User Interaction: Intro to Android

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INF 133 Fall 2014

Checking out the phone

- Unpack the phone
  - Don’t lose any parts
- Take a look at the phone

Making the phone work

- Charge the phone to 100%
  - USB to computer
  - USB to wall plug
- Wipe the phone
  - “menu” -> “settings” -> “privacy” -> “factory data reset”
    - erase the SD card too
- If necessary, go through on-phone tutorial
  - Sync to a Google account so updates start to flow
  - Set Date and Time

http://www.google.com/support/android/bin/topic.py?hl=en&topic=28930

Making the phone work

- Turn on developer mode
  - "home"->"menu"->"settings"->"applications" -> "Development"
    - "USB debugging" on
    - "Stay awake" on
    - "Allow mock locations" on
- Dial *#*#CHECKIN#*#*
  - to update phone software

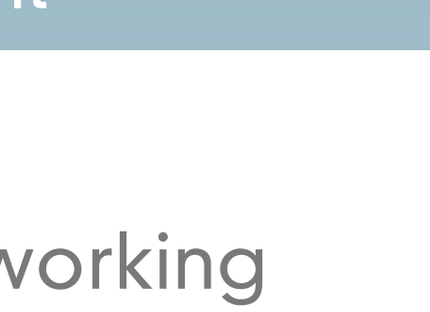
http://www.google.com/support/android/bin/topic.py?hl=en&topic=28930

