

Java and Mathematical Software

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Motivation

- The mutual interaction between mathematics and software development is becoming more and more present.
- Essential for:
 - Machine Learning;
 - (Provable) Security;
 - Formal Methods;
 - Automated Reasoning;
 - Graphics Programming for Games, Medical Research, Data Science.

Course Objective

Getting you familiar with:

- modelling mathematical tools and concepts in programming;
- extracting abstract information from programs.

Sample Contents

- Programming with logic and sets;
- Graphical visualisation and interpretation;
- Do-It-Yourself mathematical libraries;
- Symbolic evaluation;
- Introductory formal verification;

Recommendations and Requirements

- Strongly Required: solid mathematical background (elementary logic and algorithm design, matrices and vector spaces, basic calculus, graphics interpretation);
- Recommended: good communication, dynamic spirit;
- *Bonus*: familiarity with Python and GitHub;
- *Good to have, not required*: familiarity with Open Source Software and Linux operating system.

Evaluation

- Throughout:
 - homework,
 - lab + seminar work,
 - feedback, discussions;
- Final examination.