

XML (Extensible Markup Language)

```
1  <?xml version = "1.0"?>
2
3  <!-- Fig. 28.1: article.xml    -->
4  <!-- Article formatted with XML -->
5
6  <article>
7
8     <title>Simple XML</title>
9
10    <date>September 6, 1999</date>
11
12    <author>
13        <fname>Tem</fname>
14        <lname>Nieto</lname>
15    </author>
16
17    <summary>XML is pretty easy.</summary>
18
19    <content>Once you have mastered HTML, XML is easily
20        learned. You must remember that XML is not for
21        displaying information but for managing information.
22    </content>
23
24 </article>
```

Fig. 28.1 An article formatted with XML.

```
1  <?xml version = "1.0"?>
2
3  <!-- Fig. 28.2: letter.xml          -->
4  <!-- Business letter formatted with XML -->
5
6  <!DOCTYPE letter SYSTEM "letter.dtd">
7
8  <letter>
9
10     <contact type = "from">
11         <name>John Doe</name>
12         <address1>123 Main St.</address1>
13         <address2></address2>
14         <city>Anytown</city>
15         <state>Anystate</state>
16         <zip>12345</zip>
17         <phone>555-1234</phone>
18         <flag id = "P"/>
19     </contact>
20
21     <contact type = "to">
22         <name>Joe Schmoe</name>
23         <address1>Box 12345</address1>
24         <address2>15 Any Ave.</address2>
25         <city>Othertown</city>
26         <state>Otherstate</state>
27         <zip>67890</zip>
28         <phone>555-4321</phone>
29         <flag id = "B"/>
30     </contact>
31
32     <paragraph>Dear Sir,</paragraph>
33
34     <paragraph>It is our privilege to inform you about our new
35     database managed with XML. This new system will allow
36     you to reduce the load of your inventory list server by
37     having the client machine perform the work of sorting
38     and filtering the data.</paragraph>
39     <paragraph>Sincerely, Mr. Doe</paragraph>
40
41 </letter>
```

Fig. 28.2 A business letter formatted with XML .

```
1 <!ELEMENT letter (contact+, paragraph+)>
2
3 <!ELEMENT contact (name, address1, address2, city, state,
4 zip, phone, flag)>
5 <!ATTLIST contact type CDATA #IMPLIED>
6
7 <!ELEMENT name (#PCDATA)>
8 <!ELEMENT address1 (#PCDATA)>
9 <!ELEMENT address2 (#PCDATA)>
10 <!ELEMENT city (#PCDATA)>
11 <!ELEMENT state (#PCDATA)>
12 <!ELEMENT zip (#PCDATA)>
13 <!ELEMENT phone (#PCDATA)>
14 <!ELEMENT flag (EMPTY)>
15 <!ATTLIST flag id CDATA #IMPLIED>
16
17 <!ELEMENT paragraph (#PCDATA)>
```

Fig. 28.3 Business letter DTD.

```
1 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
2 <HTML>
3
4 <!-- Fig. 28.4: mathml1.html -->
5 <!-- Simple MathML -->
6
7 <BODY>
8
9 <MATH>
10   <mrow>
11     <mn>2</mn>
12     <mo>+</mo>
13     <mn>3</mn>
14     <mo>=</mo>
15     <mn>5</mn>
16   </mrow>
17 </MATH>
18
19 </BODY>
20 </HTML>
```

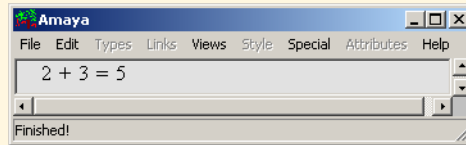


Fig. 28.4 An expression marked up with MathML .

```
1 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
2 <HTML>
3
4 <!-- Fig. 28.5: mathml2.html -->
5 <!-- Simple MathML -->
6
7 <BODY>
8
9 <MATH>
10   <mrow>
11
12     <mrow>
13       <mn>3</mn>
14       <mo>&InvisibleTimes;</mo>
15       <msup>
16         <mi>x</mi>
17         <mn>2</mn>
18       </msup>
19     </mrow>
20
21     <mo>+</mo>
22     <mi>x</mi>
23     <mo>-</mo>
24     <mfrac>
25       <mn>2</mn>
26       <mi>x</mi>
27     </mfrac>
28     <mo>=</mo>
29     <mn>0</mn>
30   </mrow>
31 </MATH>
32
33 </BODY>
34 </HTML>
```

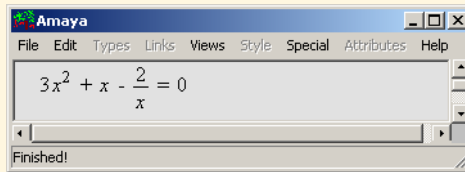


Fig. 28.5 An algebraic equation marked up with MathML .

```

1  <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
2  <HTML>
3
4  <!-- Fig. 28.6: mathml3.html -->
5  <!-- Complex MathML -->
6
7  <BODY>
8
9  <MATH>
10     <mrow>
11         <msubsup>
12             <mo>&Integral;</mo>
13             <mn>0</mn>
14             <mrow>
15                 <mn>1</mn>
16                 <mo>-</mo>
17                 <mi>x</mi>
18             </mrow>
19         </msubsup>
20
21         <msqrt>
22             <mrow>
23                 <mn>4</mn>
24                 <mo>&InvisibleTimes;</mo>
25                 <msup>
26                     <mi>x</mi>
27                     <mn>2</mn>
28                 </msup>
29                 <mo>+</mo>
30                 <mi>y</mi>
31             </mrow>
32         </msqrt>
33
34         <mi>&delta;</mi>
35         <mi>x</mi>
36     </mrow>
37 </MATH>
38 </BODY>
39 </HTML>

```

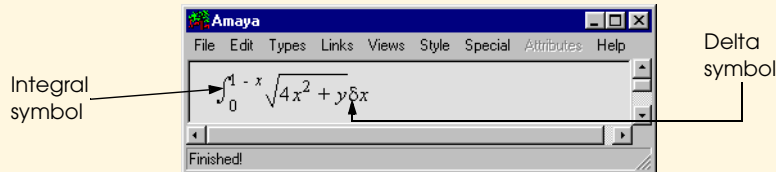


Fig. 28.6 A calculus expression marked up with MathML.

```
1 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
2 <HTML>
3
4 <!-- Fig. 28.7: mathml4.html -->
5 <!-- Matrix MathML -->
6
7 <BODY>
8
9 <MATH>
10 <table>
11
12 <tr>
13 <td>2</td>
14 <td>5</td>
15 <td>8</td>
16 <td>3</td>
17 <td>0</td>
18 </tr>
19
20 <tr>
21 <td>1</td>
22 <td>-5</td>
23 <td>3</td>
24 <td>0</td>
25 <td>y</td>
26 </tr>
27
28 <tr>
29 <td>15</td>
30 <td>2</td>
31 <td>1</td>
32 <td>1</td>
33 <td>-2</td>
34 </tr>
35
36 <tr>
37 <td>-2</td>
38 <td>x</td>
39 <td>8</td>
40 <td>12</td>
41 <td>22</td>
42 </tr>
43
44 <tr>
45 <td>-2</td>
46 <td>0</td>
47 <td>0</td>
48 <td>3</td>
49 <td>7</td>
50 </tr>
51
52 </table>
53 </MATH>
```

Fig. 28.7 A matrix marked up using MathML and rendered with Amaya (part 1 of 2).

