Android Development

Material Design. Fragments

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Questions

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sli.do

#Android

Advanced User Interface

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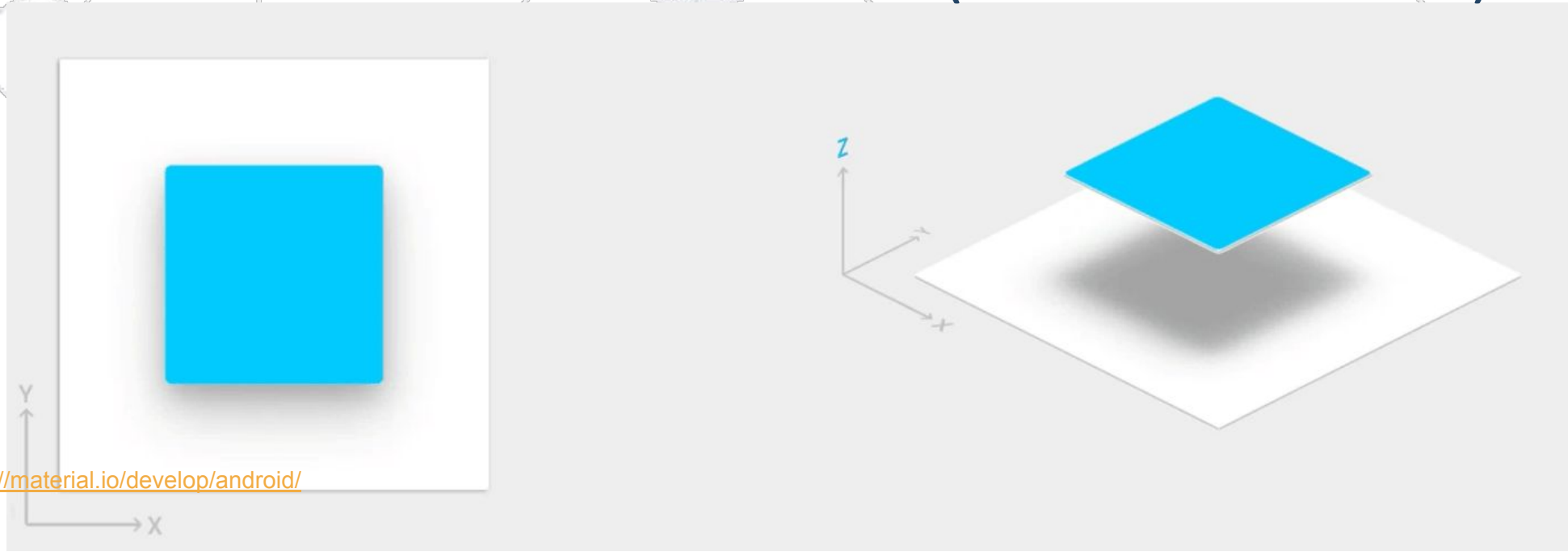
- Material Design is the name of the collection of guidelines used when designing for Android
- It has had several iterations over the years, starting with Android 5.0 Lolipop
- It relies on real-world interactions (hence “material”)



