ANDROID

Sec:8

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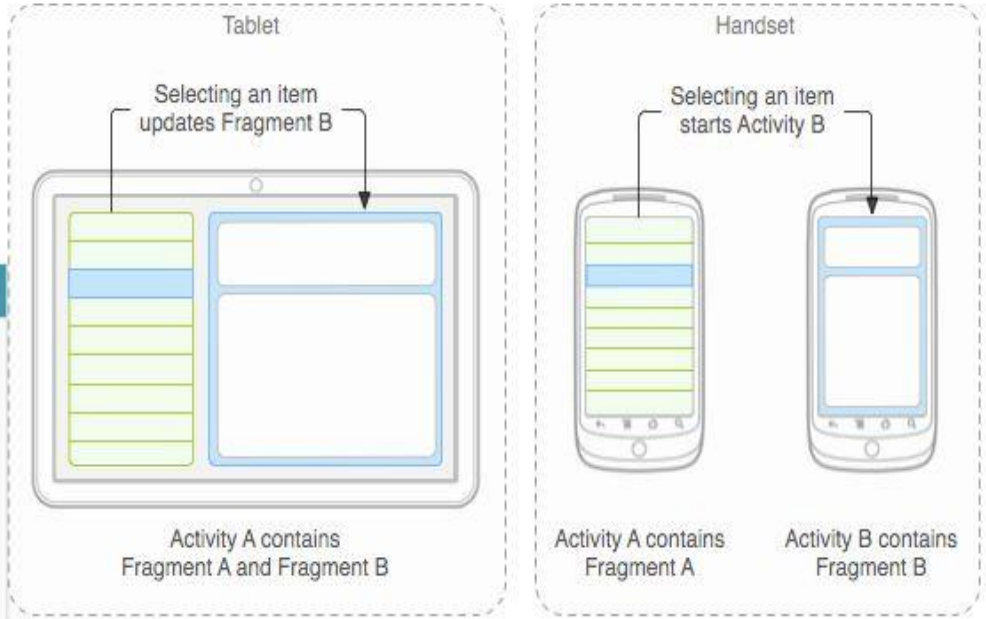
Fragment

- It represents a behavior or a portion of user interface in an Activity.
- It has its own **lifecycle**, receives its own input events, and which you can add or remove while the activity is running.
- You can combine multiple fragments in a single activity to build a multi-pane UI and reuse a fragment in multiple activities.

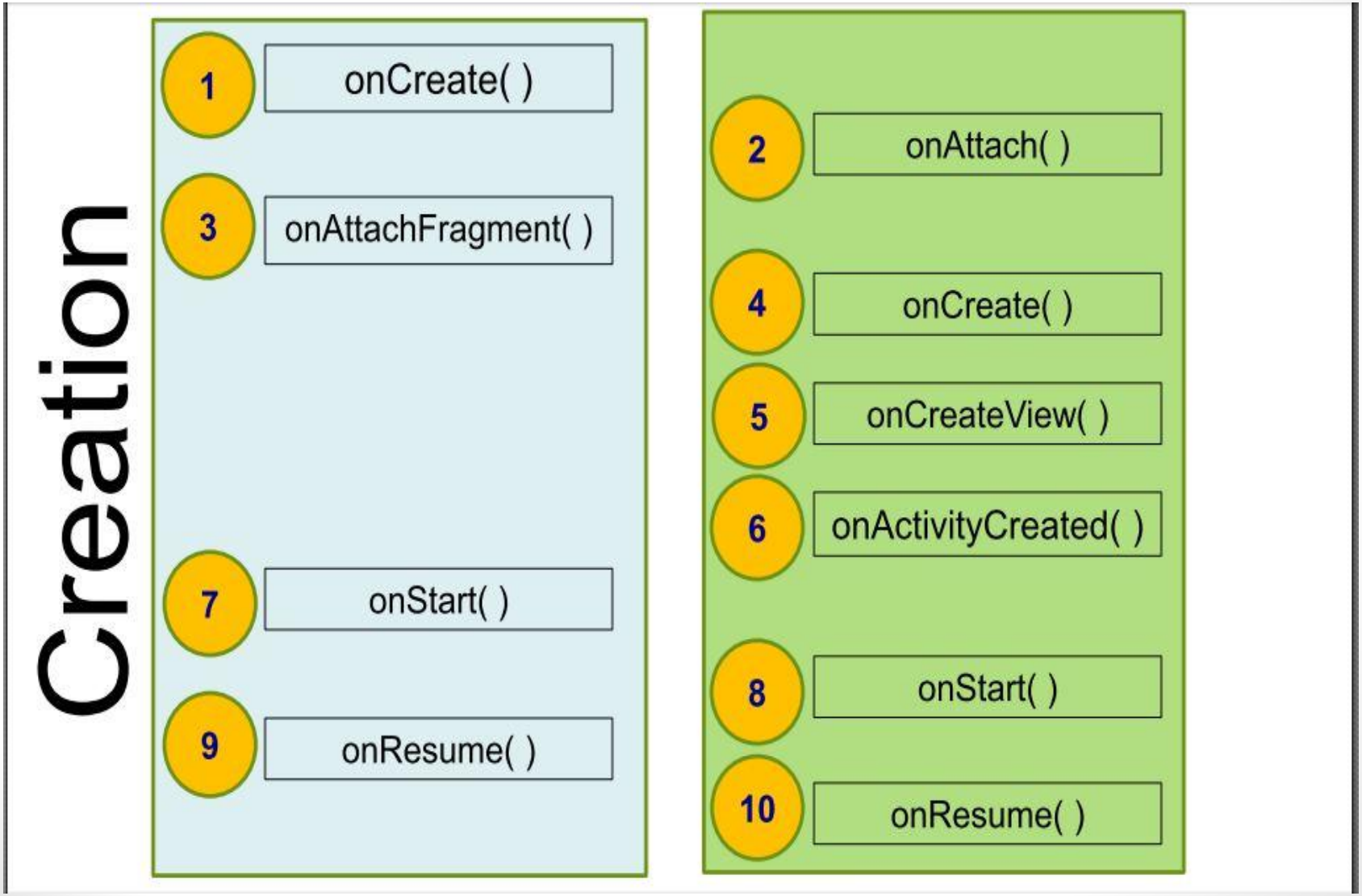
- A fragment must always be embedded in an activity and the **fragment's lifecycle** is directly affected by the host activity's lifecycle.
  - when the activity is paused, so are all fragments in it.
  - when the activity is destroyed, so are all fragments.
  - However, while an activity is running (it is in the resumed lifecycle state), you can manipulate each fragment independently, such as add or remove them.

