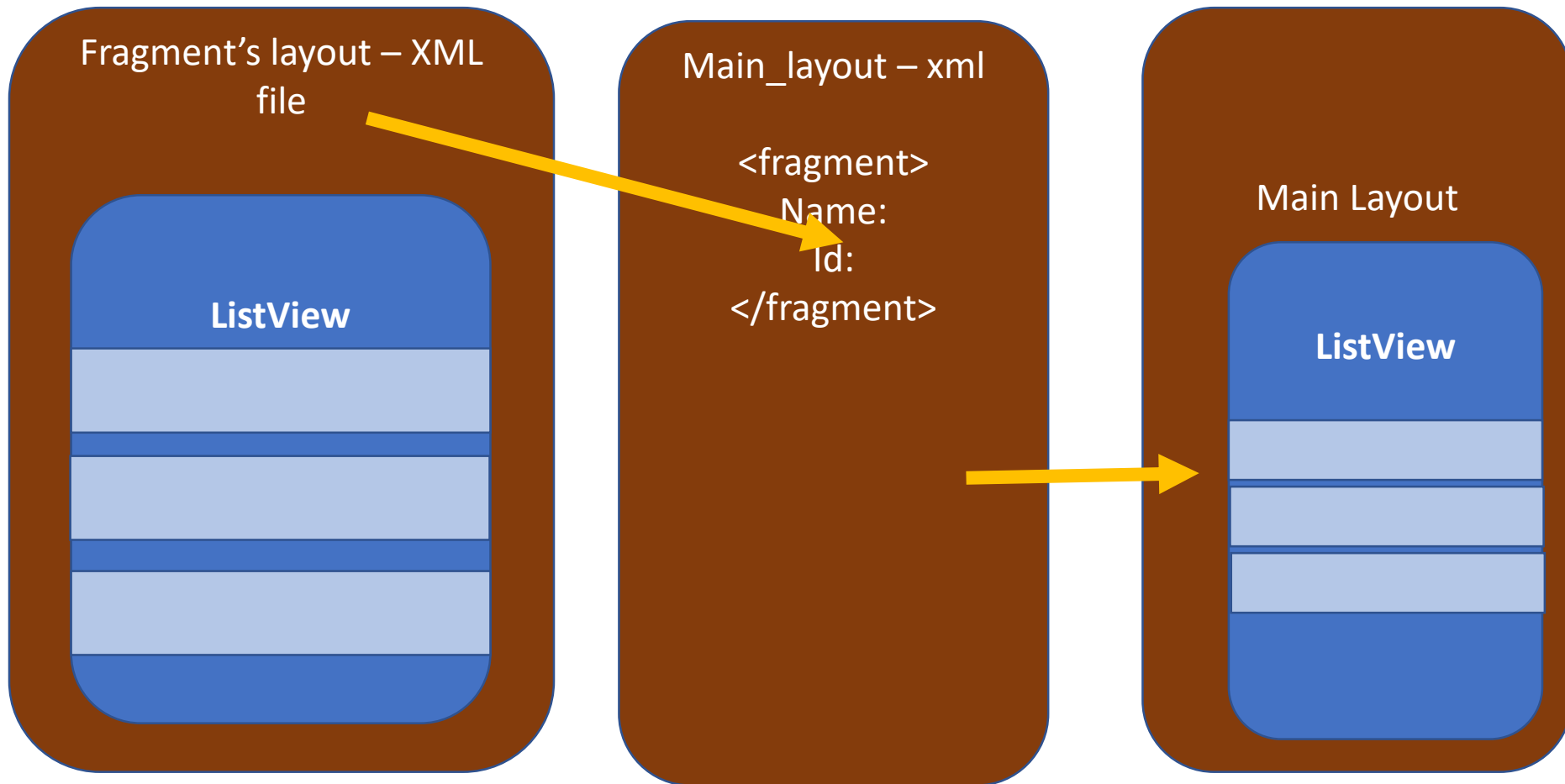
    </ListView>
</LinearLayout>
```

Fragment Class

1. Extends Fragment
2. Implement two methods of lifecycle
 - I. onCreateView
