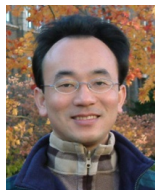




# Social Media Apps Programming

## Developing Android Native Apps with Java (Eclipse) (MIT App Inventor)

1021SMAP03  
TLMXM1A (8687) (M2143) (Fall 2013)  
(MIS MBA) (2 Credits, Elective) [Full English Course]  
Thu 9,10 (16:10-18:00) B310



Min-Yuh Day, Ph.D.  
Assistant Professor

Department of Information Management  
Tamkang University

<http://mail.tku.edu.tw/myday>



# Course Schedule (1/3)

- | Week | Date       | Subject/Topics                                                                  |
|------|------------|---------------------------------------------------------------------------------|
| • 1  | 2013/09/19 | Mid-Autumn Festival (Day off)                                                   |
| • 2  | 2013/09/26 | Course Orientation and Introduction to Social Media and Mobile Apps Programming |
| • 3  | 2013/10/03 | Introduction to Android / iOS Apps Programming                                  |
| • 4  | 2013/10/10 | Double Tenth Day (Day off)                                                      |
| • 5  | 2013/10/17 | Developing Android Native Apps with Java (Eclipse) (MIT App Inventor)           |
| • 6  | 2013/10/24 | Developing iPhone / iPad Apps Native Apps with Objective-C (Xcode)              |

# Course Schedule (2/3)

Week    Date    Subject/Topics

- 7    2013/10/31    Mobile Apps using HTML5/CSS3/JavaScript
- 8    2013/11/07    jQuery Mobile
- 9    2013/11/14    Create Hybrid Apps with Phonegap
- 10    2013/11/21    Midterm Exam Week (Midterm Project Report)
- 11    2013/11/28    jQuery Mobile/Phonegap
- 12    2013/12/05    Google App Engine

# Course Schedule (3/3)

Week	Date	Subject/Topics
• 13	2013/12/12	Google Map API
• 14	2013/12/19	Facebook API (Facebook JavaScript SDK) (Integrate Facebook with iOS/Android Apps)
• 15	2013/12/26	Twitter API
• 16	2014/01/02	Case Study on Social Media Apps Programming and Marketing in Google Play and App Store
• 17	2014/01/09	Final Project Presentation
• 18	2014/01/16	Final Exam Week (Final Project Report)

# Outline

- **Developing **Android Native Apps** with **Java****
  - **Eclipse**
  - **Android Developer Tools (**ADT**) Bundle**
  - **Building Your First Android App**
- **MIT App Inventor**

# Introduction to Android /iOS Apps Programming

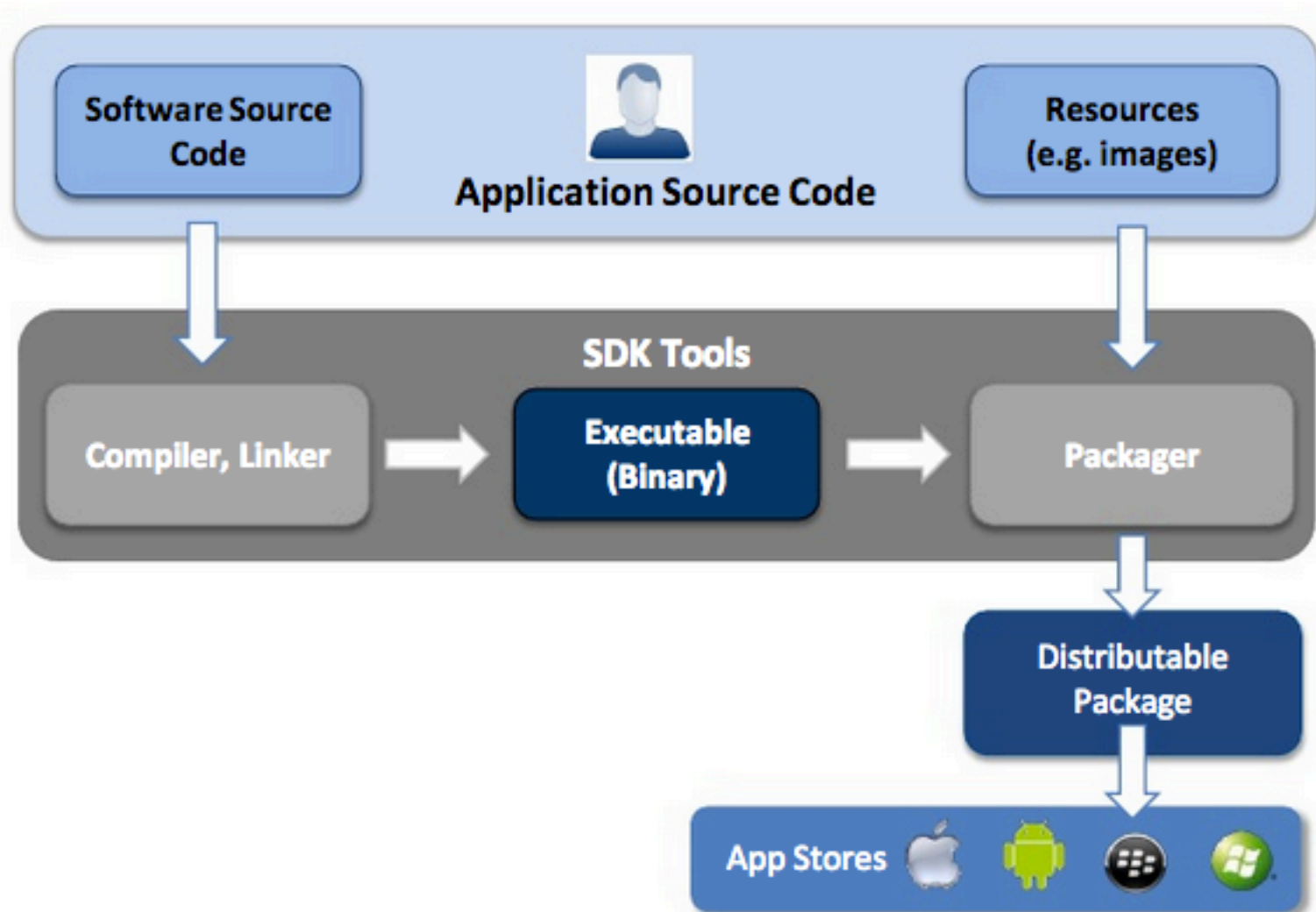
Native Apps

Hybrid Apps

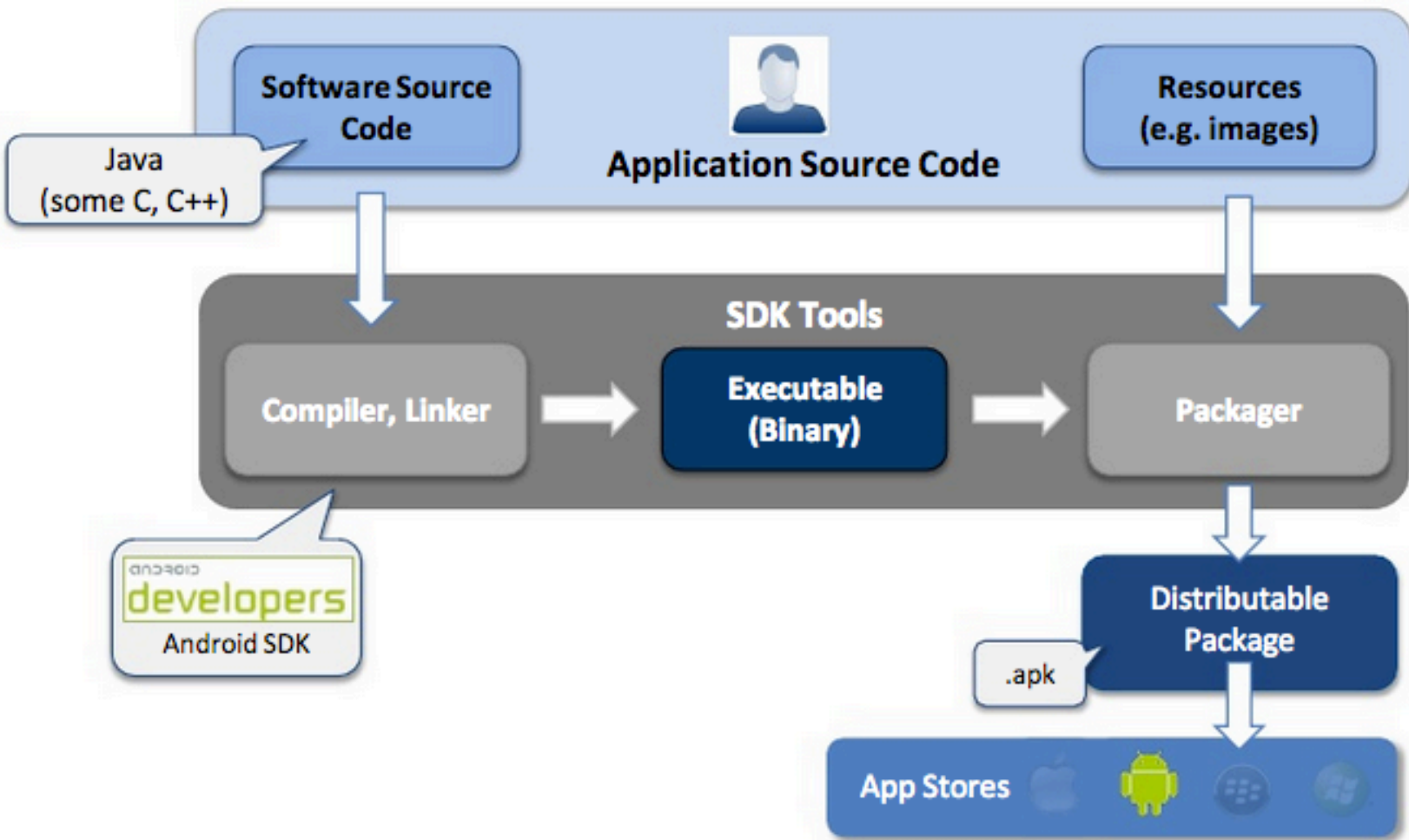
Mobile Web Apps



# Native App Development

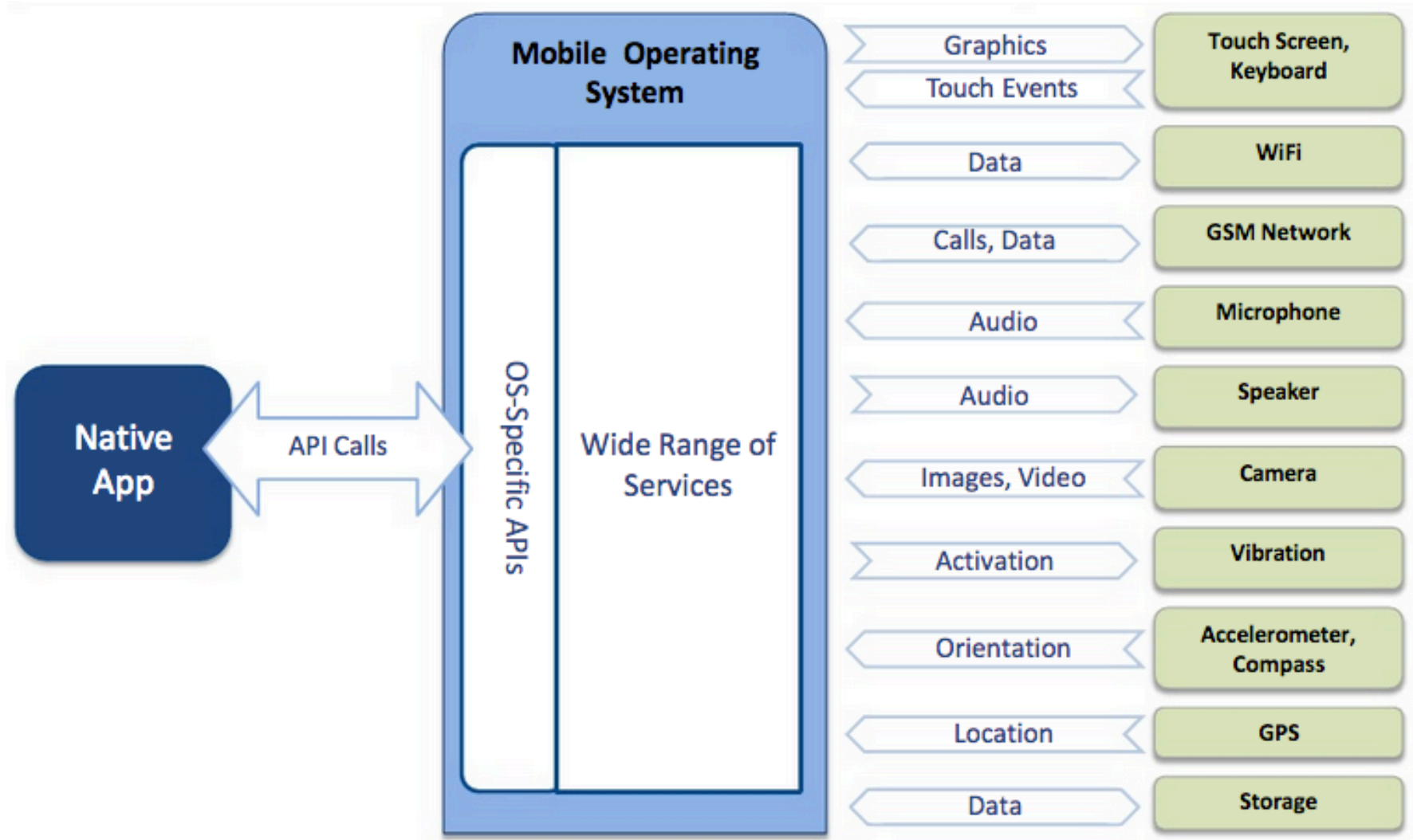


# Android - Native App Development





# Native App – Interaction with Mobile Device





## Android KitKat

We're naming the next version of Android after one of our favorite chocolate treats, KitKat. Look for specially branded KitKat bars in a store near you that give you a chance to win a Nexus 7 or Google Play credit.

[Learn more >](#)



Android KitKat



Nexus 7



Jelly Bean 4.3



Endless entertainment



**Partners**

Access the entire platform source



**Developers**

All the tools and documentation

<http://www.android.com/>



**Google Play**

Find great apps, books, movies

1.5

# Android 1.5, Cupcake

Right from the start, Android is an open OS that can run almost any app or widget so you can do what you want to do.



# Android 1.6, Donut

1.6

The world's information is at your fingertips - search the web, get driving directions...or watch cat videos.



# Android 2.0, Eclair

Make your home screen just how you want it. Arrange apps and widgets across multiple screens and in folders. Stunning live wallpapers respond to your touch.



2.0

# Android 2.2, Froyo

Voice Typing lets you input text, and Voice Actions let you control your phone, just by speaking.



2.2

# Android 2.3, Gingerbread

New sensors make Android great for gaming - so you can touch, tap, tilt, and play away.



2.3

# Android 3.0, Honeycomb

Optimized for tablets, this release opens up new horizons wherever you are.

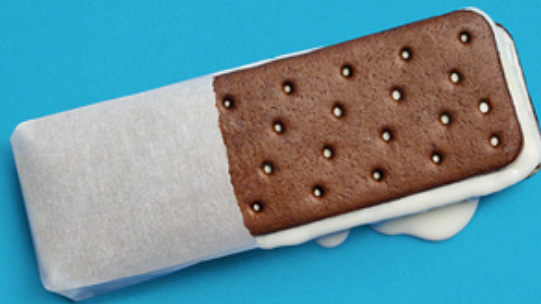


3.0



# Android 4.0, Ice Cream Sandwich

Android comes of age with a new, refined design. Simple, beautiful and beyond smart.