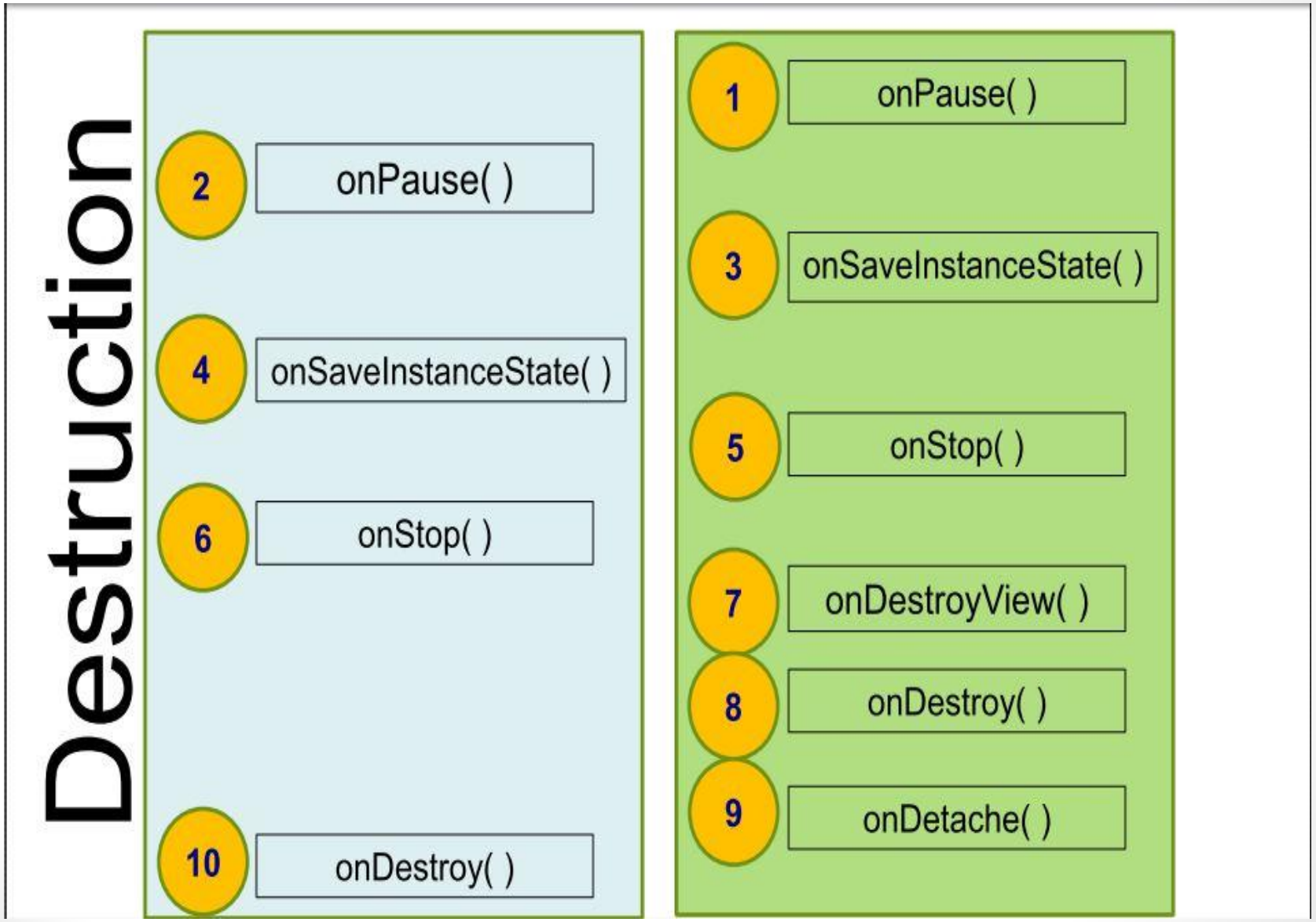
Example

SMS View



Activity vs. Fragment lifecycle



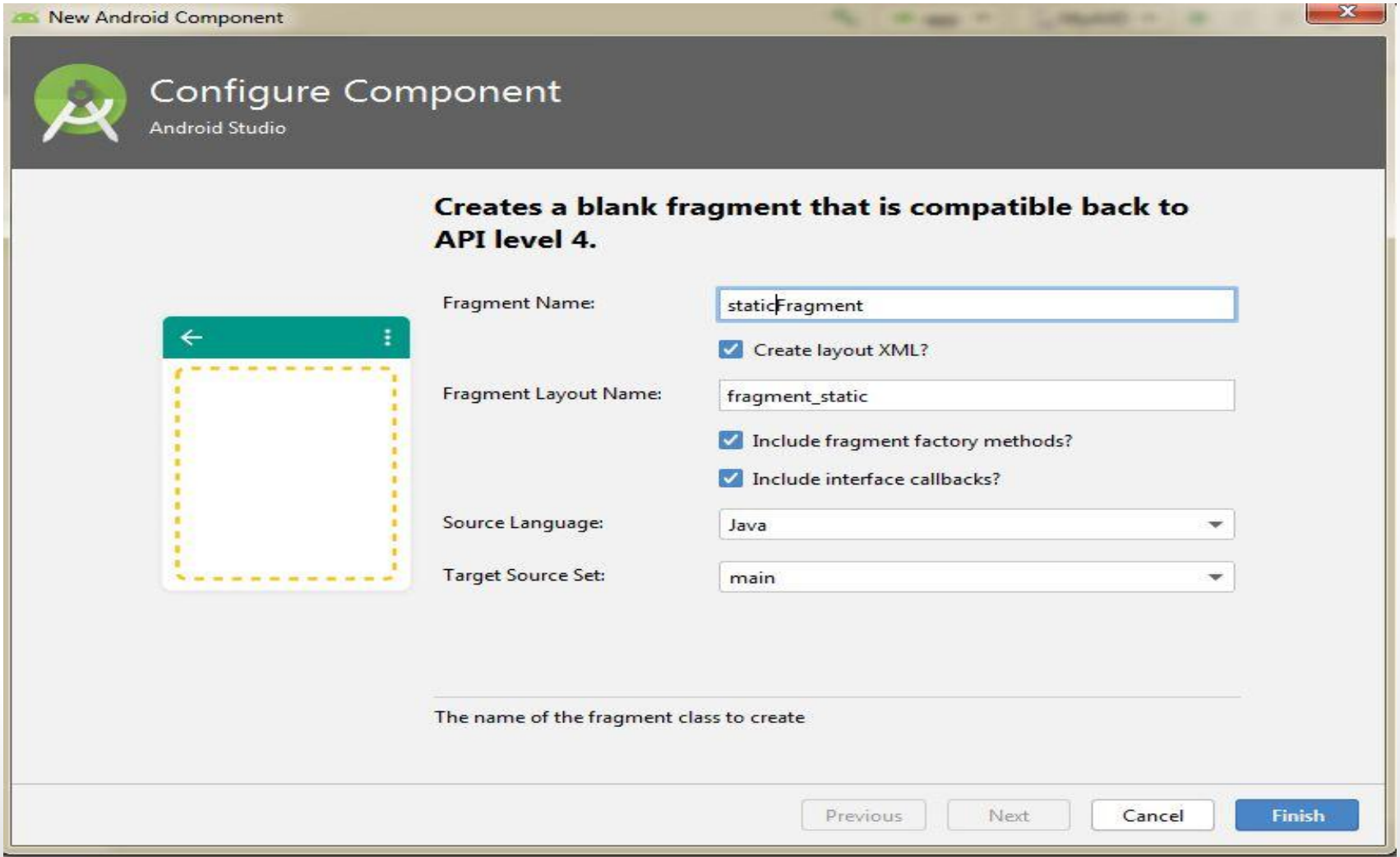

Destruction
2
onPause( )
4
onSaveInstanceState( )
6
onStop( )
10
onDestroy( )
1
onPause( )
3
onSaveInstanceState( )
5
onStop( )
7
onDestroyView( )
8
onDestroy( )
9
onDetache( )

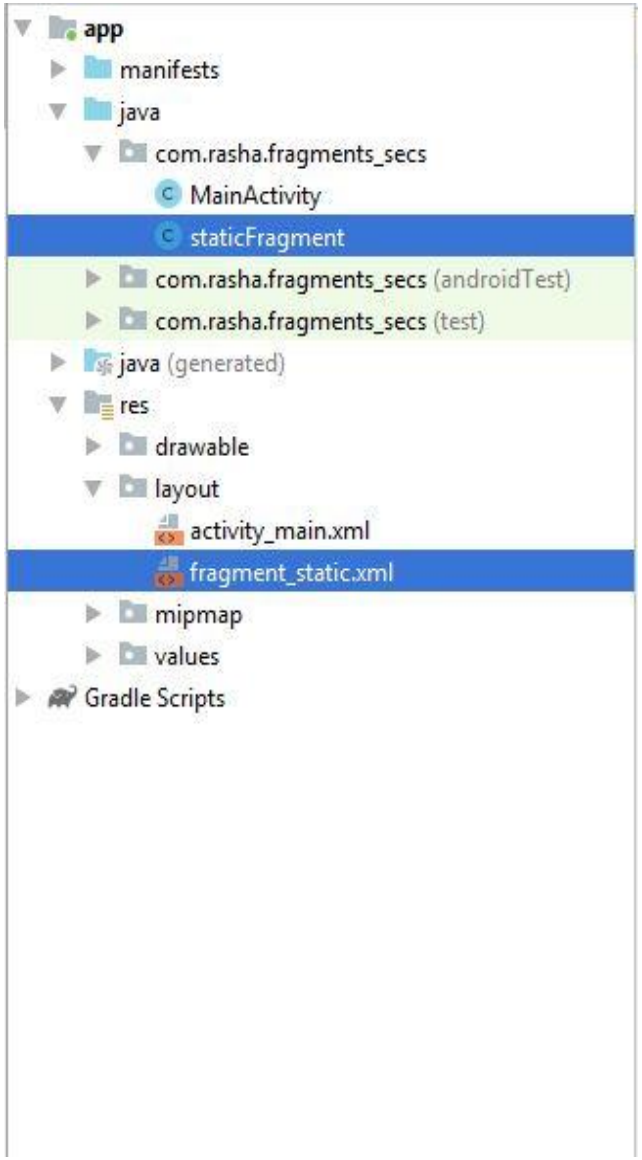
Adding fragment to activity

- Two Ways to add Fragments to an Activity:
  1. Add **<Fragment>** to the XML Layout
  2. Add Fragment in Java

1-Static Fragment

- app →new →fragment →blank fragment




app
manifests
java
com.rasha.fragments_secs
MainActivity
staticFragment
com.rasha.fragments_secs (androidTest)
com.rasha.fragments_secs (test)
java (generated)
res
drawable
layout
activity_main.xml
fragment_static.xml
mipmap
values
Gradle Scripts