 - II. onActivityCreated
3. Inflate the Layout file

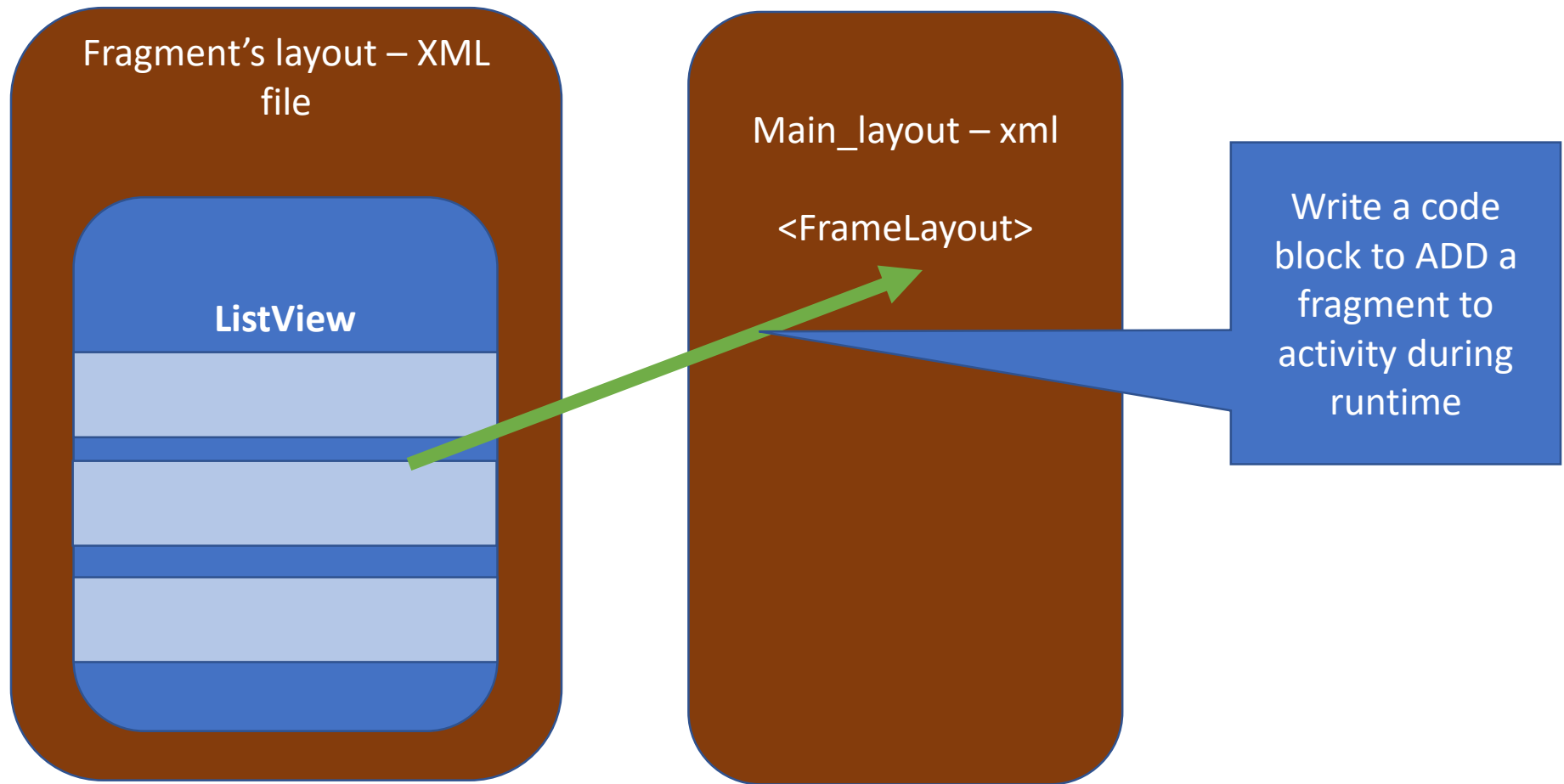
Adding Fragment to an activity

Adding fragments to an activity



Let's try it!