4.0



# Android 4.1, Jelly Bean

Android is fast and smooth with buttery graphics. With Google Now, you get just the right information at the right time.

And with more than 1 million apps on Google Play, and thousands of Android devices, you've got the freedom to do what you want on any device you choose.

4.1

# Android 4.4, KitKat

It's our goal with Android KitKat to make an amazing Android experience available for everybody.



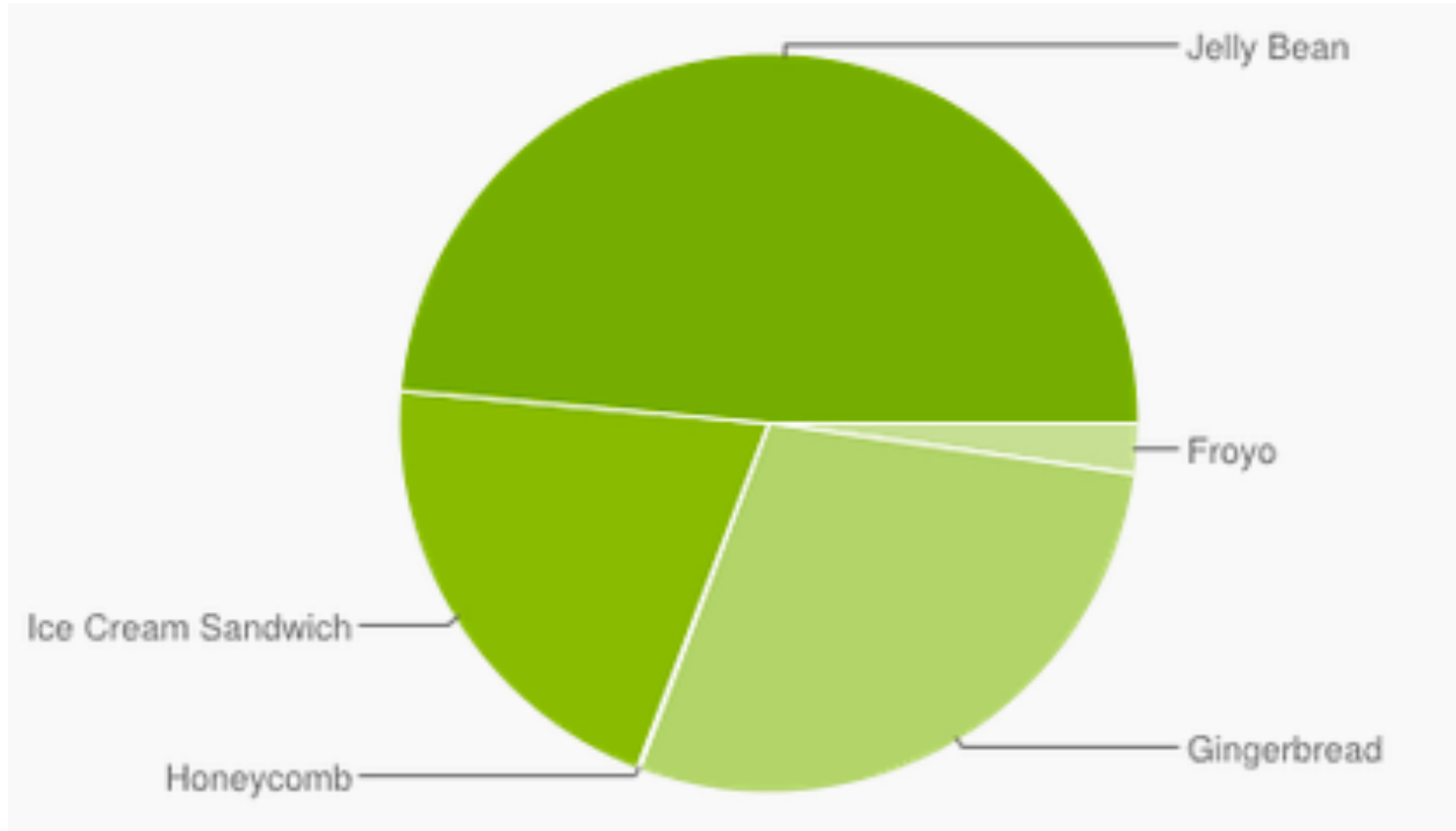
# Android Platform

Android Version	Codename	API	Distribution
2.2	Froyo	8	2.2%
2.3.3- 2.3.7	Gingerbread	10	28.5%
3.2	Honeycomb	13	0.1%
4.0.3- 4.0.4	Ice Cream Sandwich	15	20.6%
4.1.x	Jelly Bean	16	36.5%
4.2.x	Jelly Bean	17	10.6%
4.3	Jelly Bean	18	1.5%

Data collected during a 7-day period ending on October 2, 2013

<http://developer.android.com/about/dashboards/index.html>

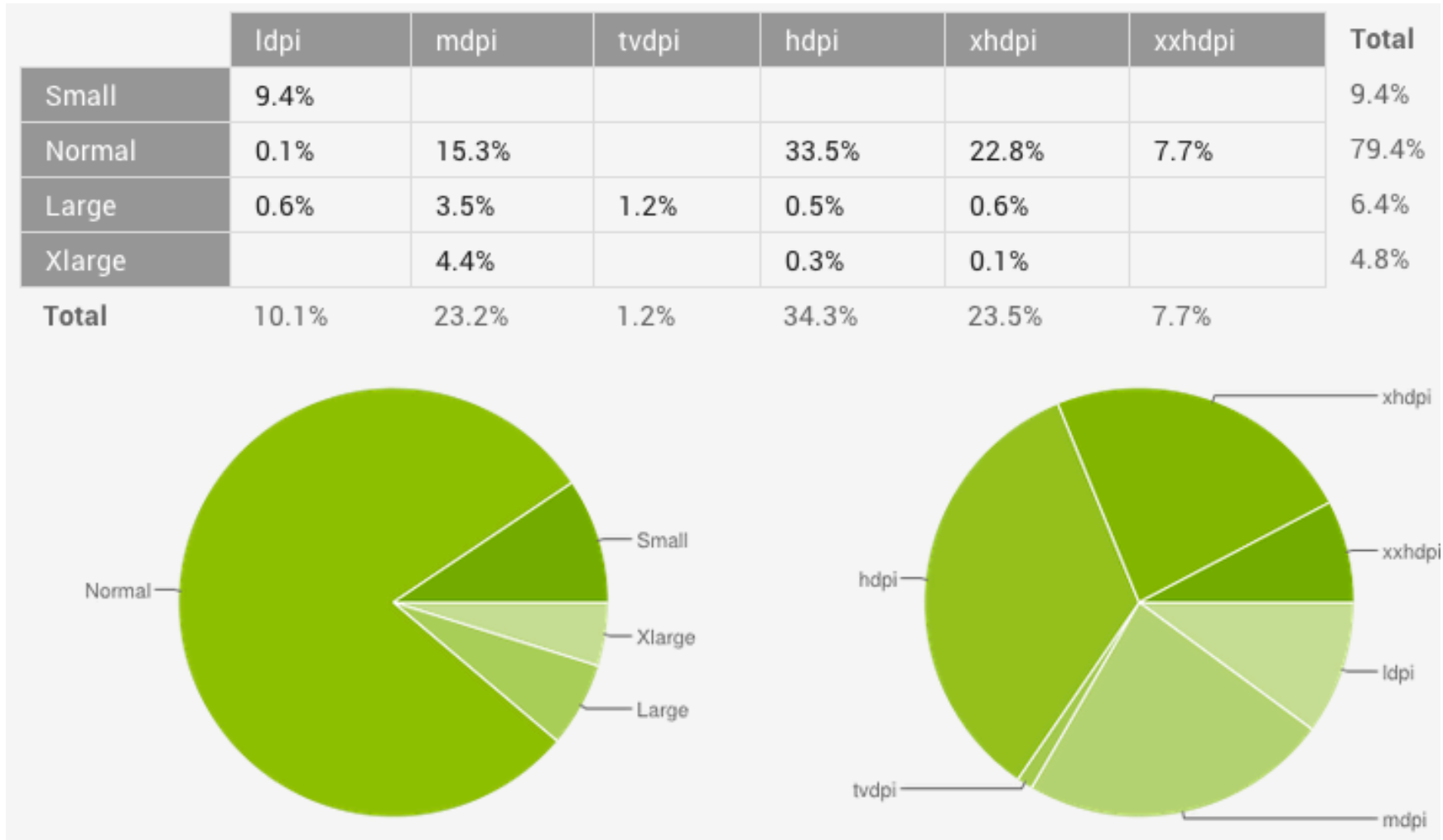
# Android Platform



Data collected during a 7-day period ending on October 2, 2013

<http://developer.android.com/about/dashboards/index.html>

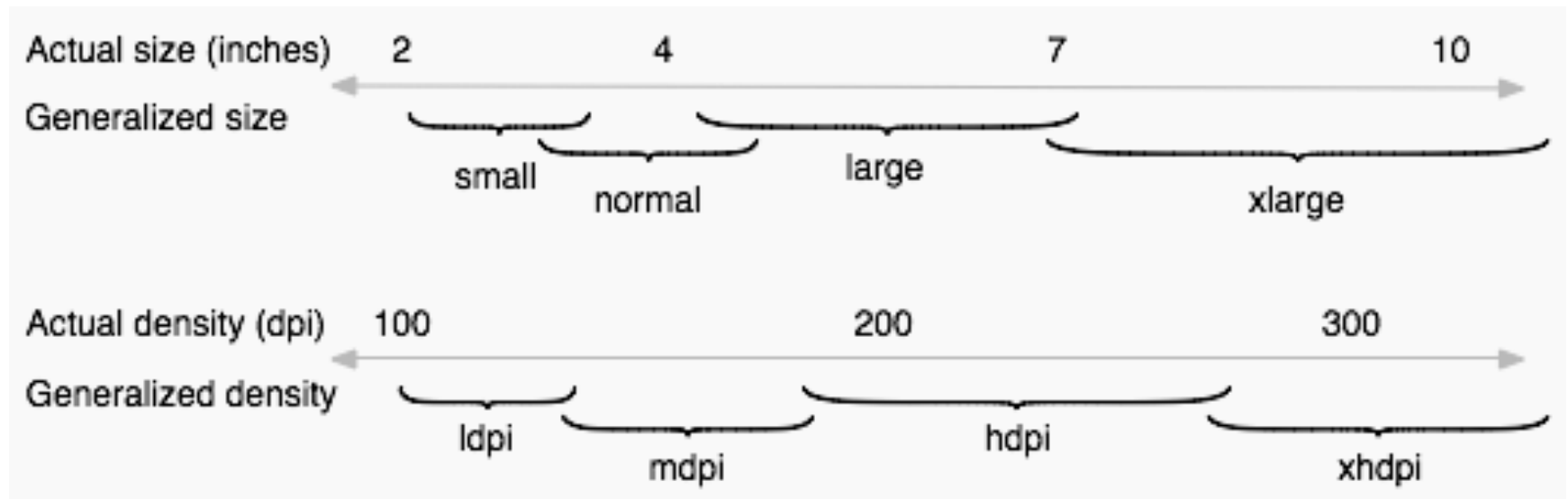
# Android Screen Sizes and Densities



Data collected during a 7-day period ending on October 2, 2013

<http://developer.android.com/about/dashboards/index.html>

# Android Screen Sizes and Densities



# Android Development Environment

Android Native Apps

1

**JDK**

(Java Development Kit)

<http://www.oracle.com/technetwork/java/javase/downloads/index.html>

2

**ADT Bundle**

(Android Developer Tools Bundle)  
(Eclipse + ADT plugin + Android SDK  
+ Android Platform + emulator )

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



# 1 JDK (Java Development Kit)

Java SE - Downloads | Oracle

www.oracle.com/technetwork/java/javase/downloads/index.html

ORACLE

Sign In/Register Help Country Communities I am a... I want to... Search


Products Solutions Downloads Store Support Training Partners About OTN

Oracle Technology Network > Java > Java SE > Downloads


Overview Downloads Documentation Community Technologies Training

## Java SE Downloads

Next Releases (Early Access) Embedded Use Previous Releases

 **DOWNLOAD**

Java Platform (JDK) 7u40

 **DOWNLOAD**

JDK 7u40 & NetBeans 7.3.1

### Java Platform, Standard Edition

#### Java SE 7u40

This release includes several new features like Java Mission Control, Deployment Rule Set, support for Retina display on Mac, and Hard Float ABI support on Linux ARM v7. It also includes bug fixes and enhancements. [Learn more](#)

#### Which Java package do I need?


- **JDK:** (Java Development Kit). For Java Developers. Includes a complete JRE plus tools for developing, debugging, and monitoring Java applications.
- **Server JRE:** (Server Java Runtime Environment) For deploying Java applications on servers. Includes tools for JVM monitoring and tools commonly required for server applications, but does not include browser integration (the Java plug-in), auto-update, nor an installer. [Learn more](#)
- **JRE:** (Java Runtime Environment). Covers most end-users needs. Contains everything

#### Java SDKs and Tools

- Java SE
- Java EE and Glassfish
- Java ME
- JavaFX
- Java Card
- NetBeans IDE
- Java Mission Control

#### Java Resources

- Java APIs
- Technical Articles
- Demos and Videos
- Forums
- Java Magazine
- Java.net
- Developer Training
- Tutorials
- Java.com

 **NEW!** Get it now for FREE! **Subscribe Today**

<http://www.oracle.com/technetwork/java/javase/downloads/index.html>

# 2

# ADT Bundle

The screenshot shows a web browser window with the URL `developer.android.com/sdk/index.html`. The page features a navigation menu with 'Developers', 'Design', 'Develop', and 'Distribute'. Below this is a secondary menu with 'Training', 'API Guides', 'Reference', 'Tools', and 'Google Services'. The main content area is titled 'Get the Android SDK' and includes a 'Download' button for the 'ADT Bundle for Mac'. A sidebar on the left lists various developer tools and guides. The page also contains a list of items included in the ADT Bundle and information about the Android Studio Early Access Preview.

Android SDK | Android Dev x

developer.android.com/sdk/index.html

Developers | Design | **Develop** | Distribute

Training | API Guides | Reference | **Tools** | Google Services

### Developer Tools

- Download** ^
- Setting Up the ADT Bundle
- Setting Up an Existing IDE v
- Android Studio v
- Exploring the SDK
- Download the NDK

### Workflow

### Support Library

### Tools Help

### Revisions

### Samples

### ADK

## Get the Android SDK

The Android SDK provides you the API libraries and developer tools necessary to build, test, and debug apps for Android.

If you're a new Android developer, we recommend you download the ADT Bundle to quickly start developing apps. It includes the essential Android SDK components and a version of the Eclipse IDE with built-in **ADT (Android Developer Tools)** to streamline your Android app development.

With a single download, the ADT Bundle includes everything you need to begin developing apps:

- Eclipse + ADT plugin
- Android SDK Tools
- Android Platform-tools
- The latest Android platform
- The latest Android system image for the emulator

### Android Studio Early Access Preview

A new Android development environment called Android Studio, based on IntelliJ IDEA, is now available as an **early access preview**. For more information, see [Getting Started with Android Studio](#).

If you prefer to use an existing version of Eclipse or another IDE, you can instead take a more customized approach to installing the Android SDK. See the following instructions:

developer.android.com/sdk/index.html#mac-bundle

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

# Building Your First Android App

1. Download the Android SDK.
  - <http://developer.android.com/sdk/index.html>
2. Install the ADT plugin for Eclipse
3. Download the latest SDK tools and platforms using the SDK Manager.

