GPS Drawing 1:

Android

Mobile and Ubiquitous Games

ICS 163

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GPS Drawing

- Issue #1
  - You must install the Play SDK to get access to location
  - The details are in Lecture 08's notes
  - You must import that project as code
  - Then you must add the project as an *Android* library which is different than the normal Java library in the build path

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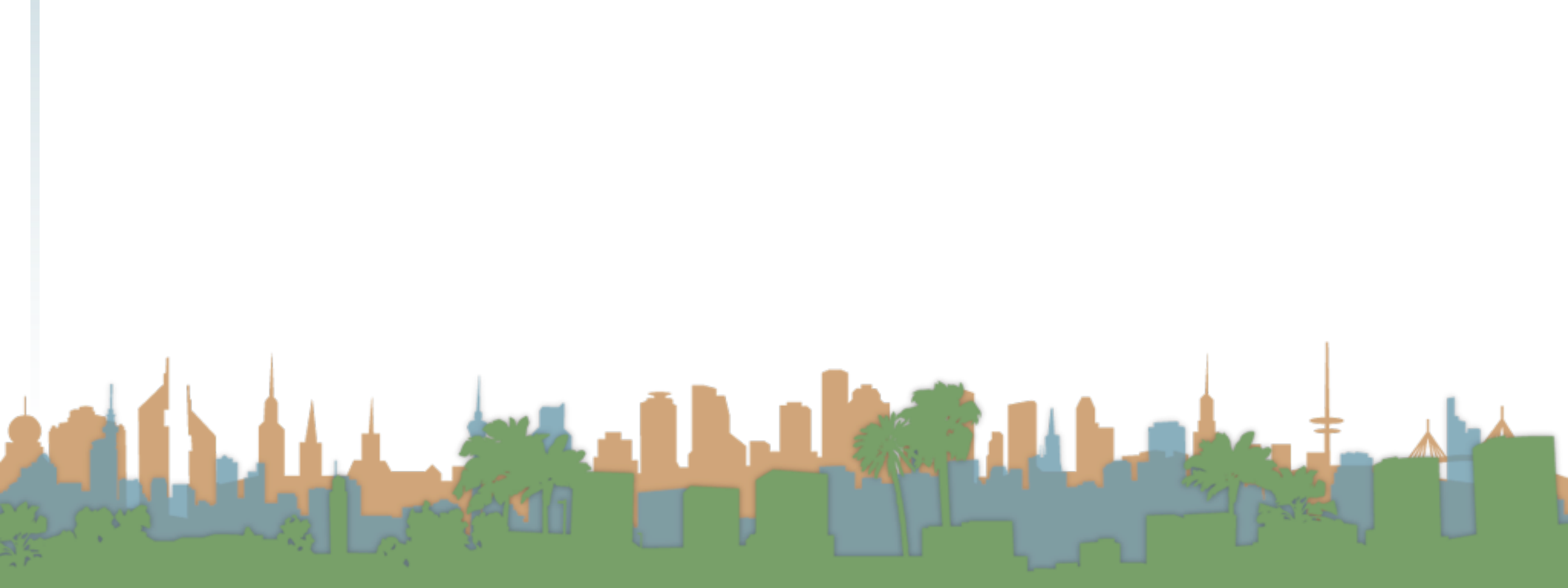
- Issue #2
  - For the Google Play SDK to work there must be a Google account associated with the phone



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- Those are both reasonable designs, but more than we are shooting for for this assignment.

- Remember, you aren't turning in your client.

- The visualization will be graded and evaluated on the server side.

- You can will be able to see your drawing in near real-time on the server

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- Should it be like this?

