Carleton Summer Teaching Institute: Computer Science A

Welcome to the Carleton Summer Teaching Institute for Computer Science! Participants in this workshop have considerable variation in levels of experience, so I've laid out activities here by a rough order of how you might cover them in a class. If you're new to Java or AP, you'll want to start with the first activity and work forward from there. If you have experience and want to jump ahead, feel free.

- GitHub folder for Dave's code

Links

- AP Computer Science A Course Home Page
- Past exam questions
- Java API
- Textbooks
- Role Playing in an Object-Oriented World
- AP demographic data
- Earning credit
- Our Google Drive folder

Getting started: warmups and arithmetic

- Intro Java Lab
- Intro Graphics Lab
- Automatic Landscape
- Automatic Landscape, Redux

String processing (and some looping)

- Renaissance translator. Huzzah!
- Double Caesar cipher

String processing + object-oriented basics (modifying code)

- AP CS Lab: Magpie. (In our Google drive, and also available on audit site. The College Board says you must treat this as confidential, as you would exam questions, so do not redistribute.)
- AP CS Lab: Consumer Review. (In our Google drive, and also available on audit site. The College Board says you must treat this as confidential, as you would exam questions, so do not redistribute.)

Object-oriented programming basics (writing own code from scratch)

Here are three different assignments involving creating your own classes. The first one is more straightforward than the other two. If you're new to AP or Java, start with the first one. If you're more experienced, choose one of the other two based on which one seems like it might be more fun to do.

- Car
- Lunar Lander

- Skyline

Loops, arrays, string processing + object-oriented basics

- Loops and array activities
- AI Author
- AP CS Lab: Data Lab. (In our Google drive, and also available on audit site. The College Board says you must treat this as confidential, as you would exam questions, so do not redistribute.)

Two-dimensional arrays, inheritance, and image processing

- AP CS Lab: Picture Lab. (In our Google drive, and also available on audit site. The College Board says you must treat this as confidential, as you would exam questions, so do not redistribute.)
- AP CS Lab: Steganography Lab. (In our Google drive, and also available on audit site. The College Board says you must treat this as confidential, as you would exam questions, so do not redistribute.)

Object-Oriented Design and Associated Algorithms

- AP CS Lab: Elevens. (In our Google drive, and also available on audit site. The College Board says you must treat this as confidential, as you would exam questions, so do not redistribute.) This lab is now likely outdated due to its use of interfaces which are no longer in the curriculum, but you're still welcome to use it if you like.

Inheritance

- Pets
- Shapes
- Sticks
- AP CS Lab: Celebrity Lab. (In our Google drive, and also available on audit site. The College Board says you must treat this as confidential, as you would exam questions, so do not redistribute.)

Recursion, Sorting, and Searching

- Recursion practice
- Searching and sorting problem set
- Sorting practice by programming

Data Structures Assignments (more advanced stuff)

- Encryption [many thanks to Lester McCann]
- Recursive queue
- Search engine via hashing
- Search engine via BST
- Big family heap