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54 </BODY>  
55 </HTML>

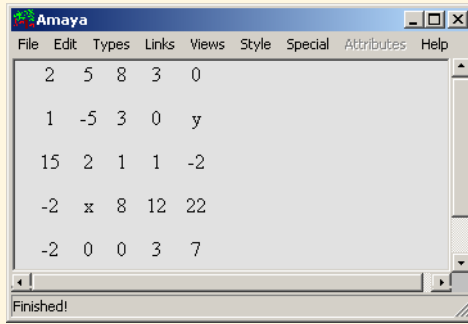
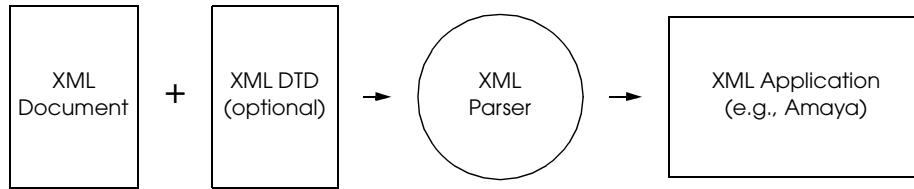


Fig. 28.7 A matrix marked up using MathML and rendered with Amaya (part 2 of 2).





**Fig. 28.8** XML documents and their corresponding DTDs are parsed and sent to an application.

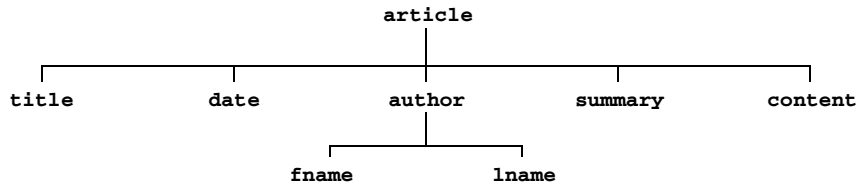


Fig. 28.9 Tree structure for `article.xml`.

```
1 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
2 <HTML>
3
4 <!-- Fig. 28.10: simple_contact.html -->
5 <!-- A Simple Contact List Database -->
6
7 <BODY>
8
9 <XML ID = ">xmlDoc">
10 <contacts>
11
12 <contact>
13 <LastName>Deitel</LastName>
14 <FirstName>Harvey</FirstName>
15 </contact>
16
17 <contact>
18 <LastName>Deitel</LastName>
19 <FirstName>Paul</FirstName>
20 </contact>
21
22 <contact>
23 <LastName>Nieto</LastName>
24 <FirstName>Tem</FirstName>
25 </contact>
26
27 </contacts>
28 </XML>
29
30 <TABLE BORDER = "1" DATASRC = "#>xmlDoc">
31 <THEAD>
32 <TR>
33 <TH>Last Name</TH>
34 <TH>First Name</TH>
35 </TR>
36 </THEAD>
37
38 <TR>
39 <TD><SPAN DATAFLD = "LastName"></SPAN></TD>
40 <TD><SPAN DATAFLD = "FirstName"></SPAN></TD>
41 </TR>
42 </TABLE>
43
44 </BODY>
45 </HTML>
```

Fig. 28.10 A simple contact list (part 1 of 2).



Fig. 28.10 A simple contact list (part 2 of 2).

```
1 <?xml version = "1.0"?>
2
3 <!-- Fig. 28.11: contact.xml -->
4
5 <contacts>
6
7   <contact>
8     <LastName>Deitel</LastName>
9     <FirstName>Harvey</FirstName>
10  </contact>
11
12  <contact>
13    <LastName>Deitel</LastName>
14    <FirstName>Paul</FirstName>
15  </contact>
16
17  <contact>
18    <LastName>Nieto</LastName>
19    <FirstName>Tem</FirstName>
20  </contact>
21
22 </contacts>
```

Fig. 28.11 A contact list database in XML.

```
23 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
24 <HTML>
25
26 <!-- Fig. 28.12: contact_list.html -->
27
28 <BODY>
29
30 <XML ID = "xmlData" src = "contact.xml"></XML>
31
32 <XML ID = "xmlSortLastName">
33   <contacts>
34     <xsl:for-each order-by = "+LastName;+FirstName"
35       select = "contact"
36       xmlns:xsl = "http://www.w3.org/TR/WD-xsl">
37       <contact>
38         <LastName><xsl:value-of select = "LastName"/>
39         </LastName>
40         <FirstName><xsl:value-of select = "FirstName"/>
41         </FirstName>
42       </contact>
43     </xsl:for-each>
44   </contacts>
45 </XML>
46
47 <XML ID = "xmlSortFirstName">
48   <contacts>
49     <xsl:for-each order-by = "+FirstName;+LastName"
50       select = "contact"
51       xmlns:xsl = "http://www.w3.org/TR/WD-xsl">
52       <contact>
53         <LastName><xsl:value-of select = "LastName"/>
54         </LastName>
55         <FirstName><xsl:value-of select = "FirstName"/>
56         </FirstName>
57       </contact>
58     </xsl:for-each>
59   </contacts>
60 </XML>
61
62 <XML ID = "xmlRevertOrder">
63   <contacts>
64     <xsl:for-each select = "contact"
65       xmlns:xsl = "http://www.w3.org/TR/WD-xsl">
66       <contact>
67         <LastName><xsl:value-of select = "LastName"/>
68         </LastName>
69         <FirstName><xsl:value-of select = "FirstName"/>
70         </FirstName>
71       </contact>
72     </xsl:for-each>
73   </contacts>
74 </XML>
75
```

