Introduction

Who am I?

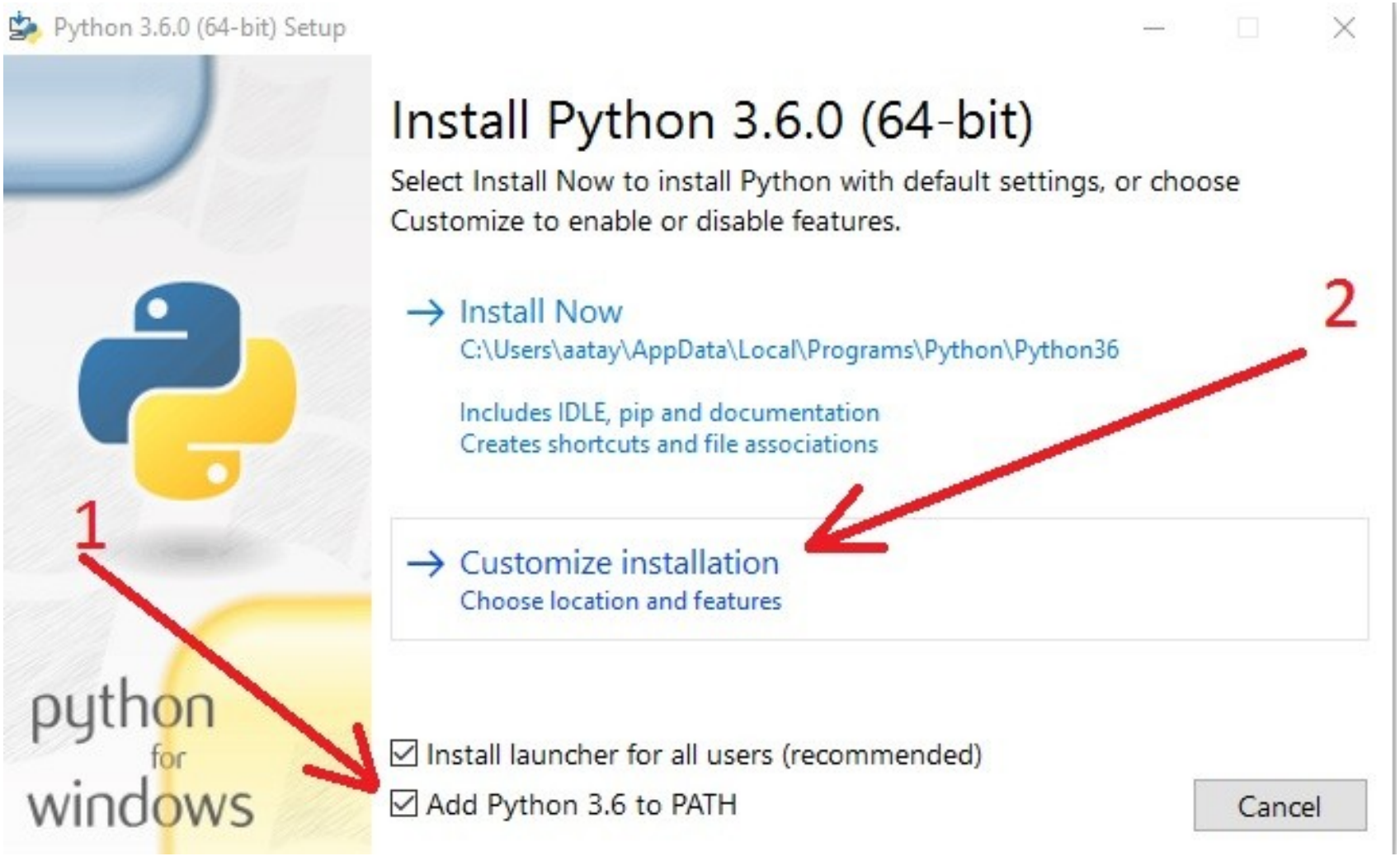
- Senior Research Fellow at MPI for Innovation and Competition
- Economics PhD from University of Cape Town
- Writing code since 8th grade
- Taught "Python for Financial Econometrics" in Cape Town, "Computational Mathematics" (Matlab, SQL, VBA) in Cape Town, "Data acquisition for Python" at GeorgiaTech and "Introduction to Machine Learning" at GeorgiaTech
- Michael.Ernst.Rose@gmail.com

Who are you?

