

Android Assignment

Challenges in Cloud and Mobile Computing (COMS E6998-7)

Due: 11/23/2011, before class

Overview

For this assignment, you will build a basic Android application, which stores data in S3. You will learn the basics of the Android application model, as well as how to develop Android applications using Eclipse and the Android Emulator.

****I will ask that everyone develop this application on Android, and *not on any other platform*. That way, 1) I will have an easier time grading the assignment, and 2) you will learn about a new platform!**

Grading + What to turn in

By the due date, I will require that everyone email me (avnermay@cs.columbia.edu) a zipped folder with all of their code, as well as their answers to the questions at the end of part 0. Additionally, I will ask that, as soon as possible everyone sign up for a 10 minute slot to come to CEPSR 6LW5 (the Social and Mobile Lab) to demo their application for me. Please sign up for your 10 minute slot here (<http://www.doodle.com/vy8g7v57vwymkiyw>). The demo times are Monday 11/28 4-6 pm, and Tuesday 11/29 2-4 pm.

This assignment has a “setup section”, and then three parts (just like the first assignment): Part 1 must function properly when you demo the assignment to me to get full credit for the assignment. If it does not, you can still get some partial credit if you turn in some code which makes sense. Part 2 is bonus, and can be done instead of part 1 (although it very much builds on part 1). Part 3 is “bonus++” (aka, just for fun), and those who do it will get the opportunity to demo their application to the class at the end of the semester!!

Part 0: Setup + Android Tutorials

1. Read about Android
 - a. <http://developer.android.com/guide/basics/what-is-android.html>
 - b. <http://developer.android.com/guide/topics/fundamentals.html>
 - c. <http://developer.android.com/guide/topics/fundamentals/activities.html>
2. Install Android SDK
 - a. <http://developer.android.com/sdk/installing.html>
 - b. <http://developer.android.com/sdk/index.html>
3. Install ADT Plugin for Eclipse
 - a. <http://developer.android.com/sdk/eclipse-adt.html#installing>
4. Hello World Tutorial
 - a. <http://developer.android.com/resources/tutorials/hello-world.html>
5. Notepad Tutorial
 - a. <http://developer.android.com/resources/tutorials/notepad/index.html>
 - b. Do all four parts of this tutorial, including the “Extra Credit” section. (note: the “Extra Credit” section does not actually count for “Extra Credit”)

Now, please answer the following questions, regarding the “Extra Credit” section of the Notepad tutorial (<http://developer.android.com/resources/tutorials/notepad/notepad-extra-credit.html>). Please turn in the answers to these questions in the same email in which you submit your code. Please make sure you

set breakpoints in all the places they specify (onCreate(), onPause(), onSaveInstanceState() and onResume()) methods in the NoteEdit class):

1. Which of these breakpoints get hit when you “Add Note”?
2. Now add a title and body to the note, and click the “Confirm” button: which breakpoints get hit?
3. Click on the note you just created, to edit it: What breakpoints get hit?
4. Now click the “back” button: Which breakpoints get hit?
5. Once again, click “Add note”, and fill in the title and body. Click the “Home” button: Which breakpoints get hit when you hit the “Home” button?
6. The last parameter to “onListItemClick” is a “long id”. Can you describe how ids are assigned to notes in this list? What happens if a note is deleted, and another is added? Can the same ID be given again? How does this relate to the row ids in the SQLite database?

Part 1: Extend Notepad Tutorial to use AWS

1. Now, instead of storing the notes in a SQLite database stored locally on the Android machine, store them in S3. Each note should be its own text file in S3.

Tip: To add a reference to AWS libraries from your Android project, right click on your project in the Package Explorer, select “Build path” -> “Add libraries” -> “AWS SDK for Java”. You will also need to copy over the AwsCredentials.properties file with your AWS keys.

Part 2 (bonus): Integrating Android application with Google Maps

1. Now, modify the Notepad application above to store GPS locations instead of notes. The view for the “Edit Notes” activity should now accept a label, a latitude value, and a longitude value, from the user, instead of simply a title and a body.
2. Add a button (“View map”) from the main page of the application which opens a new view which displays the locations of all the labels in the list on Google maps.

Part 3 (bonus++): Have fun with Android!

1. Get creative – keep playing around with Android, and develop some cool application! You have complete freedom to build whatever you want. See if you can integrate input from the various sensors (eg, microphone, camera...). Perhaps use EC2 to perform some processing of data sent from the phone (for example, some image processing of a picture you take with the camera, like in HW1 part 2).

Resources

- You should get very familiar with this site: <http://developer.android.com/index.html>

Questions?

- Email avnermay@cs.columbia.edu if you have any questions about this assignment.
- Also, remember that my office hours are Tuesdays from 5:30-6:30 pm.
- Note: A big part of this assignment is about learning how to navigate documentation and teach yourself about developing on a new platform. So please spend time reading the documentation, and trying to find answers on your own!