



Set your phone free !!!

**GOOGLE ANDROID**

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Sven Pedersen  
IT-Arkitekt @ Lenio  
Blog:[sven.trioglobal.com](http://sven.trioglobal.com)

# LENIO

- ✘ IT-projekthus – DK's bedste mellemstore arbejdsplads 2008 ☺
- ✘ Fokus på web- og integrationsløsninger
- ✘ Java (JBoss), Ruby on Rails, Adobe Flex, Drupal.
- ✘ Android passer ind i det store billede



# SHOW ME THE HARDWARE !



## Top US Smartphones

Rank	Handset Models	Share of Smart Phone Traffic
1	Apple iPhone	49.5%
2	RIM BlackBerry 8300	9.1%
3	RIM BlackBerry 8100	6.9%
4	Palm Centro	6.0%
5	HTC Dream (G1)	5.2%
6	Danger Sidekick II	3.4%
7	RIM BlackBerry 9530	1.7%
8	Samsung BlackJack II	1.6%
9	HTC Touch	1.0%
10	Motorola Q9C	0.8%

## US Operating System Share

Rank	Manufacturer	Feb 09	Aug 08	6 mon Change
1	iPhone OS	50%	10%	40%
2	RIM	21%	32%	-11%
3	Windows Mobile	13%	30%	-17%
4	Palm	7%	19%	-12%
5	Android	5%	--	5%



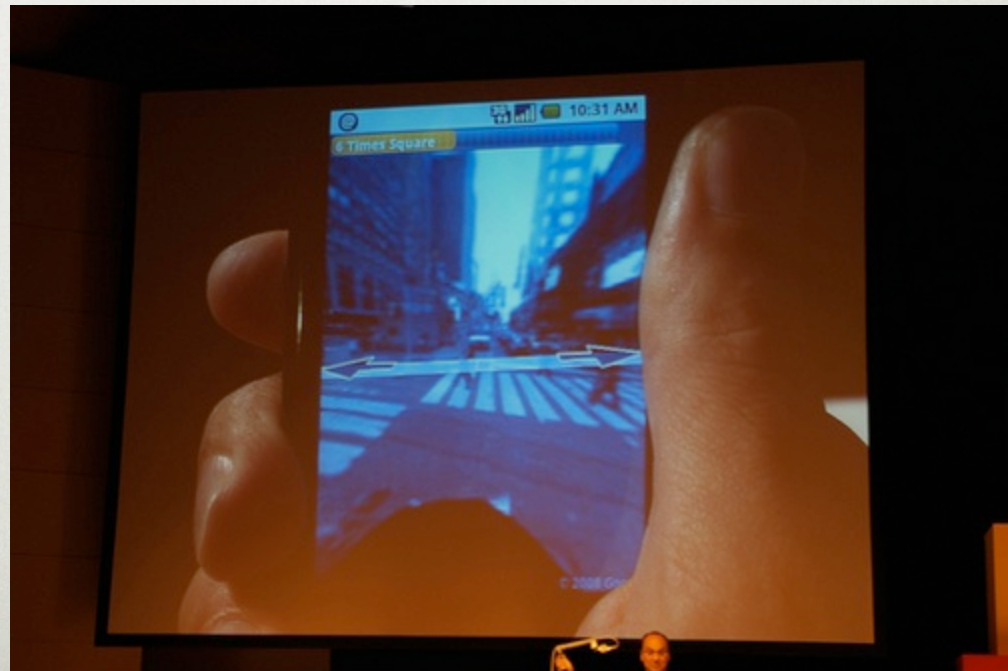
# PHONES/DEVICES IN 09



# APPLICATIONS INSTALLED

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- ✗ Amazon MP3, Youtube (for the kids..)
- ✗ And of course, Google applications
  - + One click Google search
  - + Maps
  - + Latitude
  - + IM
  - + Gmail





# It's not an iPhone killer

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# It's not an iPhone killer





# APPLE VS. IPHONE

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iPhone

Controlled  
distribution

No books?

Objective C

gPhone

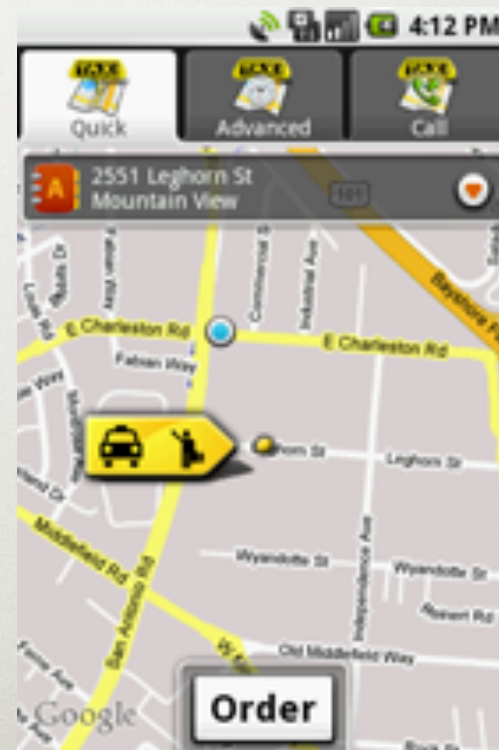
Open  
distribution

Books and lots of  
source and  
tutorials

Java

# THE COMPETITION - \$5M PRIZES

- ✗ 1788 submissions
- ✗ Winners announced – most are location based (Cab4me)





