22C:16 Quiz 3
Date: Feb 7th, 2012

1. Write down the value and type of each of these expressions. Assume that the `math` and the `sys` modules have been imported prior to the execution of these expressions. Also, suppose that the value of `sys.maxint` is 9223372036854775807.

   (a) `100L + 200.00`
   Value: 300.0
   Type: Float

   (b) `math.trunc(10.97) - math.trunc(11.17)`
   Value: -1
   Type: Int

   (c) `len(str(2222/10))`
   Value: 3
   Type: Int

   (d) `bin(5) + bin(3)`
   Value: 0b1010b11
   Type: String

   (e) `-1*sys.maxint`
   Value: -9223372036854775807
   Type: Int

2. Here is a program to find the largest *and* the second-largest numbers in a given sequence of numbers. You are required to answer the three questions below the program.

   The program starts starts by prompting the user for a positive integer, let us call this n, that represents the length of her sequence. The program then reads n non-negative integers input by the user (typed one in each line) and outputs the largest and the second-largest numbers in the given sequence.

```
n = int(raw_input("Enter a positive integer: "))
print "Now please enter", n, "non-negative integers, one per line"

max = -1
secondMax = max

count = 1
while (count <= n):
    currentNumber = int(raw_input())

    # Case 1: The current number is at least as large as the current max
    if currentNumber >= max:
            secondMax = max
            max = currentNumber

    # Case 2: The current number smaller than the current max, but at
    # least as large as the current secondMax
    if (max > currentNumber) and (currentNumber >= secondMax):
            secondMax = currentNumber
    count = count + 1

print "The largest number is", max
print "The second largest number is", secondMax
```

(a) Suppose that the user inputs 5, when prompted for `Enter a positive integer:`. Then the user enters the numbers 200, 32, 47, 185, and 99 (one number per line). Write down the values of the variables `max` and `secondMax` at the beginning of each iteration of the while-loop.

Iteration	max	secondMax
1	-1	-1
2	200	-1
3	200	32
4	200	47
5	200	185

(b) Suppose that the user inputs 1, when prompted for `Enter a positive integer:`. Then the user enters the number 53. What output is produced by the program?

The largest number is 53
The second largest number is -1

(c) Suppose that the user inputs 1, when prompted for `Enter a positive integer:`. Then the user enters the number 53. In response, I want the program to declare that both the largest and the second largest number equals 53. More generally, if the user provides an input sequence of length 1, I want the only number in the input sequence to be both the largest and the second largest. Add two lines of code that would go just above the two print statements at the end of the program, to make this happen.

```
if n <= 1:
        secondMax=max
```

This would cover the case where n=0 as well. Alternatively:

```
if n==1:
        secondMax=max
```