Fig. 28.12 Using XSL style sheets (part 1 of 3).

```

76 <XML ID = "xmlFilterLastName">
77   <contacts>
78     <xsl:for-each select = "contact[LastName='Nieto']"
79       xmlns:xsl = "http://www.w3.org/TR/W3-XSL"
80     <contact>
81       <LastName><xsl:value-of select = "LastName"/>
82     </LastName>
83       <FirstName><xsl:value-of select = "FirstName"/>
84     </FirstName>
85     </contact>
86   </xsl:for-each>
87 </contacts>
88 </XML>
89
90 <SCRIPT LANGUAGE = "Javascript">
91   var xmldoc = xmlData.cloneNode( true );
92
93   function sort( xslDoc ) {
94     xmldoc.documentElement.transformNodeToObject(
95       xslDoc.documentElement, xmlData.XMLDocument );
96   }
97 </SCRIPT>
98
99 <TABLE BORDER = "1" DATASRC = "#xmlData" DATAPAGESIZE = "3"
100   ID = "tbl">
101   <THEAD>
102   <TR>
103     <TH>Last Name</TH>
104     <TH>First Name</TH>
105   </TR>
106 </THEAD>
107
108   <TR>
109     <TD><SPAN DATAFLD = "LastName"></SPAN></TD>
110     <TD><SPAN DATAFLD = "FirstName"></SPAN></TD>
111   </TR>
112 </TABLE>
113
114 <INPUT TYPE = "button" VALUE = "Sort By Last Name"
115   ONCLICK = "sort(xmlSortLastName.XMLDocument);">
116 <INPUT TYPE = "button" VALUE = "Sort By First Name"
117   ONCLICK = "sort(xmlSortFirstName.XMLDocument);">
118 <INPUT TYPE = "button" VALUE = "Revert"
119   ONCLICK = "sort(xmlRevertOrder.XMLDocument);">
120 <BR>
121 <INPUT TYPE = "button" VALUE = "Filter for Nieto"
122   ONCLICK = "sort(xmlFilterLastName.XMLDocument);">
123 <BR>
124 <INPUT TYPE = "button" VALUE = "<" ONCLICK = "tbl.firstPage();">
125 <INPUT TYPE = "button" VALUE = "<<" ONCLICK = "tbl.previousPage();">
126 <INPUT TYPE = "button" VALUE = ">" ONCLICK = "tbl.nextPage();">
127 <INPUT TYPE = "button" VALUE = ">>" ONCLICK = "tbl.lastPage();">
128

```

Fig. 28.12 Using XSL style sheets (part 2 of 3).

129 </BODY>  
130 </HTML>

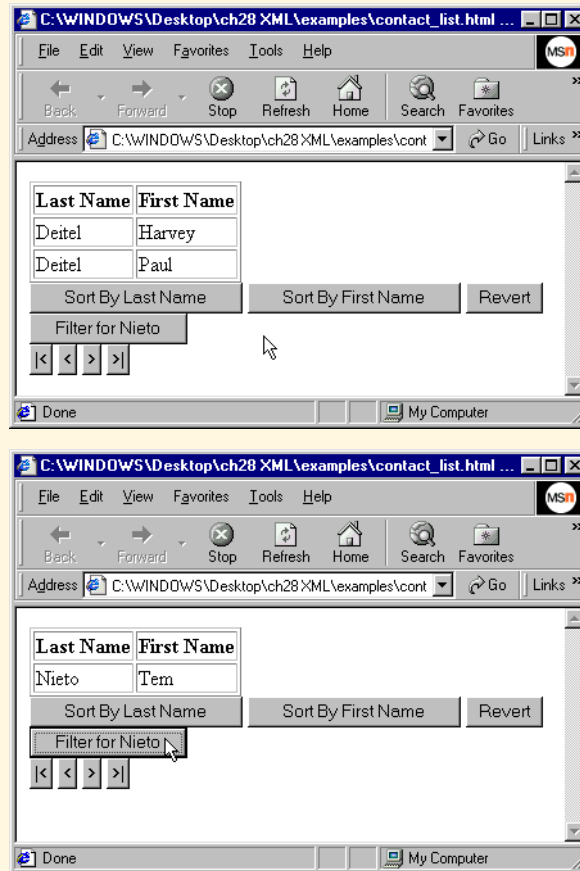


Fig. 28.12 Using XSL style sheets (part 3 of 3).



```

1  <?xml version = "1.0"?>
2  <?xml:stylesheet type = "text/xsl" href = "books.xsl"?>
3  <!-- Fig. 28.13: books.xml -->
4
5  <database xmlns = "x-schema:books-schema.xml">
6    <author>Deitel Associates</author>
7
8    <book>
9      <title>C++ How to Program, Second Edition</title>
10     <isbn>0-13-528910-6</isbn>
11     <pages>1130</pages>
12     <description>For CS1 and other courses on programming in
13       C++. This comprehensive text, aimed at students with
14
15       little or no programming experience, teaches
16       programming "the right way" from the start by placing
17       emphasis on achieving program clarity through
18       structured and object-oriented programming.
19     </description>
20     <image>cplus.jpg</image>
21   </book>
22
23   <book>
24     <title>The Complete C++ Training Course, Second
25       Edition</title>
26     <isbn>0-13-916305-0</isbn>
27     <pages>Boxed</pages>
28     <description>For any course teaching C++ programming.
29       The ultimate C++ programming package. The Complete
30       C++ Training Course, 2/e features Harvey and Paul
31       Deitel's best-selling C++ How to Program, 2/e text
32       along with a fully-interactive CD-ROM - The C++
33       Multimedia Cyber Classroom CD-ROM, 2/e - provides
34       students and programmers with the ideal medium for
35       learning how to program with C++. It's a proven fact
36       that the more involved students are, the more they
37       learn. That's what the C++ Multimedia Cyber Classroom
38       is all about - helping students learn in every way
39       possible.</description>
40     <image>cplustrain.jpg</image>
41   </book>
42
43   <book>
44     <title>Getting Started with Microsoft's Visual C++ 6
45       with an Introduction to MFC</title>
46     <isbn>0-13-016147-0</isbn>
47     <pages></pages>
48     <description></description>
49     <image></image>
50   </book>

```

Fig. 28.13 Book list database document in XML (part 1 of 3).

```

51 <book>
52   <title>Java How to Program, Third Edition</title>
53   <isbn>0-13-012507-5</isbn>
54   <pages>1200</pages>
55   <description>For CS1 and other courses on programming in
56   Java. Written by the authors of the world's
57   best-selling introductory C and C++ texts, this
58   state-of-the-art guide examines one of today's
59   hottest computer languages - Java; the first
60   general-purpose, object-oriented language that is
61   truly platform-independent. The latest Java 2
62   features are incorporated throughout this
63   edition.</description>
64   <image></image>
65 </book>
66
67 <book>
68   <title>Java How to Program, Second Edition</title>
69   <isbn>0-13-899394-7</isbn>
70   <pages></pages>
71   <description></description>
72   <image></image>
73 </book>
74
75 <book>
76   <title>The Complete Java Training Course, Second
77   Edition</title>
78   <isbn>0-13-790569-6</isbn>
79   <pages>Boxed</pages>
80   <description>For any course teaching Java programming.
81   The ultimate Java programming package. The Complete
82   Java Training Course, 2/e features Harvey and Paul
83   Deitel's best-selling Java How to Program, 2/e text
84   along with a fully-interactive CD-ROM - The Java
85   Multimedia Cyber Classroom - which provides students
86   and programmers with the ideal medium for learning
87   how to program with Java. It's a proven fact that the
88   more involved students are, the more they learn.
89   That's what the Java Multimedia Cyber Classroom is
90   all about - helping students learn in every way
91   possible.</description>
92   <image></image>
93 </book>
94
95 <book>
96   <title>Visual Basic 6 How to Program</title>
97   <isbn>0-13-456955-5</isbn>
98   <pages>1015</pages>
99   <description>For introductory through advanced level
100  courses in Visual Basic. The latest book in the
101  Deitels' How to Program Series of worldwide
102  programming language bestsellers, this is one of the
103  first books on the newest version of Microsoft's
104  Visual Basic - Visual Basic 6. Designed for beginning

