Julia for High-performance computing

We introduce a series of notes on Scientific Programming with Julia Language as part of CINECA course. We aim to provides a cohesive course on Scientific Programming with Julia Language for beginners/intermediate levels. We will also cover some advance topics, mainly parallel computing both on CPUs and GPUs. Because data science and Machine learning is a popular topcis nowadays. We also focus on the basic concept of data science and Machine learning techniques.

Teachers: R. Assante, A. Marani and N. Shukla

Target audience: Beginner + Intermediate

Resources: G100/M100

Day-1 : Introduction to Julia (10:00 am to 5:00 pm)

10:00 – 12:45 to 14:00-17:00

- Why another programming language?
- What is Julia?
- Why choose JuliaLang?
- Getting started with Julia
    - Setting up Julia enviorment
    - Basics of Julia
    - Function and methods
    - Control flow
    - Debugging
    - Files
    - Plots

Day-2 : Parallel computing with Julia (N. Shukla and A. Marani)

10:00 – 12:45

- Introduction to HPC (Guest Lecture by Alessandro Marani)
- Optimization of a julia code

14:00- 17:00

- Multithreaded parallelization
- Distributed computing
- Parallel computing on GPY

Day-3 : Data science with Julia

10:00 – 12:45

- Linear algebra

- Working munging
- Data processing tools
- Regression
- Simple Regression
- Multi regression
- Clustering

14:00- 17:00

Final project