



XML

IN 60 MINUTES A DAY

Linda McKinnon and Al McKinnon

- Master XML with a book and online workshop given by expert trainers
- Reinforce lessons from the book with online lectures and code listings
- Learn basic XML in 16 lessons — each only 1 hour long

A REVOLUTIONARY VIRTUAL CLASSROOM

Contents

Acknowledgments	xvii
About the Authors	xix
Introduction	xxi
Chapter 1 XML Backgrounder	1
Why Do We Need a History Lesson Chapter?	2
Basics: From Documents to Markup and Metalanguages	3
What's a Document?	3
What Is Markup?	4
XML Is a Markup Language and a Metalanguage	6
Markup Languages	6
Metalanguages	7
The Evolution of XML	7
The Advent of Generic Coding	7
GML Led the Way	8
Other Typesetting Developments	10
SGML: Parent of HTML and XML	12
HTML: The Older Sibling of XML	15
The Arrival of XML	17
XML-Related Applications	22
The World Wide Web Consortium and XML	25
Possible XML Issues: "Nobody's Perfect (Yet)"	27
Lab Exercises: Instructions and Conventions	28
A Brief Introduction to Space Gems, Inc.	29
Chapter 1 Labs: Web Exploration	29
Summary	32

Chapter 2	Setting Up Your XML Working Environment	39
	Hardware Requirements	40
	Web Servers	40
	Web Browsers	43
	XML Authoring Tools	45
	Simple Text Editors	45
	Graphical Editors	47
	Use Only the Latest Versions of Microsoft Word for HTML/XML Creation	49
	Integrated Development Environments	52
	Converting HTML Documents to XML	55
	Chapter 2 Labs: Creating an XML Authoring Environment	56
	Computer System Requirements	56
	Operating System Requirements	56
	Creating Your XML Environment: Overview	56
	Summary	62
Chapter 3	Anatomy of an XML Document	67
	What Are XML Documents?	67
	XML Document Processing	68
	Applications	68
	XML Parsers	69
	Document Errors	70
	The Structure of XML Documents	70
	The Logical Structure	71
	The Prolog	71
	The Data Instance	77
	The Physical Structure: Entities	92
	Entities Are Parsed or Unparsed	93
	Entities Can Be Internal or External	93
	General Entities versus Parameter Entities	94
	Preserving Characters from Parser Misinterpretation	97
	Predefined Entities	97
	Numeric Character References	98
	CDATA Sections	100
	What Is a Well-Formed XML Document?	101
	What Is a Valid XML Document?	104
	Chapter 3 Labs: Anatomy of an XML File	105
	Summary	112
Chapter 4	Document Type Definitions	117
	What Are Document Type Definitions?	118
	Why Use Document Type Definitions?	119
	Creating DTDs—General	120
	DTD Types and Locations	121
	Internal DTD Subsets	122
	External DTD Subsets	122

Private External DTDs	123
External DTD Subsets Located at Web Sites	124
Remote External DTDs with Public Access	125
Internal DTDs Combined with External DTDs	126
DTD Declarations: General	127
Element Type Declarations	128
The Content Model	129
Elements Containing Parsed Character Data	129
Element Types Containing Other Element Types	130
Element Types Containing Mixed Content	130
Empty Element Declarations	131
Elements with "Any" Content	132
Element Content Operators	132
Attribute List Declarations	134
Attribute Declarations to Preserve White Space	137
Language ID Attribute Declarations	138
Entity Declarations	139
General Entity Declarations	139
Parameter Entity Declarations	140
Notation Declarations	143
Non-XML Data Introduced with an Attribute	143
Non-XML Data Introduced as an Entity	145
Declaring Namespace Attributes in the DTD	146
Default Namespace Declarations	147
Prefix Namespace Declarations	148
Limitations of DTDs with Respect to Namespace Declarations	149
Normalization	149
Chapter 4 Labs: Creating a DTD	149
Summary	155
Chapter 5 XML Schemas	161
What Are Schemas?	162
XML Schema 1.0: A Two-Part W3C XML Schema Recommendation	163
The XML Schema Abstract Model	164
The Logical Structure of a Sample XML Schema	166
The Prolog	168
The <Schema> Element: Namespaces and Qualified or Unqualified Locals	170
Namespace Declarations	170
Target Namespaces	171
The minedata.xsd Document as a Support Schema	172
Global and Local References: Qualified and Unqualified Locals	173

