

User Interaction: Intro to Android

Assoc. Professor Donald J. Patterson
INF 133 Fall 2013



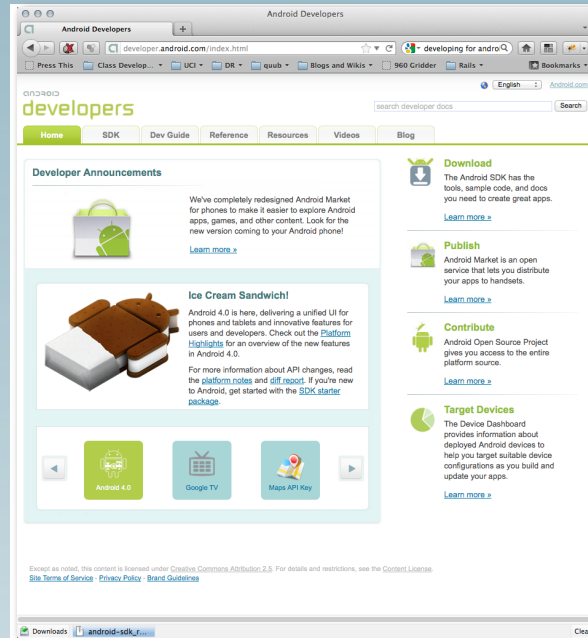
Intro to Android



<http://developer.android.com/guide/index.html>

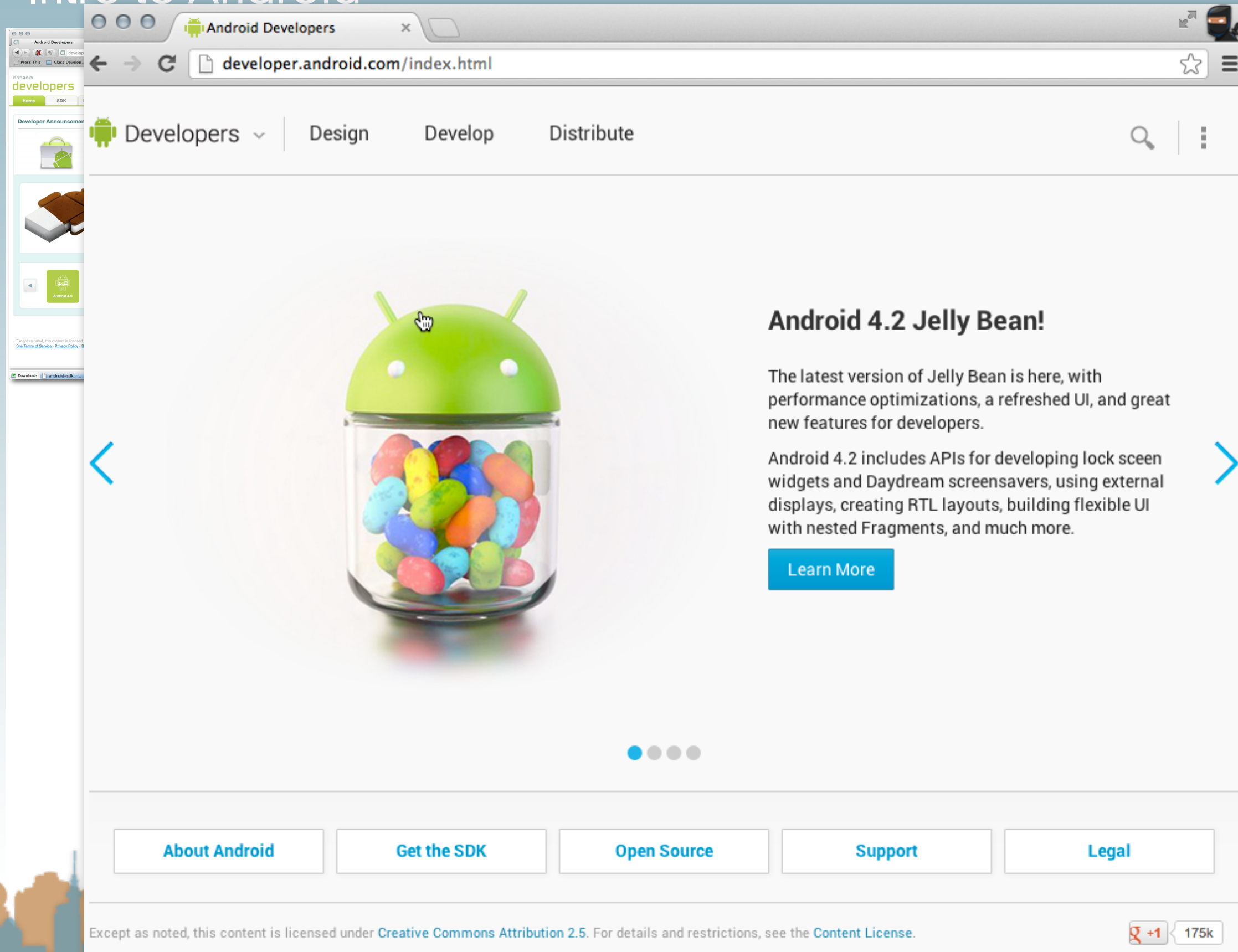
The screenshot shows a browser window titled "Android Developers" with the URL "developer.android.com/index.html". The page features a navigation menu with "Home", "SDK", "Dev Guide", "Reference", "Resources", "Videos", and "Blog". The main content area includes "Developer Announcements" with a shopping bag icon and text about the redesigned Android Market. Below this is a large section for "Ice Cream Sandwich!" featuring an Android robot made of ice cream sandwiches, with text about Android 4.0 and links to "Platform Highlights", "platform notes", "diff report", and "SDK starter package". A carousel at the bottom highlights "Android 4.0", "Google TV", and "Maps API Key". On the right side, there are four sections: "Download" (with a download icon), "Publish" (with a shopping bag icon), "Contribute" (with a robot icon), and "Target Devices" (with a pie chart icon). Each section includes a brief description and a "Learn more" link. At the bottom of the page, there is a copyright notice and links for "Site Terms of Service", "Privacy Policy", and "Brand Guidelines". The browser's download bar at the bottom shows a file named "android-sdk_r..." in the "Downloads" folder.

Intro to Android



<http://developer.android.com/guide/index.html>

Intro to Android



The screenshot shows a web browser window with the URL `developer.android.com/index.html`. The page features a navigation menu with 'Developers', 'Design', 'Develop', and 'Distribute'. The main content area is titled 'Android 4.2 Jelly Bean!' and includes a large image of the green Android robot head on top of a glass jar filled with colorful jelly beans. To the right of the image, there is a text block describing the new version and a 'Learn More' button. At the bottom of the page, there are five buttons: 'About Android', 'Get the SDK', 'Open Source', 'Support', and 'Legal'. A footer contains a Creative Commons license notice and a Google+ social share button showing 175k shares.

Android Developers

developer.android.com/index.html

Developers | Design | Develop | Distribute

Android 4.2 Jelly Bean!

The latest version of Jelly Bean is here, with performance optimizations, a refreshed UI, and great new features for developers.

Android 4.2 includes APIs for developing lock screen widgets and Daydream screensavers, using external displays, creating RTL layouts, building flexible UI with nested Fragments, and much more.

[Learn More](#)

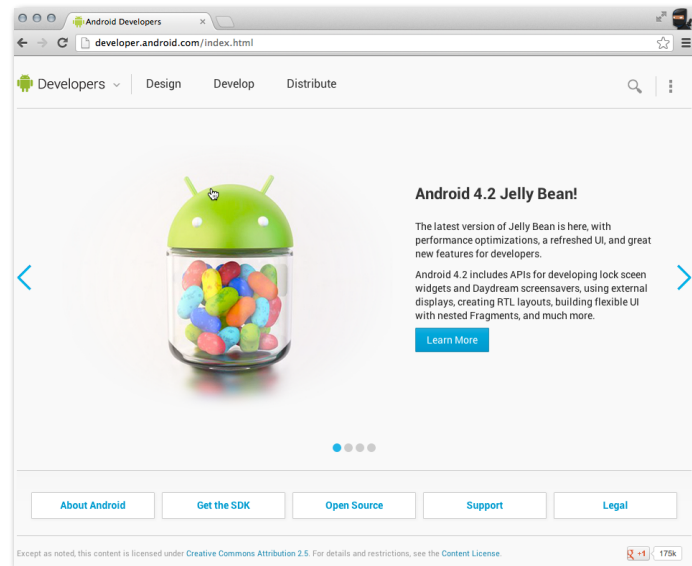
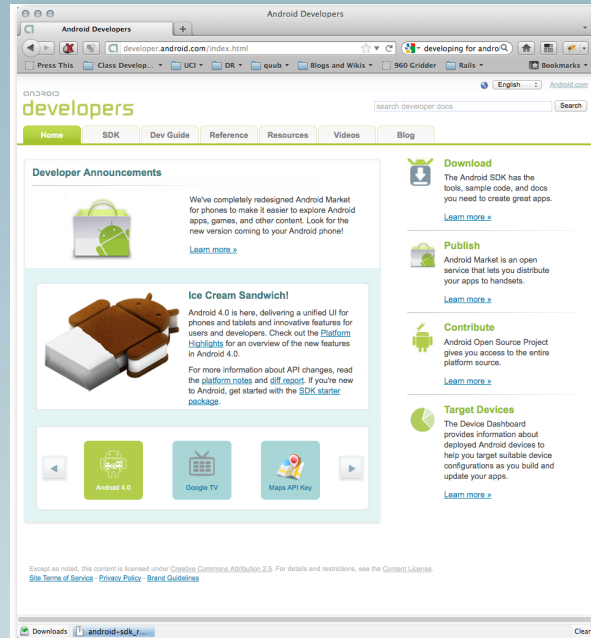
[About Android](#) [Get the SDK](#) [Open Source](#) [Support](#) [Legal](#)