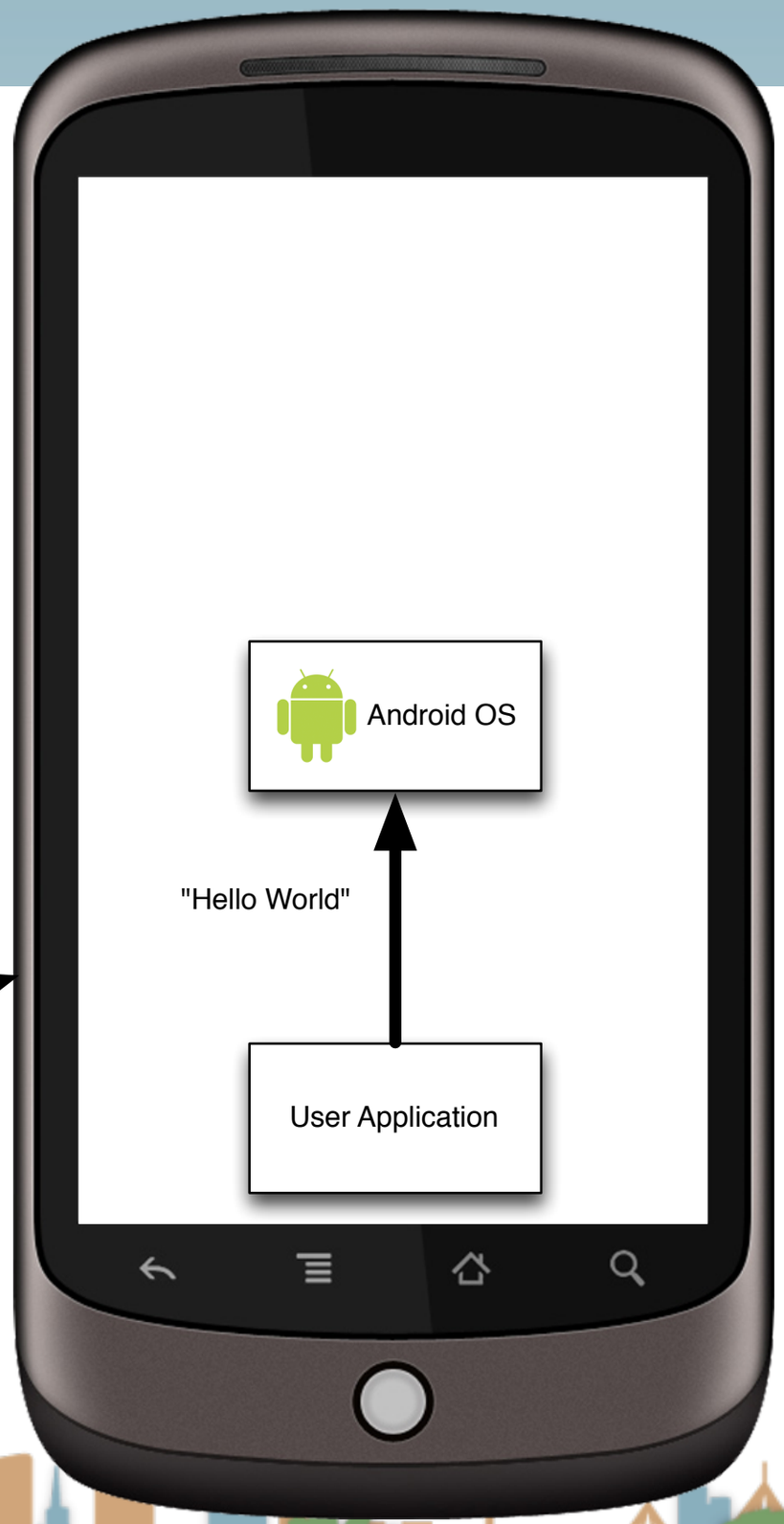
How to handle the assignment

- Stage 1
  - get your environment working with an emulator

How to handle the assignment

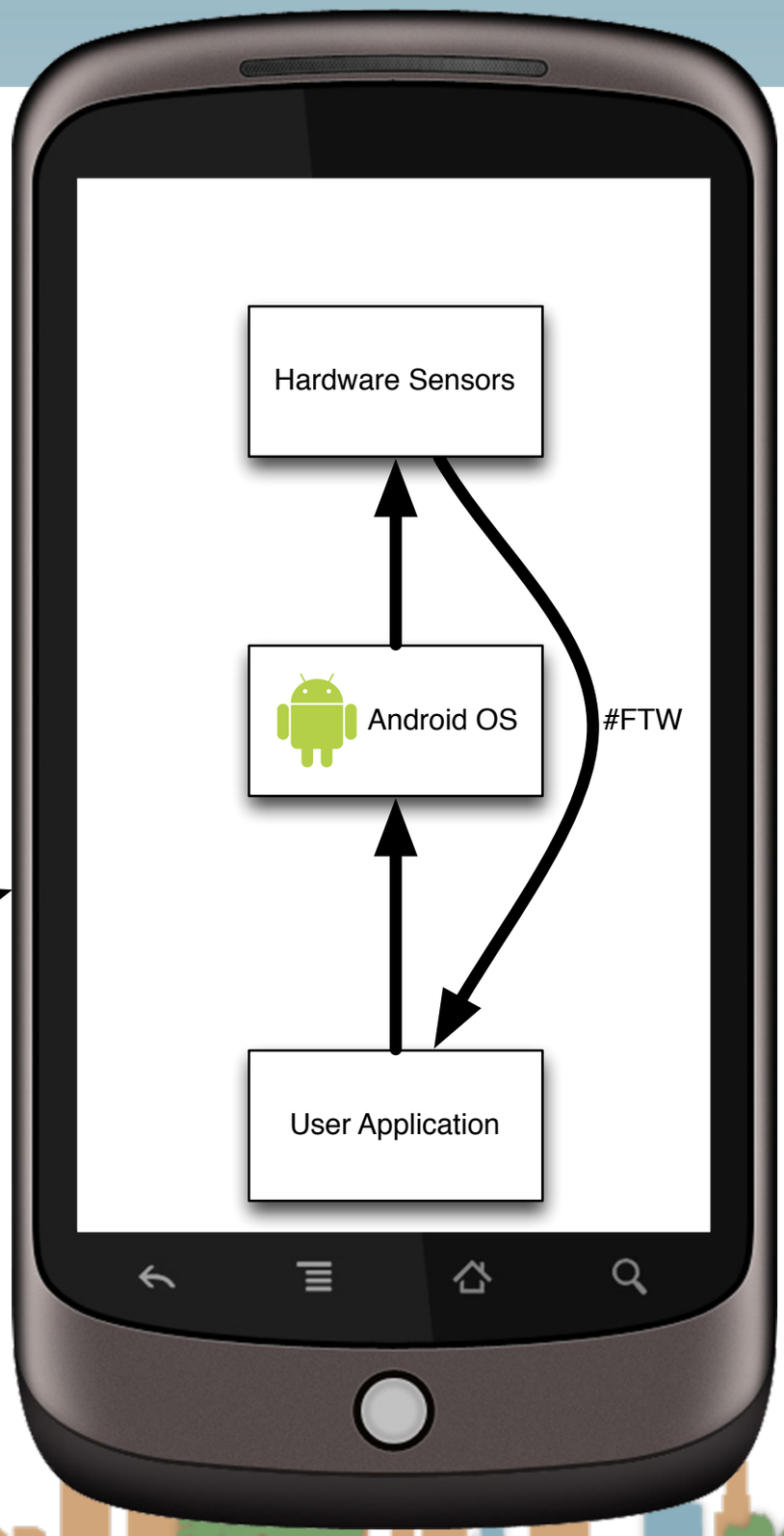
- Stage 2
  - get your environment working with a real phone