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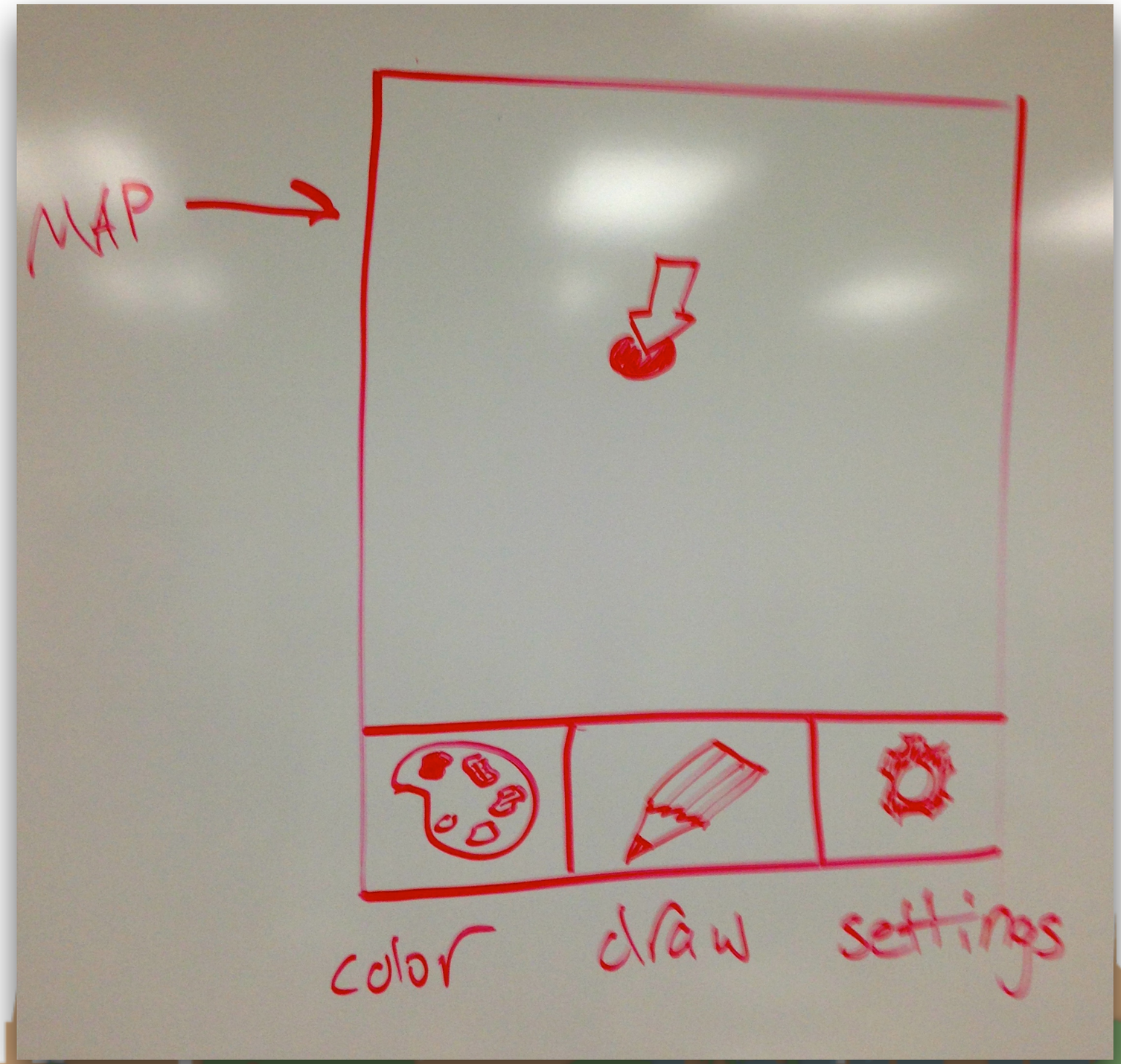
- Should it be like this?



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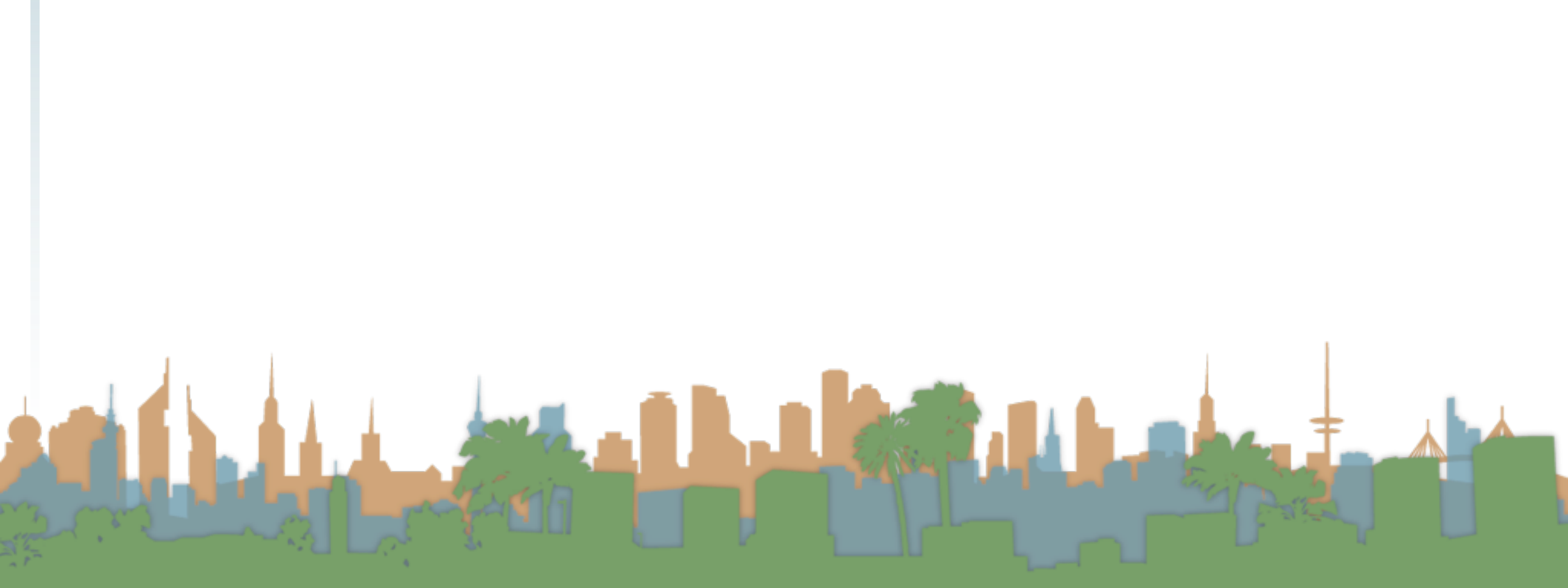
- Issue #3
  - Read the assignment it will answer many questions for you.
  - Consider what the UI should be like after reading the assignment