- Name, Affiliation, Status
- Which languages, how long?
- Which operating system?
- Is the computer your slave, or are you your computer's slave?

Time to download and install Python

https://www.python.org/downloads/



Course content

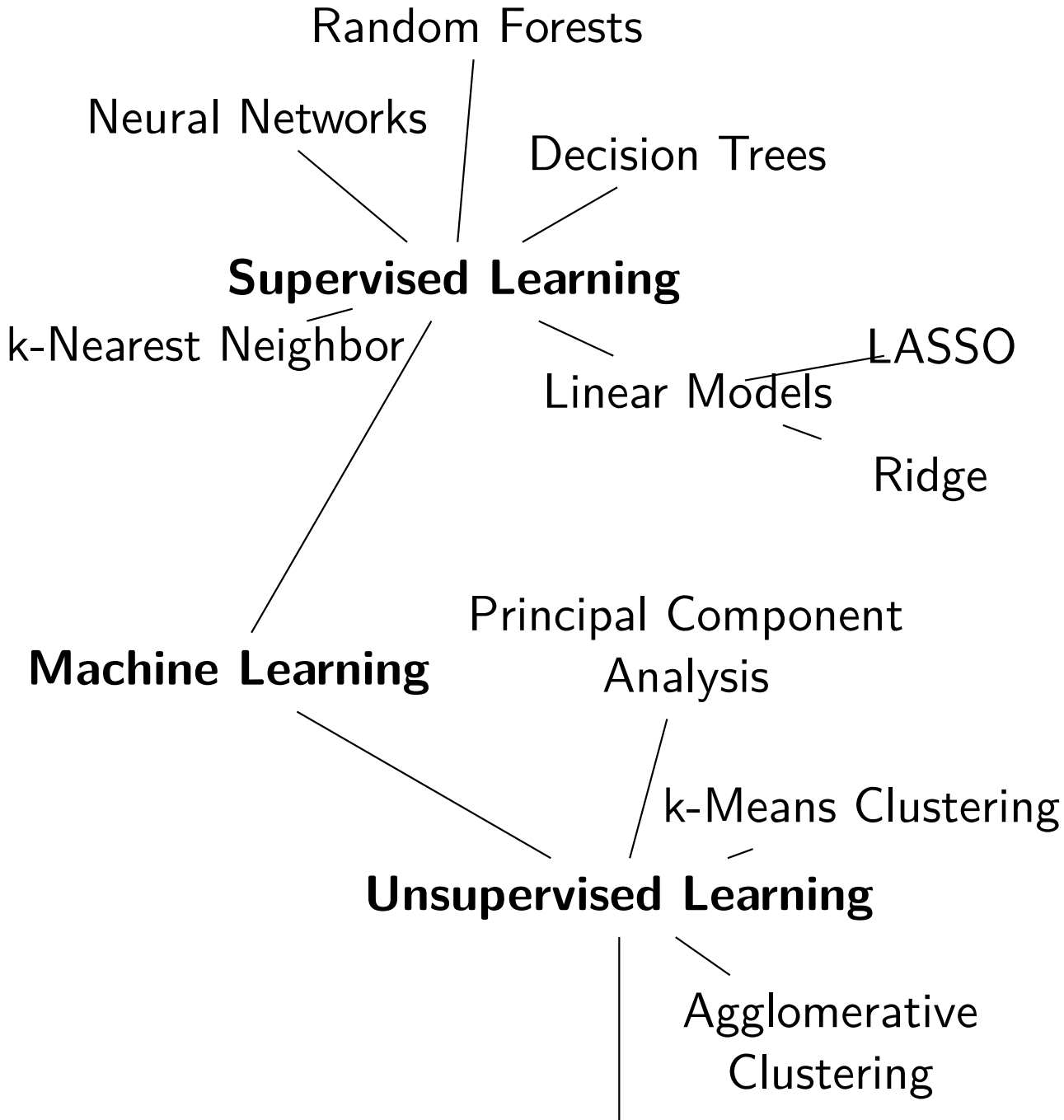
Timetable

Course content

Timetable

1. Using python, plotting and exploring data
2. Getting data
3. Managing a collaborative project
4. Supervised Machine Learning
5. Unsupervised Machine Learning
6. Natural Language Processing

Course Content, cont.



