PA196: Pattern Recognition

Exercises 01

Dr. Vlad Popovici
popovici@recetox.muni.cz

RECETOX
Masaryk University, Brno

Python environment

- the easiest is to use a "distribution" of Python
- suggestion/recommendation: Anaconda
  `http://www.continuum.io/`
- Python 2 vs Python 3: for the exercises in the course, there should be (almost) no difference
- starting with a minimal distribution: use Miniconda: `http://conda.pydata.org/miniconda.html`: pick the right installer (e.g. 64 bit)

Example:

- download the "Python 3.4/64 bit" version of Miniconda
- it may require `chmod +x Miniconda3-3.6.0-Linux-x86_64.sh`
- run the installer
- even though the base distribution is Python 3.4 you can still have Python 2.7 installed as well
- browse through the documentation
- with `conda install anaconda` you will get all the packages as in the basic "Anaconda"; alternatively you can install them on a as-needed basis
- install the machine learning kit: `conda install scikit-learn`

About Python language

- tons of source of information
- quick introduction:
  `https://docs.python.org/2/tutorial/`
- more detailed - but free book:
  `http://www.diveintopython.net/`

IPython

- great tool for interactive sessions with Python
- `www.ipython.org`
- you can have mixed code, text and results in the same *notebook*, like in Mathematica
- try: `ipython qtconsole -matplotlib inline` and in the console:

```
from matplotlib import pylab as plt
plt.plot([1,2,3],[4,5,6])
```

- try (from the command line): `ipython notebook` and then open the web page at `http://127.0.0.1:8888`

Several key packages:

- *numpy*: fast array operations and matrix manipulation
- *scipy*: loads of numerical methods, including some functions for signal and image processing
- *matplotlib*: Matlab-style plotting functions - and not only!
- *pandas*: versatile package for data analysis
- *scikit-image*: image processing (beyond scipy)
- *scikit-learn*: our main interest

Scikit-Learn

- `http://scikit-learn.org/`
- nice Python package for machine learning/pattern recognition
- good documentation
- still under development
- start Python: `ipython -matplotlib qt`
- let's go through the tutorial at `http://scikit-learn.org/stable/tutorial/basic/tutorial.html`