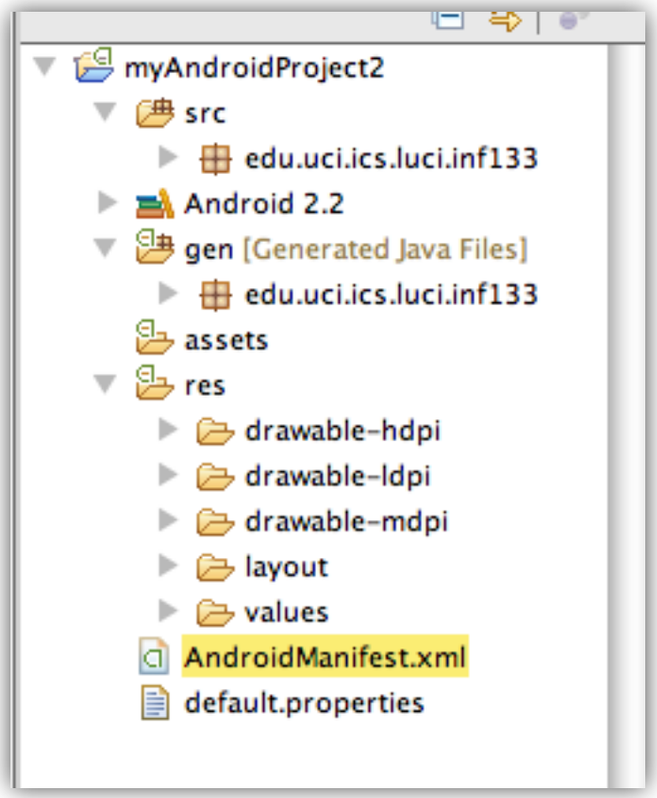
How to handle the assignment

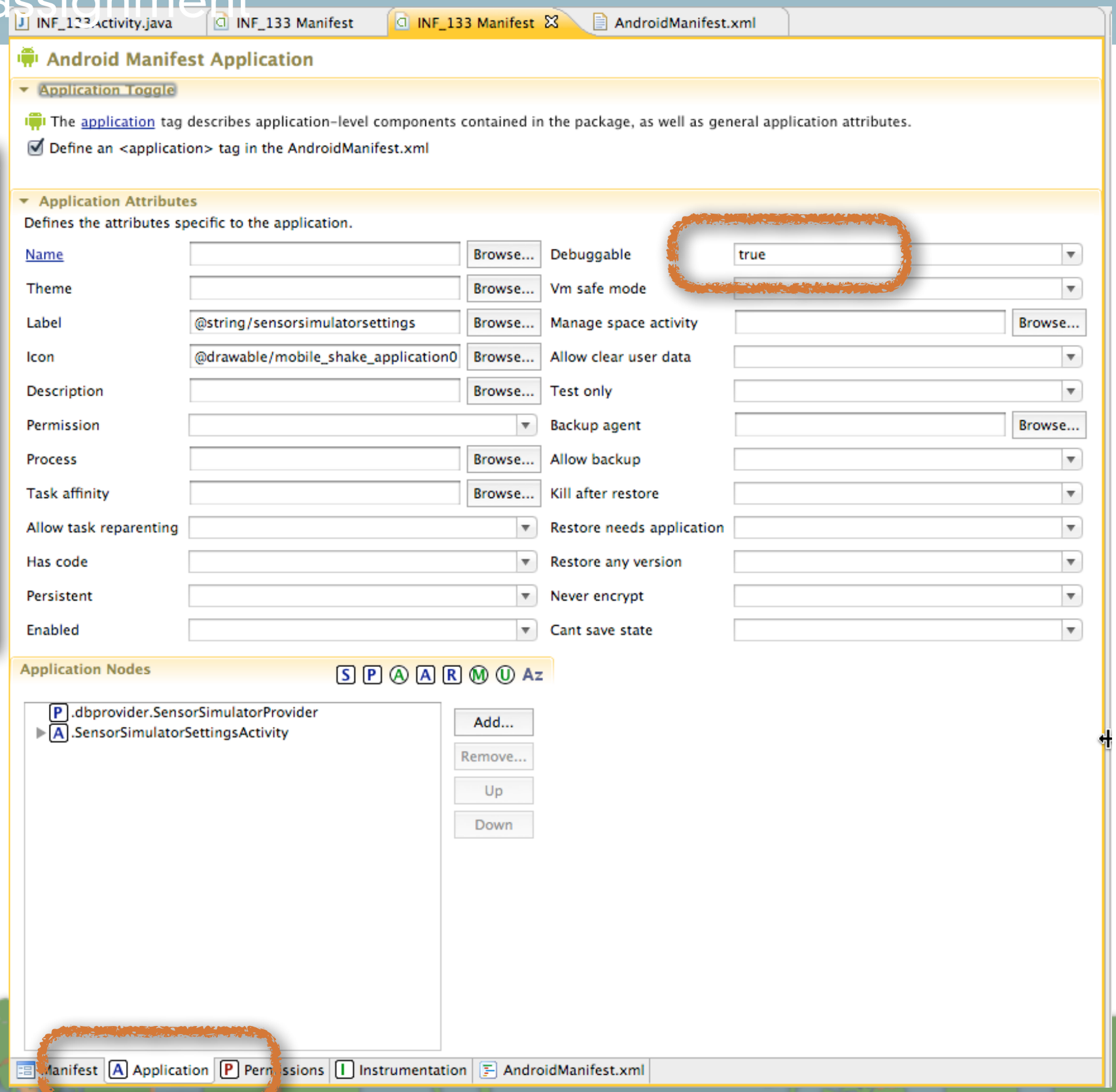
- Stage 3
  - get your environment working on a real phone with sensors



Real Phone

How to handle the assignment





How to handle the assignment

- High-Level
  - You are going to ask Android to give you information about the phone's orientation
  - You are going to do something in response to the information (with U/I and audio)

http://developer.android.com/guide/developing/device.html

How to handle the assignment

- The Main Problem
  - Information from the phone's sensors are going to arrive much much faster than the phone can redraw the U/I
  - If you don't manage this, your application will crash while it backs up waiting for you U/I to draw

http://developer.android.com/guide/developing/device.html

How to handle the assignment

- Step 1: Create a place in the U/I to show the sensor data
  - The U/I object is a static class named “R”
- Step 2: Access the Android Sensor Service
- Step 3: Create a SensorEventListener that will handle the asynchronous callbacks
- Step 4: Tell the phone you are ready to get sensor readings
- Step 5: Tell the phone you don’t want sensor readings any more

