

# CMSC 201 - Fall 2023 Midterm I

Circle your section number and TA.

- |                       |                   |                 |                  |
|-----------------------|-------------------|-----------------|------------------|
| 11 - Anna Pham        | 12 - Alexander G. | 13 - David P.   | 14 - Rusham B.   |
| 15 - Gabe A.          | 16 - Malcolm D.   |                 |                  |
| 21 - Alexander J. D.  | 22 - Matthew P.   | 23 - Kelvin Z.  | 24 - Nathan D.   |
| 25 - Khushika Shah    | 26 - Claire Kim   | 27 - Ky DeSilva |                  |
| 31 - Adrian Maldonado | 32 - Lyna Beraich | 33 - Claire Kim | 34 - Rodolfo A-R |
| 35 - Raine Gibson     | 36 - Hannah Oskam | 42 - Hikaru B.  | 43 - Gia O.S.    |
| 44 - Hieu T.          | 45 - Sean H.      | 46 - Pranav S.  |                  |
| 51 - Wojciech L.      | 52 - Wojciech L.  | 53 - Papa M.    | 54 - Drake T.    |
| 55 - Hannah Oskam     | 56 - Leann A.     | 58 - Niraj D.   |                  |

Write your name (neatly!) on the line below.

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First Name

Last Name

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Student ID, which you use for GL

## Undergraduate Honors Statement

In this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community, in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong.

## Multiple Choice: 24 points (2 points each)

Choose the correct answer by clearly filling exactly one circle per problem.

- Which statement evaluates to **True**?
  - True** and (**False** or **False**)
  - False** or (**True** and not **False**)
  - True** and **False**
  - not(**False** or not **False**)
- Which loop cannot be used to modify the element of a list?
  - for-each (for x in my\_list)
  - for-i (for i in range(len(my\_list)))
  - while (while i < len(my\_list))
- Which variable is legal in Python (will **not** cause a syntax error)?
  - 32number
  - hello\_there
  - \$perl\_is\_good
  - !goodVariable
- When running a while loop, in order to avoid an infinite loop you must:
  - Set all variables to zero.
  - Make sure none of the variables inside the loop changes.
  - Change a variable or take user input to see if the while condition changes.
  - Not do any input inside of the loop.
- To check if an integer  $x$  is divisible by 7 you would use:
  - $x \% 2 == 0$
  - $7 \% x == 0$
  - $x \% 7 == 0$
  - $7 // 2 == 1$
- Why is / different from //?
  - Because  $x // y$  gives back a remainder rather than the quotient.
  - Because // is the symbol for a comment.
  - Because // is the symbol for modulus.
  - Because // is integer division rather than floating point division.

7. If you know how many times you want to iterate, which of the following will you (most likely) use?
- For loop.
  - While loop.
  - If statement.
  - Print loop.
8. How many times will this loop execute for  $x$  in `range(3, 12, 2)`?
- 9
  - 3
  - 7
  - 5
9. When “Zero” is cast to an integer, what happens?
- The integer that results is 0 as an integer.
  - The program will hang (not terminate but not crash).
  - An error will occur which terminates the program.
  - The integer that results is 0.0 as a float.
10. Which of the following is **True**?
- 'he' in 'hello world'
  - 3 in [1, 2, 5]
  - 'sam' in 'swarm'
  - 0 in 'Zero'
11. **At most** how many elif statements **will execute** in a single if statement?
- 0
  - 1
  - $\infty$
  - 3
12. How many elif statements **can you write** in a single if statement?
- 0
  - 1
  - 17
  - As many as you can type in.

## List Manipulation: 6 points (2 points each)

For the following three problems consider this list:

```
robots = ["dalek", "data", "R2D2", "K2SO", "Marvin", "HAL 9000"]
```

For each of the problems here, write what is output in the space provided. If nothing is output, write "NO OUTPUT" and if there is an error of any kind from `SyntaxError`, `IndexError`, `ValueError`, just write "Error."

**Each part should be considered independently, meaning you should restart from the starting list every time.**

13. `print(robots[5], robots[len(robots) - 4])`

14. `robots.remove('R4')`  
`print(robots)`

15. `robots.append('Bender')`  
`print(len(robots))`

## Creating Boolean Expressions: 4 points (2 points each)

16. Write an expression that is True if and only if a string `food` contains 'cheese' (as a substring) and `drink` is not 'water'.