Course Design

- Lecture in the morning, group exercises in the afternoon
- Each exercise session starts with a Monty Python sketch
- 10 Minutes breaks after 50 Minutes of Teaching

Aim of the course

- Take away eventual fear of diving into Python
- Save you time finding the right tools
- Accustom you with Coding Principles
- Inform you about machine learning techniques and how to use them

Why Python?

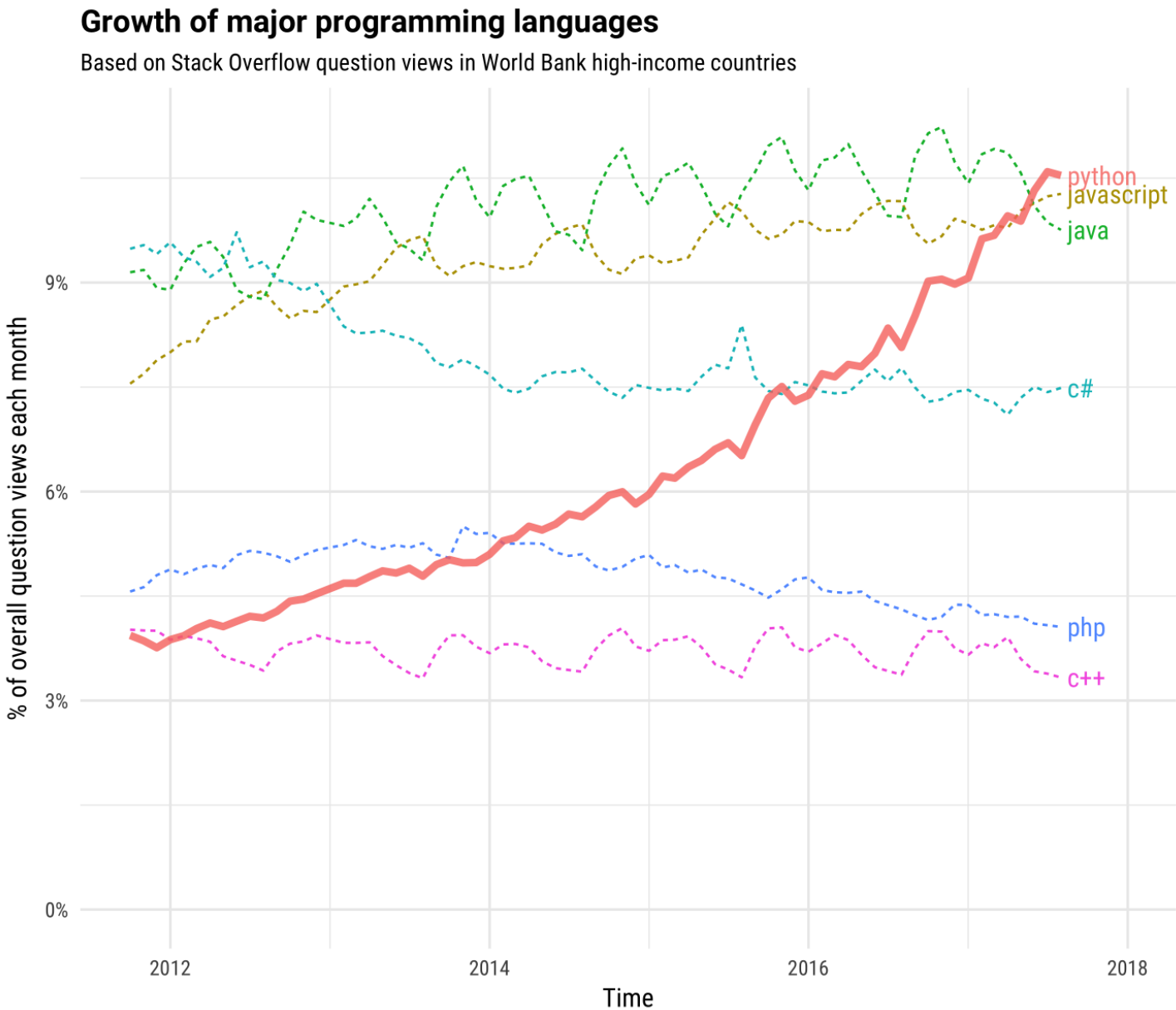
- Interpreted, high-level, general-purpose programming language
- Can be object-oriented, imperative, functional and procedural
- Free (= no licenses)
- Large (= support and many packages)
- Centralized development
- Very good first language