Adding Fragments during runtime



Fragment Transaction

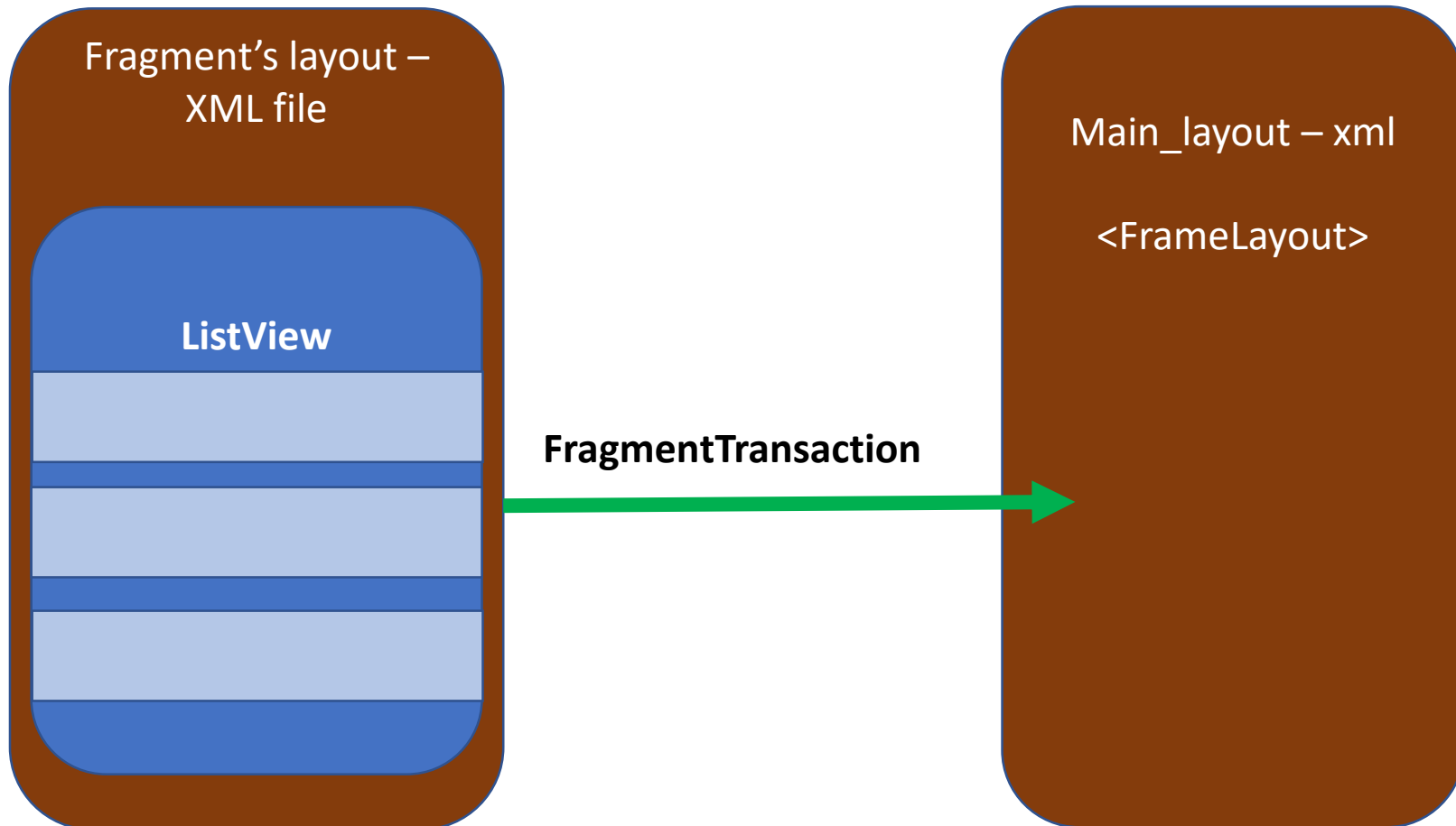
- The **FragmentManager** provides the APIs for adding, removing, and changing Fragments during runtime using a **FragmentTransaction**.
