Computational Physics with Python

First Steps: Shells, Scripts and Notebooks

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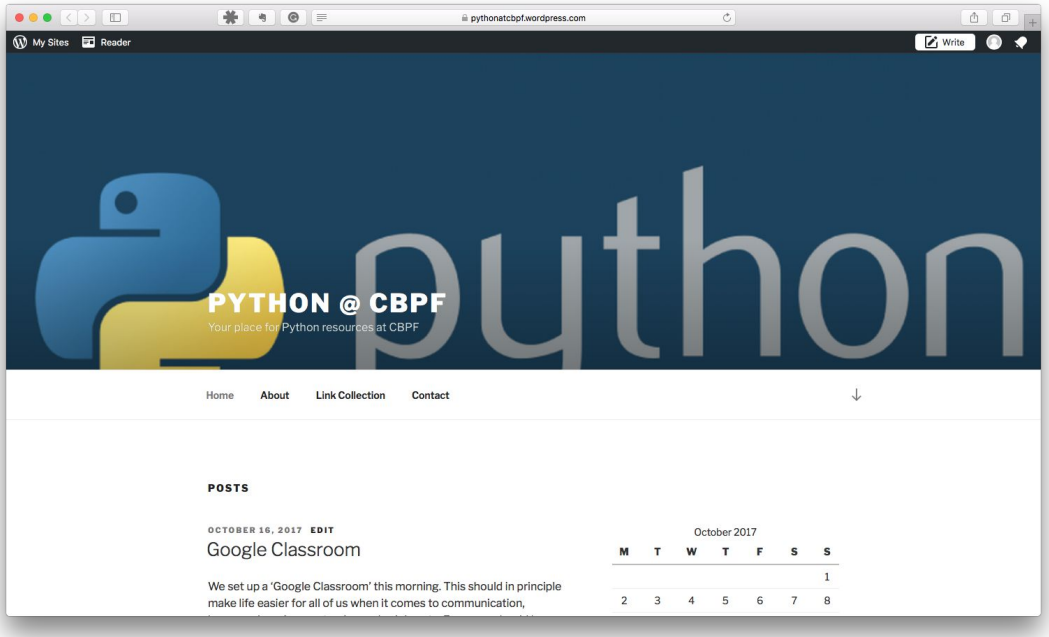
Outline

- Organisational Issues
  - Website
  - Google Classroom
- Python - First Steps
  - The Python Shell
  - Python Scripts
  - Jupyter Python Notebooks

