

# CMSC 201 Section 60

Fall 2022

## Sample Exam for Exam # 2

### Notes:

1. This sample exam has the same number and type of problems as will the actual exam. It is intended to give students practice in taking the type of exam that will be given on Wednesday, November 16.
2. The actual exam will be worth 100 points. Point values indicated below in this sample indicate the values on the actual exam.
3. The exam will be given in-class. It is open-book; open-note. The exam is subject to UMBC's academic integrity policies. You may NOT solicit help from anyone else during the exam, whether the person is a classmate, another UMBC student, or someone outside the university.

### Section 1: Multiple Choice and True/False.

Ten questions, worth 3 points each. Partial credit will NOT be given for questions in this section. There are 30 total points in this section.

1. What types of data can be written to files in Python?
  - a. Only strings
  - b. Strings, integers, floats, booleans, lists and dictionaries - just like printing to the screen
  - c. Any immutable type
  - d. None of the above is correct
2. Which of the following is true about dictionaries in Python?
  - a. They are unordered
  - b. They map between keys and values
  - c. All keys must be unique and immutable
  - d. All of the above are true
3. True or false: If I have the string  
`school = "UCLE"`

And I want to fix my typo and change school to have the value "UCLA" I can simply type

```
school[3] = "A"
```

4. Suppose I have a 2D list, scores, with 5 rows and 10 columns. Which is the proper way to access the value in the fourth row (that is, row 3- remember we start counting at 0) and the seventh column (that is, column 6)?

- a. scores(6)(3)
- b. scores[6, 3]
- c. scores [6][3]
- d. None of the above will work

5. A recursive function in Python must have how many base case(s) in order to work properly?

- a. You don't need any base cases, just a recursive case
- b. Exactly one
- c. At least one
- d. None of the above is correct

6. True or false: if you open a file in "w" mode in Python, and the file does not exist, your program will crash.

7. True or false: values in Python dictionaries must be unique, but keys do not need to be unique. That is, a value can appear only once in a Python dictionary, but a key can appear as many times as you want.

8. Why is this not a valid recursive function?

```
def recursive_factorial(num):  
    return num*recursive_factorial(num-1)
```

- a. There's no base case
- b. There's no recursive case
- c. It will always return 0
- d. None of the above is true.

9. Suppose I have a string

```
s = "marthavisitseverymondayandjuststaysuntilnoon"
```

Which of the following results in the string "visits"?

- a. v = s[6:11]
- b. v = s[6:12]
- c. for i in range(12):  
 v = s[i]

- d. None of the above gets you the desired result
10. Consider the following statement: you can have a list whose elements are each Python dictionaries, but you cannot have a dictionary whose keys are lists. What is correct about that statement?
- a. It is true as stated
  - b. Both parts of it are false - you can't have a list whose elements are dictionaries, and you can't have lists as keys in dictionaries
  - c. The first part is true - you can have a list whose elements are dictionaries. But the second part is false - you can indeed have lists as keys in dictionaries.
  - d. The first part is false - you can't have a list made up of dictionaries; Python would get confused.

## Section 2: Short answer.

Eight questions, worth 5 points each. Partial credit WILL be given for answers in this section that are substantially but not completely correct. There are 40 total points in this section.

11. What happens if you try to open a file in "r" mode in Python and the file does not exist?
12. What is the difference between opening a file in Python in "w" mode and opening a file in "a" mode?
13. In recursive programming, what is a "base case?"
14. Write the Python code that creates a dictionary, "student" with key "last\_name" having the value "Smith"; with key "first\_name" having the value "Jane"; and with key "grade" having the value "A".

15. Suppose you have the following Python program:

```
def check_input(diction):  
    diction["children"] *= 4  
    return
```

```

if __name__ == "__main__":
    d = {
        "name": "Williams",
        "occupation": "plumber",
        "children": 2
    }
    check_input(d)
    print(d)

```

When this is executed, the result is

```
{'name': 'Williams', 'occupation': 'plumber', 'children': 8}
```

Explain, using the concept of mutable and immutable types, why the number of children changed.

16. Suppose you have the following dictionary of starting quarterbacks in the AFC North division:

```

qbs = {
    "Ravens": "Jackson",
    "Bengals": "Burrow",
    "Steelers": "Pickett",
    "Browns": "Brissett"
}

```

Write a 'for' loop that prints out each quarterback's name, one per line. You don't need to write the entire Python program; only the for loop.

17. If every problem that can be solved recursively can also be solved iteratively, and if recursive solutions always cost more in terms of time and memory on the computer, why do we ever implement any recursive solution to a problem?

18. Suppose you have a two-dimensional list, 'grades', with 5 rows and ten columns. Write Python code that prints out the columns in row 3; that is, the fourth row, of grades. Print one entry at a time; do not print the entire row at once.

## Section 3: Programming.

Two questions, worth 15 points each. Partial credit WILL be given for answers in this section that are substantially but not completely correct. There are 30 total points in this section.

19. Suppose that I have a file, periodic\_table.csv, in my current directory. The file contains the symbols for each element in the chemical periodic table, in order by atomic number, with each element symbol separated by a tab. The file looks something like this:

```
H      He      Li      Be      B      C      N      O      F..
```

Write a Python program that reads in the file as a single string and then splits that string into a list, with each symbol being a separate element in the list.

20. Write a recursive Python function that takes a positive integer as a parameter and returns the product of all the integers from 1 to that number. You do not need to write the main program; just the recursive function.

Notes: you don't need to do any input validation/error checking; you can presume you're actually going to get a positive integer. Think about what your base case is; and then think about what your recursive case would be.