Introduction to (Scientific) Programming with Python

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Outline

- Why Python?
- Practical
  - Part 1: Intro to Python
  - Part 2: Python for scientific programming
  - Part 3: Python for statistical data analysis
- Additional Resources

Why Python?

**It's a general purpose programming language,
used to power many of the apps you use every day!**






Why Python?

There are free (!!) add-ons for everything:

Create your own experiments

Organise and analyse numerical data

Make beautiful figures

Perform sophisticated statistical analyses

Hop on the machine learning hype train!

Why Python?

It's just better than its competitors!


> 

Matlab is very expensive! Python is **free**. When using the right packages/add-ons, Python has the same functionality and syntax as Matlab.


> 

Python is much easier to learn, as the **syntax is less complex**.
At least for science, there is a **better community/ecosystem**.
Some Python packages run C(++) code in the background, which makes them almost as fast as their C++ counterparts.


> 

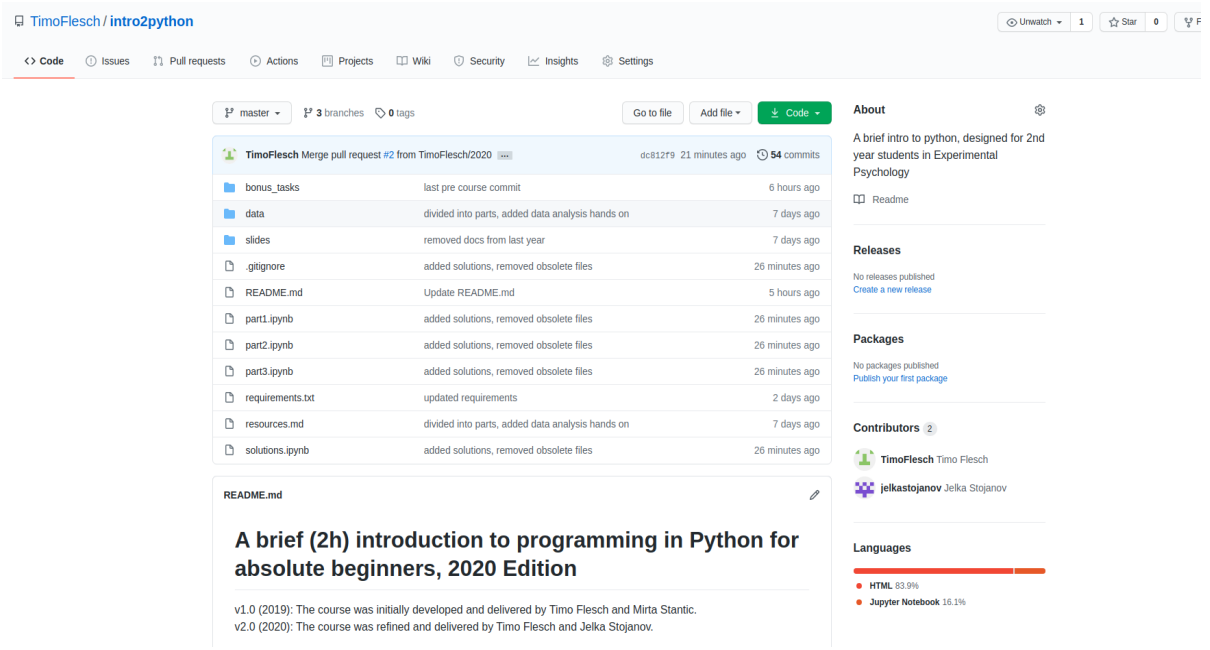
Python is a **general purpose language**. It can be used for almost everything. R was developed for statistical analyses.