Organisational Issues

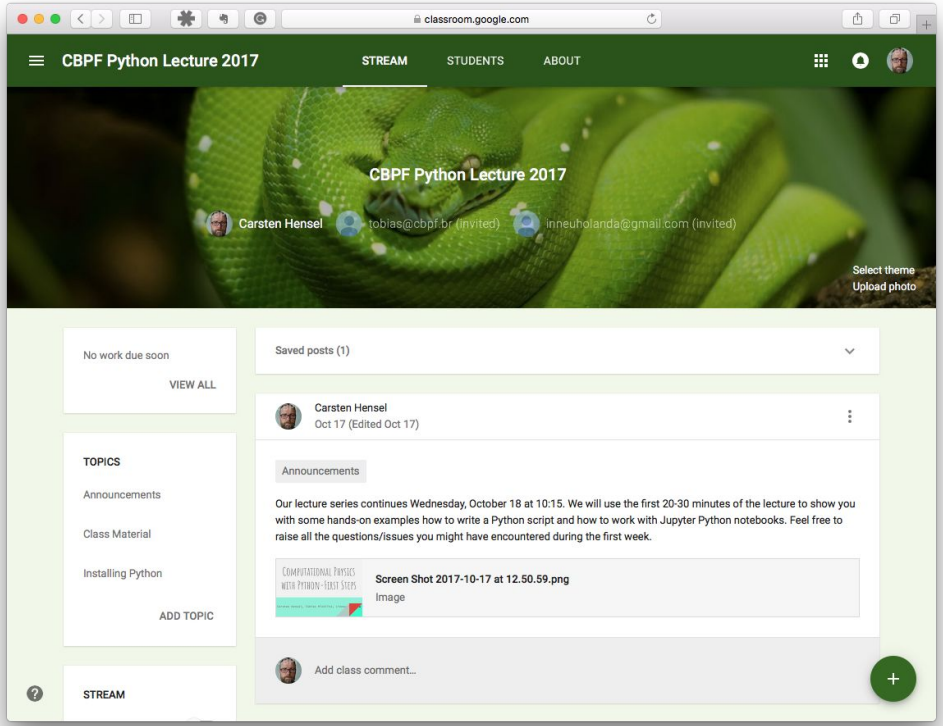
Website

- pythonatcbpf.wordpress.com
- Central place for everything Python at CBPF.
- All the lecture material (slides, notebooks, etc.)
- Content Python related that doesn't fit into the lecture.



Google Classroom

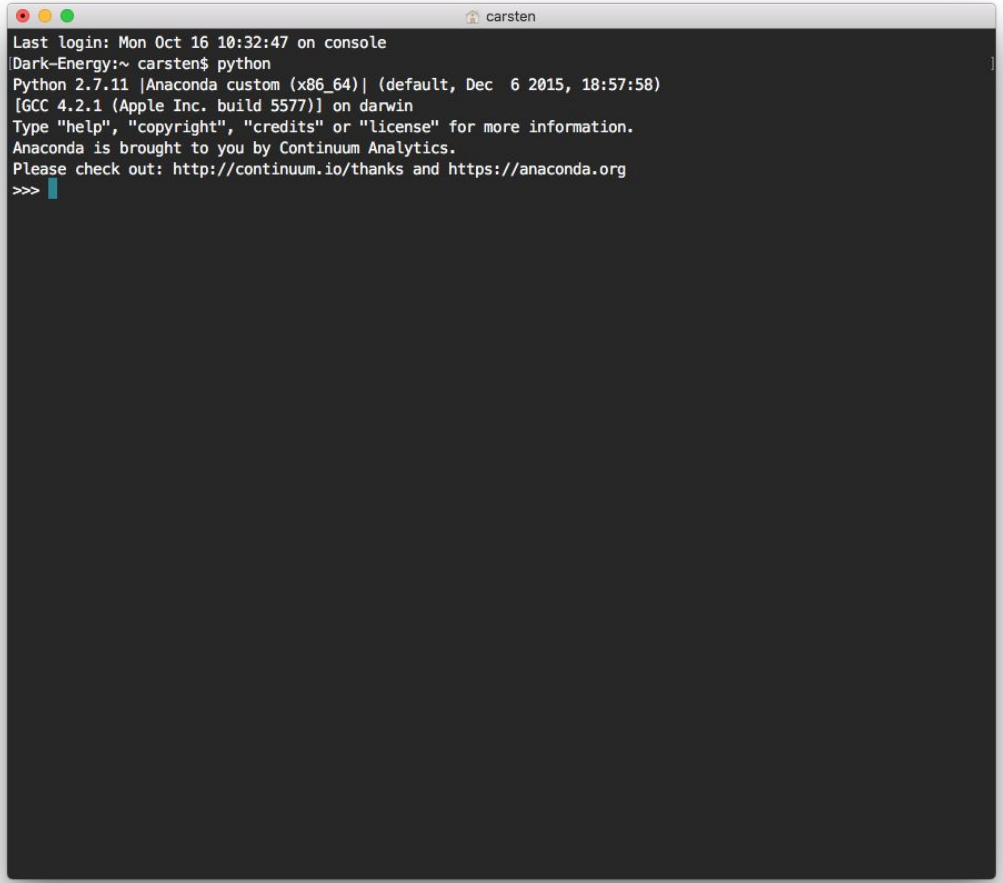
- Virtual Classroom
- Everyone should've received an invite. **If not, please let me know!**
- Everything lecture related.
  - announcements
  - communication
  - Q&A (?)
  - slides and notebooks
  - assignments (?)