Element Type Declarations	175
The <sg1:diamonds> Element Declaration:	
Complex Data Types	176
The <sg1:gem> Element Declaration	178
Compositors	181
Empty Element Content	181
The <sg1:catalog> Element: Simple Data Types	182
Mixed Content Elements	183
Using Facets to Define Data More Precisely	184
Schema Document Structures	186
The Nesting Structure	186
The Flat Catalog Structure	188
Using Schemas and DTDs Together	190
Chapter 5 Labs: Creating Simple Schemas	191
Summary	200
Chapter 6 XHTML	205
HTML Review	206
A Brief History of HTML and XHTML	206
HTML Shortcomings	208
XHTML Definition and Background	209
Advantages of XHTML	211
XHTML Is Related to XML	211
XHTML Is Extensible	212
XHTML Is Modular	213
XHTML Is Portable	214
XHTML 1.0's Three Variants, DTDs, and Schemas	214
The XHTML 1.0 Strict Variant	215
The XHTML 1.0 Transitional Variant	216
The XHTML 1.0 Frameset Variant	217
XHTML Syntax	218
The Logical Structure of an XHTML Document	218
The Prolog	219
The Data Instance	219
XHTML Follows XML's Strict Syntax Rules	220
XHTML Element Types Must Be Properly Nested	220
All HTML-Related Tag Names Must Be Lowercase	221
All XHTML Elements Must Be Closed	221
Attribute Names Must Be Lowercase; Attribute Values	
Must Be Quoted	223
Attribute Minimization Is Forbidden	223
The name Attribute Has Been Replaced by the id Attribute	224
Start Moving to XHTML Soon!	225
Converting Web Sites to XHTML	225
XHTML Utilities and Services Provided by W3C	226
W3C's HTML Validation Service	226
Amaya, W3C's Editor and Browser	227

Other XHTML Utilities and Services	229
HTML Tidy	229
HTML-Kit	229
Chapter 6 Labs: Creating XHTML Documents	230
Summary	234
Chapter 7 XML and Cascading Style Sheets	239
Overview of Cascading Style Sheets	240
CSS and the World Wide Web Consortium	240
Dave Raggett's Adding a Touch of Style Web Site	241
W3C's CSS Validation Service	241
Coping with CSS Issues	242
Specifying Styles for HTML and XML Documents	242
Inline Style Specifications	242
Internal Style Sheet Specifications	243
Internal Style Sheet Specifications for HTML and XHTML	243
Internal Style Sheet Specifications for Other XML-Related Language Documents	244
Affiliating Documents with External Style Sheets	245
Affiliating HTML and XHTML Documents with External Style Sheets	245
Affiliating Other Types of XML Documents with External Style Sheets	246
CSS and the Parsing Process	247
Creating CSS Style Rules	249
Basic Style Rule Syntax	249
Selectors	249
Declarations	251
Displaying Inline versus Block Elements	251
Selectors with Pseudo-Elements	253
Grouping Selectors by Classes	256
Grouping Selectors by Pseudo-Classes	258
Combining Pseudo-Classes with Other CSS Classes	260
Grouping Selectors by the ID Attribute	263
Inserting Images as Backgrounds	264
Inserting Images as Discrete Elements	266
Drawing Borders around Elements	268
Text Alignment, Margins, and Indentations	269
Absolute and Relative Positioning	269
Example: Absolute Positioning	269
Example: Relative Positioning	271
The Cascading Nature of Cascading Style Sheets	272
Chapter 7 Labs: Applying CSS	273
Summary	278

