

## Advanced Mobile Application Development

### Week 14: Fragments and Data

#### Superheroes

Create a new project called Superheroes

Minimum SDK: API 17

Check Phone and Tablet, leave the rest unchecked

Empty Activity template

Activity name: MainActivity

Check Generate Layout File

Layout Name: activity\_main

#### Hero java class

Create a new Java class called Hero.

```
import java.util.Arrays;
```

```
import java.util.ArrayList;
```

```
public class Hero {
    private String universe;
    private ArrayList<String> superheroes = new ArrayList<>();

    //constructor
    private Hero(String univ, ArrayList<String> heroes){
        this.universe = univ;
        this.superheroes = new ArrayList<String>(heroes);
    }

    public static final Hero[] heroes = {
        new Hero("DC", new ArrayList<String>(Arrays.asList("Superman", "Batman", "Wonder
Woman", "The Flash", "Green Arrow", "Catwoman"))),
        new Hero("Marvel", new ArrayList<String>(Arrays.asList("Iron Man", "Black Widow",
"Captain America", "Jean Grey", "Thor", "Hulk")))
        //source: http://www.ign.com/articles/2013/11/19/the-top-25-heroes-of-dc-comics
        //source: http://www.ign.com/articles/2014/09/10/top-25-best-marvel-superheroes
    };

    public String getUniverse(){
        return universe;
    }

    public ArrayList<String> getSuperheroes(){
        return superheroes;
    }

    public String toString(){
        return this.universe;
    }
}
```

## Universe List Fragment

Let's create a fragment that will be used for our first view which will have an image and a list of the superhero universes.

File | New | Fragment | Fragment(blank)

Name: UniverseListFragment

Check Create layout XML

Fragment layout name: fragment\_universe\_list

Uncheck both include check boxes

Finish

Android Studio creates a new fragment file called UniverseListFragment.java in the app/src/main/ java folder, and a new layout file called fragment\_universe\_list.xml in the app/src/res/layout folder.

Go into fragment\_universe\_list.xml

You can see that fragment layout code looks a lot like activity layout code. You can use all the same views and layouts you've been using in activities when you're creating fragments.

Change the layout code to have an ImageView and ListView

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin">

    <ImageView
        android:layout_width="175dp"
        android:layout_height="76dp"
        android:layout_gravity="center"
        android:id="@+id/imageView"
        android:src="@drawable/superheroes"
        android:contentDescription="@string/app_name" />

    <ListView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:paddingTop="10dp"
        android:id="@+id/listView" />

</LinearLayout>
```

Add image into the drawables folder.

Look at the code generated in UniverseListFragment.java

```

public class UniverseListFragment extends Fragment {
    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
        Bundle savedInstanceState) {
        return inflater.inflate(R.layout.fragment_universe_list, container, false);
    }
    public UniverseListFragment() { }
}

```

Note it extends the Fragment class instead of Activity.

The onCreateView() method gets called each time Android needs the fragment's layout, and it's where you say which layout the fragment uses. This method is optional, but you'll need to implement it almost every time you create a fragment because you need to implement it whenever you're creating a fragment with a layout.

inflater.inflate() is a fragment's equivalent to an activity's setContentView() method. It determines which layout the fragment uses.

All fragments must have a public constructor with no arguments. Android uses it to reinstantiate the fragment when needed, and if it's not there, you'll get a runtime exception. The Java compiler automatically adds a public no-argument constructor for you if your class contains no other constructors, so you only need to add it if you include another constructor with arguments.

Now we need to add the fragment to the main activity which was created for us when we created the project. In activity\_main.xml remove the TextView and add the fragment

```

<fragment
    android:layout_width="match_parent"
    android:layout_weight="2"
    android:layout_height="match_parent"
    android:id="@+id/universe_frag"
    class="com.example.aileen.superheroes.UniverseListFragment" />

```

The class attribute specifies the fully qualified name of your fragment.

Now let's update UniverseListFragment.java to load our values into our fragment's listview.