Python - First Steps

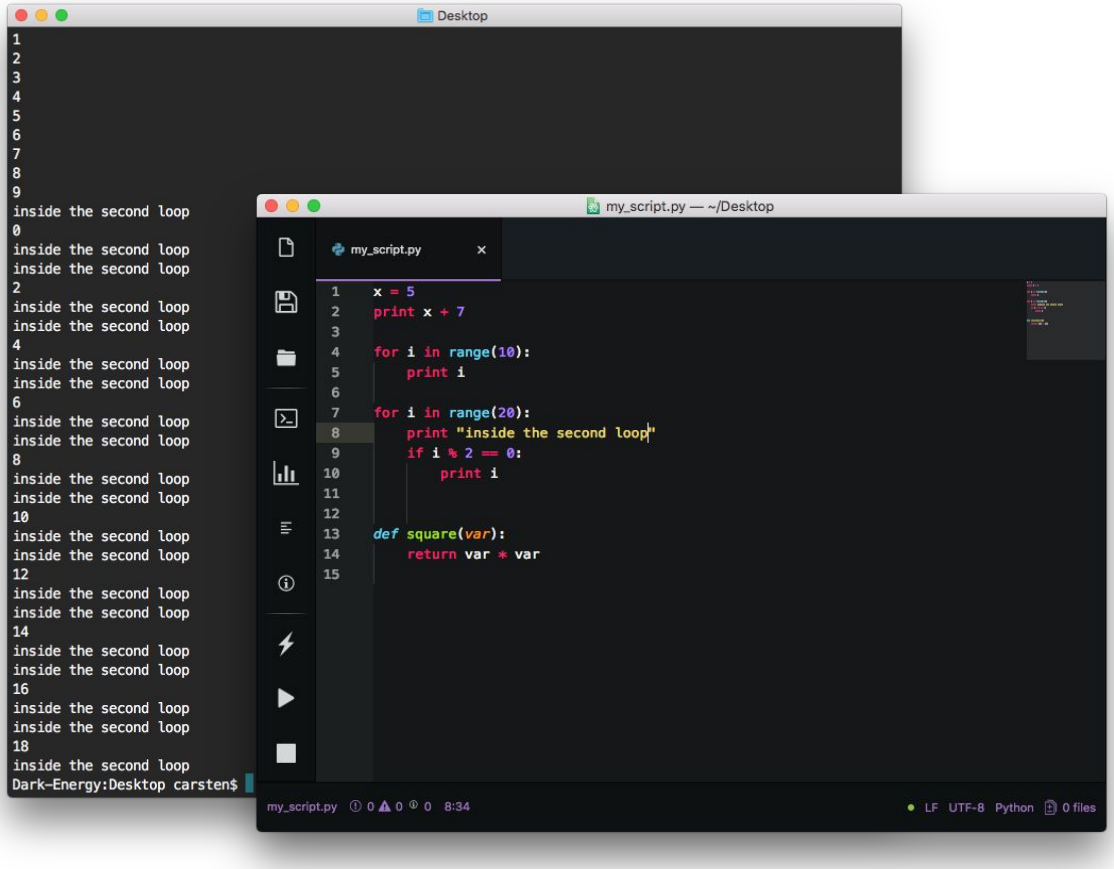
The Python Shell

- From within a terminal window just type **python**
- Each line is one command.
- Use **dir** to investigate modules.
- Use **help** to learn about modules and functions.
- To exit hit **Ctrl-d**
- Not the best way to write longer programs.



Writing a Python Script

- The Python shell has a very limited use case.
- Every time you would like execute more than just a few commands you put your code into a file.
- Open your favorite text editor (**Emacs**, **Atom**, **Vim**, **Light Table**,…)
- And start typing…
- Execute your script from a terminal with
  python my_script.py



