

# Numerical software 1

## Introduction

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Lecture 1

- lecture, on Tuesday at 9:00
- tutorial, on Tuesday 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_23.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 have to 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 [msekcce.karlin.mff.cuni.cz/~dolejsi/Vyuka/tutorial1\\_linux.pdf](http://msekcce.karlin.mff.cuni.cz/~dolejsi/Vyuka/tutorial1_linux.pdf)
- requires a downloading of large files