

DSCI 510: Principles of Programming for Data Science, Fall 2023

Sample Midterm Exam Questions

1. What software do we use to write Python code? [1 point]

- a. Text Editor
- b. MS Paint
- c. Spotify
- d. Siri

2. What will the following program print out? [1 point]

```
y = 7 * 15 % 5  
print(y)
```

3. Which operator is used for variable assignment in Python? [1 point]

- a. ->
- b. ::=
- c. :%
- d. =

4. True and False are both reserved keywords in Python and can't be used as variables. [1 point]

- a. True
- b. False

5. What is the output of the following code? [2 points]

```
x = 'this will be fun, dont you think'  
print(x[:-3:3])
```

6. What is the output of the following expression? [1 point]

```
((True or False) and (False and False) or ( True and True))
```

7. What will be printed? [2 points]

```
num = 0
while num < 10:
    if num % 2 == 0:
        continue
    print(num)
    num += 1
```

- a. 1 \n 3 \n 5 \n 7 \n 9
- b. 0 \n 2 \n 4 \n 6 \n 8
- c. Nothing, this is an infinite loop
- d. 1 \n 2 \n 3 \n 4 \n 5 \n 6 \n 7 \n 8 \n 9

8. What will the following program print out? [1 point]

```
def greet_class(greeting=None):
    greeting = "hello world"
    print(greeting)

greet_class("hello")
```

9. What will the following program print out? [1 point]

```
def test(x):
    if x == 5:
        print("x is equal to 5")
    elif x > 5:
        print("x is larger than 5")
    else:
        print("x is smaller than 5")

x = 17
test(x)
```

10. Given the list of `prices` below, write code to create a new list where the elements are double the original values. *Use a list comprehension!* [2 points]

```
prices = [33, 57, 28, 75, 14, 73, 12]
double_prices = ...
```

11. Write a Python function `all_caps` that takes a list of strings as an input argument and returns a list of those same strings but in all capital letters. [1 point]

For example:

```
input: ['canada', 'japan', 'usa']
output: ['CANADA', 'JAPAN', 'USA']
```

```
def all_caps(input_list):
    ...
    return output_list
```

12. Write a function `short_words` that takes a string of words as an input and returns a list of those words that are shorter than some length threshold. So for input string 'This is so much fun' and threshold equal to 3, the function should return the list ['is', 'so']. [3 points]

```
def short_words(input_string, threshold):
    ...
    return output_list
```

13. Fill in the following blanks - (1), (2), (3), and (4) [4 points]

```
# Convert lowercase characters to uppercase characters and
uppercase characters to lowercase characters in a string
```

```
def reverse_case(input_string):
    result = ""
    for char in input_string:
        if char.___(1)__:
            result += char.__(2)___
        elif char.__(3)__:
            result += char.__(4)___
        else:
            result += char
    return result
```

14. What will be written to the file after in the following program? [1 point]

```
message = "hello!"
with open('example_2.txt', 'w') as f:
    for s in message:
        f.write(s + '\n')
```

15. What will be the output of the following code? [1 point]

```
dict1 = {}
dict1['apple'] = 'fruit'
dict1['banana'] = 'fruit'
print(len(dict1))
```

16. Dictionaries, once created, *cannot* be resized by adding or removing key-value pairs. [1 point]

- a. True
- b. False

17. The following code attempts to create a tuple and then modify one of its elements. However, there is something missing in the code. Fill in the blank to achieve the intended result. [1 point]

```
numbers = (1, 2, 3, 4, 5)
numbers = ____ (1) ____ (numbers)
numbers[2] = 6
numbers = tuple(numbers)
print(numbers)
```