## **ADT Bundle**

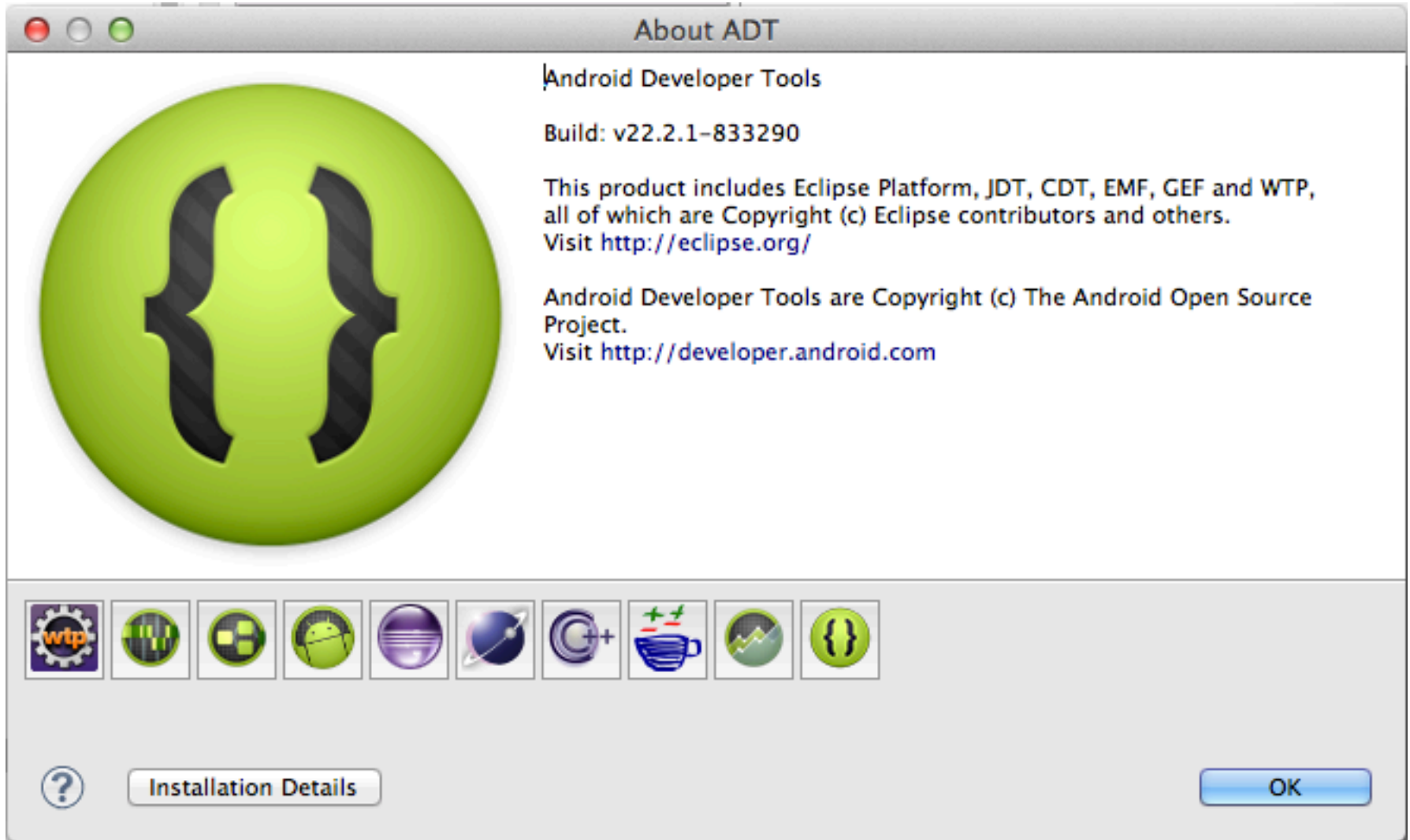
(Android Developer Tools Bundle)  
(Eclipse + ADT plugin + Android SDK  
+ Android Platform + emulator )

# ADT Bundle

## ADT (Android Developer Tools)

- With a single download, the ADT Bundle includes everything you need to begin developing apps:
  1. Eclipse + ADT plugin
  2. Android SDK Tools
  3. Android Platform-tools
  4. The latest Android platform
  5. The latest Android system image for the **emulator**

# ADT



# Android App Building Blocks

**1**

**Activity**

**2**

**Service**

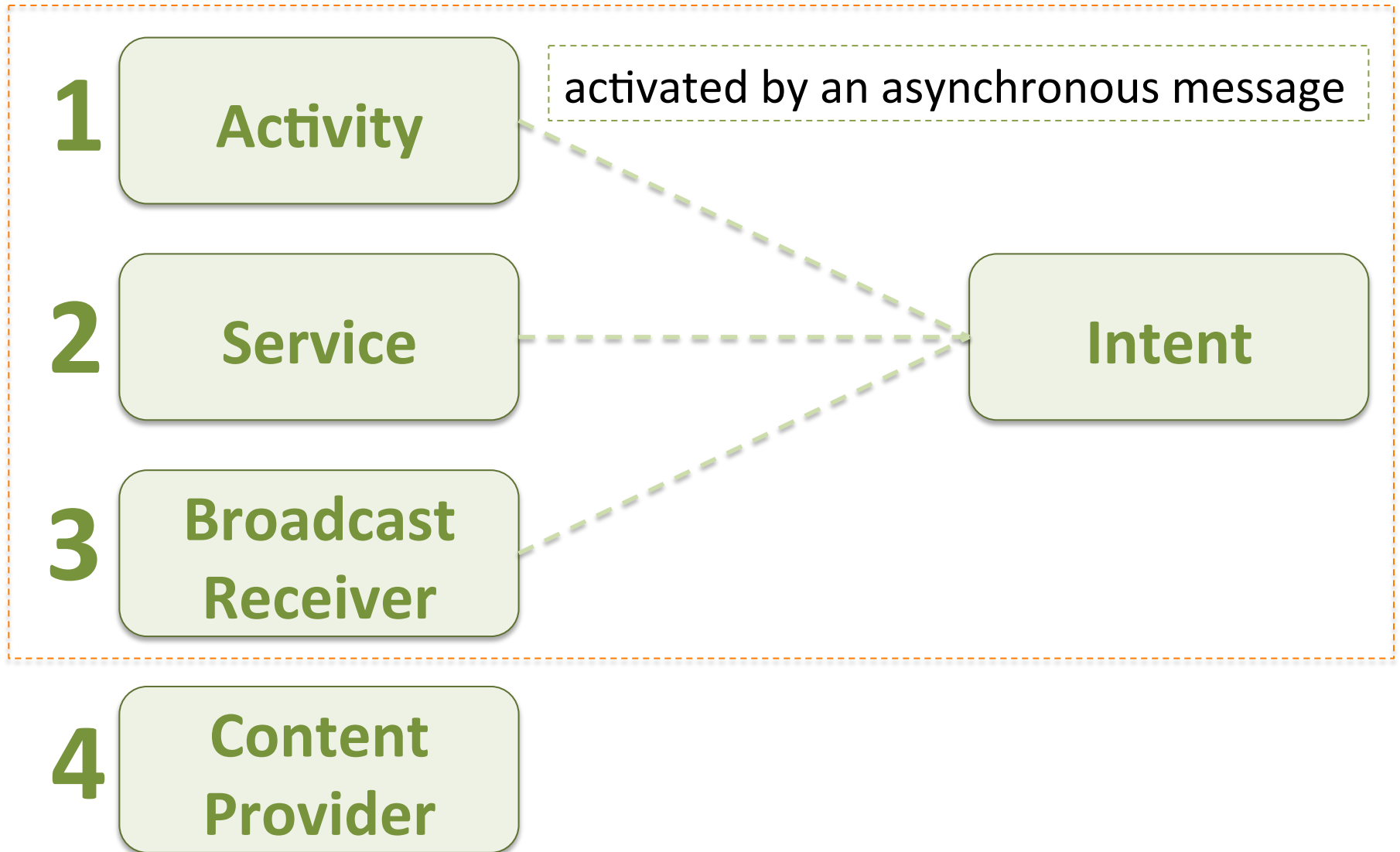
**3**

**Broadcast  
Receiver**

**4**

**Content  
Provider**

# Android App Building Blocks



# Android App Building Blocks

- 1** **Activity** a **single screen** with a user interface
- 2** **Service**
- 3** **Broadcast Receiver**
- 4** **Content Provider**



# Android App Building Blocks

1

Activity

2

Service

runs in the **background** to perform long-running operations or to perform work for remote processes

3

Broadcast  
Receiver

4

Content  
Provider

# Android App Building Blocks

1

Activity

2

Service

3

Broadcast  
Receiver

responds to system-wide broadcast  
announcements

4

Content  
Provider

# Android App Building Blocks

**1**

**Activity**

**2**

**Service**

**3**

**Broadcast  
Receiver**

**4**

**Content  
Provider**

manages a shared set of application data

# Developing Android Apps

## **1. Screen Layout Design: Views and Layouts**

- Graphical Layout
- activity\_main.xml

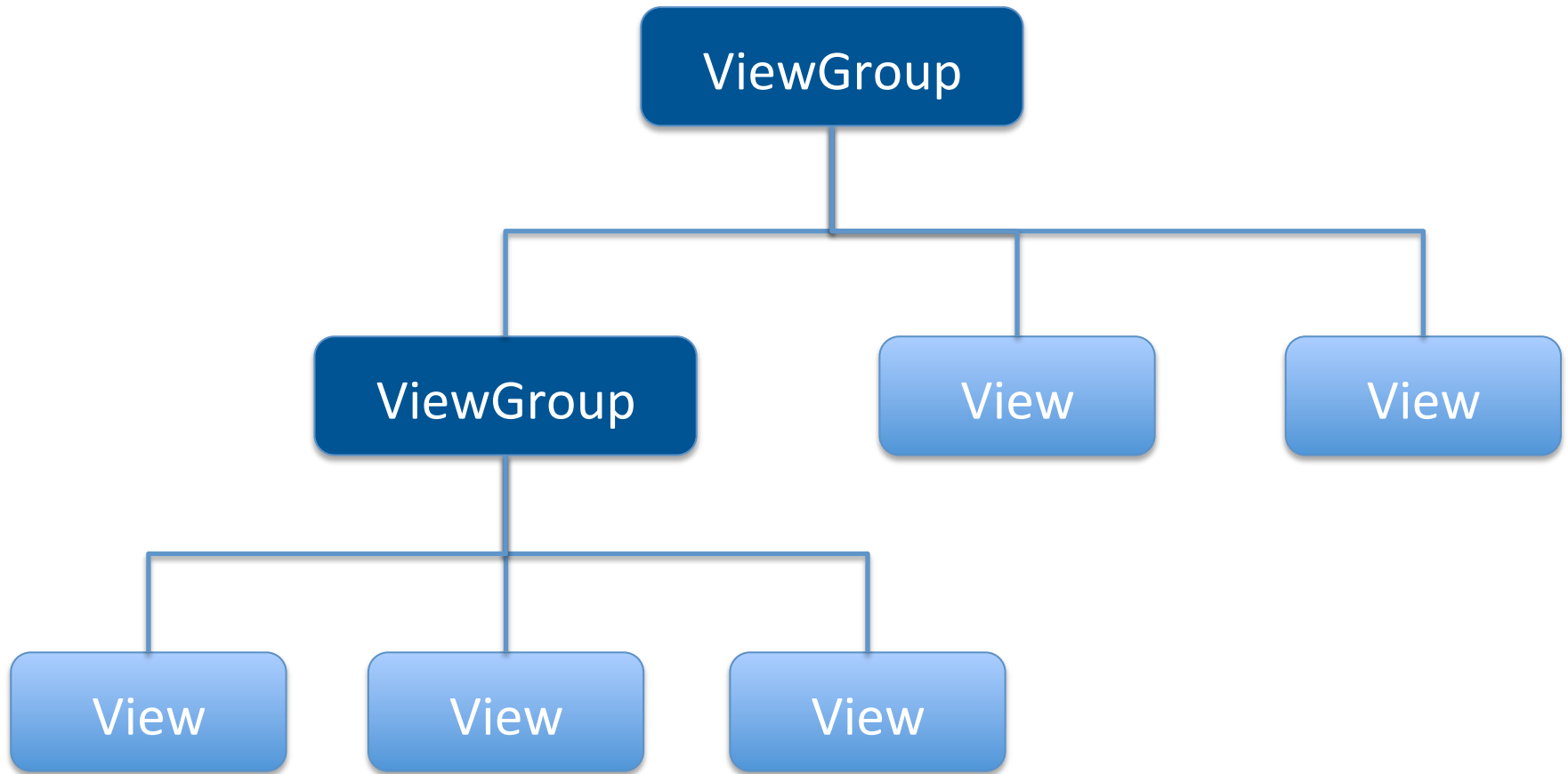
## **2. App Components (Activity) Programming**

- MainActivity.java

# Building a Simple User Interface

- Create a Linear Layout
- Add a Text Field
- Add String Resources
- Add a Button
- Make the Input Box Fill in the Screen Width