```

import android.widget.ArrayAdapter;
import android.widget.ListView;

```

```

@Override
public void onStart(){
    super.onStart();
    View view = getView();
    if (view != null){
        //load data into fragment
        //get the list view
        ListView listUniverse = (ListView) view.findViewById(R.id.listView);
        //define an array adapter
        ArrayAdapter<Hero> listAdapter = new ArrayAdapter<Hero>(getContext(),
            android.R.layout.simple_list_item_1, Hero.heroes);
    }
}

```

```

        //set the array adapter on the list view
        listUniverse.setAdapter(listAdapter);
    }
}

```

Need to use onStart() because in onCreateView() the view isn't created yet so we can't access it.

If you run it at this point you should be able to see the fragment with the image and data in the list view.

### Hero Detail Fragment

Now let's create our detail fragment to hold the list of superheroes. This is going to hold a list view of the superheroes and eventually a button to add superheroes.

File | New | Fragment | Fragment(blank)  
 Name: HeroDetailFragment  
 Check Create layout XML  
 Fragment layout name: fragment\_hero\_detail  
 Uncheck both include check boxes  
 Finish

Go into fragment\_hero\_detail.xml  
 Change the layout code to have a ListView

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin">

    <ListView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_weight="1"
        android:id="@+id/herolistView" />

</LinearLayout>

```

For now let's populate the list view with the heroes of the first universe (DC) just to get it working.

HeroDetailFragment.java

**\*\*make sure HeroDetailFragment.java imports android.app.Fragment; and NOT android.support.v4.app.Fragment;**

```

import android.widget.ListView;
import java.util.ArrayList;
import android.widget.ArrayAdapter;

```

```

//create array adapter
private ArrayAdapter<String> adapter;

@Override public void onStart(){
    super.onStart();

    View view = getView();
    ListView listHeroes = (ListView) view.findViewById(R.id.herolistView);

    // get hero data
    ArrayList<String> herolist = new ArrayList<String>();
    herolist = Hero.heroes[0].getSuperheroes();

    //set array adapter
    adapter = new ArrayAdapter<String>(getActivity(), android.R.layout.simple_list_item_1, herolist);

    //bind array adapter to the list view
    listHeroes.setAdapter(adapter);
}

```

When we used an array adapter to populate a list view with an activity we could use “this” to get the current context because activity is a type of context, the Activity class is a subclass of the Context class. The Fragment class is not a subclass of the Context class so we must use getActivity() to get the activity that the fragment is associated with. (using getContext() like we did in our other class, requires API 23 for the fragment class)

Eventually we’ll want the universe fragment to tell the hero fragment which superheroes to display. To do this we’ll need the id of the universe and a setter method to set it. Later we’ll use it to update the fragment view.

```

private long universeId; //id of the universe chosen

```

```

//set the universe id
public void setUniverse(long id){
    this.universeId = id;
}

```

Now we need to add the fragment to the main activity so it appears to the right of UniverseListFragment. We’ll use a linear layout with horizontal orientation in activity\_main.xml

```

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:orientation="horizontal"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context="com.example.aileen.superheroes.MainActivity">

```

```
<fragment
    android:layout_width="0dp"
    android:layout_weight="2"
    android:layout_height="match_parent"
    android:id="@+id/universe_frag"
    class="com.example.aileen.superheroes.UniverseListFragment" />
```

```
<fragment
    android:layout_width="0dp"
    android:layout_weight="3"
    android:layout_height="match_parent"
    android:id="@+id/detail_frag"
    class="com.example.aileen.superheroes.HeroDetailFragment" />
```

</LinearLayout>

Now when you run it you should see both fragments side by side.  
You might need to change the dimensions of your image if it's cut off.  
Cntrl fn F11 to rotate the emulator on a Mac; cntrl F11 on a PC.

### Update Detail List

Now lets get the detail view to show the heroes based on which universe the user selects.

We want the fragments to be reusable so it's best if they rely as little as possible on the activity using it.

We'll decouple the fragment and the activity by using an interface.

When we define an interface, we're saying what the minimum requirements are for one object to talk usefully to another. It means that we'll be able to get the fragment to talk to any kind of activity, so long as that activity implements the interface.

