

Table of Contents

Preface	1
About This Book	1
How the Book Is Organized	1
Who This Book Is For	4
C# Versus Visual Basic .NET	4
C# Versus Java	4
C# Versus C++	5
Conventions Used in This Book	5
Support	5
We'd Like to Hear from You	6
Acknowledgments	7
 I: The C# Language	 8
1. C# and the .NET Framework	9
1.1 The .NET Platform	9
1.2 The .NET Framework	10
1.3 Compilation and the MSIL	11
1.4 The C# Language	12
2. Getting Started: "Hello World"	14
2.1 Classes, Objects, and Types	14
2.2 Developing "Hello World"	20
2.3 Using the Visual Studio .NET Debugger	23
3. C# Language Fundamentals	26
3.1 Types	26
3.2 Variables and Constants	30
3.3 Expressions	36
3.4 Whitespace	36
3.5 Statements	37
3.6 Operators	51
3.7 Namespaces	59
3.8 Preprocessor Directives	60
4. Classes and Objects	64
4.1 Defining Classes	64
4.2 Creating Objects	69
4.3 Using Static Members	74
4.4 Destroying Objects	78
4.5 Passing Parameters	81
4.6 Overloading Methods and Constructors	86
4.7 Encapsulating Data with Properties	88
4.8 Readonly Fields	91
5. Inheritance and Polymorphism	93
5.1 Specialization and Generalization	93
5.2 Inheritance	95
5.3 Polymorphism	99
5.4 Abstract Classes	104
5.5 The Root of all Classes: Object	108
5.6 Boxing and Unboxing Types	109
5.7 Nesting Classes	111

6. Operator Overloading	114
6.1 Using the operator Keyword	114
6.2 Supporting Other .NET Languages	115
6.3 Creating Useful Operators	115
6.4 Logical Pairs	115
6.5 The Equals Operator	115
6.6 Conversion Operators	116
7. Structs	123
7.1 Defining Structs	123
7.2 Creating Structs	125
8. Interfaces	130
8.1 Implementing an Interface	130
8.2 Accessing Interface Methods	138
8.3 Overriding Interface Implementations	143
8.4 Explicit Interface Implementation	147
9. Arrays, Indexers, and Collections	156
9.1 Arrays	156
9.2 The foreach Statement	160
9.3 Indexers	173
9.4 Collection Interfaces	181
9.5 Array Lists	186
9.6 Queues	196
9.7 Stacks	198
9.8 Dictionaries	201
10. Strings and Regular Expressions	208
10.1 Strings	208
10.2 Regular Expressions	222
11. Handling Exceptions	233
11.1 Throwing and Catching Exceptions	233
11.2 Exception Objects	242
11.3 Custom Exceptions	245
11.4 Rethrowing Exceptions	247
12. Delegates and Events	251
12.1 Delegates	251
12.2 Events	270
II: Programming with C#	279
13. Building Windows Applications	280
13.1 Creating a Simple Windows Form	281
13.2 Creating a Windows Form Application	292
13.3 XML Documentation Comments	314
13.4 Deploying an Application	316

14. Accessing Data with ADO.NET	326
14.1 Relational Databases and SQL	326
14.2 The ADO.NET Object Model	329
14.3 Getting Started with ADO.NET	331
14.4 Using OLE DB Managed Providers	335
14.5 Working with Data-Bound Controls	337
14.6 Changing Database Records	348
14.7 ADO.NET and XML	363
15. Programming Web Applications with Web Forms	364
15.1 Understanding Web Forms	364
15.2 Creating a Web Form	367
15.3 Adding Controls	370
15.4 Data Binding	372
15.5 Responding to Postback Events	380
15.6 ASP.NET and C#	381
16. Programming Web Services	382
16.1 SOAP, WSDL, and Discovery	382
16.2 Building a Web Service	383
16.3 Creating the Proxy	389
III: Introduction to Web Services	394
17. Assemblies and Versioning	395
17.1 PE Files	395
17.2 Metadata	395
17.3 Security Boundary	395
17.4 Versioning	396
17.5 Manifests	396
17.6 Multi-Module Assemblies	398
17.7 Private Assemblies	406
17.8 Shared Assemblies	406
18. Attributes and Reflection	412
18.1 Attributes	412
18.2 Intrinsic Attributes	412
18.3 Custom Attributes	414
18.4 Reflection	418
18.5 Reflection Emit	428
19. Marshaling and Remoting	451
19.1 Application Domains	452
19.2 Context	461
19.3 Remoting	463
20. Threads and Synchronization	473
20.1 Threads	473
20.2 Synchronization	481
20.3 Race Conditions and Deadlocks	491

21. Streams	493
21.1 Files and Directories	493
21.2 Reading and Writing Data	503
21.3 Asynchronous I/O	509
21.4 Network I/O	514
21.5 Web Streams	531
21.6 Serialization	534
21.7 Isolated Storage	542
22. Programming .NET and COM	545
22.1 Importing ActiveX Controls	545
22.2 Importing COM Components	552
22.3 Exporting .NET Components	560
22.4 P/Invoke	562
22.5 Pointers	565
Glossary	570
Colophon	580