

fullName:_____ andrewID:_____ section:_____

15-112 N25
Quiz4 Part 1 of 2

This is the paper version of **Part 1** of **Quiz4**. This contains the multiple choice questions and 1 CT. You **must write your name and your answers on this paper and hand this back** in immediately after Part 1. You cannot answer Part 1 on the computer.

You must hand this back before you may begin Part 2. If we do not receive it immediately, you will receive a zero on the assessment.

Quiz4 Part 2 is located in section 7.9 of CS Academy (the end of Unit 7), and contains only the FRs. If you require a paper copy of Part 2, please let your proctor know.

During the quiz, as always, you may not view any other notes, prior work, websites or resources, including any form of AI. You may not communicate with anyone else except for TAs or faculty during the assessment. All syllabus policies apply.

Some students will take this at a different time with testing accommodations. As such, you may not discuss this test with anyone else, even briefly, in any form, until we have released grades. Failure to abide by these rules may result in an academic integrity violation.

Do not open this or look inside (even briefly) before we instruct you to begin. Close it once you are done.

If you do not hand this in immediately when instructed, you will receive a zero on quiz4.

Part 1[30pts total]: Multiple Choice and Code Tracing

MC1[4 pts]: Which of the following statements is FALSE?

- ☐ a. Sets are immutable
- ☐ b. Sets must only contain immutable values
- ☐ c. Sets can check for membership in $O(1)$ time
- ☐ d. Sets do not store duplicates (all elements in a set are unique)
- ☐ e. Elements in a set should be considered unordered

MC2[4 pts]: Which of the following statements is FALSE?

- ☐ a. Searching for a key in a dictionary has an efficiency of $O(1)$
- ☐ b. Dictionaries contain key-value pairs
- ☐ c. Dictionary keys must be unique
- ☐ d. Dictionary values can be mutable or immutable
- ☐ e. A dictionary can be a value in another dictionary
- ☐ f. Finding the key for a specific value in a dictionary is $O(1)$

MC3[4 pts]: What is the big-O efficiency of merge sort?

- ☐ a. $O(1)$
- ☐ b. $O(N)$
- ☐ c. $O(\log N)$
- ☐ d. $O(N \log N)$
- ☐ e. $O(N^2)$
- ☐ f. $O(2^N)$
- ☐ g. $O(N^N)$

MC4[4 pts]: What is the big-O efficiency of selection sort?

- ☐ a. $O(1)$
- ☐ b. $O(N)$
- ☐ c. $O(\log N)$
- ☐ d. $O(N \log N)$
- ☐ e. $O(N^2)$
- ☐ f. $O(2^N)$
- ☐ g. $O(N^N)$

CT[14 pts]:

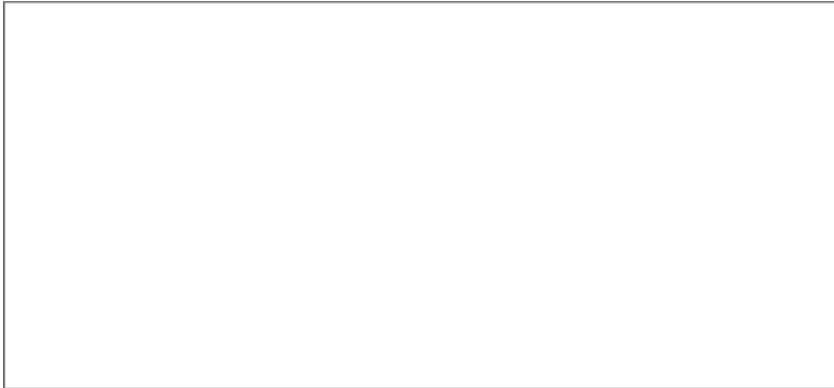
Indicate what the following code prints. Place your answer (and nothing else) in the box below.

We strongly recommend making a box-and-arrow diagram.

Be careful to get the brackets and commas right!

```
import copy
def ct(L):
    a = L
    b = copy.copy(L)
    c = copy.deepcopy(L)
    b[0] = a[1] * a[1][0]
    a[0][0] += a.pop()[0]
    b[1] = c[0]
    return b
```

```
L = [[1],[2],[3]]
print(ct(L))
print(L)
```



(The FRs will be given separately in Part 2)