Update UniverseListFragment.java to create an interface, define a listener, assign the listener to the context, and tell the listener when an item is clicked.

```
import android.content.Context;
```

```
import android.widget.AdapterView;
```

```
//create interface
```

```
interface UniverseListListener{
    void itemClicked(long id);
}
```

```
//create listener
```

```
private UniverseListListener listener;
```

```
@Override public void onAttach(Context context){
    super.onAttach(context);
    //attaches the context to the listener
    listener = (UniverseListListener) context;
}
```

Update the class to implement the AdapterView.OnItemClickListener

```
public class UniverseListFragment extends Fragment implements AdapterView.OnItemClickListener
```

```

@Override public void onItemClick(AdapterView<?> parent, View view, int position, long id){
    if (listener != null){
        //tells the listener an item was clicked
        listener.itemClicked(id);
    }
}

```

And update onStart() to attach the listener to the listview (add this after setAdapter() )

```

//attach the listener to the listview
listUniverse.setOnItemClickListener(this);

```

When an item is clicked in the fragment, the itemClicked() method in the activity will be called so that's where we can have the fragment update its details. Instead of updating the fragment details we're going to replace the detail fragment with a brand-new detail fragment each time we want its text to change. This is so the back button does what a user would expect it to and go to the previous data if they had clicked on different items, and not automatically the previous view.

To do this we first change the activity\_main.xml layout file. Instead of inserting WorkoutDetailFragment directly, we'll use a frame layout.

A frame layout is a type of view group that's used to block out an area on the screen. You define it using the <FrameLayout> element. You use it to display single items—in our case, a fragment. We'll put our fragment in a frame layout so that we can control its contents programmatically. Whenever an item in the UniverseListFragment list view gets clicked, we'll replace the contents of the frame layout with a new instance of HeroDetailFragment that displays details of the correct superheroes:

```

<FrameLayout
    android:layout_width="0dp"
    android:layout_weight="3"
    android:layout_height="match_parent"
    android:id="@+id/fragment_container" />

```

Then we need to update MainActivity.java to have our main activity implement the interface.

Update MainActivity.java

```

public class MainActivity extends AppCompatActivity implements
UniverseListFragment.UniverseListListener

```

Next we create a new HeroDetailFragment when the user clicks on a universe.

```

import android.app.FragmentTransaction;

```

```

@Override public void itemClicked(long id){
    //create new fragment instance
    HeroDetailFragment frag = new HeroDetailFragment();
    //create new fragment transaction
    FragmentTransaction ft = getFragmentManager().beginTransaction();
    //set the id of the universe selected
    frag.setUniverse(id);
}

```

```

//replace the fragment in the fragment container
ft.replace(R.id.fragment_container, frag);
//add fragment to the back stack
ft.addToBackStack(null);
//set the transition animation-optional
ft.setTransition(FragmentTransaction.TRANSIT_FRAGMENT_FADE);
//commit the transaction
ft.commit();
}

```

Fragments don't have a `onBackPressed()` method so when you press the back key the app looks for the previous activity or if there is none, exits. To have the back button work correctly with fragments we need to override the `onBackPressed()` method and have it check if there are fragments on the backstack to pop them out, otherwise follow the default behavior.

```

@Override public void onBackPressed() {
    if (getFragmentManager().getBackStackEntryCount() > 0 ){
        getFragmentManager().popBackStack();
    } else {
        super.onBackPressed();
    }
}

```

Now that we have that set up let's update the hero detail fragment so it shows the data based on which universe the user selected. We just need to change the one line where we have `Hero.heroes[0]` now use the `universeId`.

```

herolist = Hero.heroes[(int) universeId].getSuperheroes();

```

Now when you run it you should be able to select a universe and see the correct superheroes.

### Rotation

You'll notice that if you select any item other than the first, when you rotate the device the list automatically goes back to the first one. That's because the detail fragment is getting destroyed and recreated along with the activity. (control fn F11 to rotate)

In `HeroDetailFragment.java` save the current `universeId` being displayed in the fragment.

```

@Override public void onSaveInstanceState(Bundle savedInstanceState){
    savedInstanceState.putLong("universeId", universeId);
}

```

Then update `onCreateView()` to check to see if there was a saved instance and retrieve the universe id.

```

if (savedInstanceState != null){
    universeId = savedInstanceState.getLong("universeId");
}

```

### Add Superheroes

Add button to the bottom of `fragment_hero_detail.xml`

Create new layout resource for the dialog.



