

Question 12: Python Fun! (12 pts, XX min)

A) [7 pts, 1pt each] What are the results of the following Python expressions? Write the results in the correct form, as numbers, strings, or lists.

For example:

`[1] + [2] = [1,2]`

`[] + [1,2,3] = [1,2,3]`

`"race" + "car" = "racecar"`

`[1,3,5,2,4][2:4] = [5,2]`

`"1234567890"[-3:] = "890"`

`[["I","love"],["CS","10"]][0][1] = "love"`

`{'a': 1, 'b': 2, 'c': 3}['b'] = 2`

`{'c': 3, 'd': 4}.keys() = ['c','d']`

a) 1 pt. for each correct answer.

B) [6 pts] Here is a function, `copy()`, that is meant to take in a list, and return a copy of that list. However, there are bugs in this code. Find as many as you can, and write a corrected version on the following page.

| | |
|--|--|
| <pre>def copy(lst): new_list == [] i == 1 while i < len(lst): new_list.append(lst[i]) return new_list</pre> | <p>Example (assuming the function works correctly):</p> <pre>>>> copy([4, 8, 2, 'hello', 9.0]) [4, 8, 2, 'hello', 9.0] >>> a = [4, 8, 2, 'hello', 9.0] >>> b = copy(a) >>> b [4, 8, 2, 'hello', 9.0]</pre> |
|--|--|

We've found 4 bugs in the given code, and there are many different ways to fix these bugs. However, please use the same variable names and do not substitute the while loop for any other loop (i.e. for loops are not allowed). You may change the condition of the while loop and the code inside the loop. You may not need all the lines.

Bugs:

1. assignment is one "=", not two. Two fixes.
2. (i should start at 0) or ($\leq \text{len}(\text{some_list})$ and $\text{some_list}[i - 1]$)
 - a. (Fix the range somehow)
3. i needs to be incremented.

*If more bugs are needed for the point value, the colon on the while loop could be left off or something.

Answer:

```
def copy(lst):  
    new_list = []  
    i = 0  
    while i < len(lst):  
        new_list.append(lst[i])  
        i += 1  
    return new_list
```

b) 1/2 pt. fixing 1st "=="

1/2 pt. fixing other "=="

2 pt. fixing the range somehow

(1 pt. `<= len(list)` with `lst[i]`)

(1 pt. `i=0` with `<= len(lst)`)

(.5 pt. for changed `i`, `cond`, and `list` get)

(0 pt. for "For" loop)

2 pt. increment `i` correctly

(1 pt. if syntax error)

(3 pts. for completely correct recursive solution)

0 pt. changed something that didn't need to be fixed.