Python for Econometrics and Operations Research

A crash course

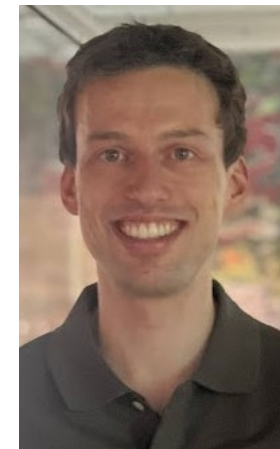# Team

Dr.ir. Sander Gribling

Dr.ir. Pieter Kleer

Prof.dr. Johan van Leeuwaarden

Dr.mr. Sven Polak

About Python

Popular programming language for **data science tasks**

- Plotting, finding roots/minima/maxima, and integration of mathematical high-dimensional functions.

- Mathematical analysis of large-scale data sets.

Developed by **Guido van Rossum** starting at CWI in Amsterdam.

Name comes from **Monty Python**'s Flying Circus

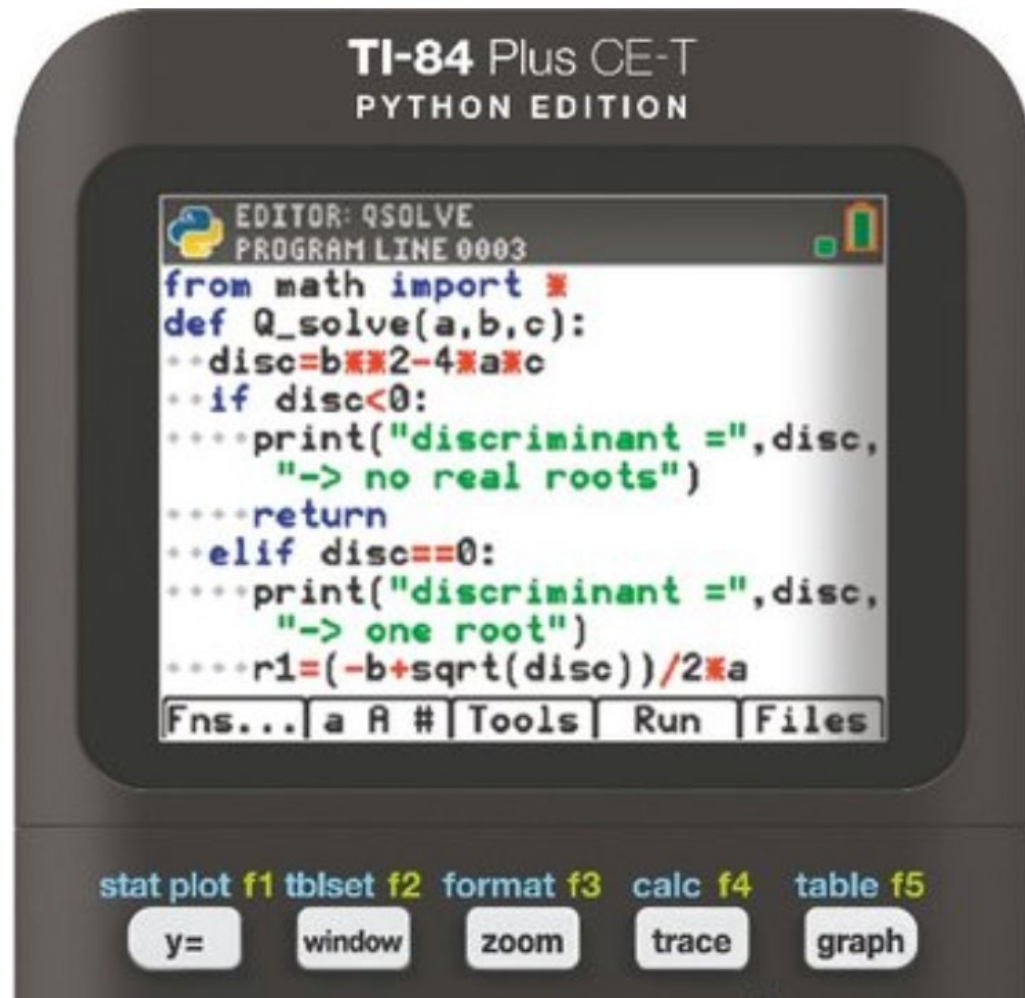- British surreal sketch comedy series

Why Python?

Free, open-source and most popular programming language for data science!

Many companies program in Python ...

- ... including master thesis students who do company internships.

Good skill to have on your CV!

Graphing calculator vs. Python

Graphing calculator (high school)
For a function like $f(x) = x^2 + 2x - 1$:
- Plot
- Integrate
- Compute roots
- Compute minimum/maximum

Python
Higher-dimensional problems, e.g., the above tasks for the two-dimensional function

$$f(x, y) = x^2y + 2xy^2 - x - 1$$

Python in EOR curriculum

- Python is used in many EOR courses!

Other programming languages in curriculum

- You will also see programming languages such as Matlab and R.

- Can perform similar tasks as Python (although "syntax" is different).
- AI-tools like ChatGPT can also program! Not always allowed, though.