Software and Tools for Computational Engineering

RWTH AACHEN UNIVERSITY

Software Lab Computational Engineering Science

Introduction

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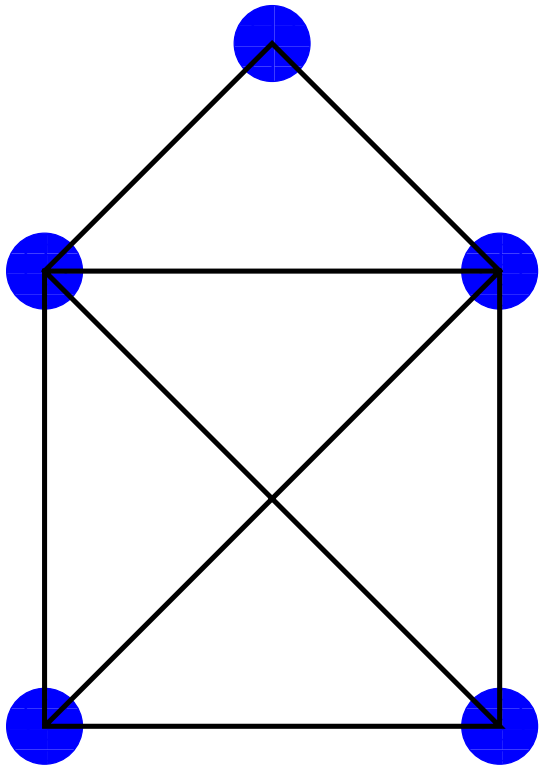
Informatik 12: Software and Tools for Computational Engineering (STCE)
RWTH Aachen University

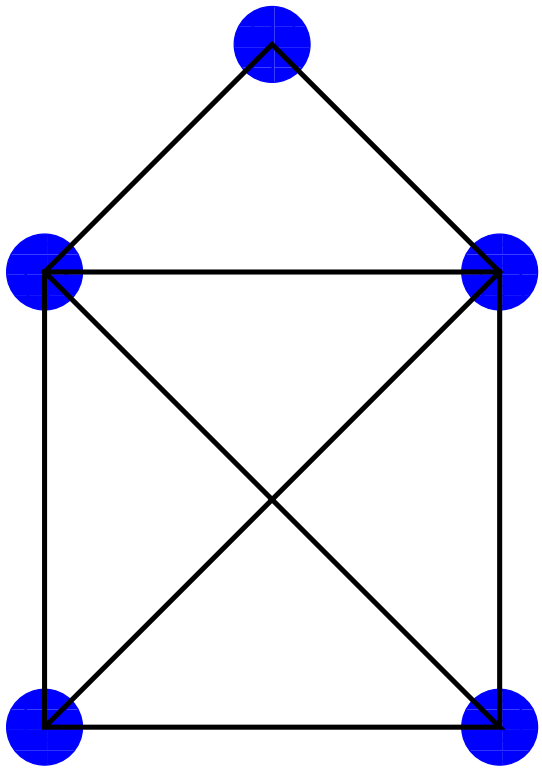
Contents

Motivation

So far ...



- alone
- from scratch
- independent



- teams
- dependencies among subprojects
- building on existing software

requiring

- documentation
- communication
- interfaces

to support efficiency, comprehension and sustainability.

- Computer Science
  - C++ Programming
  - Data Structures and Algorithms
  - Software Engineering
- Mathematics
  - Foundations (Calculus, Linear Algebra)
  - Mathematical Modeling
  - Numerical Analysis
- Engineering
  - Exposure to variety of engineering problems
  - Ability to design solutions

- object-oriented software analysis and design
- implementation with C++
- target architecture is RWTH Compute Cluster[1]
- use of git[2] for version management
- use of doxygen[3] for documentation of the source code
- use of make[4] for build infrastructure

[1] https://doc.itc.rwth-aachen.de/display/CC/Home
[2] https://git.rwth-aachen.de
[3] https://github.com/doxygen/doxygen
[4] https://www.gnu.org/software/make/

- Lectures to set the stage for tutorial (exercises) and lab (projects)
- Tutorials for oral presentation (by you) of
  - solutions to tutorial exercises
  - results of requirements analysis for lab projects
- Lab projects to be completed by start of next winter semester
- Oral presentation (by you) of results of lab projects
- Written report (by you) on results of lab projects

Admin

Schedule

- registration by Apr 23 ($\rightarrow$ RWTHmoodle)
- lectures until May 28
- groups of 3–4 members by Apr 30
- assignment of lab project topics to groups by Apr 30
- assignment of tutorial exercises to groups by May 14
- oral presentation ($\rightarrow$ LaTeX template) of solutions to tutorial exercises on Jun 18 and 25
- oral presentation of results of requirements analysis for lab projects Jul 2, 9 and 16
- oral presentation of final results of lab project work in Oct
- submission of written final report ($\rightarrow$ LaTeX template) on lab project by the end of Nov

www.stce.rwth-aachen.de/teaching/summer-semester-2020/software-lab-computational-engineering-science

- supervision (on your request!) of lab projects at various chairs
- project management is your responsibility, including
  - work within the group
  - interaction with supervisors
- overall supervision by me

Grade covering

- oral presentation of solutions to tutorial exercises (20%)
- oral presentation of results of requirements analysis for lab projects (20%)
- oral presentation of final results of lab project work (20%)
- written final report on lab project work (40%)

Grades based on evaluation of supervisors.

Single grade per group by default.