# MARKETPLACE

The screenshot displays the Android Market application interface. On the left, a list of apps is shown under the heading "My downloads". The apps listed are:

- Barcode Scanner** by ZXing Team (5 stars, FREE)
- Talking Compass** by Charles Chen (5 stars, FREE)
- Text-To-Speech Lib...** by Charles Chen (4 stars, FREE)
- Ringtone Editor** by Dominic Mazzoni (5 stars, Installed)
- GPS Test** by Mike Lockwood (5 stars, FREE)
- Slide Puzzle** by Joel Schnall (5 stars, FREE)
- Translate** (5 stars, FREE)

The main focus is on the **ZeDev Tools** app by the Android Team. The app is FREE and has 5 stars. It has 100-500 downloads and a 6 rating. The description reads: "A comprehensive collection of tools for the erudite developer." The version is 1.1 and the size is 1.08KB. Below the description is a "Comments" section with three entries:

- Scott** (08-22-2008, 3 stars): "It'd be nice if the setup wizard provided a confirmation/warning dialog before launch..."
- Ryan** (08-08-2008, 3 stars): "Very helpful to get into the guts of the device. Neat to see the raw compass and t..."
- Christoph** (08-06-2008, 3 stars): [No text visible]

An "Install" button is visible at the bottom of the app's card. Overlaid on the right side of the screen is a permission dialog box with the title "ZeDev Tools" and "Android Team". The dialog states: "This application has access to the following:"

- Network communication**: full Internet access
- Your location**: fine (GPS) location
- Development tools**: limit number of running processes, make all background applications close, enable application debugging
- System tools**: modify global system settings, set preferred applications, restart other applications, modify global animation speed, prevent phone from sleeping

The dialog has an "OK" button at the bottom.

18:32

Obama in office: 6 days

Blogs

Videos

Photos

News

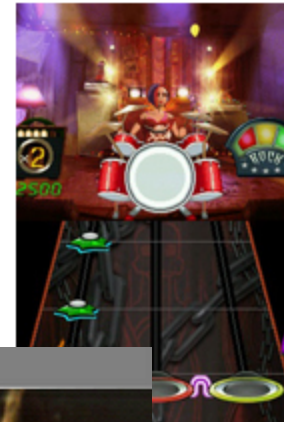
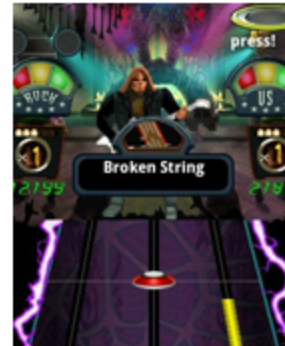
Yes we can!

Obama takes steps to reverse Bush climate policies:  
WASHINGTON (Reuters) - U.S. President Barack Obama began re.. <http://bit.ly/rhsM>

Previous

Next

## Guitar Hero® World Tour



## Arnold Sounds

Affirmative	Negative
Come on, don't bullshit me	Who's your daddy?
One of us is in deep trouble	Hahaha
Hasta la vista	I'm a cop, you idiot
Excellent	I would like to get to know you
You idiot	No problemo
You son of a bitch	What's going on
I'll be back	Get to the chopper



# ANDROID HISTORY...

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- ✗ **The origins of Android**

- + Google acquired Android Inc. in 2005

- ✗ **Launch of SDK's**

- + November 2007

- + 1.0 (September 2008)

- + 1.1 r1 (February 2009)

- + 1.5 (April 2009)

- ✗ **Launch of phone**

- + September 23<sup>rd</sup> 2008



# Open Handset Alliance

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- ✘ Aim to advance open standards for mobile devices
- ✘ Members are: Handset providers, mobile operators and software companies
- ✘ Members have promised not to lock their Android phones
- ✘ Members  
T-Mobile, HTC, LG, Motorola, Samsung, Sony Ericsson and many more



# Advantages

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- ✗ A free and open platform!
- ✗ Java
- ✗ OS – middleware and a rich API which hides the ugly details 😊
- ✗ Multitasking – with a nice back button...
- ✗ Pluggable architecture
  - + create your own call list etc.



# ANDROID SDK

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- ✘ Available for Linux, Mac OS X & Windows
- ✘ Contains
  - + Emulator
  - + Debugger
  - + Profiling tools
  - + Documentation and samples
- ✘ Eclipse Plugin (ADT)