# Building a Simple User Interface



# Building a Simple User Interface

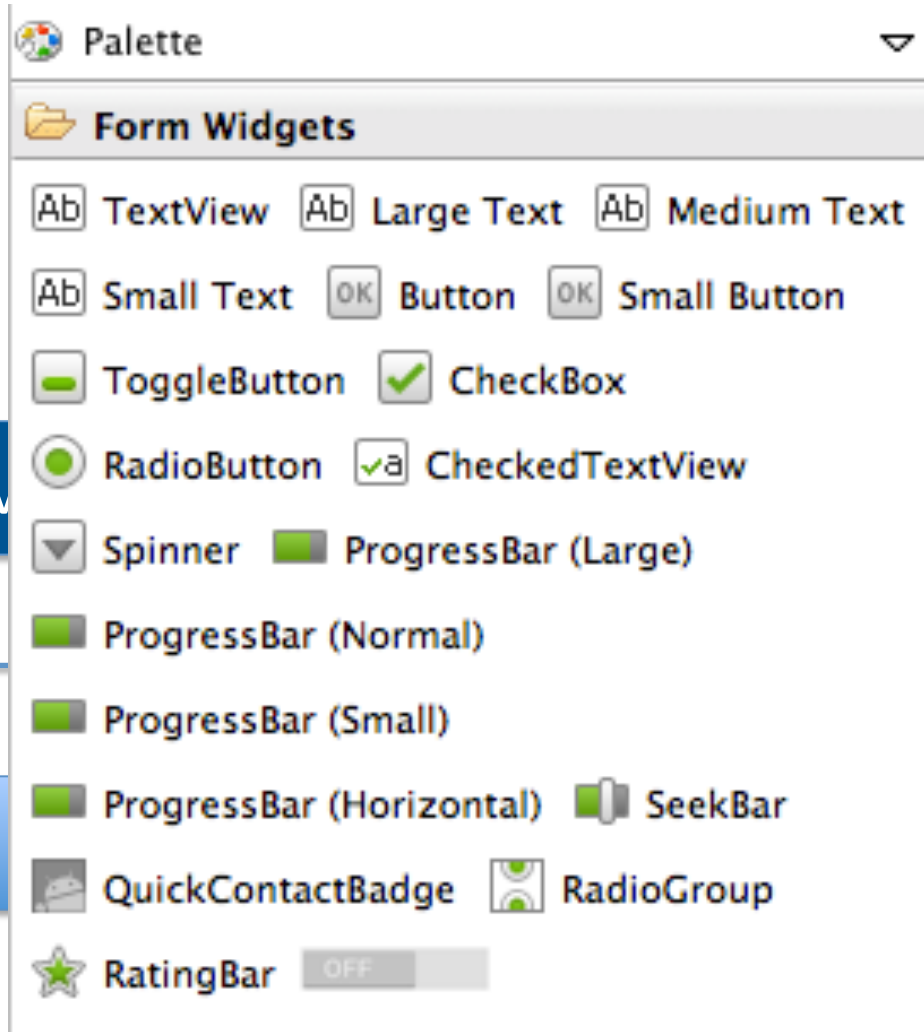
View

TextView

Button

View

View



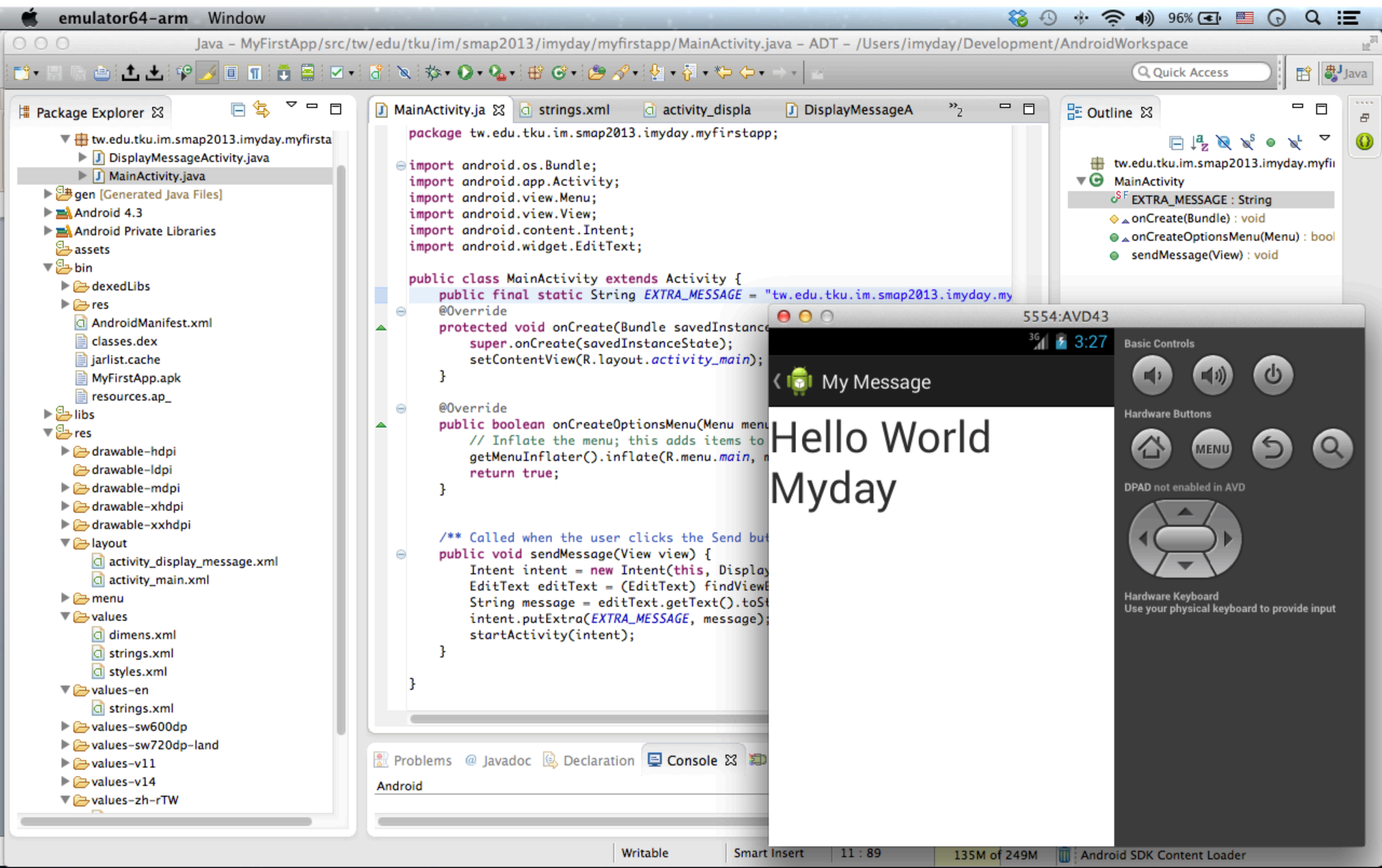
View

View





**Demo:**  
**Building Your First Android App**  
**with**  
**Android Developer Tools**  
**(ADT)**



- Getting Started ^
- Building Your First App** ^
- Creating an Android Project
- Running Your Application
- Building a Simple User Interface
- Starting Another Activity
- Adding the Action Bar v
- Supporting Different Devices v
- Managing the Activity Lifecycle v
- Building a Dynamic UI with Fragments v
- Saving Data v
- Interacting with Other Apps v
- Building Apps with Content Sharing v
- Building Apps with Multimedia v
- Building Apps with Graphics & Animation v

## Building Your First App

Welcome to Android application development!

This class teaches you how to build your first Android app. You'll learn how to create an Android project and run a debuggable version of the app. You'll also learn some fundamentals of Android app design, including how to build a simple user interface and handle user input.

Before you start this class, be sure you have your development environment set up. You need to:

1. Download the Android SDK.
2. Install the ADT plugin for Eclipse (if you'll use the Eclipse IDE).
3. Download the latest SDK tools and platforms using the SDK Manager.

If you haven't already done these tasks, start by downloading the [Android SDK](#) and following the install steps. Once you've finished the setup, you're ready to begin this class.

This class uses a tutorial format that incrementally builds a small Android app that teaches you some fundamental concepts about Android development, so it's important that you follow each step.

[Start the first lesson](#)



[GET STARTED](#) >

**DEPENDENCIES AND PREREQUISITES**

- [Android SDK](#)
- [ADT Plugin 20.0.0](#) or higher (if you're using Eclipse)

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eclipse

- FAVORITES**
- Dropbox
  - All My Files
  - AirDrop
  - Applications
  - Desktop
  - Documents
  - Downloads
  - Movies
  - Music
  - Pictures
  - imyday
- DEVICES**
- iMyday的Mac...
  - Macintosh HD

- Applications
- bin
- Desktop
- Development
- Documents
- Downloads
- Dropbox
- jEdit
- man
- Movies
- Music
- my-app
- Pictures
- Public
- tmp
- VirtualBox VMs

- adt-bundl...-20130917
  - eclipse
    - sdk
- AndroidWorkspace
- artifacts.xml
- configuration
- dropins
- Eclipse.app



Name	Eclipse.app
Kind	Application
Size	526 KB
Created	2013年9月18日 上午09:21
Modified	今天 上午09:09
Last opened	今天 上午09:09
Version	3.8

Macintosh HD > Users > imyday > Development > adt-bundle-mac-x86\_64-20130917 > eclipse > Eclipse.app

- Getting Started ^
- Building Your First App ^
  - [Creating an Android Project](#)
  - Running Your Application
  - Building a Simple User Interface
  - Starting Another Activity
- Adding the Action Bar v
- Supporting Different Devices v
- Managing the Activity Lifecycle v
- Building a Dynamic UI with Fragments v
- Saving Data v
- Interacting with Other Apps v
- Building Apps with Content Sharing v
- Building Apps with Multimedia v
- Building Apps with Graphics & Animation v

## Creating an Android Project

An Android project contains all the files that comprise the source code for your Android app. The Android SDK tools make it easy to start a new Android project with a set of default project directories and files.

This lesson shows how to create a new project either using Eclipse (with the ADT plugin) or using the SDK tools from a command line.

**Note:** You should already have the Android SDK installed, and if you're using Eclipse, you should also have the [ADT plugin](#) installed (version 21.0.0 or higher). If you don't have these, follow the guide to [Installing the Android SDK](#) before you start this lesson.

< PREVIOUS      NEXT >


**THIS LESSON TEACHES YOU TO**

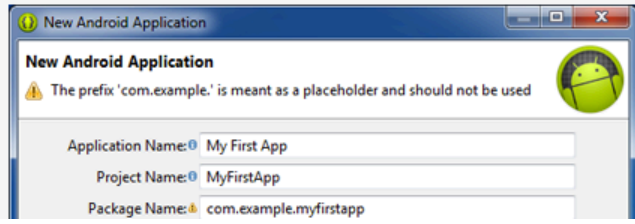
1. [Create a Project with Eclipse](#)
2. [Create a Project with Command Line Tools](#)

**YOU SHOULD ALSO READ**

- [Installing the SDK](#)
- [Managing Projects](#)

### Create a Project with Eclipse

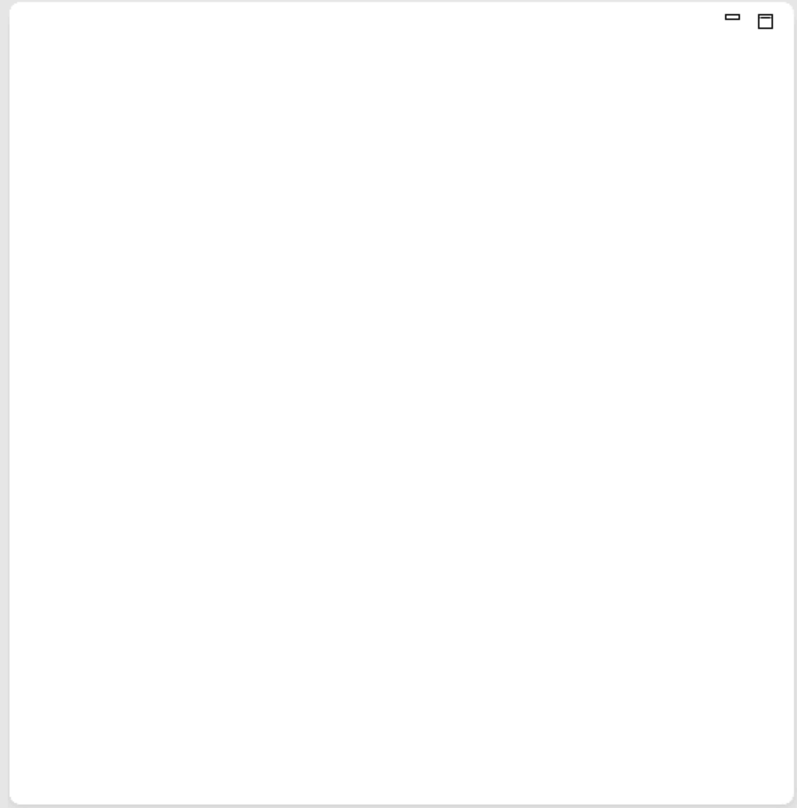
1. Click **New**  in the toolbar.
2. In the window that appears, open the **Android** folder, select **Android Application Project**, and click **Next**.
3. Fill in the form that appears:
  - **Application Name** is the app name that appears to users. For this project, use "My First App."
  - **Project Name** is the name of your project directory and the name visible in Eclipse.



Package Explorer



Package Explorer



Outline

An outline is not available.

Android IDE

### Welcome!

The Android Developer Tools provide a first-class dev integrated development environment is set up with the image so you can immediately begin building apps and

[New Android Application...](#)

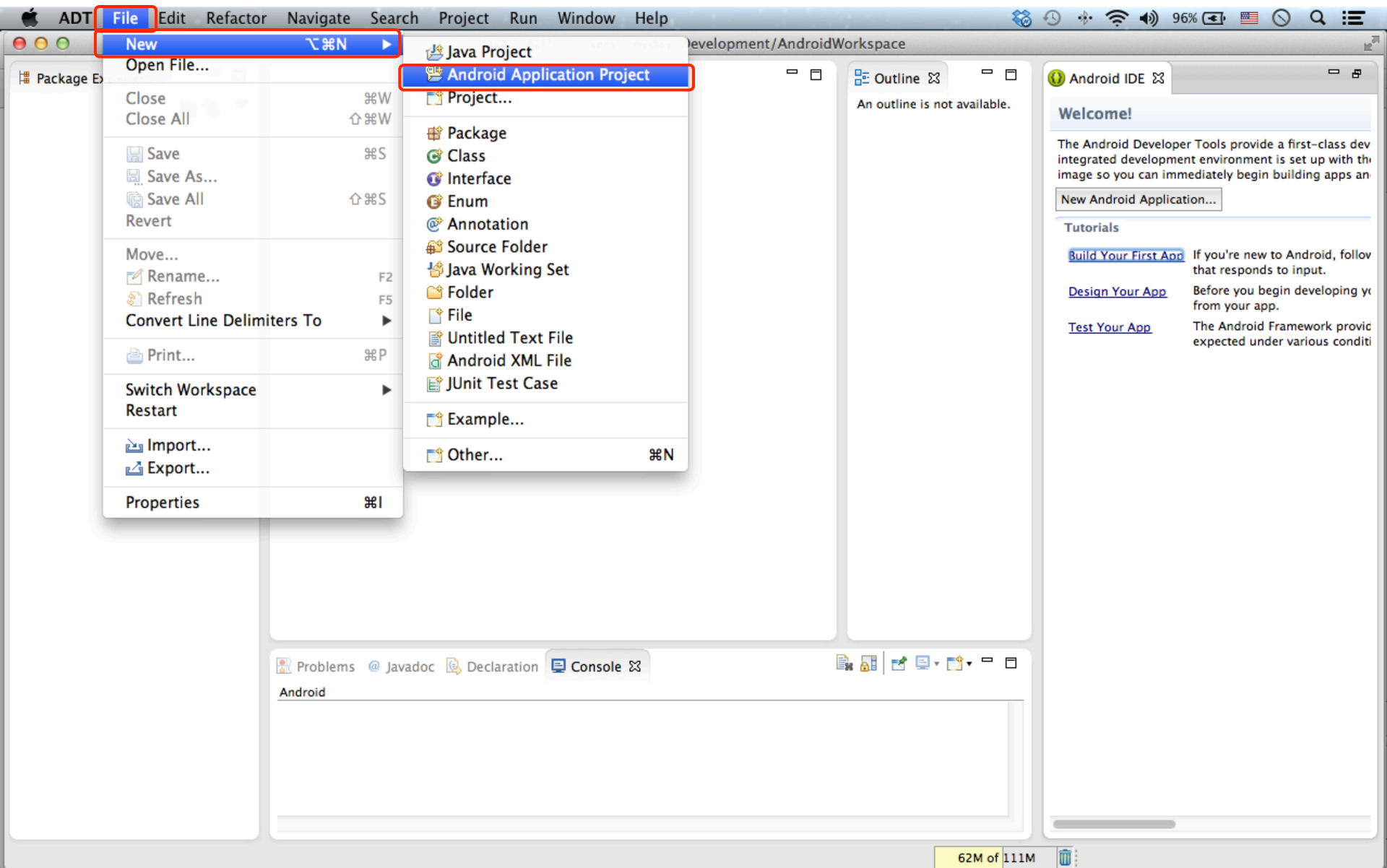
#### Tutorials

- [Build Your First App](#) If you're new to Android, follow that responds to input.
- [Design Your App](#) Before you begin developing your from your app.
- [Test Your App](#) The Android Framework provides expected under various conditions

Problems @ Javadoc Declaration Console


Android





Package Explorer

### New Android Application

 The prefix 'com.example.' is meant as a placeholder and should not be used

Application Name:

Project Name:


Package Name:

Minimum Required SDK:

Target SDK:

Compile With:

Theme:

 The application name is shown in the Play Store, as well as in the Manage Application list in Settings.

**Android IDE**

## Welcome!

The Android Developer Tools provide a first-class dev integrated development environment is set up with the image so you can immediately begin building apps and

[New Android Application...](#)

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- [Test Your App](#) The Android Framework provides expected under various conditions.

Problems @ Javadoc Declaration Console

Android



Package Explorer

### 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.

### Welcome!

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Problems @ Javadoc Declaration Console

Android

Package Explorer

### New Android Application

Creates a new Android Application

Application Name:

Project Name:

Package Name:

Minimum Required SDK:

Target SDK:

Compile With:

Theme:  Holo Light with Dark Action Bar

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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- [Test Your App](#) The Android Framework provides expected under various conditions.