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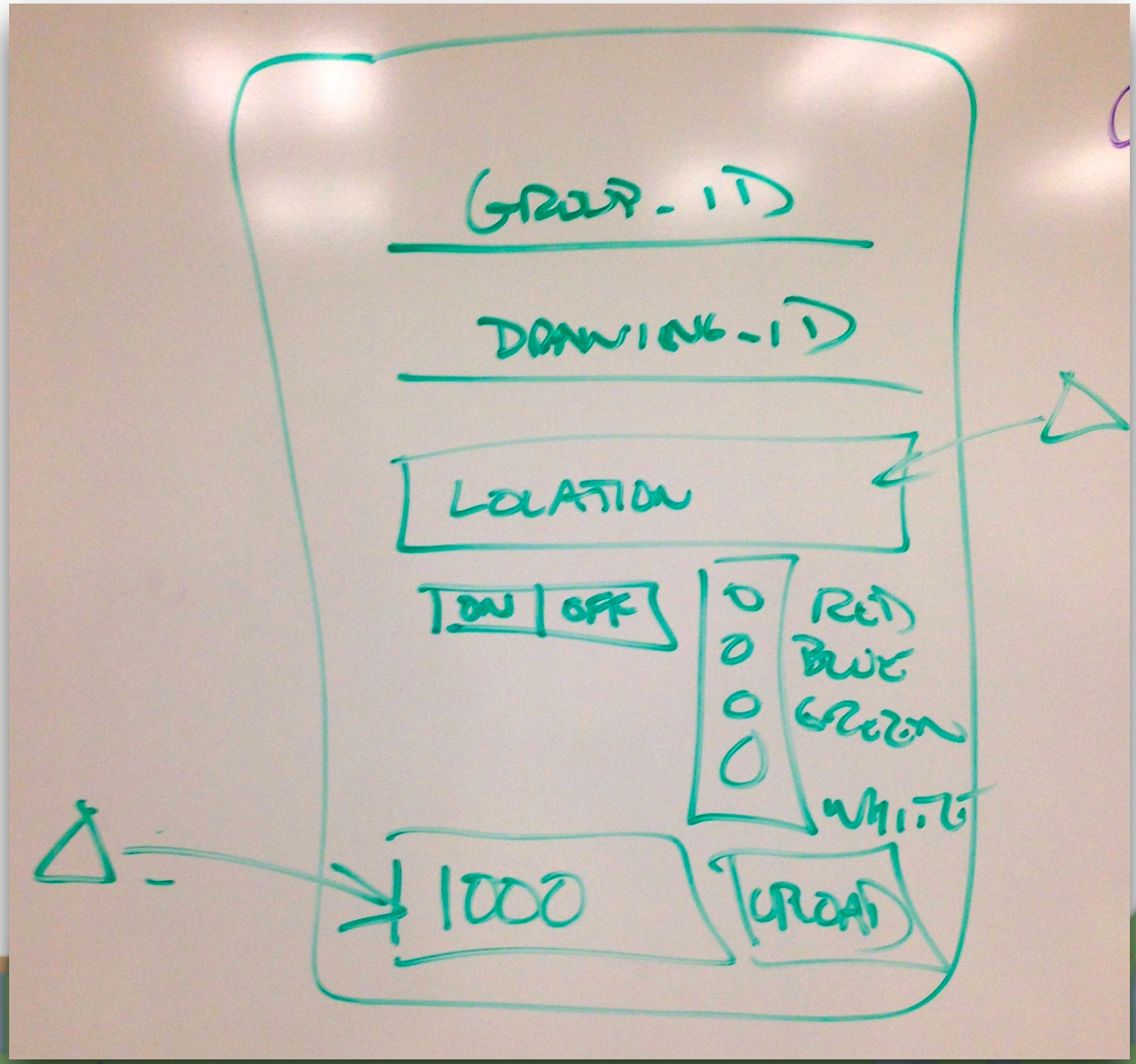
- So something more like this is in order:
  - One view, Android native widgets, basic callbacks



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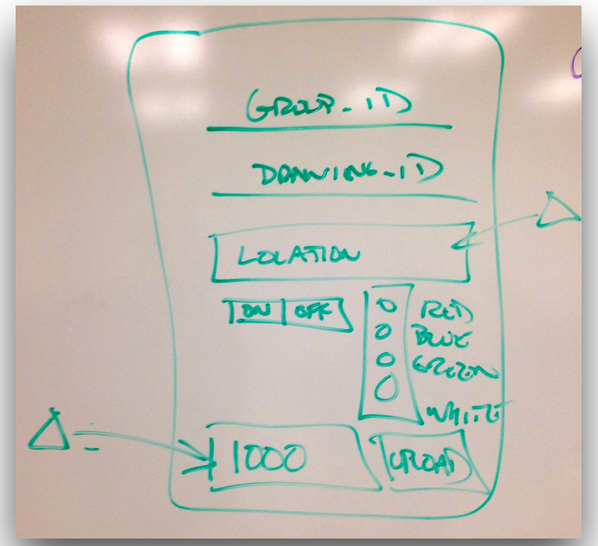
- So something more like this is in order:
  - One view, Android native widgets, basic callbacks
- A place to type in group id
- A place to type in drawing id
- A location feedback area
- A place to toggle the pen
- A place to select color
- A feedback area showing the buffer fullness
- A button to upload the data



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- Threading
  - Android is a multi-threaded platform
  - There is only one thread that is allowed to update the U/I
    - You have to make sure that your code is being run by the U/I thread to change the U/I, or Exception
  - You have to make sure that long-running processes don't take the U/I thread's time, or Android will shut. you. down.