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[+1](#) 175k

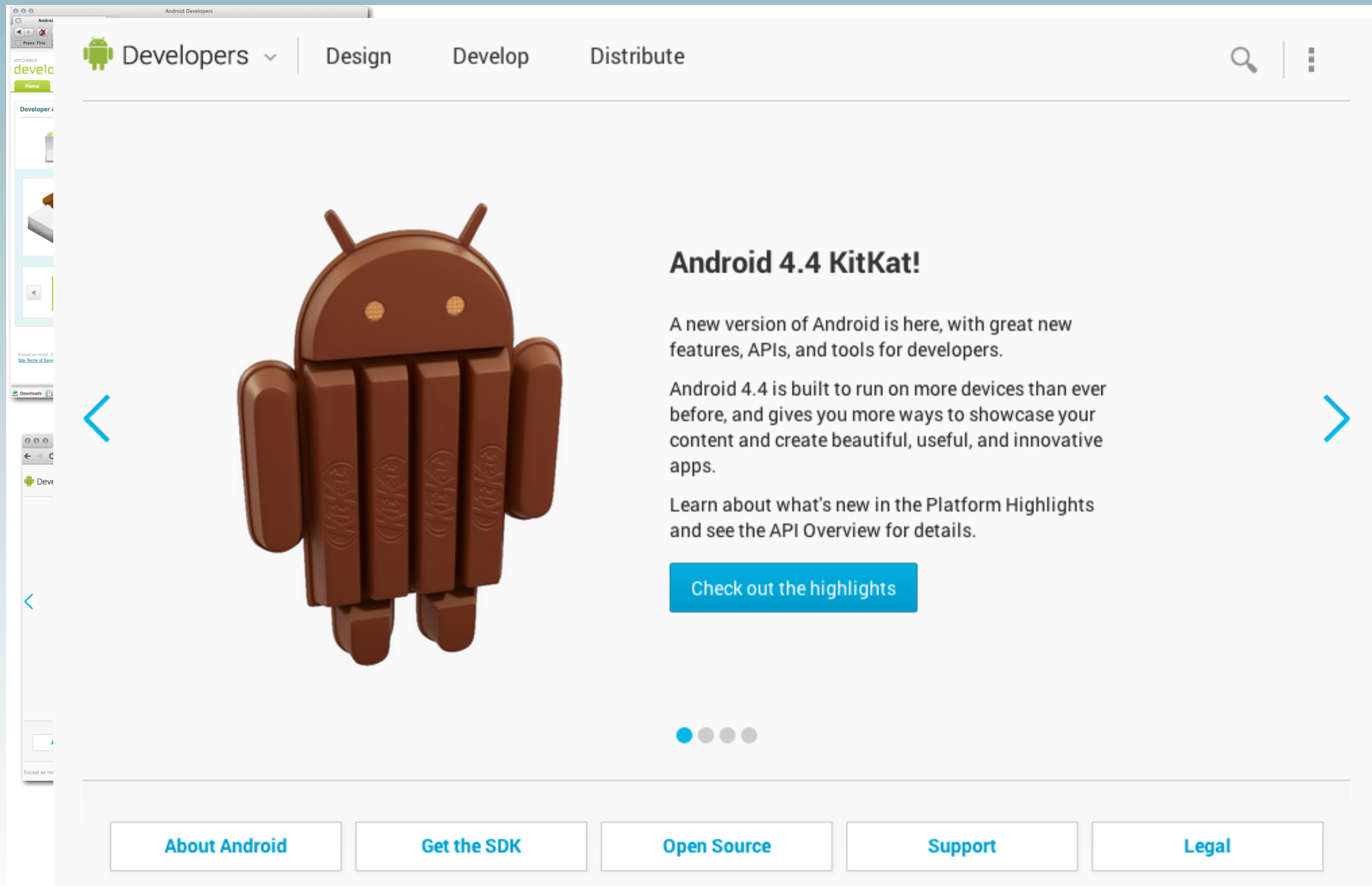
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Intro to Android



<http://developer.android.com/guide/index.html>

Intro to Android



The screenshot shows the Android Developers website with a navigation bar at the top containing 'Developers', 'Design', 'Develop', and 'Distribute'. The main content area features a large image of the Android 4.4 KitKat mascot, a brown chocolate figure. To the right of the mascot, the text reads: 'Android 4.4 KitKat! A new version of Android is here, with great new features, APIs, and tools for developers. Android 4.4 is built to run on more devices than ever before, and gives you more ways to showcase your content and create beautiful, useful, and innovative apps. Learn about what's new in the Platform Highlights and see the API Overview for details.' Below this text is a blue button labeled 'Check out the highlights'. At the bottom of the page, there are five navigation buttons: 'About Android', 'Get the SDK', 'Open Source', 'Support', and 'Legal'.

Android Developers | Design | Develop | Distribute

Android 4.4 KitKat!

A new version of Android is here, with great new features, APIs, and tools for developers.

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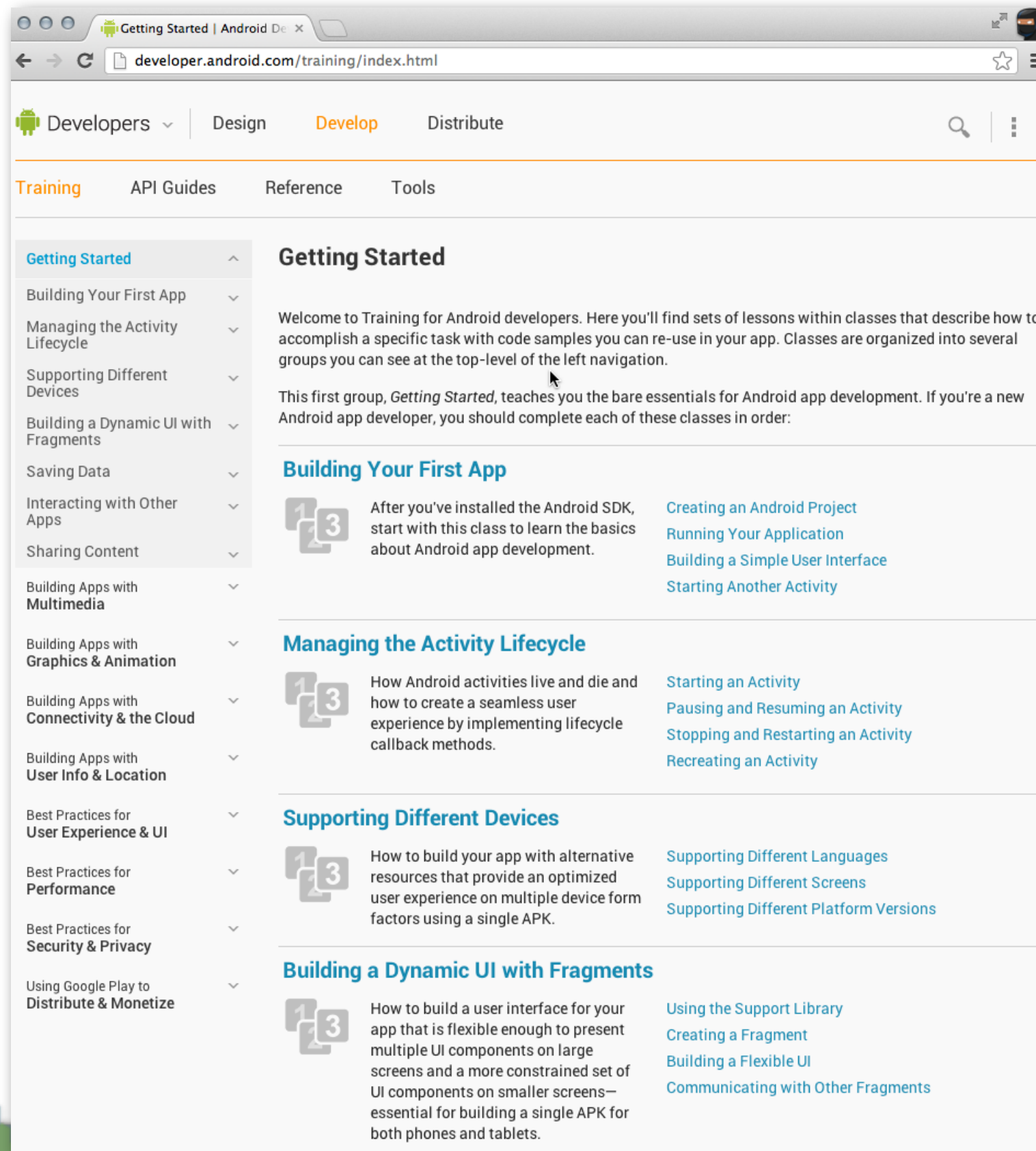
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[Check out the highlights](#)

[About Android](#) | [Get the SDK](#) | [Open Source](#) | [Support](#) | [Legal](#)

<http://developer.android.com/guide/index.html>

Intro to Android



The screenshot shows a web browser window displaying the Android Developer Training page. The browser's address bar shows the URL `developer.android.com/training/index.html`. The page features a navigation menu with categories like 'Design', 'Develop', and 'Distribute'. The 'Training' section is expanded, showing a list of topics on the left and detailed content for 'Getting Started' on the right. The 'Getting Started' section includes a welcome message and a list of sub-topics: 'Building Your First App', 'Managing the Activity Lifecycle', 'Supporting Different Devices', and 'Building a Dynamic UI with Fragments'. Each sub-topic is accompanied by a brief description and a list of related articles.