Problems @ Javadoc Declaration Console

Android

Package Explorer

### New Android Application

Configure Project

- Create custom launcher icon
- Create activity
- Mark this project as a library
- Create Project in Workspace

Location:

Working sets

Add project to working sets

Working sets:

### Android IDE

#### Welcome!

The Android Developer Tools provide a first-class dev integrated development environment is set up with the image so you can immediately begin building apps and

#### Tutorials

- [Build Your First App](#) If you're new to Android, follow that responds to input.
- [Design Your App](#) Before you begin developing your from your app.
- [Test Your App](#) The Android Framework provides expected under various conditions

Problems @ Javadoc Declaration Console

Android

Package Explorer

### Configure Launcher Icon

Configure the attributes of the icon set

Foreground: **Image** Clipart Text

Image File: launcher\_icon

Trim Surrounding Blank Space


Additional Padding:  0%


Foreground Scaling: **Crop** Center


Shape **None** Square Circle


Background Color:

Preview:

mdpi: 

hdpi: 

xhdpi: 

xxhdpi: 

### Welcome!

The Android Developer Tools provide a first-class dev integrated development environment is set up with the image so you can immediately begin building apps and

#### Tutorials

- [Build Your First App](#) If you're new to Android, follow that responds to input.
- [Design Your App](#) Before you begin developing your from your app.
- [Test Your App](#) The Android Framework provides expected under various conditions

Problems javadoc Declaration Console

Android

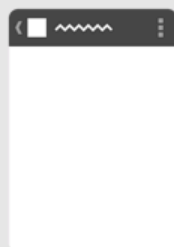
Package Explorer

### New Android Application

**Create Activity**  
Select whether to create an activity, and if so, what kind of activity.

Create Activity

- Blank Activity
- Fullscreen Activity
- Master/Detail Flow



**Blank Activity**  
Creates a new blank activity, with an action bar and optional navigational elements such as tabs or horizontal swipe.

**Welcome!**

The Android Developer Tools provide a first-class dev integrated development environment is set up with the image so you can immediately begin building apps and

[New Android Application...](#)

**Tutorials**

- [Build Your First App](#) If you're new to Android, follow that responds to input.
- [Design Your App](#) Before you begin developing your from your app.
- [Test Your App](#) The Android Framework provides expected under various conditions

Problems Javadoc Declaration Console

Android

Package Explorer


### New Android Application


**Blank Activity**  
Creates a new blank activity, with an action bar and optional navigational elements such as tabs or horizontal swipe.

Activity Name

Layout Name

Navigation Type



 The name of the activity class to create

**Welcome!**

The Android Developer Tools provide a first-class dev integrated development environment is set up with the image so you can immediately begin building apps and

[New Android Application...](#)

**Tutorials**

- [Build Your First App](#) If you're new to Android, follow that responds to input.
- [Design Your App](#) Before you begin developing your from your app.
- [Test Your App](#) The Android Framework provides expected under various conditions

Problems | Javadoc | Declaration | Console

Android

Package Explorer

- MyFirstApp
  - src
    - tw.edu.tku.im.smap2013.imyday
      - MainActivity.java
  - gen [Generated Java Files]
  - Android 4.3
  - Android Private Libraries
  - assets
  - bin
  - libs
  - res
    - AndroidManifest.xml
    - ic\_launcher-web.png
    - proguard-project.txt
    - project.properties

```
activity_main.xml MainActivity.java
```

```
package tw.edu.tku.im.smap2013.imyday.myfirstapp;

import android.os.Bundle;

public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the action bar i
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }

}
```

Outline

- tw.edu.tku.im.smap2013.imyday
  - MainActivity
    - onCreate(Bundle)
    - onCreateOptionsMenu

Android IDE

### Welcome!

The Android Developer Tools provide a first-class dev integrated development environment is set up with the image so you can immediately begin building apps and

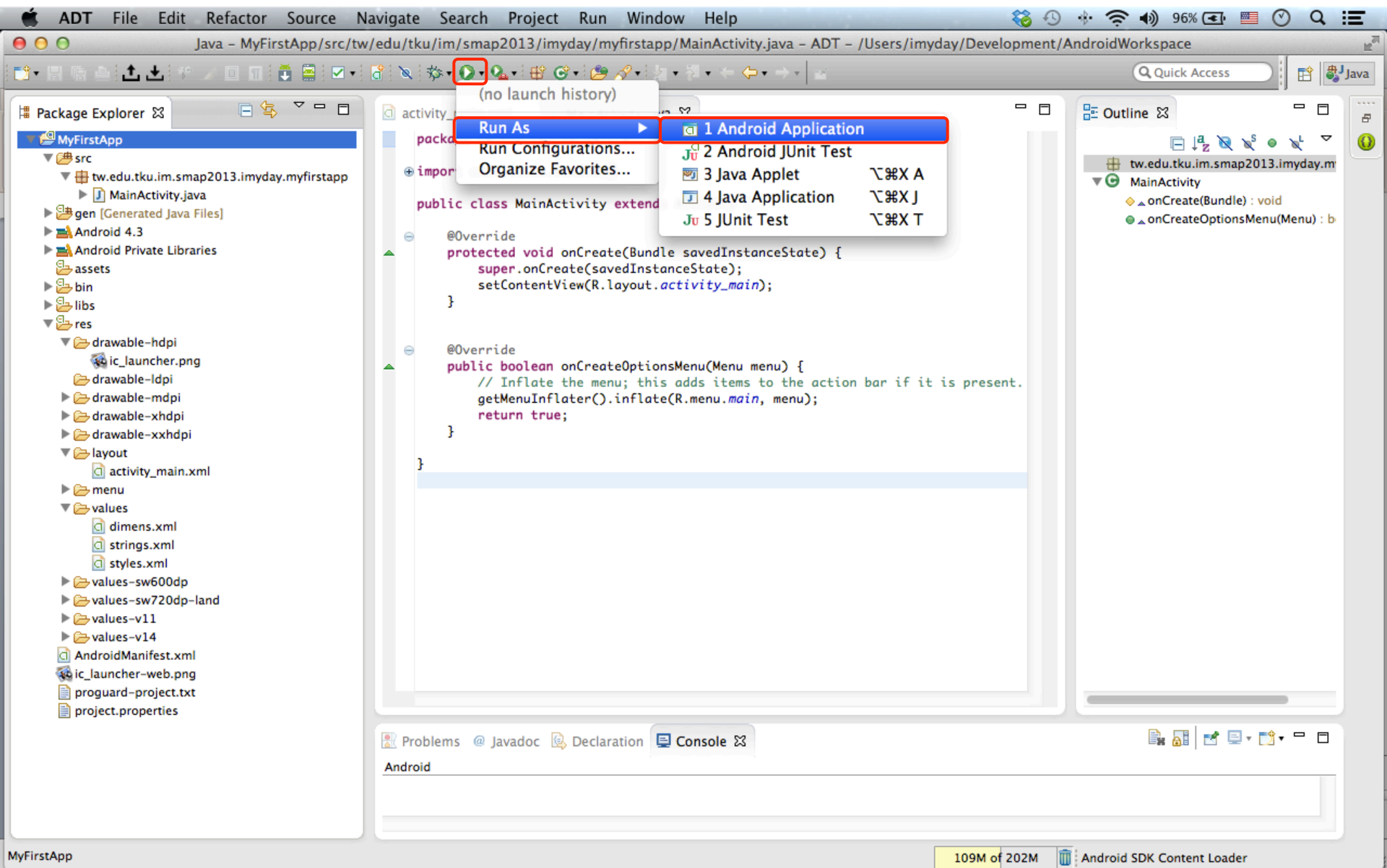
[New Android Application...](#)

#### Tutorials

- [Build Your First App](#) If you're new to Android, follow that responds to input.
- [Design Your App](#) Before you begin developing your app.
- [Test Your App](#) The Android Framework provides expected under various conditions.

Problems @ Javadoc Declaration Console

Android





Package Explorer

- MyFirstApp
  - src
    - tw.edu.tku.im.smap2013.imyday.myfirstapp
      - MainActivity.java
  - gen [Generated Java Files]
  - Android 4.3
  - Android Private Libraries
  - assets
  - bin
  - libs
  - res
    - drawable-hdpi
      - ic\_launcher.png
    - drawable-ldpi
    - drawable-mdpi
    - drawable-xhdpi
    - drawable-xxhdpi
    - layout
      - activity\_main.xml
    - menu
    - values
      - dimens.xml
      - strings.xml
      - styles.xml
    - values-sw600dp
    - values-sw720dp-land
    - values-v11
    - values-v14
  - AndroidManifest.xml
  - ic\_launcher-web.png
  - proguard-project.txt
  - project.properties

```
activity_main.xml MainActivity.java
```

```
package tw.edu.tku.im.smap2013.imyday.myfirstapp;

import android.os.Bundle;

public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }

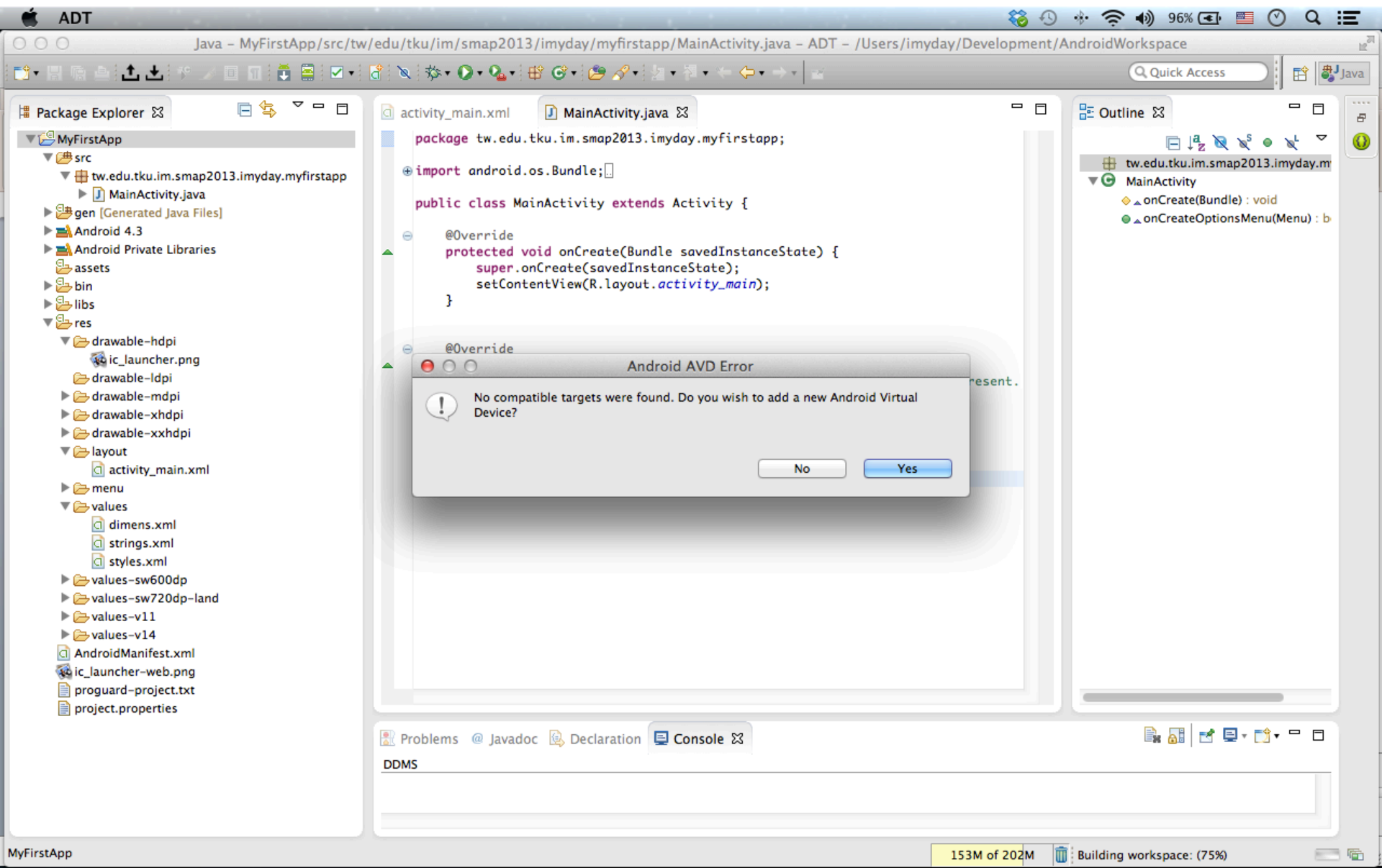
    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the action bar if it is present.
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }
}
```

Outline

- tw.edu.tku.im.smap2013.imyday.m
  - MainActivity
    - onCreate(Bundle) : void
    - onCreateOptionsMenu(Menu) : b

Problems @ Javadoc Declaration Console

DDMS



Package Explorer

- MyFirstApp
  - src
    - tw.edu.tku.im.smap2013.imyday.myfirstapp
      - MainActivity.java
  - gen [Generated Java Files]
  - Android 4.3
  - Android Private Libraries
  - assets
  - bin
  - libs
  - res
    - drawable-hdpi
      - ic\_launcher.png
    - drawable-ldpi
    - drawable-mdpi
    - drawable-xhdpi
    - drawable-xxhdpi
    - layout
      - activity\_main.xml
    - menu
    - values
      - dimens.xml
      - strings.xml
      - styles.xml
    - values-sw600dp
    - values-sw720dp-land
    - values-v11
    - values-v14
  - AndroidManifest.xml
  - ic\_launcher-web.png
  - proguard-project.txt
  - project.properties

activity\_main.xml MainActivity.java

```
package tw.edu.tku.im.smap2013.imyday.myfirstapp;
```

### Android Device Chooser

Select a device with min API level 8.

Choose a running Android device

Serial Number	AVD Name	Target	Debug	State

Launch a new Android Virtual Device

AVD Name	Target Name	Platform	API Level	CPU/ABI	Details...
--	No AVD available	--	--		Start... Refresh Manager...

