Chris Piech Section #7

CS 106A May 23, 2018

Section #7: Lesson Plan

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This section is primarily about classes, although there’s some problems that give practice with interactors as well. The goal for this section is to make sure students solidly understand what classes are for (serving as blueprints for custom variables types) and how to define and use them. Ideally, by the end of section they will have clarified and refined a lot of the concepts/skills they need for NameSurfer, which is due next Wednesday and relies heavily on getting classes to work together.

**Key Concepts**

* **JComponents** (Interactors)
  + Buttons, text fields, labels
  + Use of **init()** method *only*to set up the window
  + Asynchronous control flow, very similar to **MouseEvents**
* Classes
  + Templates or bluprints that allow us to define custom variable types
  + Need a constructor, instance variables (almost always), and methods
  + Promote program decomposition into multiple files with different jobs
  + Encapsulation: public vs. private and the wall of abstraction
  + Use of **this** when assigning values to instance variables, to disambiguate

**Lecture Recap**

Here’s quick summaries of the relevant lectures for this week’s section. Please check out the slides in full if you haven’t been in lecture.

1. Interactors

Buttons, text fields, labels, init() vs. run(), asynchronicity

1. Classes Part 1

Templates/blueprints for custom variable types  
Require subvariables (ivars), methods, constructor

Bank Account example

Encapsulation: public vs. private variables & methods

1. Classes Part 2

Inner workings of a GRect as example of a class

Bouncing balls example

Email client example

Wall of abstraction

1. Data Visualization

Very close parallels to NameSurfer’s use of classes!

**Classes Problems (3, 4)**

Either problem 1 or 3 will give good practice with arrays. It’s worth hammering home why arrays are good for these problems. Problem 1 can get tricky both because it starts counting at 2 instead of 0 and because it’s the index, not the contents, of the array that indicates the number of interest. This one is very much helped by walking through it on the board, crossing out numbers.

**Matrix (2D Array) Problems (4, 5, 6)**

Problems 4 and 5 are high-priority and worth particular focus this week because they’re so similar to what students will be doing with image matrix manipulation in ImageShop. If you haven’t looked over that assignment, it would be helpful to do so before section so you set them up for the assignment or walk them through points of confusion. It’s particularly valuable here to make sure they understand why and how we find the number of rows and number of columns in a matrix.

**HashMap Problems (7, 8)**

Either one of these problems should give good review of HashMaps. Problem 7 is similar to the How Unique name collection question from last week’s handout, so if you did that last week in section this can be a good one to help hammer home how different data structures lend themselves to different tasks.