Source: https://material.io/develop/android/

Tabs vs Bottom Navigation

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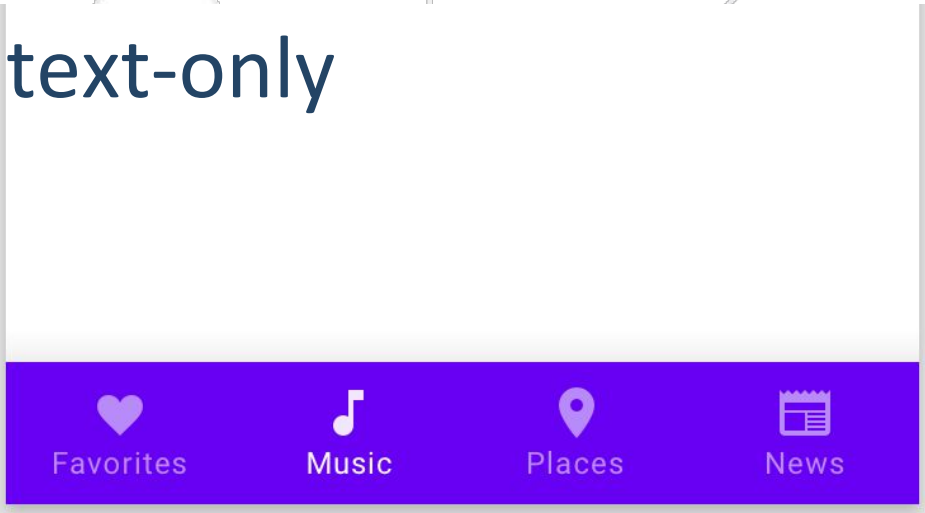
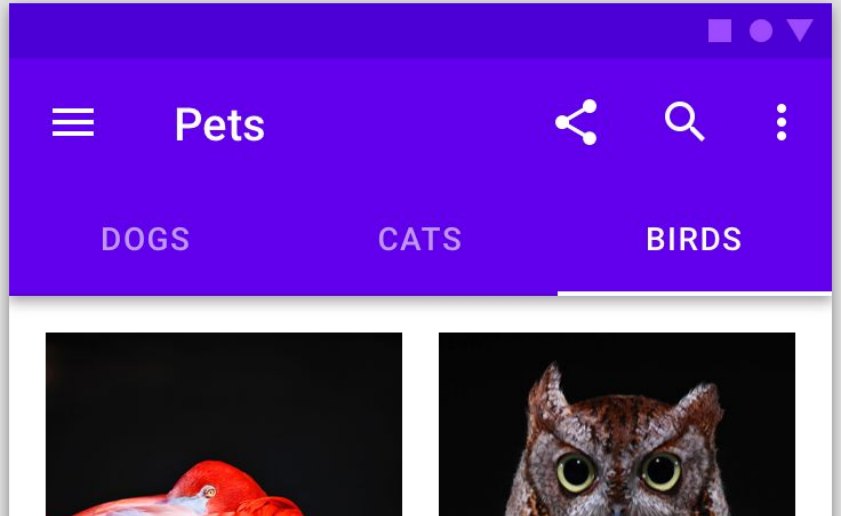
- Tabs are navigation buttons shown in a bar at the top (usually)
- Bottom Navigation is shown at the bottom of the screen
- BN is usually used for top-level navigation and has icons
- Tabs can be used also for internal screen navigation. Can be text-only





Source: https://material.io/develop/android/components/bottom-navigation-view/
https://material.io/develop/android/components/tab-layout/

