

Name : _____

Grading TA: _____

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- 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 9 questions on 11 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. Expressions	10	
4. Multiple Choice	5	
5. Range and Modulo	5	
6. If and For	3	
7. Movie Ifs	7	
8. CountUp	8	
9. Body Mass Index	9	
Total:	61	

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] argument

Solution: argument - A value provided to a function when the function is called. This value is assigned to the corresponding parameter in the function.

- (b) [3 pts] keyword

Solution: A reserved word that is used by the compiler to parse program; you cannot use keywords (such as if, def, and while) as variable or function names (identifiers).

- (c) [3 pts] local variable

Solution: A local variable is a variable that can only be seen (is visible) within the function that defined it. Once the function returns, the local variable is lost.

2. (5 points)

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

- (a) [1 pt] Convert the decimal number 8 into binary:

Solution: 1000

- (b) [1 pt] Convert the decimal number 173 into binary:

Solution: 10101101

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

Solution: 43

- (d) [1 pt] Convert the binary number 110111 into decimal:

Solution: 55

- (e) [1 pt] Convert the decimal number 7 into hexadecimal:

Solution: 7

3. (10 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
$1 + 2 * 3$	7	int
$7 \% 4$		
"cat" + "dog" * 2		
<code>len(range(4,10,2))</code>		
$10 + 5 / 2$		
$2**(10//3)$		

Solution:

Expression	Result	Type
$1 + 2 * 3$	7	int
$7 \% 4$	3	int
"cat" + "dog" * 2	'catdogdog'	str
<code>len(range(4,10,2))</code>	3	int
$10 + 5 / 2$	12.5	float
$2**(10//3)$	8	int

Grading: +1 point for each correct answer.

4. (5 points)

For each of the following multiple choice questions, indicate the best answer by circling it.

- (a) [1 pt] Given the following code, what is printed?

```
if type("True") == bool or type(5 // 4) == float:
    print ("Braves")
elif type(5) == int:
    print("Falcons")
else:
    print("Hawks")
```

- A. Braves
- B. Falcons
- C. Hawks
- D. A and B
- E. None of the above

- (b) [1 pt] What is the value of newStr after the code below is executed?

```
aStr = "abc"
anum="3"
```

```
newStr = aStr * len(anum)
```

- A. 'abc3'
- B. 'abcabc'
- C. 'abc'
- D. 'abcababc'
- E. The code produces an error

(c) [2 pts] Assume the following code has been executed by the python interpreter:

```
z = 4//2/2
```

What is the TYPE of the value stored in z?

- A. Integer
- B. Float**
- C. String
- D. List
- E. NoneType

What is the VALUE stored in z?

- A. 1
- B. 1.0**
- C. '1'
- D. '1.0'
- E. 4
- F. 4.0
- G. '4'
- H. '4.0'

(d) [1 pt] What is the type of the data stored in X after this line of code is executed?

```
X = print("2.0")
```

- A. String
- B. Int
- C. Float
- D. Bool
- E. NoneType**

5. (5 points)

What does the following code PRINT when executed?

```
for n in range(1,10):  
    if (n%3 == 0) or (n%5 == 0):  
        print("oak")  
    elif (n%4 == 0):  
        print("elm")  
    if (n==5):  
        print("birch")
```

Solution:

```
oak  
elm  
oak  
birch  
oak  
elm  
oak
```

Grading: +5 for all correct. Otherwise, -1 for each missing or extra item. (zero minimum)

6. (3 points)

Execute the following piece of code as if you were the python interpreter. Next to the code, write down exactly what would be printed.

```
p="ting"
if 12%4==0:
    print ("hi")
    p="test"
elif p in "testing":
    p="ohayo!"
    print (p)
if p.find("t") == 4:
    p=[1,2,0]
    for i in p:
        print (p[i])
elif 'es' in p:
    for i in p[::-1] :
        print(i)
else:
    print("bye!")
```

Solution:

```
hi
t
s
e
t
```

Grading:

- +1 for "hi" in front.
- +1 for "tset" (backwards test)
- +1 if T, S, E, T are on their own lines.
- 1 for any extra items.

7. (7 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 fastFurious(movieNum):  
    if movieNum > 8:  
        print("Not yet made")  
    return None  
    print("Fast Cars!")  
fastFurious(9)
```

Solution:

Not yet made

Grading: 2 points for "Not yet made" with nothing else. 0 for anything else.

```
(b) def speed2(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!")  
speed(-1,8,3)
```

Solution:

ERROR - NameError: name 'speed' is not yet defined, on last line.

Grading: 1 point for ERROR, 1 point for correct lines. (last)

```
(c) def counterStrike(b):  
    if b==0:  
        return 17  
    else:  
        print(b-1)  
        return counterStrike(b-1)  
print(counterStrike(5))
```

Solution:

4

3

2
1
0
17

Grading: 2 points for 4,3,2,1,0 (one point if not vertical) and 1 point for the 17.

8. (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.

9. (9 points)

Write a function named `bodyMassIndex`. Prompt the user to enter their weight in kilograms and height in meters. Make sure to use a descriptive prompt for each value. You may assume that the user will enter valid floating point numbers (e.g. 44.8). Your function should calculate the Body Mass Index of that person using the following formula:

$$BMI = Weight/Height^2$$

Then print the result. The result should be formatted to one significant digit after the decimal point. For example, your function should print something like: “Your BMI is 18.5”.

Example run:

```
>>> bodyMassIndex()
Please enter your weight in kg: 79.3
Please enter your height in meters: 1.82
Your BMI is 23.9
>>>
```

Solution:

```
def bodyMassIndex():
    weightStr = input(Please enter your weight in kilograms: )
    heightStr = input(Please enter your height in meters: )
    weight = float(weightStr)
    height = float(heightStr)
    bmi = weight/(height*height) #or weight / (height**2)
    print('Your BMI is {:.1f}'.format(bmi))
```

Grading: 1 point for a correct header.

1 point for getting weight

1 point for getting height

2 points for correctly converting weight/height to float

2 points for correct math.

2 points for correct output formatting.

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!