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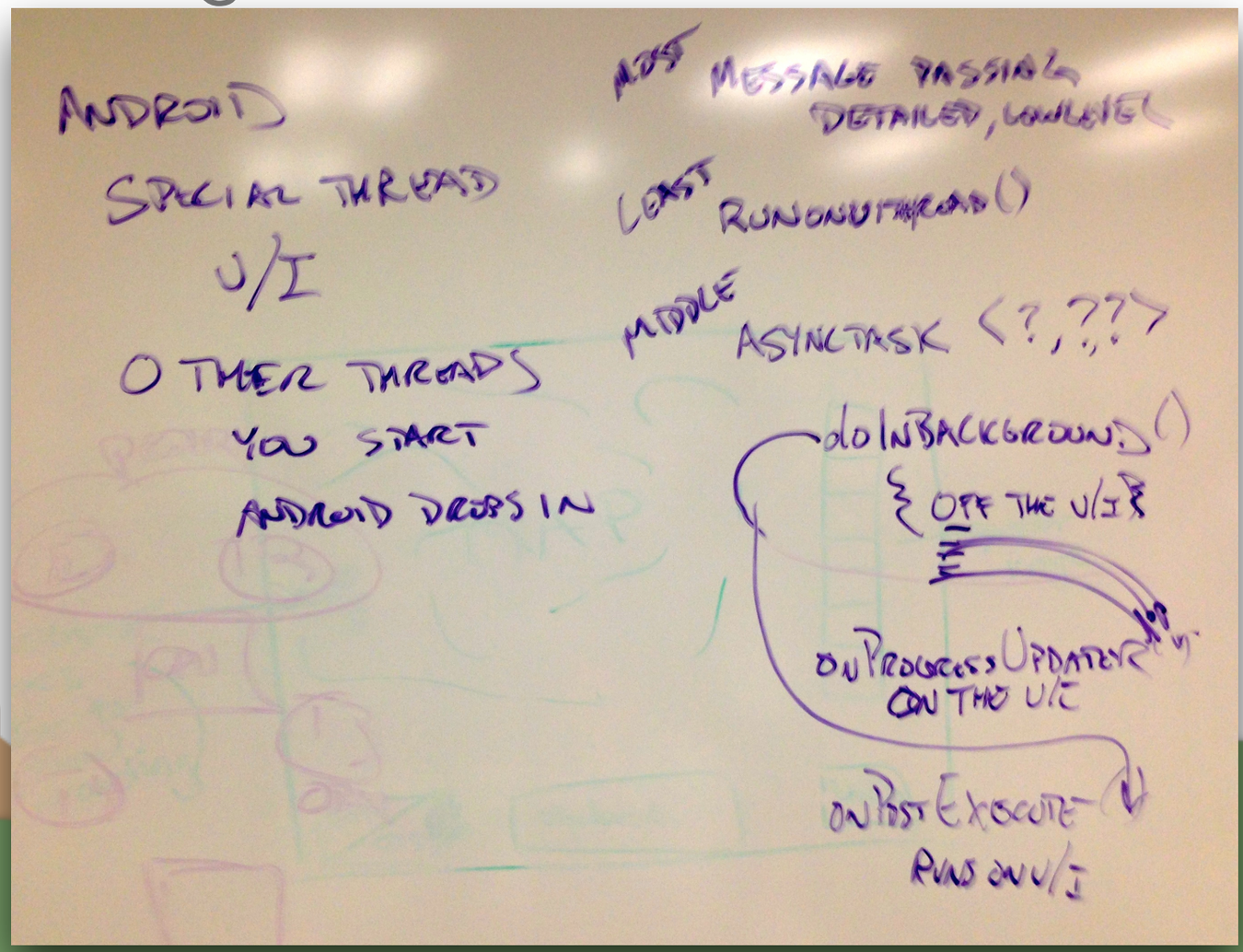
- Threading
  - Three ways to manage threading:
    - runOnUIThread() construct
    - AsyncTask construct
    - low-level message passing
    - (more to come)



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- AsyncTask construct
  - For running a task that takes a long time and still being able to update the UI thread
  - Android runs each section on the right thread
  - 4 hooks, each optional
    - onPreExecute(), runs on the UI thread
    - doInBackground(), runs on a non-UI thread
    - onProgressUpdate(), runs on UI thread
    - on PostExecute(), runs on UI thread
  - Example and usage: click below

http://developer.android.com/reference/android/os/AsyncTask.html

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- Actually Making the U/I
  - The U/I is defined in XML
  - Can be manipulated graphically
  - Supports internationalization out of the box
  - Supports multi-resolution displays out of the box
  - Supports multi-sized displays out of the box
  - Is complex as a result

