Android 1: Background

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1.1 Buzzwords…

- The Android platform originated in a separate company
- It was acquired by Google
- It is supported by the Open Handset Alliance (OHA)
- From a business perspective, Android is distinguished by the fact that many vendors are cooperating to provide a non-proprietary development environment

Key components of this successful alliance are:

- Hardware device manufacturers
- Mobile service providers
- Android/Google, which provides the basic software operating and development environments
- Independent app developers marketing through the app store or other places

The platform is based on:

- A secure operating system, Linux
- Virtual machines running on top of Linux (known as Dalvik virtual machines)
- A widely-known object-oriented language, Java
- An advanced software development environment, Android Studio

Proprietary vs. non-proprietary

- Android is based on open source licensing
- Developers do not have to pay fees to use the development tool kit
- They do not have to pay fees on the apps developed with it
- The app developer API includes everything that a “native” programmer would have access to

- The theory is that there is a large potential market
- By opening up the environment, you increase the size of the pie for everyone
- Android is growing from phones to tablets to other devices
- The growth is being driven by the app market

Versions

- The different versions of Android have been given the names of “sweets”
- Version 8 is the current version, known as Nougat
- As with all growing platforms, backwards compatibility and other issues can be significant
- They will be of some significance for this class because the devices which are provided have older versions of the software installed

1.2 Development Software

- There are various different ways of going about developing apps for Android
- Development environments range from the graphical to heavy-duty programming
- For example, there are environments specifically designed to help developers implement games without necessarily becoming expert in the details of raw Android development

- Some students ask whether they can use these alternative environments for the project in this class
- The answer is “yes”, with the following understanding:
- Using an alternative environment will allow you to more easily implement a game, potentially with more features, but the cost is that you learn less about Android itself

- The default development environment for this course, and what the course materials will cover, will consist of raw Android tools
- To start developing for Android you essentially need to download and install two pieces of software:

- 1. The Java SDK
- 2. Android Studio with the Android SDK
- Java is available for downloading from the Java (Oracle) Web site, www.java.com
- Android Studio is available through the Google Web site, developer.google.com

- As with all growing and changing systems, trying to do definitive documentation of installation and use is hopeless
- As with all software installations, it will be necessary for you to fiddle around and get things right
- Students are usually better at this than I am

- If you’re not using the latest version of Java, I would recommend installing it before installing Android
- If you’re having trouble installing Android, you might find the beginning part of the optional textbook to be of assistance

- This is tangential to the installation procedures for the versions of the development software, but it is directly relevant to this class:
- The actual physical devices available for class are Nexus 7's running various Android versions, in the 4.x range

1.3 Class Resources

- The textbook for this course is optional because you may be able to figure things out by yourself
- It only covers Android Studio—not the heart of Android programming itself
- The book is made available in case extra assistance is needed for topics which are not covered in detail in class

- Virtually anything you might want to know about Android programming can be found at the developer's Web site
- The site includes tutorials on app development
- It includes Java-like documentation of the packages and classes in the Android API
- It includes detailed technical information

Overhead Contents

- The problem with the Web site is the eternal one:
- There is too much information
- A beginning programmer may not know where to start and can't distinguish the essential from the interesting or the overwhelming
- The purpose of this set of overheads and those that follow is to provide a guide to getting started and a clear path that is realistic for a one semester introductory course

- There are two important principles at work here that kitchen-sink Web site and textbook authors seem to be unfamiliar with:
- 1. There are lots of things that you simply don’t have to be told about at the beginning
- There may come a time in the future when some overlooked items will be introduced, but until then, ignorance may not be bliss, but it’s necessary

- 2. There are lots of things where you will have to accept that they exist and learn how to use them at a minimal level without having any idea of how they work
- In other words, at the beginning you will be doing a lot of monkey work just to get the Android machinery to run a painfully simple app
- For the time being you will have to accept the machinery without explanation

1.4 The Emulator

Another useful aspect of the development environment:

- It comes with an emulator for handheld devices
- This means that you can initially develop and test code on a PC with the development environment installed
- You don’t literally have to develop on the handheld device

Emulation isn’t the be-all, end-all:

- The emulator is slow
- The emulator can be problematic
- The emulator may not fully model the hardware device of interest
- The reality is that you eventually have to test and finish development on a hardware device if you expect to roll out the app on that device

The Emulator: Boon or Bane?

- It is unbelievable how slow the emulator is on an up-to-date, reasonably powerful machine with a reasonable amount of memory
- If you try to launch an app on an emulator that hasn’t yet fully started, the app won’t run
- This can be a source of confusion and problems
- The moral of the story is to make sure the emulator is fully up and running before trying to run an app on it

- There are two immediate benefits to having the emulator
- If you have troubles with device drivers for an attached Android device, you can still check your work on the emulator
- Also, you can take screen shots of how apps work and include those screen shots in PowerPoint presentations
- You may want to do this for your presentation at the end of the semester

Summary and Mission

- That’s the end of the introductory blah blah blah
- You have a single mission, which is not graded homework:
- 1. Install Java and Android Studio and make sure you will be able to start doing development work

The End