Projeto usando Android SDK

EA998/MC933
Guido Araujo e Sandro Rigo

Introdução

- Livros adotados (e-books)
  - Learning Android, Marco Gargenta, O'Reilly Media (livro texto)
  - Professional Android Application, Reto Meier, Wrox

- Abordagem
  - Curso será composto, em sua maioria, por aulas práticas (*hands-on*)
  - Terá como base o projeto de um pequeno Twiter (Yamba)
  - Aulas cobrirão aspectos básicos de projeto usando Android
  - Maioria serão aulas de laboratório onde o aluno desenvolverá Yamba

Aulas

- Ch1: Android Overview
- Ch2: The Stack
- Ch3: Quick Start
- Ch4: Main Building Blocks
- Ch5: Yamba Project Overview
- Ch6: Android User Interface
- Ch7: Preferences, Project Overview, Filesystems, Menus and Intents
- Ch8: Services
- Ch9: Database
- Ch10: List Adapters
- Ch11: Broadcast receivers

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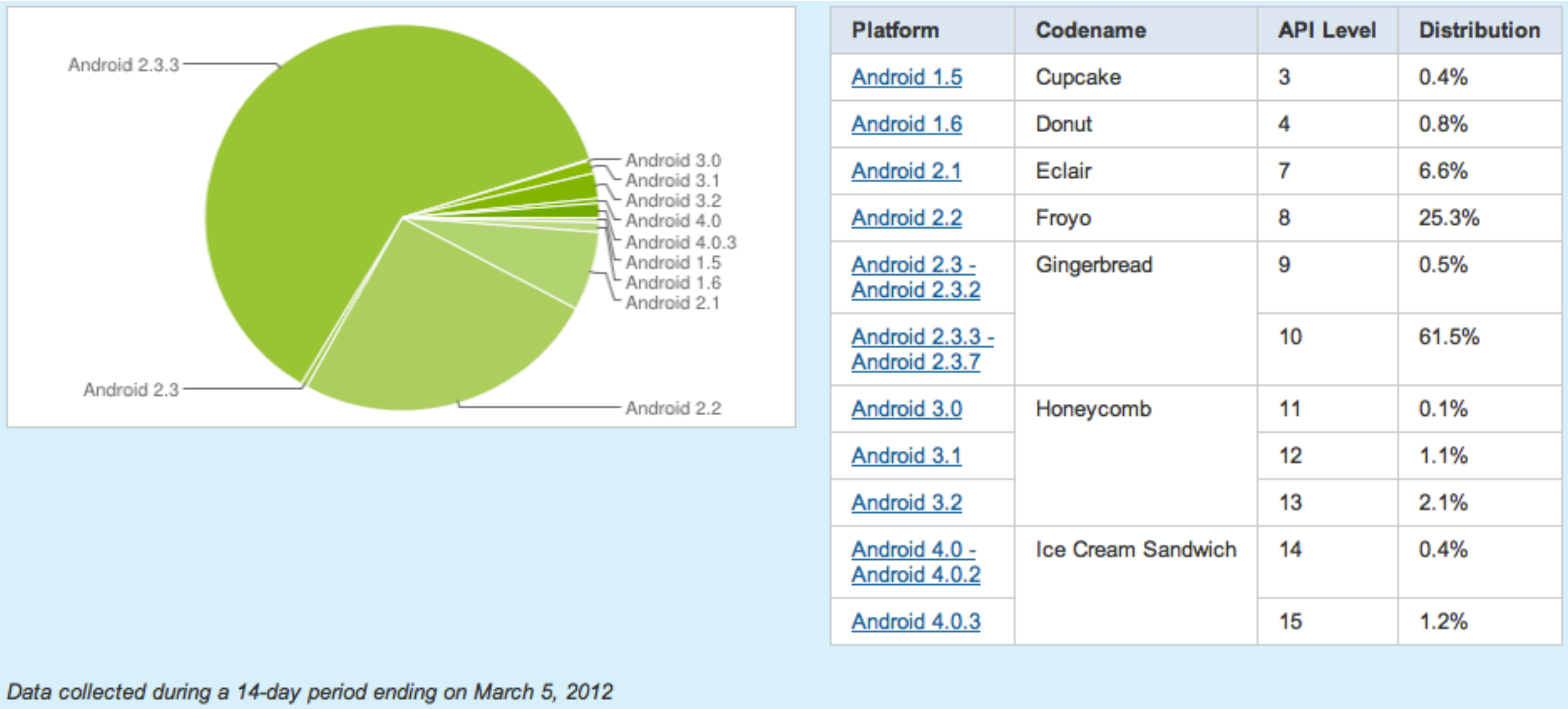
Android Overview

- Android OS
  - Baseado em Linux
  - Código aberto, promovido pela Google
  - Licença (Apache/MIT) é amigável a negócios
  - Separa efetivamente hardware de software
  - Organizado pela Open Handset Alliance
- Histórico
  - 2005: Google compra Android, Inc.
  - 2007: Criada Open Handset Alliance
  - 2009: Android se espalha
  - 2010: Segundo apenas a Blackberry
  - 2011: 50% do mercado de Smartphones

Versões do Android



Platform	Codename	API Level	Distribution
Android 1.5	Cupcake	3	0.4%
Android 1.6	Donut	4	0.8%
Android 2.1	Eclair	7	6.6%
Android 2.2	Froyo	8	25.3%
Android 2.3 - Android 2.3.2	Gingerbread	9	0.5%
Android 2.3.3 - Android 2.3.7		10	61.5%
Android 3.0	Honeycomb	11	0.1%
Android 3.1		12	1.1%
Android 3.2		13	2.1%
Android 4.0 - Android 4.0.2	Ice Cream Sandwich	14	0.4%
Android 4.0.3		15	1.2%

