# Instructions for FYSC12 labs:
# How to install and run Jupyter Notebooks

The "online" visualization that the Maestro MCA software allows is very helpful but limited and tedious to use for multiple data samples or to estimate systematic uncertainties – no way around writing our own code!

Lucky for you, key aspects of the analysis are already coded and uploaded to Live@Lund. The next sections explain what is needed in order to run the analysis and how to do so.

## 1   Installing Prerequisites

The analysis is written in Python3 with the SciPy library[1] for scientific computing and run inside a Jupyter Notebook[2] – it's all free and open software, available for all major platforms and highly flexible; and the key packages are just a download away: Anaconda[3] provides the complete toolkit we need. You can find more detailed installation instructions online.[4]

## 2   Running the Analysis

Download the zipped code from Live@Lund into a directory of your liking and extract the file contents.

**Conda environment**

An environment in conda[5], makes it easy to have portable code, i.e. program that can run on any computer with any operative system. The *F*YSC12 environment is described by the file *e*nvironment.yml in the folder 'analysis_code'. You have two options on how to install and activate the environment:

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[1] http://www.scipy.org
[2] https://jupyter.org/
[3] https://www.continuum.io/downloads, choose the version for Python 3!
[4] For example: https://jupyter.readthedocs.io/en/latest/install.html
[5] https://conda.io/docs/user-guide/tasks/manage-environments.html

## 1 - With the Anaconda Navigator (recommended)

- Open the navigator.

- Click 'Environment' on the left-hand menu.

- Click 'Import' on the bottom of the GUI.

- Navigate to the folder you downloaded and choose the file 'environment.yml'.

- Once the installation is completed, click on the 'play' button to activate the environment.

- NOTE: whenever you want to run the FYSC12 notebooks you need to activate the environment first.

## 2 - From a command prompt

Run the following in a command prompt (also called *Terminal* or *Konsole* (also possible with the conda prompt):

```
cd path/to/the/directory/you/chose
conda env create −f environment.yml
(On Linux) source activate FYSC12−Labs
(On Mac) source activate FYSC12−Labs ?
(With conda prompt) conda activate FYSC12−Labs ?
(On Windows) conda activate FYSC12−Labs ?
./postBuild
```

## Open the jupyter notebook

Now start up the Jupyter server by

Look for and click the *Jupyter Notebook* icon in the Anaconda navigator.

Alternatively:

```
cd path/to/the/directory/you/chose
jupyter notebook
```

on the command prompt (also called *Terminal* or *Konsole* depending on the OS).

Now your default web browser should launch and display the Jupyter application running at `http://localhost:8888`. Navigate to the Jupyter notebook you want to use for the lab and select it to open it in a new tab.

## For the KF7-Beta lab

In the opened jupyter server navigate to the folder KF7-Beta and open the file 'beta-lab_notebook.ipynb'.
Follow the instructions in the notebook at least until the point where you see the first plot –
and you are all set for the lab!