

## **Table of Contents**

*This is not intended as a map of things that are already written, but a path of things to work on or that I already have. It's a huge task to tackle a book and there's a lot of stuff I want to cover. I even keep coming upon things I forgot to mention in earlier chapters so first I make a change here before going back (just in case I forget). In other words, this is to keep my in line so I don't ramble off into complete gibberish or start writing about things out of there chapter context.*

### Part 1: Introduction to Computers and Programming

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  - c. A Simple Example
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  - e. Storage
  - f. Logic
  - g. Hardware
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  - b. The Decimal Numbering System
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  - e. Distinguishing Numbering Systems
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  - g. The Binary Numbering System (base 2)
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  - a. Computers Use Binary
  - b. N-Bit CPU
  - c. Hexadecimal Saves Us
  - d. Multiple Byte Data Storage

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  - a. Choosing a Language
  - b. History of C++

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  - c. C++ Software
  - d. Command Console
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  - a. Breaking into the Circle
  - b. The 'Hello World' Program
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  - d. My Dear Aunt Sally (operator precedence)
  - e. Outputting Numbers
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  - h. Limits
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  - a. What is a Variable
  - b. Data Types
  - c. Declaring a Variable
  - d. Declaring Multiple Variables
  - e. Identifiers
  - f. C++ Keywords
  - g. Literals
  - h. Constants
  - i. Assignment
  - j. Basic Arithmetic
  - k. Casting
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  - m. Input
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  - o. Land Plot Analogy
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  - b. Scope and Nesting
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- j. Complex Conditions
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  - f. Using Struct Variables
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  - h. Pointers and Structures
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  - j. Unions
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  - c. Prototyping and Definition
  - d. First Example
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  - f. Void
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  - c. Looping Subscripts

- d. Initializing Arrays
- e. Declaring Arrays without Size
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- h. Pointers to Arrays
- i. Pointer Arithmetic
- j. References to Arrays
- k. Constant Arrays
- l. Array Function Parameters
- m. Passing Arrays to Functions
- n. SizeOf Array

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- a. Text is Character Strings
- b. Character Literals
- c. ASCII and Assumptions
- d. Char
- e. Character Functions
- f. String Literals and Constants
- g. Variable Strings
- h. Initializing Strings
- i. Pointers to Strings
- j. Cin and Strings
- k. String Assignment
- l. SizeOf String
- m. Concatenation
- n. Comparing Strings
- o. Converting Strings to Numbers
- p. Changing String Case
- q. Unicode Strings

## 10. Pre-Processing

- a. The “Other” Compiler
- b. #include
- c. Custom Headers
- d. Macros
- e. Destroying Macros
- f. Flow Control
- g. Existence Checking
- h. Parenthesis Unnecessary
- i. Raising Errors
- j. Concise Types

## 11. Classes and Objects

- a. Blobs with Class
- b. Simple Declaration and Usage
- c. Member Functions
- d. Constructors and Destructors
- e. Custom Constructors

- f. Initializing Member Variables
- g. Inheritance
- h. Overloading
- i. Class Namespaces
- j. Static Members
- k. Access Modifiers
- l. Friends
- m. This
- n. Structures are Classes

## 12. Files and I/O

- a. Console I/O (**cout/cin**)
- b. Escape Characters
- c. File I/O (**ofstream/ifstream**)
- d. Binary Files
- e. Reading in a Structure

## Part 3: Advanced C++ and Programming

1. Memory
  - a. Stack Memory / Call Stack
  - b. Heap Memory
  - c. Allocating and Freeing Memory
2. Name Spaces
  - a. Global
  - b. std
3. Advanced Flow Control
  - a. Switch
  - b. Else If
  - c. Comma Operator
  - d. Ternary Operator
4. Bit Manipulation
  - a. Bit Variables in Objects
  - b. Bitwise Operators
  - c. Shifting
  - d. Making Flags
  - e. Using Enum/Define for Flag Constants
5. Modularization
  - a. Header Files
  - b. Multiple Source Files
  - c. Static Code Libraries
  - d. Dynamic Code Libraries (DLL, SO)
  - e. **extern** Keyword
6. Recursion
  - a. Show Folder and all Sub-Folders
  - b. Towers of Hanoi
7. Advanced Functions
  - a. Variable Arguments
  - b. Pointers to Functions

- c. Callbacks
- d. Functions inside Functions
- e. Templates
- f. Function Overloading
- g. Operator Overloading

#### Part 4: Object Orientation with Classes

- 1. Introduction to Classes
  - a. Versus struct
- 2. Member Functions
  - a. Pointers to
- 3. Protected, Private, and Public
- 4. Member Scope
- 5. Operator Overloading
  - a. making my string class act like a char\*

#### Part 5: Performance and Tuning

- 1. Data Alignment
- 2. Cached and Volatile Variables
  - a. What is Caching?
  - b. Cached Variables: **register**
  - c. Non-Cached Variables: **volatile**
- 3. Outline and Inline Functions
- 4. Name Spaces
- 5. Unicode
- 6. Etiquette
  - a. Conventions

#### Part 6: Debugging

- 1. Tracing
- 2. Assertions
- 3. Using a Debugger

#### Part 7: Standard C++ and the STL

- 1. Correct C++
  - a. Default Name Space
  - b. A Politically Correct ‘Hello World’
- 2. Intro to STL
- 3. Vectors and Iterators
- 4. Strings

#### Part 8: Multi-Threading

- 1. Synchronization Nightmare