

Name _____

CSCI 150
Exam 1
March 13, 2015

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

1. What will the following program print?

```
def C(n):
    for j in range(0, n):
        print(j, end=" ")
    print()

def B( n ):
    return 2*n

def A(n):
    x = B(n)
    C(x)
    C(B(x))

def main():
    A(2)

main()
```

2. What will this program print? Read it carefully.

```
def change(x):  
    x = 3  
  
def main():  
    for x in range(1, 6):  
        print(x)  
        change(x)  
        if x == 3:  
            done = True  
  
main()
```

3. In the following program I get an error on the print statement:
`print("That string has %d spaces."%num)`

. The error message says

`NameError: name 'num' is not defined`

Fix the program so that it correctly prints the number of spaces in any string we enter.

```
def CountSpaces(s):
```

```
    # This returns the number of space characters in string s.
```

```
    num = 0
```

```
    for letter in s:
```

```
        if letter == " ":
```

```
            num = num+1
```

```
    return num
```

```
def main():
```

```
    s = input("Enter a string: ")
```

```
    CountSpaces(s)
```

```
    print("That string has %d spaces." %num )
```

```
main()
```

4. The following program is supposed to read numbers from the user and print the corresponding factorial. It mostly works – if I give it 3 it prints 6; if I give it 5 it prints 120, if I give it 10 it prints 3628800. When I give the input 0 the program is supposed to print 1 as the result of factorial(0) and then exit. However, it doesn't exit or print anything on input 0; it just sits there caught in some kind of loop. Explain in one or two English sentences what is wrong. I'm not asking you to fix or rewrite the program, just explain why it doesn't work for input 0.

```
def factorial(n):
    total = 1
    x = n
    while x != 1:
        total = total*x
        x = x-1
    return total

def main():
    done = False
    while not done:
        x = input( "Enter a number or 0 to exit: " )
        if x == 0:
            done = True
        print factorial(x)

main()
```

5. Write the Rumplestiltskin program. This repeatedly asks the user “What is my name?” If the user replies “Rumplestiltskin” the program prints “Drat!” and halts. If the user replies anything but “Rumplestiltskin” the program says “NO!” and asks again “What is my name?” Here is a sample run, with what the computer prints in **boldface**:

What is my name? bob

NO!

What is my name? Frodo

NO!

What is my name? Some annoying character from a German folktale

NO!

What is my name? Rumplestiltskin

Drat!

6. Write a method **Triangle(n)** that draws a triangle made of '*'s, where n is the number of rows of the triangle. For example, when n is 2 this should draw

```
*  
**
```

When n is 4 it should draw

```
*  
**  
* *  
***
```

When n is 6 it should draw

```
*  
**  
* *  
*  *  
*   *  
***
```

7. Write a function **singles(L)** whose argument L is a list of strings. The function should print every string that appears in L only once. For example,
- ```
singles(["Bob", "Harry", "Hermione", "Ron", "Neville", "Bob", "Harry", "Ron"])
```
- prints

```
Hermione
Neville
```

Note to the Fall 2015 class: we haven't talked about lists yet, so this isn't a question I can ask on Exam I this term.

You can use this page for scratch work.

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