



*Lesson 5*  
*Optional material*

# Android

## Improving Layouts

### HierarchyViewer & lint

Victor Matos  
Cleveland State University

Notes are based on:  
Android Developers  
<http://developer.android.com>

Portions of this page are reproduced from work created and [shared by Google](#) and used according to terms described in the [Creative Commons 3.0 Attribution License](#).

## Improving Layouts

Reference: <http://developer.android.com/tools/debugging/debugging-ui.html>

To help debug issues in your layout and Manifest, the Android SDK provides the **Hierarchy Viewer** and **lint** tools.

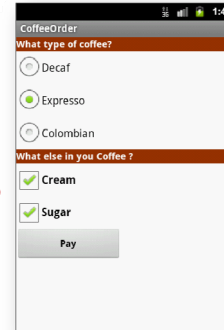
- **The Hierarchy Viewer** application allows you to debug and optimize your user interface.
  - It provides a visual representation of the layout's View hierarchy (the View Hierarchy window) and
  - a magnified view of the display (the Pixel Perfect window).
- Android **lint** is a static code scanning tool that helps you optimize the layouts and layout hierarchies of your applications, as well as detect other common coding problems.

## Improving Layouts

### Hierarchy Viewer

Shows the tree structure of your XML layout. Assume the **CoffeeOrder** app is running in the emulator. To execute the program do the following:

- Make sure the emulator is displaying the UI you want to assess
- Run a DOS shell
- Make sure the path includes access to the **/android-sdk/tools** folder. In the DOS shell type **PATH=your-path\Android\android-sdk\tools;%PATH%**
- Type the command **hierarchyviewer name-offolder-holding-your-app**



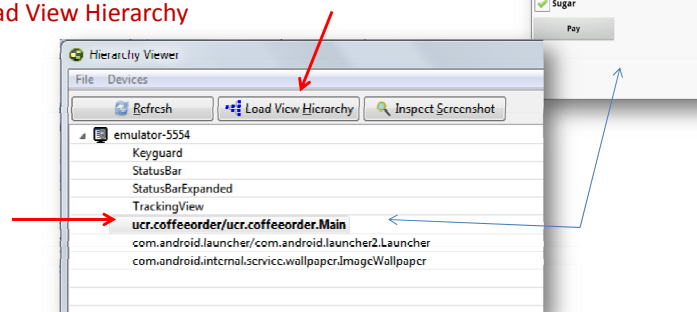
3

## Improving Layouts

### Hierarchy Viewer

The next screen offers a list of activities. Choose the activity whose UI is to be explored

In this case we pick: **Main**  
Click on **Load View Hierarchy**



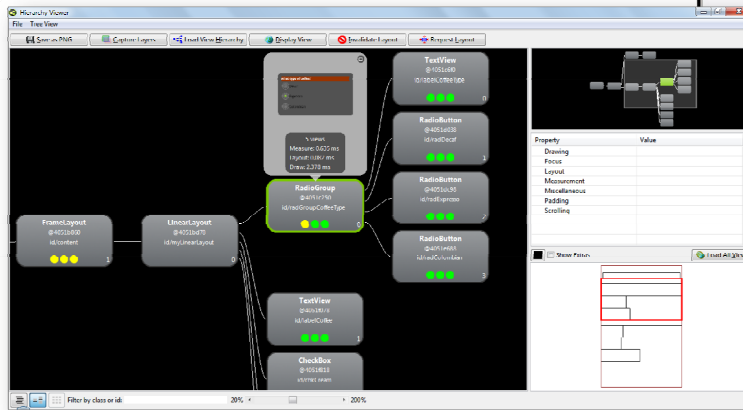
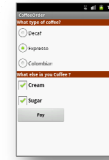
4

# Improving Layouts

## Hierarchy Viewer

For details on how to use the tool see video:

[http://www.youtube.com/watch?v=PAgE7saQUUY&feature=player\\_embedded](http://www.youtube.com/watch?v=PAgE7saQUUY&feature=player_embedded)