Getting Started | Android De x

developer.android.com/training/index.html

Developers | Design | **Develop** | Distribute

Training | API Guides | Reference | Tools

Getting Started

Welcome to Training for Android developers. Here you'll find sets of lessons within classes that describe how to accomplish a specific task with code samples you can re-use in your app. Classes are organized into several groups you can see at the top-level of the left navigation.

This first group, *Getting Started*, teaches you the bare essentials for Android app development. If you're a new Android app developer, you should complete each of these classes in order:

Building Your First App

After you've installed the Android SDK, start with this class to learn the basics about Android app development.

- [Creating an Android Project](#)
- [Running Your Application](#)
- [Building a Simple User Interface](#)
- [Starting Another Activity](#)

Managing the Activity Lifecycle

How Android activities live and die and how to create a seamless user experience by implementing lifecycle callback methods.

- [Starting an Activity](#)
- [Pausing and Resuming an Activity](#)
- [Stopping and Restarting an Activity](#)
- [Recreating an Activity](#)

Supporting Different Devices

How to build your app with alternative resources that provide an optimized user experience on multiple device form factors using a single APK.

- [Supporting Different Languages](#)
- [Supporting Different Screens](#)
- [Supporting Different Platform Versions](#)

Building a Dynamic UI with Fragments

How to build a user interface for your app that is flexible enough to present multiple UI components on large screens and a more constrained set of UI components on smaller screens—essential for building a single APK for both phones and tablets.

- [Using the Support Library](#)
- [Creating a Fragment](#)
- [Building a Flexible UI](#)
- [Communicating with Other Fragments](#)

<http://developer.android.com/training/index.html>



- SDK (Software development kit)
- AVD (Android Virtual Device)
- .apk (Android application package file)
- “platform”: Gingerbread v2.3.6 / v2.3.4 is our target
- ADT (Android Development Tools) Eclipse plug-ins plus command line tools

Intro to Android - Development Environment Progression

- Eclipse - DIY
 - Download Eclipse
 - Install all the pieces on top of your Eclipse install
- Eclipse - Prebuilt with all the Android tools already there
 - Lives alongside other installations of Eclipse
- Android Studio
 - Based on the IntelliJ IDE
 - Looks like it is the future of Android Development
 - Not ready for prime-time use yet



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Actually Developing for Android 2.3.6

- Requirements
- SDK/AVD
- Eclipse Plug-in
- Hello World

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Intro to Android: Requirements

- OS
 - Windows XP (32), Vista (32/64) or Windows 7 (32/64)
 - Mac OS 10.5.8 or later (Leopard, x86 only)
 - Linux (e.g., Ubuntu Lucid Lynx (32))
- IDE
 - Eclipse 3.5 or greater
 - “Eclipse IDE for Java Developers” (for example)
- Java
 - JDK 5 or 6 (1.5 or 1.6 (not just JRE!))

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Intro to Android: SDK

- **Recommended:** Download and unpack the appropriate “Android SDK /ADT bundle”

Platform	Package	Size	MD5 Checksum
Windows 32-bit	adt-bundle-windows-x86.zip	417851015 bytes	42d9a6c15113d405a97eed05e6d42e2b
Windows 64-bit	adt-bundle-windows-x86_64.zip	417851515 bytes	73bdd1168fce0e36a27255a4335c865d
Mac OS X 64-bit	adt-bundle-mac-x86_64.zip	382957959 bytes	a320f8bbaee8572a36e68c434564bdd0
Linux 32-bit	adt-bundle-linux-x86.zip	411065882 bytes	39687b06fedfea7487ff0824a4d32ee8
Linux 64-bit	adt-bundle-linux-x86_64.zip	411217430 bytes	b0590fe9c1533da9b20ea65525b77677

- This is the SDK and a version of eclipse all set up and ready to go

Intro to Android: SDK

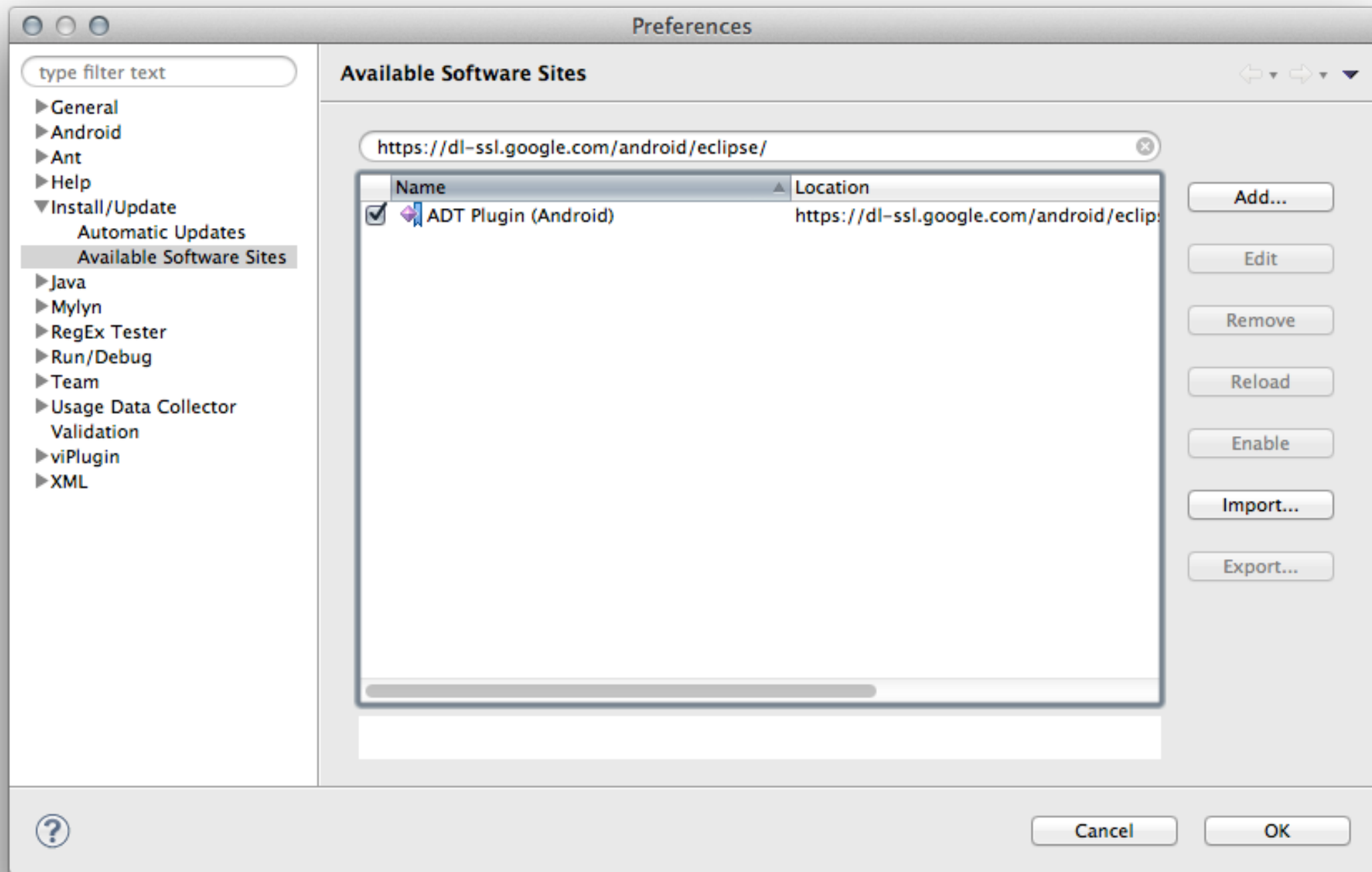
- **Alternative:** This is just the SDK if you want to add Android to an existing Eclipse IDE installation