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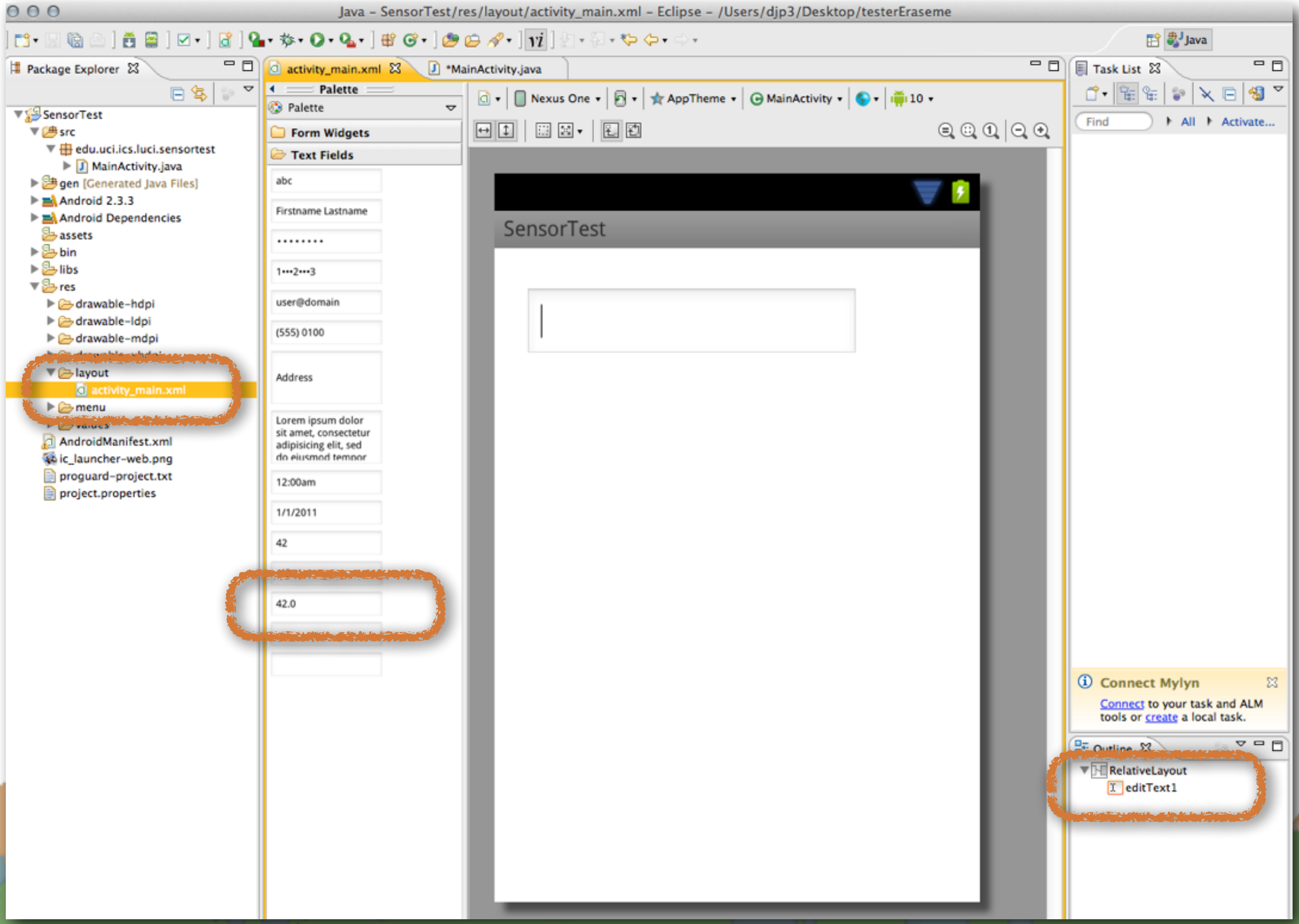
How to handle the assignment

- Step 1: Create a place in the U/I to show the sensor data



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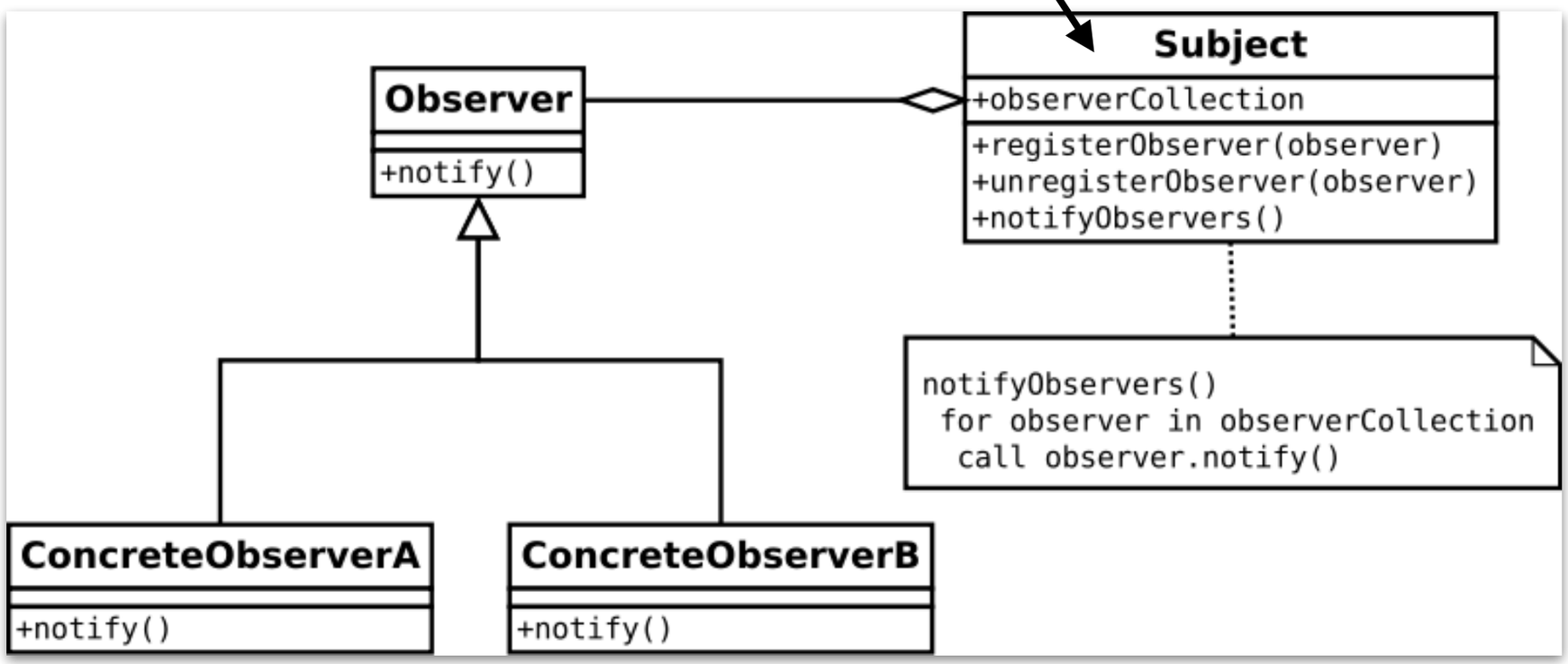
How to handle the assignment

```
mSensorManager = (SensorManager) getSystemService(SENSOR_SERVICE);
```