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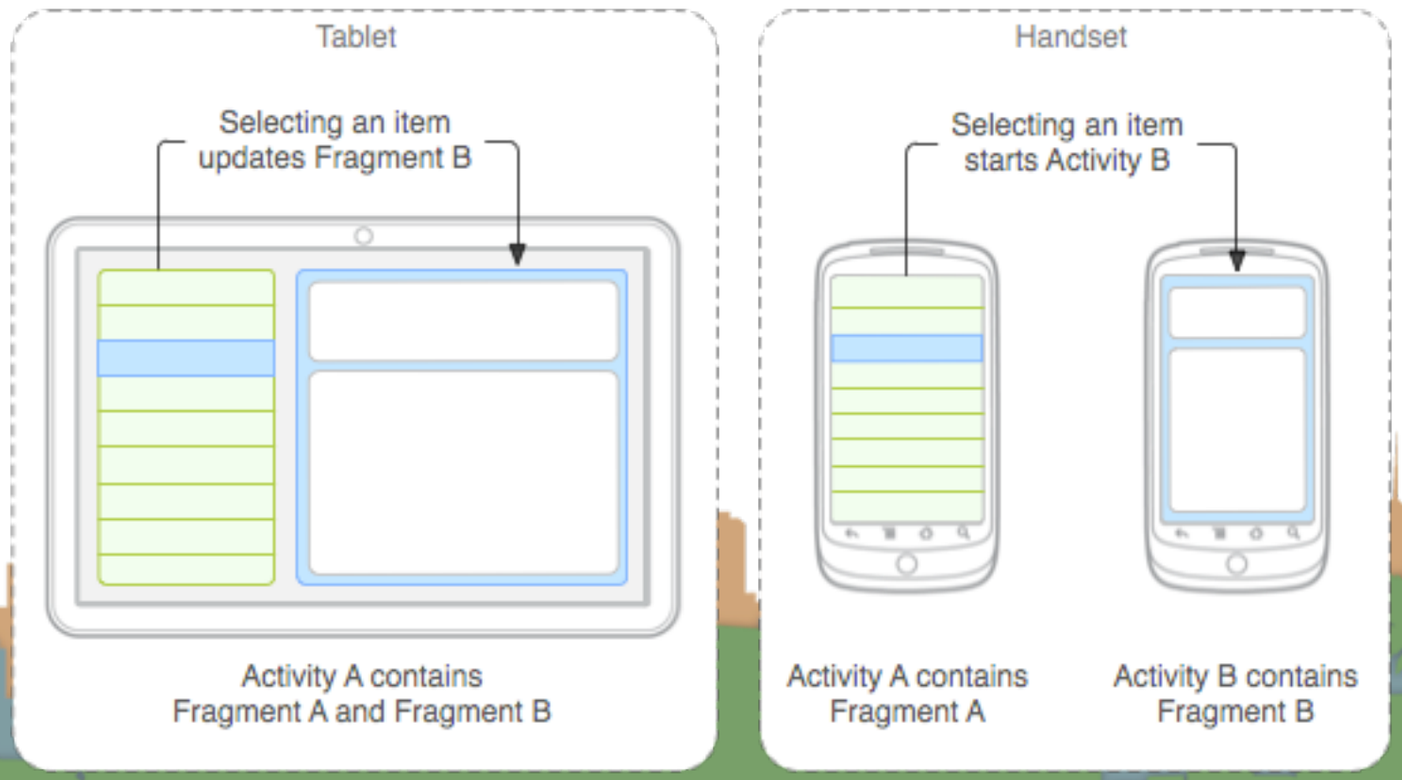
- Fragments
  - Enable one code base to work on many different sized devices
  - Each fragment is like a small app with it's own lifecycle
  - Big displays will run multiple fragments at once
  - Small displays will run fewer at once



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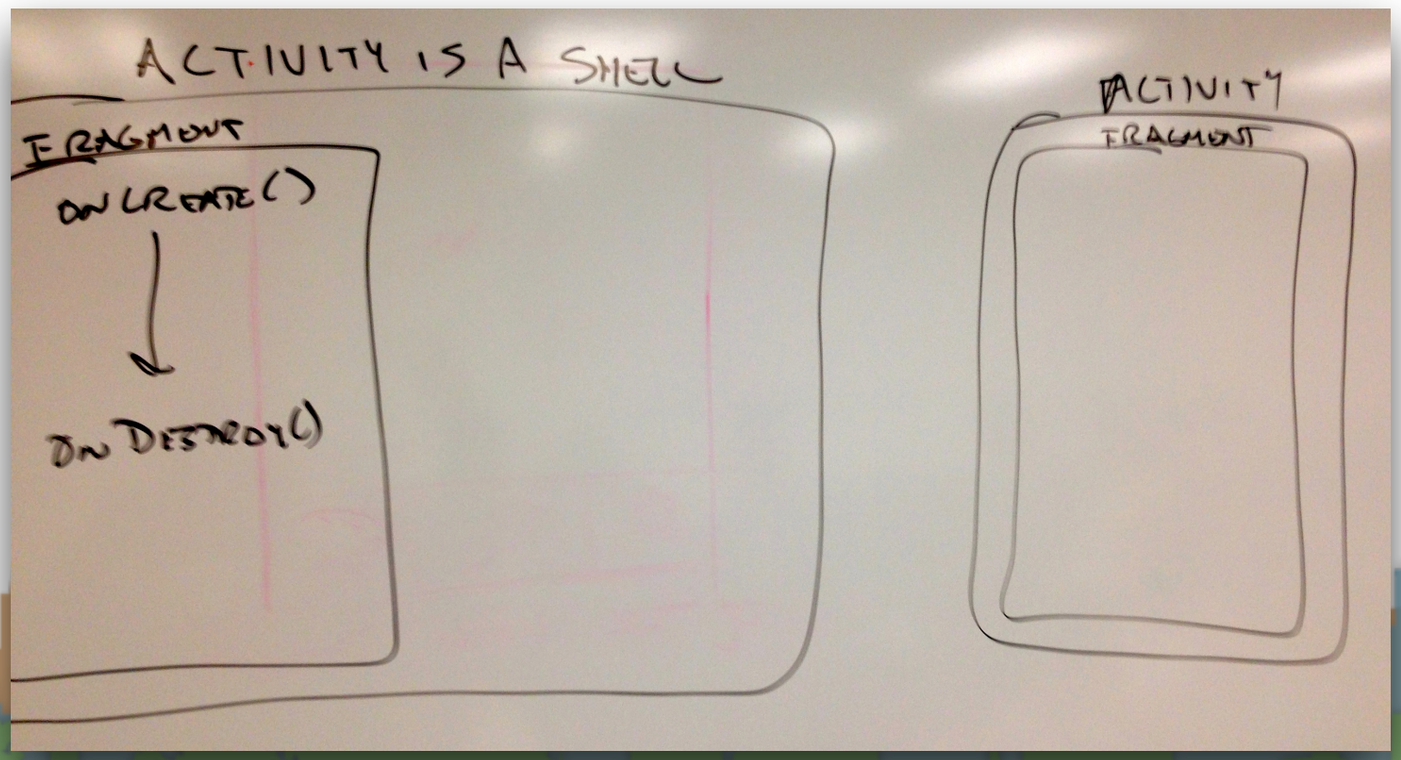
- Fragments
  - They are complicated
  - For our project we are just going to have Activity as a shell for one Fragment
  - We are going to turn off device rotation
  - We will treat the Fragment as a single U/I