File name: dialog.xml  
Root element: Linear Layout  
Source set: main

Add an EditText and Button to it

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

    <EditText
        android:id="@+id/editTextHero"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="10dp"
        android:layout_marginRight="10dp"
        android:layout_marginTop="10dp"
        android:ems="20"
        android:hint="@string/addtext_hint">

        <requestFocus />
    </EditText>

    <Button
        android:id="@+id/addButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_marginBottom="10dp"
        android:text="@string/adddialog_title" />

</LinearLayout>
```

HeroDetailFragment.java

```
import android.app.Dialog;
import android.widget.Button;
import android.widget.EditText;
import android.content.Context;
```

Update HeroDetailFragment.java to create an interface, define a listener, assign the listener to the context, and tell the listener when the button is clicked.

```
//create interface
interface ButtonClickListener{
    void addheroclicked(View view);
}
```

*//create listener*

```
private ButtonClickListener listener;
```

```
@Override public void onAttach(Context context){  
    super.onAttach(context);  
    //attaches the context to the listener  
    listener = (ButtonClickListener)context;  
}
```

Implement OnClickListener for the button(this will show an error until you implement the onClick() method)

```
public class HeroDetailFragment extends Fragment implements View.OnClickListener{
```

```
    @Override public void onClick(View view){  
        if (listener !=null){  
            listener.addheroclicked(view);  
        }  
    }  
}
```

And update onStart() to attach the listener to the button

```
Button addButton = (Button) view.findViewById(R.id.addButton);  
addButton.setOnClickListener(this);
```

Create addHero() method

```
public void addhero(){  
    final Dialog dialog = new Dialog(getActivity());  
    dialog setContentView(R.layout.dialog);  
    dialog.setTitle("Add Hero");  
    dialog.setCancelable(true);  
    final EditText editText = (EditText) dialog.findViewById(R.id.editTextHero);  
    Button button = (Button) dialog.findViewById(R.id.addButton);  
    button.setOnClickListener(new View.OnClickListener() {  
        @Override  
        public void onClick(View v) {  
            String heroName = editText.getText().toString();  
            // add hero  
            Hero.heroes[(int) universeId].getSuperheroes().add(heroName);  
            //refresh the list view  
            HeroDetailFragment.this.adapter.notifyDataSetChanged();  
            dialog.dismiss();  
        }  
    });  
    dialog.show();  
}
```

Then we need to update MainActivity.java to have our main activity implement the interface.

Update MainActivity.java

```
public class MainActivity extends AppCompatActivity implements  
UniverseListFragment.UniverseListListener, HeroDetailFragment.ButtonClickListener
```

```

@Override public void addheroClicked(View view){
    HeroDetailFragment fragment =
    (HeroDetailFragment)getFragmentManager().findFragmentById(R.id.fragment_container);
    fragment.addhero();
}

```

Now when you run it you should be able to add a superhero.

### Delete Heroes

When the user does a long-press on an item we want them to be able to delete it. We'll do this through a context menu so they can choose to delete the hero or not.

In HeroDetailFragment.java add the following

```

import android.view.ContextMenu;
import android.view.MenuItem;
import android.widget.AdapterView;

```

Create a context menu on the long press

```

@Override public void onCreateContextMenu(ContextMenu menu, View view,
ContextMenu.ContextMenuInfo menuInfo){
    super.onCreateContextMenu(menu, view, menuInfo);
    //cast ContextMenu.ContextMenuInfo to AdapterView.AdapterContextMenuInfo since we're using an adapter
    AdapterView.AdapterContextMenuInfo adapterContextMenuInfo =
    (AdapterView.AdapterContextMenuInfo) menuInfo;
    //get hero name that was pressed
    String heroname = adapter.getItem(adapterContextMenuInfo.position);
    //set the menu title
    menu.setHeaderTitle("Delete " + heroname);
    //add the choices to the menu
    menu.add(1, 1, 1, "Yes");
    menu.add(2, 2, 2, "No");
}

```

Then we have to handle the delete when they chose a menu item selection