> 

Again, much **simpler syntax**. You can achieve the same results with fewer lines of code

Python Practical

1. Go to http://www.github.com/timoflesch/intro2python

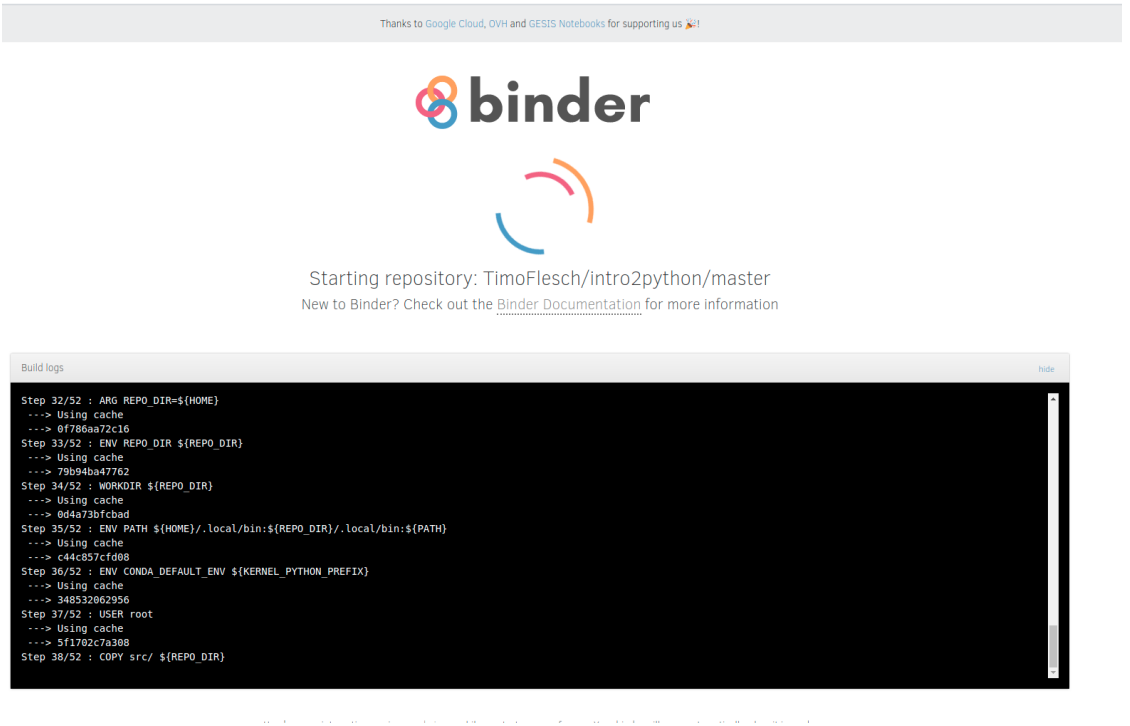


Python Practical

2. Click on “launch binder”

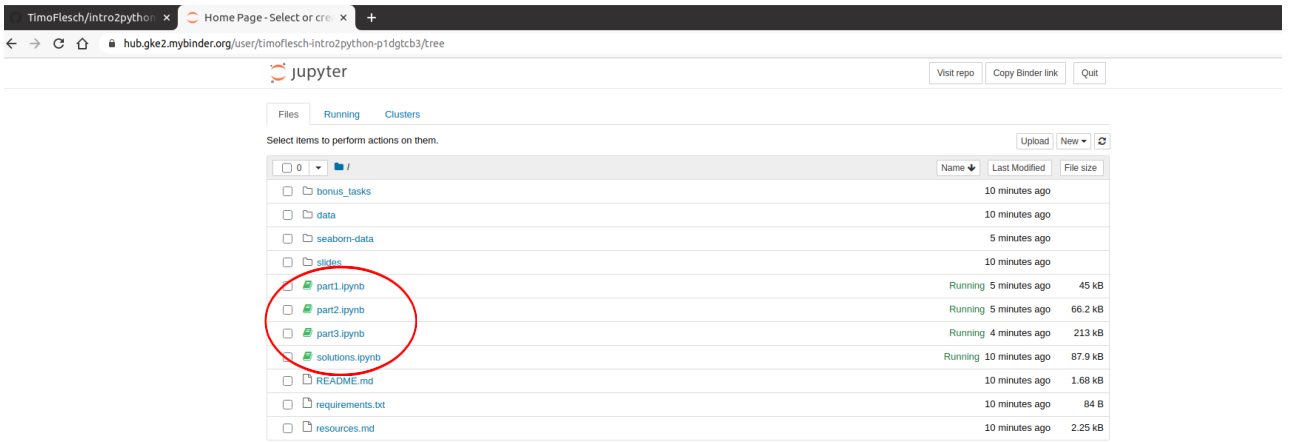
Python Practical

3. Stare for a while at this screen



Python Practical

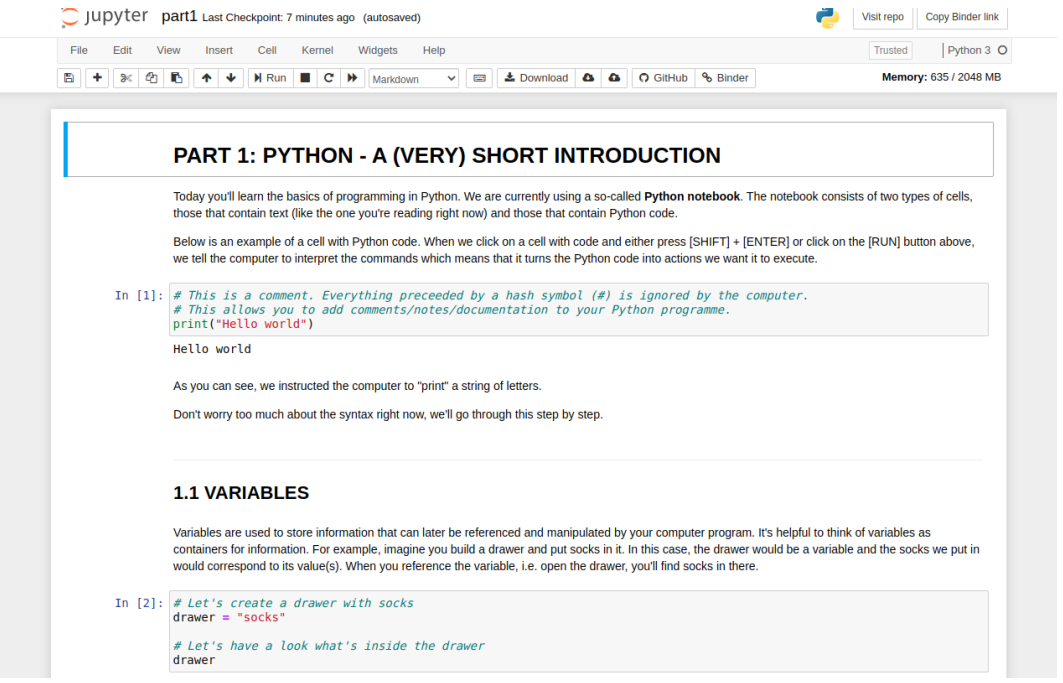
4. Now this screen should show up



From here you can open the worksheets that we have provided for you. This will run an interactive Python session in your browser, where you can write and execute your own Python programs.

Python Practical

5. You’re now running an interactive worksheet with Python code in your web-browser. **Have fun** ☺



Outlook

Learn to code!

1. A complete course https://www.learnpython.org

2. ditto https://www.w3schools.com/python/

3. Advanced Course https://automatetheboringstuff.com

How to install Python

1. Just Python https://www.codecademy.com/articles/install-python

2. Jupyter Notebook (that you have used today) https://jupyter.org/install

3. Anaconda (a collection of useful packages and other software for data scientists) https://www.anaconda.com/distribution/

Outlook

Text editors

1. atom editor https://atom.io/

2. vscode https://code.visualstudio.com/

3. Sublime https://www.sublimetext.com/

All in One Solutions (Similar to the Matlab interface or R-Studio)

1. Spyder (free) https://www.spyder-ide.org/

2. Pycharm (free basic and commercial pro version) https://www.jetbrains.com/pycharm/

Outlook

Coding Challenges

1. Hackerrank https://www.hackerrank.com/

2. Leetcode https://leetcode.com

Python for Psychologists

https://www.marsja.se/best-python-libraries-psychology/