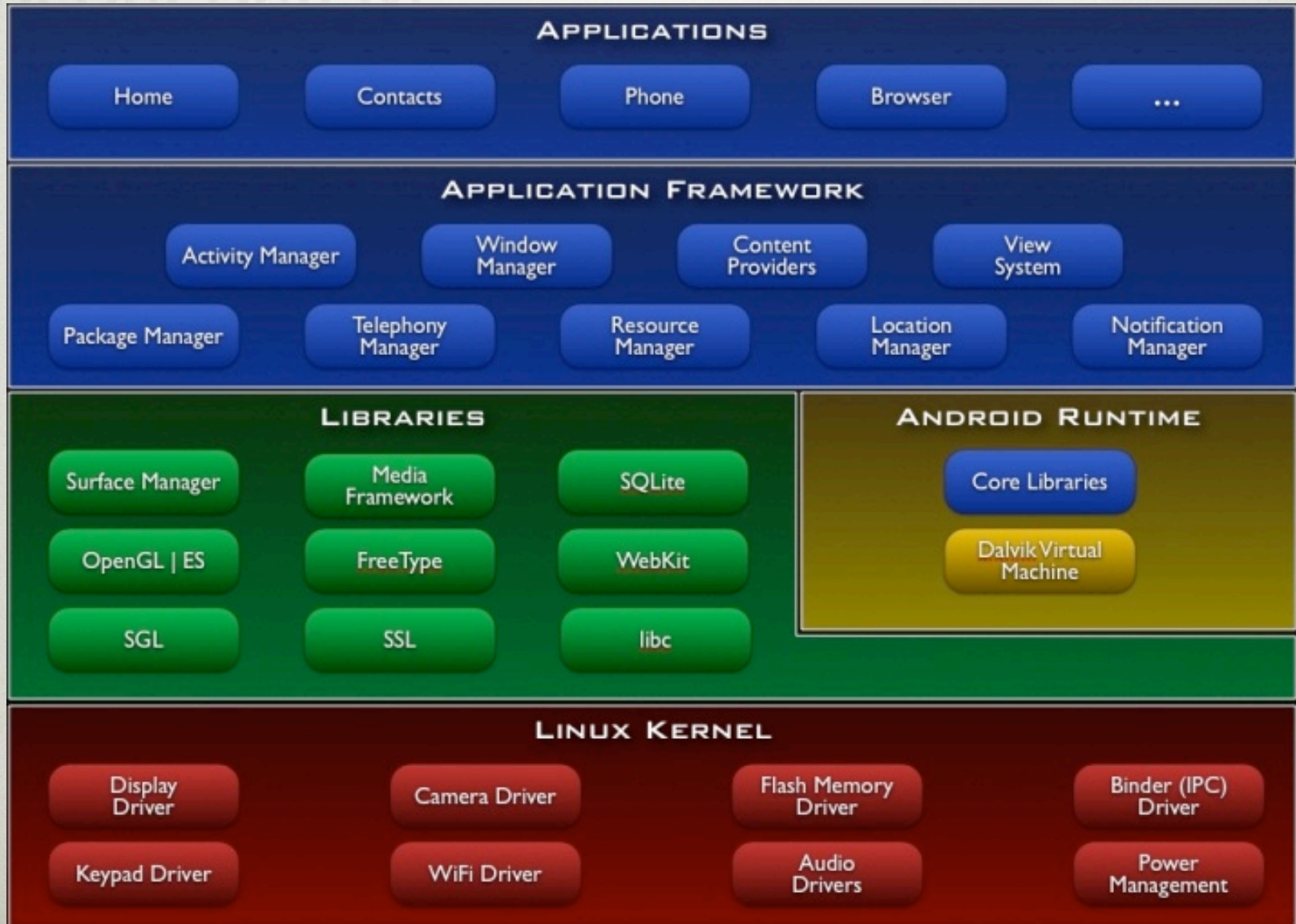
# IDE'S

- ✗ Eclipse – official plugin
- ✗ Aptana
- ✗ IntelliJ
- ✗ Netbeans



```
activitycreator.bat --out Demo --ide  
intellij dk.lenio.Demo.java
```

# API OVERVIEW





# ANDROID ENGINE

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- ✘ Core library including most of the core Java libraries
- ✘ Java -> Dalvik bytecode (.dex)
- ✘ Dalvik - VM running Dalvik bytecode (dex)
- ✘ One instance of Dalvik JVM for each application



# THE DEX FILE FORMAT

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Offset	Size	Description
0x0	8	'Magic' value: "dex\n009\0"
0x8	4	Checksum
0xC	20	SHA-1 Signature
0x20	4	Length of file in bytes
0x24	4	Length of header in bytes (currently always 0x5C)
0x28	8	Padding (reserved for future use?)
0x30	4	Number of strings in the string table
0x34	4	Absolute offset of the string table
0x38	4	Not sure. String related
0x3C	4	Number of classes in the class list
0x40	4	Absolute offset of the class list
0x44	4	Number of fields in the field table
0x48	4	Absolute offset of the field table
0x4C	4	Number of methods in the method table
0x50	4	Absolute offset of the method table
0x54	4	Number of class definitions in the class definition table
0x58	4	Absolute offset of the class definition table