```

Fig. 28.13 Book list database document in XML (part 2 of 3).

```
105     through experienced programmers, it includes hundreds
106     of complete working programs - totaling more than
107     10,000 lines of code - numerous valuable programming
108     tips, and hundreds of interesting and challenging
109     exercises.</description>
110     <image>vb.jpg</image>
111 </book>
112
113 <book>
114   <title>The Complete Visual Basic 6 Course</title>
115   <isbn>0-13-082929-3</isbn>
116   <pages>Boxed</pages>
117   <description>For any course teaching Visual Basic 6
118     programming. The ultimate Visual Basic programming
119     package, The Complete Visual Basic Training Course,
120     features Harvey and Paul Deitel's Visual Basic 6 How
121     to Program text along with a fully-interactive CD-ROM
122     - The Visual Basic Multimedia Cyber Classroom CD-ROM
123     - which provides students and programmers with the
124     ideal medium for learning how to program with Visual
125     Basic. It's a proven fact that the more involved
126     students are, the
127     more they learn. That's what the Visual Basic
128     Multimedia Cyber Classroom is all about - helping
129     students learn in every way possible.</description>
130     <image>vbtrain.jpg</image>
131 </book>
132
133 <book>
134   <title>C How to Program, Second Edition</title>
135   <isbn>0-13-226119-7</isbn>
136   <pages>926</pages>
137   <description>This text is especially appropriate for
138     students learning programming for the first time.
139     Highly practical in approach, it introduces
140     fundamental notions of structured programming, gets
141     up to speed quickly, and covers not only the full C
142     language, but includes a review of library functions
143     and a solid introduction C++ and object- oriented
144     programming.</description>
145     <image>c.gif</image>
146 </book>
147
148 </database>
```

Fig. 28.13 Book list database document in XML (part 3 of 3).

```
149 <?xml version = "1.0"?>
150
151 <!-- Fig. 28.14: books-schema.xml -->
152
153 <Schema xmlns = "urn:schemas-microsoft-com:xml-data"
154       xmlns:dt = "urn:schemas-microsoft-com:datatypes">
155
156     <ElementType name = "author"/>
157
158     <ElementType name = "image"/>
159     <ElementType name = "title"/>
160     <ElementType name = "isbn"/>
161     <ElementType name = "pages"/>
162     <ElementType name = "description"/>
163
164     <ElementType name = "database" content = "eltOnly">
165       <group minOccurs = "0" maxOccurs = "1">
166         <element type = "author"/>
167       </group>
168       <group minOccurs = "1" maxOccurs = "*">
169         <element type = "book"/>
170       </group>
171     </ElementType>
172
173     <ElementType name = "book" content = "eltOnly">
174       <element type = "image"/>
175       <element type = "title"/>
176       <element type = "isbn"/>
177       <element type = "pages"/>
178       <element type = "description"/>
179     </ElementType>
180
181 </Schema>
```

Fig. 28.14 XML schema for the database document type .

```

182 <?xml version = "1.0"?>
183
184 <!-- Fig. 28.15: books.xsl -->
185
186 <xsl:stylesheet xmlns:xsl = "http://www.w3.org/TR/WD-xsl">
187   <xsl:template match = "/">
188     <HTML>
189       <HEAD>
190         <TITLE>
191           <xsl:value-of select = "database/author"/>
192         </TITLE>
193         <STYLE>
194           .head1 {font: bold}
195           .head2 {font: bold; cursor: hand}
196         </STYLE>
197       </HEAD>
198
199       <SCRIPT><xsl:comment><![CDATA[
200         var sortBy;
201         var source;
202         var stylesheet;
203
204         function sort( data )
205         {
206           sortBy.value = data;
207           list.innerHTML =
208             source.documentElement.transformNode(
209               stylesheet );
210         }
211       ]]></xsl:comment></SCRIPT>
212
213       <SCRIPT FOR = "window" EVENT = "ONLOAD">
214         <xsl:comment><![CDATA[
215           stylesheet = document.XSLDocument;
216           source = document.XMLDocument;
217           sortBy = document.XSLDocument.selectSingleNode(
218             "@order-by" );
219         ]]></xsl:comment>
220       </SCRIPT>
221
222       <BODY>
223         <H1>
224           <CENTER>
225             <xsl:value-of select = "database/author"/>
226           </CENTER>
227         </H1>
228
229         <DIV ID = "list">
230           <xsl:apply-templates match = "database"/>
231         </DIV>
232       </BODY>
233     </HTML>

```

Fig. 28.15 XSL specification for the book database (part 1 of 3).

```

234 </xsl:template>
235
236 <xsl:template match = "database">
237   <TABLE WIDTH = "100%" CELSPACING = "0" BORDER = "1">
238     <THEAD>
239       <TD WIDTH = "200" ALIGN = "center">
240         <DIV CLASS = "head1">Image</DIV>
241       </TD>
242       <TD WIDTH = "25%" ALIGN = "center">
243         <DIV ONCLICK = "sort('title;isbn')">
244           CLASS = "head2">Title</DIV>
245       </TD>
246       <TD WIDTH = "10%" ALIGN = "center">
247         <DIV ONCLICK = "sort('isbn;title')">
248           CLASS = "head2">ISBN</DIV>
249       </TD>
250       <TD WIDTH = "5%" ALIGN = "center">
251         <DIV ONCLICK = "sort('pages;title')">
252           CLASS = "head2">Pages</DIV>
253       </TD>
254       <TD WIDTH = "60%" ALIGN = "center">
255         <DIV CLASS = "head1">Description</DIV>
256       </TD>
257     </THEAD>
258
259     <xsl:for-each select = "book" order-by = "title">
260       <TR>
261         <TD WIDTH = "200" ALIGN = "center" VALIGN = "top">
262           <xsl:choose>
263             <xsl:when test = "image[!]=''">
264               <xsl:element name = "IMG">
265                 <xsl:attribute name = "SRC">
266                   <xsl:value-of select = "image"/>
267                 </xsl:attribute>
268               </xsl:element>
269             </xsl:when>
270             <xsl:otherwise>
271               n/a
272             </xsl:otherwise>
273           </xsl:choose>
274         </TD>
275
276         <TD WIDTH = "25%" ALIGN = "LEFT" VALIGN = "top">
277           <xsl:choose>
278             <xsl:when test = "title[!]=''">
279               <xsl:value-of select = "title"/>
280             </xsl:when>
281             <xsl:otherwise>
282               n/a
283             </xsl:otherwise>
284           </xsl:choose>
285         </TD>
286
287         <TD WIDTH = "10%" ALIGN = "center" VALIGN = "top">