SDK Tools Only			
Platform	Package	Size	MD5 Checksum
Windows	android-sdk_r21-windows.zip	99093893 bytes	7311452823470365f7975a545f8a2be4
	installer_r21-windows.exe (Recommended)	77523031 bytes	29ca8cb8f0bc8db627fa2adc2139a3cc
Mac OS X	android-sdk_r21-macosx.zip	65792626 bytes	67e46adca90dd18d7291443f6c15d6af
Linux	android-sdk_r21-linux.tgz	91378351 bytes	7f8d73b629f808cdcfc9f9900bbd7580

- Download and unpack the appropriate “Android SDK”

<http://developer.android.com/sdk/index.html>

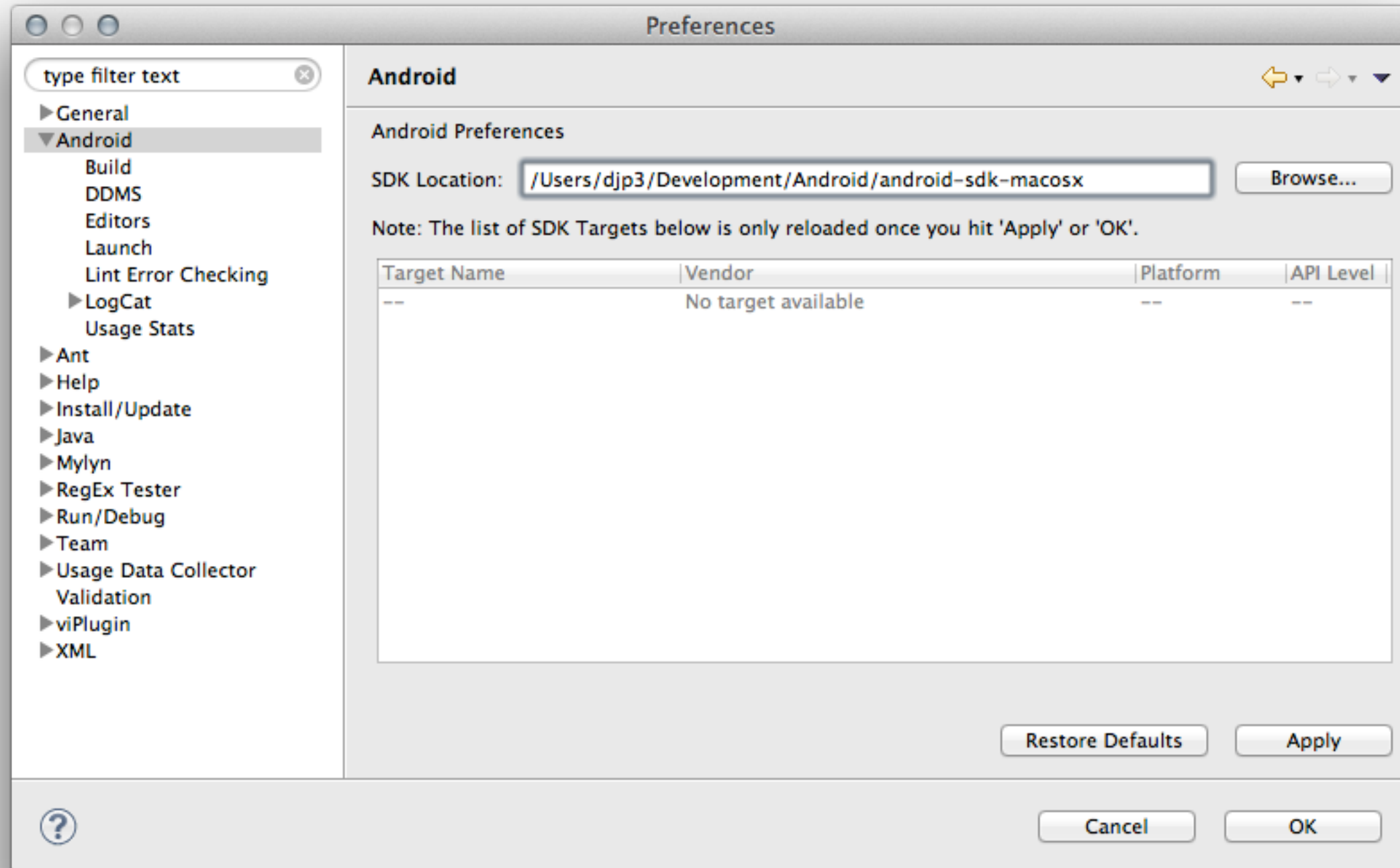
- **Alternative:** Install the Eclipse Android ADT tools



Intro to Android: Eclipse Plug-in

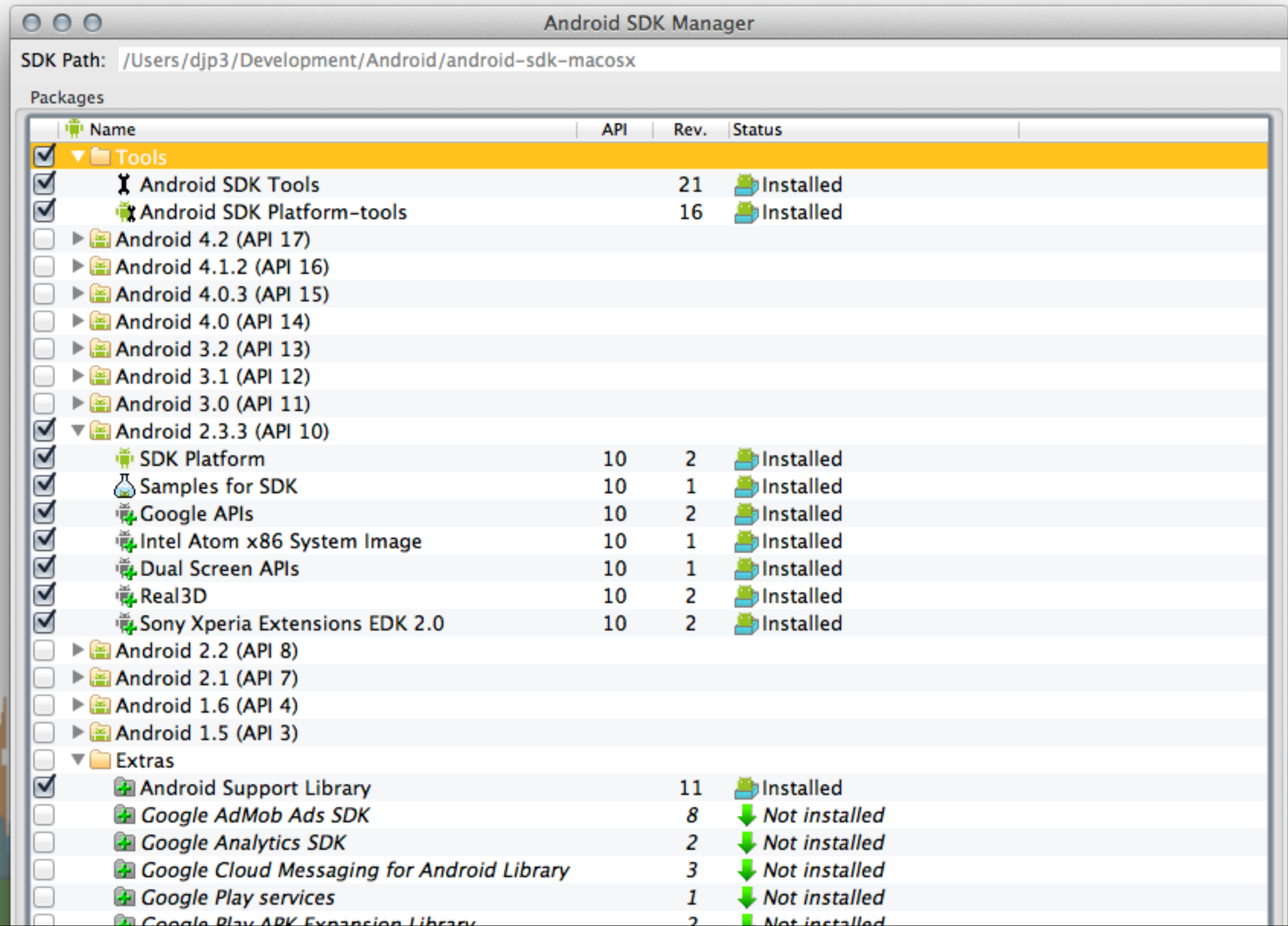
- The Eclipse Plug-in is called the “ADT”
 - Android Development Tools
 - Support for menu options in Eclipse which support
 - Automatically building Android projects
 - User-Interface building for Android
 - Debugging support for Android
 - Packaging files for the Android Market (.apk files)
- **Alternative:** The ADT is installed from within Eclipse

- **Alternative:** Restart Eclipse and load the SDK location



Intro to Android: SDK

- **Both:** Pick which platform you are developing for



Intro to Android: SDK

- **Both:** Restart Eclipse after installing the SDKs
- This is a snapshot of what worked for me.