Data collected during a 14-day period ending on March 5, 2012

Fonte: developer.android.com

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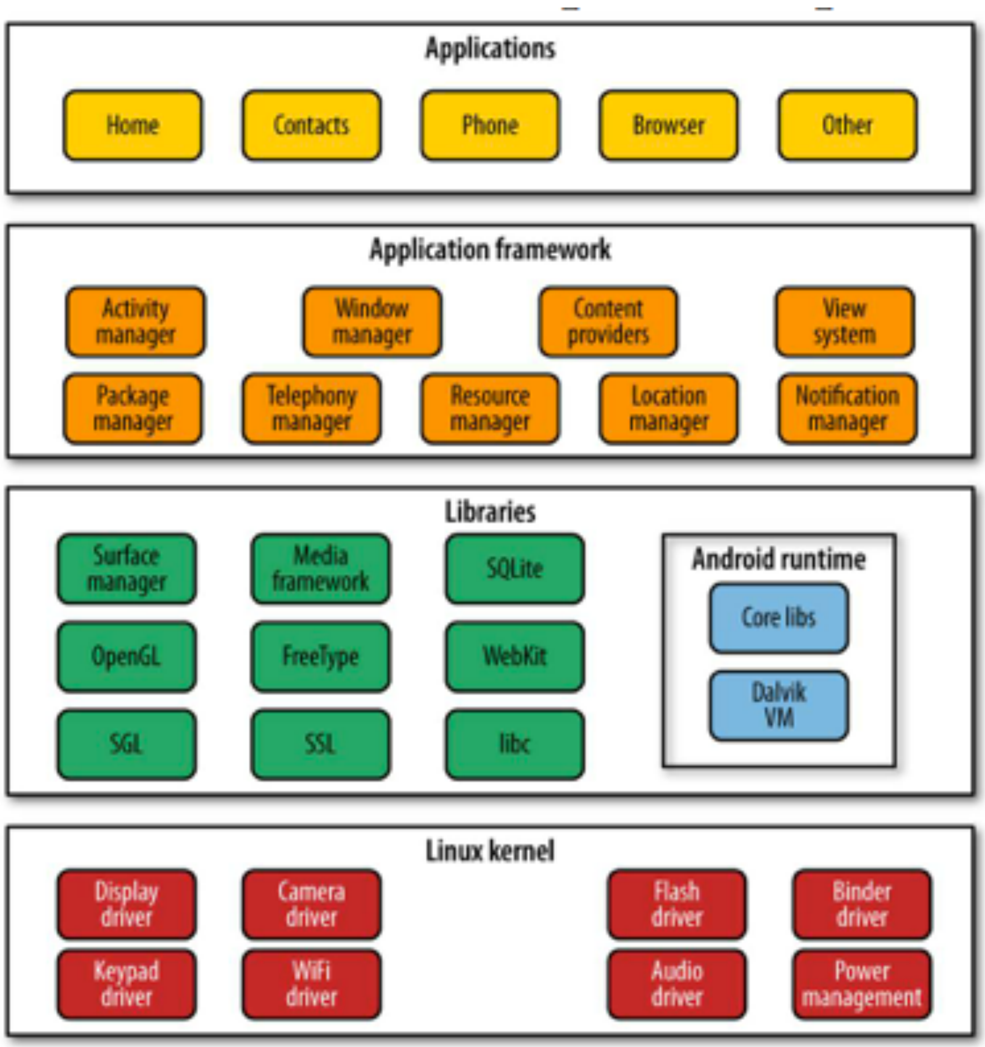
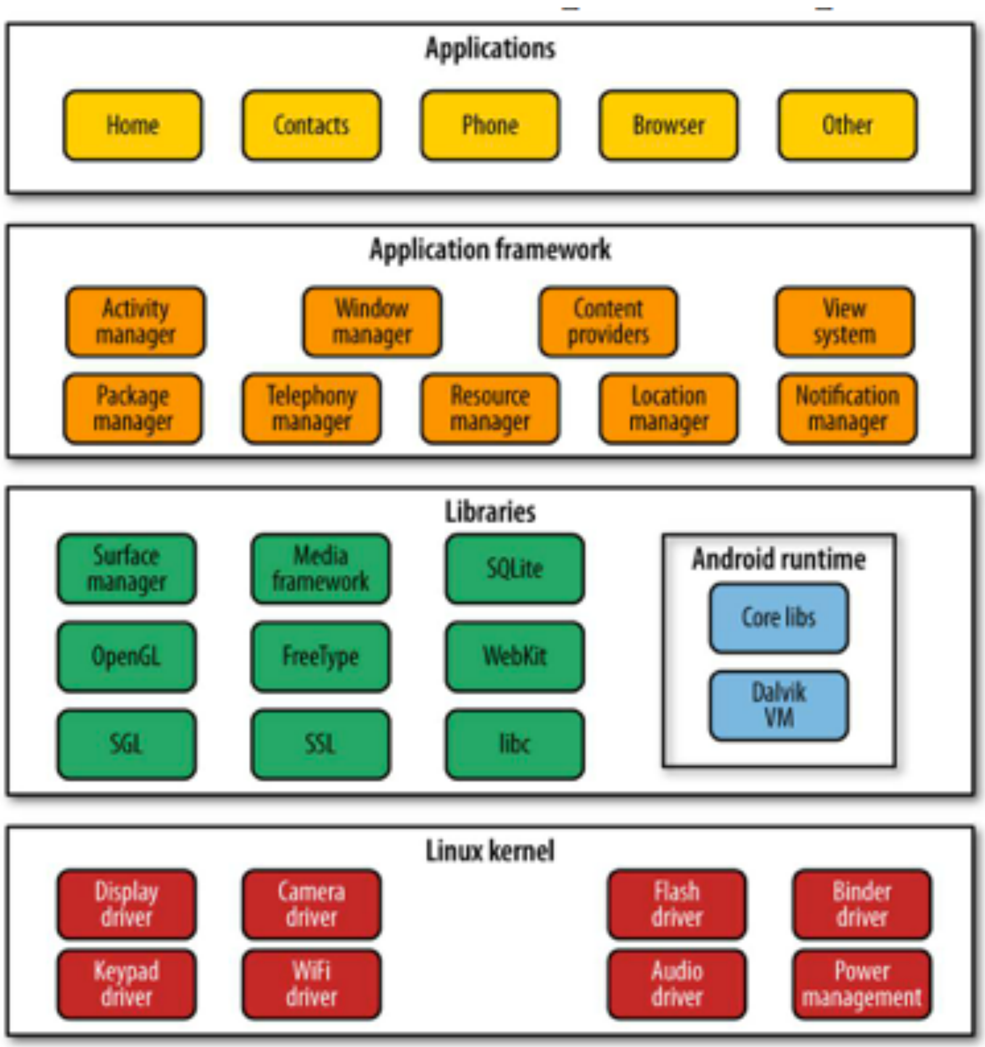
The Stack

- Estudada na primeira parte do curso (Prof. Eleri)
- Composta por várias camadas
  - Applications
  - Application framework
  - Libraries
  - Liniux kernel



