

Advanced Programming

Advanced problem solving using the C language
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Goals

- ⑩ Advanced C (dynamic memory)
- ⑩ Capability to know and choose among basic data structures and algorithms
- ⑩ Capability to implement in C basic data structures and algorithms



Outline

- Dynamic memory allocation in C
- Modularity in C
- Sorting algorithms
- Complexity Analysis
- Problem Solving paradigms
- Dynamic Sets
 - Lists, Binary Trees, Hash Tables
- Graph Theory
 - Traversals, Shortest Paths

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Requirements: Programming skills

- C Syntax
- Write, compile, debug small programs



Programming Tools

- DevCpp
 - <http://sourceforge.net/projects/dev-cpp/>
- Eclipse CDT
 - <http://www.eclipse.org/cdt/>
- Other tools for Linux
 - Kate/Emacs with gcc and gdb ; Kdevelop
- Other tools for Windows
 - Microsoft Developer Studio



C Standards

- K&R (1978)
- C89 (ANSI X3, 159-1989)
- C90 (ISO/IEC 9899:1990)
- **C99 (ANSI/ISO/IEC 9899: 1999, INCITS/ISO/IEC 9899: 1999)**



Text books

- Our Slides
- C Reference language
- Introduction to Algorithms (2nd Edition)
 - Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein
 - McGraw-Hill Book company



Course Web site

- **<http://softeng.polito.it/tongji/AP/>**
- News about the Course
- Material
 - slides
 - exercises
 - tool, software



Exam

- Writing a C Program
- .. in 2 hours of time
- Docs and manuals can be used