

Name_____

CSCI 150
Exam 1
March 11, 2016

The exam has 7 questions worth 14 points each. You get 2 points for free. When you are finished write the Honor Pledge on the last page.

1. What does this print? Read it carefully.

```
def increase(x):  
    x = x+10  
    return x  
  
def main():  
    x = 5  
    if x < 10:  
        increase(x)  
    print(x)  
  
main()
```

2. The following program tries to find and print the next prime number after 25, which is 29. Unfortunately, it crashes with an error message that points at the line `print(nextP)`. The error message says that `nextP` is not defined. Doesn't the line `nextP = n` within function `nextPrime()` define `nextP`? Explain this error message in one or two sentences. You don't need to fix the program; just explain why `nextP` is not defined.

```
def isPrime(x):
    # This tries to say if x is a prime number
    for d in range(2,x):
        if x%d == 0:
            return False
    return True

def nextPrime(n):
    # This looks for the next prime number after n
    x = n+1
    while not isPrime(x):
        x = x+1
    nextP = x

def main():
    nextPrime(25)
    print( nextP )

main()
```

3. Consider the following program, which has a **recursive** function `count()`:

```
def printer(n):
    if n > 0:
        print(n)

def count(n):
    if n == 0:
        print( "I'm done!" )
    else:
        printer(n)
        count(n-2)

def main():
    count(6)

main()
```

If I call `count(6)` in `main()` the program prints

```
6
4
2
I'm done!
```

However, if I call `count(7)` I get pages and pages of error messages, then the program crashes, finally saying “maximum recursion depth exceeded”. Explain in one or two sentences what is wrong. You don’t need to correct the program, just explain why it doesn’t work.

4. Here is a program that is supposed to check for palindromes.

```
def reverse(s):
    rev = ""
    for letter in s:
        rev = letter + rev
    print( "The reversal of %s is %s."%(s, rev) )

def isPalindrome(str):
    if str == reverse(str):
        print( "%s IS a palindrome"%str )
    else:
        print( "Nope. %s IS NOT a palindrome."%str )

def main():
    if isPalindrome("bob"):
        print( "Yippee" )

main()
```

When I run this it prints

```
The reversal of bob is bob.
Nope. bob IS NOT a palindrome
```

- a) Explain in one sentence why this says “bob” is not a palindrome when it has already said “bob” is the reversal of “bob”.
- b) Fix the program so it says “bob” is a palindrome and then prints “Yippee” in main(). You don't need to rewrite the program; cross out lines or add code to the text above.

5. Write a program that repeatedly asks the user for numbers; the input ends when the user enters 0. The program then prints the sum of the numbers it was given. Here is a sample run, where the text in bold is printed by the computer:

```
number: 3  
number: 14  
number: 25  
number: 0  
Those sum to 42
```

6. Write a **recursive** function `noSpace(s)` that takes a string argument `s` and returns a new string just like `s` but with the spaces removed. So `noSpace("bob")` returns `"bob"`, `noSpace("Marvin Krislov")` returns `"MarvinKrislov"` and `noSpace("a b c d e f g")` returns `"abcdefg"`.

7. Write a function `moreBobs(s, t)` that takes two string arguments, `s` and `t` and returns the one with more instances of "bob". If neither has any instances of "bob" the function should return "bobless". If they have the same number of instances of "bob" it should return "tie". For example, `moreBobs("bob is the bob", "bobobob")` should return "bobobob", (successive instances of "bob" can share letters so "bob is the bob" has 2 instances while "bobobob" has 3) and `moreBobs("bob is the blob", "shishkabob")` should return "tie".

You can use this page as extra space. If you want me to grade anything here mark it clearly and say which question it pertains to.

Please write and sign the Honor Pledge when you are finished with the exam. If you did not take this in the classroom also write your starting and stopping times.