

COMP3222/6246 Week 1 (Not marked)

Python

*“Beautiful is better than ugly.
Explicit is better than implicit.
Simple is better than complex.
Complex is better than complicated.
Flat is better than nested.
Sparse is better than dense.
Readability counts.”*

PEP20 -- The Zen of Python, Tim Peters

Python is a high level programming language which supports many programming paradigms such as procedural, object-oriented, and functional programming paradigm. It is also widely considered to be easy to learn. With a large number of open-source libraries including scikit-learn and scipy, Python has become one of the mainstream languages for machine learning projects.

Below is a list that compares and contrasts between Java and Python:

- Both Java and Python are high level programming languages.
- By a usage of whitespace instead of brackets and parentheses, Python is comparably more readable than Java and other languages.
- Python does dynamic type checking (and could cause a failure at runtime), but Java is a static type checked language.
- Python software can be faster than Java software. (Do you know why?)
- Regarding memory management techniques, Python mainly relies on reference counting whereas Java mainly relies on tracing.

There are many online tutorials where you can learn Python easily. We recommend [learnpython.org](https://www.learnpython.org/) which allows you to learn and try Python interactively at the same time. They also introduce you to Numpy and Pandas that we will frequently use. You are strongly recommended to try out their short exercises at the end of each lesson. A list of cheat sheets has been provided by DataCamp and can be used to help with your learning as well:

- Python (https://s3.amazonaws.com/assets.datacamp.com/blog_assets/PythonForDataScience.pdf),
- Numpy (https://s3.amazonaws.com/assets.datacamp.com/blog_assets/Numpy_Python_Cheat_Sheet.pdf), and
- Pandas (https://s3.amazonaws.com/assets.datacamp.com/blog_assets/PandasPythonForDataScience.pdf).

We strongly encourage you to try every command in this cheat sheet in the Jupyter notebook before starting the laboratory session on the 2nd week. An official tutorial on Python can also be accessed from <https://docs.python.org/3.6/tutorial/>.