

Self-Test: Comprehension in Action

1. Create a list of all files in a directory that are MS Word files (i.e. they end in .docx).
2. Given a dictionary `dictionary` create a sub-dictionary with all key-value pairs where the value is even. You can assume that all values are integers.
3. Given a list `alist`, create a list of all elements in `alist` that are integers. Use `isinstance(<var>, int)` to check whether `<var>` is an integer.
4. Given a definition `matrix = 4*[4*[0]]`, verify that this is indeed a matrix, and then see what happens if you change an element via `matrix[1][2]=3`.

Solutions:

```
[filename for filename in os.listdir(directoryname) if filename.endswith(".py")]
```

```
>>> dictionary = {"one":1, "two":2, "three":3, "four":4}
>>> dictionary
{'one': 1, 'two': 2, 'three': 3, 'four': 4}
>>> subdic = {x:dictionary[x] for x in dictionary if dictionary[x]%2==0}
>>> subdic
{'two': 2, 'four': 4}
```

```
>>> alist =[1, "two", 3, "four", 5.0, 6]
>>> blist = [x for x in alist if isinstance(x, int)]
>>> blist
[1, 3, 6]
```

```
>>> matrix = 4*(4*[0])
>>> print(matrix)
[0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0]
>>> matrix = 4*[4*[0]]
>>> matrix
[[0, 0, 0, 0], [0, 0, 0, 0], [0, 0, 0, 0], [0, 0, 0, 0]]
>>> matrix[1][2]
0
>>> matrix[1][2]=3
>>> matrix
[[0, 0, 3, 0], [0, 0, 3, 0], [0, 0, 3, 0], [0, 0, 3, 0]]
```