

CS8 Midterm Exam Study Guide and Sample Questions

Study Guide

For the midterm exam, the topics you will be tested on are **EVERYTHING that we've learned so far** (through and including the lesson on Tuesday, 4/30/19). These include:

- 1) Common data types
- 2) Arithmetic operators and precedence rules
- 3) Variable naming conventions and rules
- 4) Strings and operators therein; indexing and slicing; string methods
- 5) Lists and operators therein
- 6) Tuples
- 7) Functions: defining vs. calling; use of parameters
- 8) The difference between print & return
- 9) Mutability of variables
- 10) Modules in Python: creating and using them
- 11) Boolean (relational) operators and logic
- 12) Conditional statements (if-else / if-elif-else / nested if-else)
- 13) Loops (for statements / while statements)
- 14) Basic Turtle graphics

What follows are some sample questions to try out while studying.

Instructions: (Please read this)

- Read the questions carefully – make sure you understand what is being asked.
- PAY ATTENTION TO DETAIL!
- Write out the answers by **HAND FIRST**. If you like, you can then check your answers by trying out the various codes on IDLE. Remember that, in the exam, you will have to present all your answers in **WRITTEN** form.
- Check your answers in the “Answers” section of this document.
- Remember that these questions that follow are **NOT COMPREHENSIVE** of all the topics listed above.

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Questions:

1. Which of these is the answer that I will see when I execute this statement:

```
print(4 * 3 ** 2)
```

 - A. 24
 - B. 144
 - C. 36
 - D. 44422
 - E. I will get a syntax error

2. According to one of lab assignments, which of these is *a possible* answer that I will see when I execute this statement:

```
print( (3**0.5)**2 )
```

 - A. 2.25
 - B. 3.33333...
 - C. 3.14159...
 - D. 2.99999...
 - E. I will get a syntax error

3. Which of these is NOT a valid name for a Python variable?
 - A. 2Good2BTrue
 - B. UR2Good2BTrue
 - C. var4me
 - D. ThisCS8ClassIsPrettyAwesomeDontyaknow
 - E. integers

4. Given a tuple, `t = (77, -77, 50)`. What happens when I give this instruction:

```
t[0] = 42
```

 - A. The tuple `t` becomes `(42, -77, 50)`.
 - B. The tuple `t` remains unchanged.
 - C. The tuple `t` is reassigned as `(42)`.
 - D. The tuple `t` is converted into a list.
 - E. None of the above

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- 5.
- Write a function, **MyFun()**, that determines if an argument, **n**, an integer number, is a number that ends with either 5 or with 0.
 - Additionally, write a for-loop that tests out this function as it calls it using all integer numbers -50 and 50 (inclusive of those two numbers). Make sure you clearly show the needed tabbed spaces.
6. Write a function, **DrawRectangle()**, that takes in 2 integer arguments, **width** and **height**, and draws a rectangle with *triple* those parameters using the Turtle module. Your full code would be this (put in the missing function definition):

```
def DrawRectangle():  
    # Define the function here  
    #  
    import turtle  
    t = turtle.Turtle()  
    DrawRectangle(t, 40, 60)
```

7. Consider a string **FullName** set to 'Jimbo Jones', what is the value of the following?
- FullName.count('j')**
 - FullName.count('J')**
 - FullName.replace('J', ' ')**
 - (FullName[3:7].lower() + "ack").replace(' ', '')**

8. What is the exact output of this Python code?

```
for m in (1, 8, 2):  
    print (m*2)
```

9. What is the exact output of this Python code?

```
for p in (8, 16):  
    print (8*(p - 8)/8)
```

10. What is the exact output of this program?

```
for s in range(1, -5):  
    print(s)
```

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11. What is the exact output of this program?

```
for s in range(49, 5, -10):  
    print(s)
```

12. What is the exact output of this Python code?

```
sum = 0  
for p in range(-10, 11, 2):  
    if p < 0:  
        sum = sum + p  
    else:  
        sum = sum + 2*p  
print (sum)
```

13. What is the exact output of this Python code?

```
a = 10  
b = 20  
c = 5  
if (a/c) >= (b/a):  
    print ((b % c) != (a - 2*c))  
else:  
    print ((c ** 2)/a > 0)
```

14. Repeat problem from above (#13), but with **c = 10**.

15. Find the mistake(s), *if any*, in this Python code:

```
x = 5  
y = 2  
if x > y and y < 0 or (x * y) > (5*x + 7*y)  
    print("Bingo!")  
else:  
    if y - x != 3*x:  
        print("...was his name-o")
```

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16. What is the exact output of this program?

```
limit = 10
for s in range(1, limit):
    if limit/s <= 2:
        print(s)
```

17. What is the exact output of this program?

```
sum = 0
n = 0
MyL = [3, 1, 4, -1, -10, 3]
while sum >= 0:
    sum = sum + MyL[n]
    n = n + 1
print("Last sum =", sum)
```

18. If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. Write Python code that can find (prints out) all the multiples of 3 or 5 below 1000.

19. If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6 and 9. *The sum of these multiples is 23.* Write Python code that can find (prints out) *the sum of all the multiples of 3 or 5 below 1000.*

20. The sum of the squares of the first ten natural numbers is:

$$1^2 + 2^2 + \dots + 10^2 = 385.$$

The square of the sum of the first ten natural numbers is:

$$(1 + 2 + \dots + 10)^2 = 55^2 = 3025$$

Hence the difference between the sum of the squares of the first ten natural numbers and the square of the sum is $3025 - 385 = 2640$.

Write Python code that can find (prints out) the difference between the sum of the squares of **the first one hundred** natural numbers and the square of their sum.

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Answers: NOTE that some of these answers are not unique, which means, particularly for the coding questions, there might be more than 1 way to solve these. As long as your answer is functionally correct AND you've only used instructions that we've covered in class, you'll get full credit on an exam.

1. C
2. D
3. A
4. B
- 5.

```
a. def MyFun(n):  
    if n%5 == 0:  
        print (n, "is divisible by 5")  
b. for j in range(-50, 51):  
    MyFun(j)
```

```
6.  
def DrawRectangle(t, width, height):  
    for k in range(2):  
        t.forward(3*width)  
        t.right(90)  
        t.forward(3*height)  
        t.right(90)
```

7.
 - a. 0
 - b. 2
 - c. JimboJones
 - d. bojack

8. On separate lines: 2 16 4

9. On separate lines: 0.0 8.0

10. Nothing is printed

11. On separate lines: 49 39 29 19 9

12. 30

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13. False

14. True

15. The colon (:) is missing at the end of the 3rd line! No other mistakes.

16. On separate lines: 5 6 7 8 9

17. Last sum = -3

```
18. for n in range(1000):  
    if n%3 == 0 or n%5 == 0:  
        print(n)
```

```
19. sum = 0  
for n in range(1000):  
    if n%3 == 0 or n%5 == 0:  
        sum = sum + n
```

```
20. sumSquares = 0  
sum = 0  
for n in range(11):  
    sumSquares = sumSquares + n**2  
    sum = sum + n  
print(sum**2 - sumSquares)
```