

Sample Python Assessment for the Online AI executive Certificate

1. Which of the following is TRUE about variable and parameter names in Python?
 - a. A name declaration in Python involves specifying a data type.
 - b. A name may start with a letter, digit, or underscore.
 - c. A name may refer to different objects at different times
 - d. Assigning a variable to an object (or passing an object to a parameter) creates a copy of the object.
 - e. Other: _____
2. Indentation is optional in Python.
 - a. True
 - b. False

3. What does the following program print?

```
list1 = [4,1,2,9,3,1,7,8]
x = 0
for i in range(len(list1)):
    if list1[i] < list1[x]:
        x = i

print(x)
```

- a. Choose: 0,1,2,3,4,5,6,7,8, or 9
4. What objects in Python are immutable?
 - a. Lists
 - b. Strings
 - c. Tuples
 - d. Integers
 - e. Dictionaries
 5. Which exception might occur at runtime in the following program?

```
with open('data.txt') as f:
    total = 0
    count = 0
    for line in f:
        total += int(line.strip())
        count += 1
    average = total/count
```

- a. ZeroDivisionError
- b. NameError
- c. ValueError
- d. All of the Above

6. Let n be a positive integer. What is the big-O running time of the following program?

```
k = 0
while k < n*n:
    if k % 2 == 1:
        while k < n*n*n:
            k += 1
        k += 1
    k += 1
```

- a. $O(\log(n))$
 - b. $O(n)$
 - c. $O(n^2)$
 - d. $O(n^3)$
 - e. $O(n^5)$
 - f. $O(2^n)$
7. What does the following program print?

```
class Version(object):
    def __init__(self,name):
        self.subversion = 0
        self.name = name
    def update(self):
        self.subversion += 1
        return Version(str(self.name) + "." + str(self.subversion))

v = Version("1")
w = v.update()
y = w.update()
x = w.update()

print(x.name)
```

- a. 1.3
 - b. 1.2.3
 - c. 1.1.1
 - d. 1.1.2
 - e. 4
8. Which of the following is TRUE about dictionaries?
- a. The key value pairs in dictionaries are sorted.
 - b. The keys in a dictionary need to be immutable.
 - c. The in operator can be used to check if a value is present in the dictionary.
 - d. Tuples may not be used as keys.
 - e. The values in a dictionary are unique.

9. What does the following program print?

```
d = {'a':[1, 2, 3], 'b':[3, 2, 1]}  
d ['c'] = d['a']  
d ['a'] = [4, 5, 6]  
d ['a'] . append (7)  
  
print (d ['c'])
```

- a. [4, 5, 6]
- b. [4, 5, 6, 7]
- c. [1, 2, 3]
- d. [1, 2, 3, 7]
- e. Other: _____

10. Consider a as the NumPy ndarray below. Which of the following doesn't return array([[4, 5, 0], [6, 9, 4]]) ?

```
a = np.array(  
    [[7, 0, 9, 3, 2, 3],  
     [2, 1, 4, 5, 0, 8],  
     [0, 0, 6, 9, 4, 1],  
     [3, 9, 2, 8, 5, 2],  
     [6, 4, 2, 2, 3, 0],  
     [2, 3, 1, 9, 7, 4]]  
)
```

- a. a[1:3, 2:5]
- b. A[1:3][2,3,4]
- c. A[1:-3,2:5]
- d. a[1:3][:, 2:5]
- e. a[[1,2],2:5]