```

Fig. 28.15 XSL specification for the book database (part 2 of 3).

```

288     <xsl:choose>
289         <xsl:when test = "isbn[.='']">
290             <xsl:value-of select = "isbn"/>
291         </xsl:when>
292         <xsl:otherwise>
293             n/a
294         </xsl:otherwise>
295     </xsl:choose>
296 </TD>
297
298 <TD WIDTH = "5%" ALIGN = "center" VALIGN = "top">
299     <xsl:choose>
300         <xsl:when test = "pages[.='']">
301             <xsl:value-of select = "pages"/>
302         </xsl:when>
303         <xsl:otherwise>
304             n/a
305         </xsl:otherwise>
306     </xsl:choose>
307 </TD>
308
309 <TD WIDTH = "60%" ALIGN = "LEFT" VALIGN = "top">
310     <xsl:choose>
311         <xsl:when test = "description[.='']">
312             <xsl:value-of select = "description"/>
313         </xsl:when>
314         <xsl:otherwise>
315             n/a
316         </xsl:otherwise>
317     </xsl:choose>
318 </TD>
319
320 </TR>
321 </xsl:for-each>
322 </TABLE>
323 </xsl:template>
324 </xsl:stylesheet>

```

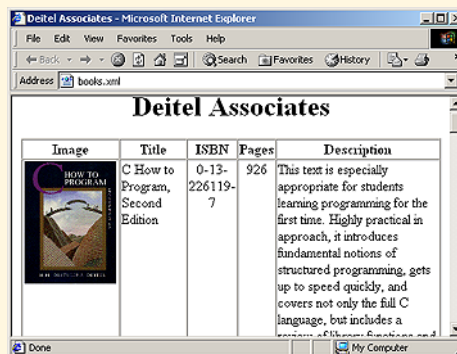


Fig. 28.15 XSL specification for the book database (part 3 of 3).

```
1 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0 Transitional//EN">
2 <HTML>
3
4 <!-- Fig. 28.16: chess.html -->
5
6 <HEAD>
7 <TITLE>Chess</TITLE>
8
9 <SCRIPT LANGUAGE = "JavaScript">
10 <!--
11     // variables for display of captured pieces
12     var captureWhite = 0;
13     var captureBlack = 0;
14
15     // variables for going through the xml data
16     var i = 0;
17     var timer;
18
19     // variables for the xml data
20     var xml = new ActiveXObject( "msxml" );
21     var gameInfo;
22     var gameMoves;
23
24     // temporary data variables
25     var move;
26     var info;
27     var pieceSrc1;
28     var pieceSrc2;
29
30     // displays a single move
31     function display()
32     {
33
34         if ( i >= gameMoves.length ) {
35             clearInterval( timer );
36             window.button.value = "Reset";
37             return;
38         }
39
40         move = gameMoves.item( i );
41
42         if ( parseInt( i/2 + 1 ) != move.getAttribute( "turn" ) ) {
43             alert( "The XML data set is invalid" );
44             clearInterval( timer );
45             window.button.value = "Reset";
46             return;
47         }
48
49         // determine the turn data.
50         window.infoTurn.innerHTML = move.getAttribute( "turn" );
51
52         if ( move.getAttribute( "player" ) == "white" )
53             window.infoTurn.innerHTML += "w";
```

Fig. 28.16 Chess example with the [ScholarMate.xml](#) file (part 1 of 14).



```
54     else
55         window.infoTurn.innerHTML += "b";
56
57         // determine which piece is moved.
58         window.infoPiece.innerHTML = move.getAttribute( "piece" );
59
60         if ( window.infoPiece.innerHTML == "" )
61             window.infoPiece.innerHTML = " ";
62
63         // determine where to move from.
64         info = move.children.item( "from" );
65         window.infoFrom.innerHTML = info.getAttribute( "x" ) +
66             info.getAttribute( "y" );
67
68         if ( window.infoFrom.innerHTML != "" ) {
69             pieceSrc1 = window.document.images( "image" +
70                 window.infoFrom.innerHTML ).src;
71             window.document.images( "image" +
72                 window.infoFrom.innerHTML ).src = "blank.gif";
73
74             if ( pieceSrc1.indexOf( "blank.gif" ) != -1 ) {
75                 alert( "The XML data set is invalid" );
76                 clearInterval( timer );
77                 window.button.value = "Reset";
78                 return;
79             }
80         }
81         else
82             window.infoFrom.innerHTML = " ";
83
84         // determine where to move to.
85         info = move.children.item( "to" );
86         window.infoTo.innerHTML = info.getAttribute( "x" ) +
87             info.getAttribute( "y" );
88
89         if ( window.infoTo.innerHTML != "" ) {
90             pieceSrc2 = window.document.images( "image" +
91                 window.infoTo.innerHTML ).src;
92             window.document.images( "image" +
93                 window.infoTo.innerHTML ).src = pieceSrc1;
94         }
95         else
96             window.infoTo.innerHTML = " ";
97
98         // determine if there are any special flags.
99         info = move.children.item( "flag" );
100        window.infoFlag.innerHTML = info.text;
101
102        // no flags
103        if ( info.text == "" )
104            window.infoFlag.innerHTML = " ";
105
```

Fig. 28.16 Chess example with the [ScholarMate.xml](#) file (part 2 of 14).

```
106 // capture flag
107 if ( info.text.indexOf( "x" ) != -1 ) {
108     window.infoFlag.innerHTML = info.text;
109
110     if ( move.getAttribute( "player" ) == "white" ) {
111         window.document.images( "black" +
112             captureBlack ).src = pieceSrc2;
113         captureBlack++;
114     }
115     else {
116         window.document.images( "white" +
117             captureWhite ).src = pieceSrc2;
118         captureWhite++;
119     }
120 }
121
122 // king-side castle flag
123 if ( info.text.indexOf( "0-0" ) != -1 ) {
124     if ( move.getAttribute( "player" ) == "white" ) {
125         window.document.images( "imageg1" ).src =
126             "whiteking.gif";
127         window.document.images( "imagee1" ).src =
128             "blank.gif";
129         window.document.images( "imagef1" ).src =
130             "whiterook.gif";
131         window.document.images( "imageh1" ).src =
132             "blank.gif";
133     }
134     else {
135         window.document.images( "imageg8" ).src =
136             "blackking.gif";
137         window.document.images( "imagee8" ).src =
138             "blank.gif";
139         window.document.images( "imagef8" ).src =
140             "blackrook.gif";
141         window.document.images( "imageh8" ).src =
142             "blank.gif";
143     }
144 }
145
146 // queen-side castle flag
147 if ( info.text.indexOf( "0-0-0" ) != -1 ) {
148     if ( move.getAttribute( "player" ) == "white" ) {
149         window.document.images( "imagec1" ).src =
150             "whiteking.gif";
151         window.document.images( "imagee1" ).src =
152             "blank.gif";
153         window.document.images( "imaged1" ).src =
154             "whiterook.gif";
155         window.document.images( "imagea1" ).src =
156             "blank.gif";
157     }
```