- **A Fragment transaction consists of:**
 - Starting a transaction
 - Performing one or multiple actions
 - Committing the transaction

Fragment Transactions

- **Fragment Manager** – manages the overall fragment and transactions
- **FragmentManager** – Interface for interacting with fragments
 - Add
 - Replace

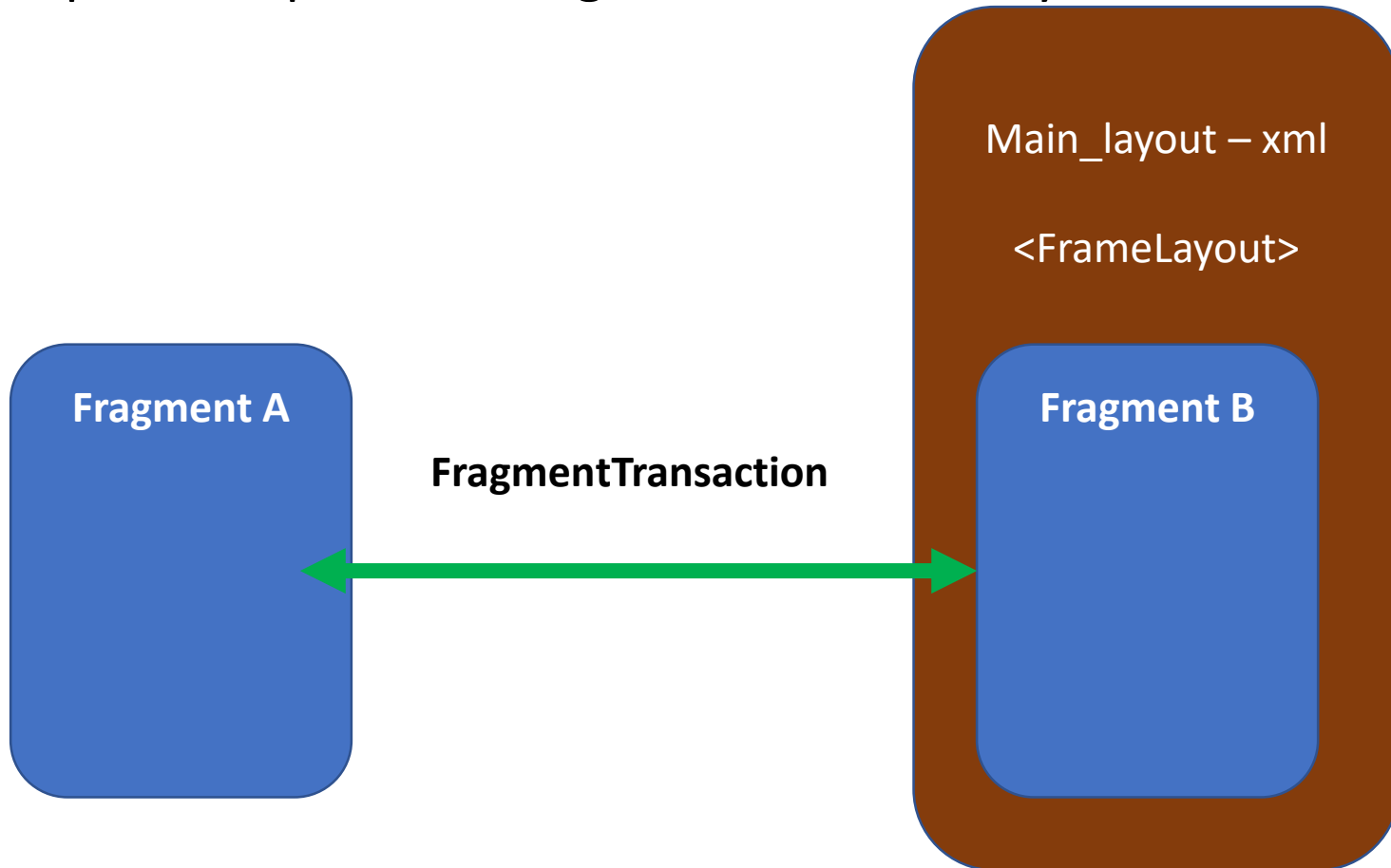
Fragment Transactions

- Add – adds up a fragment to the activity



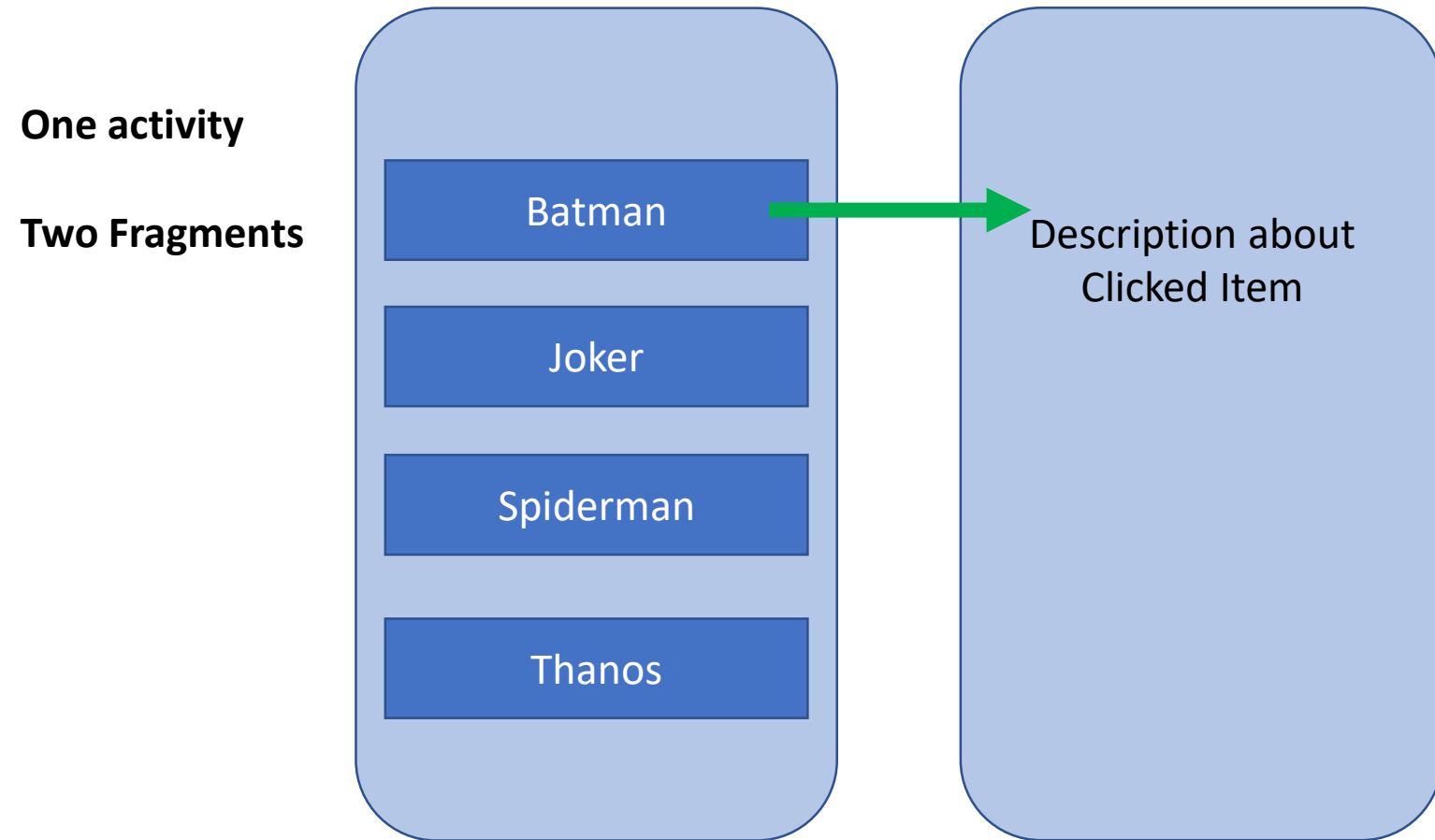
Fragment Transactions

