ENGSCI 233 – Computational Techniques and Computer Systems

Week 2: Data and Objects PY03 – Strings, Iterables, and Classes

Andreas W. Kempa-Liehr

THE UNIVERSITY OF
AUCKLAND
NEW ZEALAND

ENGINEERING

Department of Engineering Science

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Important data types in Python

Strings Important for reading Comma Separated Files (CSV) or Natural Language Processing (NLP)

Iterables Strings, lists, tuples, dictionaries, as wells as matrix-like objects like numpy.array or table-like objects pandas.DataFrame

Classes Problem-specific data models including data specific functions

Thursday lecture

- Working with the file systems
- Saving and loading data files

Resources for learning

- Giovanni Moruzzi. *Essential Python for the physicist*. Cham: Springer, 2020. DOI: 10.1007/978-3-030-45027-4, Sec. 1.1-1.16
- Python Like You Mean It: https://www.pythonlikeyoumeanit.com/index.html
- An Informal Introductionto Python https://docs.python.org/3.9/contents.html

Strings

Besides numbers, Python can also manipulate strings, which can be
expressed in several ways. They can be enclosed in single quotes ('...')
or double quotes ("...") with the same result. The backslash \ can be
used to escape quotes.

```
>>> 'spam eggs'  # single quotes
'spam eggs'
>>> 'doesn\'t'  # use \' to escape the single quote...
"doesn't"
>>> "doesn't"  # ...or use double quotes instead
"doesn't"
>>> '"Yes," they said.'
'"Yes," they said.'
>>> "\"Yes,\" they said."
'"Yes," they said.'
>>> '"Isn\'t," they said.'
'"Isn\'t," they said.'
```

Indexing

One way to remember how slices work is to think of the indices as pointing
between characters, with the left edge of the first character numbered 0.
Then the right edge of the last character of a string of n characters has
index n, for example:

```
 +---+---+---+---+---+---+
 | P | y | t | h | o | n |
 +---+---+---+---+---+---+
 0   1   2   3   4   5   6
-6  -5  -4  -3  -2  -1
```

The first row of numbers gives the position of the indices $0 \ldots 6$ in the
string; the second row gives the corresponding negative indices. The slice
from i to j consists of all characters between the edges labeled i and j,
respectively.

```python
print("Python"[2:4])  # Example
```

```
th
```