Use same device for future launches

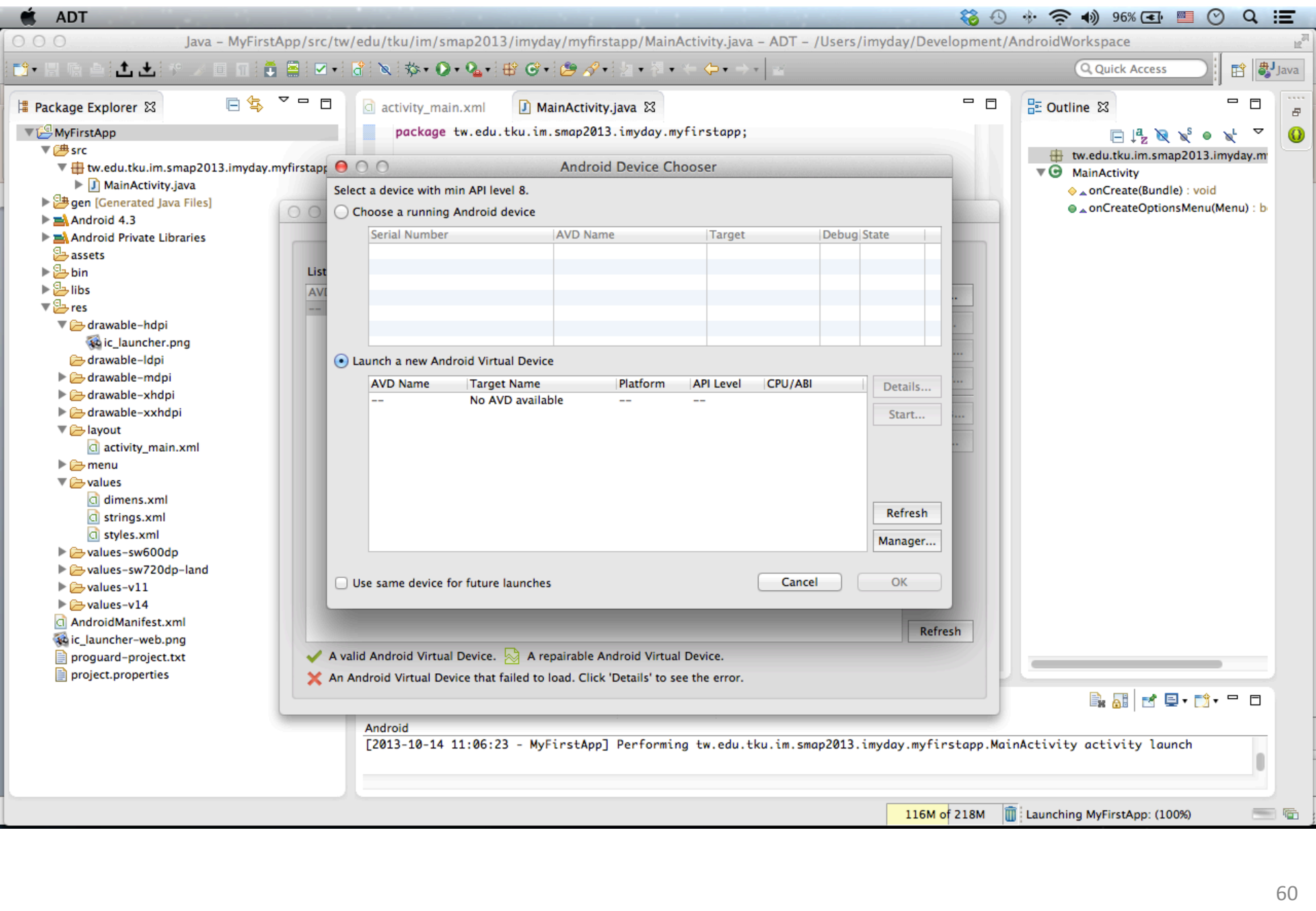
Cancel OK

### Outline

- tw.edu.tku.im.smap2013.imyday.m
  - MainActivity
    - onCreate(Bundle) : void
    - onCreateOptionsMenu(Menu) : b

Android

```
[2013-10-14 11:06:23 - MyFirstApp] Performing tw.edu.tku.im.smap2013.imyday.myfirstapp.MainActivity activity launch
```



### Android Device Chooser

Select a device with min API level 8.

Choose a running Android device

Serial Number	AVD Name	Target	Debug	State

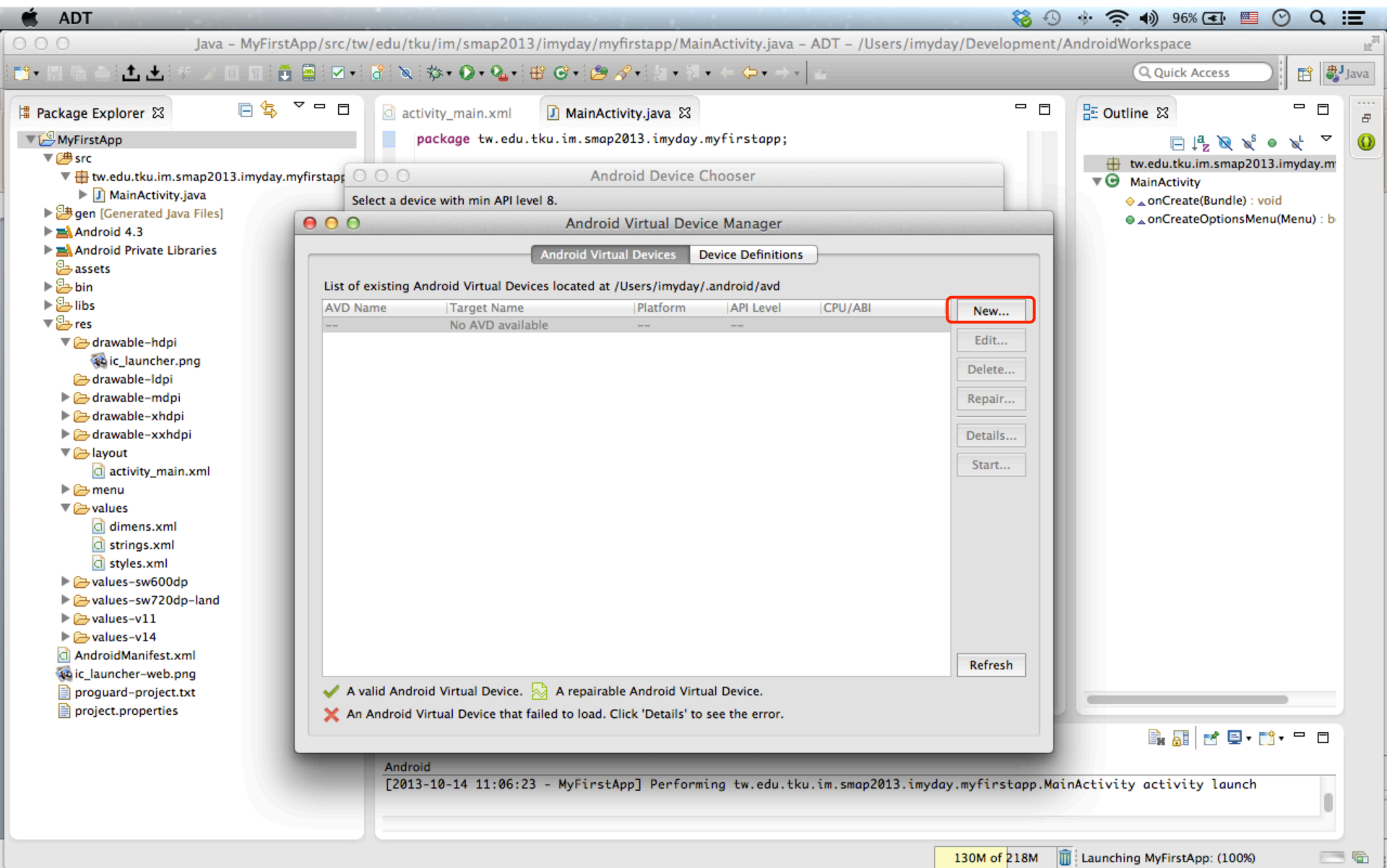
Launch a new Android Virtual Device

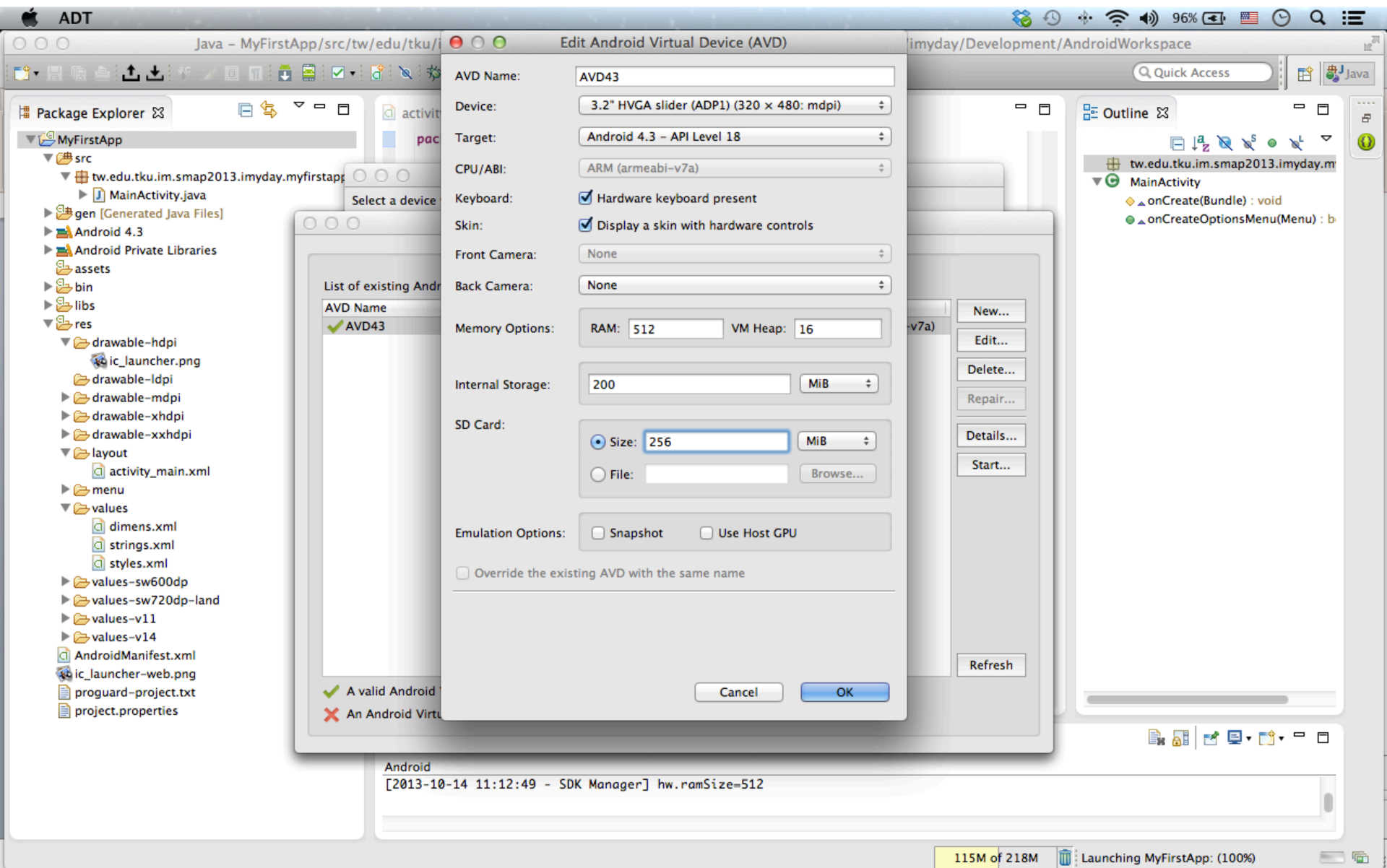
AVD Name	Target Name	Platform	API Level	CPU/ABI	Details...
--	No AVD available	--	--		Start...

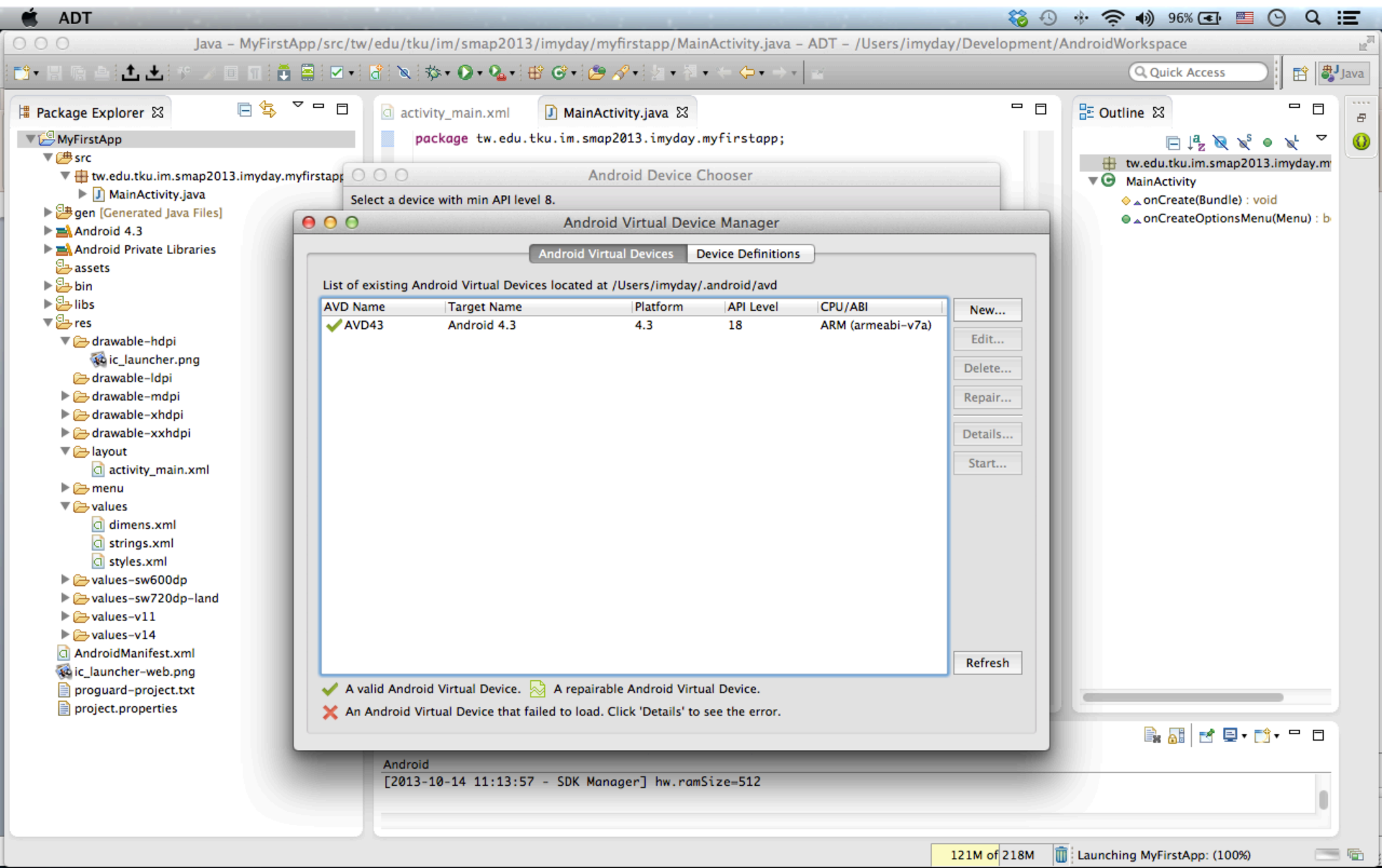
Use same device for future launches

- ✔ A valid Android Virtual Device. 🔧 A repairable Android Virtual Device.
- ✘ An Android Virtual Device that failed to load. Click 'Details' to see the error.

Android  
 [2013-10-14 11:06:23 - MyFirstApp] Performing tw.edu.tku.im.smap2013.imyday.myfirstapp.MainActivity activity launch







Android Device Chooser

Select a device with min API level 8.

Android Virtual Device Manager

Android Virtual Devices    Device Definitions

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

AVD Name	Target Name	Platform	API Level	CPU/ABI
✓ AVD43	Android 4.3	4.3	18	ARM (armeabi-v7a)

New...  
Edit...  
Delete...  
Repair...  
Details...  
Start...  
Refresh

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

Android  
[2013-10-14 11:13:57 - SDK Manager] hw.ramSize=512

121M of 218M    Launching MyFirstApp: (100%)

Package Explorer

- MyFirstApp
  - src
    - tw.edu.tku.im.smap2013.imyday.myfirstapp
      - MainActivity.java
  - gen [Generated Java Files]
  - Android 4.3
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    - drawable-ldpi
    - drawable-mdpi
    - drawable-xhdpi
    - drawable-xxhdpi
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      - dimens.xml
      - strings.xml
      - styles.xml
    - values-sw600dp
    - values-sw720dp-land
    - values-v11
    - values-v14
  - AndroidManifest.xml
  - ic\_launcher-web.png
  - proguard-project.txt
  - project.properties

activity\_main.xml MainActivity.java

```
package tw.edu.tku.im.smap2013.imyday.myfirstapp;
```

Android Device Chooser

Select a device with min API level 8.

Choose a running Android device

Serial Number	AVD Name	Target	Debug	State

Launch a new Android Virtual Device

AVD Name	Target Name	Platform	API Level	CPU/ABI	Details...
AVD43	Android 4.3	4.3	18	ARM (armeabi...	Start...

