

Learning Java concepts

Introduction

We give suggestions for when and how to study to best learn Java concepts and rules.

Typically, one starts cramming for a test anywhere from one day to one week before the test, and the studying consists mainly of reading the text, powerpoint slides, and anything else one can find. This is inefficient and even ineffective in two ways.

First, most of the material taught in one lecture is used in the next lecture. Therefore, if you haven't fully understood one lecture, the next lecture will be even less understandable, and you find yourself falling further and further behind. The material in one lecture may also be used in the next programming assignment, and you then have to hurriedly cram to get through the assignment

Many of you can play a musical instrument. You took weekly lessons. Did you procrastinate in practicing each week and only put in an hour of practice just before the lesson? No! If you did that, your teacher would be horrified. You practiced every day, and you really learned. In the same way, you have to practice and study programming on a daily basis to gain fluency. .

Especially in a course like this, with anywhere from 200 to 650 students, it is imperative that you stay abreast of the material. Don't wait and then cram. Study every day or every other day for ½ hour (or more) and you will find the course much more manageable and enjoyable. Moreover, you will be able to get help easily from the course staff when you need it.

Second, just *reading* is a poor way to learn. Better than reading is *doing*. Every day, or every other day, write and test a small method, or attempt to do something in Eclipse or DrJava in order to understand a concept. Play with Java, try things on a daily basis, as you would do when learning a musical instrument.

Also, there are some concepts that you must learn and master immediately —like: how the new-expression is evaluated, the definition of **static**, the inside-out rule, how a method call is executed, and how the try-statement is executed.

You need to know these things because you haven't fully mastered Java until you do. You also have to know them for tests. On a test, you may be asked to write down these things, and if you haven't *practiced* writing them down, you won't be able to do it.

Below, we show you a relatively painless way to learn what the new-expression is and how it is evaluated. We choose this example because many students have trouble understanding the new-expression fully. We first define the new-expression. We then discuss the best way to learn it —this is the important part!

Example: Learning about the new-expression

Do you know the format, i.e. the syntax, of the new-expression? Can you write it down? Here is the syntax of the new-expression:

(1) **new** <constructor call>

Next, can you explain how the new-expression is evaluated? Here are the three steps in evaluating a new-expression **new** C(args):

- (2) 1. Draw (create) a new object of class C. Remember to put its name (e.g. C@48ae) on the tab of the object. Put the default values in the fields. If Java creates it, the hexadecimal number 48ae is the memory location where the object is stored.
2. Execute the constructor call C(args) —remember, the constructor lives in the new object.
3. Use as the value of the new-expression the name of the new object (e.g. C@48ae).

(Note: When Java creates the object, it figures out the name. If *you* draw or create the object, *you* give it any name your want, perhaps C@6 will do.)

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How to learn and master the new-expression

Can you write (1) and (2) down? *If you can't, you don't understand the new-expression.* Given a new-expression, can you evaluate it yourself? *If you can't, you don't understand the new-expression.*

Get out a blank piece of paper and try writing down the syntax and the three steps of evaluation. Don't look at the above while doing that! When done, compare what you wrote with the above. If you didn't get it right, then you have work to do. *Copy (1) and (2) onto a piece of paper, slowly, concentrating on what you are writing and what it means.* Then, get out a blank piece of paper and try again to write (1) and (2). Now, put it all aside for 24 hours. Then, try once more to write down (1) and (2). Continue this process until you can write down (1) and (2) whenever asked for it. It won't take long, perhaps 10-15 minutes total over 2-3 days.

Next, try to evaluate a new-expression yourself. Suppose class C has one **int** field x and that the constructor specification is

```
/** Save x in field x. */  
public C(int x)
```

Evaluate the new-expression **new** C(5), using a blank sheet of paper —i.e. carry out the three steps in (2). If you have trouble, then you don't understand the three steps. Get Help! Talk to an instructor, TA, or consultant. They are all happy to help.