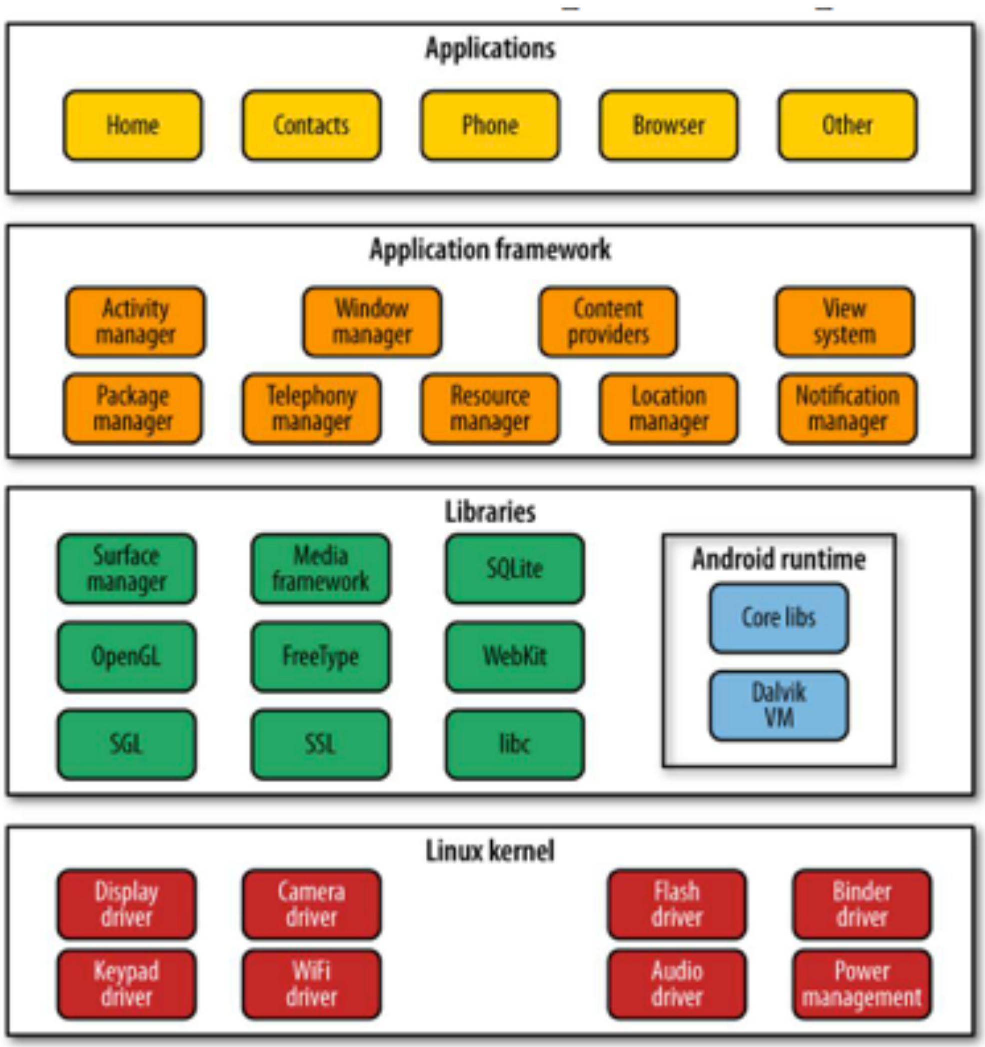
The Linux Kernel

- Escritas em C
- Altamente portável
- Elementos
  - Display driver
  - Camera driver
  - Keypad driver
  - WiFi driver
  - Flash driver
  - Audio driver
  - Binder driver
  - Power Management



Native Libraries

- Webkit
- SQLite
- Apache Harmony
- OpenGL
- 3D graphics libraries
- OpenSSL
- libc (Bionic)
- Dalvik VM



Native Libraries - Dalvik VM

- DVM pensada para mobile
- Questão licença JVM (2005)
- Foco em código aberto
- Recompila para Dalvik bytecode
- Mudanças em Java (2005)
- Tomou como base bytecode

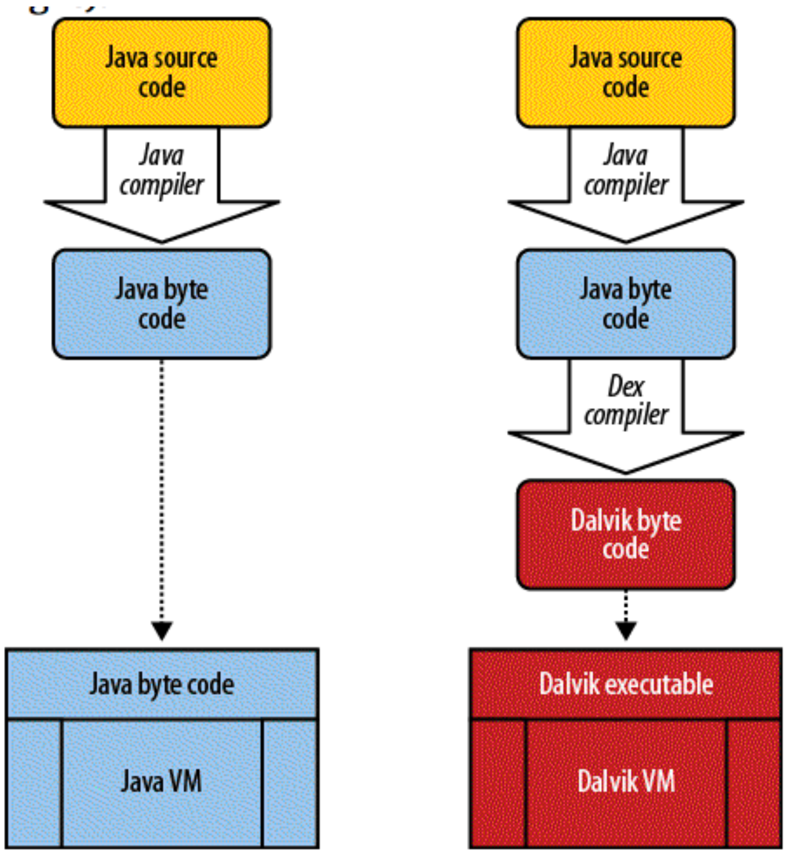
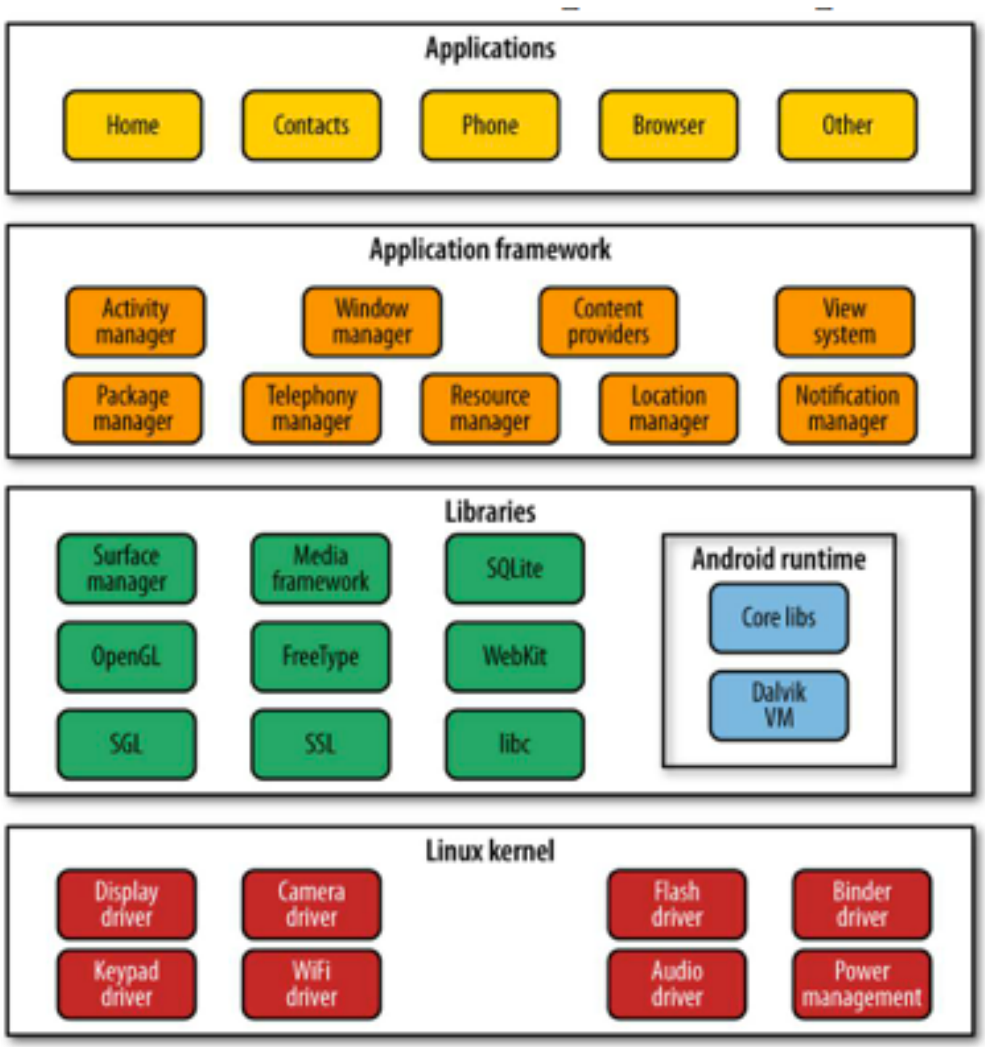


