

Name : _____

Grading TA: _____

- **INTEGRITY:** By taking this exam, you pledge that this is your work and you have neither given nor received inappropriate help during the taking of this exam in compliance with the Academic Honor Code of Georgia Tech. Do NOT sign nor take this exam if you do not agree with the honor code.
- **DEVICES:** If your cell phone, pager, PDA, beeper, iPod, or similar item goes off during the exam, you will lose 10 points on this exam. Turn all such devices off and put them away now. You cannot have them on your desk.
- **ACADEMIC MISCONDUCT:** Academic misconduct will not be tolerated. You are to uphold the honor and integrity bestowed upon you by the Georgia Institute of Technology.
 - Keep your eyes on your own paper.
 - Do your best to prevent anyone else from seeing your work.
 - Do NOT communicate with anyone other than a proctor for ANY reason in ANY language in ANY manner.
 - Do NOT share ANYTHING during the exam. (This includes no sharing of pencils, paper, erasers).
 - Follow directions given by the proctor(s).
 - Stop all writing when told to stop. Failure to stop writing on this exam when told to do so is academic misconduct.
 - Do not use notes, books, calculators, etc during the exam.
- **TIME:** Don't get bogged down by any one question. If you get stuck, move on to the next problem and come back once you have completed all of the other problems. This exam has 8 questions on 10 pages including the title page. Please check to make sure all pages are included. You will have 50 minutes to complete this exam.

I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech community. I have also read and understand the requirements outlined above.

Signature: _____

Question	Points	Score
1. Vocabulary	9	
2. Expressions	26	
3. Iffy Letters	4	
4. Three Foos	6	
5. Same Behavior	4	
6. Print vs. Return	5	
7. CountUp	8	
8. Inches To Feet	8	
Total:	70	

1. (9 points)

For each of the following vocabulary terms, write a concise 1-2 sentence definition. Be brief, and to the point.

(a) [3 pts] boolean expression

Solution: A python statement that evaluates to either True or False. Typically contains a comparison operator ($<$, $>$, $<=$, $>=$, $==$, $!=$) and may contain boolean operators such as AND, OR, or NOT.

(b) [3 pts] nested loop

Solution: A loop inside the body of another loop.

(c) [3 pts] syntax error

Solution: An error in a program that makes it impossible to parse – and therefore impossible to interpret.

2. (26 points)

Pretend you are the python interpreter. Evaluate each of the expressions below. Write down the value that they evaluate to, and the type of that value in the provided columns. If the expression is not valid python syntax, or will throw an exception, simply write "Error". The first line has been provided as an example.

Expression	Result	Type
6+5.5	11.5	float
12+3		
"3*5"		
3+4==2		
True and (3 < 2)		
4+6//5		
int(4.5) / 2		
print("%.2f percent" % 6.312)		
True or (4==3)		
"End" + "Program"		
"Hello" * 3		
(6-3)**2-4		
2+6/3.0		
3%2		

	Expression	Result	Type
Solution:	6+5.5	11.5	float
	12+3	15	int
	"3*5"	3*5	str
	3+4==2	False	bool
	True and (3 < 2)	False	bool
	4+6//5	5	int
	int(4.5) / 2	2.0	float
	print("%.2f percent" % 6.312)	6.31 percent	str
	True or (4==3)	True	bool
	"End" + "Program"	EndProgram	str
	"Hello" * 3	HelloHelloHello	str
	(6-3)**2-4	5	int
	2+6/3.0	4.0	float
	3%2	1	int

Grading: +1 point for each correct answer.

3. (4 points)

What does the python interpreter print when the following code is executed?

```
def mathFunc(x):
    if x%2 == 1:
        print("a")
    else:
        print("b")
    if x/2 <= 5.0:
        print("c")
    if x*1.5 <= 25:
        print("d")
    elif x*1.5 <= 20:
        print("e")
    if x%4 > 2.0:
        print("f")
    elif x%4 >= 2:
        print("g")
    elif x%4 > 1:
        print("h")
```

```
mathFunc(10)
```

Solution: b c d g

+1 point for each correct letter. -1 point for each incorrect letter.
-1 point if they don't draw them vertically.