- Replace – updates a fragment in an activity



Let's practice fragments

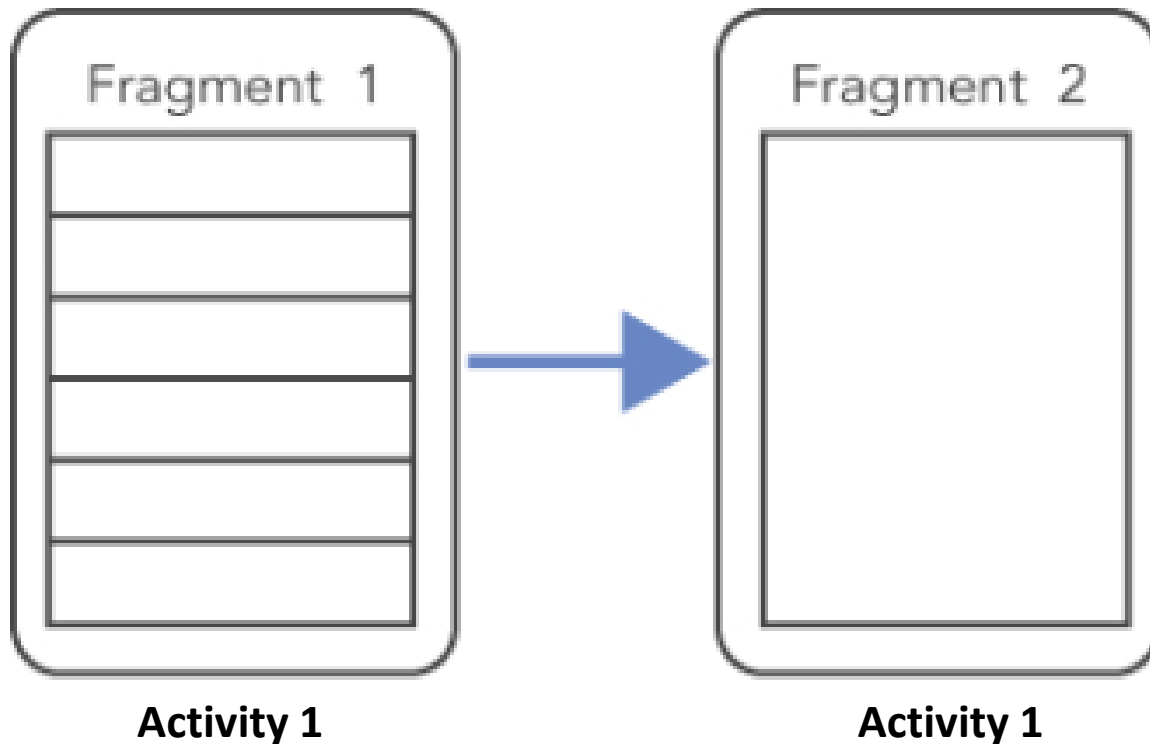
Fragments – practice



Fragments - practice

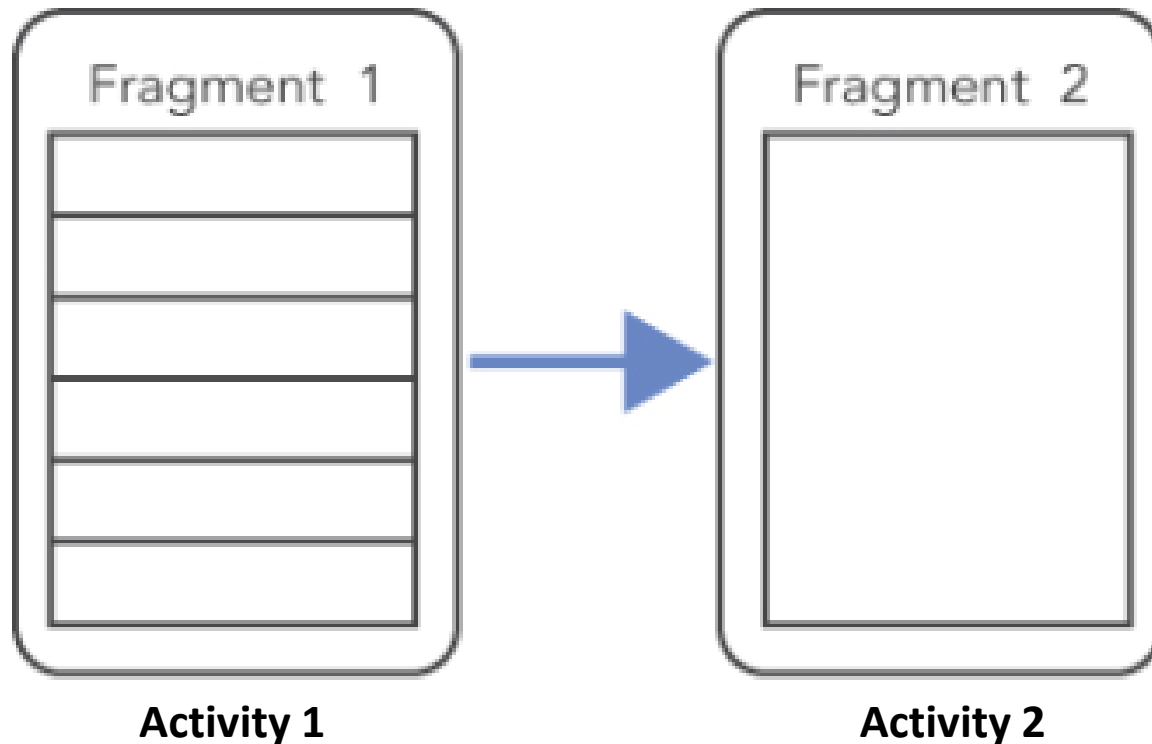
Portrait Mode

Replace Fragment 1 with Fragment 2 upon item click



Fragments - practice

Replace Fragment 1 with Fragment 2 upon item click



Steps for Multiview representation

- Step 1: Fragments configuration
- Step 2: Main Layout configuration
- Step 3: load the fragments during runtime
- Step 4: provide data to each fragment
