Name_____

CSCI 150
Exam 1
October 9, 2015

The exam has 7 questions worth 14 points each. You get 2 points for free.

1. What will this print?

```
def foo(n):
        for i in range(0, n):
                print( “*”, end=””)
        print(“!”)
def bar(n):
        for i in range(0, n):
                foo(2*i)
def main():
        bar(3)
main()
```

2. The following program is supposed to decide whether numbers between 5 and 10 are prime. It prints

```
5 True
6 False
7 True
8 False
9 True
```

Oops; 9 is not actually prime.

a) Explain why this program says 9 is prime.

b) In general, for which numbers n will isPrime(n) be True?

```
def isPrime(n):
    for d in range(2, n):
        if n%d == 0:
            return False
        else:
            return True

for x in range(5, 10):
    print(x, isPrime(x))
```

3. How can we fix the following program? It is supposed to let the user enter positive numbers and then print the average of those numbers. When I give it numbers 1, 2, 3, and then -1 to exit it reports the average as 1.67. I am pretty sure the average of 1, 2, and 3 is 2.0. Change the program so it correctly calculates the average.

```
sum = 0
count = 0
done = False
while not done:
        x = eval(input("Enter a number, or -1 to exit: " ))
        sum = sum+x
        if x < 0:
                done = True
        else:
                count = count + 1
print( "The average is %.2f"%(sum/count))
```

4. What will the following program print?

```
def main():
        print( f(3) )

def f(x):
        for y in range(0, x):
                return g(y)

def g(x):
   if x > 0:
      return x-1

main()
```

5. The following function gets an error message on the line

        for y in range(Start, x)

   The message says that variable Start is undefined. Explain this message. Doesn't the line

        Start = 3

   define Start? Note that I am not asking you to change the program; just explain this error message.

```
def printer(x):
   # This prints the numbers from Start up to x
        for y in range(Start, x):
                print( y, end=" ")
        print()

def main():
        Start = 3
        printer(5)

main()
```

6. Here is a sequence of numbers: 0, 1, 3, 6, 10, 15, 21, 28, ...
   Note that the first pair (0 and 1) differ by 1, the second pair (1 and 3) differ by 2, the next pair (3 and 6) differ by 3, and so forth. Write a program that asks the user for a number n and then prints the first n elements of this sequence. You can print them horizontally or vertically; I don't care about the format as long as you print the correct numbers.

7. Write function **duplicates(s)** that returns the number of duplicate letters in string s. For example, **duplicates("abacaba")** is 4 because the initial 'a' is repeated 3 times after its initial appearance and the 'b' is repeated once. Similarly **duplicates("bob")** is 1 and **duplicates("abba")** is 2.

You can use this space for extra work on any problem. If you want me to grade anything here, indicate clearly which problem you are referring to.

Please write and sign the Honor Pledge when you have finished the exam.