Why Python?

- Interpreted, high-level, general-purpose programming language
- Can be object-oriented, imperative, functional and procedural
- Free (= no licenses)
- Large (= support and many packages)
- Centralized development
- Very good first language

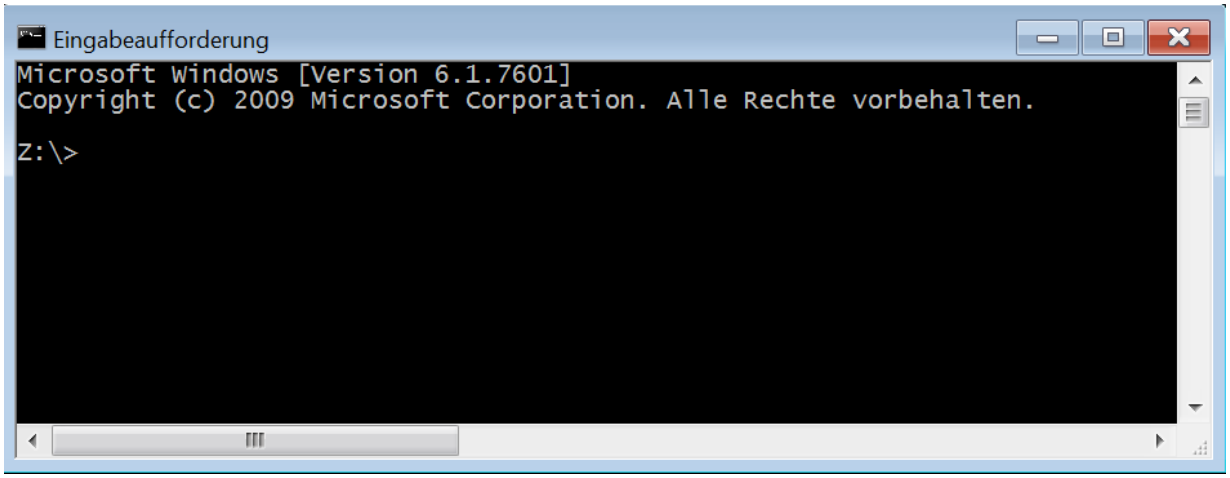
There should be one– and preferably only one –obvious way to do it.
Although that way may not be obvious at first unless you're Dutch. (Tim Peters - The Zen of Python)