- Step 5: Pass data between fragments

Fragment Configuration

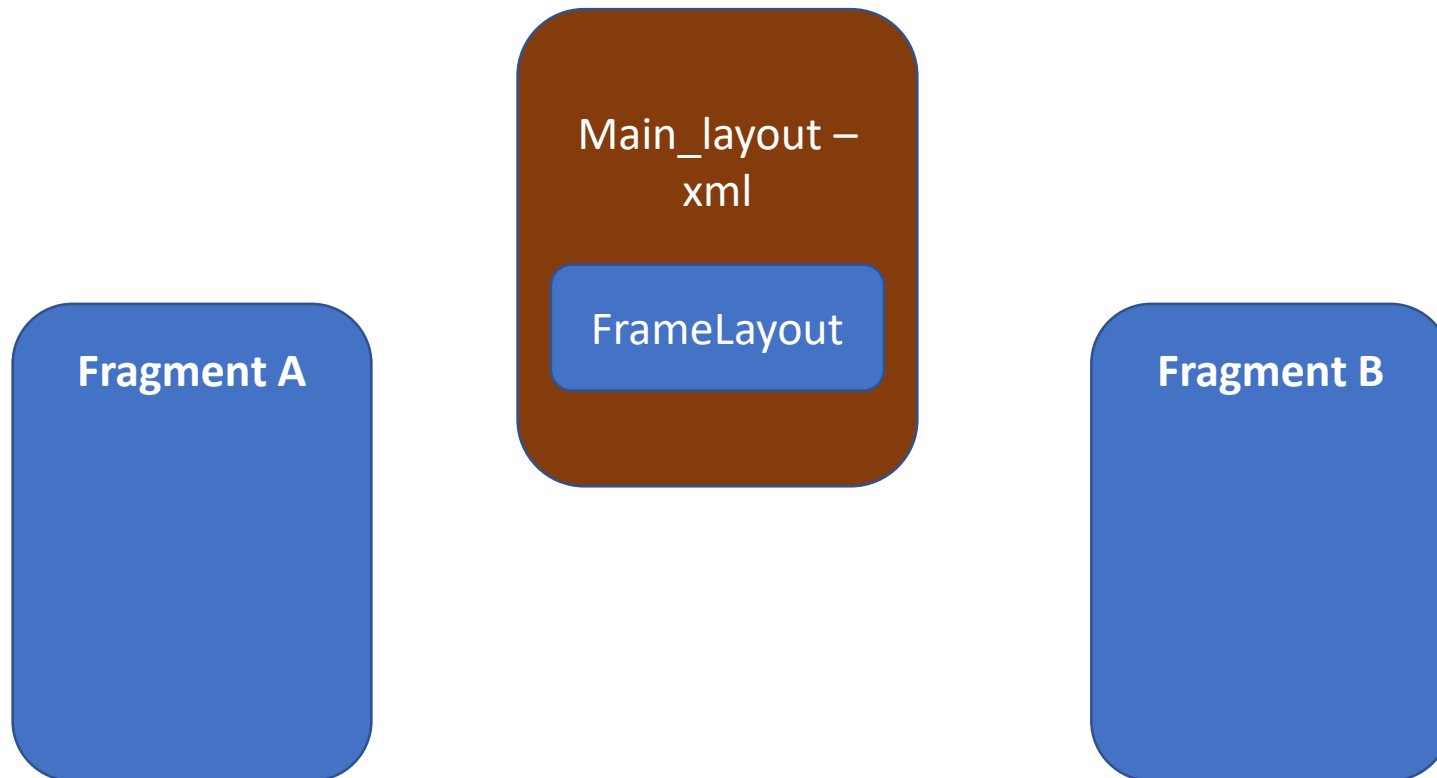
Fragment Configuration

- Step 1: Create two fragments
 - Fragment 1 (MainFragment): Item list
 - Fragment 2 (DetailsFragment): Detailed view
- Step 2: customize the layout files of each fragment
 - Fragment 1 – attach a listview
 - Fragment 2 – attach a textview

Main Layout configuration

Main Layout Configuration

- In main layout, we will include a **container(FrameLayout)** to hold your fragments
