C++

Presentation

Course information

- Lectures:
  - Monday – 4th period – M5
  - Lecturer:
    - Name: Pierre-Alain Fayolle (fayolle@u-aizu.ac.jp)
    - Office: Computer Graphics Laboratory, 323-C
- Exercises:
  - Mon – 5th period
- 14 lectures / 14 labs
- 1 final exam / (1 mid-term exam ?)
- Web-site: http://www.u-aizu.ac.jp/~fayolle/teaching/2010/C++/index.html

Course information

- Grading:
  - Presence to lectures and labs, (random) quizzes: 5%
  - Labs: 35% - 45%
  - Exams: 60% - 50%
- Keywords: C++, Object Oriented Programming (OOP), Generic Programming

Course policy

- Academic honesty:
  - Students are expected to act maturely. Students are responsible for their actions.
  - Cheating on exams is strictly forbidden.
  - During exercises and homework, students can help each other through hints and explanations. Copying code from somebody else is strictly forbidden.
- Absence to an exam (any of them) is equivalent to no grade.

Course Plan

- Lecture 1 – Introduction, Separate compilation
- Lecture 2 – Data abstraction and classes, static members
- Lecture 3 – Pointers, References
- Lecture 4 – Const correctness, Definition and declaration
- Lecture 5 – Overloading, Constructors and assignment operator
- Lecture 6 – Destructors, order of construction / destruction; Inheritance: introduction
- Lecture 7 – Inheritance access control, substitution principle
- Lecture 8 – Inheritance: virtual functions, overriding vs overloading, Abstract Base Classes
- Lecture 9 – Inheritance: public, private and protected inheritance Exceptions
- Lecture 10 – Operator overloading Introduction to generic programming
- Lecture 11 – Function and class templates, Container classes
- Lecture 12 – STL: Sequences and iterators, Introduction to algorithms
- Lecture 13 – STL: Function pointers, Function objects (functors)
- Lecture 14 – STL: Algorithms continued, more containers: set, map, hash_map

References: books

- *The C++ programming language*, B. Stroustrup
- *The C++ Standard Template Library*, P. J. Plauger, A. A. Stepanov, M. Lee, D. Musser
- For the curious students:
  - *Design Patterns*, E. Gamma, R. Helm, R. Johnson, and J. Vlissides

References: web pages

- C++ reference: http://www.cppreference.com/wiki/start
  - Note 1: it also includes some documentation on the standard library
  - Note 2: there is a Japanese translation of this site
- The STL documentation: http://www.sgi.com/tech/stl/