Demo

Bottom Navigation

Constraint Layout

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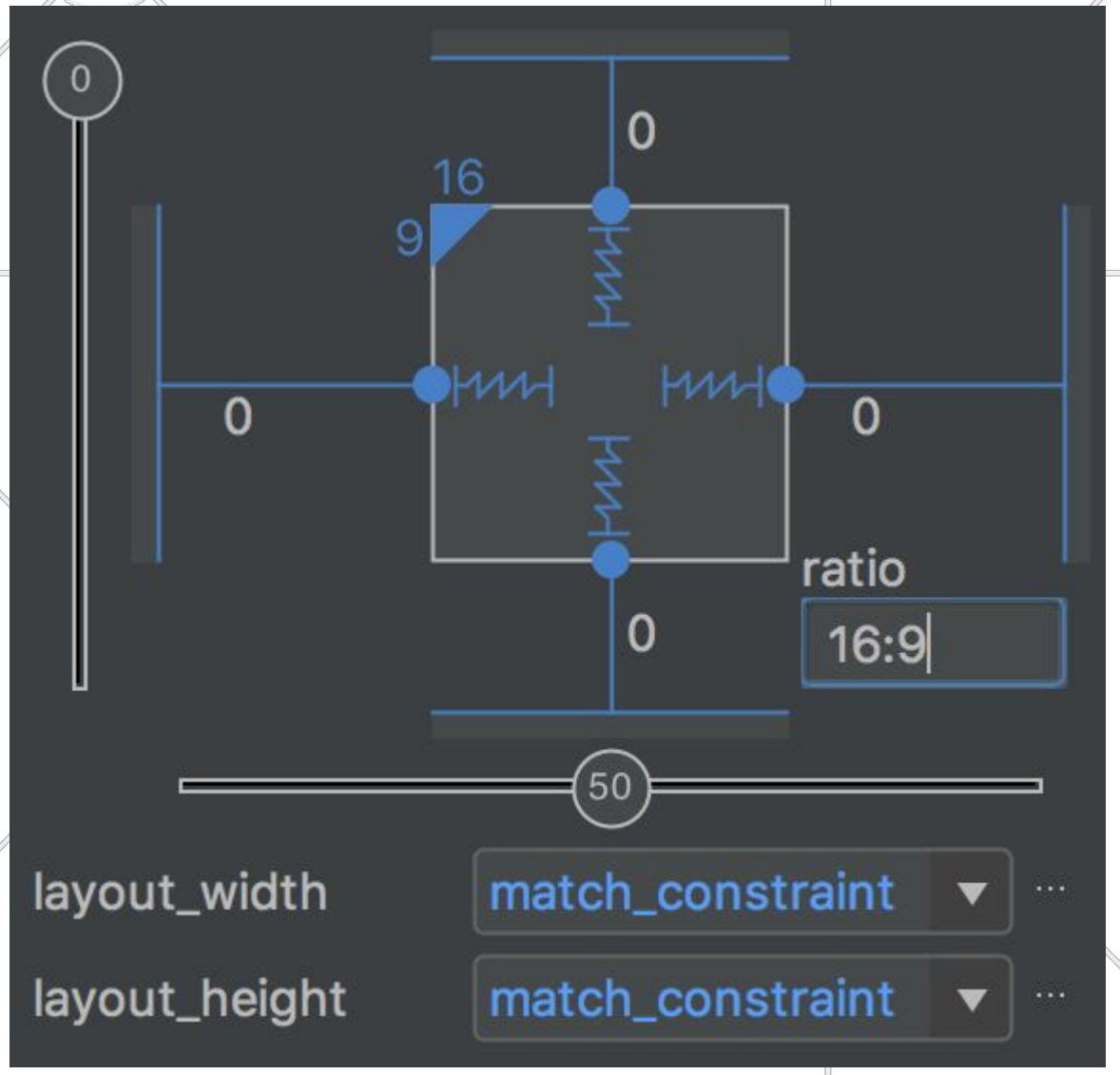
- Iteration of Relative Layout
- Helps keep the view hierarchy flat
- All attributes can be easily set from the Design Tab, without writing code



Source: https://developer.android.com/training/constraint-layout

Constraint Layout Usage

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- Each view has to have at least one vertical and one horizontal constraint
- For view sizes we have: fixed size, wrap_parent and match_constraint
- The Layout Editor allows us:
  - To convert a relative layout into a constraint layout
  - To automatically set constraints depending where the view is
  - To easily align multiple views together
  - To set default margins