 - During runtime we will update this **container** with your fragments

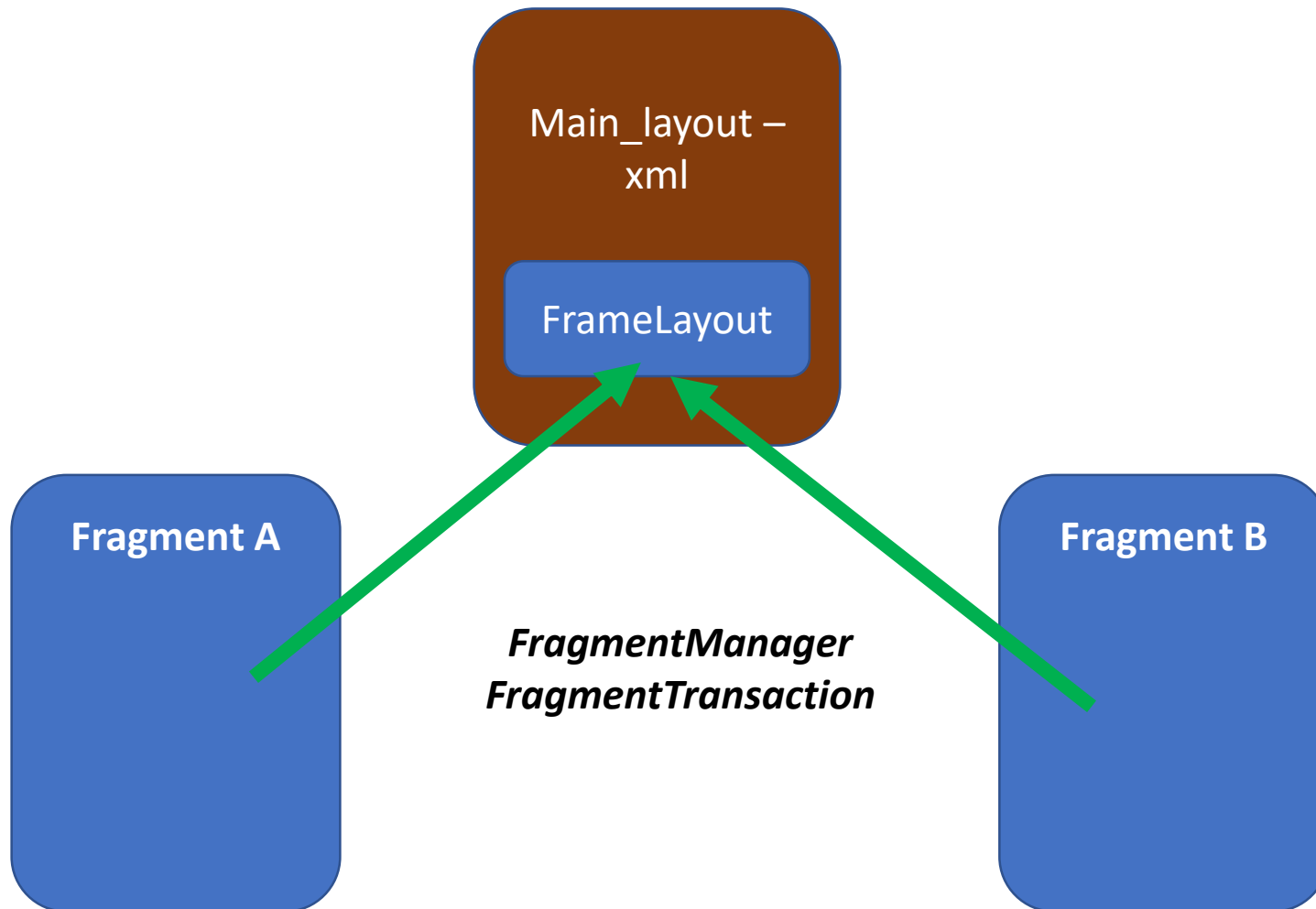


Main Layout Configuration

- Create a Frame Layout inside your Main Layout file
 - This will act as a container to hold our fragments

Load the fragments during
runtime

Main Layout Configuration



Steps involved in adding fragments during runtime

- Get the **FragmentManager** (`getSupportFragmentManager()`)
- Begin a **FragmentTransaction**
- Multiple actions can occur within the transaction(`Add()`, `Replace()`)
- Finalize the transaction -> `commit()`

Provide data to each fragment

Fragment 1 - MainFragment

- Use an ArrayAdapter to create to populate the list view



```
new ArrayAdapter(getActivity(), android.R.layout.simple_list_item_1, characters);
```



Passing data from One Fragment to Another

Passing data between fragments

- **One option**

- Use Bundles -> create a Bundle and setParameters
- SetArgument() on New Fragment-> to pass the data between fragments in same activity