Name (p.	rint):		

• INSTRUCTIONS:

- Keep your eyes on your own paper and do your best to prevent anyone else from seeing your work.
- Do NOT communicate with anyone other than the professor/proctor for ANY reason in ANY language in ANY manner.
- This exam is closed notes, closed books, and no calculator.
- Turn all mobile devices OFF and put them away now. You cannot have them on your desk.
- Write neatly and clearly indicate your answers. If I can not read your answer, I will assume to be incorrect.
- Stop writing when told to do so at the end of the exam. I will take 10 points OFF
 if you keep writing after I told you to stop.
- Academic misconduct will not be tolerated. Suspected academic misconduct will be immediately referred to the Emory Honor Council. Penalties for misconduct will be a zero on this exam, an F grade in the course, and/or other disciplinary action that may be applied by the Emory Honor Council.
- TIME: This exam has 8 questions on 8 pages including the title page. Please check to make sure all pages are included. You will have 75 minutes to complete the 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 Emory community. I have also read and understand
the requirements and policies outlined above.

Signature:			
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Question:	1	2	3	4	5	6	7	8	Total
Points:	12	15	10	10	10	4	4	10	75
Score:									

1. Ans	swer the following questions. Be concise and limit your response to 50 words.
(a)	In Linux environment,
()	i. (1 point) what command is used to check the current working directory?
	Solution: pwd
	ii. (1 point) what command is used to list files in the current working directory?
	Solution: ls
(b)	(2 points) What is a variable?
	Solution: A variable is a memory location which contains a value and addressed with a symbolic name.
(c)	(2 points) Which of the following are valid variable names in Python (circle the correct answer)?
	$\sqrt{\rm v3ariable}$ \bigcirc 5number \bigcirc even-number \bigcirc _sums() $\sqrt{\rm exactAmount5432}$ $\sqrt{\rm COLLECTION}$ $\sqrt{\rm NAME}$ $\sqrt{\rm _int}$
(d)	(2 points) What data types are available in Python?
	Solution: string, integer, float, boolean, tuple, list
(e)	(2 points) List the sequence types in Python and briefly describe their difference (in terms of mutability and data types they can contain).

Solution: String is immutable sequence type which can contain only characters. Tuple is immutable sequence type which can contain any types. List is mutable sequence type which can contain any types.

(f) (2 points) Explain the usage of keywords break and continue.

Solution: break used to exit the current executing loop. continue is used to skip the remainder of the loop body.

2. (15 points) Evaluate each expression. Then give the result of the evaluation and the data type of the result. If the expression cannot be evaluated or it's not a proper Python expression, simply write "error" for the value.

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Expression	Value	Type
5 + 1.0	6.0	float
6 - 3 / 2	4.5	float
4 * 3 % 2	0	integer
"Pie" ** 3	Error	
9 - 5 // 6	9	integer
"Python" + 5	Error	
2 ** 4.0	16.0	float
"NFL" + 'Pro'	NFLPro	string
str(6 // 5) + str(2 % 3)*3	1222	string
3 > 1/2 and 9/3.0 == 3)	True	boolean
4 > 5 or 5 < 4	False	boolean
not 2 * 3 and 2 > 3	False	boolean
"Python"[6]	Error	
2 != 1 or 2 > 1 and 2 < 1	True	boolean
(5,"5")[1]	5	string

3. (10 points) Write down the output of each of the print statements below. If the statement would generate an error, simply write "error".

```
word = "Emory" +'\tU'
print ( word.lower() + 'niversity')
```

Solution: emory university

print (word [0:4])

Solution: Emor

print (word [2:])

Solution: ory U

print (word [:-2])

Solution: Emory

print (word [- len(word)])

Solution: E

4. (10 points) For the code below, the user will see a series of strings printed to the terminal. Write down these strings in the order they appear.

```
n = 2
k = 2
while n < 10:
    n = n + k
    k = k+1
    print(n)
    if n % 2 == 0:
        print( "+" )
    else:
        print( "-" )
    print(k)
print(n+k)</pre>
```

```
Solution:

4
+
3
7
-
4
11
-
5
16
```

5. A student wrote the following code to calculate the sum of non-negative even numbers less than the input number n. (lines are numbered for your convenience)

```
1:  n = int(input("Please input a number: ")
2:  evens = 0
3:  while n != 0:
4:     n = n - 2
5:     evens = evens + n
6:
7:  print ("The sum of even numbers is", evens)
```

(a) (5 points) There are several problems with this code. Specifically, there is a syntax error and there is a logical error. Find those errors and explain why the code would get stuck if we give an input of 5. (feel free to refer to line numbers in the program above for easy reference.)

Solution: A. The first line is missing a closing parentheses.

B. If the input number is an odd number, the loop condition never evaluates to False and therefore the program would stuck in a dead-loop.

(b) (5 points) Rewrite the code to fix the errors.

```
Solution:
     n = int(input("Please input a number: "))
2:
     evens = 0
3:
     if n % 2 ==1:
4:
         n = n + 1
5:
     while n > 0:
         n = n - 2
6:
7:
         evens = evens + n
8:
9:
     print ("The sum of even numbers is", evens)
```

6. (4 points) Rewrite the following while loop with a for loop.

```
n = 1
while n <= 100:
    print (n)
    n = n + 1</pre>
```

```
Solution:

n = 1
for i in range(100):
    print (i+1)
```

7. (4 points) The variables ta and tb are tuples and they may have some elements in common. Your task is to write several lines of code which would print out the elements common to both tuples. For example, if

```
ta = ('a', 'b', 5, True, 2.7)
tb = ('b', True, 'c', 1.3, 5)
then your code should print out
b
True
```

```
Solution:

for i in ta:
   if i in tb:
      print (i)
```

8. (10 points) Write a Python program $\operatorname{mul.py}$ which takes a number n from the user and prints out n by n multiplication table. For example:

```
python3 mul.py
Please input a number:
4
Here is the multiplication table:
1  2  3  4
2  4  6  8
3  6  9  12
4  8  12  16
```

```
Solution:

n = int(intput("Please input a number:\n"))

print("Here is the multiplication table:")

for i in range(1,n+1):
    for j in range(1,n+1):
        print(i*j, end=" ")
    print()
```