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 Monday, 2/4/19). 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)

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.
- 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.

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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. integer

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

5.
   a. Write a function, **MyFun()**, that determines if an argument, **n**, an integer number, is a number that ends with either 5 or with 0.
   b. 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):

```
# 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?

```
a. FullName.count('j')
b. FullName.count('J')
c. FullName.replace('J',' ')
d. (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)
```

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) 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")
```

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
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:
    $\mathbf{1^2 + 2^2 + ... + 10^2 = 385}$.
    The square of the sum of the first ten natural numbers is:
    $\mathbf{(1 + 2 + ... + 10)^2 = 55^2 = 3025}$
    Hence the difference between the sum of the squares of the first ten natural numbers and the square of the sum is $\mathbf{3025 - 385 = 2640}$.
    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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<u>Answers:</u> 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

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)
```