



15-112
Lecture 2

Week 4 Thu
1-D Lists

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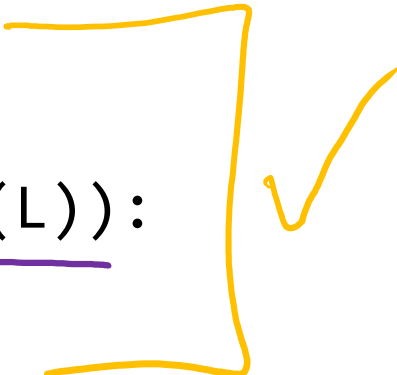
Poll 6

$$L = L * 2$$

Which is best?


I.

```
def doubleValues(L):  
    for i in range(len(L)):  
        L[i] *= 2
```



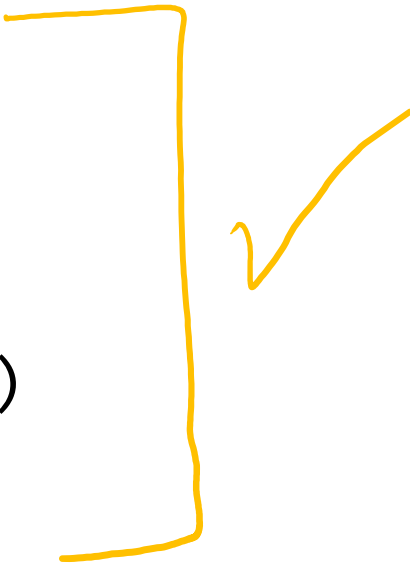
II.

```
def doubleValues(L):  
    for i in range(len(L)):  
        L[i] *= 2  
return L
```




III.

```
def doubleValues(L):  
    A = []  
    for item in L:  
        A.append(item*2)  
return A
```



IV.

```
def doubleValues(L):  
    A = []  
    for item in L:  
        A.append(item*2)
```

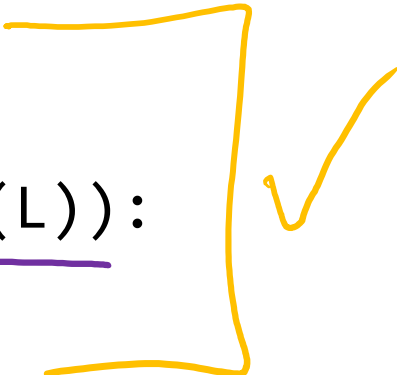


Poll 6

Which is best?

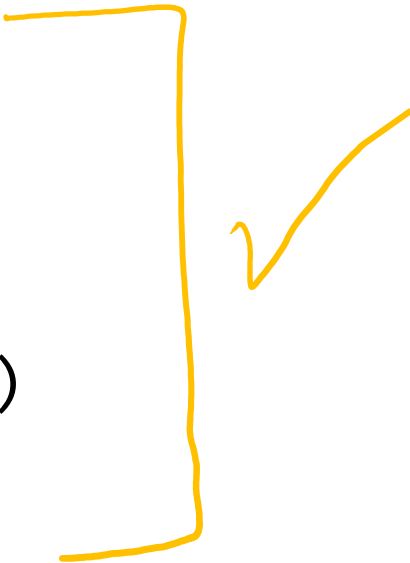
I.

```
def doubleValues(L):  
    for i in range(len(L)):  
        L[i] *= 2
```



III.

```
def doubleValues(L):  
    A = []  
    for item in L:  
        A.append(item*2)  
    return A
```



Poll 7

What does this print?

- I. <class 'int'>
- II. <class 'str'>
- III. <class 'list'>
- IV. <class 'tuple'>
- V. (<class 'str'>, <class 'int'>)
- VI. ERROR
- VII. I have no idea

```
def f():  
    return 'a', 3  
  
x = f()  
print(type(x))
```

Tuples and List Comprehensions

Tuples

Like lists but immutable

FAIL: `myTuple[0] = 99`

Simulate multiple return values

```
def sumProd(x, y):  
    return x+y, x*y
```

Multiple assignment

```
cx, cy = width/2, height/2
```

One line swapping!

```
y, x = y, x
```

Single element tuples

```
myTuple = (99,)
```

List Comprehension

Sample for loop

```
newList = []  
for variable in sequence:  
    newList.append(expression)
```

Python shorthand

```
newList = [expression for variable in sequence]
```



List Comprehension

Sample for loop (now with a filter)

```
newList = []  
for variable in sequence:  
    if condition:  
        newList.append(expression)
```

Python shorthand (now with a filter)

```
newList = [expression for variable in sequence if condition]
```


1-D List Examples

Anagrams

<https://www.youtube.com/watch?v=83ds4j16R8>

“SETEC ASTRONOMY”

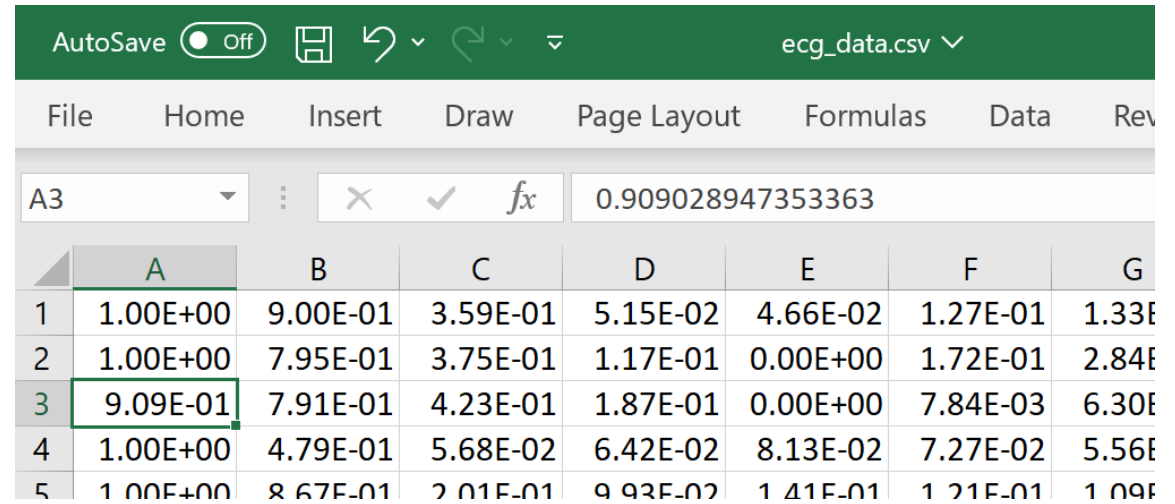


“TOO MANY SECRETS”

Locker Problem

Visualizing ECG Data

Data in CSV file



	A	B	C	D	E	F	G
1	1.00E+00	9.00E-01	3.59E-01	5.15E-02	4.66E-02	1.27E-01	1.33E-01
2	1.00E+00	7.95E-01	3.75E-01	1.17E-01	0.00E+00	1.72E-01	2.84E-01
3	9.09E-01	7.91E-01	4.23E-01	1.87E-01	0.00E+00	7.84E-03	6.30E-01
4	1.00E+00	4.79E-01	5.68E-02	6.42E-02	8.13E-02	7.27E-02	5.56E-01
5	1.00E+00	8.67E-01	2.01E-01	9.93E-02	1.41E-01	1.21E-01	1.09E-01

Data as list of floats

[0.909028947353363, 0.7914820909500122, 0.4231686592102051, ...]

Plot lines

Dataset: <https://www.kaggle.com/datasets/shayanfazeli/heartbeat>