Python is popular and increasing in popularity

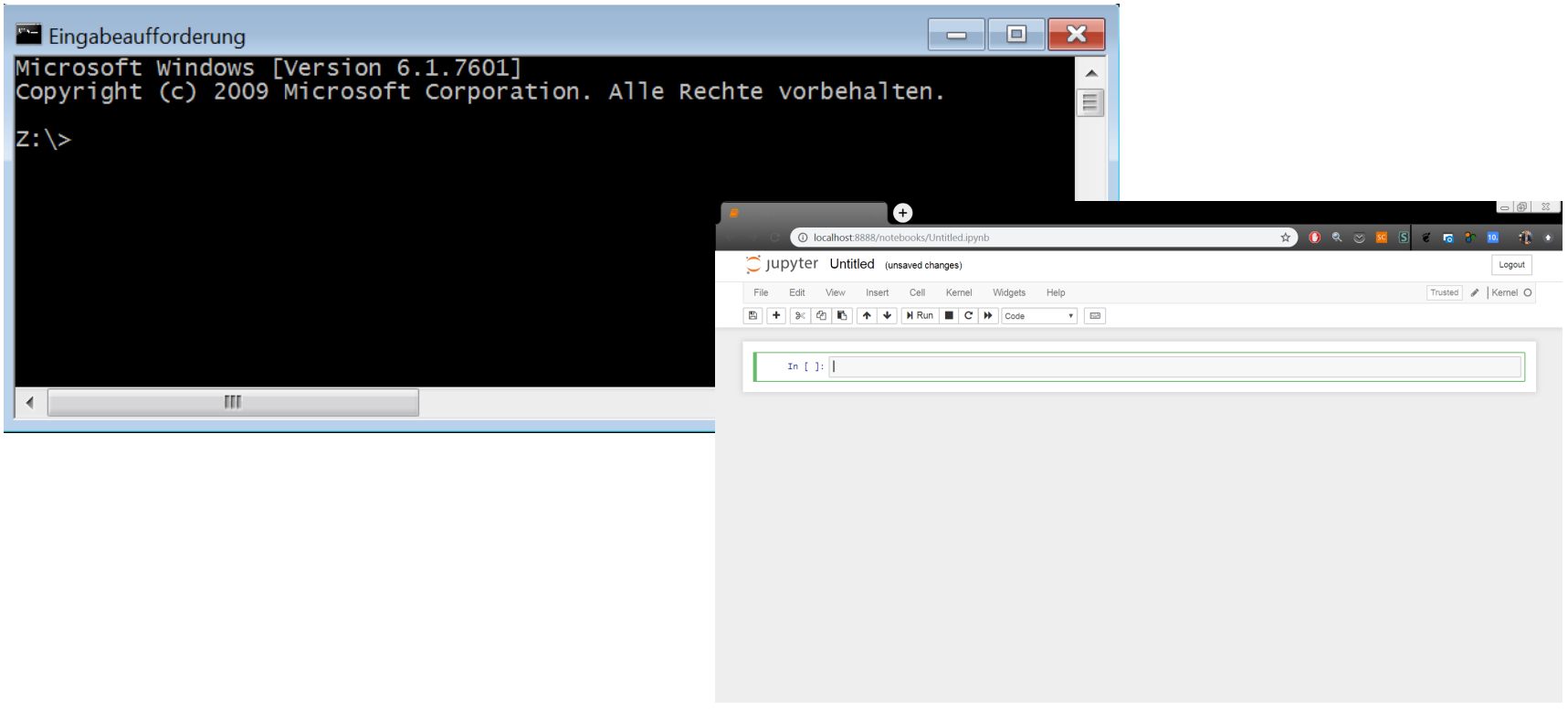


Dave Robinson, "The