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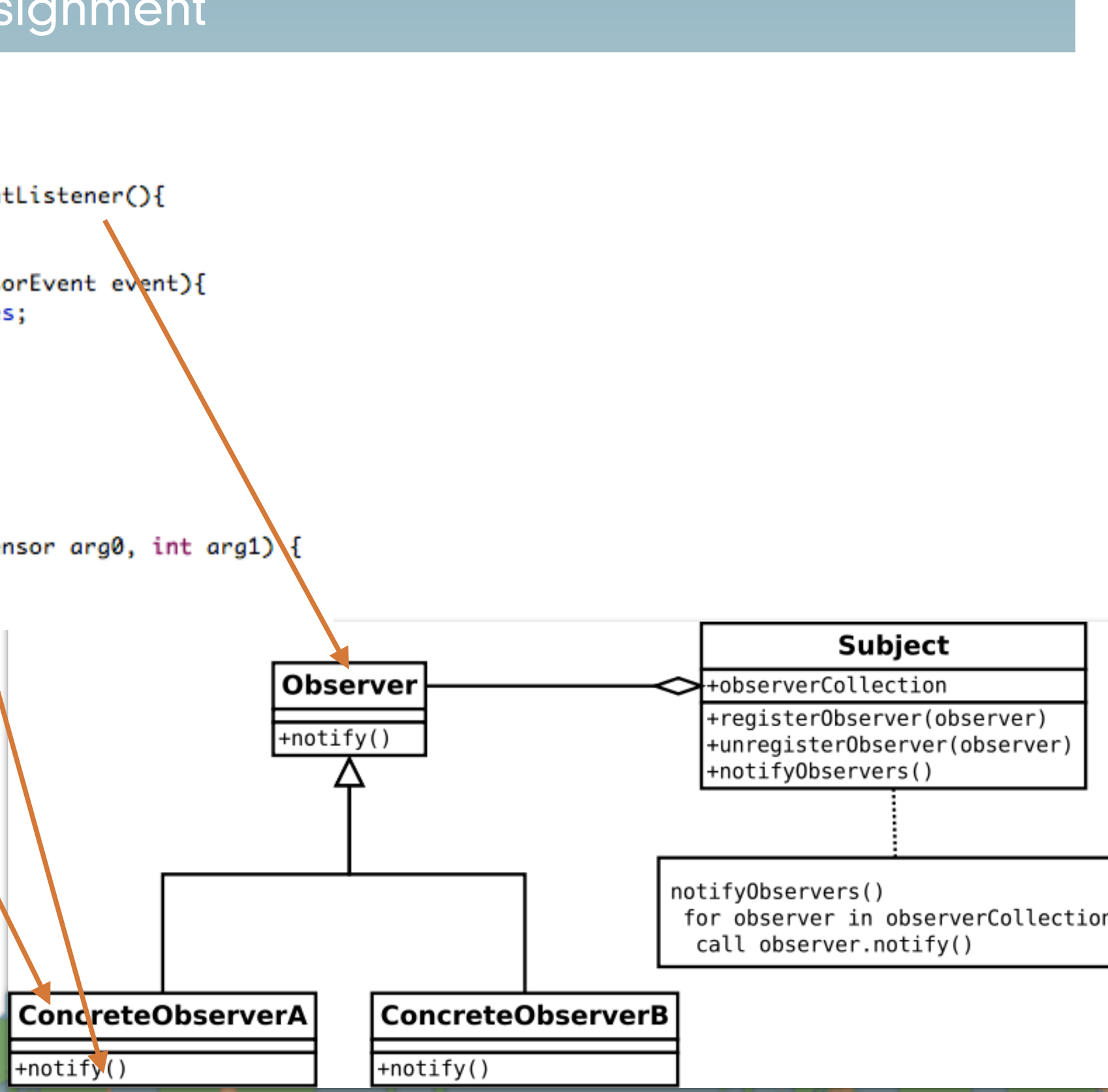
How to handle the assignment

```
mEventListenerLight = new SensorEventListener(){

    @Override
    public void onSensorChanged(SensorEvent event){
        float[] values = event.values;
        lastLightValue = values[0];
        updateUI();
    }



    @Override
    public void onAccuracyChanged(Sensor arg0, int arg1) {
    }
};
```