```

@Override public boolean onContextItemSelected(MenuItem item){
    //get the id of the item
    int itemId = item.getItemId();
    if (itemId == 1) { //if yes menu item was pressed
        //get the position of the menu item
        AdapterView.AdapterContextMenuInfo info = (AdapterView.AdapterContextMenuInfo)
item.getMenuInfo();
        //remove the hero
        Hero.heroes[(int) universeId].getSuperheroes().remove(info.position);
        //refresh the list view
        HeroDetailFragment.this.adapter.notifyDataSetChanged();
    }
    return true;
}

```

Register the context menu in onStart()  
registerForContextMenu(listHeroes);

### Persistent Data

We're going to add data persistence using shared preferences  
Update Hero.java

```
import android.content.SharedPreferences;
import android.content.Context;
import android.content.SharedPreferences.Editor;
import java.util.HashSet;
import java.util.Set;
```

Change Hero[] to

```
public static final Hero[] heroes = {
    new Hero("DC", new ArrayList<String>()),
    new Hero("Marvel", new ArrayList<String>())
};
```

Add methods to write to, and read from, shared preferences.

```
public void storeHeroes(Context context, long universeId){
    //get access to a shared preferences file
    SharedPreferences sharedPrefs = context.getSharedPreferences("Superheroes",
Context.MODE_PRIVATE);
    //create an editor to write to the shared preferences file
    SharedPreferences.Editor editor = sharedPrefs.edit();
    //create a set
    Set<String> set = new HashSet<String>();
    //add heroes to the set
    set.addAll(heroes[(int) universeId].getSuperheroes());
    //pass the key/value pair to the shared preference file
    editor.putStringSet(heroes[(int) universeId].getUniverse(), set);
    //save changes
    editor.commit();
}

public void loadHeroes(Context context, int universeId){
    //get access to a shared preferences file
    SharedPreferences sharedPrefs = context.getSharedPreferences("Superheroes",
Context.MODE_PRIVATE);
    //create an editor to read from the shared preferences file
    SharedPreferences.Editor editor = sharedPrefs.edit();
    //create a set with the hero list
    Set<String> set = sharedPrefs.getStringSet(heroes[universeId].getUniverse(), null);
    //if there was a saved list add it to the heroes array
    if (set != null){
        Hero.heroes[universeId].superheroes.addAll(set);
    }
}
```

```

//if no hero list was saved, use the defaults
else {
    switch (universeId) {
        case 0:
            Hero.heroes[0].superheroes.addAll(Arrays.asList("Superman", "Batman", "Wonder Woman", "The Flash", "Green Arrow", "Catwoman"));
            break;
        case 1:
            Hero.heroes[1].superheroes.addAll(Arrays.asList("Iron Man", "Black Widow", "Captain America", "Jean Grey", "Thor", "Hulk"));
            break;
        default:
            break;
    }
}
}
}

```

Update HeroDetailFragment.java

Update onCreateView()

*//if the hero list is empty, load heroes*

