

Numerical software 1

Introduction

Vít Dolejší

Charles University Prague, Faculty of Mathematics and Physics

Lecture 1

- lecture, on Friday at 9:00
- tutorial, on Friday at 10:40

Style of the lecture

- **lecture notes** are available at
`msekce.karlin.mff.cuni.cz/~dolejsi/Vyuka/NS2018.html`
together with other sources
- **plan for each week** at
`msekce.karlin.mff.cuni.cz/~dolejsi/Vyuka/NumSoft_25_ZS.html`
- **lectures**: presentations by the teacher, questions are warmly welcome
- **tutorials**: learning and solution of several tasks under the supervision of the teacher

The aim of these courses

- this lecture fill a gap in lectures given at our faculty
- implementation of numerical methods is also a non-trivial task
- we need **efficiency**, **accuracy** and **robustness**
- important aspect is an **adaptation**
- it is advantageous to use software libraries (subroutines written in Fortran, C++, etc.)
- we learn
 - to **understand** the basic principles of numerical software
 - to **use** public software for basic tasks
 - to **employ** public software for your own project
- a practical introduction to more advanced numerical methods
- role of **tutorials**: students will solve several **Exercises** and two **Main tasks**

General aims

- passive learning of **linux** and **fortran** – very frequently used in scientific computations
- solution of simple problems demonstrating the given subject
- **basic level**: using the pre-prepared code by me
- **middle level**: a minor modification of the given code (with my interaction)
- **advanced level**: a major modification of the given code – optional

First step – installation of linux

- either: complete installation
- or: more easier using of **virtual box**, see `msekce.karlin.mff.cuni.cz/~dolejsi/Vyuka/tutorial1_linux.pdf`
- requires a downloading of large files