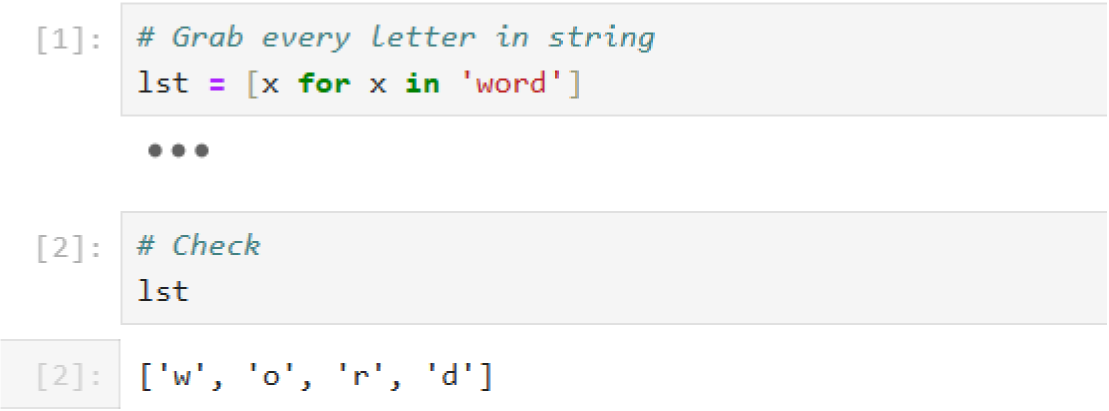
😊 List Comprehensions in Python

In addition to sequence operations and list methods, Python includes a more advanced operation called a list comprehension. In Python, a list comprehension is a concise way to create a new list from an existing iterable (like a list, tuple, or string) by applying an expression to each item and optionally filtering items based on a condition, all within a single line of code.

1. This is the basic idea of a list comprehension. The code takes each letter from the word **"word"** and puts it into a list. So, it creates ['w', 'o', 'r', 'd']. It's just a **shorter way** to make a list from a string without using a loop.



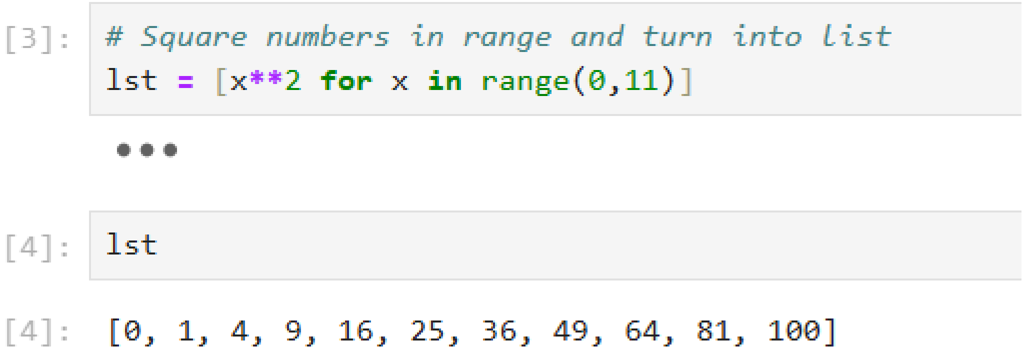
```
[1]: # Grab every letter in string
     lst = [x for x in 'word']

     •••

[2]: # Check
     lst

[2]: ['w', 'o', 'r', 'd']
```