4. (6 points)

Given the following functions, write what they print to the screen when they are executed. If the function produces an error, write ERROR and draw an arrow to the line that caused the error.

```
(a) def foo1(a,b,c):
    b=a++
    if b>a:
        print(True)
    else:
        return b<a
foo1(1,2,3)
```

Solution:

ERROR - Line 1 (a++)

Grading: 1 point for Error, 1 point for knowing where.

```
(b) def foo2(a,b,c):
    if b>c:
        if c>0:
            print("Yes!")
        elif b>0:
            b=c-b
        elif a<0:
            print("Uhm")
        if b!=c:
            print (b)
        else:
            print("No.")
    else:
        print("Finish!")
foo2(-1,8,3)
```

Solution:

Yes!

8

Grading: 1 point for each correct line, -1 point for incorrect lines.

```
(c) def foo3(a,b):
    if b==0:
        return a
    else:
        return foo3(b,a%b)
print( foo3(10,6) )
```

Solution:

2

Grading: 2 points for the correct number (2)

5. (4 points)

Which two functions will have the same output when executed with the same input? You may assume that the n parameter will always be an integer.

1.

```
def countUp(n):  
    for i in range(n):  
        print(i+1)
```
2.

```
def countUp(n):  
    i=1  
    while i<n:  
        print(i)  
        i = i+1
```
3.

```
def countUp(n):  
    i=0  
    while i<n:  
        print(i+1)
```
4.

```
def countUp(n):  
    i=0  
    while i<n :  
        i = i+1  
        print(i)
```

Functions _____ and _____ have the same behavior when called with the same input.

Solution: Functions 1 and 4 are the correct answers.
Grading: 4 points if they chose the correct two functions. Else zero.

6. (5 points)

Complete each statement below by filling in the blank with the appropriate letter from these options:

- A. return
- B. print
- C. both print and return
- D. neither print nor return

1. _____ can be used while defining the code for a function.
2. _____ can be used outside a function definition.
3. _____ can be used to terminate execution inside a function.
4. _____ will always show the result on screen.

5. _____ will assure you an A in your CS class.

Solution: Grading: +1 for each correct answer.

C

B

A

B

The 'correct' answer is D, but we give them a free point for anything.

7. (8 points)

Write a function called **countUp** that accepts two integer parameters. The function will print out all integers between the two parameters (excluding both parameters!) in ascending order *using a while loop*. You may assume that the two parameters are valid integers, and that the first parameter will always be smaller than the second parameter. Note that you **may not use a for loop** in your solution!

Example test case:

```
>>>countUp(1,5)
2
3
4
>>>
```

Solution:

```
def countUp(a,b):
    a = a + 1
    while a < b:
        print(a)
        a = a+1
```

Grading: 2 points for a correct header.

2 points for starting the printout at a+1

2 points for printing multiple numbers with the while loop.

2 points for stopping correctly just before b.

8. (8 points)

Write a function named `inchesToFeet` that takes in a float parameter which represents a number of inches. It should return a string representing the calculated number of feet and inches in the input parameter.

The string must be formatted as follows: "X feet, Y.Y inches", where X and Y should be replaced by the number of feet and inches you calculate. The string you return should be formatted such that the remainder of inches always has one decimal place. Note: 1 foot = 12 inches.

Example test cases:

```
>>> ans1 = inchesToFeet(44.0)
>>> print(ans1)
3 feet, 8.0 inches
>>> ans2 = print inchesToFeet(65.5)
>>> print(ans2)
5 feet, 5.5 inches
>>>
```

Solution:

```
def inchesToFeet( aNum):
    feet = int(aNum) // 12
    #or feet = int(aNum / 12)
    inches = aNum % 12

    answer = "{0:i} feet, {1:.1f} inches".format(feet, inches)
    return answer
```

Grading: 1 point for a correct header.

1 point for using "int()" and integer division to make the feet come out right

1 point for dividing by 12 to get the number of feet

2 points for using modulo/remainder correctly to find the number of left-over inches.

1 point for formatting the inches answer with one decimal place.

1 point for returning a string.

1 point for correctly inserting the number of inches and feet into the string.

This page intentionally left blank. You may use it for scratch paper. If you place an answer on this page, box it, indicate which problem it is for by number, and BE SURE TO WRITE “Answer on last page” at the problem location!