Figure 2-2. Java versus Dalvik

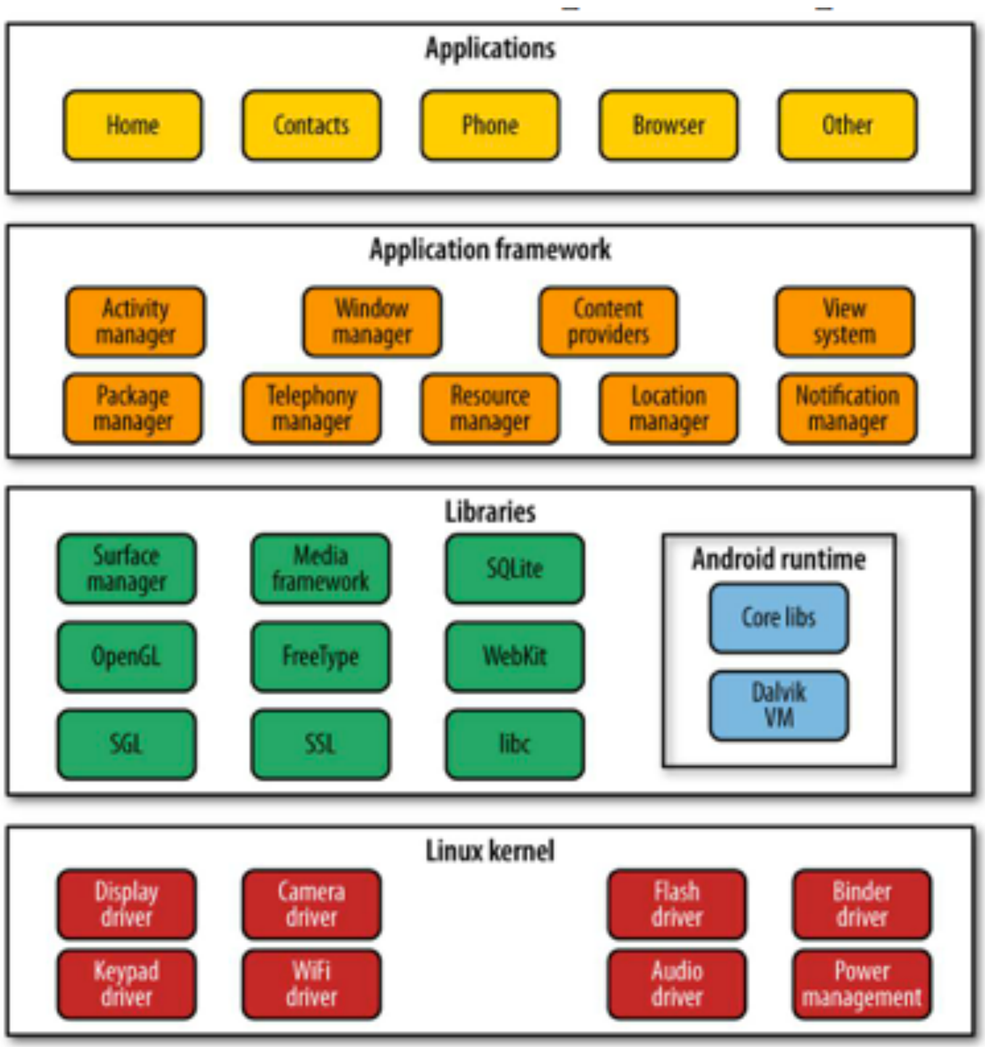
Application Framework

- Interface com desenvolvedor
- Oferta de serviços
- Elementos
  - Activity manager
  - Package manager
  - Window manager
  - Telephony manager
  - Resource manager
  - Contents providers
  - Location manager
  - View Systems
  - Notification manager



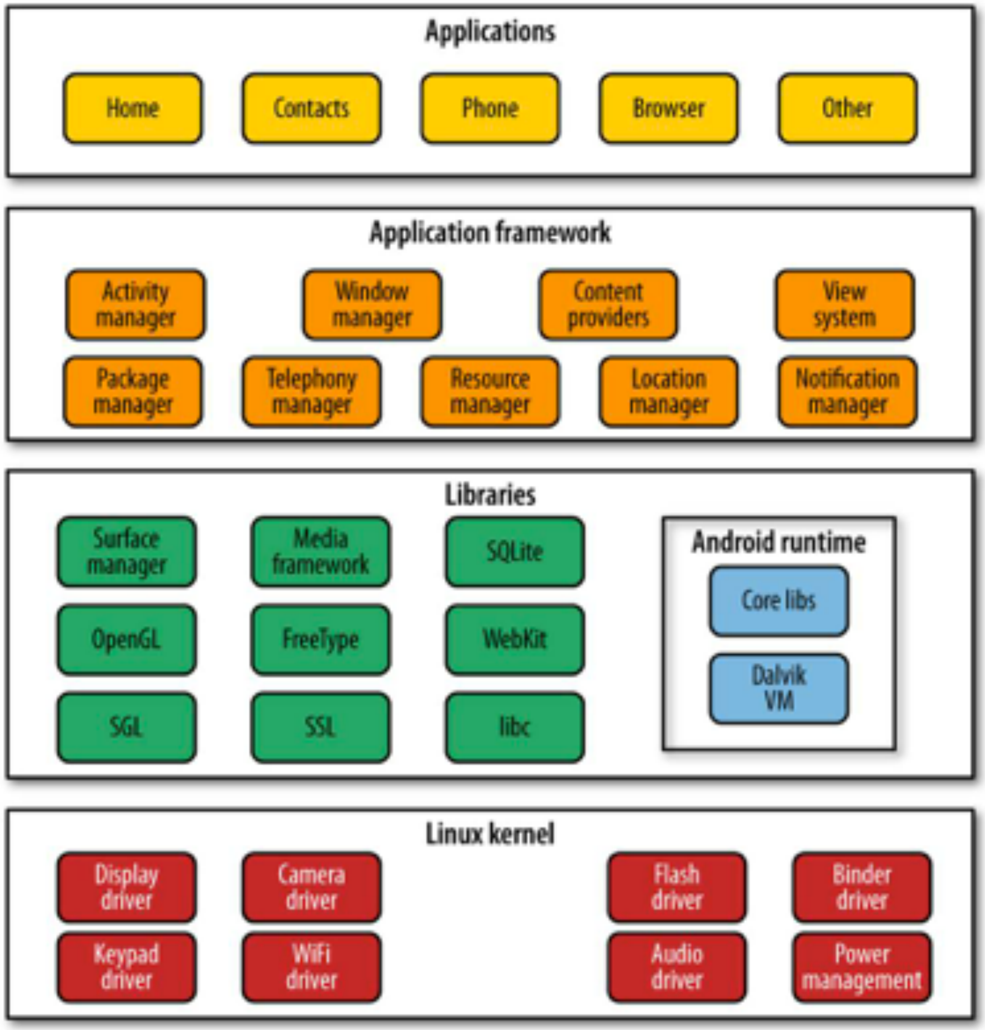
Application Layer

- O seu domínio…
- App é um pacote (APK)
- Conteúdo
  - Executable Dalvik
  - Resources
  - Libraries



Application Layer

- Assinatura
  - Antes de instalado
  - Projeto: chave de debug
  - Produção: sua chave
- Distribuição
  - Vários lojas virtuais
  - Android Market (Google)
- Segurança
  - Mercado regula…



