CMSC 201 Final Review Sheet 2

1. Circle valid python variable names (some don’t follow coding standards, but are valid)

​**1Direction4Ever ILOVECMSC201 \_num\_fru!ts DoGsRgOoD thebestclassis201 print Go0D1ucK0NtH#f|nAL!**

1. What gets printed? Does the following code snippet cause an error? Why or why not?

|  |
| --- |
| my\_list = [“here”, “are”, “some”,  “strings”]  x = 4  if x < len(my\_list) and len(my\_list == 5):  print(my\_list[x + 1]) |

1. What gets printed on lines 8 and 10 and why?
2. def do\_something(my\_string):
3. my\_string = my\_string.upper()
4. my\_list = my\_string.split()
5. my\_string = ””.join(my\_list)

5

1. if \_\_name\_\_ == “\_\_main\_\_”
2. my\_string = “hello world”
3. print(my\_string)
4. do\_something(my\_string)
5. print(my\_string)

11

12

1. Describe the difference between for and while loops.
2. Why do we use Boolean flags?
3. Why important to close the file after using it during file I/O?
4. What is the difference between appending and writing to a file?
5. What are the components of a dictionary? Describe their properties
6. What happens when a function is called?
7. Describe mutability, which data types are mutable/immutable, and applications of mutable data types.
8. What is incremental development?
9. Implement a recursive Fibonacci function
10. Implement a pascal’s triangle function.
11. Why would you use a dictionary over a list?
12. What is the output of this code snippet?

1. def count\_vowels(word):
2. vowels = [“a”, “e”, “i”, “o”, “u”]
3. if word = “”:
4. return 0
5. elif word[0] in vowels:
6. return count\_vowels(word[1:]) + 1
7. else:
8. return count\_vowels(word[1:])

9

1. if \_\_name\_\_ == “\_\_main\_\_”
2. word = “Elephants Are Great”
3. print(“The Number of Vowels is ”, count\_vowels(word))

1. Given the following code, write the output
   1. fact = “201 has the Coolest Professors, shhh!”

print(fact[4:6] + fact[21] + fact[33:35])

* 1. fact = “201 students will do great on the exam if they try hard!”

print(fact[4:8]+fact[46])`

* 1. fact = “Finally, the Important Things In Life That Matter!”

print(fact[0:5]+fact[28]+fact[43:])

1. What is the minimum number of base cases required for a recursive function? Minimum for recursive cases?
2. What is the correct order for the range()parameters?

A. start, step, stop

B. start, stop, step

C. step, start, stop

1. Why can’t you iterate through a dictionary with a loop? What can you use to iterate over a dictionary?
2. What is the difference between sentinel values and boolean flags?
3. Describe the best-case runtimes (and why) for the following: bubble sort, binary search, linear search, selection sort, insertion sort, quick sort
4. In some situations, a recursive function will run until a RecursionDepth error occurs. *Why*does this error occur, and *what*should be done to fix it?
5. List the fundamental differences between looping and recursion
6. Explain the differences between **read()**, **readline(),** and **readlines().** Give an example of when you might use each.
7. Recursively determine if a number is prime.
8. Recursively determine if a number is a power of n.
9. List and explain the different file access modes.
10. Why do we care about runtimes?
11. What’s the difference between top-down and bottom-up development?
12. List string escape sequences.
13. List and differentiate the different ways to access the keys of a dictionary.
14. Rank the following runtimes from **fastest** to **slowest**
    1. n2,1, log2n, n, nlog2n
15. Convert the following decimal numbers to binary and hexadecimal:
    1. 463
    2. 63
    3. 31
    4. 255
16. Convert the following binary numbers to hexadecimal:
    1. 1010 0011 0101 1111
    2. 1101 1100 1011 0000
    3. 0000 0001 0010 0011
    4. 0110 1011 0101 1011
17. Convert the following hexadecimal numbers to binary and decimal:
    1. 14AD
    2. 002F
    3. 10BA
    4. FFFF
    5. 13EC