

Introduction to Comp. Sci., Homework 3

Due at 12pm on Friday Feb. 22

Readings from Liang

Read the sections on `for` loops, nested loops, `break` and `continue`, and methods in Liang. In the ninth edition, these are sections 4.4, 4.6, and 4.9 and chapter 5. Skim the rest of the chapter on loops.

Optional readings and exercises from HFJ

Read pages 114 and 115. Try the exercise on page 118.

To be turned in

Create a Java program, `hw3.PrimeFactor`. It should be a class named `PrimeFactor` in the package `hw3` in `hw3/PrimeFactor.java` in Subversion. It should have two static methods:

- `countFactors`, which takes two `int` arguments and returns an `int`. It should return the number of factors of the second number that appear in the first. For example, `countFactors(28, 2)` should return 2 because 28 is divisible by 2^2 . If the first argument is not divisible by the second, it should return zero. The first argument is guaranteed to be at least one, and the second is guaranteed to be at least two.
- `main` should ask the user to enter a positive number and print the prime factors of that number, one to a line. If a prime factor appears more than once in the factorization of a number, it should be printed with the proper exponent. For example:

```
$ java hw3.PrimeFactor
Enter a number: 28
2^2
7
```

It does not need to do anything in particular for numbers smaller than one or text that is not a valid number. One has no prime factors, so if the user enters “1” it should print nothing at all.

I wrote a smoke test for your programs. You can run it with (Mac):

```
$ testing/test.sh Hw3Test
```

or (Windows):

```
> testing\test.ps1 Hw3Test
```