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Quick Start

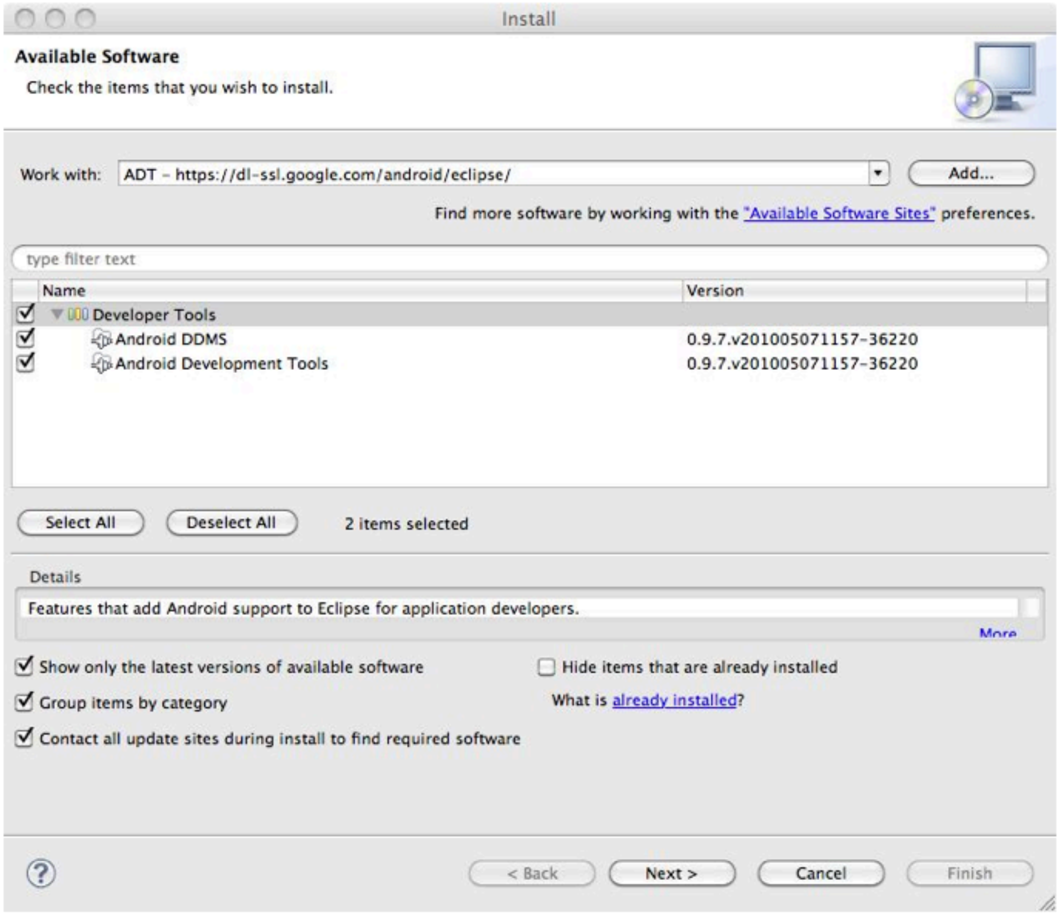
- Instalando Android SDK
  - *http://developer.android.com/sdk/*
  - *~/android-sdk*
- Ajustando *PATH*
  - *~/android-sdk/tools* e *~/android-sdk/platform-tools*
- Instalando Eclipse
  - Eclipse IDE for Java Developers (mais leve)
  - *http://www.eclipse.org/downloads/*
- Definir pasta trabalho
  - *~/workspace*

Android Tools

- Help > Install New Software
- Available Software > Add
- Add name

  Android Plugin
- Add Location e OK

  https://dl-ssl.google.com/android/eclipse
- Marque checkboxes (ao lado) e prossiga com Next
- Leia e aceite a licença
- Clique Finish
- Reinicie Eclipse



Install

Available Software

Check the items that you wish to install.

Work with: ADT - https://dl-ssl.google.com/android/eclipse/ [Add...]

Find more software by working with the "Available Software Sites" preferences.

type filter text

	Name	Version
☑	Developer Tools	
☑	Android DDMS	0.9.7.v201005071157-36220
☑	Android Development Tools	0.9.7.v201005071157-36220

[Select All] [Deselect All] 2 items selected

Details

Features that add Android support to Eclipse for application developers.

More

☑ Show only the latest versions of available software

☐ Hide items that are already installed

☑ Group items by category

What is already installed?

☑ Contact all update sites during install to find required software

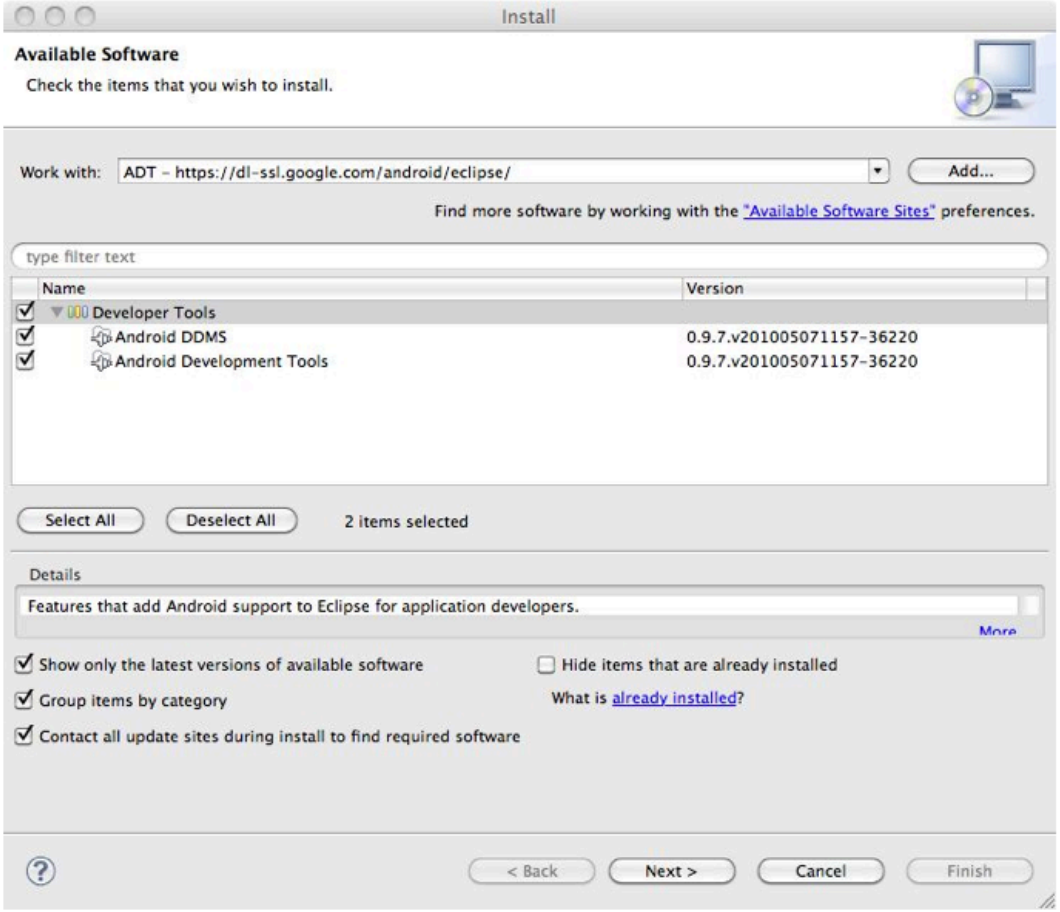
Criando um Projeto

- File > New > Android Project
- Project Name

  HelloWorld
- Build target: *Android 2.2*
- Project Properties

  Name and package
- Package name

  com.marakana.calculator
- Activity (Ch6): *HelloWorld*
- Minimum version: *8, i.e Android 2.2*
- Finish



