High Performance Computing Workshops for the Central Bank of Chile

Course 1: Introduction to Scientific Computing with Python and Julia

Provider: QuantEcon

August 2, 2022

Course 1 will provide

1. In-person teaching, including lectures and tutorials.
2. Non-graded tutorial and homework exercises.
3. Accompanying Jupyter notebooks containing both code and theory.
4. Access to a cloud computing option for all workshop participants.

Instructors:

1. John Stachurski (Australian National University, Co-founder of QuantEcon)
2. Pablo Winant (CREST and ESCP Business School, lead developer of `dolo`)

Dates:

- September 20th-23rd 2022.

Daily format:

- 08:30 - 10:30: Lecture
- 10:30 - 11:00: Coffee Break
- 11:00 - 13:00: Practice Sessions

- 13:00 - 14:30: Lunch (at Central Bank offices)
- 14:30 - 16:00: Office hours

Price: 5000 USD.

Topics:

1. Python for scientific computing
2. NumPy array operations on the CPU
3. Introduction to the Numba just-in-time (JIT) compiler
4. Application: Markov chains, time series models and distribution dynamics
5. Application: Search and optimal stopping
6. Application: Asset pricing
7. Application: Dynamic programming
8. Application: Default cascades in financial networks
9. Parallelization on the CPU
10. Parallelization on the GPU via CUDA
11. Automatic differentiation and GPU computing with JAX
12. Introduction to deep learning methods in Python