Chapter 8	XLinks	283
	XLink: The XML Linking Language	284
	The W3C and XLink	284
	XLink and XPointer Implementations	285
	Basic XLink Concepts	285
	Resources	285
	Link Traversal, Arcs, and Link Direction	286
	XLink Logical Structures	286
	Declare an XLink Namespace	287
	Naming XLink Links	287
	XLink's Global Attributes	287
	A Linking Element Needs a type Attribute	289
	Other Important Attributes: show and actuate	291
	Combining XLink Type Elements and Attributes:	
	Two Restrictions	292
	Example: Simple-Type XLink	294
	Example: Extended-Type XLink	295
	Combining XLink, XPath, and XPointer to	
	Access Subresources	300
	The XML Path Language (XPath)	300
	XPath Expressions, Location Paths, and Location Steps	301
	XPath Expressions and Location Paths	301
	Location Steps	303
	Axes	304
	Node Tests	306
	Predicates	307
	XPath Expressions Can Contain Functions	308
	The XML Pointer Language Extends XPath	311
	Pointers Address a Document's Internal Structure	312
	XPointer Basics: Points, Ranges, and Locations	313
	XPointer Points	313
	Node-points	313
	Character-points	314
	XPointer Ranges	314
	Browser Display of XLink Links and Syntax	315
	Chapter 8 Labs: Using XLink, XPath, and XPointer	316
	Summary	325
Chapter 9	XML Transformations	331
	Why Transform XML Data?	332
	The W3C and Transformations	333
	The Extensible Stylesheet Language (XSL)	333
	XSL Parsers	334
	The XSL Transformation Language (XSLT)	334
	XML Path Language (XPath)	335

Sample XML Transformation: Tabulating a List of Diamonds	336
The XML Source Document	337
The XSLT Style Sheet	341
Node 5: Begin Transformation Using Query Contexts and First Template Rule	346
Nodes 6 through 12: Creating Elements Using <code><xsl:element></code>	348
Node 13: Building an HTML Table with XSLT Element Types	348
Node 14: Processing Continues on the Source <code><gem></code> Node	349
Node 15: The Current Template Rule and a Template Rule for <code><gem></code>	349
Node 16: Creating the First Row in the HTML Table	349
Node 17: More Template Patterns Fill Out the Table Row	350
Nodes 23 through 25: Filling Out the Individual Name Table Cell	350
Nodes 18 through 22: Filling Out the Other Cells in the Table Row	350
Filling In the Other Rows in the Table	351
Chapter 9 Labs: Using XML Transformation Software	351
Summary	368

Chapter 10 XML Data Binding **373**

What Is Data Binding?	374
Performing Data Binding	376
Data Placeholders: Data Consumer Elements	376
The <code><div></code> Element	378
The <code></code> Element	380
The <code><table></code> Element	380
Data Source/Data Fields: The <code>datasrc</code> and <code>datafld</code> Attributes	385
Data Nesting and the Two-Level Rule	387
Data Island Storage of XML Data	389
External Data Islands	389
Internal XML Data Islands	391
Data Binding and Table Repetition Agents	392
Data Source Objects (DSOs)	393
Navigating Recordsets	396
Chapter 10 Labs: Data Binding with XML	401
Summary	409

Chapter 11 VML **415**

Basic Digital Imaging Technologies	416
Bitmap Graphics	416
Vector Graphics	418
VML Development	419
What Is VML? A Definition	420
Creating VML Documents	421
Logical Structure: A Prolog and an <code><html></code> Element	422
Namespace Declarations	422

Behavior Declarations	423
VML Elements in the <body> Element	424
The <shape> Element	425
Creating Graphic Objects Using the path Attribute or <path> Element	426
VML's Predefined Shapes	430
The <shapetype> Element for Frequently Used Custom Figures	435
Figure Placement	435
Altering the Appearance of VML Figures	440
Grouping Shapes Together	444
Scalable Vector Graphics (SVG)	446
Chapter 11 Labs: Creating VML Documents	447
Summary	450
Chapter 12 SMIL	455
What Is Streaming Media?	455
What Is the Synchronized Multimedia Integrated Language?	456
The W3C and SMIL	457
SMIL 1.0	457
SMIL 2.0	458
XHTML+SMIL Profile	459
Viewing and Creating SMIL Documents	459
Creating SMIL Documents	459
The Prolog	460
The SMIL 1.0 DTD	460
The Root Element: <smil>	461
The <head> Element	462
The <layout> Element	462
The <root-layout> Element	463
The <region> Element	465
When Media Object Dimensions Don't Match	
Region Dimensions	466
The <meta> Element	469
The <switch> Element	469
The <body> Element: Content, Temporal, and Linking Information	470
Synchronizing Media Objects with the <par> and <seq> Elements	470
The SMIL Media Object Elements	472
The <switch> Element	477
SMIL's Hyperlinking Elements	479
Chapter 12 Labs: Getting Started with SMIL	483
Summary	491

