

Contents

Preface.	ix
Acknowledgments.	xvii
Part I: C++ Reference	2
C++ in Plain English	4
C++ Elements A to Z	30
Operators	42
Keywords	66
Preprocessor Elements	138
Library Functions	156
I/O Stream Classes	256
Part II: C++ Tutorial	296
Chapter 1: What C++ Will Do for You	298
The Origins of C++	300
Making the Transition from C to C++	301
Classes: Organization by Objects	302
Encapsulation: Cure for a Programming Headache	304
Polymorphism: Decentralized Control	306
C++ and Strengthened Types	307
Function overloading	308
Operator overloading	308
C++ : Future Directions	309
Chapter 2: Basic Features of C++ Programs	312
Your First C++ Program	314
Adding Data Declarations	315
More About #include	317
What Can I Do with a Statement?	319
Assigning values	319
Printing output	320
Getting input	321

Some C++ Quirks	322
Watch out for that semi!	322
Assignments are expressions, too	324
Adding Functions to Your Program	325
General syntax for functions	326
Function example	326
Functions in the void	328
Local, Global, and Other Variables	328
Local variables	328
Global variables	329
Static variables	330
External variables	331
Fun with Control Structures	332
The if statement	332
The while statement	334
Impress Your Friends with Fancy C++ Operators	334
Increment and decrement operators	335
Assignment operators	336
Bitwise, logical, and shift operators	337
Bit Fields: Extreme Compaction	339
Chapter 3: Pointers, Strings, and Things	342
A More Efficient Way to Pass Data	344
Pointers and Passing by Reference	345
Steps for passing by reference	346
Two complete pass-by-reference examples	347
Pointers and Arrays	348
Array basics	349
Loop processing with pointers	352
C++ Strings	354
String literals	358
Wide-character strings	360
Using new and delete Operators	361
Chapter 4: Input, Output, and C++	364
Going with the Flow: Introduction to Streams	365
Stream Operators (<< and >>); A First Look	367
The Joy of Formatting	370
Line-Based Input with stdio.h	371
File Operations with stdio.h	373
Files and Stream Operators	376
To Stream or Not to Stream	377

Chapter 5: A Touch of Class	380
Developing Class: A Better String Type	381
Member Functions: A Class Act	383
Organizing the code into files	385
The deadly semi., Watch out for that syntax!	386
What's an object, anyway?	387
Calling a member function	388
Member functions: A walk-through	392
Pointers to Objects	393
Reaping the Benefits of Private Data	394
The Dynamic-Memory Implementation: A Walk-Through	397
Life and Death of an Object: Constructors	399
Function Inlining for Fun and Profit	401
Structures as a Special Case of Classes	403
Classes in Perspective	403
Encapsulation	403
Classes, objects, and instantiation	404
Classes: Reusing and publishing	404
Chapter 6: Another Look at Constructors	406
Overloading: Constructors and More Constructors	407
A Tale of Two Constructors	409
Interlude with the Default Constructor	409
The Copy Constructor and References	411
References: The address operator [&] used in a new way	413
Writing the copy constructor	414
The finishing touch: The const keyword	415
Other Constructor Examples	416
How C++ Calls Constructors (Conversion)	418
Summary: The Key Points of Construction	419
Overloaded constructors	419
The default constructor	419
The copy constructor	420
Initialization and conversion	420
Chapter 7: Class Operations (Operator Overloading)	422
The Basic Syntax	424
Writing the Addition [+] Operator Function	425
The mechanics of calling an operator function	426
And the rest. . . (other addition functions)	427
Who needs friends?	428

Writing the Assignment Function	430
The assignment function definition	431
The “this” pointer and its uses	432
Assignments and reference types (&)	433
Writing a Conversion Function	434
The CStr Class in Summary	436
Another Class Operator Example	438
Forging Ahead with Operator Overloading	440
Naming an operator function	440
Binary operators	440
Unary operators	441
The assignment operator	442
Assignment from other types	442
Other assignment operators (+=, -=, ++, and so on)	442
Increment and decrement operators	443
The subscript operator ([])	444
The new and delete operators	444
The function call operator (())	445
Summary of Syntax Rules	445
Chapter 8: Inheritance: C++ and Good Genes	446
Return to CStr: A Software Dilemma	447
Son of CStr (Or Is It “Daughter”?)	448
Derived class syntax	449
Writing functions for the new class	450
Overriding functions and clarifying scope	451
Inheritance hierarchies	452
Without Inheritance: Doing It the Hard Way	454
Public, Private, and Protected Access	456
Another Example: Fast Cars and Inheritance Trees	459
Base-Class Constructors	462
Base Classes and Pointers	463
Chapter 9: Virtual Functions and Why They’re Good	468
Applying the virtual Keyword	470
When Should You Make a Function Virtual?	472
Menu Command Example	473
Declaring and defining the base class	473
Declaring and defining the menu objects	474
Using the objects	475
The advantage of virtual menu commands	477
Functions with No Implementation (Pure Virtual Functions)	478
How Virtual Functions Are Implemented	479

Chapter 10: Advanced Use of Stream Classes	484
Interacting with I/O Classes	486
Extending the ostream insertion operator (<<)	486
Extending the istream extraction operator (>>)	487
Improving the display format	489
I/O Manipulators	490
Format Flags	491
Overview of the Stream Classes	493
Input classes	494
Output classes	495
Input/output classes	496
Appendix A: Summary of C/C++ Differences	498
Appendix B: Overview of ANSI C++ Features	502
Appendix C: Standard Exceptions	510
Appendix D: ASCII Character Codes	514
Appendix E: The Iconv Structure	518
Glossary.	522
Index	572