

Comprehensions

September 17, 2024

1 Comprehensions

Comprehensions are a compact format for processing collections, yielding another collection, or an iterable.

They come from the world of functional programming.

Their great advantage is that you know at a glance that data processing is happening and you know exactly where to look to find out what is going on.

```
[15]: text = '''To be or not to be that is the question
Whether tis nobler in the mind to suffer
The slings and arrows of outrageous fortune
Or to take arms against a sea of troubles
And by opposing end them To die to sleep
No more and by a sleep to say we end
'''
words = text.lower().split()
```

1.0.1 List comprehension

Yields a list.

```
[5]: capwords = [word.upper() for word in words if len(word) > 4]
capwords
```

```
[5]: ['QUESTION',
      'WHETHER',
      'NOBLER',
      'SUFFER',
      'SLINGS',
      'ARROWS',
      'OUTRAGEOUS',
      'FORTUNE',
      'AGAINST',
      'TROUBLES',
      'OPPOSING',
      'SLEEP',
      'SLEEP']
```

1.0.2 Set comprehension

Yields a set

```
[7]: wordset = {word.upper() for word in words if len(word) > 4}
wordset
```

```
[7]: {'AGAINST',
      'ARROWS',
      'FORTUNE,',
      'NOBLER',
      'OPPOSING',
      'OUTRAGEOUS',
      'QUESTION',
      'SLEEP',
      'SLINGS',
      'SUFFER',
      'TROUBLES',
      'WHETHER'}
```

1.0.3 Dict comprehension

Yields a dictionary

```
[8]: worddict = {word: len(word) for word in words if word.startswith('o')}
worddict
```

```
[8]: {'or': 2, 'of': 2, 'outrageous': 10, 'opposing': 8}
```

1.0.4 Generator expression

Yields a generator object

Difference between a generator and a list

- Lists can be random accessed, generators yield values in a sequence
- Once a value has been yielded from the generator, it can't be put back
- A generator takes up very little space in memory, a list requires space for all its data at the same time

```
[10]: wordgen = (word.upper() for word in words if len(word) > 4)
wordgen
```

```
[10]: <generator object <genexpr> at 0x7f4c942c3a98>
```

```
[12]: print(next(wordgen))
print('-----')
for w in wordgen:
    print(w)
```

QUESTION

WHETHER
NOBLER
SUFFER
SLINGS
ARROWS
OUTRAGEOUS
FORTUNE,
AGAINST
TROUBLES
OPPOSING
SLEEP
SLEEP