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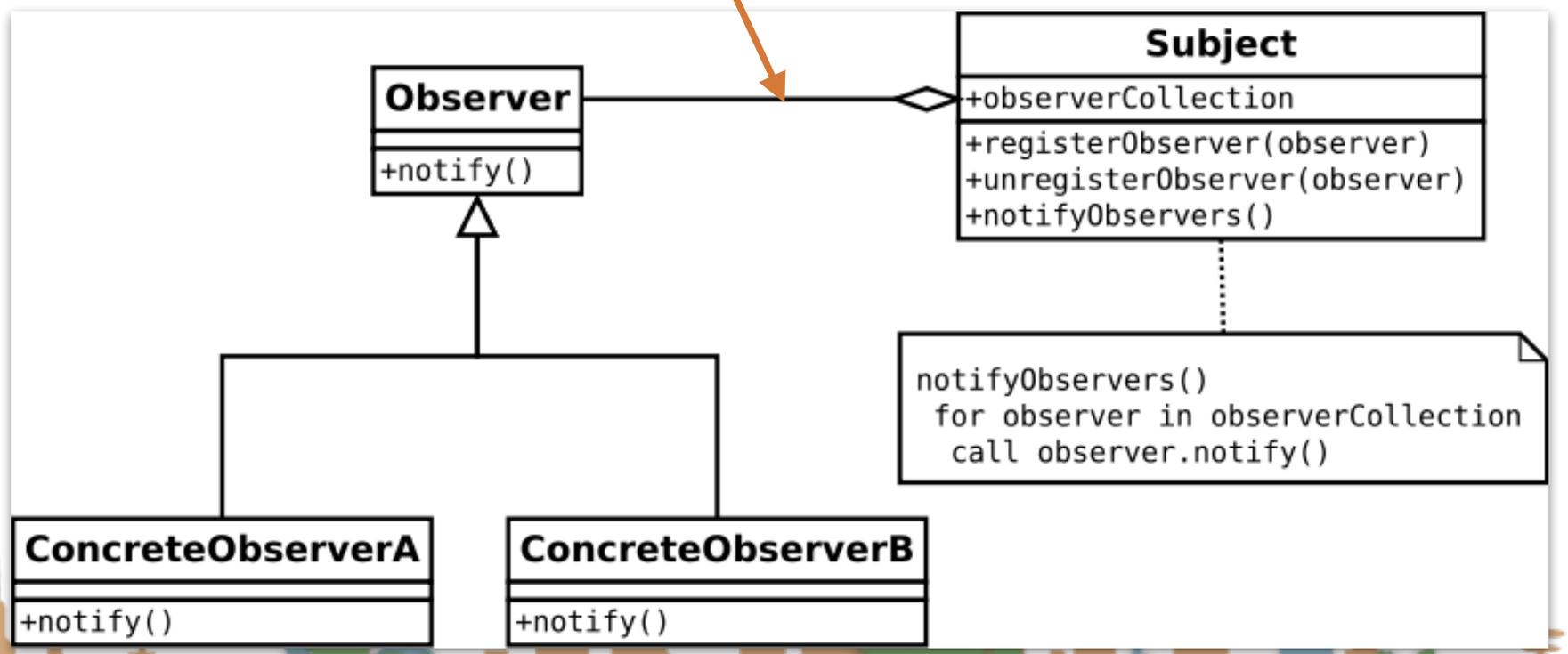
How to handle the assignment

```
mSensorManager.registerListener(mEventListenerLight,
        mSensorManager.getDefaultSensor(Sensor.TYPE_LIGHT),
        SensorManager.SENSOR_DELAY_FASTEST);
```