```

if (Hero.heroes[0].getSuperheroes().size() == 0 ) {
    Hero.heroes[0].loadHeroes(getActivity(), 0);
}
if (Hero.heroes[1].getSuperheroes().size() == 0 ) {
    Hero.heroes[1].loadHeroes(getActivity(), 1);
}

```

We need to save our hero list whenever we add or delete a hero.

Update addhero() and onContextItemSelected() after you call notifyDataSetChanged()

Hero.**heroes**[(**int**) **universeId**].storeHeroes(getActivity(), **universeId**);

### Phone and tablet layouts

One of the reasons we're using fragments is so our app can look different on a tablet than on a phone. On a table we want to see both fragments, as we are now. On a phone since the screen is smaller we want to only see one at a time. Just like with other resources you can create multiple layout folders with names to target specific specifications.

Switch to the Project view hierarchy and go to app/src/main/res and create a new resource directory.

Directory name: layout-sw400dp

Resource type: layout

Source set: main

This will target devices with the smallest available width of 400dp.

You can also use layout-w500dp(available width) or layout-land for landscape phone and tablet but not portrait phone or tablet.

(starting with Android 3.2, API 13, layout folders no longer use screen size values like –large)

[http://developer.android.com/guide/practices/screens\\_support.html#DeclaringTabletLayouts](http://developer.android.com/guide/practices/screens_support.html#DeclaringTabletLayouts)

[http://labs.rampinteractive.co.uk/android\\_dp\\_px\\_calculator/](http://labs.rampinteractive.co.uk/android_dp_px_calculator/)

Select your activity\_main.xml file in your layout folder and copy/paste it into your new layout-sw400dp folder. This layout with side by side fragments will be used for devices with the smallest available width of 400dp.

Now let's update activity\_main.xml in the layout folder to change the layout for smaller devices. Make sure you open activity\_main.xml in the original layout folder.

Remove the FrameLayout so all you have is the one fragment for the universe list fragment.

Now we need to create a new Activity called DetailActivity that will use HeroDetailFragment. So instead of using both fragments in MainActivity, MainActivity will use UniverseListFragment and DetailActivity will use HeroDetailFragment when the user clicks on a universe.

Use the wizard to create a new empty activity called DetailActivity with a layout file named activity\_detail. Make sure activity\_detail.xml is in your layout folder so any device can use it.

Update activity\_detail.xml

```
<?xml version="1.0" encoding="utf-8"?>
<fragment xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/fragment_container"
    class="com.example.aileen.superheroes.HeroDetailFragment"
    android:layout_width="match_parent"
    android:layout_height="match_parent" />
```

If the app is running on a phone MainActivity will need to start DetailActivity with an intent and pass the universe id to the HeroDetailFragment using its setUniverse() method.

Update DetailActivity.java

```
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_detail);

    //get reference to the hero detail fragment
    HeroDetailFragment heroDetailFragment = (HeroDetailFragment)
    getSupportFragmentManager().findFragmentById(R.id.fragment_container);
    //get the id passed in the intent
    int universeId = (int) getIntent().getExtras().get("id");
    //pass the universe id to the fragment
    heroDetailFragment.setUniverse(universeId);
}
```

Since DetailActivity.java will be running the HeroDetailFragment we need DetailActivity to implement the ButtonClickListener as well.

**public class** DetailActivity **extends** AppCompatActivity **implements** HeroDetailFragment.ButtonClickListener

```
@Override public void addheroclicked(View view){
    HeroDetailFragment fragment =
    (HeroDetailFragment)getSupportFragmentManager().findFragmentById(R.id.fragment_container);
    fragment.addhero();
}
```

DetailActivity will get the id from the intent that starts it. We need MainActivity to start DetailActivity only when the app is running on a phone. So we want MainActivity to perform different actions if the device is using activity\_main.xml in the layout or layout-sw400dp folder.

If the app is running on a phone it will be running activity\_main.xml in the layout folder which doesn't include the HeroDetailFragment so we'd want MainActivity to start DetailActivity.

If the app is running on a tablet it will be running activity\_main.xml in the layout-sw400dp folder which includes a frame layout with the id fragment\_container so we'd need to display a new instance of HeroDetailFragment in the fragment container(as we have been doing).

Update MainActivity.java

```
import android.view.View;
```

```
import android.content.Intent;
```

Update itemClicked()

```
//get a reference to the frame layout that contains HeroDetailFragment
```

```
View fragmentContainer = findViewById(R.id.fragment_container);
```

```
//large layout device
```

```
if (fragmentContainer != null) {
```

```
    ** put the rest of the existing code in the body of the if statement
```

```
} else { //app is running on a device with a smaller screen
```

```
    Intent intent = new Intent(this, DetailActivity.class);
```

```
    intent.putExtra("id", (int) id);
```

```
    startActivity(intent);
```

```
}
```

Define an AVD that is a tablet so you can test it on a phone and tablet. Chose category Tablet and pick one(I picked Nexus 7 API 23).

You should see both fragments side by side on the tablet and only 1 fragment at a time on a phone.

Make sure you've tested rotation as well and if you've clicked on an item other than the first when you rotate it stays on that data.

Don't forget launcher icons.