Fig. 28.16 Chess example with the [ScholarMate.xml](#) file (part 3 of 14).

```

158         else {
159             window.document.images( "imagec8" ).src =
160                 "blackking.gif";
161             window.document.images( "imagee8" ).src =
162                 "blank.gif";
163             window.document.images( "imaged8" ).src =
164                 "blackrook.gif";
165             window.document.images( "imagea8" ).src =
166                 "blank.gif";
167         }
168     }
169
170     i++;
171 }
172
173 // controls the display function
174 function main()
175 {
176     if ( window.button.value == "Start" ) {
177         window.button.value = "Stop";
178         timer = setInterval( "display()", 1500 );
179     }
180     else if ( window.button.value == "Stop" ) {
181         window.button.value = "Start";
182         clearInterval( timer );
183     }
184     else if ( window.button.value == "Reset" ) {
185         xml.url = window.xmlfile.value;
186         gameInfo = xml.root.children.item( 0 ).text;
187         gameMoves = xml.root.children.item( 1 ).children;
188
189         window.gameTitle.innerHTML = gameInfo;
190
191         i = 0;
192         captureBlack = 0;
193         captureWhite = 0;
194
195         window.button.value = "Start";
196         resetPieces();
197     }
198 }
199
200 // resets the location of the chess pieces
201 function resetPieces()
202 {
203     window.document.images("imagea1").src = "whiterook.gif";
204     window.document.images("imageb1").src =
205         "whiteknight.gif";
206     window.document.images("imagec1").src =
207         "whitebishop.gif";
208     window.document.images("imaged1").src =
209         "whitequeen.gif";
210     window.document.images("imagee1").src = "whiteking.gif";

```

Fig. 28.16 Chess example with the **ScholarMate.xml** file (part 4 of 14).

```

211     window.document.images("imagef1").src =
212         "whitebishop.gif";
213     window.document.images("imageg1").src =
214         "whiteknight.gif";
215     window.document.images("imageh1").src = "whiterook.gif";
216
217     window.document.images("imagea2").src = "whitepawn.gif";
218     window.document.images("imageb2").src = "whitepawn.gif";
219     window.document.images("imagec2").src = "whitepawn.gif";
220     window.document.images("imaged2").src = "whitepawn.gif";
221     window.document.images("imagee2").src = "whitepawn.gif";
222     window.document.images("imagef2").src = "whitepawn.gif";
223     window.document.images("imageg2").src = "whitepawn.gif";
224     window.document.images("imageh2").src = "whitepawn.gif";
225
226     window.document.images("imagea8").src = "blackrook.gif";
227     window.document.images("imageb8").src =
228         "blackknight.gif";
229     window.document.images("imagec8").src =
230         "blackbishop.gif";
231     window.document.images("imaged8").src =
232         "blackqueen.gif";
233     window.document.images("imagee8").src = "blackking.gif";
234     window.document.images("imagef8").src =
235         "blackbishop.gif";
236     window.document.images("imageg8").src =
237         "blackknight.gif";
238     window.document.images("imageh8").src = "blackrook.gif";
239
240     window.document.images("imagea7").src = "blackpawn.gif";
241     window.document.images("imageb7").src = "blackpawn.gif";
242     window.document.images("imagec7").src = "blackpawn.gif";
243     window.document.images("imaged7").src = "blackpawn.gif";
244     window.document.images("imagee7").src = "blackpawn.gif";
245     window.document.images("imagef7").src = "blackpawn.gif";
246     window.document.images("imageg7").src = "blackpawn.gif";
247     window.document.images("imageh7").src = "blackpawn.gif";
248
249     for ( var a = 97; a <= 104; a++ ) {
250         for ( var b = 3; b <= 6; b++ ) {
251             window.document.images( "image" +
252                 String.fromCharCode( a ) + b ).src = "blank.gif";
253         }
254     }
255
256     for ( var a = 0; a <= 15; a++ ) {
257         window.document.images( "white" + a ).src =
258             "blank.gif";
259         window.document.images( "black" + a ).src =
260             "blank.gif";
261     }
262

```

Fig. 28.16 Chess example with the **ScholarMate.xml** file (part 5 of 14).





```

369     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
370         <IMG HEIGHT = "25" NAME = "black2" SRC = "blank.gif"
371             WIDTH = "25"></TD>
372     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
373         <IMG HEIGHT = "25" NAME = "black3" SRC = "blank.gif"
374             WIDTH = "25"></TD>
375 </TR>
376
377 <TR>
378     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
379         <IMG HEIGHT = "25" NAME = "white4" SRC = "blank.gif"
380             WIDTH = "25"></TD>
381     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
382         <IMG HEIGHT = "25" NAME = "white5" SRC = "blank.gif"
383             WIDTH = "25"></TD>
384     <TD WIDTH = "50" HEIGHT = "25"></TD>
385     <TD VALIGN = "center" ALIGN = "right" WIDTH = "25"
386         HEIGHT = "25">6&nbsp; </TD>
387     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
388         <IMG HEIGHT = "25" NAME = "imagea6" SRC = "blank.gif"
389             WIDTH = "25"></TD>
390     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
391         <IMG HEIGHT = "25" NAME = "imageb6" SRC = "blank.gif"
392             WIDTH = "25"></TD>
393     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
394         <IMG HEIGHT = "25" NAME = "imagec6" SRC = "blank.gif"
395             WIDTH = "25"></TD>
396     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
397         <IMG HEIGHT = "25" NAME = "imaged6" SRC = "blank.gif"
398             WIDTH = "25"></TD>
399     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
400         <IMG HEIGHT = "25" NAME = "imagee6" SRC = "blank.gif"
401             WIDTH = "25"></TD>
402     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
403         <IMG HEIGHT = "25" NAME = "imagef6" SRC = "blank.gif"
404             WIDTH = "25"></TD>
405     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
406         <IMG HEIGHT = "25" NAME = "imageg6" SRC = "blank.gif"
407             WIDTH = "25"></TD>
408     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
409         <IMG HEIGHT = "25" NAME = "imageh6" SRC = "blank.gif"
410             WIDTH = "25"></TD>
411     <TD WIDTH = "50" HEIGHT = "25"></TD>
412     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
413         <IMG HEIGHT = "25" NAME = "black4" SRC = "blank.gif"
414             WIDTH = "25"></TD>
415     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
416         <IMG HEIGHT = "25" NAME = "black5" SRC = "blank.gif"
417             WIDTH = "25"></TD>
418 </TR>
419
420 <TR>
421     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">

```

Fig. 28.16 Chess example with the **ScholarMate.xml** file (part 8 of 14).

