

STAT 2255: Sample Midterm Exam

Name: _____

Student ID: _____

There are 20 questions in this exam, each question is worth 5 points.

1. Multiple Choices Questions.

Each of the following questions has **one** correct answer. Please **circle** the correct answer.

(a) (5 points) What is the returned value of the following code?

```
100 != 10**2 or 5 <= 5
```

- A. yes
 - B. None
 - C. False
 - D. True
- (b) (5 points) If you write a function without an explicit return statement, what will happen?
- A. The function will return a RuntimeError.
 - B. If the return keyword is absent, the function will return None.
 - C. If the return keyword is absent, the function will return True.
 - D. The function will enter an infinite loop because it won't know when to stop executing its code.
- (c) (5 points) Given the Coin class defined below, what is the correct way for calling the flip method on Coin class?

```
class Coin:
    def __init__(self):
        self.faces = ['Tail', 'Head']
    def flip(self):
        print('Flipping a coin!')
```

- A. coin1 = Coin()
coin1.flip()
- B. coin1 = Coin()
coin1.flip(self)
- C. coin1 = Coin(self)
coin1.flip()
- D. coin1 = Coin(self)
coin1.flip(self)

(d) (5 points) What does a class's `__init__()` method do?

- A. It makes classes aware of each other if more than one class is defined in a single code file.
- B. It is a method that acts as a constructor and is called automatically whenever a new object is created from a class. It sets the initial state of a new object.
- C. It is included to preserve backwards compatibility from Python 3 to Python 2, but no longer needs to be used in Python 3.
- D. It initializes any imports you may have included at the top of your file.

(e) (5 points) What is the returned value of the following code?

```
L1 = ['a', 'b']
L2 = [1, 2]
for char in L1:
    for num in L2:
        if num == 1:
            continue
        print(char, num)
```

- A. a 1
a 2
b 1
b 2
- B. a 1
b 1
- C. a 1
b 1
a 2
b 2
- D. a 2
b 2

(f) (5 points) What is the primary difference between lists and tuples?

- A. You can access a specific element in a list by indexing to its position, but you cannot access a specific element in a tuple unless you iterate through the tuple.
- B. Lists are immutable, meaning you cannot change the data that is inside them once you have created the list. Tuples are mutable, meaning you can change the data that is inside them at any time.
- C. Lists are mutable, meaning you can change the data that is inside them at any time. Tuples are immutable, meaning you cannot change the data that is inside them once you have created the tuple.

D. Lists can hold several data types inside them at once, but tuples can only hold the same data type if multiple elements are present.

(g) (5 points) what will this command return?

```
{x for x in range(100) if x % 3 == 0}
```

- A. a list of all the multiples of 3 less than 100.
- B. a set of all the multiples of 3 less than 100.
- C. a set of all the number from 0 to 100 multiplied by 3.
- D. a set of all the multiples of 3 less than 100 excluding 0.

(h) (5 points) Given code below, what are the print values?

```
x = [1, 2, 3, 4]
y = [1, 2, 3, 4]
print(x is y)
print(x == y)
```

- A. True
False
- B. False
True
- C. True
True
- D. False
False

(i) (5 points) Given a list defined as `num = [1,2,3,4]`, what is the value of `num[-2]`?

- A. 1
- B. 2
- C. 3
- D. 4

(j) (5 points) Suppose we defined functions `f1`, `f2` and `f3` in module named `my_function`. Which of the following allow you import **only** function `f1`?

- A. `import my_function`
- B. `import f1 from my_function`
- C. `from my_function import *`
- D. `from my_function import f1`

2. True/False Questions

- (a) (5 points) Python's class definition starts with the keyword `def`. (True/False)
- (b) (5 points) Function created with the `def` keyword must have at least one argument. (True/False)
- (c) (5 points) What does `1 == True` return in Python? (True/False)
- (d) (5 points) Same method can be called on different objects refers to Composition feature in Object-oriented Programming. (True/False)

3. Short Answer Questions

Write down the output of the following codes.

- (a) (5 points)

```
L = list(range(1, 10, 2))  
L[1:-1]
```

- (b) (5 points)

```
L = list(range(1, 10, 2))  
[(i, i*2) for i in L if i > 5]
```

- (c) (5 points)

```
import numpy as np  
a = np.array([3, 3, 3, 2, 2, 1, 1, 4, 4])  
np.unique(a)
```

(d) (5 points)

```
import numpy as np
a = np.array([[1.5, -0.1, 3], [0, -3, 6.5], [1, 2, 3]])
a.sort(axis=1)
a
```