# Improving Layouts

## Hierarchy Viewer – Detail

Rendering time includes:

1. Measuring,
2. Laying out,
3. Drawing

In the example, the **RadioGroup** component consumes a moderate measuring time (yellow circle) and relatively fast layout & draw timing (green circles)

Time in milliseconds is also displayed

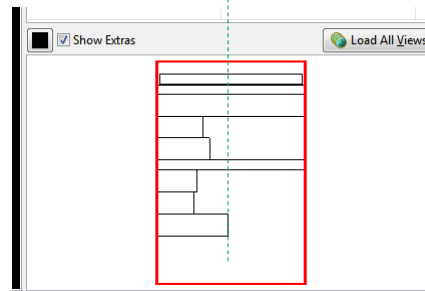
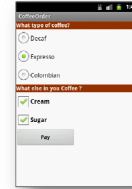


# Improving Layouts

## Hierarchy Viewer – Detail

The lower right panel displays an outline of the UI.

Observe that some stretching might be needed to make all radio & check boxes have similar width



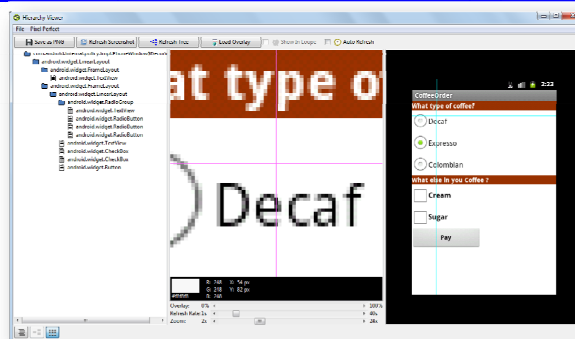
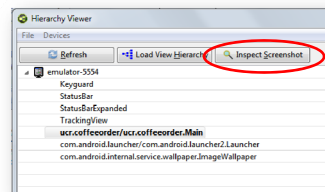
# Improving Layouts

## Pixel Perfect

- Gives a very detailed depiction of the UI.
- Useful way of saving templates, and adding **Overlay Layers** to 'beautify' the screen design.

For details see the video:

[http://www.youtube.com/watch?v=C45bMZGdN7Y&feature=player\\_embedded](http://www.youtube.com/watch?v=C45bMZGdN7Y&feature=player_embedded)



## Improving Layouts

### Lint

Use **lint** on your resource directories to check for inefficiencies or other types of problems that could be affecting the performance of your application.

```
c:\Users\1002125\workspace-ANDROID> lint 04-6-UI-Coffee-Order
Scanning 04-6-UI-Coffee-Order: .....
Scanning 04-6-UI-Coffee-Order (Phase 2): ..
proguard.cfg:19: Error: Obsolete ProGuard file; use -keepclasseswithmembers instead of -keepclasseswithmembernames [Proguard]
-keepclasseswithmembernames class * {
^
AndroidManifest.xml:22: Warning: <uses-sdk> tag appears after <application> tag [ManifestOrder]
<uses-sdk
^
res\layout\main.xml:8: Warning: Unexpected text found in layout file: "d" [ExtraText]
^
res\layout\main.xml:92: Warning: Avoid using "px" as units; use "dp" instead [PxUsage]
res\values\strings.xml:3: Warning: The resource R.string.hello appears to be unused [UnusedResources]
<string name="hello">Hello World, Main!</string>
^
res: Warning: Missing density variation folders in res: drawable-xhdpi [IconMissingDensityFolder]
res\layout\main.xml:24: Warning: [18N] Hardcoded string "What type of coffee?", should use @string resource [HardcodedText]
^
res\layout\main.xml:36: Warning: [18N] Hardcoded string "Decaf", should use @string resource [HardcodedText]
<RadioButton
^
...
1 errors, 13 warnings
```

9

## Improving Layouts

# Questions?

10