Chapter 13	RDF	497
	Web Search and Publication Issues	498
	Metadata Is the Key to the Solution	499
	The W3C, PICS, and RDF	500
	RDF Defined	502
	The Semantic Web and Recent RDF Developments	504
	RDF Implementations	506
	RDF Concepts and Syntax	507
	Statements	507
	Resources	508
	Properties	508
	Values	509
	RDF Graphs	509
	The Logical Structure of an RDF Document	510
	The Prolog	510
	The <RDF> Root Element, Namespaces, and Content Models	510
	Resource Descriptions Are Nested within <Description> Elements	512
	Property Elements	513
	Abbreviating RDF	515
	Substituting Our Own XML Data into Others' Data	
	Content Models	515
	Using the resource Attribute	516
	Chapter 13 Labs: Creating and Validating RDF	516
	Summary	523
Chapter 14	CDF	529
	Basic Communication Concepts	530
	Basic Webcasting and Managed Webcasting	531
	What Are Channels?	532
	The User's Side of CDF: Accessing Channels	534
	Investigating Available Channels	534
	Adding a Web Site Channel to Your Favorites List	536
	Adding a Channel from a Web Site That Does Not Provide a CDF Subscription	536
	Adding a Channel from a Web Site That Offers CDF Subscription	539
	Channel Synchronization: Setup and Activation	542
	Viewing a Channel Offline	543
	Development of the CDF Specification	544
	CDF Resources	544
	Channel Definition Format: A Definition	545
	The Publisher's Side of CDF: Creating CDF Channels	546
	Designing the Channel	547
	Creating Logo Images	549

The Logical Structure of a CDF Document	549
The Prolog	549
The <channel> Element	550
Other CDF Elements	552
Special Characters and Character Encoding	563
Test Your Comprehension with a Sample CDF File	564
Posting the CDF File to the Web Server	564
Providing Access to the Channel	564
Chapter 14 Labs: Getting Started with CDF	567
Basic CDF File for Web Pages	568
Summary	574
Chapter 15 SOAP	579
What Are Web Services?	580
The UDDI : Organization, Project, Specification, and Registry	581
The Web Service Description Language (WSDL)	585
WSDL Development	585
A Real WSDL File at Work: The GetLocalTime Web Service	586
WSDL File Structure	588
A Sample WSDL Document File: GetLocalTime	588
The Prolog	589
The <definitions> Root Data Element	589
The <types> Element	589
The <message> Element	590
The <portType> Element	591
The <binding> Element	592
The <service> and <port> Elements	593
The Last Line	594
The Bottom Line	594
What Is SOAP?	594
Development of the SOAP Specification	595
Basic SOAP Message Construct	597
The SOAP Envelope	598
The SOAP Header	599
The role Attribute	600
The mustUnderstand Attribute	600
The encodingStyle Attribute	601
The SOAP Body	602
SOAP Request Example	602
SOAP Response Example	603
SOAP Faults	603
Values for the <Value> Element within the <Code> Element	604
Example SOAP Fault Message	605
Chapter 15 Labs: Accessing Web Services with SOAP	605
Summary	609

Chapter 16	MathML	615
	Mathematical Expression Issues	616
	Early Visual Presentation Solutions	618
	The W3C and MathML	619
	The W3C Math Working Group	620
	MathML Design Goals	620
	MathML Implementations	621
	What Is MathML?	622
	The Logical Structure of a MathML Document	623
	The Prolog	623
	MathML DTDs or Schemas	623
	MathML and Style Sheets	625
	MathML Markup Specifications	625
	The <math> Element	626
	MathML and Namespaces	628
	MathML Attributes	629
	Bases, Scripts, Characters, and Symbols	629
	Presentation Markup	630
	Content Markup	633
	Prefix Notation	636
	Combining Presentation and Content Markup	637
	Two Basic Math-Expression Creation	
	Techniques and Concepts	637
	Abstract Expression Trees	638
	Layout Boxes	638
	Chapter 16 Labs: Getting Started with MathML	640
	Summary	649
Appendix	About the 60 Minutes Web Site	655
Index		659