Midterm 1

CSCI 110 Section 1

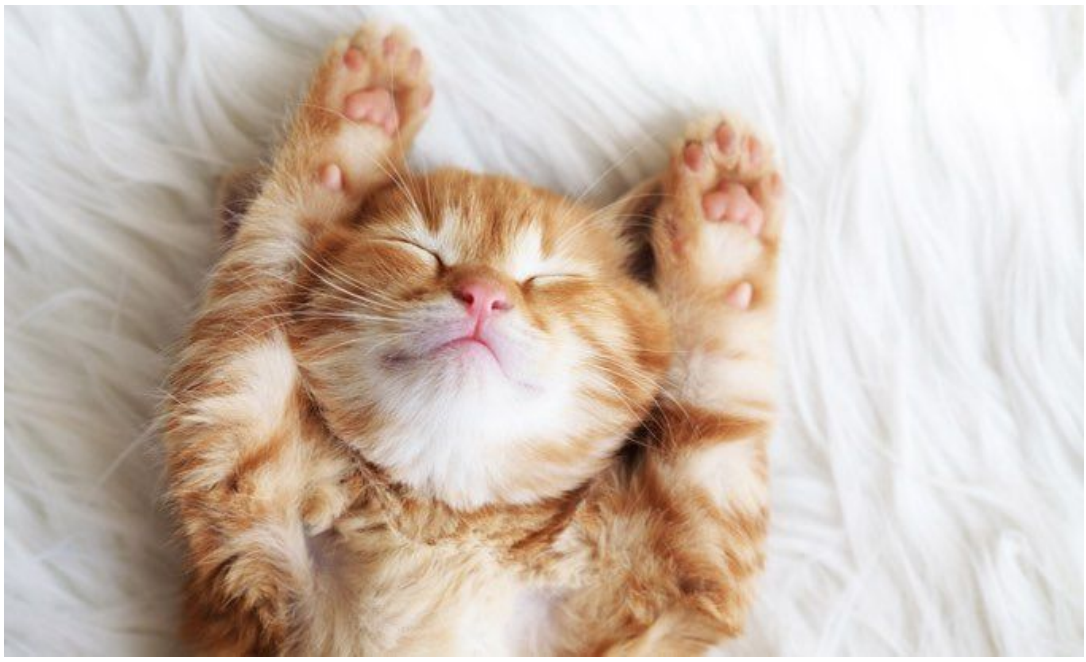
Monday, September 12, 2016

Name: _____

Total: 1000 points

Take a deep breath before starting. When in doubt, make educated guesses. You've got this!

Please leave this exam on your desk when you're finished.



1) Determine the result of evaluating each expression. [200 points]

```
28 / 5
```
_____

```
29 % 5
```
_____

```
true && !(false || true)
```
_____

```
"5" == 5 || true
```
_____

```
(4 * 5) % 3 > 2 ||
    (35 - 15) % 3 == 0
```
_____

```
"Wonderful" > "great"
```
_____

```
int a = 13;
int b = 4;
a % b > 1 || a / b > 3
```
_____

```
boolean a = false;
boolean b = true;
!(b || !b) || !(a || !a)
```
_____

```
float c = 4.7;
int d = 5;
boolean e = d < c;
String f = "hello";
(f.length() * 3) % d > c ||
    (e && (d + c) < 10)
```
_____

```
String g = "damn";
String h = "daniel";
boolean i = g.length() > 4;
boolean j = h.length() > 5;
i = true;
boolean k = !i || !j;
(i && j) || (j && k)
```
_____

2) How many times will the body of the following while loop be executed? [50 points]

```
int i = 12;
while (i < 35) {
    i++;
    System.out.println("foo");
}
```

3) What will be printed when the following function is called? [50 points]

```
int a = 0;
System.out.println("ready 2 roll");
int n = 0;
while (n < 6) {
    n += 2;
    a += n + ",";
}
System.out.println(a);
```

4) Briefly explain what each line of code does. [100 points]

```
01  String makeEmail(String first, String last, String domain) {
02      String result = last + "." + first + "@" + domain + ".com";
03      return result;
    }
04  System.out.println(makeEmail("jay", "leno", "cars"));
05  System.out.println(makeEmail("leslie", "knope", "parks"));
06  System.out.println(makeEmail("sandor", "clegane", "pacifism"));
07  System.out.println("that's all folks");
```

01 _____

02 _____

03 _____

04 _____

05 _____

06 _____

07 _____

5) Please convert the following while loop to a for loop. [100 points]

```
float h = 6.0f;
boolean j = false;
float m = 243.54f;
String k = "bar";
int l = 900;
while (l != 6080) {
    k += "baz";
    h -= 2.0f;
    m = h * h + m;
    j = !j;
    l += 1;
}
```

Say you have the following function:

```
String mystery(String a, float b, boolean c) {
    String result = "";
    while (c) {
        while (result.length() < 12) {
            result += a;
            result += Boolean.toString(c);
        }
        return result;
    }
    if (b > 10) {
        float y = b;
        while (y < 4 * b) {
            result += "foobar";
            y += a.length();
        }
    }
    return result;
}
```

6) What's the result of calling mystery("hello", 11.0f, false)? You can show your work by tracing the values of variables. [100 points]

7) What's the result of calling mystery("goodbye", 25.0f, true)? [100 points]

8) Assume there are already defined integers x and y that you don't know the values of. If x is positive and y is negative, or if x is negative and y is positive, print "whoa". Otherwise, print "chill". [100 points]

9) Say there are two functions already defined: `boolean isFuzzy(int num)` takes an integer and returns true if the number is fuzzy and false if not. `boolean isMagical(int num)` takes an integer and returns true if the number is magical and false if not. Write a loop to count how many numbers are fuzzy but NOT magical between 867 and 10942 (inclusive). [100 points]

10) Assume there's an integer named `num` that you don't know the value of. Write code to round `num` to the nearest multiple of 10. For numbers in the middle (i.e. ending in 5) round up. Hint: how do you get the last digit of a number? [100 points]

11) Say you have two ranges [a1, a2] and [b1, b2] where a1, a2, b1, and b2 are pre-defined integers. Write code to calculate a boolean value: true if the two ranges overlap, false if not. Example: Given two ranges [0, 3] and [2, 4], there is an overlap from 2 to 3 so the result would be true. Hint: draw a number line to help visualize this problem. [extra credit, 100 points]