The screenshot shows the Android SDK Manager window with the following details:

- SDK Path:** /Users/djp3/temp/adt-bundle-mac-x86_64-20131030/sdk
- Table of Packages:**

Name	API	Rev.	Status
Tools			
Android SDK Tools		22.3	Installed
Android SDK Platform-tools		19	Installed
Android SDK Build-tools		19	Installed
Android SDK Build-tools		18.1.1	Installed
Android SDK Build-tools		18.1	Not installed
Android SDK Build-tools		18.0.1	Not installed
Android SDK Build-tools		17	Not installed
Android 4.4 (API 19)			
Documentation for Android SDK	19	1	Not installed
SDK Platform	19	1	Installed
Samples for SDK	19	1	Not installed
ARM EABI v7a System Image	19	1	Installed
Google APIs	19	1	Not installed
Sources for Android SDK	19	1	Not installed
Android 4.3 (API 18)			
Android 4.2.2 (API 17)			
Android 4.1.2 (API 16)			
Android 4.0.3 (API 15)			
Android 4.0 (API 14)			
Android 3.2 (API 13)			
Android 3.1 (API 12)			
Android 3.0 (API 11)			
Android 2.3.3 (API 10)			
SDK Platform	10	2	Installed
Samples for SDK	10	1	Installed
Intel x86 Atom System Image	10	2	Installed
Google APIs	10	2	Installed
Android 2.2 (API 8)			
Android 2.1 (API 7)			
Android 1.6 (API 4)			
Android 1.5 (API 3)			
Extras			
Android Support Repository		3	Installed
Android Support Library		19	Installed
Google AdMob Ads SDK		11	Not installed
Google Analytics App Tracking SDK		3	Not installed
[Deprecated] Google Cloud Messaging for An		3	Not installed
Google Play services for Froyo		12	Not installed
Google Play services		13	Not installed
Google Repository		4	Not installed
Google Play APK Expansion Library		3	Not installed
Google Play Billing Library		5	Not installed
Google Play Licensing Library		2	Not installed
Google USB Driver		8	Not compatible with Mac C
Google Web Driver		2	Not installed
Intel x86 Emulator Accelerator (HAXM)		3	Installed

At the bottom of the window, there are controls for filtering and sorting packages:

- Show:** Updates/New Installed Obsolete [Select New or Updates](#)
- Sort by:** API level Repository [Deselect All](#)
- [Install packages...](#) [Delete packages...](#)

<http://developer.android.com/adt.html>

Intro to Android:

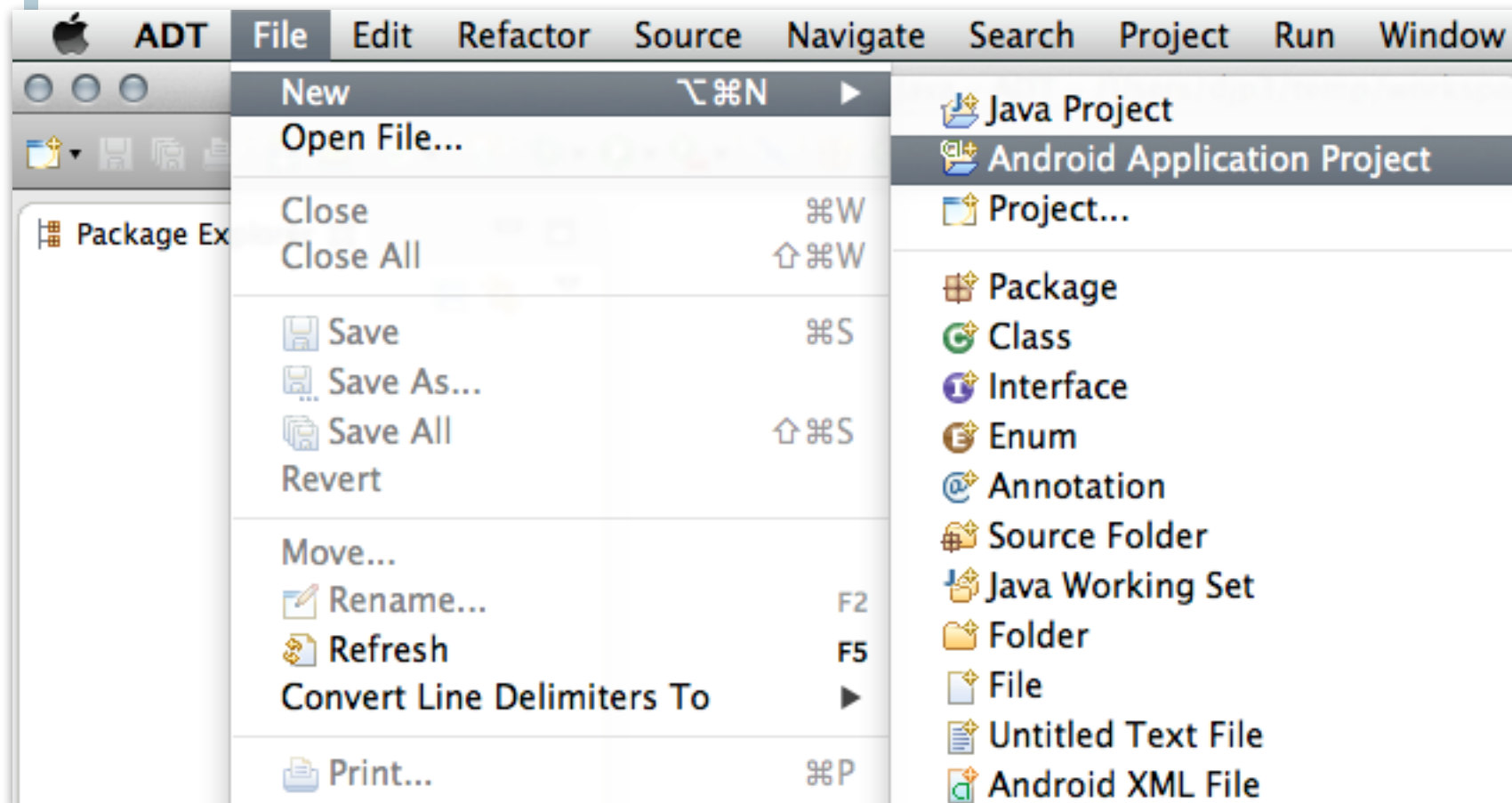
- Set up a project



<http://developer.android.com/sdk/installing/installing-adt.html>

Intro to Android:

- Set up a project




<http://developer.android.com/sdk/installing/installing-adt.html>

Intro to Android:

New Android Application

Creates a new Android Application



Application Name:

Project Name:


Package Name:


Minimum Required SDK:

Target SDK:

Compile With:

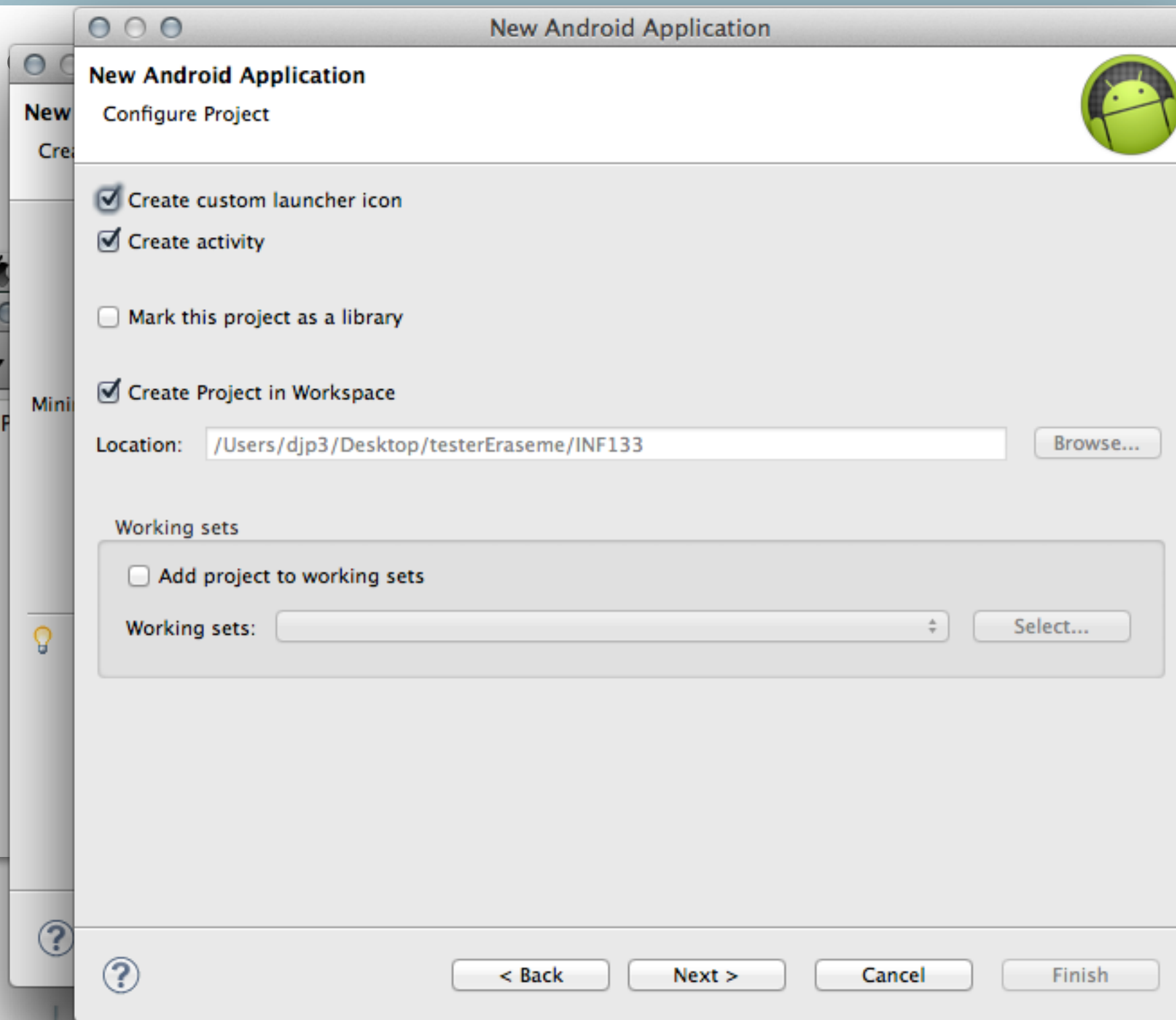
Theme:

 The package name must be a unique identifier for your application. It is typically not shown to users, but it *must* stay the same for the lifetime of your application; it is how multiple versions of the same application are considered the "same app". This is typically the reverse domain name of your organization plus one or more application identifiers, and it must be a valid Java package name.



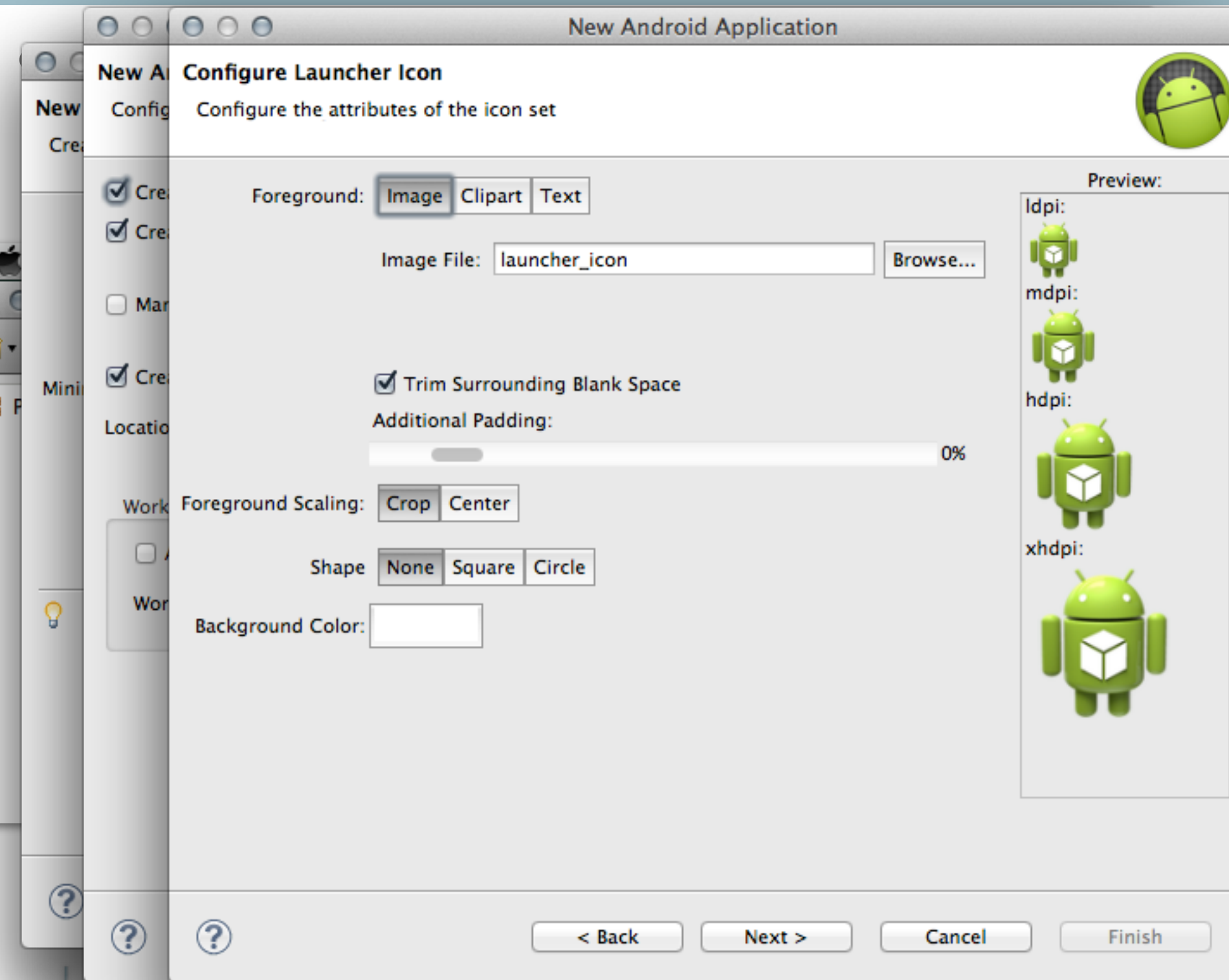
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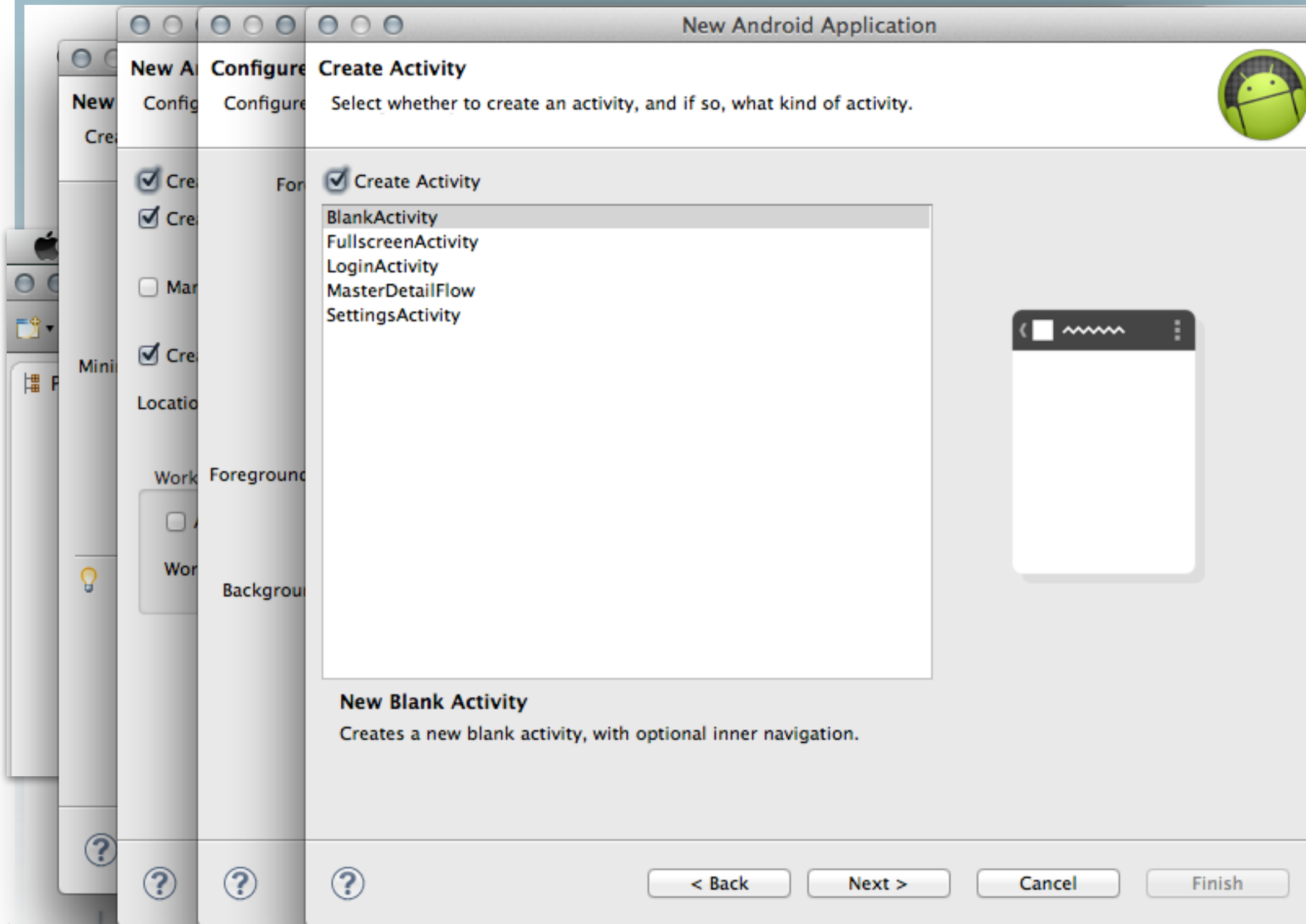
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Intro to Android:

New Android Application

Install Dependencies

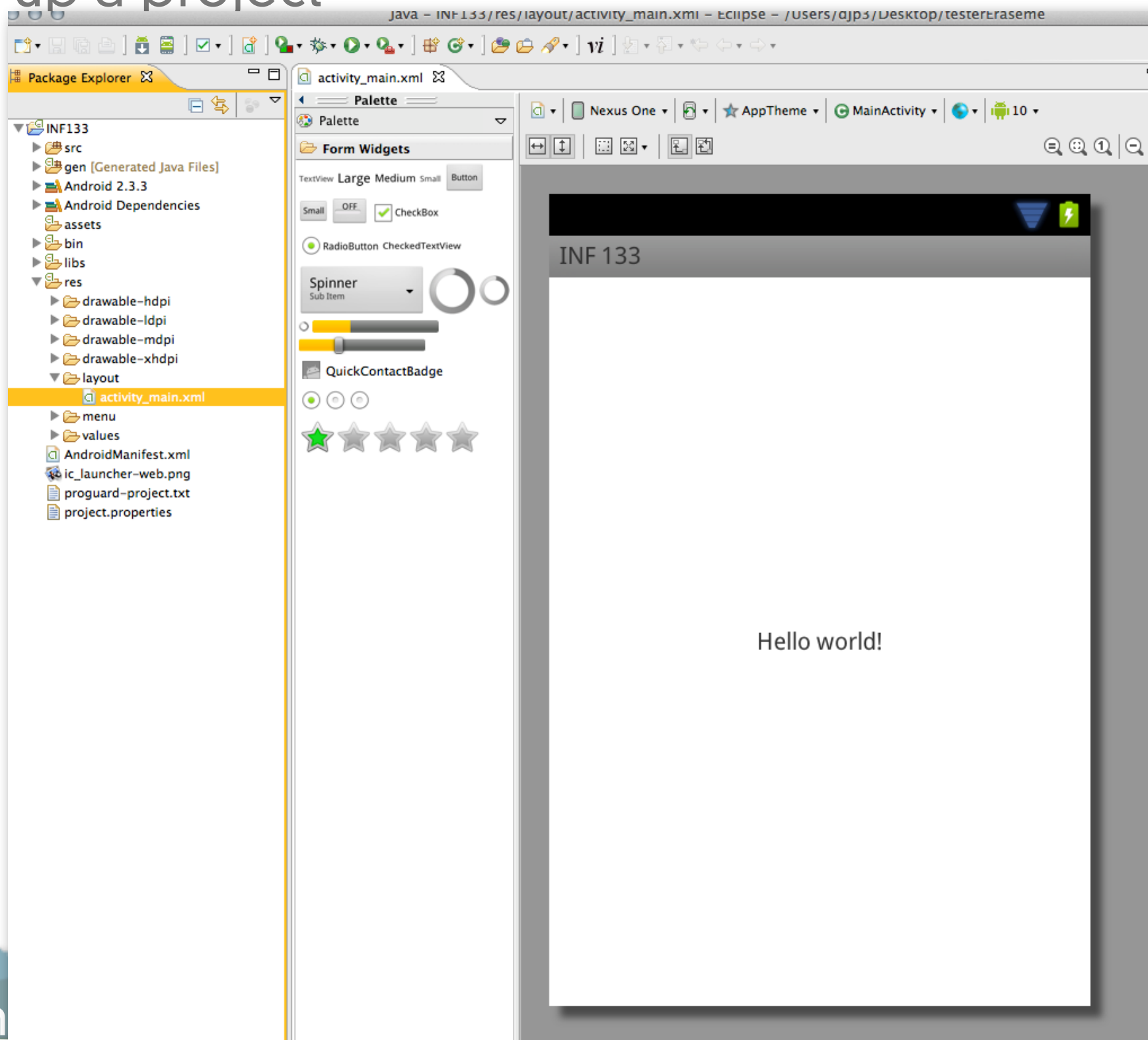
This template depends on the Android Support library, which is either not installed, or the template depends on a more recent version than the one you have installed.

<http://developer.android.com/tools/extras/support-library.html>

Required version: 8
Installed version: 11

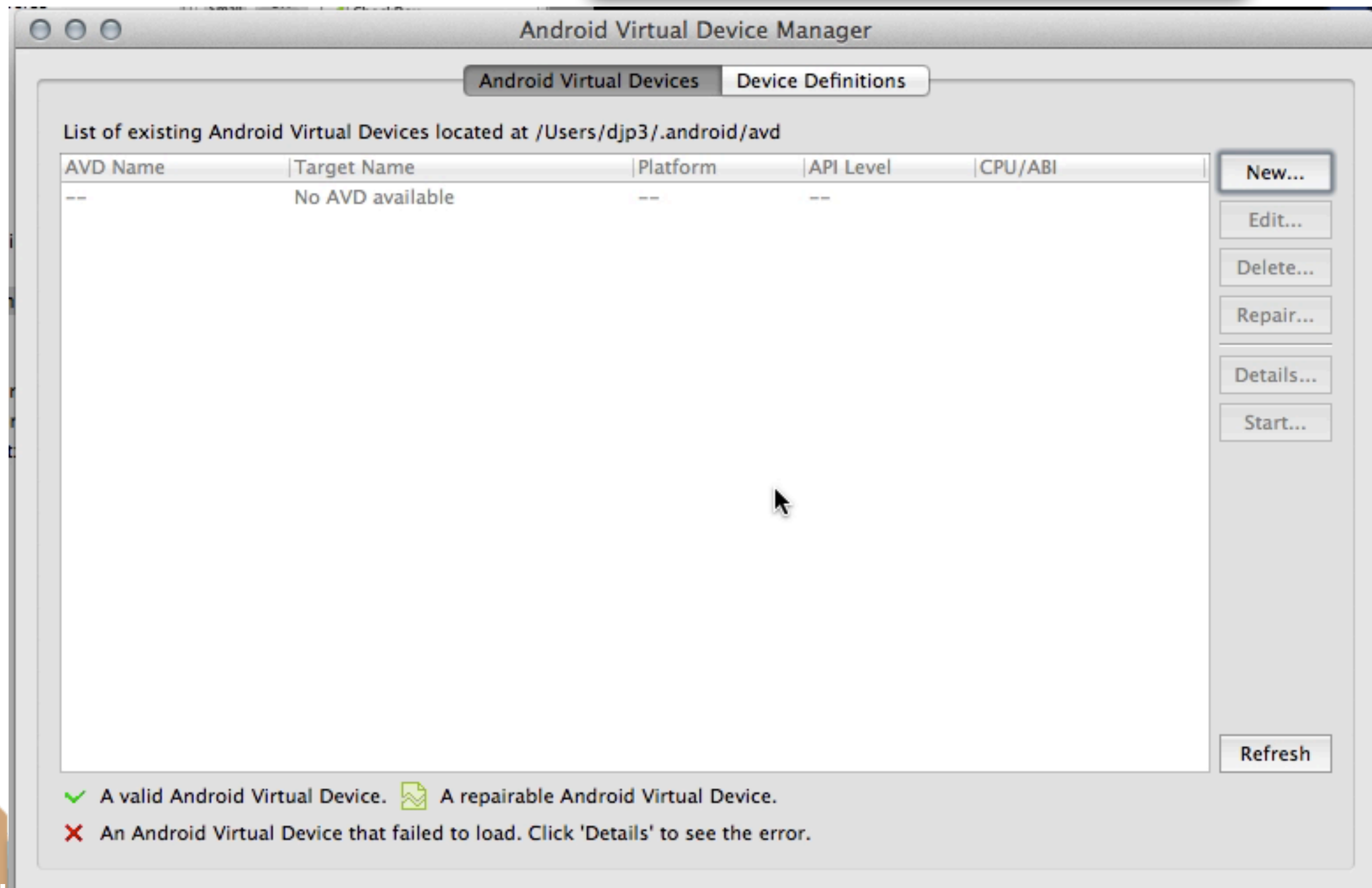
You can install or upgrade it by clicking the Install button below, or alternatively, you can install it outside of Eclipse with the SDK Manager, then click on "Check Again" to proceed.