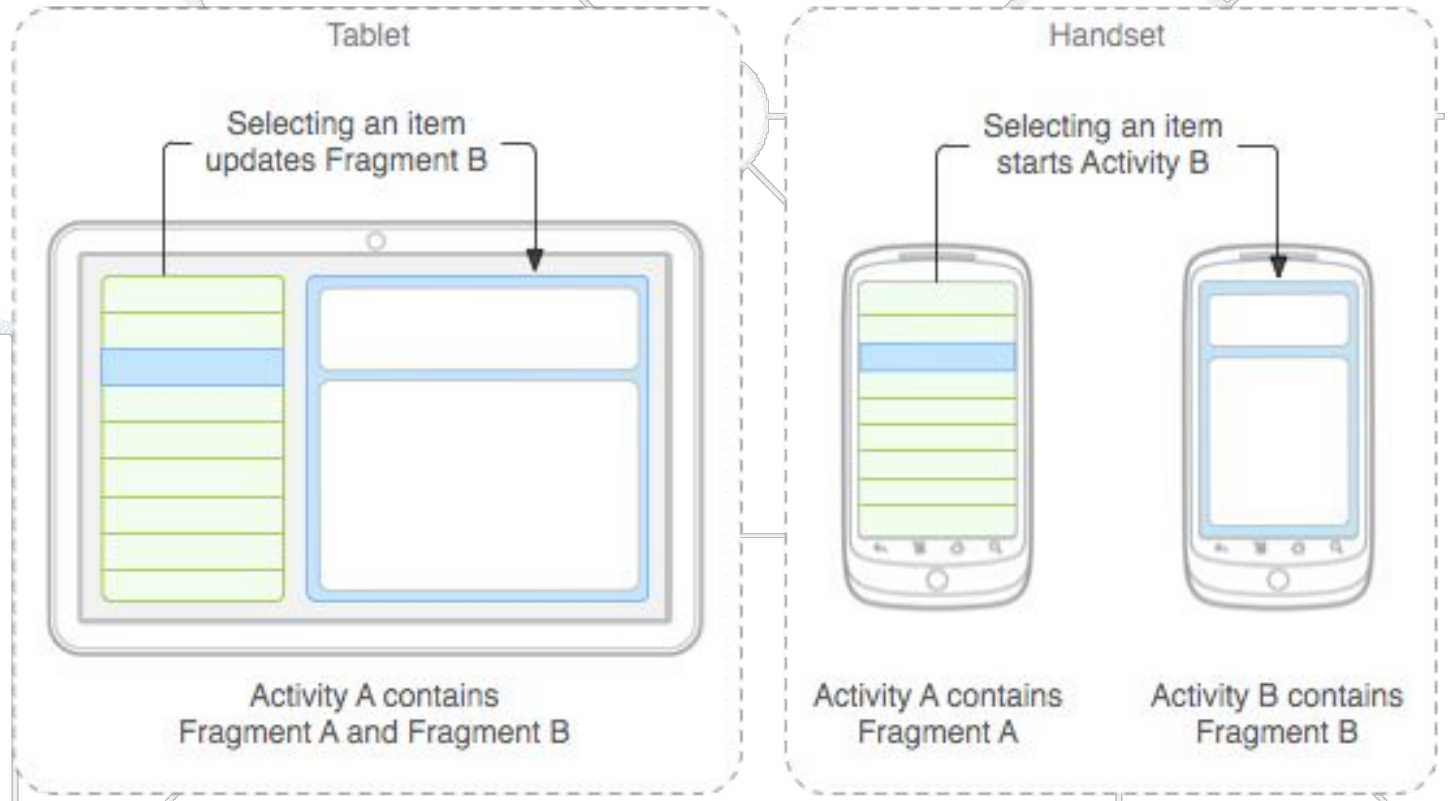
Source: https://developer.android.com/training/constraint-layout