# THE PARTS OF AN APPLICATION

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APK package

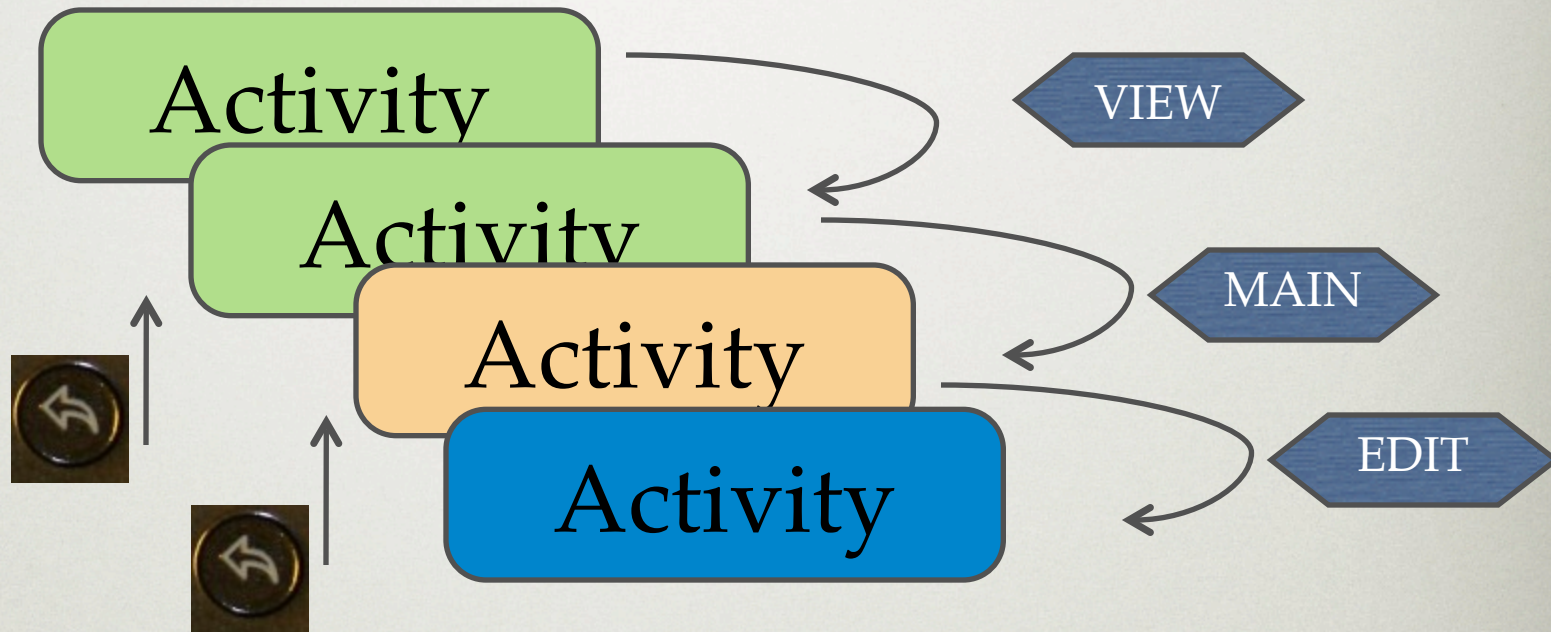
Activity

Service

Content  
Provider

Views

# STACK OF ACTIVITIES





# ANDROID MANIFEST

**Android Manifest Application**

**Application Toggle**

The [application](#) tag describes application-level components contained in the package, as well as general application information.

Define an `<application>` tag in the AndroidManifest.xml

**Application Attributes**

Defines the attributes specific to the application.

Name	<input type="text"/>	Browse...	Allow task reparenting	<input type="text"/>
Theme	<input type="text"/>	Browse...	Has code	<input type="text"/>
Label	<input type="text" value="@string/app_name"/>	Browse...	Persistent	<input type="text"/>
Icon	<input type="text" value="@drawable/icon"/>	Browse...	Enabled	<input type="text"/>
Description	<input type="text"/>	Browse...	Settable	<input type="text"/>
Permission	<input type="text"/>			
Process	<input type="text"/>			
Task affinity	<input type="text"/>			

**Application Nodes**

- .Demo (Activity)

