

CPSC 427a: Object-Oriented Programming

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C++ Overview

Comparison of C and C++

Example

Insertion sort

C version

C++ Overview

General properties of C++

- ▶ Widely used in the real world
- ▶ Close to the machine
- ▶ Gives programmer fine control over use of resources
- ▶ Supports object-oriented programming paradigm
- ▶ Supports modularity and component isolation
- ▶ Supports reusable code through derivation and templates

C++ Extends C

- ▶ C++ grew out of C.
- ▶ Goals were to improve support for modularity, portability, and code reusability.
- ▶ Most C programs will compile and run under C++.
- ▶ C++ replaces several problematic C constructs with safer versions.
- ▶ Although most old C constructs will still work in C++, they should *not* be used in new code where better alternatives exist.

Example: Use Boolean constants `true` and `false` instead of 1 and 0.

Some Extensions in C++

- ▶ Comments `//` (now in C99)
- ▶ Executable declarations (now in C99)
- ▶ Type `bool`
- ▶ Enumerated types
- ▶ Reference parameters
- ▶ Definable type conversions
- ▶ Operator extensions
- ▶ Generic/overloaded functions
- ▶ Name hiding
- ▶ Classes

Tools

Low-level

- ▶ A text editor such as `emacs` or `vi`.
- ▶ The compiler suite: `g++`.
- ▶ Project management: `make`

Eclipse IDE (integrated development environment)

- ▶ Integrates various low-level tools
- ▶ Open source
- ▶ Works on many platforms
- ▶ Facilitates development cycle

Generic Insertion Sort

Two implementations of simple insertion sort:

1. **C version:** Written in object-oriented style to the extent possible in C.
2. **C++ version:** Similar code but with C++ support

C version

See code demo.