

# **Three Python**

# **Nuances**

# **I wish I'd known earlier**

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```
l = [[0] * 5] * 5
```

```
print(l)
```

```
[[0, 0, 0, 0, 0],  
 [0, 0, 0, 0, 0],  
 [0, 0, 0, 0, 0],  
 [0, 0, 0, 0, 0],  
 [0, 0, 0, 0, 0]]
```

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```
l[0][3] = 1
```

```
print(l)
```

```
[[0, 0, 0, 1, 0],  
 [0, 0, 0, 1, 0],  
 [0, 0, 0, 1, 0],  
 [0, 0, 0, 1, 0],  
 [0, 0, 0, 1, 0]]
```



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# Nuance Number One

Lists don't contain objects  
They contain references to objects  
And it's hella weird

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# Let's try again

```
a = [0, 0, 0, 0, 0]
```

```
b = []
```

```
for _ in range(5):  
    b.append(copy(a))
```

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# Clean it up

## with list comprehensions

```
l = [[0 for i in range(5)] for j in range(5)]  
print(l)
```

```
[[0, 0, 0, 0, 0],  
 [0, 0, 0, 0, 0],  
 [0, 0, 0, 0, 0],  
 [0, 0, 0, 0, 0],  
 [0, 0, 0, 0, 0]]
```

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# Nuance Number Two

Default arguments are evaluated when a function is defined

*Not* each time a function is called

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# Arbitrary example:

**Let's write a function to append an item to a list**

```
def list_append(element, input_list=[]):  
    input_list.extend([element])  
    return input_list
```

```
print(list_append(3))  
[3]  
print(list_append([5, 7]))  
[3, 5, 7]
```

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# Here's how to do it

```
def list_append(element, input_list=None):  
    if not input_list:  
        input_list = []  
    return input_list.extend([element])  
print(list_append(3))  
[3]  
print list_append([5, 7])  
[5, 7]
```

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# Nuance Number Three

== **VS** is

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# Equality vs identity: truthy and falsey values

```
print(1 == True)
True
print(1 is True)
False
a = True
print(a is True)
True
print(0 == False)
True
print(0 is False)
False
b = False
print(b is False)
True
```

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# Equality vs identity: equivalent variables

a and b variables pointing to the same id

```
a = [1, 2, 3, 4, 5]
b = a
print(b == a)
True
print(b is a)
True
print(id(a), id(b))
4437740104, 4437740104
```

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a and b are different objects, but the values of their contents are identical

```
a = [1, 2, 3, 4, 5]
b = [1, 2, 3, 4, 5]
print(b == a)
True
print(b is a)
False
print(id(a), id(b))
4437740104, 4442640968
```

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# Thank You!

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