

# ELEC0018-1 – Energy Markets

## Workshop 4: Programming tools

Thibaut Théate

Antoine Dubois

Adrien Bolland



# Assignment – Programming tools suggested

- **Anaconda** (or simply conda) for managing your Python environments.
- **Python 3.7** (please avoid Python 2.7).
- **Pyomo** (software for optimization).
- Choose a **text editor** or an **IDE**:
  - Visual Studio Code (Text editor).
  - Spyder (IDE installed with Anaconda).
  - PyCharm (IDE).



# Programming tools – Anaconda



Installation of Anaconda:

- Windows: <https://docs.anaconda.com/anaconda/install/windows>
- MacOS: <https://docs.anaconda.com/anaconda/install/mac-os>
- Linux: <https://docs.anaconda.com/anaconda/install/linux>

Verification of the installation: <https://docs.anaconda.com/anaconda/install/verify-install>

Official Anaconda user guide: <https://docs.anaconda.com/anaconda/user-guide>

Useful cheat sheets:

- <https://docs.anaconda.com/anaconda/user-guide/cheatsheet>
- <https://docs.conda.io/projects/conda/en/4.6.0/user-guide/cheatsheet.html>

# Programming tools – Conda environment

Creation of a new environment named *EnergyMarkets* for the assignment:

1. Open a new terminal (Anaconda Prompt for Windows).
2. Run the following command: **conda create --name EnergyMarkets python=3.7**
3. Verify the information printed and press “y” to confirm.
4. Run the following command: **conda env list**
5. Check that your new environment named *EnergyMarkets* is present in the list.
6. To activate this environment, run the following command:
  - Windows: **activate EnergyMarkets**
  - MacOS or Linux: **source activate EnergyMarkets**



Do not forget to activate the *EnergyMarkets* environment before working on the assignment!





# Programming tools – Pyomo

Installation of Pyomo (into the *EnergyMarkets* environment):

1. Open a new terminal (Anaconda Prompt for Windows).
2. Activate the *EnergyMarkets* environment:
  - Windows: **activate EnergyMarkets**
  - MacOS or Linux: **source activate EnergyMarkets**
3. Run the following command to install Pyomo: **conda install -c conda-forge pyomo**
4. Run the following command to install extras: **conda install -c conda-forge pyomo.extras**
5. Run the following commands to install optimization solvers:
  - **conda install -c conda-forge ipopt**
  - **conda install -c conda-forge glpk**

# Programming tools – Tutorials

- Python:

- The official Python tutorial: <https://docs.python.org/3.7/tutorial>
- The tutorial from W3School: <https://www.w3schools.com/python>
- The tutorial from learnpython.org: <https://www.learnpython.org>
- The tutorial from Programiz: <https://www.programiz.com/python-programming/tutorial>

- Pyomo:

- The official Pyomo documentation: <https://pyomo.readthedocs.io/en/stable/index.html>
- ND Pyomo Cookbook: <https://jckantor.github.io/ND-Pyomo-Cookbook/>



Any questions?