ECE 1778 - Creativity and Programming for Mobile Devices
January 2011
Programming Assignment #P1, for Programmers

Development Environment and Simple Widgets

The goal of this assignment is to set up the Android Development environment that you will use throughout this course, and make a basic Hello World program and run it. As we are trying to move quickly on the basics in the course, we will also learn about how to layout simple buttons on the phone and how to react to them.

1   Setting Up The Android Environment

If you are using the ECE computers, the Android Environment will already be set up for you. (See document "Accessing the Android Development Environment on ECE Computers") If you are using your own computer, then you will have to download and install several packages on your computer. Three main platforms are supported - Windows, Linux and Macintosh. The Android organization SDK web page (see http://developer.android.com/sdk/index.html) will show you how to do this - the section labeled 'Quick Start' tells you what to do, but is rather terse. See **Installing the SDK** for the more detailed version.

To ensure that you've got the basic setup working, do the "Hello World" tutorial described in the tutorials section of the Android Developers website: http://developer.android.com/resources/tutorials/hello-world.html.   The key thing is to learn how to start a project and make the Android Phone emulator work on your development computer.

The installation and tutorial make use of the Eclipse development environment (which is used in many other software development contexts) together with the Android Development Tools (ADT) which is specific to the Android operating system.

2   Learn Basic Environment

Read Chapters 1 through 9 (pages 1 through 92) of the Murphy Book, **The Busy Coder's Guide to Android Development, version 3.4**, doing the small coding exercises given there.   Chapter 2 gives another set of instructions on how to install part of the development kit, in a somewhat different order, which you won't need if you've followed the instructions above in part 1. If you have trouble with the instructions above, you could try these instead.

Chapters 3, 4 and 5 will expose you to the basic development environment, as well as the structure of an Android Project's files, and the Eclipse environment. Chapters 7, 8 and 9 then moves on to describe *activities* (which are the pages that an app user sees), and how

to lay these out. This includes user interfaces such as buttons and text fields, and how to display images. Note that while this book often suggests using the non-Eclipse text-based development environment, it is recommended that you use the Eclipse environment you started with above, using the following:

You can download all of the examples in the **The Busy Coder's Guide to Android Development** book from the website http://github.com/commonsguy/cw-android .   To download all of the examples in a zip or tar far, click on the 'Download Source' button on the upper right section of the page.

If you want to run these examples within the Eclipse environment, start Eclipse, see the instructions on page 46 of the text. (Basically choose File->New->Android Project. Put a related name in the 'Project Name' box, and click on the 'Create project from existing source' radio button. Using the browse button next to the 'Location', select the directory that contains the complete project – i.e. the one that contains AndroidManifest.xml, assets, bin, gen, libs, res and src folders/directories. Click 'finish' and the code will be imported into Eclipse as usual.)

3   Assignment

Write an Android application that presents the users with three widgets:
   1. A text field that initially contains the word 'Nothing has happened yet.'
   2. A button labeled **Change**.
   3. A button labeled **Picture.**

The program should respond to the pressing of the buttons in the following way:
   • When **Change** is pressed, the text field should have its contents changed to 'The Change Button has been pressed 1 times.'   Subsequent presses of the button should increment the count.
   • When the **Picture** button is pressed, a picture of a dog should appear below the buttons. The next time it is pressed, the picture should disappear, and then appear on alternate presses.

You should only need an emulator to do this assignment, not an actual phone.

Due date: January 25th, before start of class.
What to submit: a zip file containing your complete project, runable from Eclipse.