Incredible Growth of Python", Sep 6th 2017

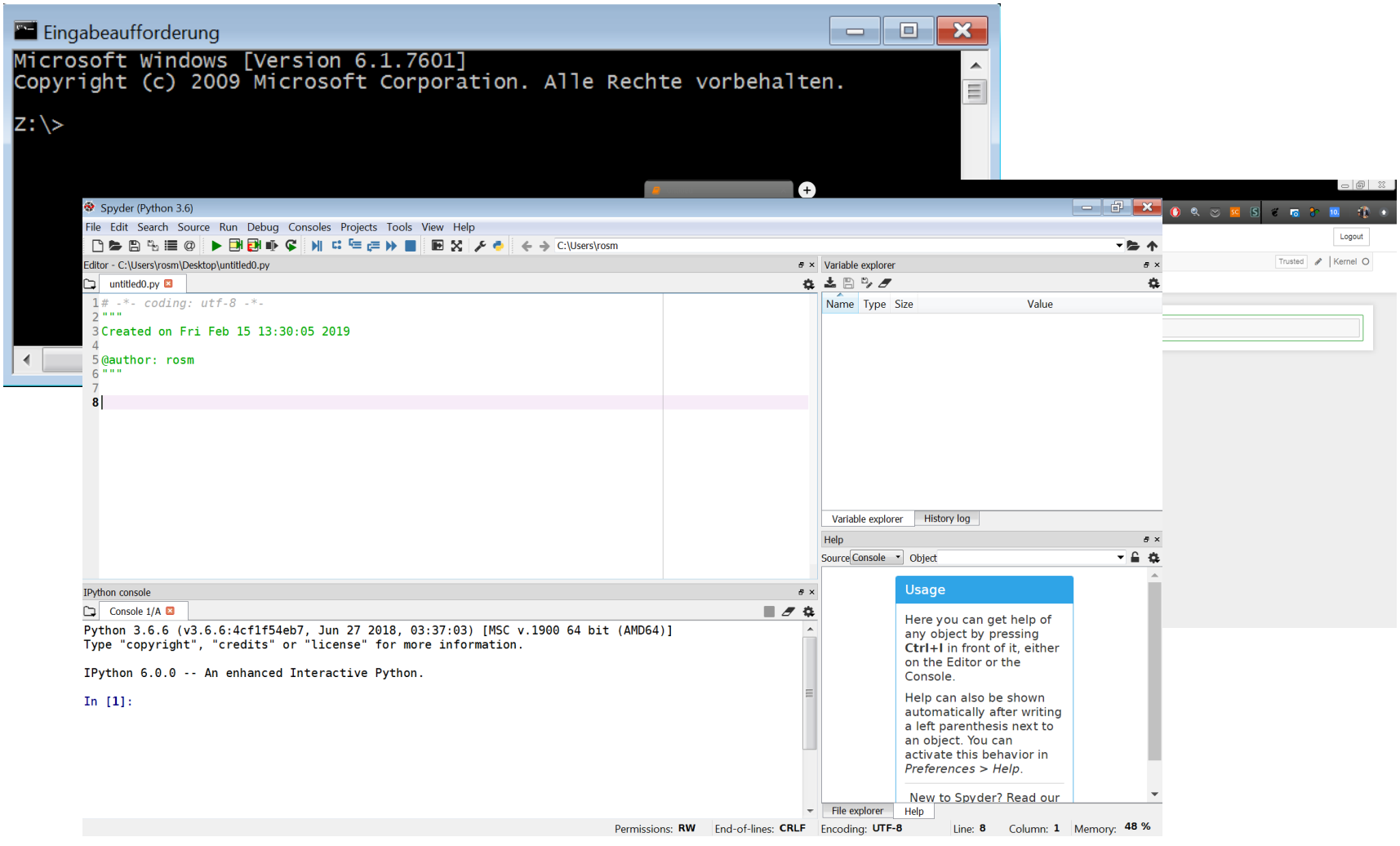
How to use Python?



