

**WV AP Summer Institute**  
**July 10-13, 2018**  
**George Washington High School, Charleston, WV**  
**Computer Science A**  
**Instructor: Kyle Gillette**

During the workshop, we will explore the concepts students need to understand and apply in order to have a successful AP CS program. Discussion of different curriculum choices, strategies, and teaching techniques will be addressed. Interesting projects that can help with understanding those concepts will be discussed. If you have a project that you feel is particularly effective, please bring an electronic copy of that project with you to share.

### **Day 1**

Introductions

Please share what it is that you wish to take away from this workshop. This could be areas that you wish your students to become stronger, concepts with which your students struggle, or ?

Course Description (particularly new changes/clarifications)

Course Home page for APCS

IDE choices: BlueJ, DrJava, Eclipse, JCreator, jGRASP, NetBeans

Curriculum choices: procedural (Building Java Programs...), objects first (Objects First with Java, Java Methods), ...

Basics: primitive types, class, constructor, accessors, toString,

Foundational programs (Fractions) – methods, branching, recursion (early intro.)

<http://codingbat.com/java> - great resource for interactive practice

Unit testing – using System.out.println

### **Day 2**

Strings - <http://codingbat.com/java> practice

Foundational Program (Editor) - editor problem version 1, information hiding - editor problem version 2

Arrays and ArrayLists – a major key to AP success

- binary project
- josephus 1 – array of Booleans
- <http://codingbat.com/java> practice
- APArrayList – roll your own ArrayList of strings (I avoid generics)
- josephus 2 – ArrayList of Integer (Wrapper classes and autoboxing)
- Mazesolver – (can use Location class from Gridworld or your own)

### **Day 3**

Foundational Program (Geometry) – interfaces, inheritance, polymorphism

Person -> Employee -> Hourly, Salaried, Commission example. Inheritance, abstract class

List interface – What does it mean to be a list? Differentiated learning (linked list or Cons'ed list)

New Labs : Picture Lab/Image Manipulation

Sharing projects

### **Day 4**

Role of Gridworld?

New Labs: Elevens, Magpie

Other resources for APCS

Organizations: CSTA, SIGCSE, APcentral discussion group

Wrap up: questions, reflections, & goals