Overview Application Permissions

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="dk.lenio"
    android:versionCode="1"
    android:versionName="1.0.0">
  <application android:icon="@drawable/icon" android:label="@string/app_name">
    <activity android:name=".Demo"
      android:label="@string/app_name">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />
        <category android:name="android.intent.category.LAUNCHER" />
      </intent-filter>
    </activity>
  </application>
</manifest>
```

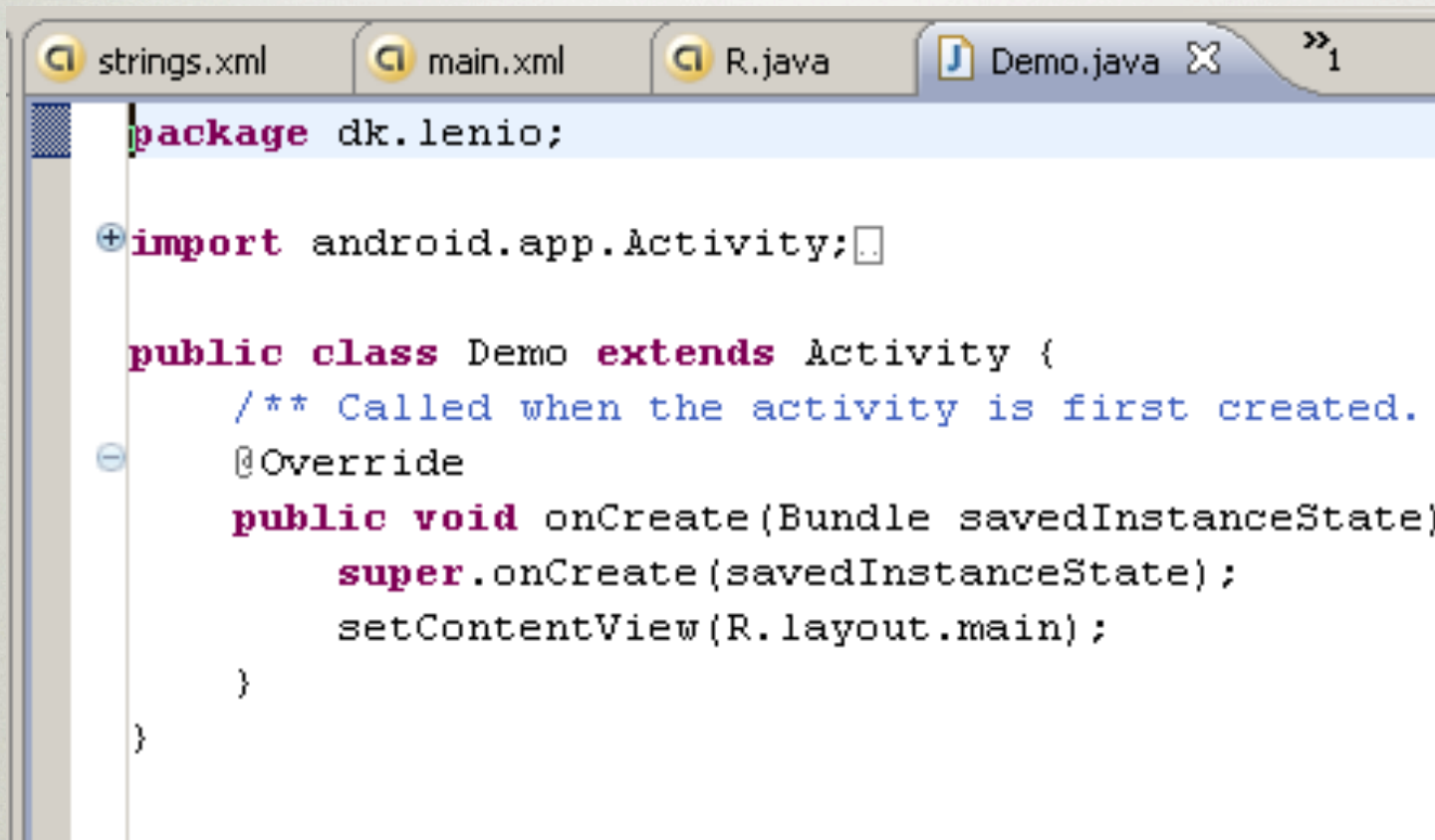
# PERMISSIONS

- ✗ `permission:android.permission.FACTORY_TEST`
- ✗ `permission:android.permission.ACCESS_DOWNLOAD_MANAGER`
- ✗ `permission:android.permission.CALL_PRIVILEGED`
- ✗ `permission:android.permission.ACCESS_CHECKIN_PROPERTIES`
- ✗ `permission:android.permission.CONTROL_LOCATION_UPDATES`
- ✗ `permission:android.permission.INTERNAL_SYSTEM_WINDOW`
- ✗ `permission:android.permission.ADD_SYSTEM_SERVICE`
- ✗ `permission:android.permission.INJECT_EVENTS`
- ✗ `permission:android.permission.STATUS_BAR`
- ✗ `permission:android.permission.BATTERY_STATS`
  
- ✗ `permission:android.permission.BRICK !!!!!!! ????`





# A SIMPLE APP



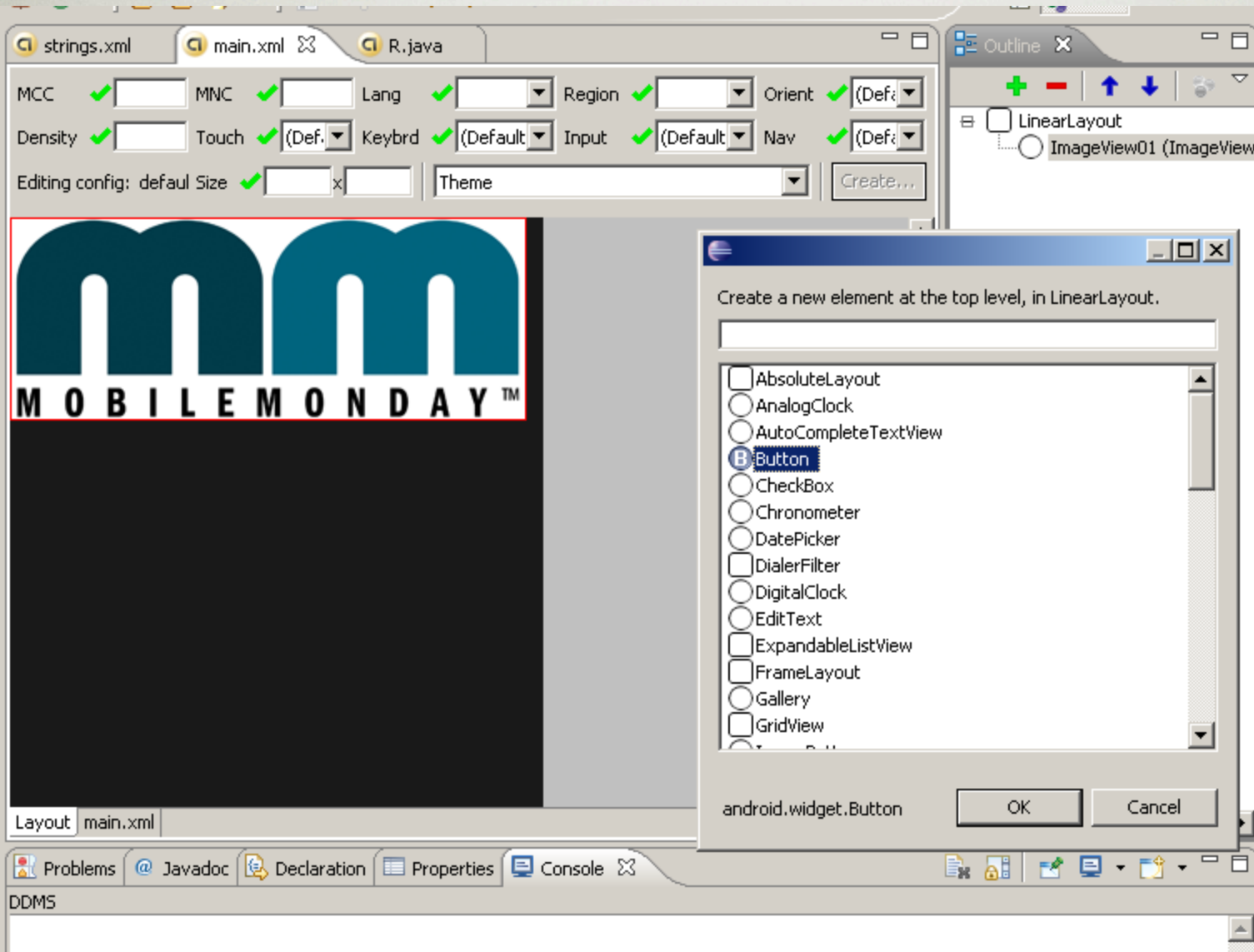
The image shows a screenshot of an IDE window with several tabs: strings.xml, main.xml, R.java, and Demo.java. The Demo.java tab is active and shows the following code:

```
package dk.lenio;

import android.app.Activity;

public class Demo extends Activity {
    /** Called when the activity is first created.
    @Override
    public void onCreate(Bundle savedInstanceState)
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);
    }
}
```





# THE LAYOUT – DECLARATIVE STYLE

```
<?xml version="1.0" encoding="utf-8"?>

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical" android:layout_width="fill_parent"
    android:layout_height="fill_parent">

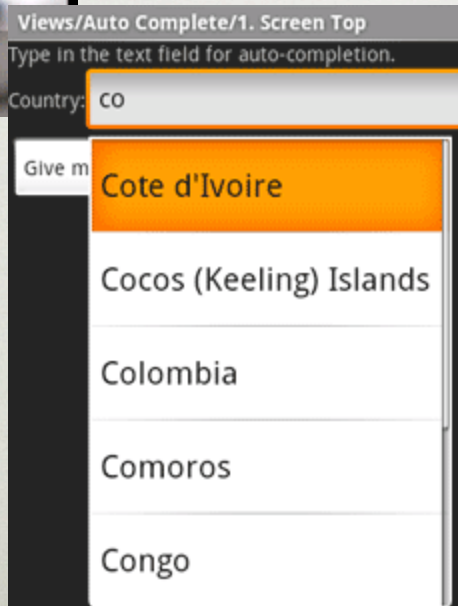
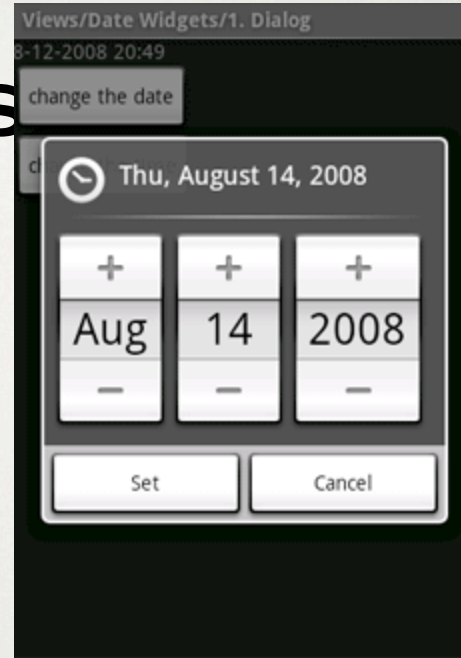
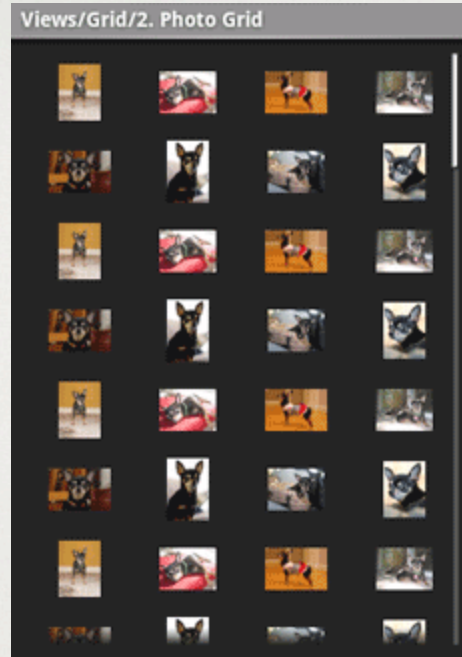
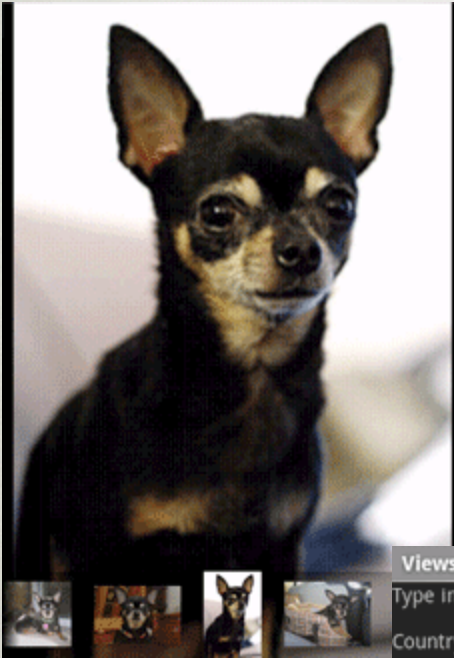
    <ImageView android:id="@+id/ImageView01"
        android:layout_width="wrap_content" android:layout_height="wrap_content"
        android:src="@drawable/logo"></ImageView>