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- Buttons
  - How do we get control when someone clicks a button?
  - Statically via the XML U/I description
  - Dynamically via code
  - Here is a project you can download with examples:
  - http://www.ics.uci.edu/~djp3/classes/2014_03_ICS163/Lectures/Lecture_09_01.zip

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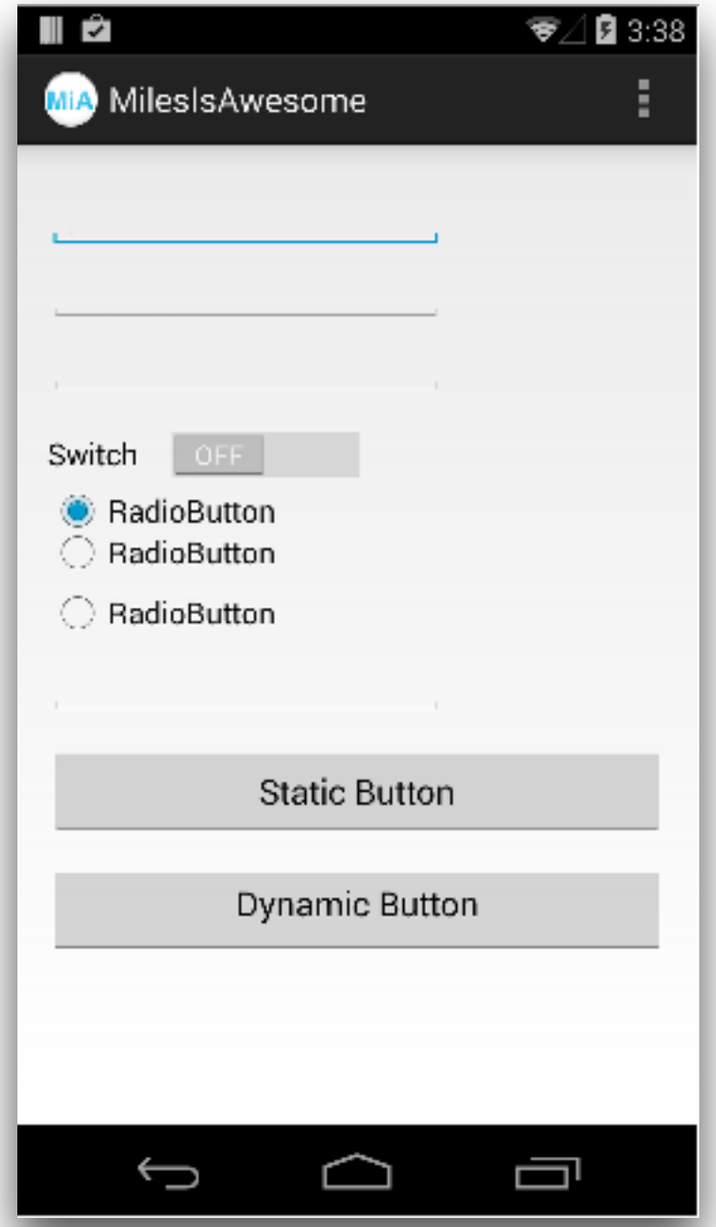
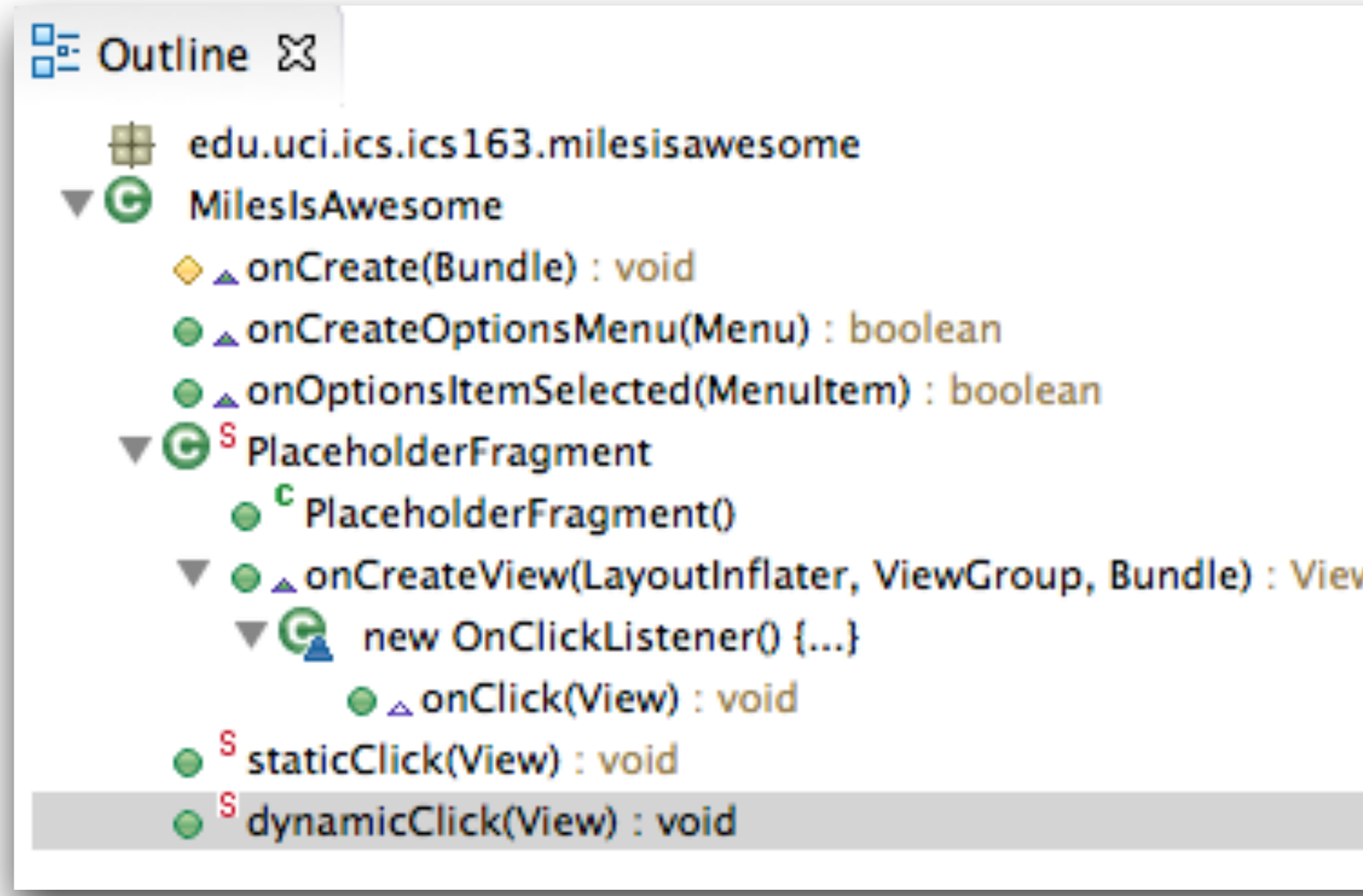