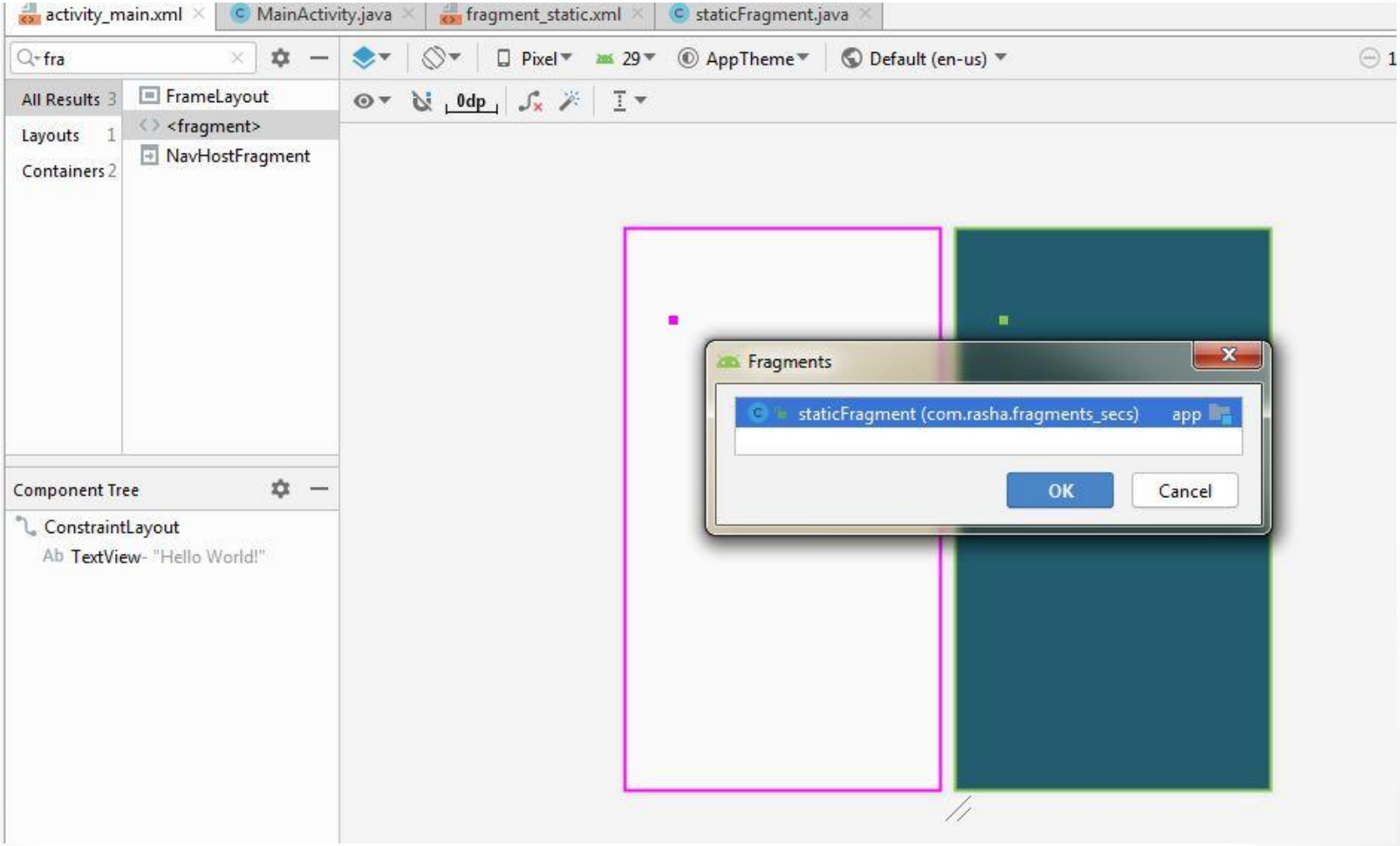
staticFragment.java

Fragment_static.xml

activity_main.xml | MainActivity.java | fragment_static.xml | staticFragment.java

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
3      xmlns:tools="http://schemas.android.com/tools"
4      android:layout_width="match_parent"
5      android:layout_height="match_parent"
6      tools:context=".staticFragment">
7
8      <!-- TODO: Update blank fragment layout -->
9      <TextView
10         android:layout_width="match_parent"
11         android:layout_height="match_parent"
12         android:text="hello_static_fragment" />
13
14 </FrameLayout>
```

Adding fragment to activity

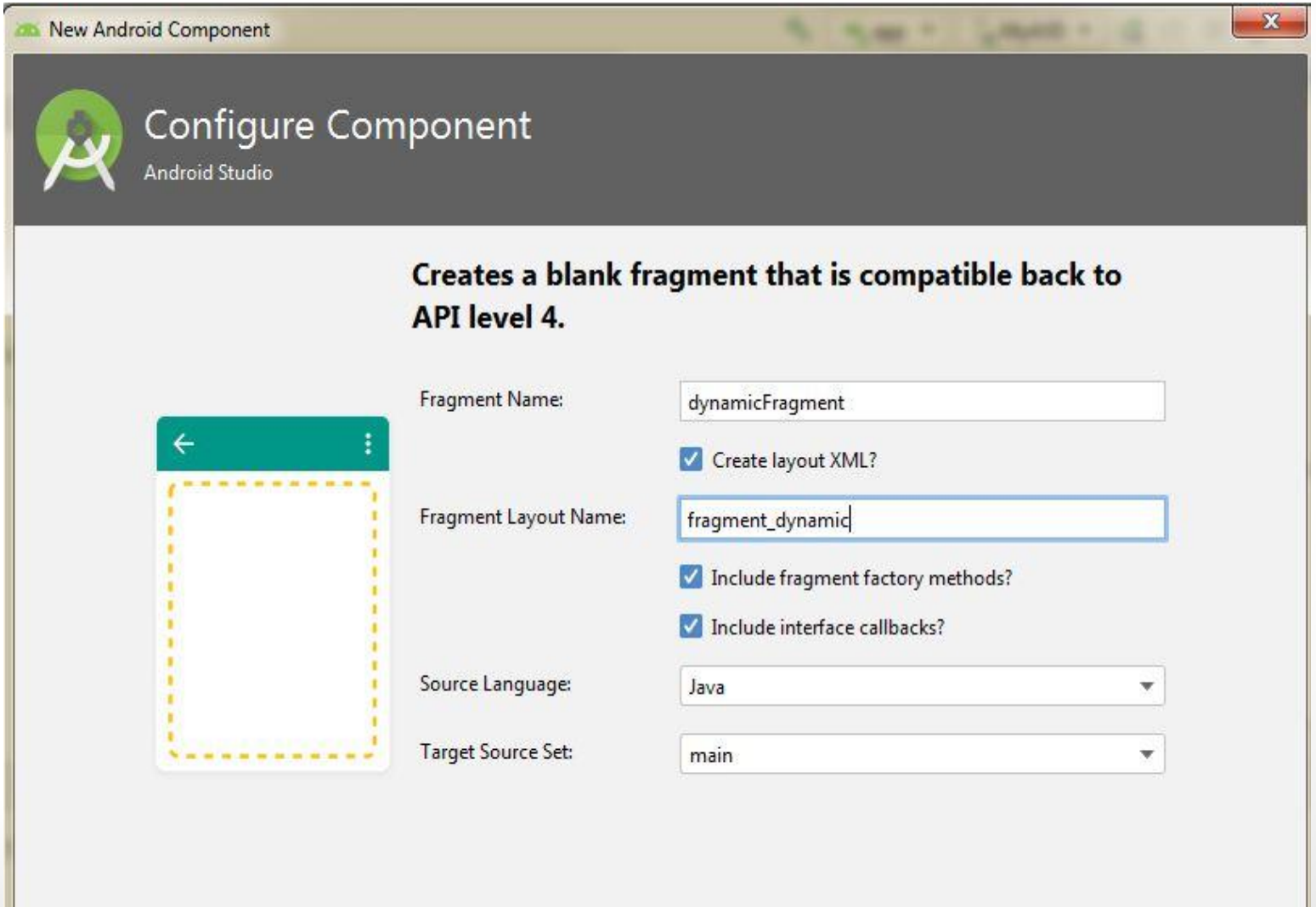


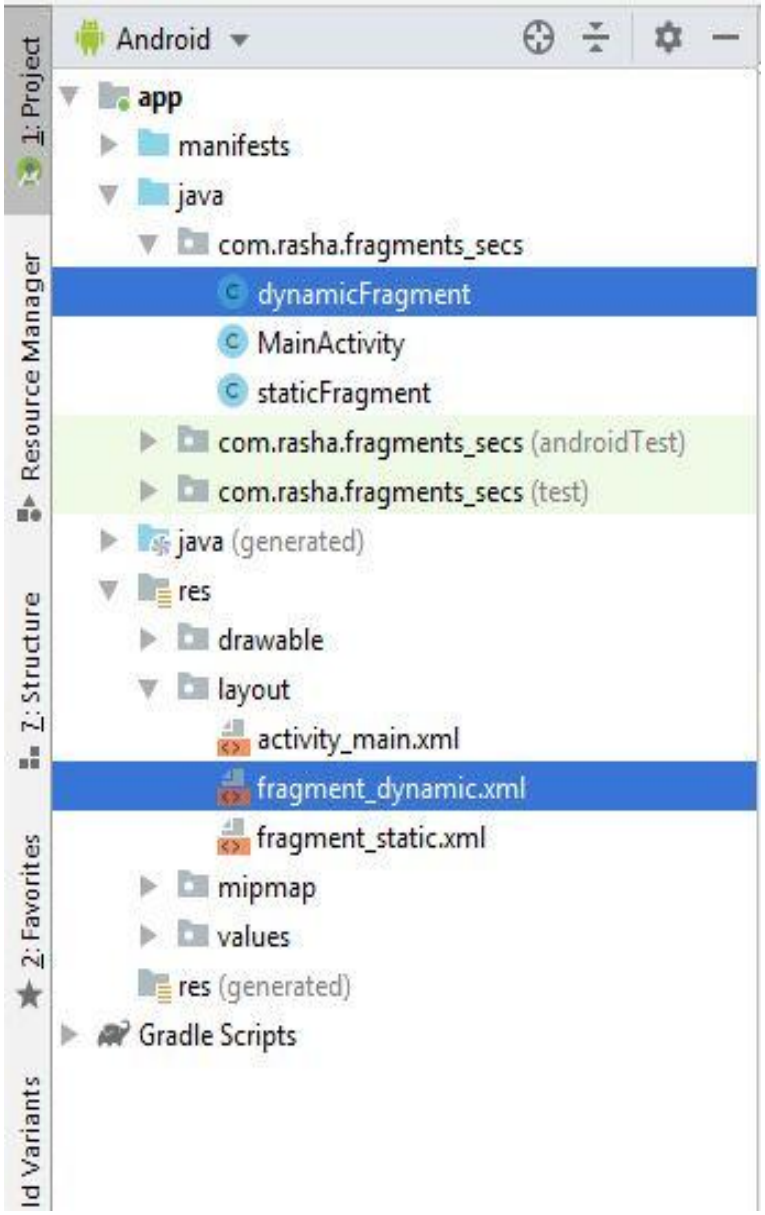
activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <fragment
        android:id="@+id/fragment"
        android:name="com.rasha.fragments_secs.staticFragment"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

2-Dynamic Fragment

app →new →fragment →blank fragment




Android
app
manifests
java
com.rasha.fragments_secs
dynamicFragment
MainActivity
staticFragment
com.rasha.fragments_secs (androidTest)
com.rasha.fragments_secs (test)
java (generated)
res
drawable
layout
activity_main.xml
fragment_dynamic.xml
fragment_static.xml
mipmap
values
res (generated)
Gradle Scripts
1: Project
Resource Manager
7: Structure
2: Favorites
ld Variants

Dynamic_fragment.java

activity_main.xml | fragment_dynamic.xml | dynamicFragment.java | MainActivity.java | fragment_static.xml | staticFragment.java