17. Write an expression that is True if and only if `x` is at least 30 and `y` is between 1 and 10 (inclusively).

## Short Answers: 6 points (2 points each)

18. What are the two possibilities that can happen based on different inputs of x?

```
x = int(input('Input int: '))
while x > 0:
    print('hello')
```

19. Explain what happens when we replace an if with an elif statement instead. What is the difference between the two? For instance consider the code below:

```
num = int(input('>>'))
if num > 10:
    print('num is larger than 10')
if num > 20:
    print('num is larger than 20')
```

20. Fill each blank with the a word conveying the meaning of the argument in the range.

range(			)
range(		)	
range(	)		

## Order of Operations: 3 points (1 points each)

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Evaluate the following expressions.

21. Let  $x = 4, y = 5$ , then:

$$3 * (x + y) < y ** 2 - x$$

22. `True and (False or not False)`

23. `not [] and not (5 or 'a')`

## Code Evaluations: 6 points (2 points each)

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Evaluate each code snippet below and answer the question asked. You may assume that the code is syntactically correct. Make sure that you pay attention to the formatting of the output when you write down your answer. **Mark your final answer clearly by boxing it.**

24. When the code is run, what is the output?

```
halving = 50
while halving > 0:
    halving //= 2
    print(halving)
```

25. When the code is run, what is the output?

```
s = 'hello'
n = 15
if n == 20 and s == 'hello':
    print("Both are true.")
elif n == 15:
    print("15 is equal to 3 times 5")
elif s == 'hello':
    print("Well Hello There")
else:
    print("Obi Wan Kenobi, You're my only hope")
```

26. When the code is run, what is the output?

```
for i in range(16, 2, -4):
    print(i)
```

## Debugging: 12 points (1 point per line, 2 points per correction)

The code below has 6 errors. The errors may be syntax errors or logic errors, consider all errors that occur in one line as a single error; examine the code carefully to find them. Indicate each of the errors you find by writing the line number and correction in the space provided below. Each error can be solved with a single fix, and should not be counted twice. Comments do not contain errors. The direction of the string symbols are not an error.

27. You must find and correct 4 of the errors. (You cannot fix more than 4 errors!)

```
1  """
2  We will remove all of the bad symbols, which are in the
3  bad_symbols list from the strings in the_list. We will
4  count the number of removals and report them.
5  """
6  # the lists do not contain errors
7  bad_symbols = ["!", "@", '#', '$', '%', '^', '&', '*',
8                '(', ')', ',', '.', ]
9  the_list = ['hello', '&(*Byte', 'Kilobyte!', 'S$u@s!h#i']
10 # start here
11 new_list = []
12 removed_symbol = 0
13 for the_string in the_list
14     new_string = ''
15     for x in range(len(the_string)):
16         if the_string[x] in bad_symbols:
17             new_string += the_string[x]
18         elif:
19             removed_symbol + 1
20     new_list.append(the_string)
21
22 print(', '.join new_list )
23 print(f'We removed {removed_symbol} bad symbols')
```

Line Num.	Your correction for that error.



## Programming Problem No. 1: 7 points

28. Input a list of integers (you are allowed to assume that the user will only type integers) until the user types zero. Output a list where the even numbers are squared from what was input but the odd numbers are left alone.

For instance if you input the numbers 21, 13, 8, 3, 2, 6, 17, 0 then the program will output [21, 13, 64, 3, 4, 36, 17].

```
if __name__ == '__main__':
```

## Programming Problem No. 2: 7 points

29. Write a program after the beginning code that takes the string\_list and determines the string with the maximum number of "a" characters. For instance if the user enters "archibald" "aardvark" "sandal" "stop" then aardvark will be printed since it has the most "a" characters. Notice we have already converted the strings to lower case so you don't have to worry about that.

```
if __name__ == '__main__':
    string_list = []
    s = input("Enter a string: ")
    while s != "stop":
        string_list.append(s.lower())
        s = input("Enter a string: ")
    # begin your code here
```