    <Button android:id="@+id/Button01" android:layout_width="wrap_content"
        android:layout_height="wrap_content" android:autoText="true"
        android:text="Push it !"></Button>

</LinearLayout>
```









# DESIGN

The screenshot shows the DroidDraw application interface. The main window has a menu bar (File, Edit, Project, Help) and a toolbar. A context menu is open over the design canvas, listing options like 'Load string resources', 'Load color resources', 'Load array resources', 'Set drawables directory', 'Load resource directory', and 'Send GUI to device'. The design canvas displays a black background with a white button labeled 'Button' and a white analog clock. The 'Properties' panel on the right shows settings for a 'Button' widget, including 'Id', 'Width', 'Height', and 'Background Color'. The 'Output' panel at the bottom shows the generated XML code for the layout.

```
<?xml version="1.0" encoding="utf-8"?>
<AbsoluteLayout
  android:id="@+id/widget35"
  android:layout_width="fill_parent"
  android:layout_height="fill_parent"
  xmlns:android="http://schemas.android.com/
  >
  <AnalogClock
    android:id="@+id/widget30"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    ...
  >
  </AnalogClock>
</AbsoluteLayout>
```

The screenshot shows the AnDroidDraw application interface. The top bar displays the time as 9:17 PM. The main window shows the 'Layout XML' editor with the following code:

```
<?xml version="1.0"
encoding="utf-8"?>
<LinearLayout
  android:orientation="vertical"
  android:id="@+id/widget27"
  android:layout_width="fill_par
ent"
```

Below the XML editor, there is a 'Preview Layout' button and a 'Accept Connections' checkbox with a checkmark icon.

# DEBUGGING

**Dalvik Debug Monitor**

File Edit Actions Device Help

Info Threads VM Heap Allocation Tracker Sysinfo Emul

Call Hang Up

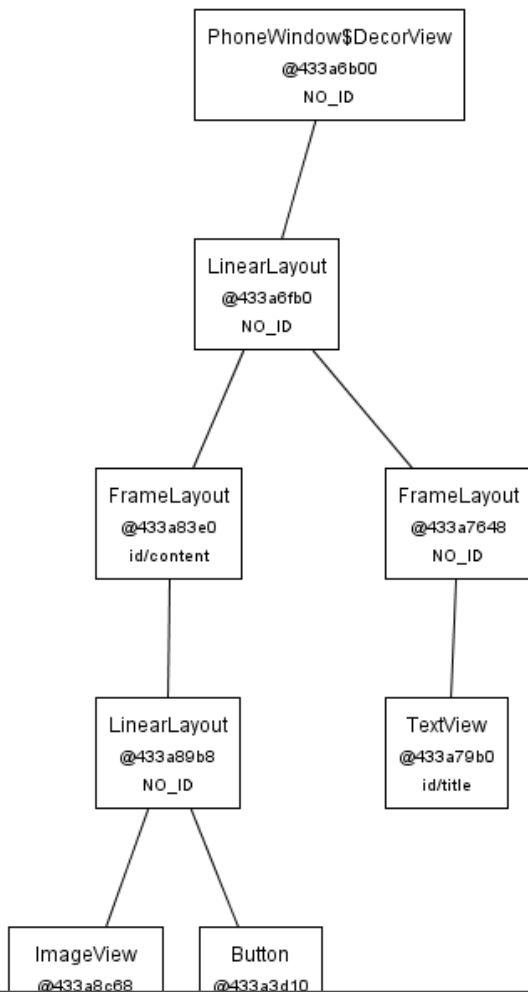
Location Controls

Manual GPX KML

Decimal  
 Sexagesimal

Longitude   
Latitude

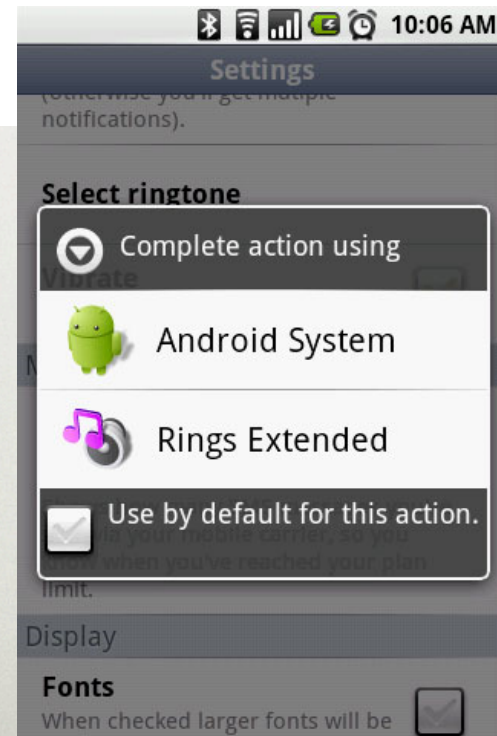
i4	Online		1.1 (debug)
52		→	8600
88		→	8601
94		→	8602
123		→	8603
133		→	8604
162		→	8605
169		→	8606
177		→	8607
184		→	8608 / 8700





# HOOKING IN...