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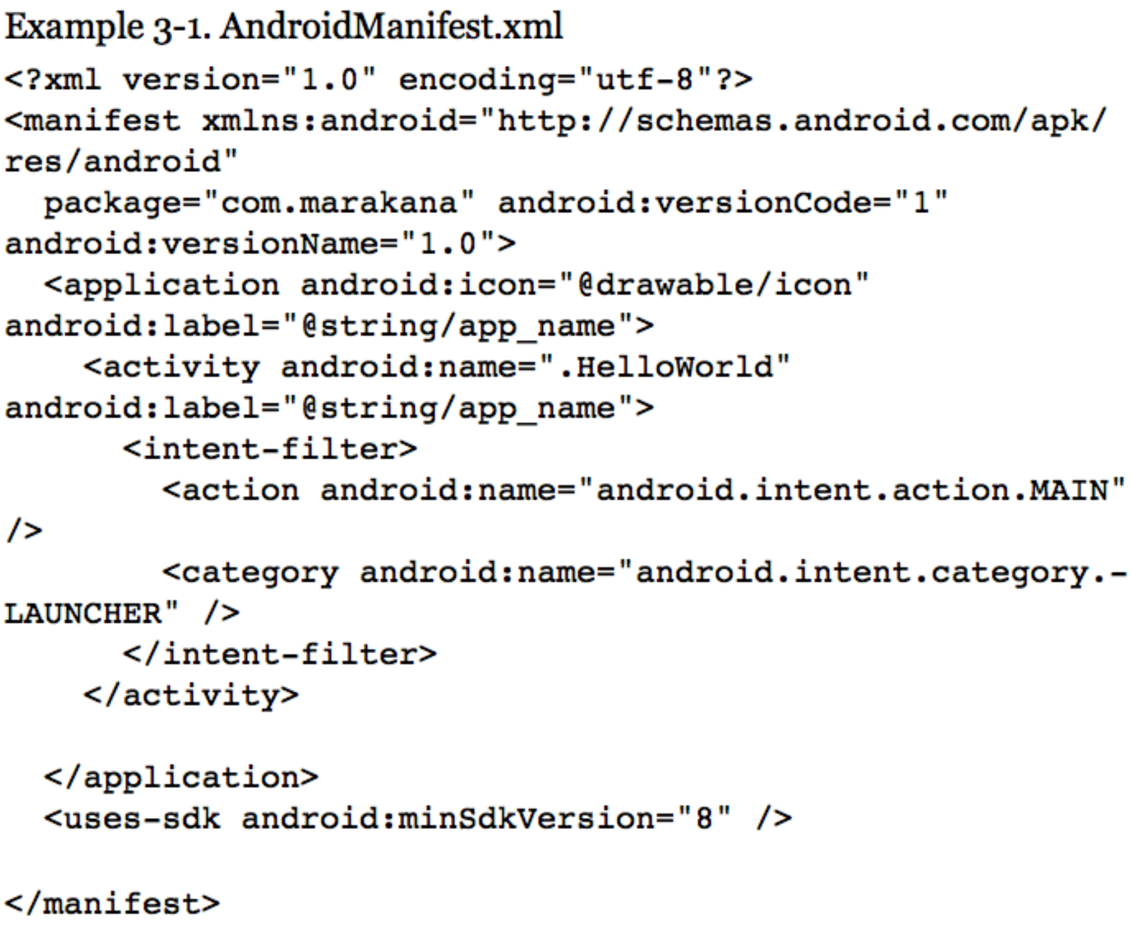
Manifesto

- Descreve a App
  - Seus blocos principais
  - Permissões
  - Cola tudo junto…



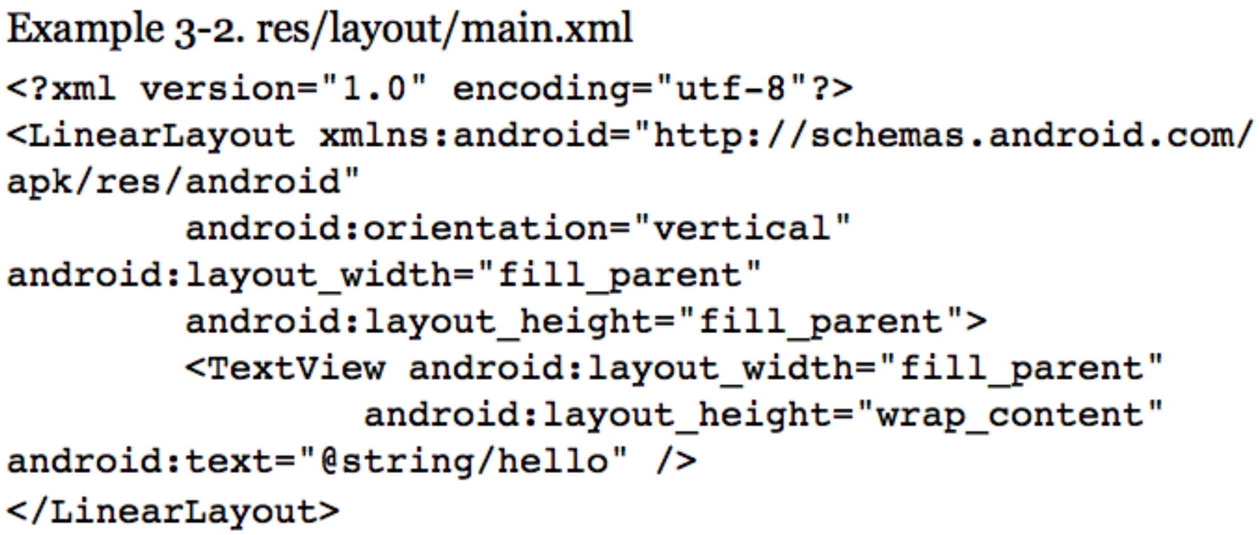
Example 3-1. AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/
res/android"
  package="com.marakana" android:versionCode="1"
android:versionName="1.0">
  <application android:icon="@drawable/icon"
android:label="@string/app_name">
    <activity android:name=".HelloWorld"
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>
  <uses-sdk android:minSdkVersion="8" />

</manifest>
```

Layout XML Code

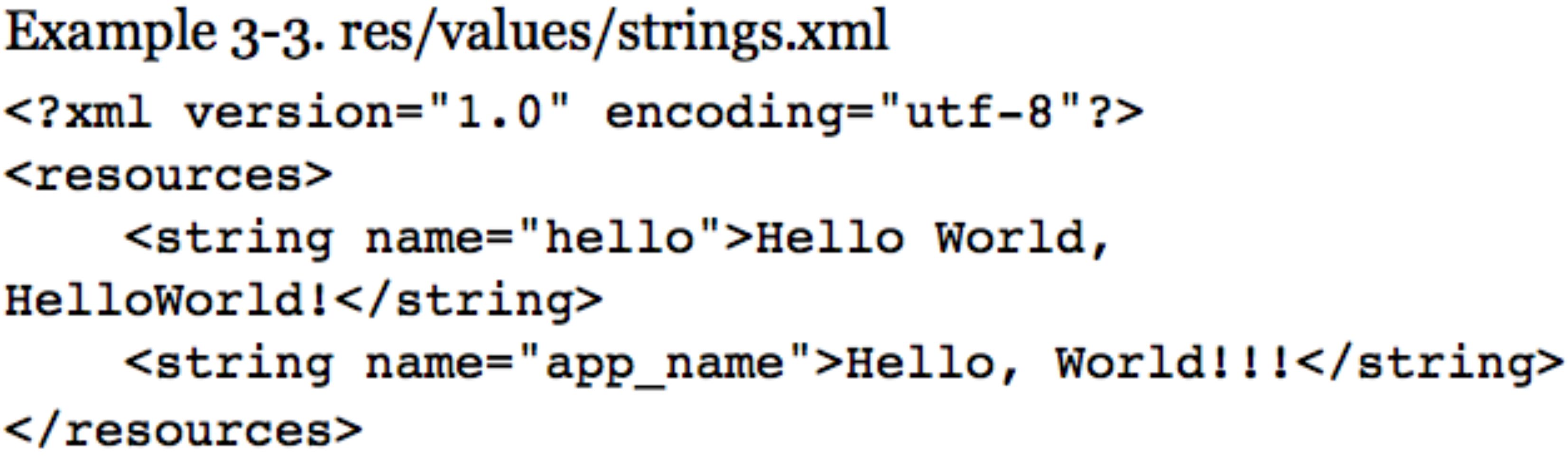


Example 3-2. res/layout/main.xml

