

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 10 questions on 8 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. Base Conversions	5	
3. Short Answer	8	
4. Speed	10	
5. Div Function	8	
6. FooBar!	4	
7. Robot Drawing	8	
8. trainCrash	5	
9. CountUp	8	
10. Inches To Feet	8	
Total:	73	

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] block

(b) [3 pts] boolean expression

(c) [3 pts] parameter

2. (5 points)

For each of the following base conversion questions, give a brief answer:

(a) [1 pt] Convert the decimal number 9 into binary:

(b) [1 pt] Convert the decimal number 172 into binary:

(c) [1 pt] Convert the hexadecimal number 2A into decimal:

(d) [1 pt] Convert the binary number 110101 into decimal:

(e) [1 pt] Convert the decimal number 9 into hexadecimal:

3. (8 points)

(a) [5 pts] Answer the following questions about python symbols and operators:

Which symbol tells the interpreter to ignore anything after it?

Which symbol is used for string formatting?

Which symbol is used to enclose a string?

Which symbol is the modulo operator?

Which symbol in python indicates that a new code block will begin on the next line?

(b) [3 pts] With respect to the print statement and the return statement:

Which one ends a function?

Which one always shows the value on the screen?

Which one allows the value to be used later in the program?

4. (10 points)

Look at the following function and then copy it below. For each line, determine if the code will work or not. If the line is correct, just copy it. If the line is not correct, correct the line as you re-write it so that the function will work correctly.

```
Def speed():
    userIn = raw_input("Enter current car speed:")
    userIn = float(s)
    if userIn > 65
        print "You are driving too fast!" + userIn + "is more than 65!"
    elif speed < 40:
        print "You are driving too slow!" + userIn + "is less than 40!"
    Else:
        print "Good Driving, keep it up!"
```

5. (8 points)

Assume the following code is executed by the Python interpreter:

```
def div(a,b):
    if b != 0:
        result = a/b
        return result
```

```
num1 = div(5,2)
num2 = div(5,0)
num3 = div(4,3)
num4 = div(4.0,3)
```

- (a) [2 pts] What is stored in num1?
- (b) [2 pts] What is stored in num2?
- (c) [2 pts] What is stored in num3?
- (d) [2 pts] What is stored in num4?

6. (4 points)

What does the following program PRINT when executed?

```
def foo(a, b):
    print "foo!"
    return bar(a, b)

def bar(a, b):
    res = 0
    for i in range(b):
        res = res + a
    return res

def runProgram():
    print foo(3, 4)
    return "Done!"

print runProgram()
```

7. (8 points)

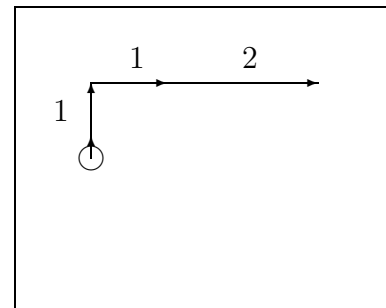
Robot Drawing - Assume `turn90degrees()` has been defined as below so the robot turns right 90° and `nudge(x)` has been defined to move the robot forward x units.

```
def turn90degrees():
    turnRight(1, 1)
```

```
def nudge(x):
    forward(1, x)
```

The following code makes the robot drive the trajectory drawn in the box to the right.

```
nudge(1)
turn90degrees()
nudge(1)
nudge(2)
```



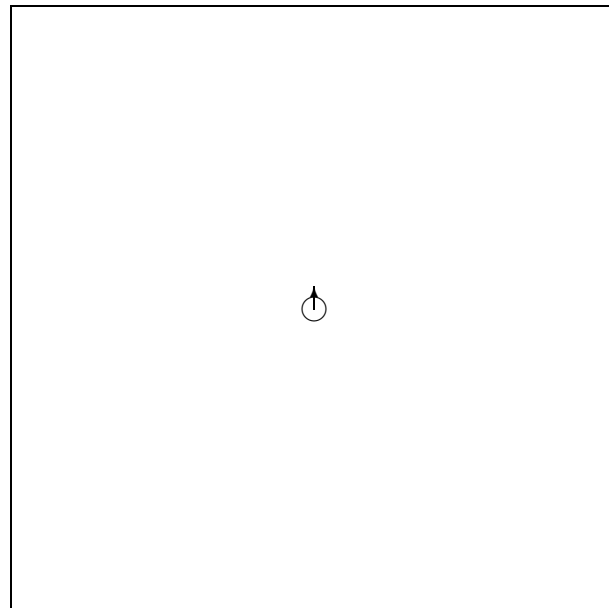
Draw the robot's trajectory when the following code is executed. Label the length of each move (nudge) using numbers as in the example above.

```
def turn90degrees():
    turnRight(1, 1)

def nudge(x):
    forward(1, x)

turns = [3,5]

for idx in [2,3,3,5,1]:
    if idx in turns:
        turn90degrees()
    nudge(idx + 1)
```



8. (5 points)

Examine the following code:

```
def trainCrash (x):
    while x <= 10:
        if x % 5 == 0:
            return "oh no, Crash!"
        if x % 3 == 0:
            print "I'm a train..."
        x = x + 1
        print "Choo-choo!"
    return "I'm too tired to go on"
```

If this code is called from the IDLE window as follows:

```
y = trainCrash(8)
```

(a) [3 pts] What is displayed on the screen?

(b) [2 pts] What will be stored in the y variable from the example function call above?

9. (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
>>>
```

10. (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
>>>
```