C++ Fundamentals

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1 Development Environments

In this section we look at development environments.

- command line, *make* and *vim*
- g++ and clang
- .o .a .lib files
- gdb, lldb, gdbtui, gdbgui
- Eclipse CDT
- Visual Studio, CLion

2 Namespaces and Hello World

- header files
- operator overloading >> and <<
- return from main
- namespaces

3 Revision

- pointers
- references
- char* and strings
- arrays and vectors

4 Files and I/O

- iostream
- cout, cin, cerror, clog
- fstream

5 Extension to C

- function name overloading
- inline functions
- new and delete

6 Classes

- CTORs
- DTORs
- initialization lists
- const
- inline and separate header and implementation

7 More Classes

- classes using the heap
- statics
- aggregate types

8 Operator Overloading

- binary and unary operators
- using references
- reference returns
- member and free functions
- side effect operators
- overloading >> an <<

9 Shallow and Deep Copying

- gotchars
- Copy CTOR
- reference counting

10 Standard Template Library

- containers: vector, list, map, unordered map
- algorithms
- iterators
- functors and lambdas

11 Inheritance and Polymorphism

- class hierachies
- initialization
- public, protected and private
- protected and private inheritance
- abstract classes and interfaces
- V-Tables
- dynamic and static binding

- multiple inheritance

12   Templates

- function templates
- class templates

13   Exception Handling

- standard exceptions
- user defined exceptions