C++ Programming II

Fundamentals of Object Oriented C ++ Programming

C++ Programming II
September 17, 2018

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Bern University of Applied Sciences

Welcome

Welcome to C++ Programming II

Time & Location:

- Monday 15:45h-17:30h Weekly
- Break: 16:30h
- 14 x 2 Lectures
- ISTB, Lecture Hall 1, Basement, Stauffacherstrasse 78

Lecture Style:

- $<$ 50% Theory
- $>$ 50% Coding

Homepage:

`http://www.bme.master.unibe.ch/studies/curriculum/list_of_courses/c_programming_ii/`

Course Material:

`https://ilias.unibe.ch/goto_ilias3_unibe_crs_1233454.html`

Exercises and Credits

Credits

- **~7 Exercises**, when handed in on time: **10**%
- **1 written exams**, midterm exam **50**%
- **Code Project & Presentation:** 4 Weeks project & 15“ presentation: **40**%
- Dates for exam: (Vote here):
  1. 05.11.2018
  2. 12.11.2018 (preferred date)
  3. 19.11.2018
- Dates for presentation:
  1. 10.17.2018
  2. 17.12.2018

Procedure

- Exercises are strongly recommended
- Submission of at least **5 exercises** is required for exam admission
- Time for exercise is **2 week**, *i.e.* you can ask questions after one week!
- Exercises are discussed in the lecture
- Place questions on the forum:
  `https://ilias.unibe.ch/goto_ilias3_unibe_frm_1366286.html`

Content

FS2018 - Content Overview

Theory: ~8 Weeks

1. Getting Started, Compiler, IDE, CMake
2. STL Containers, Algorithms & Iterators
   - Lambda Functions
   - Knowing STL
   - Write faster, better and more readable code
3. STL Concurrent Programming
   - `thread & asynch`
   - `future & promise`
   - `mutex, lock & lock_guard`
   - `condition_variable`
4. Design Patterns
   - Observer Patterns
   - Factory Design

Hands-on:~6 Weeks

1. Intro to GUI Programming
   - Qt-Framework
2. Building and using third-party libraries
   - VTK, ITK, openCV with CMake

Code Project

Creative Project Ideas and Proposals are very welcome!

Although you can freely choose your project, the following criteria are **mandatory**:

- Use CMake to control the software compilation process
- Use at least one third-party library, *i.e.* Qt, openCV, fftw, etc...
- Provide a GUI
- Use multiple threads
- Use as much STL as possible

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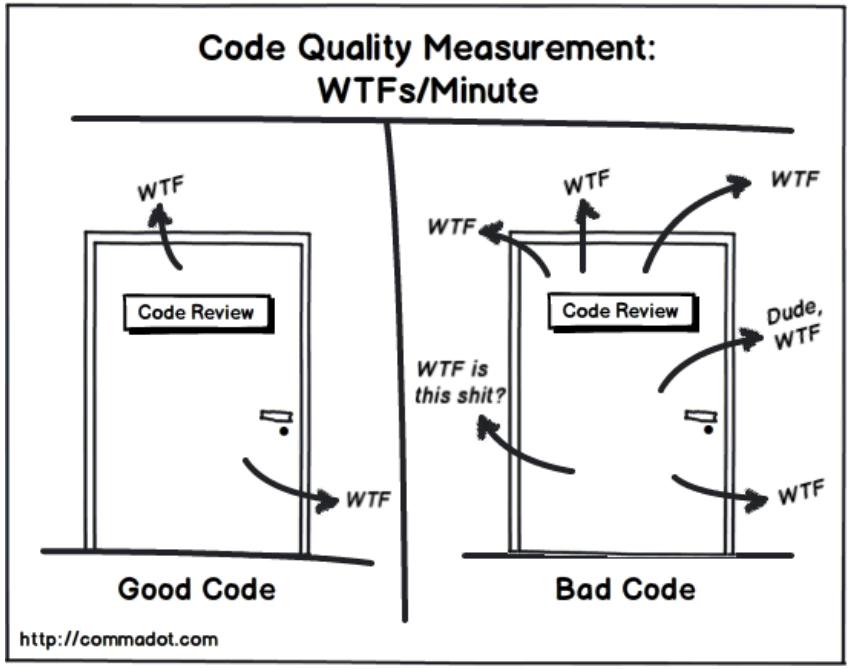
Code Review in Teams of 2

- Learn to review code
- and to write readable code!
- You will review the code twice during the project (details follow)



Literature

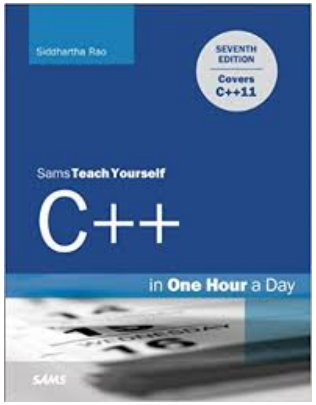
Text Books

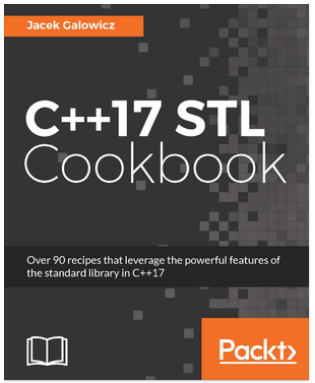
The course closely follows the following Literature:

- **Sams Teach Yourself, C++ in One Hour a Day** (8th Edition, 2017), Siddhartha Rao, ISBN-13: 978-0789757746

Comprehensive Reference book:

- **The C++ Programming Language** (4th Edition, 2015), Bjarne Stroustrup, ISBN/ISSN: 2244009029992
- **C++17 STL Cookbook** (First Edition, 2017), Jacek Galowicz, ISBN-13: 978-1-78712-049-5





Have Fun !!!

Thank You