```
<?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">
        <TextView android:layout_width="fill_parent"
                android:layout_height="wrap_content"
android:text="@string/hello" />
</LinearLayout>
```

- Layout da tela da App
  - *res/layout/main.xml*
  - *Carregado por HelloWorld.java*

Strings



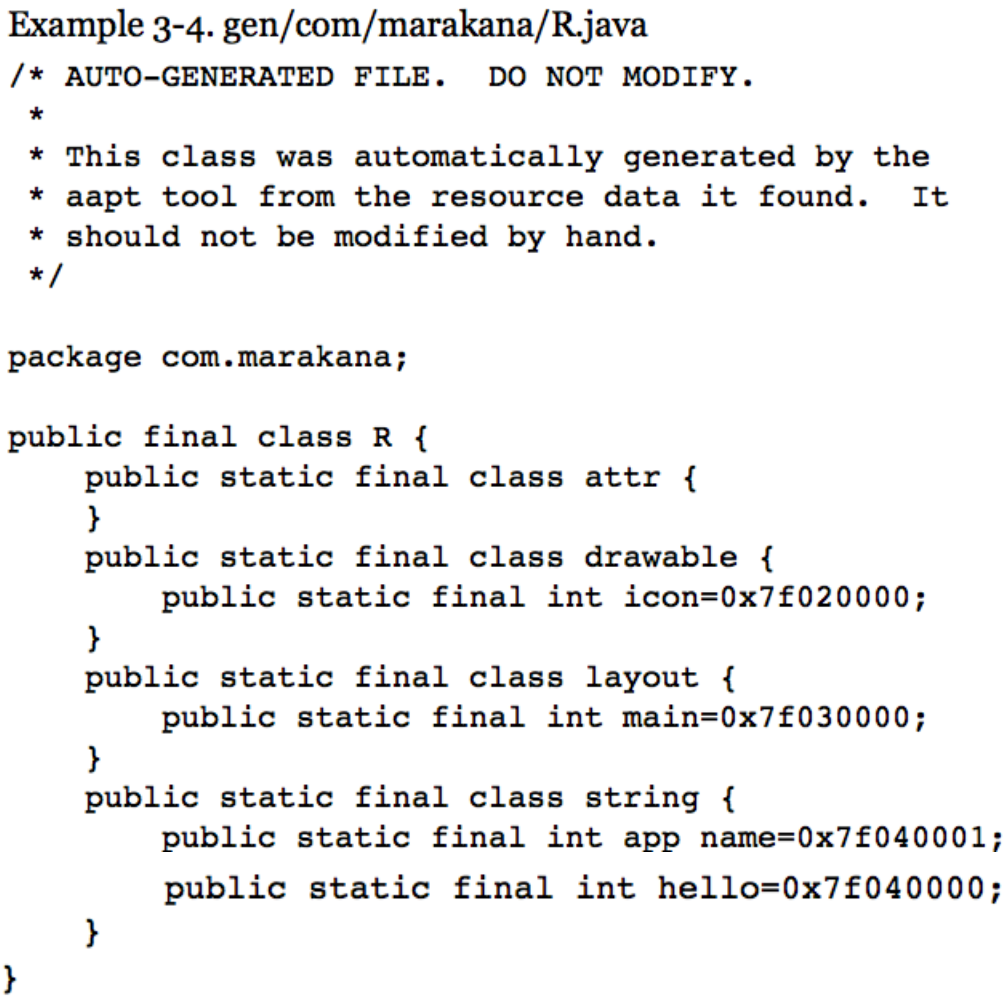
Example 3-3. res/values/strings.xml

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <string name="hello">Hello World,
HelloWorld!</string>
    <string name="app_name">Hello, World!!!</string>
</resources>
```

- Contém todo o texto da aplicação
  - *res/values/strings.xml*
  - Nomes de: *buttons, labels, default text, etc.*

The R File

- Conecta Java a Resources
  - Gerado automaticamente
  - Recriado quando modifica pasta *res*
  - Por exemplo, quando adiciona uma imagem ou XLM



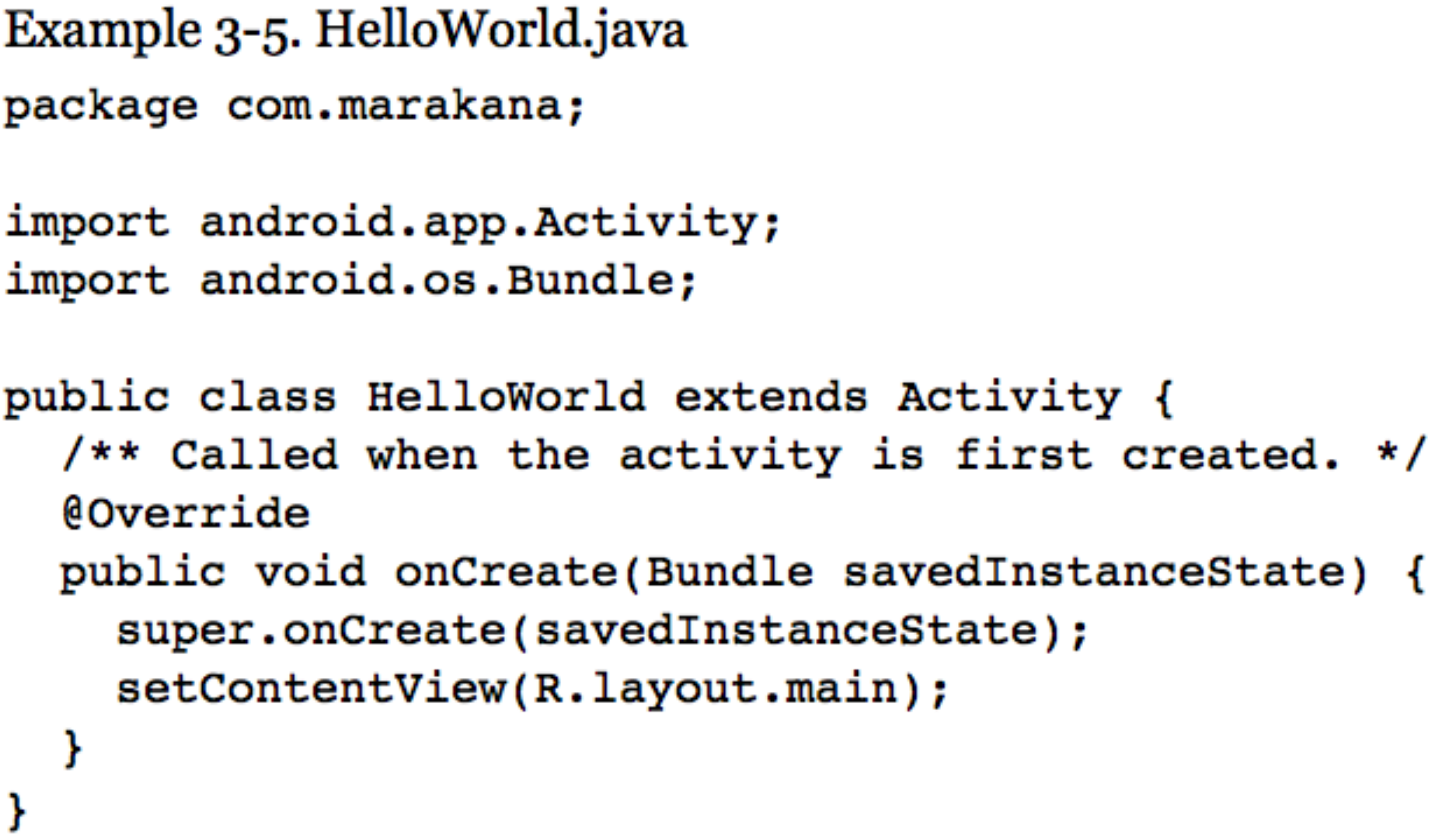
Example 3-4. gen/com/marakana/R.java

```
/* AUTO-GENERATED FILE.  DO NOT MODIFY.
 *
 * This class was automatically generated by the
 * aapt tool from the resource data it found.  It
 * should not be modified by hand.
 */

package com.marakana;

public final class R {
    public static final class attr {
    }
    public static final class drawable {
        public static final int icon=0x7f020000;
    }
    public static final class layout {
        public static final int main=0x7f030000;
    }
    public static final class string {
        public static final int app name=0x7f040001;
        public static final int hello=0x7f040000;
    }
}
```

