CS100J October 23, 2003

Arrays. Reading: Secs 8.1, 8.2, 8.3

```
  100: 04  A+   ****
95-99: 07  A    *******
90-94: 08  A    ********
85-89: 15  A    ***************
80-84: 17  B+   *****************
75-79: 21  B    *********************
70-74: 15  B    ***************
65-69: 16  C+   ****************
60-64: 26  C    **************************
55-59: 16  C    ****************
50-54: 16  C–   ****************
45-49: 08  D    ********
40-44: 03  D–   ***
```

Quote for the Day: Computer science has its field of computational complexity. Mine is computational simplicity. **Gries**

Computational simplicity

If you are writing too much code --it gets longer and longer, with no end in sight: **stop and look for a better way**.

If your code is getting convoluted, and you have trouble understanding it: **stop and look for a better way**.

Learning to keep things simple, to solve problems in a simpler way, sometimes requires a different way of thinking.

I am trying to teach not just Java but how to think about problem solving.

Make everything as simple as possible, but no simpler. Einstein

Computational simplicity

```
// Precondition: n > 0, n: 1, 2, 3, 4, 5
b= 1;
// invariant: b is a power of 2    and   b <= n
while (    n >= 2*b                    ) {
      b= 2*b;
}
// postcondition: b is a power of 2    and   b <= n  and n < 2*b
```

b 1 2 4

n 5

```
public class Fraction {
   private int numerator;
   private int denominator;     // Always > 0!!!

   // Constructor: the fraction a/b. Precondition: b != 0
   public Fraction(int a, int b) {
     if (b < 0)
       { a= -a; b= -b; }
    numerator= a;
    denominator= b;
   }
}
```

Purpose of constructor: initialize (some of) the fields of a new instance

Polya (How to Solve it): USE ALL THE DATA

a / b = –a / –b

3/4 = 6/8, 3/4 = 12/16.

New topic: Arrays

This is the last new Java feature that you will be studying in this course.

Chapters 8 and cover arrays. Start studying it. Chapter 8 of the class text.

Most of what we did was on the blackboard.