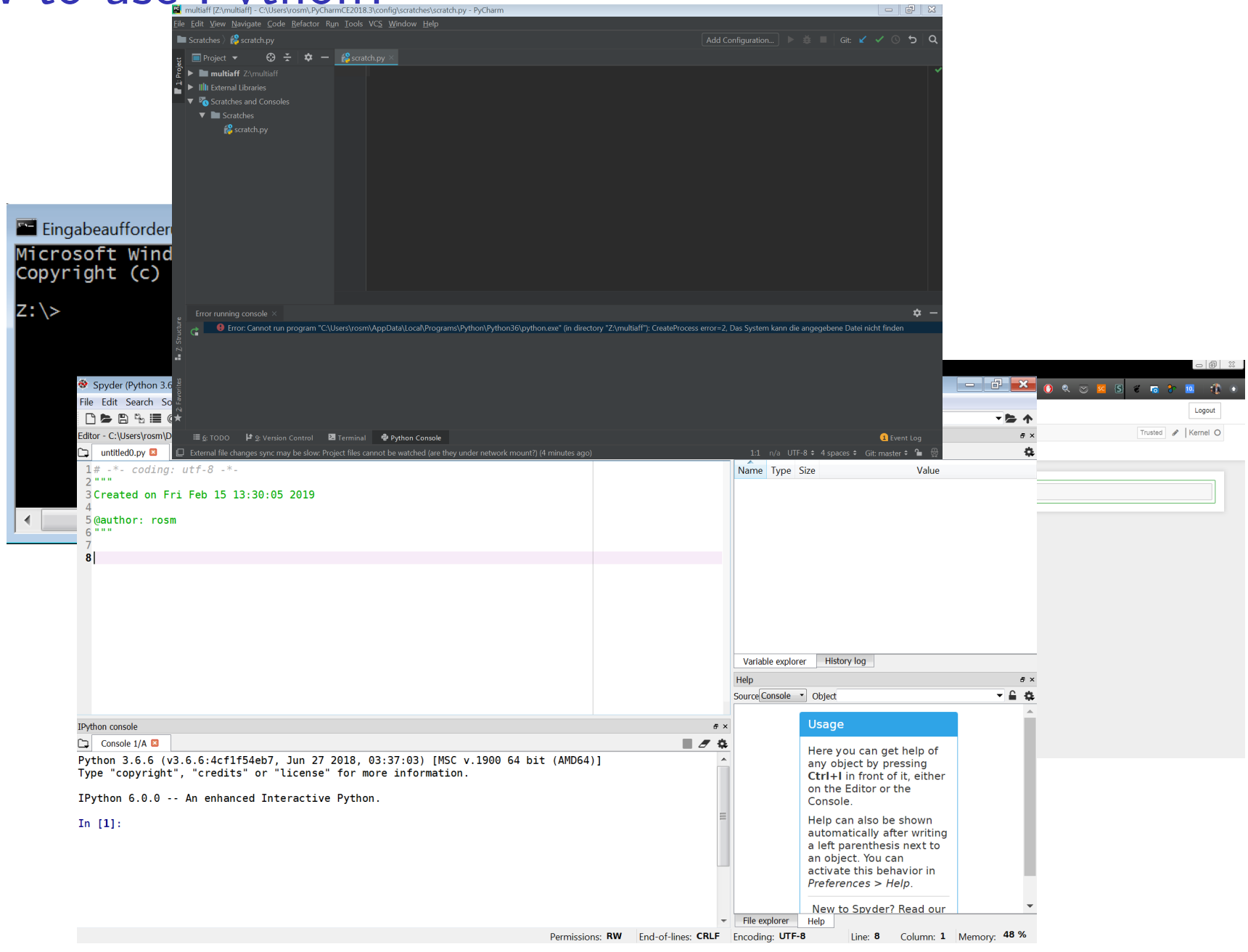
How to use Python?



How to use Python?



How to use Python?



Terminal/Console

- Console uses DOS language (Windows) or `shell` and `bash`
- Starts python environment, Jupyter, spyder ...[1]
- Install packages here using `pip`[2]
- Execute scripts: `./<scriptname>` (unless you're on Windows)
- Get a proper text editor (Sublime 2, Notepad ++, NOT WordPad)

[1] Windows users: make sure Python is the environment paths
[2] Windows users: make sure pip is the environment paths

Terminal/Console

- Console uses DOS language (Windows) or `shell` and `bash`
- Starts python environment, Jupyter, spyder ...[1]
- Install packages here using `pip`[2]
- Execute scripts: `./<scriptname>` (unless you're on Windows)
- Get a proper text editor (Sublime 2, Notepad ++, NOT WordPad)

```
pip install pandas
pip install matplotlib
pip install numpy
pip install pandas --upgrade
```

[1] Windows users: make sure Python is the environment paths
[2] Windows users: make sure pip is the environment paths

Jupyter Notebook

- Create a folder for this course and navigate there in your terminal

Jupyter Notebook

- Create a folder for this course and navigate there in your terminal
- Type

```
pip install --upgrade pip
pip install jupyter
jupyter notebook
```

- Your browser will fire up, with cells for either text or code

Jupyter Notebook, cont.

Type in cell

```
%matplotlib inline
import numpy as np
import matplotlib.pyplot as plt
x = np.linspace(-10, 10, 100)
y = np.sin(x)
plt.plot(x, y, marker="x")
```

Recap Python basics

Recap Python basics

What matters in Python?

- Indentation is key (convention: four spaces)
- Case-sensitive
- Variables must not start with numbers
- It's a language, *not* a program