2. The code makes a list of numbers **from 0 to 10**, squares each one, and stores them in a list.



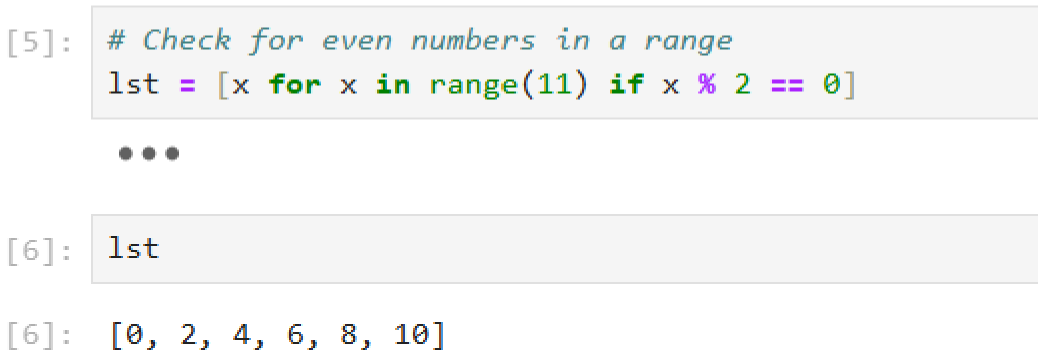
```
[3]: # Square numbers in range and turn into list
     lst = [x**2 for x in range(0,11)]

     •••

[4]: lst

[4]: [0, 1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
```

3. The code takes numbers from **0 to 10**, checks if each one is even, and adds only the even numbers to a list.



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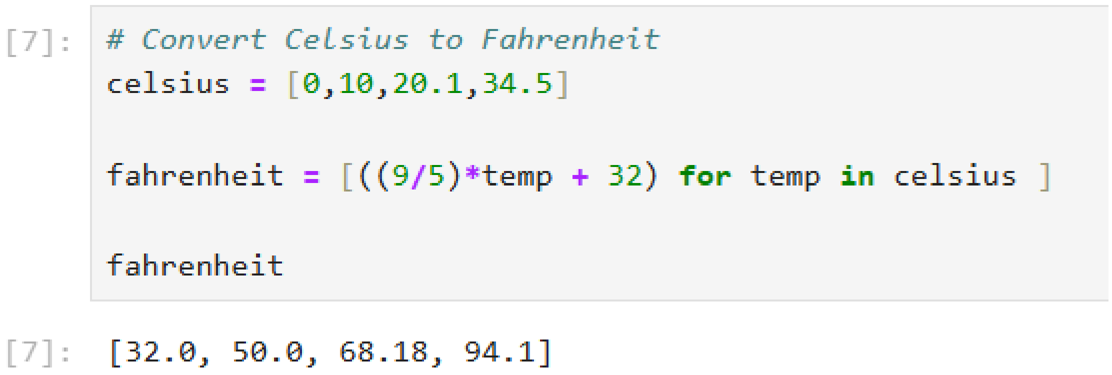
[5]: # Check for even numbers in a range
     lst = [x for x in range(11) if x % 2 == 0]

     •••

[6]: lst

[6]: [0, 2, 4, 6, 8, 10]
```

4. The code takes a list of temperatures in **Celsius** and converts each one to **Fahrenheit** using the formula F = (9/5) * C + 32. The result is a new list with Fahrenheit values.



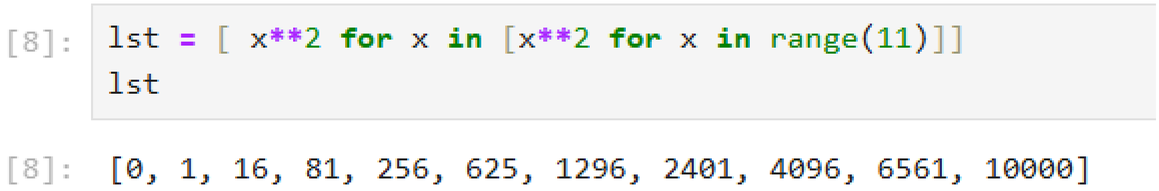
```
[7]: # Convert Celsius to Fahrenheit
     celsius = [0,10,20.1,34.5]

     fahrenheit = [((9/5)*temp + 32) for temp in celsius ]

     fahrenheit

[7]: [32.0, 50.0, 68.18, 94.1]
```

5. The code **first squares** numbers from 0 to 10, creating a list. Then, it **squares those results again**, making [0, 1, 16, 81, 256, 625, 1296, 2401, 4096, 6561, 10000]. It's a **double squaring process** using **nested list comprehensions**.



```
[8]: lst = [ x**2 for x in [x**2 for x in range(11)]]
     lst

[8]: [0, 1, 16, 81, 256, 625, 1296, 2401, 4096, 6561, 10000]
```