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```

422         <IMG HEIGHT = "25" NAME = "white6" SRC = "blank.gif"
423             WIDTH = "25"></TD>
424     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
425         <IMG HEIGHT = "25" NAME = "white7" SRC = "blank.gif"
426             WIDTH = "25"></TD>
427     <TD WIDTH = "50" HEIGHT = "25"></TD>
428     <TD VALIGN = "center" ALIGN = "right" WIDTH = "25"
429         HEIGHT = "25">5&nbsp;</TD>
430     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
431         <IMG HEIGHT = "25" NAME = "imagea5" SRC = "blank.gif"
432             WIDTH = "25"></TD>
433     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
434         <IMG HEIGHT = "25" NAME = "imageb5" SRC = "blank.gif"
435             WIDTH = "25"></TD>
436     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
437         <IMG HEIGHT = "25" NAME = "imagec5" SRC = "blank.gif"
438             WIDTH = "25"></TD>
439     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
440         <IMG HEIGHT = "25" NAME = "imaged5" SRC = "blank.gif"
441             WIDTH = "25"></TD>
442     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
443         <IMG HEIGHT = "25" NAME = "imagee5" SRC = "blank.gif"
444             WIDTH = "25"></TD>
445     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
446         <IMG HEIGHT = "25" NAME = "imagef5" SRC = "blank.gif"
447             WIDTH = "25"></TD>
448     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
449         <IMG HEIGHT = "25" NAME = "imageg5" SRC = "blank.gif"
450             WIDTH = "25"></TD>
451     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
452         <IMG HEIGHT = "25" NAME = "imageh5" SRC = "blank.gif"
453             WIDTH = "25"></TD>
454     <TD WIDTH = "50" HEIGHT = "25"></TD>
455     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
456         <IMG HEIGHT = "25" NAME = "black6" SRC = "blank.gif"
457             WIDTH = "25"></TD>
458     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
459         <IMG HEIGHT = "25" NAME = "black7" SRC = "blank.gif"
460             WIDTH = "25"></TD>
461 </TR>
462
463 <TR>
464     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
465         <IMG HEIGHT = "25" NAME = "white8" SRC = "blank.gif"
466             WIDTH = "25"></TD>
467     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
468         <IMG HEIGHT = "25" NAME = "white9" SRC = "blank.gif"
469             WIDTH = "25"></TD>
470     <TD WIDTH = "50" HEIGHT = "25"></TD>
471     <TD VALIGN = "center" ALIGN = "right" WIDTH = "25"
472         HEIGHT = "25">4&nbsp;</TD>
473     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">

```

Fig. 28.16 Chess example with the `ScholarMate.xml` file (part 9 of 14).



```

474         <IMG HEIGHT = "25" NAME = "imagea4" SRC = "blank.gif"
475             WIDTH = "25"></TD>
476     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
477         <IMG HEIGHT = "25" NAME = "imageb4" SRC = "blank.gif"
478             WIDTH = "25"></TD>
479     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
480         <IMG HEIGHT = "25" NAME = "imagec4" SRC = "blank.gif"
481             WIDTH = "25"></TD>
482     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
483         <IMG HEIGHT = "25" NAME = "imaged4" SRC = "blank.gif"
484             WIDTH = "25"></TD>
485     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
486         <IMG HEIGHT = "25" NAME = "imagee4" SRC = "blank.gif"
487             WIDTH = "25"></TD>
488     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
489         <IMG HEIGHT = "25" NAME = "imagef4" SRC = "blank.gif"
490             WIDTH = "25"></TD>
491     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
492         <IMG HEIGHT = "25" NAME = "imageg4" SRC = "blank.gif"
493             WIDTH = "25"></TD>
494     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
495         <IMG HEIGHT = "25" NAME = "imageh4" SRC = "blank.gif"
496             WIDTH = "25"></TD>
497     <TD WIDTH = "50" HEIGHT = "25"></TD>
498     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
499         <IMG HEIGHT = "25" NAME = "black8" SRC = "blank.gif"
500             WIDTH = "25"></TD>
501     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
502         <IMG HEIGHT = "25" NAME = "black9" SRC = "blank.gif"
503             WIDTH = "25"></TD>
504 </TR>
505
506 <TR>
507     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
508         <IMG HEIGHT = "25" NAME = "white10" SRC = "blank.gif"
509             WIDTH = "25"></TD>
510     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
511         <IMG HEIGHT = "25" NAME = "white11" SRC = "blank.gif"
512             WIDTH = "25"></TD>
513     <TD WIDTH = "50" HEIGHT = "25"></TD>
514     <TD VALIGN = "center" ALIGN = "right" WIDTH = "25"
515         HEIGHT = "25">3&nbsp;  &#x2013;</TD>
516     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
517         <IMG HEIGHT = "25" NAME = "imagea3" SRC = "blank.gif"
518             WIDTH = "25"></TD>
519     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
520         <IMG HEIGHT = "25" NAME = "imageb3" SRC = "blank.gif"
521             WIDTH = "25"></TD>
522     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
523         <IMG HEIGHT = "25" NAME = "imagec3" SRC = "blank.gif"
524             WIDTH = "25"></TD>
525     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">

```

Fig. 28.16 Chess example with the `ScholarMate.xml` file (part 10 of 14).

```

526         <IMG HEIGHT = "25" NAME = "imaged3" SRC = "blank.gif"
527             WIDTH = "25"></TD>
528     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
529         <IMG HEIGHT = "25" NAME = "imagee3" SRC = "blank.gif"
530             WIDTH = "25"></TD>
531     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
532         <IMG HEIGHT = "25" NAME = "imagef3" SRC = "blank.gif"
533             WIDTH = "25"></TD>
534     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
535         <IMG HEIGHT = "25" NAME = "imageg3" SRC = "blank.gif"
536             WIDTH = "25"></TD>
537     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
538         <IMG HEIGHT = "25" NAME = "imageh3" SRC = "blank.gif"
539             WIDTH = "25"></TD>
540     <TD WIDTH = "50" HEIGHT = "25"></TD>
541     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
542         <IMG HEIGHT = "25" NAME = "black10" SRC = "blank.gif"
543             WIDTH = "25"></TD>
544     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
545         <IMG HEIGHT = "25" NAME = "black11" SRC = "blank.gif"
546             WIDTH = "25"></TD>
547 </TR>
548
549 <TR>
550     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
551         <IMG HEIGHT = "25" NAME = "white12" SRC = "blank.gif"
552             WIDTH = "25"></TD>
553     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
554         <IMG HEIGHT = "25" NAME = "white13" SRC = "blank.gif"
555             WIDTH = "25"></TD>
556     <TD WIDTH = "50" HEIGHT = "25"></TD>
557     <TD VALIGN = "center" ALIGN = "right" WIDTH = "25"
558         HEIGHT = "25">2&nbsp; </TD>
559     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
560         <IMG HEIGHT = "25" NAME = "imagea2"
561             SRC = "whitepawn.gif" WIDTH = "25"></TD>
562     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
563         <IMG HEIGHT = "25" NAME = "imageb2"
564             SRC = "whitepawn.gif" WIDTH = "25"></TD>
565     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
566         <IMG HEIGHT = "25" NAME = "imagec2"
567             SRC = "whitepawn.gif" WIDTH = "25"></TD>
568     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
569         <IMG HEIGHT = "25" NAME = "imaged2"
570             SRC = "whitepawn.gif" WIDTH = "25"></TD>
571     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
572         <IMG HEIGHT = "25" NAME = "imagee2"
573             SRC = "whitepawn.gif" WIDTH = "25"></TD>
574     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
575         <IMG HEIGHT = "25" NAME = "imagef2"
576             SRC = "whitepawn.gif" WIDTH = "25"></TD>
577     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">

```

Fig. 28.16 Chess example with the **ScholarMate.xml** file (part 11 of 14).