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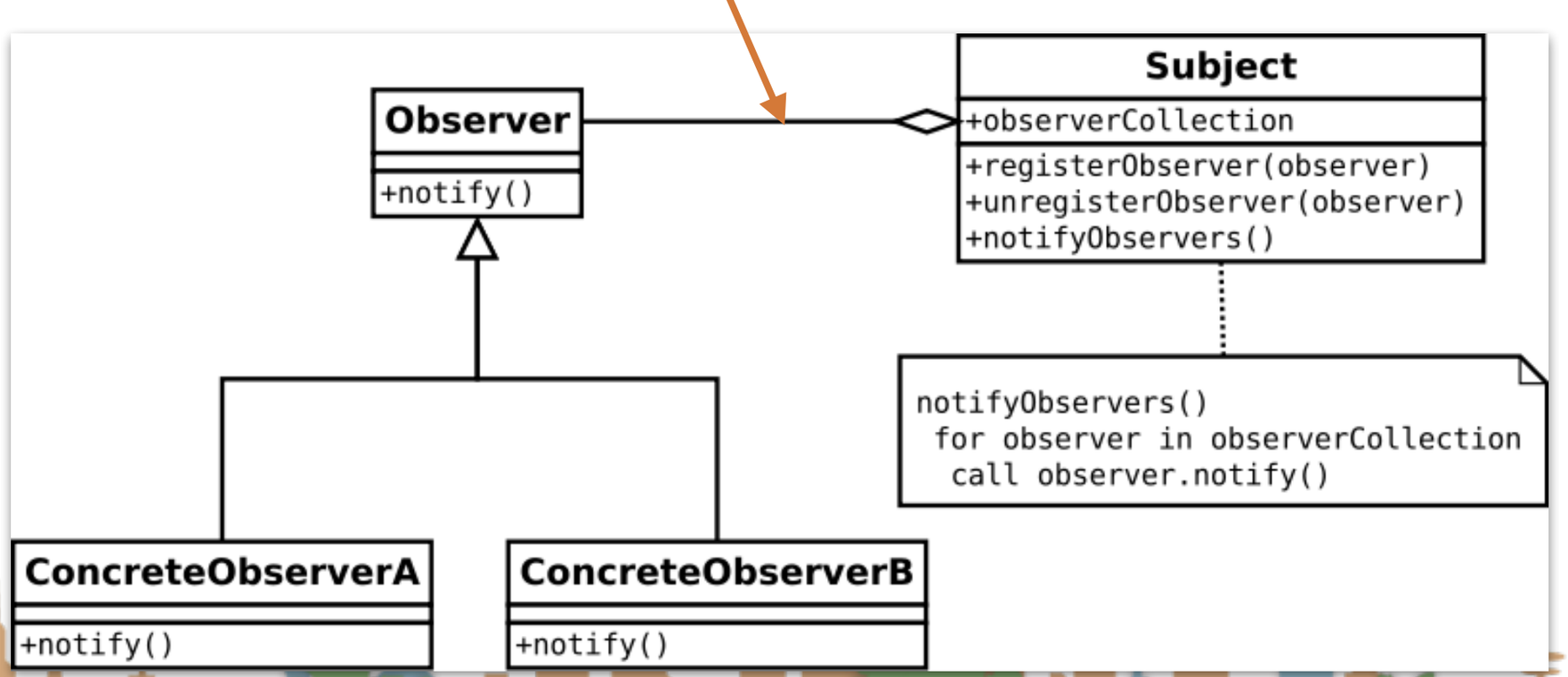
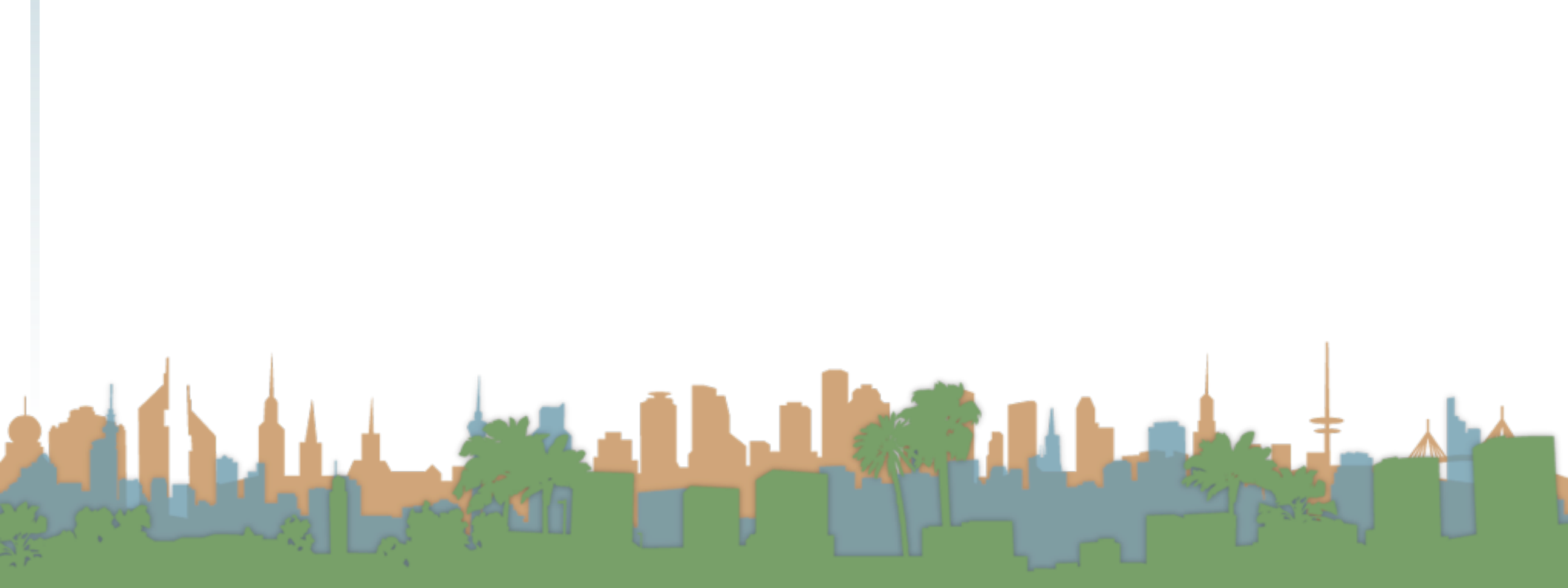
```
mSensorManager.unregisterListener(mEventListenerLight);
```