```
1   package com.rasha.fragments_secs;
2
3   import ...
12
13
14  public class dynamicFragment extends Fragment {
15
16
17      @Override
18      public View onCreateView(LayoutInflater inflater, ViewGroup container,
19                               Bundle savedInstanceState) {
20
21          return inflater.inflate(R.layout.fragment_dynamic, container, attachToRoot: false);
22      }
23
24
25  }
26
```

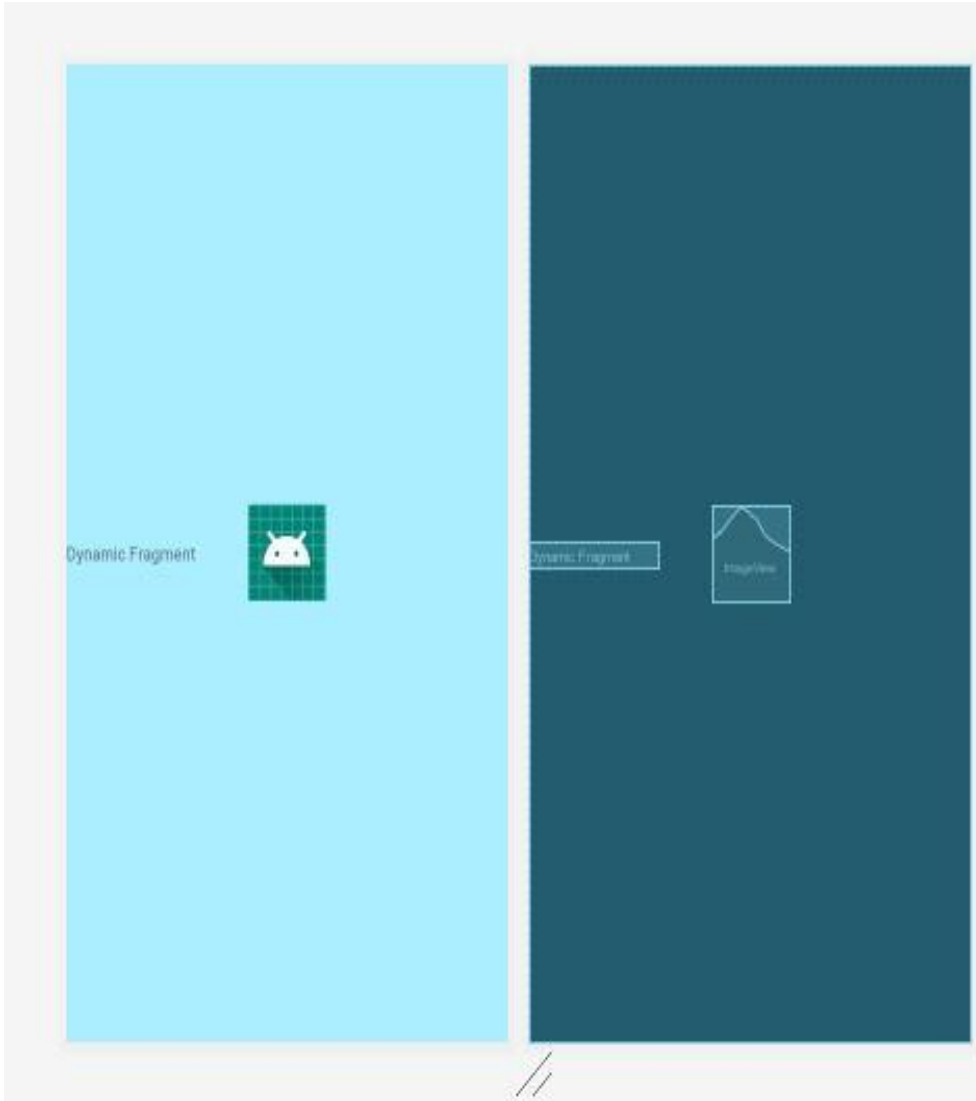
Fragmnet_dynamic.xml

activity_main.xml | fragment_dynamic.xml | dynamicFragment.java | MainActivity.java | fragment_static.xml | staticFragment.java

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
3      xmlns:tools="http://schemas.android.com/tools"
4      android:layout_width="match_parent"
5      android:layout_height="match_parent"
6      xmlns:app="http://schemas.android.com/apk/res-auto"
7      tools:context=".dynamicFragment"
8      android:background="#aef">
9
10
11     <ImageView
12         android:layout_width="wrap_content"
13         android:layout_height="wrap_content"
14         android:src="@mipmap/ic_launcher"
15         android:id="@+id/img"
16         android:layout_gravity="center"/>
17
18     <TextView
19         android:layout_width="wrap_content"
20         android:layout_height="wrap_content"
21         android:text="Dynamic Fragment"
22         android:layout_gravity="center_vertical"/>
23
24 </FrameLayout>
```