Use same device for future launches

Cancel OK Refresh

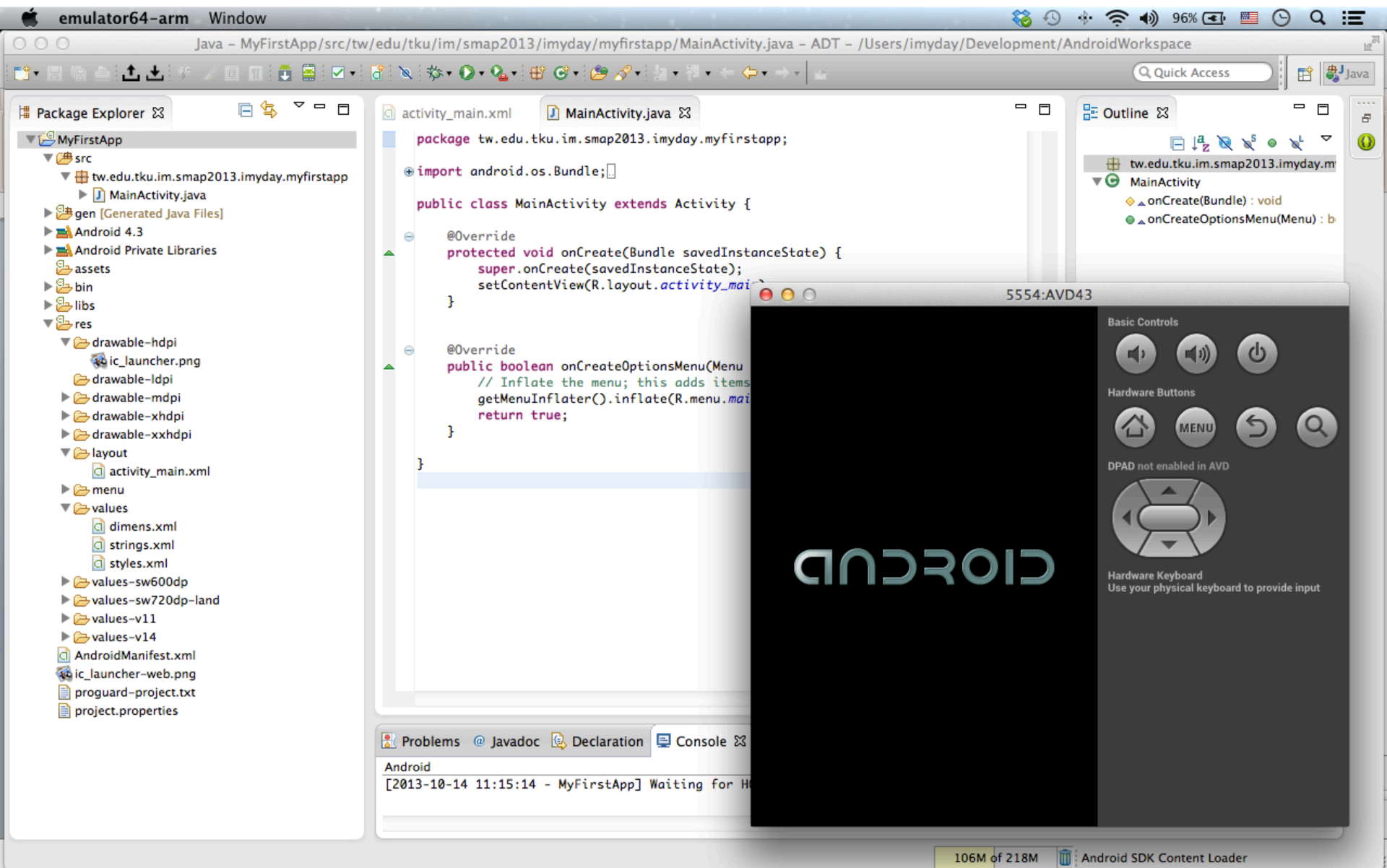
Android  
[2013-10-14 11:13:57 - SDK Manager] hw.ramSize=512

Outline

- tw.edu.tku.im.smap2013.imyday.m
  - MainActivity
    - onCreate(Bundle): void
    - onCreateOptionsMenu(Menu): b

132M of 218M Launching MyFirstApp: (100%)





Package Explorer

- MyFirstApp
  - src
    - tw.edu.tku.im.smap2013.imyday.myfirstapp
      - MainActivity.java
  - gen [Generated Java Files]
  - Android 4.3
  - Android Private Libraries
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      - ic\_launcher.png
    - drawable-ldpi
    - drawable-mdpi
    - drawable-xhdpi
    - drawable-xxhdpi
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      - activity\_main.xml
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    - values-sw600dp
    - values-sw720dp-land
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  - AndroidManifest.xml
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  - proguard-project.txt
  - project.properties

activity\_main.xml MainActivity.java

```
package tw.edu.tku.im.smap2013.imyday.myfirstapp;

import android.os.Bundle;

public class MainActivity extends Activity {

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

Outline

- tw.edu.tku.im.smap2013.imyday.m
  - MainActivity
    - onCreate(Bundle) : void
    - onCreateOptionsMenu(Menu) : b

5554:AVD43

Auto Monitor Logcat

Would you like ADT to automatically monitor logcat output for messages from applications in the workspace?

No, do not monitor logcat output.

Yes, monitor logcat and display logcat view if there are messages with priority higher than:

5554:AVD43

3G 11:16

Basic Controls

- Speaker
- Volume
- Power

Hardware Buttons

- Home
- MENU
- Back
- Search

DPAD not enabled in AVD

Hardware Keyboard

Use your physical keyboard to provide input

Make yourself at home

You can put your favorite apps here.

To see all your apps, touch the circle.

Camera

OK

Problems @ Javadoc Declaration Console

Android

[2013-10-14 11:16:43 - MyFirstApp] ActivityManag

Package Explorer

- MyFirstApp
  - src
    - tw.edu.tku.im.smap2013.imyday.myfirstapp
      - MainActivity.java
  - gen [Generated Java Files]
  - Android 4.3
  - Android Private Libraries
  - assets
  - bin
  - libs
  - res
    - drawable-hdpi
      - ic\_launcher.png
    - drawable-ldpi
    - drawable-mdpi
    - drawable-xhdpi
    - drawable-xxhdpi
    - layout
      - activity\_main.xml
    - menu
    - values
      - dimens.xml
      - strings.xml
      - styles.xml
    - values-sw600dp
    - values-sw720dp-land
    - values-v11
    - values-v14
  - AndroidManifest.xml
  - ic\_launcher-web.png
  - proguard-project.txt
  - project.properties

```
activity_main.xml MainActivity.java
```

```
package tw.edu.tku.im.smap2013.imyday.myfirstapp;

import android.os.Bundle;

public class MainActivity extends Activity {

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

**Auto Monitor Logcat**

Would you like ADT to automatically monitor logcat output for messages from applications in the workspace?

No, do not monitor logcat output.

Yes, monitor logcat and display logcat view if there are messages with priority higher than:

OK

Outline

- tw.edu.tku.im.smap2013.imyday.m
  - MainActivity
    - onCreate(Bundle) : void
    - onCreateOptionsMenu(Menu) : b

Problems @ Javadoc Declaration Console

Android

[2013-10-14 11:16:43 - MyFirstApp] ActivityManager: Starting: Intent { act=android.intent.action.MAIN cat=[android.intent.c

Package Explorer

- MyFirstApp
  - src
    - tw.edu.tku.im.smap2013.imyday.myfirstapp
      - MainActivity.java
  - gen [Generated Java Files]
  - Android 4.3
  - Android Private Libraries
  - assets
  - bin
  - libs
  - res
    - drawable-hdpi
      - ic\_launcher.png
    - drawable-ldpi
    - drawable-mdpi
    - drawable-xhdpi
    - drawable-xxhdpi
    - layout
      - activity\_main.xml
    - menu
    - values
      - dimens.xml
      - strings.xml
      - styles.xml
    - values-sw600dp
    - values-sw720dp-land
    - values-v11
    - values-v14
  - AndroidManifest.xml
  - ic\_launcher-web.png
  - proguard-project.txt
  - project.properties

```

activity_main.xml | MainActivity.java
package tw.edu.tku.im.smap2013.imyday.myfirstapp;

import android.os.Bundle;

public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the menu.
        getMenuInflater().inflate(R.menu.menu_main, menu);
        return true;
    }
}

```

Outline

- tw.edu.tku.im.smap2013.imyday.m
  - MainActivity
    - onCreate(Bundle) : void
    - onCreateOptionsMenu(Menu) : b

5554:AVD43 11:18

Basic Controls

Hardware Buttons

DPAD not enabled in AVD

Hardware Keyboard  
Use your physical keyboard to provide input

APPS WIDGETS

API Demos	Browser	Calculator	Calendar
Camera	Clock	Custom Locale	Dev Settings
Dev Tools	Downloads	Email	Gallery
Gestures Builder	Messaging	Music	My First App

Problems @ Javadoc Declaration Console

Saved Filters + - Search for messages. Accepts Java

Package Explorer

- MyFirstApp
  - src
    - tw.edu.tku.im.smap2013.imyday.myfirstapp
      - MainActivity.java
  - gen [Generated Java Files]
  - Android 4.3
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      - ic\_launcher.png
    - drawable-ldpi
    - drawable-mdpi
    - drawable-xhdpi
    - drawable-xxhdpi
    - layout
      - activity\_main.xml
    - menu
    - values
      - dimens.xml
      - strings.xml
      - styles.xml
    - values-sw600dp
    - values-sw720dp-land
    - values-v11
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  - AndroidManifest.xml
  - ic\_launcher-web.png
  - proguard-project.txt
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```
activity_main.xml MainActivity.java
package tw.edu.tku.im.smap2013.imyday.myfirstapp;
import android.os.Bundle;
public class MainActivity extends Activity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the menu bar.
        getMenuInflater().inflate(R.menu.menu_main, menu);
        return true;
    }
}
```

```
tw.edu.tku.im.smap2013.imyday.m
MainActivity
onCreate(Bundle) : void
onCreateOptionsMenu(Menu) : b
```

5554:AVD43 3G 11:19

My First App

Hello world!

Basic Controls

- Speaker
- Volume
- Power

Hardware Buttons

- Home
- MENU
- Back
- Search

DPAD not enabled in AVD

Hardware Keyboard  
Use your physical keyboard to provide input

- Getting Started ^
- Building Your First App ^
  - Creating an Android Project
  - Running Your Application
  - Building a Simple User Interface
  - Starting Another Activity
- Adding the Action Bar v
- Supporting Different Devices v
- Managing the Activity Lifecycle v
- Building a Dynamic UI with Fragments v
- Saving Data v
- Interacting with Other Apps v
- Building Apps with Content Sharing v
- Building Apps with Multimedia v
- Building Apps with Graphics & Animation v
- Building Apps with Connectivity & the Cloud v
- Building Apps with User Info & Location v
- Best Practices for v

on the second activity.

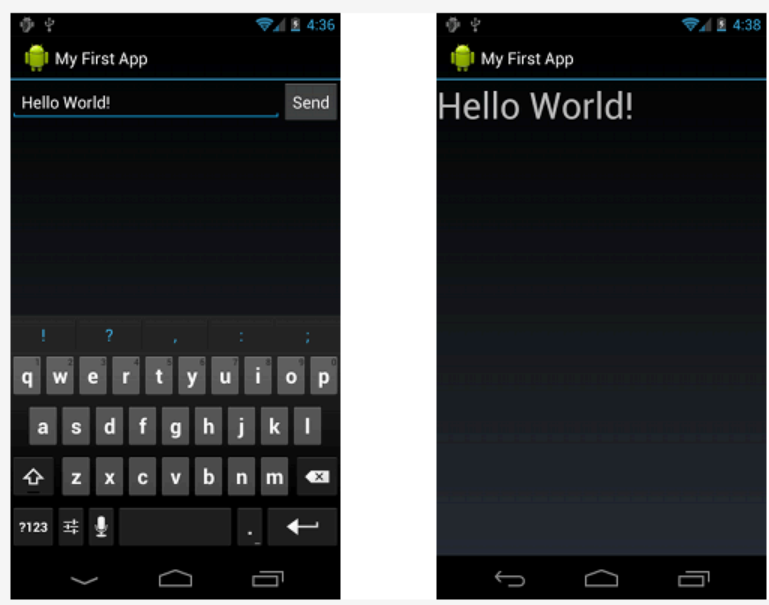


Figure 2. Both activities in the final app, running on Android 4.0.

That's it, you've built your first Android app!

To learn more, follow the link below to the next class.

+1 350

< PREVIOUS NEXT >

NEXT CLASS: ADDING THE ACTION BAR >

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emulator64-arm Window

Java - MyFirstApp/src/tw/edu/tku/im/smap2013/imyday/myfirstapp/MainActivity.java - ADT - /Users/imyday/Development/AndroidWorkspace

Quick Access

Package Explorer

- tw.edu.tku.im.smap2013.imyday.myfirsta
  - DisplayMessageActivity.java
  - MainActivity.java
- gen [Generated Java Files]
- Android 4.3
- Android Private Libraries
- assets
- bin
  - dexedLibs
  - res
    - AndroidManifest.xml
    - classes.dex
    - jarlist.cache
    - MyFirstApp.apk
    - resources.ap\_
- libs
- res
  - drawable-hdpi
  - drawable-ldpi
  - drawable-mdpi
  - drawable-xhdpi
  - drawable-xxhdpi
  - layout
    - activity\_display\_message.xml
    - activity\_main.xml
  - menu
  - values
    - dimens.xml
    - strings.xml
    - styles.xml
  - values-en
    - strings.xml
  - values-sw600dp
  - values-sw720dp-land
  - values-v11
  - values-v14
  - values-zh-rTW

MainActivity.java

```

package tw.edu.tku.im.smap2013.imyday.myfirstapp;

import android.os.Bundle;
import android.app.Activity;
import android.view.Menu;
import android.view.View;
import android.content.Intent;
import android.widget.EditText;

public class MainActivity extends Activity {
    public final static String EXTRA_MESSAGE = "tw.edu.tku.im.smap2013.imyday.my";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }
    /** Called when the user clicks the Send button */
    public void sendMessage(View view) {
        Intent intent = new Intent(this, DisplayMessageActivity.class);
        EditText editText = (EditText) findViewById(R.id.edit_message);
        String message = editText.getText().toString();
        intent.putExtra(EXTRA_MESSAGE, message);
        startActivity(intent);
    }
}

```

strings.xml

activity\_displa

DisplayMessageA

Outline

- tw.edu.tku.im.smap2013.imyday.myfir
  - MainActivity
    - EXTRA\_MESSAGE : String
    - onCreate(Bundle) : void
    - onCreateOptionsMenu(Menu) : bool
    - sendMessage(View) : void

5554:AVD43

My First App

Hello World Myday | Send

Basic Controls

Hardware Buttons

DPAD not enabled in AVD

Hardware Keyboard  
Use your physical keyboard to provide input

Problems @ Javadoc Declaration Console

Android

Writable Smart Insert 11 : 89 133M of 249M Android SDK Content Loader

emulator64-arm Window

Java - MyFirstApp/src/tw/edu/tku/im/smap2013/imyday/myfirstapp/MainActivity.java - ADT - /Users/imyday/Development/AndroidWorkspace

Quick Access

Package Explorer

- tw.edu.tku.im.smap2013.imyday.myfirsta
  - DisplayMessageActivity.java
  - MainActivity.java
  - gen [Generated Java Files]
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  - Android Private Libraries
  - assets
  - bin
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      - classes.dex
      - jarlist.cache
      - MyFirstApp.apk
      - resources.ap\_
    - libs
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      - drawable-hdpi
      - drawable-ldpi
      - drawable-mdpi
      - drawable-xhdpi
      - drawable-xxhdpi
      - layout
        - activity\_display\_message.xml
        - activity\_main.xml
      - menu
      - values
        - dimens.xml
        - strings.xml
        - styles.xml
      - values-en
        - strings.xml
      - values-sw600dp
      - values-sw720dp-land
      - values-v11
      - values-v14
      - values-zh-rTW

MainActivity.java