```
<!-- The main entry to our application: allows the user to select
      a ringtone, and returns it to the caller. -->
<activity android:name=".RingsExtended">
  <intent-filter>
    <action android:name="android.intent.action.RINGTONE_PICKER"/>
    <category android:name="android.intent.category.DEFAULT"/>
  </intent-filter>
</activity>
```



Surgery Follow-Up

Check all that apply:

- Fever
- Diarrhea
- Constipation
- Wound drainage
- Pain surrounding wound

Prev

Next

Surgery Follow-Up

Record any verbal notes to send to the physician.

Start Recording

Stop Recording

Prev

Next

Surgery Follow-Up

Take Picture of Surgery Site

Add Picture

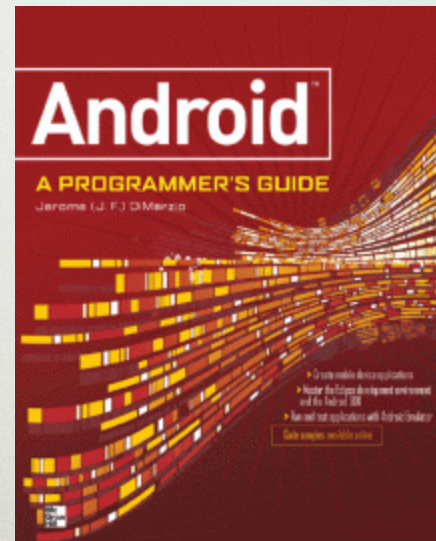
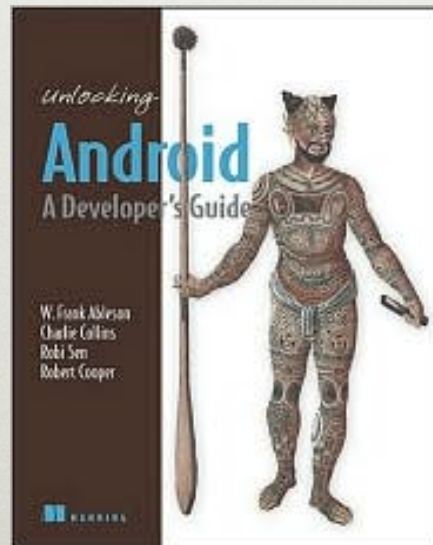
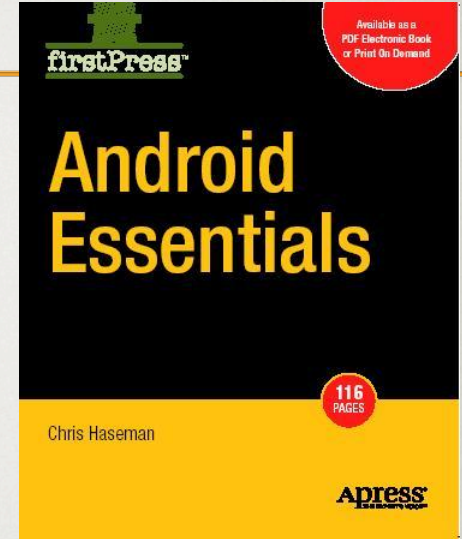
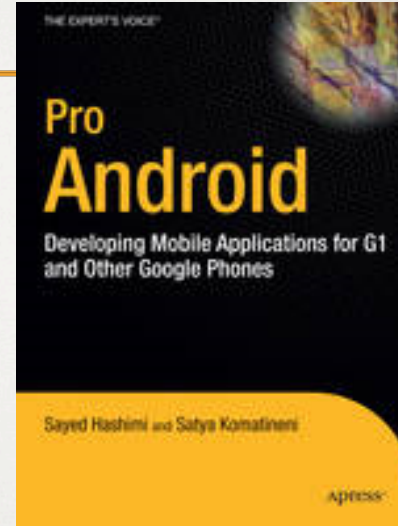
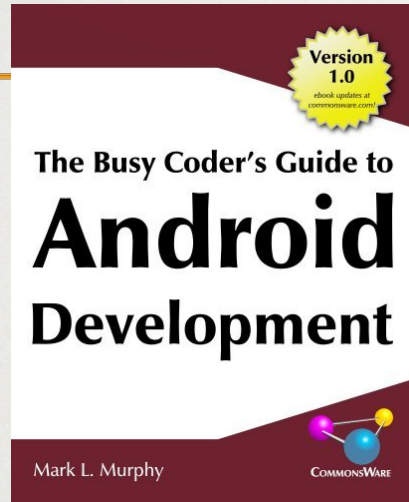


Prev

Done

<http://sourceforge.net/projects/mocamobile/>







# MORE INFORMATION

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[www.android.com](http://www.android.com)

[developer.android.com/](http://developer.android.com/)

[www.pragprog.com/titles/eband/hello-android](http://www.pragprog.com/titles/eband/hello-android)

[www.androidapps.com](http://www.androidapps.com)

[www.openhandsetalliance.com](http://www.openhandsetalliance.com)

[www.androiddenmark.dk](http://www.androiddenmark.dk)

...and much more on:

<http://groups.google.dk/group/mobiludvikling/web/links-til-infomation-vedr-android-udvikling>

Get your hands dirty on the tutorial:

[developer.android.com/guide/tutorials/notepad/index.html](http://developer.android.com/guide/tutorials/notepad/index.html)