

## Homework

### Programming Tracing

1. Trace through the following code segments and illustrate the output and memory.

	Memory	Output
a) <pre>int a = 3; int b = 9; System.out.println(b); a = b + 2; a = a + b; System.out.println(b+3); System.out.println(a);</pre>	<pre>a = 3 44 20 b = 9</pre>	<pre>9 12 20 &gt;</pre>
b) <pre>int ans = 10; int res = 6; int num; num=ans + res; System.out.println(num + 2); res=num + 3; System.out.println( res);</pre>	<pre>num = 16 res = 19</pre>	<pre>18 19 &gt;</pre>
c) <pre>int a, b, c; double d, e, f; a = 10; b = 4; d = a; c = a / b; e = a / b; f = e / b; a = a + 2 * b; d = b - d * 2; System.out.println(a); System.out.println(b); System.out.println(c); System.out.println(d); System.out.println(e);</pre>	<pre>a = 40 18 b = 4 d = 40 -16 c = 2 e = 2.0 f = 0.5</pre>	<pre>18 4 2 -16 2.0 &gt;</pre>

2. To switch the values contained in the variables x and y, a programmer wrote the following segment:

```
x = y;
```

```
y = x;
```

- a) If, before execution of the segment, x contains the value 7 and y contains the value 4, what value would each have after the segment was performed?

x = 4; y = 4

**Hint:** Remember that a computer can only do ONE instruction at a time!

Try doing a trace of the above steps. What's the problem? Did it do what the programmer wanted it to do?

- b) Rewrite the segment so that it performs the intended task correctly.

Try to do it WITHOUT hard-coding any values.

(In other words, DON'T do x = 4; or y = 7;)

```
int temp = x;
```

```
x = y;
```

```
y = temp;
```

#### Reference for questions 2

Carter, John. An Introduction To Computer Science Using Java. Toronto: University of Toronto Press, 2003