```

package tw.edu.tku.im.smap2013.imyday.myfirstapp;

import android.os.Bundle;
import android.app.Activity;
import android.view.Menu;
import android.view.View;
import android.content.Intent;
import android.widget.EditText;

public class MainActivity extends Activity {
    public final static String EXTRA_MESSAGE = "tw.edu.tku.im.smap2013.imyday.my";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the menu
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }
    /** Called when the user clicks the Send button */
    public void sendMessage(View view) {
        Intent intent = new Intent(this, DisplayMessageActivity.class);
        EditText editText = (EditText) findViewById(R.id.edit_message);
        String message = editText.getText().toString();
        intent.putExtra(EXTRA_MESSAGE, message);
        startActivity(intent);
    }
}

```

strings.xml

activity\_displa

DisplayMessageA

Outline

- tw.edu.tku.im.smap2013.imyday.myfir
  - MainActivity
    - EXTRA\_MESSAGE : String
    - onCreate(Bundle) : void
    - onCreateOptionsMenu(Menu) : bool
    - sendMessage(View) : void

5554:AVD43

My Message

Hello World  
Myday

Basic Controls

Hardware Buttons

DPAD not enabled in AVD

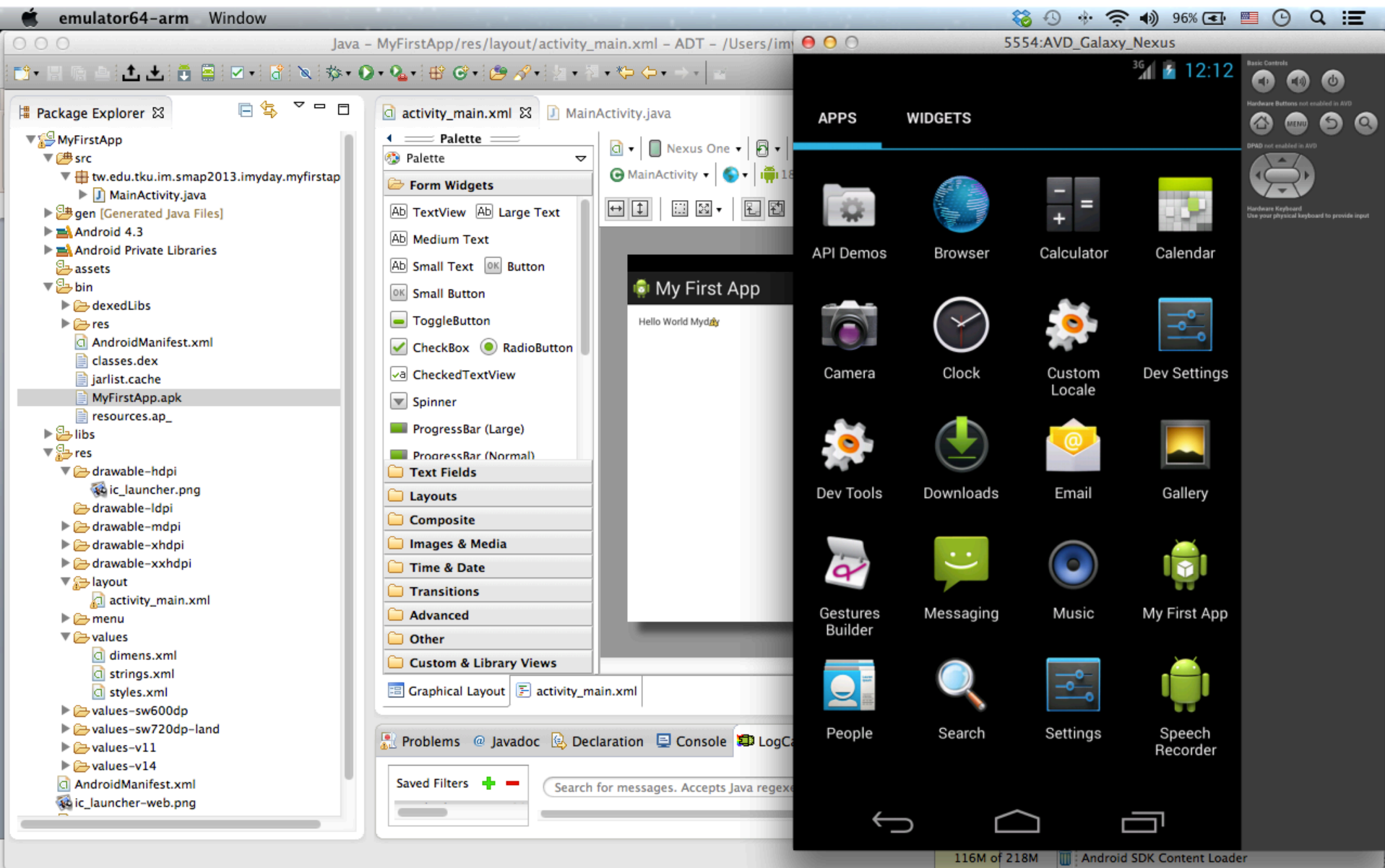
Hardware Keyboard  
Use your physical keyboard to provide input

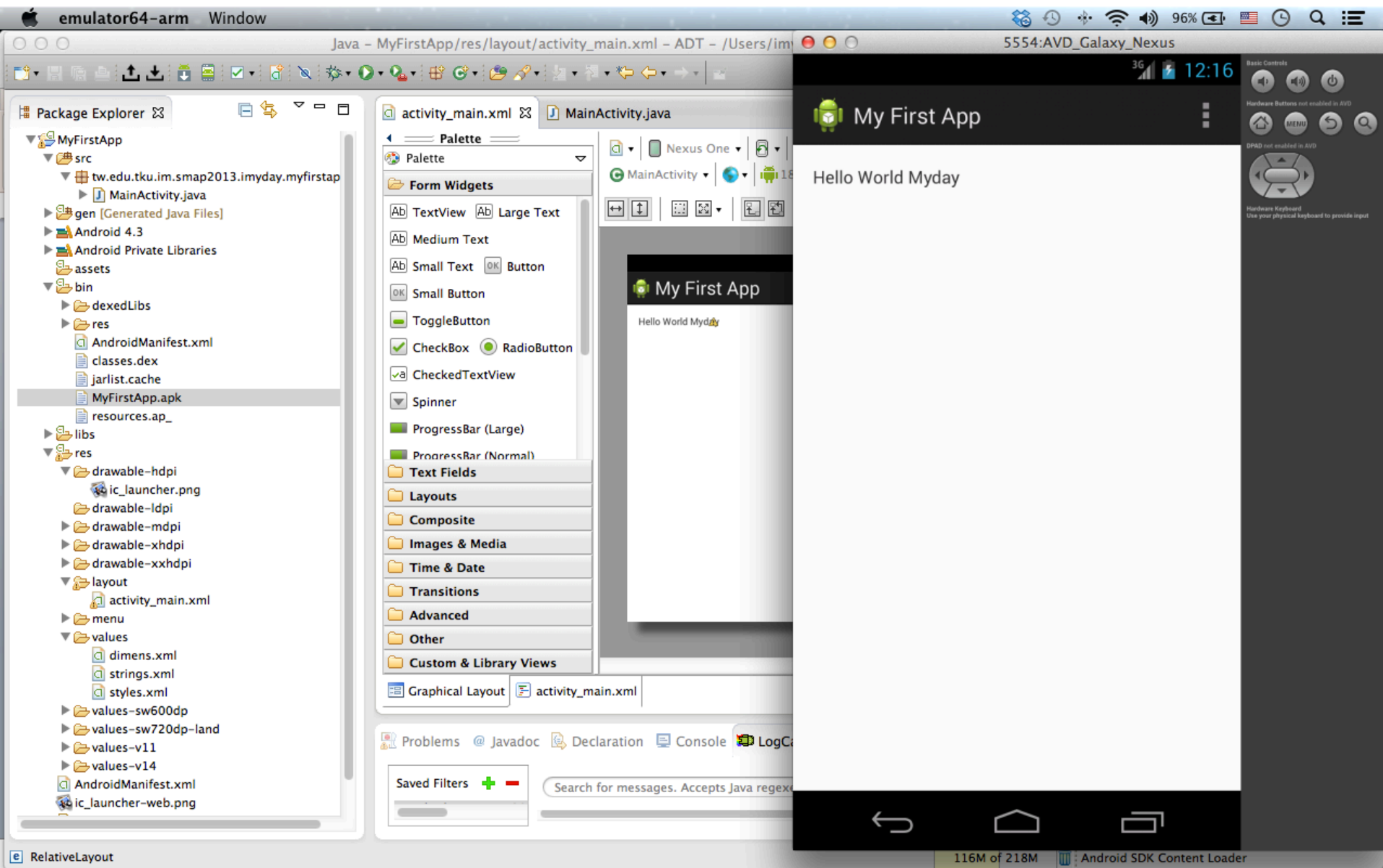
Problems @ Javadoc Declaration Console

Android

Writable Smart Insert 11 : 89 135M of 249M Android SDK Content Loader







# activity\_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="horizontal">
    <EditText android:id="@+id/edit_message"
        android:layout_weight="1"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:hint="@string/edit_message" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/button_send"
        android:onClick="sendMessage" />
</LinearLayout>
```

# activity\_display\_message.xml

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context=".DisplayMessageActivity" >

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/hello_world" />

</RelativeLayout>
```

# strings.xml

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

  <string name="app_name">My First App</string>
  <string name="action_settings">Settings</string>
  <string name="hello_world">Hello world!</string>
  <string name="edit_message">Enter a message</string>
  <string name="button_send">Send</string>
  <string name="title_activity_main">MainActivity</string>
  <string name="title_activity_display_message">My Message</string>

</resources>
```

# AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="tw.edu.tku.im.smap2013.imyday.myfirstapp"
    android:versionCode="1"
    android:versionName="1.0" >

    <uses-sdk
        android:minSdkVersion="8"
        android:targetSdkVersion="18" />

    <application
        android:allowBackup="true"
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >
        <activity
            android:name="tw.edu.tku.im.smap2013.imyday.myfirstapp.MainActivity"
            android:label="@string/app_name" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <activity
            android:name="tw.edu.tku.im.smap2013.imyday.myfirstapp.DisplayMessageActivity"
            android:label="@string/title_activity_display_message"
            android:parentActivityName="tw.edu.tku.im.smap2013.imyday.myfirstapp" >
            <meta-data
                android:name="android.support.PARENT_ACTIVITY"
                android:value="tw.edu.tku.im.smap2013.imyday.myfirstapp" />
            </activity>
    </application>

</manifest>
```

# DisplayMessageActivity.java

```
package tw.edu.tku.im.smap2013.imyday.myfirstapp;

import android.os.Bundle;
import android.app.Activity;
import android.view.Menu;
import android.view.MenuItem;
import android.support.v4.app.NavUtils;
import android.annotation.SuppressLint;
import android.annotation.TargetApi;
import android.os.Build;
import android.content.Intent;
import android.widget.TextView;

public class DisplayMessageActivity extends Activity {

    @SuppressWarnings("NewApi")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_display_message);
        // Show the Up button in the action bar.
        setupActionBar();

        //Get the message from the intent
        Intent intent = getIntent();
        String message = intent.getStringExtra(MainActivity.EXTRA_MESSAGE);

        //Great the text view
        TextView textView = new TextView(this);
        textView.setTextSize(40);
        textView.setText(message);

        setContentView(textView);
    }
    ...
}
```

# MainActivity.java

```
package tw.edu.tku.im.smap2013.imyday.myfirstapp;

import android.os.Bundle;
import android.app.Activity;
import android.view.Menu;
import android.view.View;
import android.content.Intent;
import android.widget.EditText;

public class MainActivity extends Activity {
    public final static String EXTRA_MESSAGE = "tw.edu.tku.im.smap2013.imyday.myfirstapp.MESSAGE";

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        // Inflate the menu; this adds items to the action bar if it is present.
        getMenuInflater().inflate(R.menu.main, menu);
        return true;
    }

    /** Called when the user clicks the Send button */
    public void sendMessage(View view) {
        Intent intent = new Intent(this, DisplayMessageActivity.class);
        EditText editText = (EditText) findViewById(R.id.edit_message);
        String message = editText.getText().toString();
        intent.putExtra(EXTRA_MESSAGE, message);
        startActivity(intent);
    }
}
```



# DisplayMessageActivity.java

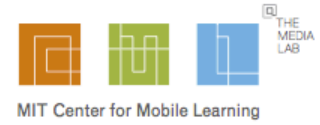
```
/**
 * Set up the {@link android.app.ActionBar}, if the API is available.
 */
@TargetApi(Build.VERSION_CODES.HONEYCOMB)
private void setupActionBar() {
    if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.HONEYCOMB) {
        getActionBar().setDisplayHomeAsUpEnabled(true);
    }
}

@Override
public boolean onCreateOptionsMenu(Menu menu) {
    // Inflate the menu; this adds items to the action bar if it is present.
    getMenuInflater().inflate(R.menu.display_message, menu);
    return true;
}

@Override
public boolean onOptionsItemSelected(MenuItem item) {
    switch (item.getItemId()) {
        case android.R.id.home:
            // This ID represents the Home or Up button. In the case of this
            // activity, the Up button is shown. Use NavUtils to allow users
            // to navigate up one level in the application structure. For
            // more details, see the Navigation pattern on Android Design:
            //
            // http://developer.android.com/design/patterns/navigation.html#up-vs-back
            //
            NavUtils.navigateUpFromSameTask(this);
            return true;
    }
    return super.onOptionsItemSelected(item);
}
}
```

# Alternatives for Developing Android Apps

- MIT App Inventor
  - drag-and-drop Android app development tool.
  - <http://appinventor.mit.edu/>
- Appery.io
  - develop apps for Android (iOS / Windows Phone).
  - <http://appery.io>
- Appnotch
  - drag-and-drop service that allows you to develop apps for Android (iOS).
  - <http://www.appnotch.com/>



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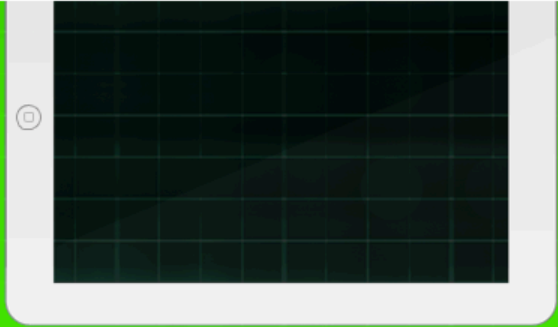
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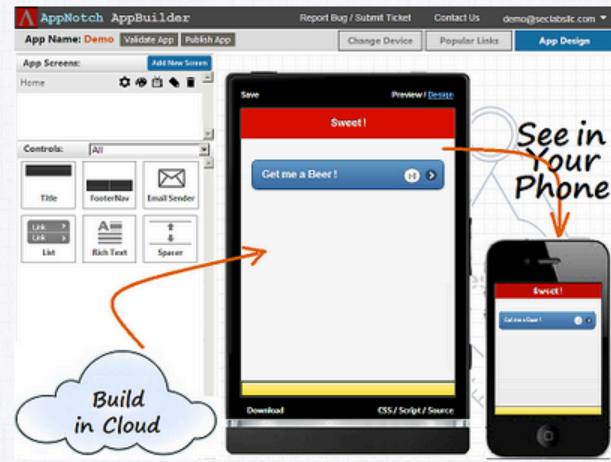
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# References

- Android Developer: <http://developer.android.com/>
- MIT App Inventor: <http://appinventor.mit.edu/>
- Native, Web or Hybrid Mobile Apps?,  
<https://www.youtube.com/watch?v=Ns-JS4amITc>