

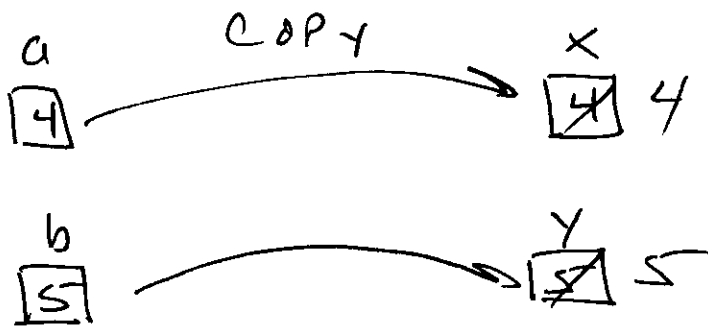
cse 20

10-30-20

1

Part: ext. 1 day

recall `swap(x, y)` passed its arguments by value



that's why it failed.

Ex Another swap function that works .

```
def swap(L, i, j):
```

```
    temp = L[i]
```

```
    L[i] = L[j]
```

```
    L[j] = temp
```

```
# end swap()
```

```
# main prog -----
```

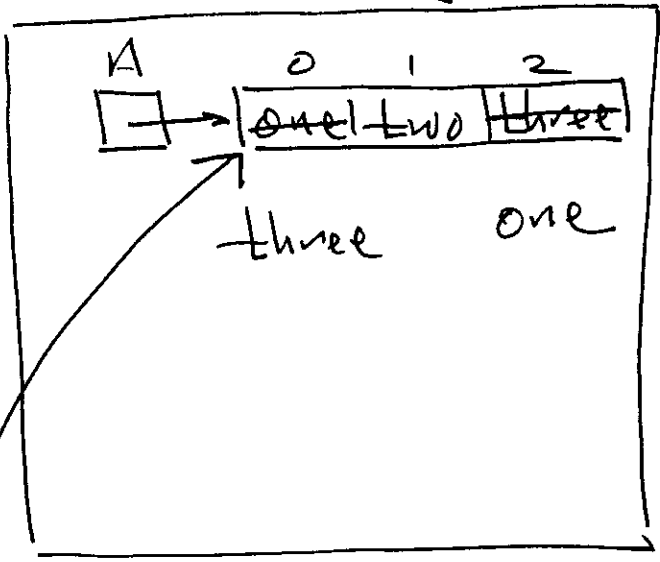
```
A = ['one', 'two', 'three']
```

```
print(A) # ['one', 'two', 'three']
```

```
swap(A, 0, 2)
```

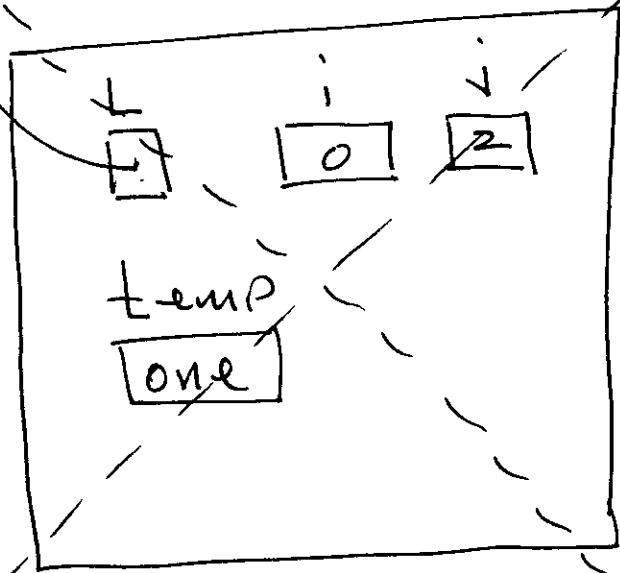
```
print(A) # ['three', 'two', 'one']
```

main P-og



Passing list
A by reference

Swap(A, 0, 2)



deallocated

more on range objects

note: `range(10)` is not a list

variations on range object:

`list(range(3, 10))` $\neq$ `[3, 4, 5, 6, 7, 8, 9]`

`list(range(10, 3))` $\neq$ `[]` empty list

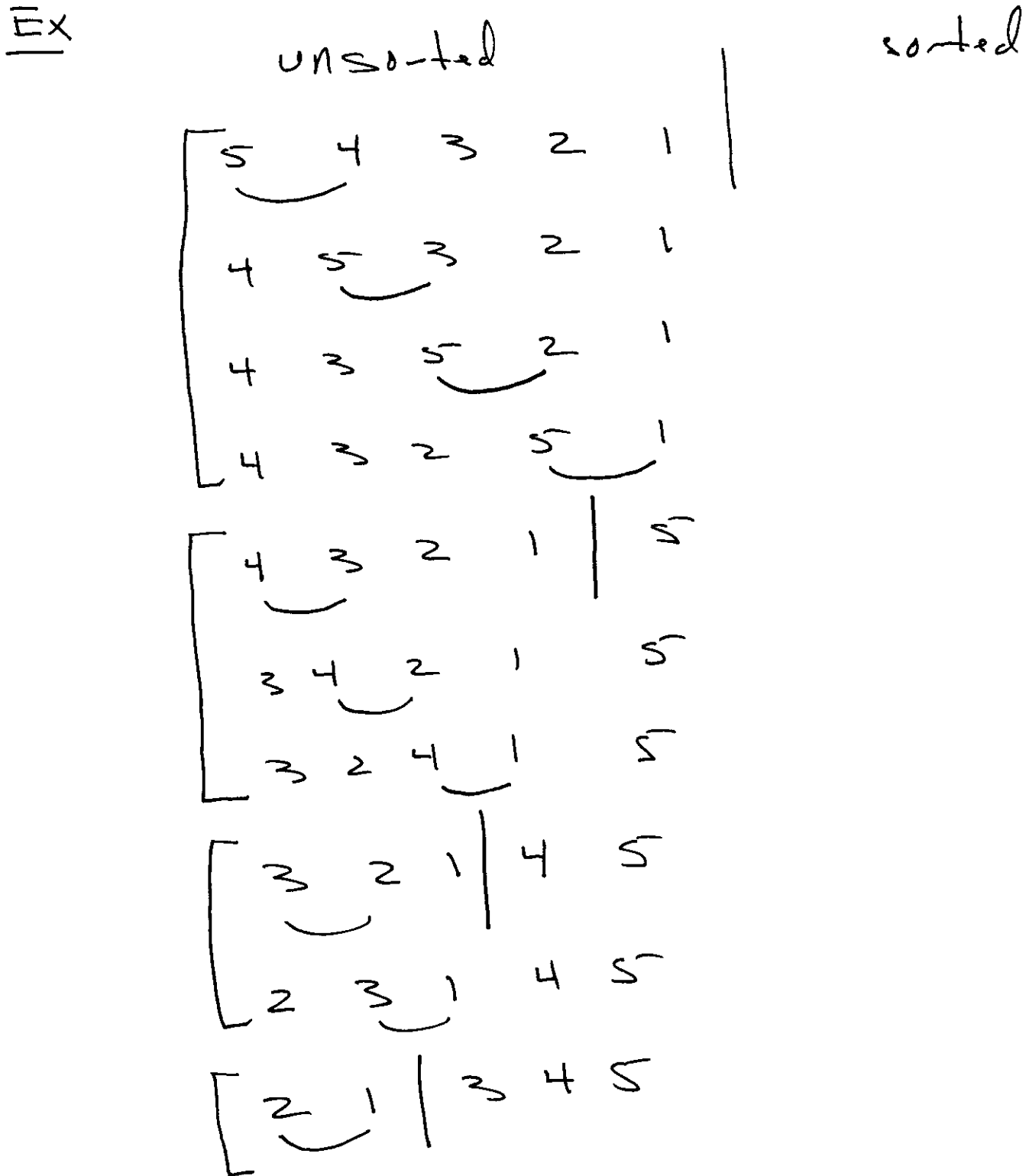
`list(range(3, 10, 2))` $\neq$ `[3, 5, 7, 9]`

`list(range(3, 11, 2))` $\neq$ `[3, 5, 7, 9]`

`list(range(10, 3, -1))` $\neq$ `[10, 9, 8, ..., 5, 4]`

`list(range(10, 3, -2))` $\neq$ `[10, 8, 6, 4]`

Bubble Sort



1 | 2 3 4 5

Done!

Ex.

$$\left[\begin{array}{ccccc|c} 4 & 3 & 1 & 5 & 2 & \\ \hline & \underbrace{\hspace{1cm}} & & & & \\ 3 & 4 & 1 & 5 & 2 & \\ & \underbrace{\hspace{1cm}} & & & & \\ 3 & 1 & 4 & 5 & 2 & \\ & & \underbrace{\hspace{1cm}} & & & \\ 3 & 1 & 4 & 5 & 2 & \\ & & & \underbrace{\hspace{1cm}} & & \end{array} \right]$$

$$\left[\begin{array}{cccc|c} 3 & 1 & 4 & 2 & 5 \\ \hline & \underbrace{\hspace{1cm}} & & & \\ 1 & 3 & 4 & 2 & 5 \\ & \underbrace{\hspace{1cm}} & & & \\ 1 & 3 & 4 & 2 & 5 \\ & & \underbrace{\hspace{1cm}} & & \end{array} \right]$$

$$\left[\begin{array}{ccc|cc} 1 & 3 & 2 & 4 & 5 \\ \hline & \underbrace{\hspace{1cm}} & & & \\ 1 & 3 & 2 & 4 & 5 \\ & & \underbrace{\hspace{1cm}} & & \\ 1 & 2 & 3 & 4 & 5 \\ & \underbrace{\hspace{1cm}} & & & \end{array} \right]$$

1 | 2 3 4 5

Done!

See

Ex. NestedLoop.py

for next time.

Part:

note `exit()` kills your
Program.