Software Lab Computational Engineering Science

Introduction

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Informatik 12: Software and Tools for Computational Engineering (STCE)
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Contents

Motivation

Prerequisites

Software

Admin
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Motivation

So far ...

- alone
- from scratch
- independent
Motivation

Now …

- teams
- dependencies among subprojects
- building on existing software

requiring

- documentation
- communication
- interfaces

to support efficiency, comprehension and sustainability.
Prerequisites

We link ...

- **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
Non-Functional Requirements

- 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/
Admin
Concept

- **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 (→ 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 (→ 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 (→ LaTeX template) on lab project by the end of Nov

www.stce.rwth-aachen.de/teaching/summer-semester-2020/software-lab-computational-engineering-science
Admin
Supervision and Project Management

▶ 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.