FrameLayout

Design | Text


Dynamic Fragment
Dynamic Fragment
ImageView

activity_main.xml

activity_main.xml | fragment_dynamic.xml | dynamicFragment.java | MainActivity.java | fragment_static.xml | staticFragmer

```
1   <?xml version="1.0" encoding="utf-8"?>
2   <androidx.constraintlayout.widget.ConstraintLayout
3       xmlns:android="http://schemas.android.com/apk/res/android"
4       xmlns:app="http://schemas.android.com/apk/res-auto"
5       xmlns:tools="http://schemas.android.com/tools"
6       android:layout_width="match_parent"
7       android:layout_height="match_parent"
8       tools:context=".MainActivity">
9
10
11      <Button
12          android:id="@+id/btn"
13          android:layout_width="match_parent"
14          android:layout_height="wrap_content"
15          android:text="show dynamic fragment"
16          app:layout_constraintBottom_toBottomOf="parent"
17          app:layout_constraintHorizontal_bias="0.0"
18          app:layout_constraintLeft_toLeftOf="parent"
19          app:layout_constraintRight_toRightOf="parent"
20          app:layout_constraintTop_toTopOf="parent"
21          app:layout_constraintVertical_bias="0.046" />
```

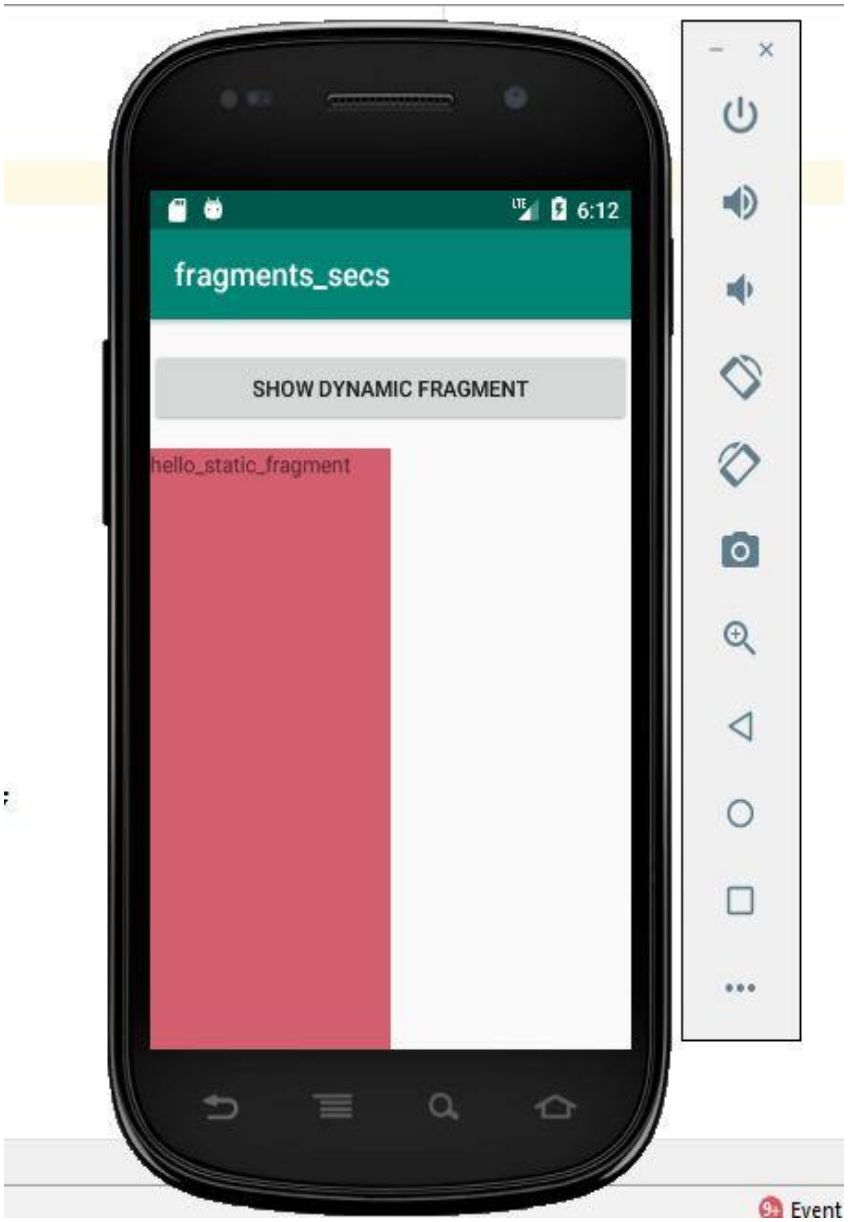
```
22
23      <LinearLayout
24          android:layout_width="match_parent"
25          android:layout_height="match_parent"
26          android:layout_marginTop="80dp"
27          android:orientation="horizontal"
28          app:layout_constraintBottom_toBottomOf="parent"
29          app:layout_constraintEnd_toEndOf="parent"
30          app:layout_constraintStart_toStartOf="parent"
31          app:layout_constraintTop_toTopOf="parent">
32
33          <fragment
34              android:id="@+id/fragment"
35              android:name="com.rasha.fragments_secs.staticFragment"
36              android:layout_width="0dp"
37              android:layout_height="match_parent"
38              android:layout_weight="1" />
39
40          <FrameLayout
41              android:id="@+id/framelayout_id"
42              android:layout_width="0dp"
43              android:layout_weight="1"
44              android:layout_height="match_parent"/>
45      </LinearLayout>
46  </androidx.constraintlayout.widget.ConstraintLayout>
```