Demo

Constraint Layout

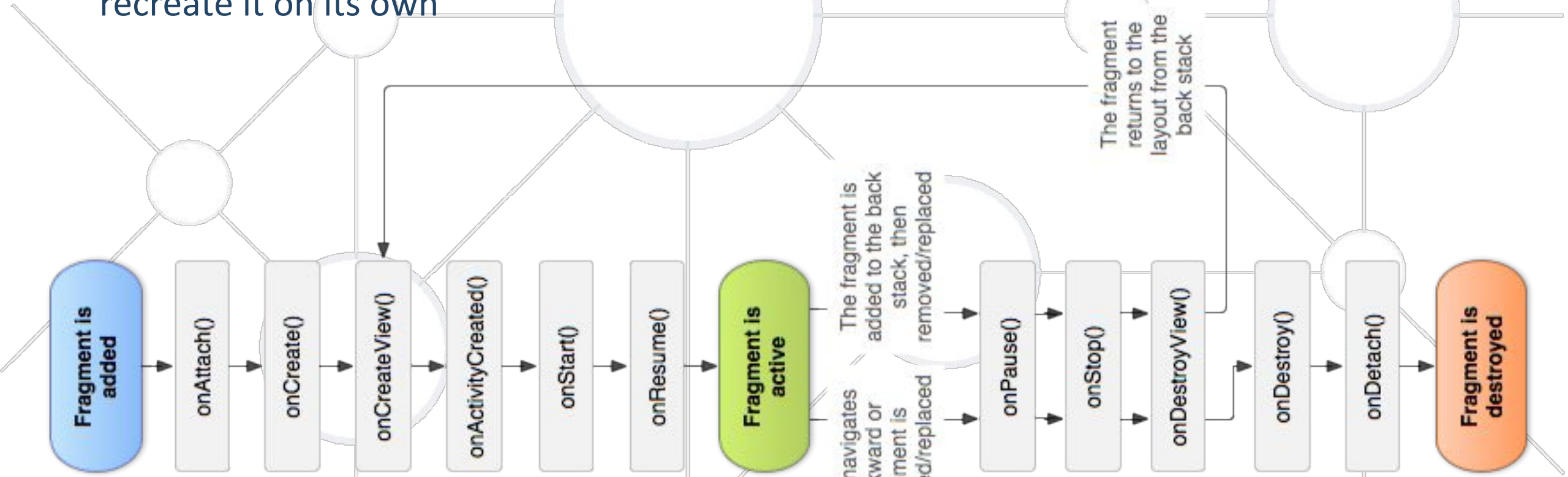
Fragments

- Fragments can be viewed as sub-activities
- In reality, they are ordinary view groups
- Fragments have a life-cycle
- They need to be attached to an activity
- One activity can have many fragments
- Fragments can be attached, detached, swapped while the activity is running
- Fragment lifecycle depends on the activity lifecycle, but not vise-versa



Fragment Lifecycle

- Lifecycle is similar to the activity lifecycle
- Main difference is the onCreateView method, which handles fragment's layout inflation
- A fragment needs an empty constructor, so the Android system can destroy and recreate it on its own



Source: https://developer.android.com/guide/components/fragments

Adding a Fragment

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- Static:

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <fragment android:name="com.example.news.ArticleListFragment"
            android:layout_width="match_parent"
            android:layout_height="match_parent" />
</LinearLayout>
```

Adding a Fragment

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- Dynamic:

```
FragmentManager fragmentManager = getFragmentManager();
FragmentTransaction fragmentTransaction =
fragmentManager.beginTransaction();


ExampleFragment fragment = new ExampleFragment();
fragmentTransaction.add(R.id.fragment_container, fragment);
transaction.addToBackStack(null);
fragmentTransaction.commit();
```

Talk to an Activity

- From Activity to Fragment:
  - keep fragment instance in Activity and call fragment methods directly
- From Fragment to Activity
  - Pass a callback when the Fragment is created

```
public class HeadlinesFragment extends Fragment {
    OnHeadlineListener callback;

    public void setOnHeadlineListener(OnHeadlineListener callback) {
        this.callback = callback;
    }
     public interface OnHeadlineListener {
        public void onArticleSelected(int position);
    }
}
```

```
public static class MainActivity extends Activity
                                implements OnHeadlineListener {