```

578         <IMG HEIGHT = "25" NAME = "imageg2"
579             SRC = "whitepawn.gif" WIDTH = "25"></TD>
580     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
581         <IMG HEIGHT = "25" NAME = "imageh2"
582             SRC = "whitepawn.gif" WIDTH = "25"></TD>
583     <TD WIDTH = "50" HEIGHT = "25"></TD>
584     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
585         <IMG HEIGHT = "25" NAME = "black12" SRC = "blank.gif"
586             WIDTH = "25"></TD>
587     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
588         <IMG HEIGHT = "25" NAME = "black13" SRC = "blank.gif"
589             WIDTH = "25"></TD>
590 </TR>
591
592 <TR>
593     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
594         <IMG HEIGHT = "25" NAME = "white14" SRC = "blank.gif"
595             WIDTH = "25"></TD>
596     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
597         <IMG HEIGHT = "25" NAME = "white15" SRC = "blank.gif"
598             WIDTH = "25"></TD>
599     <TD WIDTH = "50" HEIGHT = "25"></TD>
600     <TD VALIGN = "center" ALIGN = "right" WIDTH = "25"
601         HEIGHT = "25">1&nbsp; </TD>
602     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
603         <IMG HEIGHT = "25" NAME = "imagea1"
604             SRC = "whiterook.gif" WIDTH = "25" ></TD>
605     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
606         <IMG HEIGHT = "25" NAME = "imageb1"
607             SRC = "whiteknight.gif" WIDTH = "25"></TD>
608     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
609         <IMG HEIGHT = "25" NAME = "imagec1"
610             SRC = "whitebishop.gif" WIDTH = "25"></TD>
611     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
612         <IMG HEIGHT = "25" NAME = "imaged1"
613             SRC = "whitequeen.gif" WIDTH = "25"></TD>
614     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
615         <IMG HEIGHT = "25" NAME = "imagee1"
616             SRC = "whiteking.gif" WIDTH = "25"></TD>
617     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
618         <IMG HEIGHT = "25" NAME = "imagef1"
619             SRC = "whitebishop.gif" WIDTH = "25"></TD>
620     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
621         <IMG HEIGHT = "25" NAME = "imageg1"
622             SRC = "whiteknight.gif" WIDTH = "25"></TD>
623     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#eeeeaa">
624         <IMG HEIGHT = "25" NAME = "imageh1"
625             SRC = "whiterook.gif" WIDTH = "25"></TD>
626     <TD WIDTH = "50" HEIGHT = "25"></TD>
627     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">
628         <IMG HEIGHT = "25" NAME = "black14" SRC = "blank.gif"
629             WIDTH = "25"></TD>
630     <TD WIDTH = "25" HEIGHT = "25" BGCOLOR = "#d26900">

```

Fig. 28.16 Chess example with the **ScholarMate.xml** file (part 12 of 14).

```

631         <IMG HEIGHT = "25" NAME = "black15" SRC = "blank.gif"
632             WIDTH = "25"></TD>
633     </TR>
634
635     <TR>
636         <TD WIDTH = "25" HEIGHT = "25"></TD>
637         <TD WIDTH = "25" HEIGHT = "25"></TD>
638         <TD WIDTH = "50" HEIGHT = "25"></TD>
639         <TD VALIGN = "top" ALIGN = "middle" WIDTH = "25"
640             HEIGHT = "25"></TD>
641         <TD WIDTH = "25" HEIGHT = "25" VALIGN = "top"
642             ALIGN = "middle">a</TD>
643         <TD WIDTH = "25" HEIGHT = "25" VALIGN = "top"
644             ALIGN = "middle">b</TD>
645         <TD WIDTH = "25" HEIGHT = "25" VALIGN = "top"
646             ALIGN = "middle">c</TD>
647         <TD WIDTH = "25" HEIGHT = "25" VALIGN = "top"
648             ALIGN = "middle">d</TD>
649         <TD WIDTH = "25" HEIGHT = "25" VALIGN = "top"
650             ALIGN = "middle">e</TD>
651         <TD WIDTH = "25" HEIGHT = "25" VALIGN = "top"
652             ALIGN = "middle">f</TD>
653         <TD WIDTH = "25" HEIGHT = "25" VALIGN = "top"
654             ALIGN = "middle">g</TD>
655         <TD WIDTH = "25" HEIGHT = "25" VALIGN = "top"
656             ALIGN = "middle">h</TD>
657         <TD WIDTH = "50" HEIGHT = "25"></TD>
658         <TD WIDTH = "25" HEIGHT = "25"></TD>
659         <TD WIDTH = "25" HEIGHT = "25"></TD>
660     </TR>
661 </TABLE>
662 </DIV>
663 </DIV>
664
665 <BR>
666
667 <DIV ALIGN = "center">
668     <TABLE BORDER = "1" CELLSPACING = "0" CELLPADDING = "2">
669         <TR>
670             <TD WIDTH = "50" ALIGN = "middle"><B><FONT SIZE = "2">
671                 Turn</FONT></B></TD>
672             <TD WIDTH = "50" ALIGN = "middle"><B><FONT SIZE = "2">
673                 Piece</FONT></B></TD>
674             <TD WIDTH = "50" ALIGN = "middle"><B><FONT SIZE = "2">
675                 From</FONT></B></TD>
676             <TD WIDTH = "50" ALIGN = "middle"><B><FONT SIZE = "2">
677                 To</FONT></B></TD>
678             <TD WIDTH = "50" ALIGN = "middle"><B><FONT SIZE = "2">
679                 Flag</FONT></B></TD>
680         </TR>
681
682         <TR>
683             <TD WIDTH = "50" ALIGN = "middle" ID = "infoTurn">

```

Fig. 28.16 Chess example with the **ScholarMate.xml** file (part 13 of 14).



```
1 <?xml version = "1.0"?>
2
3 <!-- Fig. 28.17: ScholarMate.xml -->
4
5 <game>
6   <info>Scholar Mate</info>
7   <moves>
8
9     <move turn = "1" player = "white" piece = "P">
10      <from x = "e" y = "2"/>
11      <to x = "e" y = "3"/>
12      <flag></flag>
13    </move>
14
15    <move turn = "1" player = "black" piece = "P">
16      <from x = "e" y = "7"/>
17      <to x = "e" y = "5"/>
18      <flag></flag>
19    </move>
20
21    <move turn = "2" player = "white" piece = "B">
22      <from x = "f" y = "1"/>
23      <to x = "c" y = "4"/>
24      <flag></flag>
25    </move>
26
27    <move turn = "2" player = "black" piece = "P">
28      <from x = "h" y = "7"/>
29      <to x = "h" y = "6"/>
30      <flag>?</flag>
31    </move>
32
33    <move turn = "3" player = "white" piece = "Q">
34      <from x = "d" y = "1"/>
35      <to x = "h" y = "5"/>
36      <flag></flag>
37    </move>
38
39    <move turn = "3" player = "black" piece = "P">
40      <from x = "a" y = "7"/>
41      <to x = "a" y = "5"/>
42      <flag>??</flag>
43    </move>
44
45    <move turn = "4" player = "white" piece = "Q">
46      <from x = "h" y = "5"/>
47      <to x = "f" y = "7"/>
48      <flag>x#</flag>
49    </move>
50
51   </moves>
52 </game>
```

Fig. 28.17 XML file that describes a sequence of chess moves.