CMSC 104 Section 2
Fall 2025
Key to Sample Quiz 4

Instructions:

This is an open-book, open-notes exam. You may use your laptop or notes. You may use an IDE to test/debug code, but all answers must be hand-written on this test paper. You may not interact with any other student, and you may not use AI such as ChatGPT, Copilot, Gemini, etc.

Section 1: Multiple Choice and True/False

8 questions; 4 points each. 32 total points; no partial credit

1. True or False: an object is a variable that is an instance of a class.
   a. ***True***
   b. False

2. True or False: In Object-Oriented programming, the term "inheritance" means that objects of a class can also use the methods of any sub-classes that may be defined. .
   a. True
   b. ***False (it's backwards - inheritance means that the objects of the subclass can use the methods of the parent class)***

3. True or False: dictionaries are unordered. Unlike lists, there is no index 0, or index 1, or… in a dictionary
   a. ***True***
   b. False

4. What is the best way to develop software?
   a. ***Write a little; test a little. Like, write a function and test it. Then move on to the next function.***
   b. Write the whole darned thing and hope like heck it works when you test it.
   c. Don't be ridiculous; the answer is a.
   d. I'm serious; just choose a.

5. The parameters in a function definition must match the arguments in the call, in what ways?
   a. ***Number (there have to be the same number) and type (each argument must be the same type as its corresponding parameter)***
   b. Value; arguments and parameters must have the same values
   c. Names - arguments and parameters must have the same names
   d. None of the above is correct

6. Which of the following is not a valid variable name in Python?
   ```
   a. Too_cool_for_school
   ```
   b. 2_cool_for_school you can't start with a digit
   ```
   c. _too_cool_4_school
   d. Too_COOL_FOR_SCHOOL
   ```


7. Suppose that we have a list assignment in Python:
   ```
   l = [ 1, 2, 3]
   ```
What is the result of the statement
   ```
   print(l*2)
   a. Nothing. This is an error because you can't multiply a list by
      an integer
   b. [2, 4]
   c. [1, 2, 1, 2]
   d. [1, 1, 2, 2]
   ```
   The correct answer is [1,2,3,1,2,3] - sorry for the typo

8. True or False: a variable of type list can be a value in a dictionary, but it cannot be a key in a dictionary.
   a. ***True - keys can only be immutable types - int, float, string, boolean***
   b. False

Section 2: Short answer

8 questions; 6 points each. 48 total points; partial credit is given

9. What is the difference between an object and a class in Object-Oriented design?
A class is the structure/definition for a set of objects. An object is a specific instance of the class

10. What types of variables can be keys in a Python dictionary?

Immutable types - string, int, float, boolean

11. What is "encapsulation" when talking about Python classes and objects?
Combining all the data and methods into a single structure (the class) to provide efficiency and security/privacy

12. What is the purpose of the "get" method when used with Python dictionaries?
It's a robust way of retrieving the value associated with a key. If the key does not exist, "get" allows you to specify what to return, rather than simply having the program crash

13. If list b = ['d', 'a', 'z', 'b', 's'], what is the result of
```
print(b.sort())
```

['a','b','d','s','z']

14. If list b = ['d', 'a', 'z', 'b', 's'],, what is the result of
```
print(b.reverse())
```
['s', 'b', 'z', 'a', 'd']

15. Suppose you have the following dictionary:
```
Al_east  = {
   "Baltimore":"Orioles",
   "Boston":"Red Sox",
   "New York":"Yankees"
}
```
What Python statement could you use to insert a new key-value pair into the dictionary, with a key of "Toronto" and a value of "Blue Jays"?

Al_east['Toronto'] = 'Blue Jays'

16. What if anything is returned when a Python function either has no return statement, or has return statements that don't get executed?

The value None.

Section 3: Coding

2 questions; 10 points each. 20 total points; partial credit is given

17. Write a Python program that creates a list, `numbers,` containing the numbers from 0 to 9 in order from smallest to largest. You may use any type of loop you wish to accomplish this. Your program should then print these numbers in order. Your output should consist of five rows, with two numbers per row, with numbers separated by a blank space. Again, you may use any type of loop you wish to print this output.

```
# first create the list of numbers
numbers = []
for i in range(0,10):
    numbers.append(i)

# now, the printing part
for j in range(0,10,2):
    print(numbers[j], numbers[j+1])
```

18. Write a program that builds a dictionary by asking a user for keys and values. The details are:
- Create an empty dictionary, called `scores`
- Prompt the user to enter a key and its corresponding value, on a single line, separated by spaces.
    - The loop will stop when the user enters "q" or "Q"
- For each line of input, create a new entry in the dictionary
    - The key is what the user entered as a key
    - The value is whatever the user entered as the value. You can safely presume that the value is a string, as entered by the user. .
- When the user has entered all the data and pressed "q" or "Q", your program should print out the dictionary with a label.

```python
scores = {}
ipt = input("enter a key and its corresponding value, on a single line,
separated by spaces. Type q to quit: ")
while ipt.lower() != "q":
    i_list = ipt.split()
    scores[i_list[0]] = i_list[1]
    ipt = input("enter a key and its corresponding value, on a single line,
separated by spaces. Type q to quit: ")

#now print
print("The data you entered were: ")
for x in scores.keys():
    print(x, scores[x])
```