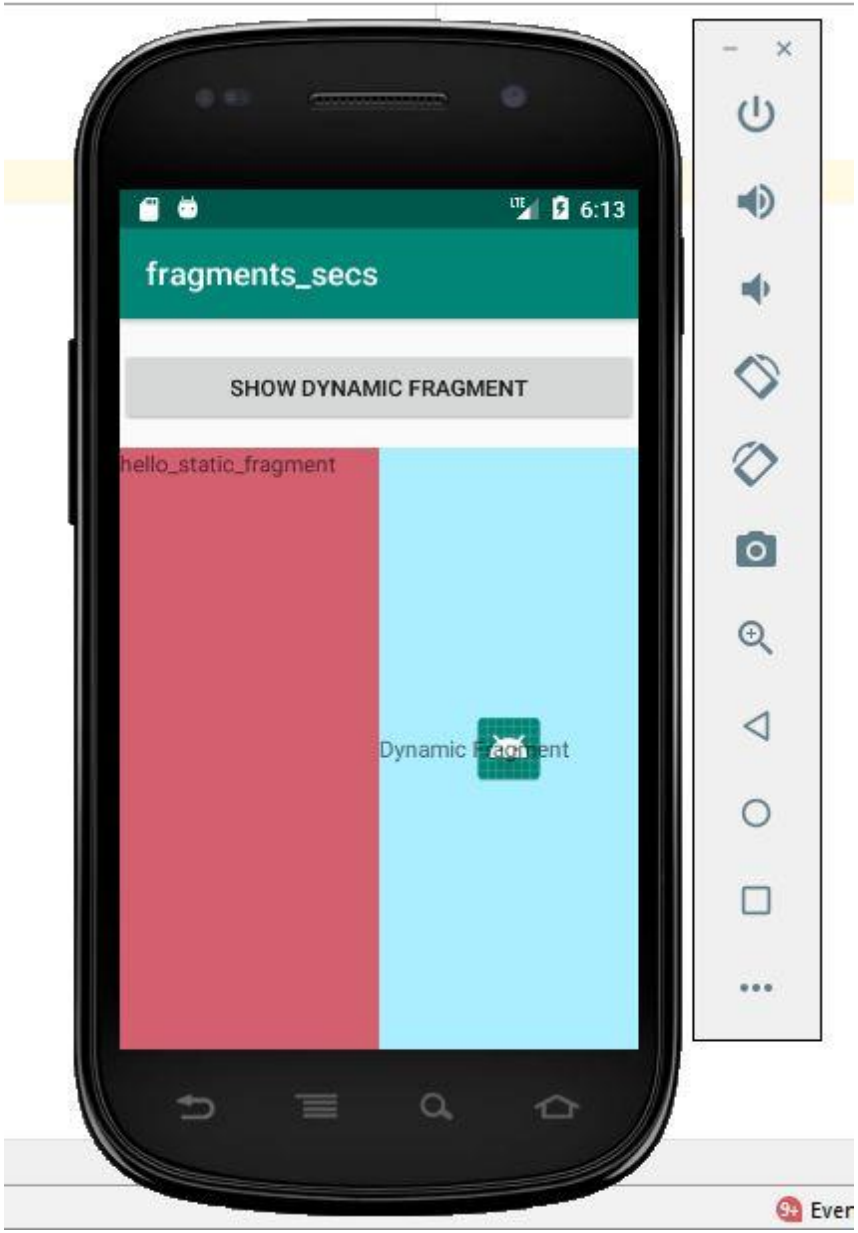
androidx.constraintlayout.widget.ConstraintLayout › LinearLayout