3:38
MilesIsAwesome
Switch
OFF
RadioButton
RadioButton
RadioButton
Static Button
Dynamic Button


Outline
edu.uci.ics.ics163.milesisawesome
MilesIsAwesome
onCreate(Bundle) : void
onCreateOptionsMenu(Menu) : boolean
onOptionsItemSelected(MenuItem) : boolean
PlaceholderFragment
PlaceholderFragment()
onCreateView(LayoutInflater, ViewGroup, Bundle) : View
new OnClickListener() {...}
onClick(View) : void
staticClick(View) : void
dynamicClick(View) : void

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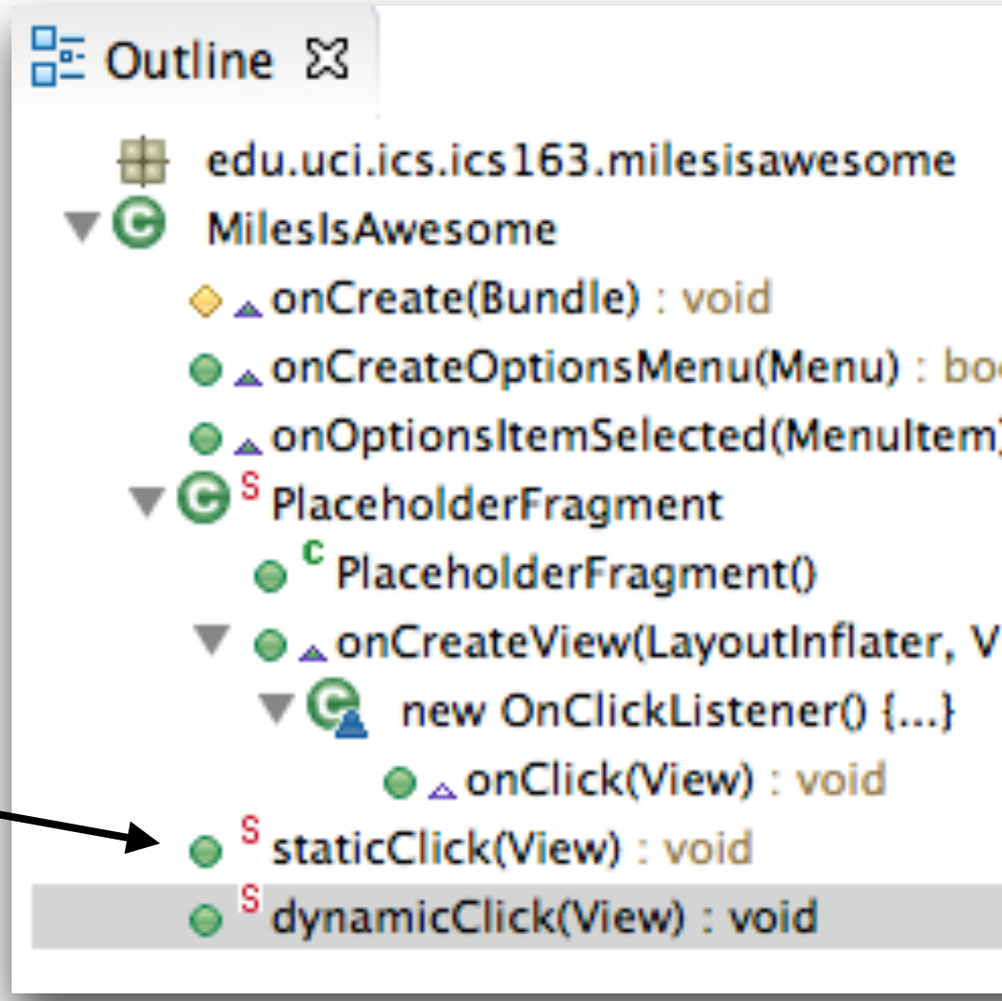
- The static button is assigned a callback function in the XML U/I

```
<Button
    android:id="@+id/button1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentLeft="true"
    android:layout_alignParentRight="true"
    android:layout_below="@+id/editText4"
    android:layout_marginTop="15dp"
    android:onClick="staticClick"
    android:text="@string/static_button" />
```



