CS 105 Midterm Review 1

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Question 1.

What types of variables are there?

Question 2.

Let's use `==` and `.equals()`.

(a) Are integers `x` and `y` equal?

(b) Are Strings `str1` and `str2` equal?

Question 3.

(a) Convert the statement "it is not raining outside" to a `boolean` in Java.

(b) Convert the statement "it is raining outside" to a `boolean` in Java.

Question 4.

Complete the truth table for `a && b`.

a	b	a && b
true	true	
true	false	
false	true	
false	false	

Question 5.

Complete the truth table for `a || b`.

a	b	a || b
true	true	
true	false	
false	true	
false	false	

Question 6.

Complete the truth table for `!a`.

a	!a
true	
false	

Question 7.

For each snippet of code, what is the output?

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

```
boolean x = false;
boolean y = true;
boolean z = false;
println((x || y) && !(y && z) || (!x && z));
```

Question 8.

For each of the following, write the function header.

(a) Write a function that takes two integers and returns `true` if both integers are either positive or both are negative, and `false` otherwise.

(b) Write a function `isLeapYear` that takes an integer year and returns `true` if it is a leap year, and `false` otherwise.

(c) Write a function inRange that takes two integers. Return true if one of the two numbers is in the range 10-20 (inclusive), but not both.

Question 9.

For 8 (a) and (b), create a ground truth table that has a good range of test cases.

(a) Question 8 (a)

(b) Question 8 (c)

Question 10.

Implement the function from either question 8 (a) or (c). Do not do this on the computer, instead use paper and pencil (to better prepare for the exam).

Now that we've reviewed together, use the old midterms (on Moodle) to practice. Ideally, we'll review those that you have already completed but have questions about. Also, if you have anything you'd like me to hit on Sunday, ***please let me know!*** I already plan to cover conditionals, loops, and maybe some more functions, but please either tell me here or email me (*eshbaugj@lafayette.edu*) if you want me to touch on anything specifically on Sunday.