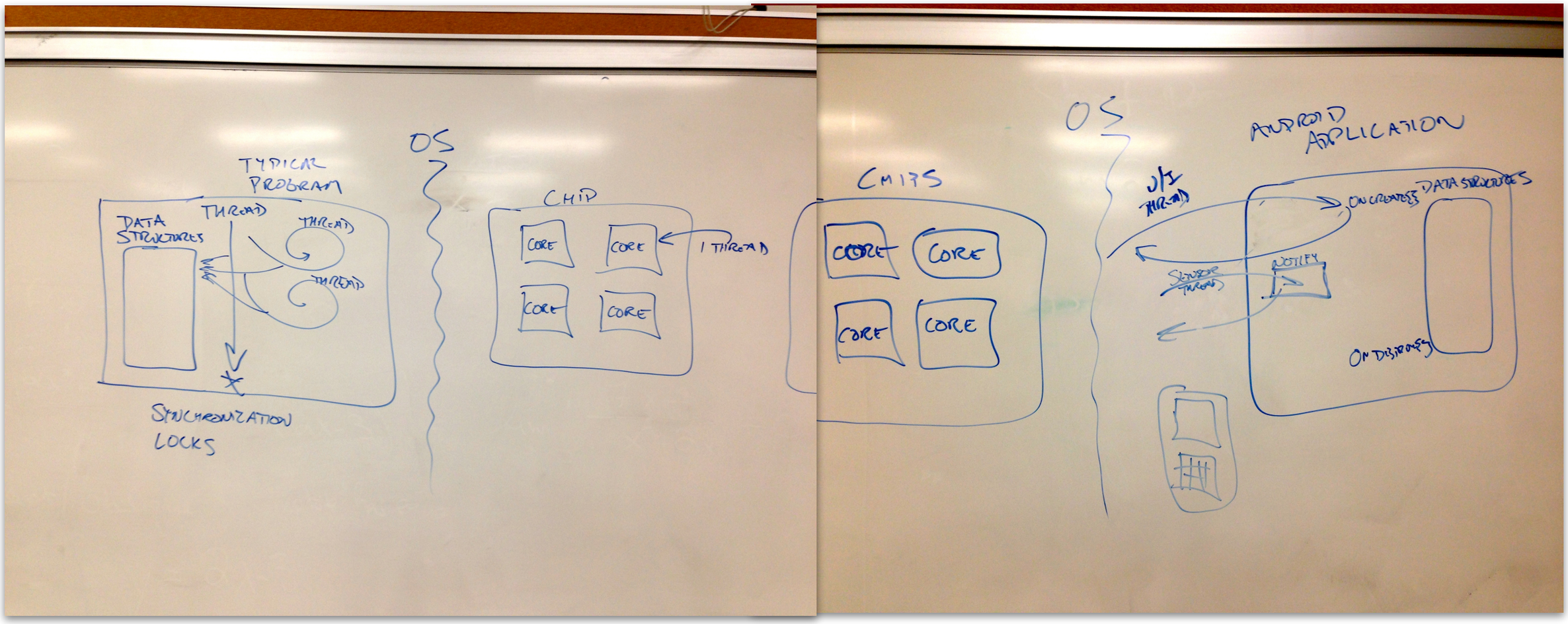


What it looks like when it's working

- Demo



the UI thread



Hints

```
public class MainActivity extends Activity {

    private TextView mTextViewLight;
    private SensorManager mSensorManager;
    private SensorEventListener mEventListenerLight;
    protected float lastLightValue;

    private void updateUI() {
        runOnUiThread(new Runnable(){
            @Override
            public void run() {
                mTextViewLight.setText("Light is "+lastLightValue);

            }});

    }
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);
        mTextViewLight = (TextView) findViewById(R.id.editText1);

        mSensorManager = (SensorManager) getSystemService(SENSOR_SERVICE);

        mEventListenerLight = new SensorEventListener(){

            @Override
            public void onSensorChanged(SensorEvent event){
                float[] values = event.values;
                lastLightValue = values[0];
                updateUI();
            }



            @Override
            public void onAccuracyChanged(Sensor arg0, int arg1) {
            }
        };
    }
```

Hints

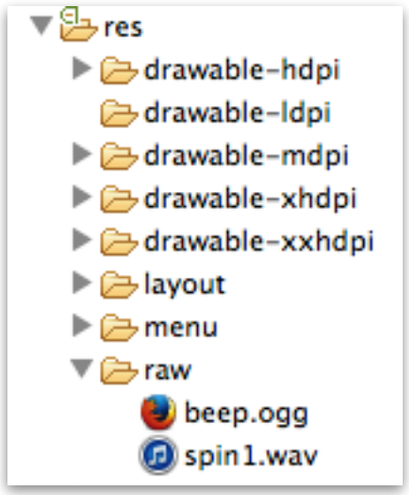
```
@Override
public void onResume() {
    super.onResume();
    mSensorManager.registerListener(mEventListenerLight,
            mSensorManager.getDefaultSensor(Sensor.TYPE_LIGHT),
            SensorManager.SENSOR_DELAY_FASTEST);
}

@Override
public void onStop() {

    mSensorManager.unregisterListener(mEventListenerLight);
    super.onStop();
}
```

Hints

- Playing a sound
  - The key is the MediaPlayer call
  - Do not instantiate more than one MediaPlayer object

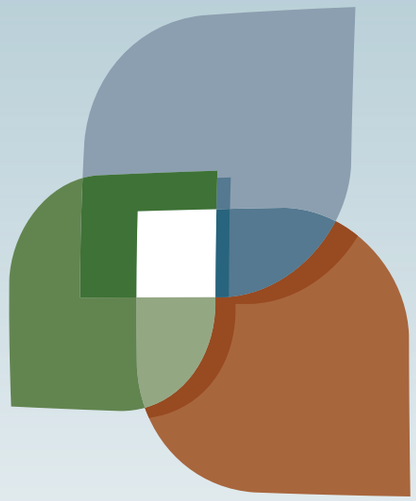



```
static MediaPlayer mp;
AssetFileDescriptor afd;

//synchronized so that each call of playAudio is completed before another begins.
synchronized void playAudio(AssetFileDescriptor afd){
    if(mp.isPlaying()){
        return;
    }
    mp.reset();
    try{
        mp.setDataSource(afd.getFileDescriptor(), afd.getStartOffset(), afd.getLength());
        mp.prepare();
    }
    catch(Exception e){
        Log.d("playAudio","Exception:"+e.getStackTrace()[0].toString()+" afd: "+afd.toString());
    }
    mp.start();
}
```

```
mp = new MediaPlayer();
afd = getApplicationContext().getResources().openRawResourceFd(R.raw.spin1);
```

- http://developer.android.com/guide/topics/media/index.html



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