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- The dynamic button is assigned a callback function in the code.
- First the container is created in onCreate

```
setContentView(R.layout.activity_miles_is_awesome);
```

- Then the fragment is built and put in the container

```
if (savedInstanceState == null) {
    getFragmentManager().beginTransaction()
            .add(R.id.container, new PlaceholderFragment()).commit();
}
```

- Then the fragment is built in onCreateView, the button is located dynamically, and an anonymous function is assigned to the button that is used as the callback function

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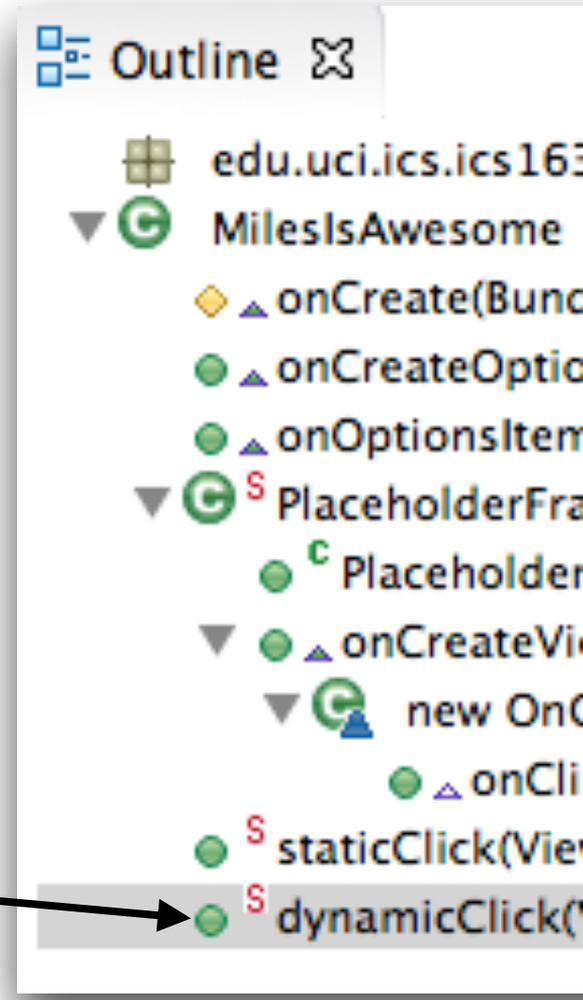
```java
/**
 * A placeholder fragment containing a simple view.
 */
public static class PlaceholderFragment extends Fragment {

    public PlaceholderFragment() {
    }

    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
            Bundle savedInstanceState) {
        View rootView = inflater.inflate(
                R.layout.fragment_miles_is_awesome, container, false);

        Button updateButton = (Button) rootView.findViewById(R.id.button2);
        updateButton.setOnClickListener(new View.OnClickListener() {
            public void onClick(View v) {
                dynamicClick(v);
            }
        });
        return rootView;
    }
}
```



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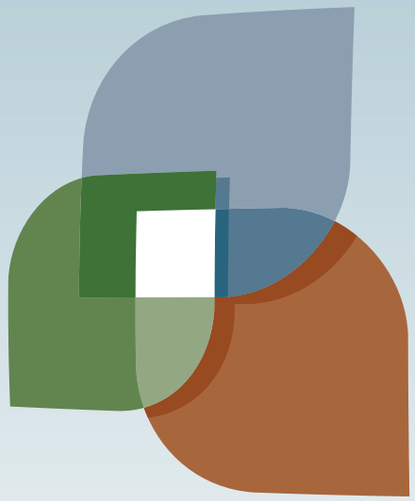
- So, that should be enough to make a U/I
  - With buttons
  - That respond to being clicked
- Next
  - Location
  - Updating U/I
- Uploading Data



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