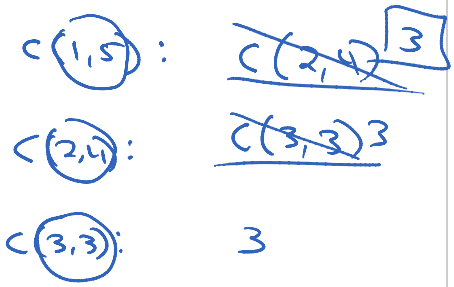
Ch 8 review

Wednesday, April 17, 2013
9:38 AM

The next several questions refer to the following recursive method:

```
public static int compute(int x, int y) {
     if (x != y)
          return compute(x+1, y-1);
     else
          return x;
}
```



1. What is returned by the call `compute(1, 5)`?
   a. 1
   b. 2
   c. 3
   d. 4
   e. No value is returned because infinite recursion occurs.

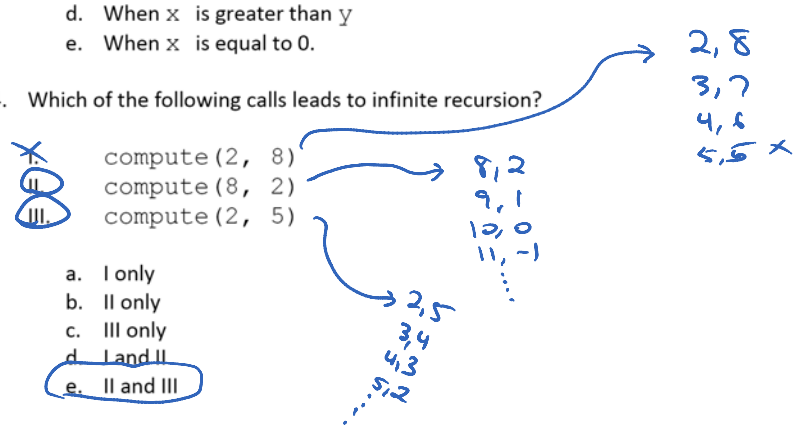
2. How many times would `compute` be called in the previous problem (including the initial call)? (free response)

   3

3. What is the condition for the base case in the recursive method?
   a. When `x` is not equal to `y`
   b. When `x` is equal to `y`
   c. When `x` is less than `y`
   d. When `x` is greater than `y`
   e. When `x` is equal to 0.

4. Which of the following calls leads to infinite recursion?

   I. `compute(2, 8)`
   II. `compute(8, 2)`
   III. `compute(2, 5)`



   a. I only
   b. II only
   c. III only
   d. I and II
   e. II and III

The next two questions involve the following recursive method. The method is designed to print every other positive number that is less than or equal to a given positive number; printing starts with either 1 or 2.

```
public static void recur(int n) {
    if (n != 0) {
        recur(n - 2);
        System.out.print(n + " " );
    }
}
```

Base Case n == 0

5. The `recur` method is prone to infinite recursion. What initial values of `n` would lead to infinite recursion? (free response)

Negative numbers
Odd numbers

6. What change could be made to the `if` statement to make the method resistant to infinite recursion? (free response)

if (n > 0)

For the following questions consider the following recursive method, and assume that int[ ] a = {15, 10, 11, 16, 20, 18}

length = 6

```
public static int mysteryMethod(int[] a, int j) {
    if (j < a.length) {
        if (a[j] % 10 != 0)
            return mysteryMethod(a, j+1);
        else
            return mysteryMethod(a, j+1) + 1;
    }
    else
        return 0;
}
```

mm(a,0): 2 → mm(a,1)
mm(a,1): 1 → mm(a,2) + 1 → 2
mm(a,2): 1 → mm(a,3)
mm(a,3): mm(a,4)
mm(a,4): 0 → mm(a,5) + 1 → 1
mm(a,5): mm(a,6) 0
mm(a,6): 0

```
public static int someMethod(int[] a, int j) {
    if (j < a.length) {
        return a[j] + someMethod(a, j+2);
    }
    else
        return 0;
}
```

15/10/11/16/20/18

sm(a,0): 15 + sm(a,2) 31 → 46
sm(a,2): 11 + sm(a,4) 20 → 31
sm(a,4): 20 + sm(a,6) 0 → 20
sm(a,6): 0

7. What would a call to `mysteryMethod(a, 0)` result in?
(Free Response)

2 (Counts the multiples of 10 starting at index j)

8. What would a call to `mysteryMethod(a, 2)` result in?
(Free Response)

1

9. What would a call to `someMethod(a, 0)` result in?
(Free Response)

46 (it adds every other number starting at index j)

10. What would a call to `someMethod(a, 1)` result in?
(Free Response)

10 + 16 + 18 = 44

11. What would a call to `someMethod(a, 2)` result in?
(Free Response)

11 + 20 = 31