Quiz 5: More logic SOLUTION

CSCI 110 Section 1

Friday, August 26, 2016

1) Determine the result of evaluating each expression on the left: true, false, error, or don't know. [70 points]

```
false || (false && true)                                    false

!(true || false) && true                                    false

32 > 23 && 23 <= 32                                          true

5 > 100 || 4 + 5 == 9                                        true

!(19 % 3 == 2)                                               true

((false || true) && !false)                                  true

String a = "a"; String b = "b";
(a + b).equals("ab") &&
    a.equals("a")                                            true

String s = "bob";
"stan".equals(s) || "bob" == s                          don't know

int a = 5; int b = 7;
b < 7 || a == b || a >= 5                                    true

!(2 % 1 == 0 && 6 < 7)                                      false

int b = 20; boolean c = false;
!(!(b <= 10 || !c) && b >= 20)                               true

!(5 / 2 == 2 || 5 < 1 / 2)                                  false

int a = 12; int b = 1;
int c = 14; int d = 7;
((a / b >= 1 || b / c >= 1) &&
 (c / d >= 1 || d / a >= 1))                                 true

(!true || !false) ==
    !(true && false)                          true  (this is de morgan's law)
```

next problem on back

2) Fill out the blanks to complete the following program. If the user likes just dogs or just cats, greet them with, "Hello fellow dog-lover" or "Hello fellow cat-lover" respectively. If the user likes both, print "Hello animal-lover!". Hint: all three are compound expressions [30 points]

```
import java.util.Scanner;
class AnimalAsker {
    public static void main(String[] args) {
        Scanner reader = new Scanner(System.in);
        System.out.print("Do you like dogs? (true/false) ");
        boolean likesDogs = reader.nextBoolean();
        System.out.print("Do you like cats? (true/false) ");
        boolean likesCats = reader.nextBoolean();

        if (likesDogs && !likesCats) {
            System.out.println("Hello fellow dog lover!");
        }
        if (!likesDogs && likesCats) {
            System.out.println("Hello fellow cat lover!");
        }
        if (likesDogs && likesCats) {
            System.out.println("Hello animal lover!");
        }
    }
}
```

3) Swap two Strings a and b using a third variable. [extra credit, 15 points]

```
String tmp = a;
a = b;
b = tmp;
```

4) Swap two integers a and b without using a third variable. [extra credit, 25 points]

This is the XOR swap algorithm. This was pretty tricky since you had to realize that integers are represented in binary, then make the leap that the XOR operator goes bit-by-bit for integers.

```
a = a ^ b;
b = b ^ a;
a = a ^ b;
```