    @Override
    public void onAttachFragment(Fragment fragment) {
        if (fragment instanceof HeadlinesFragment) {
            HeadlinesFragment headlinesFragment =
                                (HeadlinesFragment) fragment;
            headlinesFragment.setOnHeadlineListener(this);
        }
    }
}
```

Source: https://developer.android.com/training/basics/fragments/communicating

Demo

Fragments

Summary and Resources

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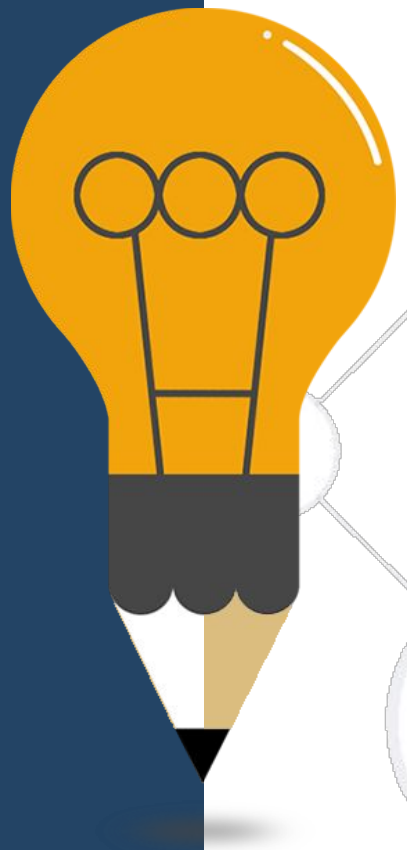
Fragments are the main UI element. Each fragment should be a new screen.

Resources:

https://www.youtube.com/watch?v=4N4bCdyGcUc
https://www.youtube.com/watch?v=Ske1_LuymRI

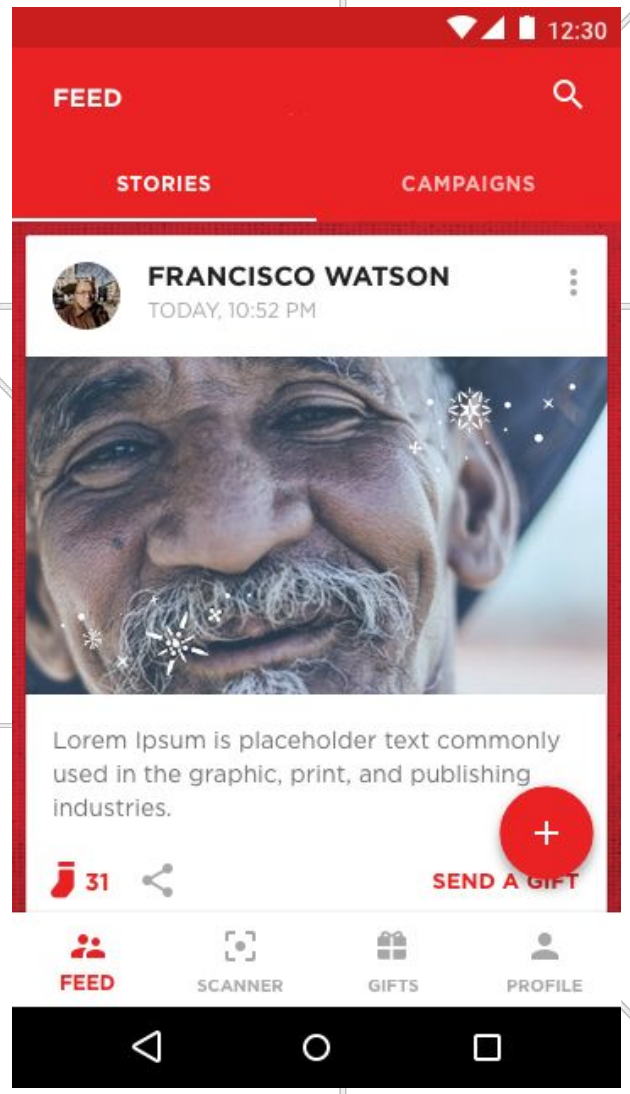
Homework (1)



Create an app with the following design.

It should have:

- Toolbar with action. Pressing the action should open a context menu.
- Bottom Navigation with Fragments
- The Feed page should have tabs
- The Stories tab should have a recycler view and a FAB
- Each element of the recycler view should be a card view
- Pressing the + FAB will open a new page where inforamtion can be added:
  - User image and name
  - Story image and text
  - Add Story button, upon pressing it the story is added to the local database and it's shown on Feed > Stories
- The scanner, gifts and profile screens can be empty
- The campaign screen can be empty



You will find resources for the design (icons) in the github of the course. (https://github.com/android-soft-uni/03-Views-Layouts)

Questions?

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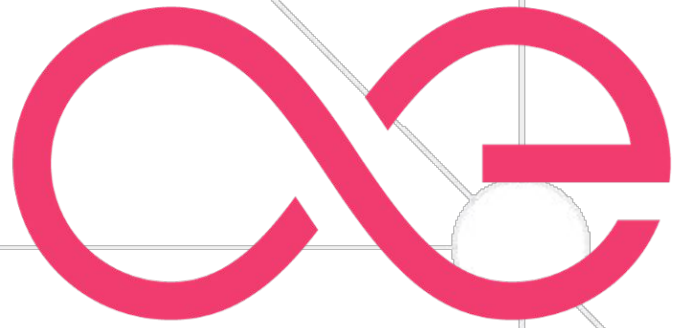

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