Jupyter Notebooks

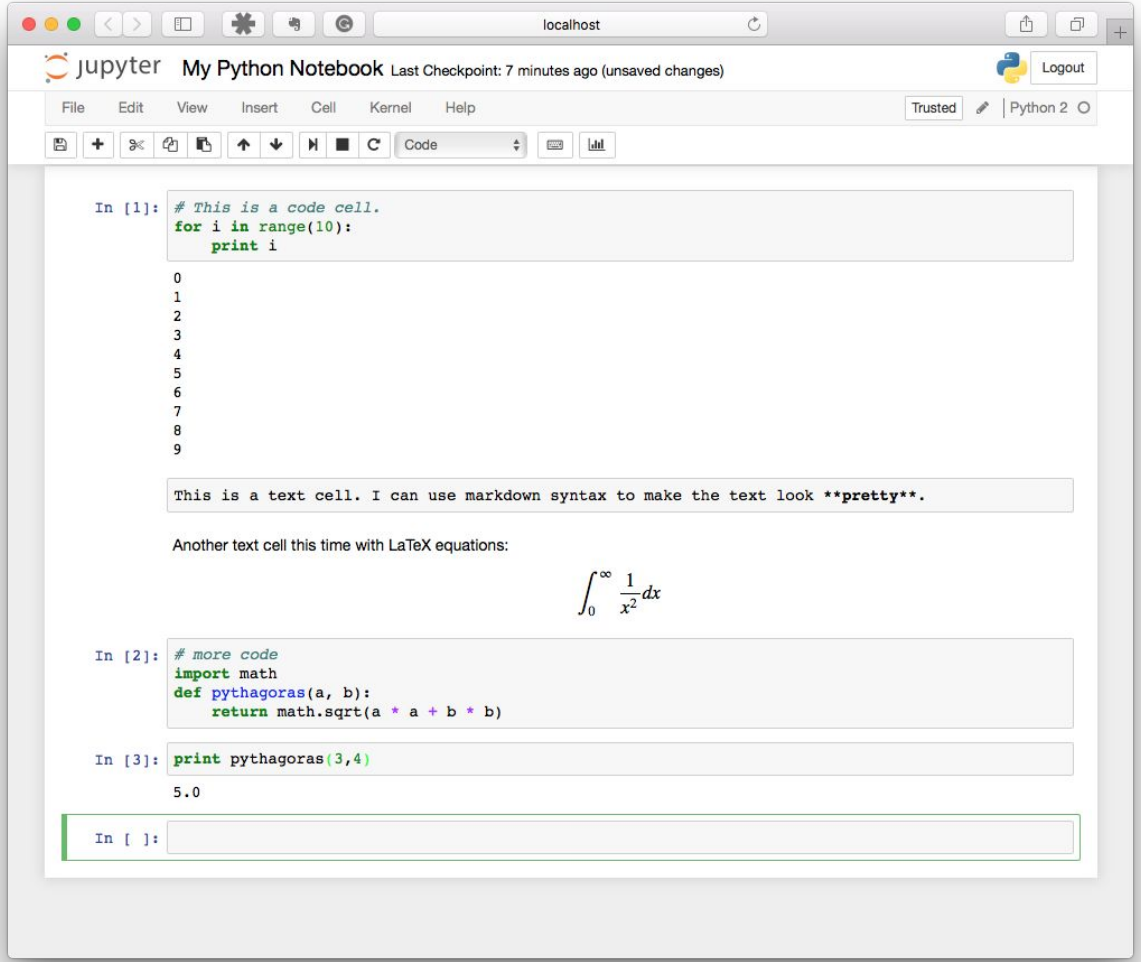
- Scripts have one big disadvantage: they lack interactivity.
- Especially when developing new code, producing a plot, calculating a number,... instant feedback would be great.
- **Jupyter Notebooks** to the help!

How to use Jupyter?

- What is Jupyter?
  - Formerly known as IPython
  - Interactive programming environment
  - Not only available for Python (C++, Perl, Julia,R, ...)
  - Something between the Python shell and a Python script.
  - Allows to mix source code and commentary (-> makes for a great logbook)
- Jupyter comes pre-installed with Anaconda
- Jupyter runs in your browser (Chrome, Safari, Firefox, ...)
- How to start a notebook?
  - Open a terminal and type **jupyter notebook**
  - A new tab should open in your browser.

Typical Jupyter Workflow

- Cells
- Adding text/code
- Code execution (**shift-return**)
- Clearing the output
- Adding and moving cells
- Export code to script



Summary - Part 1

Summary

- Let’s try to utilize the communication tools introduced.
- There are various ways to work with Python.
  - Python shell - the quick calculator
  - Python script - for anything larger
  - Jupyter Notebook - an interactive programming environment
- Pick and choose according to your needs.