High Performance Computing Workshops for the Central Bank of Chile

Course 1: Introduction to High Performance Computing with Python and Julia

Provider: QuantEcon

March 8, 2022

Course 1 will provide

1. 16 hours of 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`)

Price: 5000 dollars.

Dates:

- Early May 2022, with exact dates to be determined.

Topics:

- Introduction to Python for scientific computing
- Remote and cloud computing with Python

- NumPy array operations on the CPU
- Numerical optimization tools
- Introduction to the Numba just-in-time (JIT) compiler
- Writing optimized code for Numba
- Application: Markov chains and time series models
- Application: Distribution dynamics
- Application: Search and optimal stopping
- Application: Sovereign default models
- Application: Default cascades in financial networks
- Parallelization on the CPU
- Parallelization on the GPU via CUDA
- Automatic differentiation and GPU computing with JAX
- Introduction to the Julia language
- Types, multiple dispatch and the Julia JIT compiler