Java Source Code



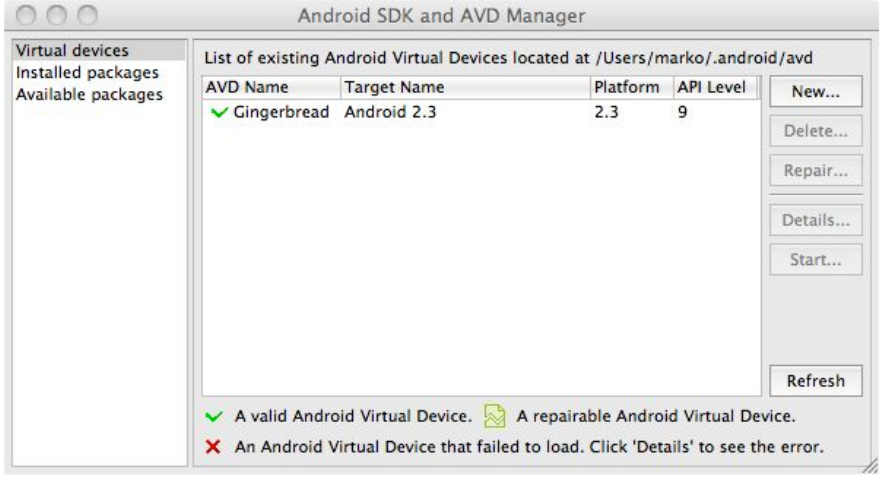
Example 3-5. HelloWorld.java

```
package com.marakana;

import android.app.Activity;
import android.os.Bundle;

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

Emulator



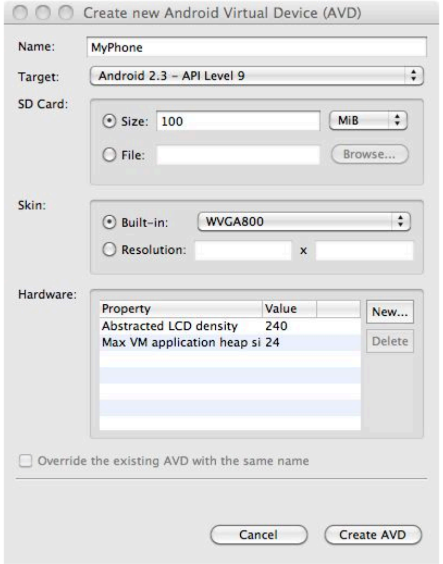
Android SDK and AVD Manager

Virtual devices
Installed packages
Available packages

List of existing Android Virtual Devices located at /Users/marko/.android/avd

AVD Name	Target Name	Platform	API Level
✓ Gingerbread	Android 2.3	2.3	9

✓ A valid Android Virtual Device. A repairable Android Virtual Device.
✗ An Android Virtual Device that failed to load. Click 'Details' to see the error.



Create new Android Virtual Device (AVD)

Name: MyPhone
Target: Android 2.3 – API Level 9
SD Card:
● Size: 100 MiB
○ File:
Skin:
● Built-in: WVGA800
○ Resolution: x
Hardware:

Property	Value
Abstracted LCD density	240
Max VM application heap si	24

□ Override the existing AVD with the same name

- Criando um Android Virtual Device (AVD)
  - Acionar Android SDK and AVD Manager: botão Eclipse
  - New… dar um nome para o AVD, e escolher plataforma alvo
  - Escolher, por exemplo, Android 2.3 – API level 9
  - Um AVD precisa de um *SD card*, escolha um tamanho em MB, e crie…

Emulator - Execução

- Aparece o deu AVD na lista
- Inicialize e ele aparece!!!

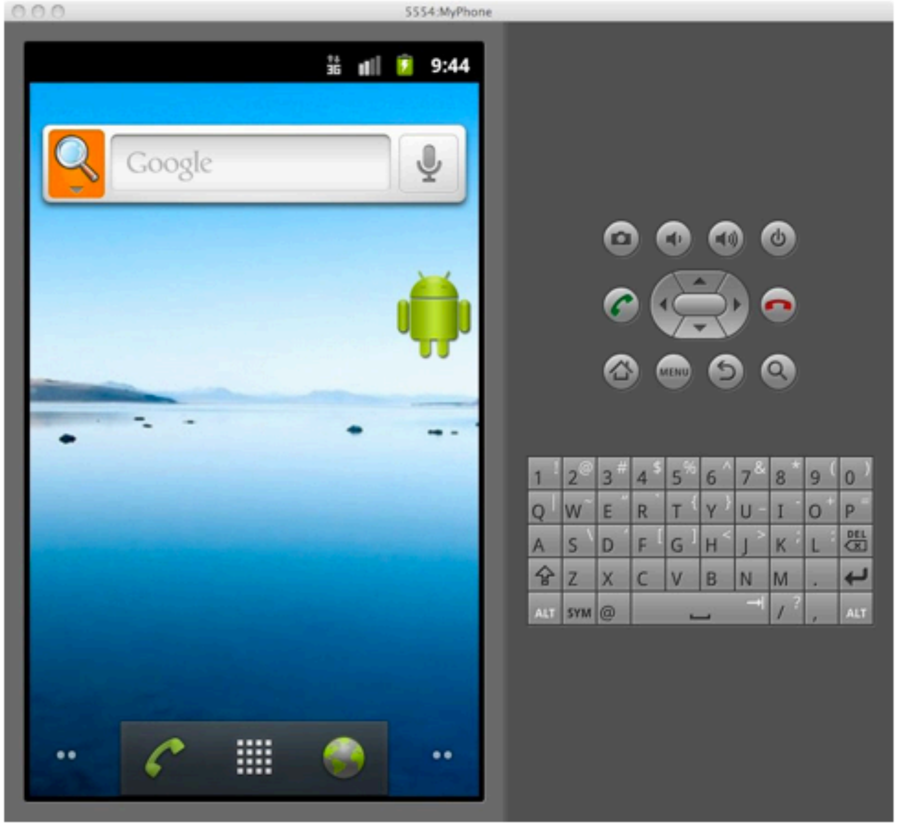


Figure 3-5. Emulator

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