B(E)3M33UI — Introduction to Python

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1 Python Info

Python is *interpreted*, high-level, general-purpose programming language. The code is compiled into bytecode and run in a Python virtual machine. Python has a large and comprehensive standard library.

- Recommended python is version $\geq$ **3.6.x** (version: 2.7.x will retire in 2020)

- `http://python.org`, `http://docs.python.org`

- Suggested textbook: Mark Pilgrim, *Dive into Python* (available in PDF).

- V české verzi knihu vydalo sdružení CZ.NIC (kniha je dostupná v PDF).

- Python packages and modules, `import`.

- Python scientific stack: Numpy, Scipy, matplotlib, pandas, . . .

- Python distributions: "official" Python, Canopy, Anaconda . . .

2 Python basics

For a basic use of Python you should know about the following topics:

- Variables and types of values

- Data structures: list, tuple, dictionary; **zero-based indexing**

- The role of **indentation** in Python: `for`, `if`, `while`

- Functions, named arguments, default argument values.

- Python run via script, interactive shell (IPython), or Jupyter lab

3 Homework

You will not learn to use Python, if you will not use it. You should spend six hours of home work per week preparing for the course. Use these six hours in the next week to learn about the above mentioned topics, read the book or other tutorial and **try the examples yourself!**

Use the *Dive into Python 3* book. The important topics are covered in the following chapters and sections:

- **Chapter 1: Your first Python program**
  Functions and their arguments, docstrings, importing modules, everything is an object, indenting code, everything is case-sensitive, running scripts.

- **Chapter 2: Native data types**
  Especially lists, tuples, dictionaries (at least basic usage).

- **Chapter 11: Files**
  Opening and closing text files, `with` statement, specifying an encoding, reading line by line. For now, you can ignore binary files.

The additional topics in the book, if you still have some time left:

- Chapter 4: Strings
  Interesting reading, but we will need probably only a few string methods, like `str.split()`, `str.strip()`, etc.

- Chapter 7: Classes and iterators
  This particular topic is IMHO not explained very nicely in the book. We will probably use classes only a few times and in a very simple way.

Each language has some unique features that distinguish it from the others. In case of Python, these are IMHO described in

- Chapter 3: Comprehensions, and

- Chapter 6: Closures and generators.

Further, you should also be familiar with **numpy** package and basic operations on arrays and matrices, see the tutorial at `https://docs.scipy.org/doc/numpy/user/quickstart.html`

There is no need to hand-in or upload anything, but **we strongly urge you to put your hands on Python**, try it, explore it, **and ask questions on the forum!**