- Set up a project



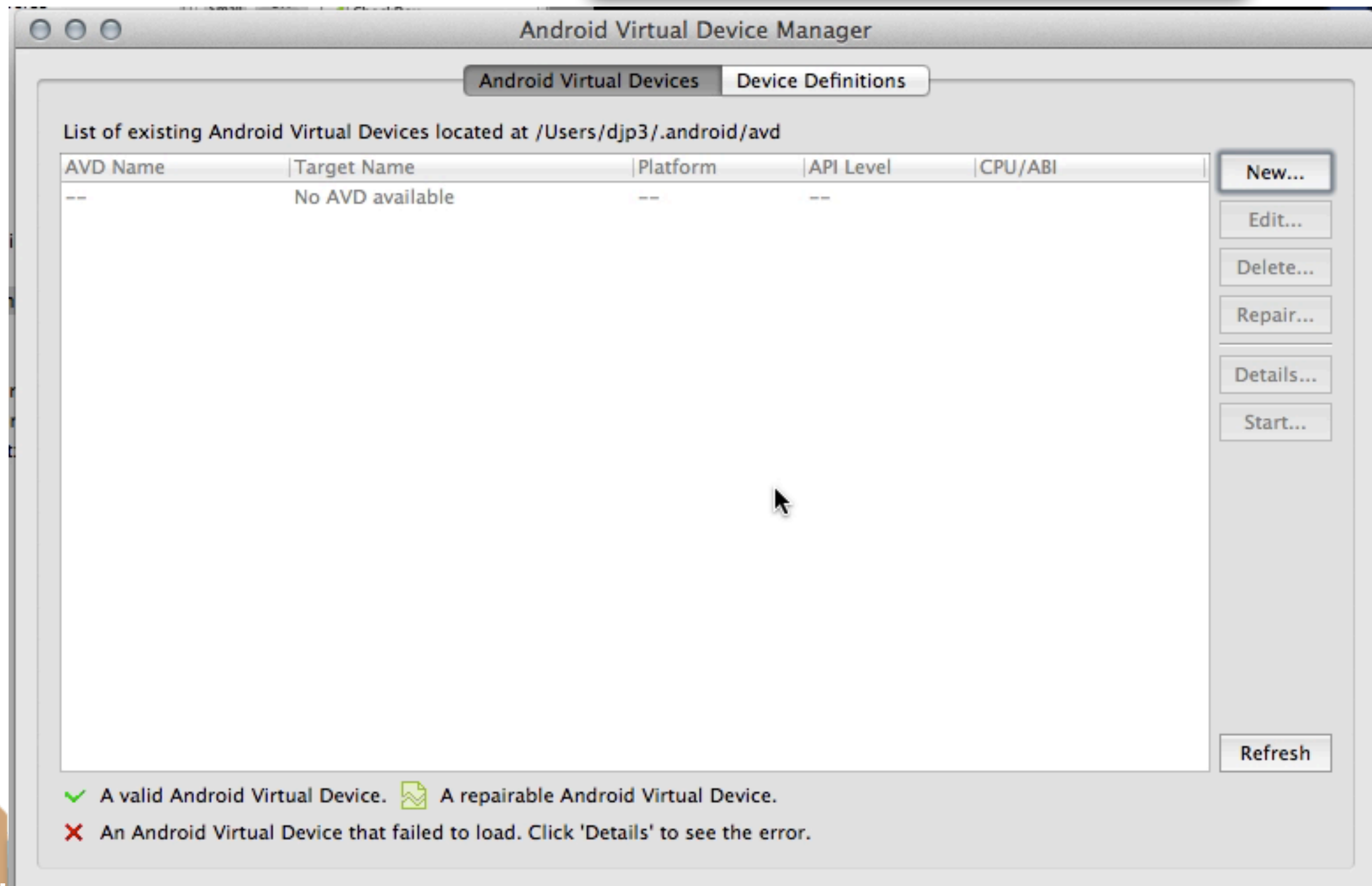
Intro to Android: AVD

- Set up a virtual device



Intro to Android: AVD

- Set up a virtual device

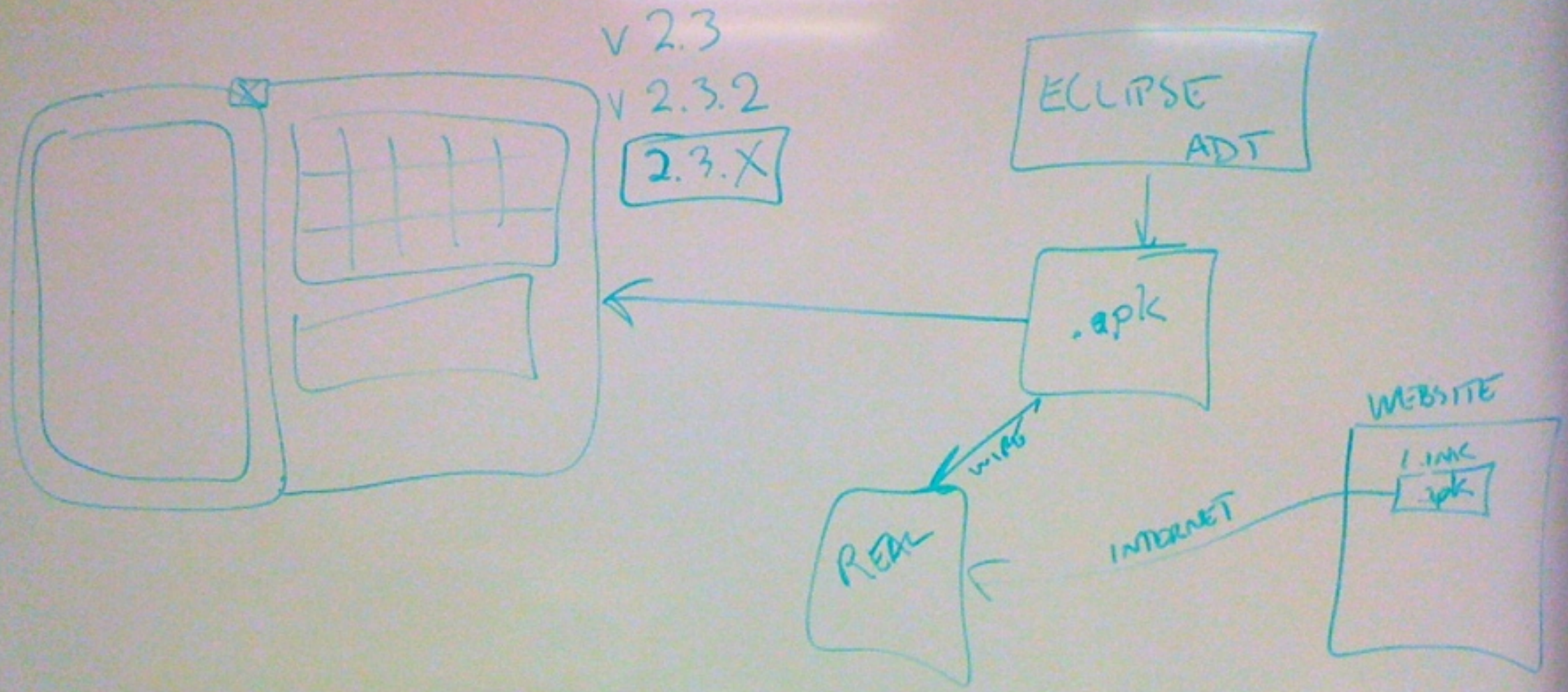


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Hello World

- Create a project
- Build a basic U/I
- Run the Application
- Improve the U/I
- Debug the Application

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Intro to Android: Eclipse Plug-in

The screenshot shows the Eclipse IDE interface with the following components:

- Menu Bar:** Eclipse, File, Edit, Source, Refactor, Navigate, Search, Project, Run, Window, Help.
- Toolbar:** Standard Eclipse development tools like Save, Run, and Undo.
- Package Explorer (Left):** Shows the project structure for 'INF_133', including 'src', 'gen', 'Android 2.3.3', 'assets', 'bin', 'res', 'AndroidManifest.xml', 'proguard.cfg', and 'project.properties'.
- Main Editor (Center):** Displays the code for 'INF_133Activity.java':

```
package edu.uci.ics.luci.inf133;

import android.app.Activity;

public class INF_133Activity extends Activity {
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);
    }
}
```
- Task List (Right):** Contains a 'Connect Mylyn' notification and a search bar.
- Outline (Right):** Shows the class hierarchy: 'edu.uci.ics.luci.inf133' > 'import declarations' > 'INF_133Activity' > 'onCreate(Bundle) : void'.
- Problems (Bottom):** Shows '0 items' in a table with columns: Description, Resource, Path, Location, Type.
- Status Bar (Bottom):** Shows 'Writable', 'Sma...ert', and 'Command mode:'.

Intro to Android: Eclipse Plug-in

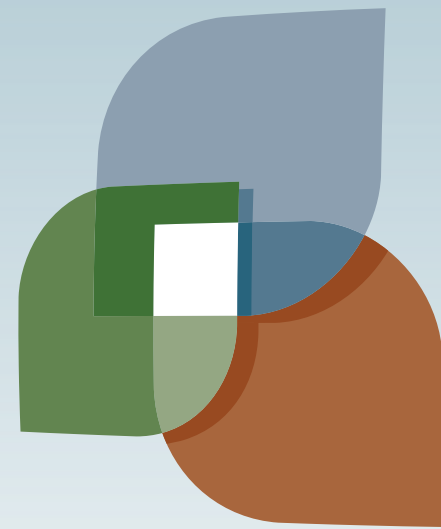
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L U C I