Main_activity.java

MainActivity.java

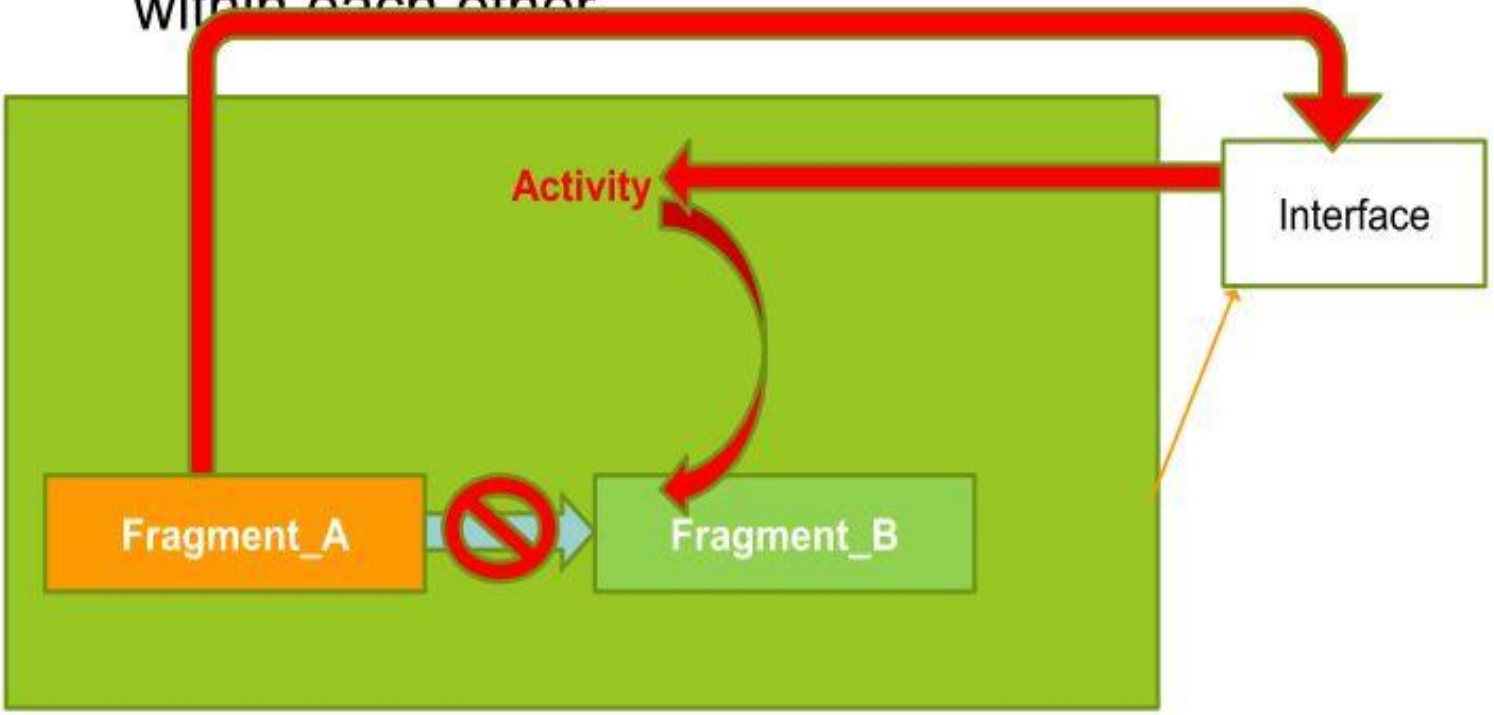
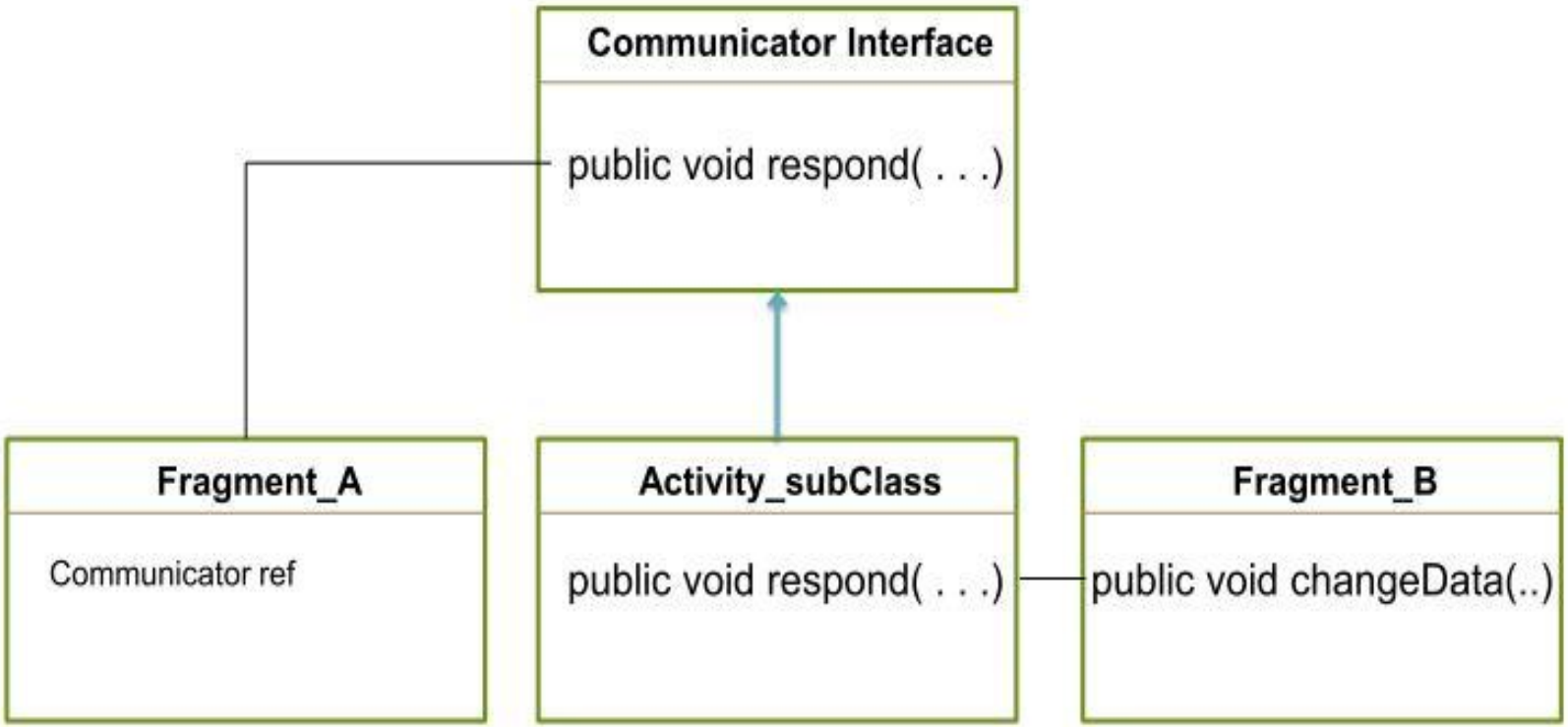
```
11
12  public class MainActivity extends AppCompatActivity {
13
14      Button fragment_btn;
15
16      @Override
17      protected void onCreate(Bundle savedInstanceState) {
18          super.onCreate(savedInstanceState);
19          setContentView(R.layout.activity_main);
20
21          fragment_btn=findViewById(R.id.btn);
22
23          fragment_btn.setOnClickListener(new View.OnClickListener() {
24              @Override
25              public void onClick(View view) {
26                  dynamicFragment d_fragment=new dynamicFragment();
27                  FragmentManager f_manager=getSupportFragmentManager();
28                  FragmentTransaction f_trans=f_manager.beginTransaction();
29                  f_trans.add(R.id.framelayout_id,d_fragment, tag: "myFragment");
30
31                  f_trans.commit();
32              }
33          });
34
```


6:12
fragments_secs
SHOW DYNAMIC FRAGMENT
hello_static_fragment
Event


6:13
fragments_secs
SHOW DYNAMIC FRAGMENT
hello_static_fragment
Dynamic Fragment

Inter fragment communication

- Fragments should be loosely coupled.
- Don't maintain direct reference of fragments within each other



Communicator design pattern