

# XML

vs. JSON, YAML, TOML, etc.

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Lecture #7 out of 16

80 minutes

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Extensible Markup Language (XML)

XSD, XPath, XSLT, XQuery, etc.

JavaScript Object Notation (JSON)

YAML, TOML, CSV

Books, Venues, Call-to-Action

Chapter #1:

# Extensible Markup Language (XML)

## Library in XML

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <library>
3   <book id="42">
4     <author>David West</author>
5     <title>Object Thinking</title>
6   </book>
7   <book id='43'>
8     <author>Martin Fowler</author>
9     <title>Refactoring</title>
10  </book>
11 </library>
```

## Namespaces

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <library xmlns="https://innopolis.university/ssd16"
3   xmlns:a="https://www.amazon.com"
4   xmlns:t="https://www.twitter.com">
5   <book id="42">
6     <a:dp>0134757599</a:dp>
7     <t:author>@martinfowler</t:author>
8     <author>Martin Fowler</author>
9     <title>Refactoring</title>
10  </book>
11 </library>
```

## Escaping

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <formulas>
3   <f title='Fibonacci&apos;s'> <!-- Fibonacci's -->
4     <e>if x &lt; 2 return x</e> <!-- if x < 2 return x -->
5     <e>else return f(x-1) + f(x-2)</e>
6   </f>
7 </formulas>
```

[ XML Namespaces Escaping [Formats](#) ]



[https://en.wikipedia.org/wiki/Category:XML-based\\_standards](https://en.wikipedia.org/wiki/Category:XML-based_standards) →

## XML Based Formats/Protocols

SOAP, RSS, Atom, SVG, XHTML, HTML5,  
Open Office XML, XMPP,  
SyncML, RDF, XMI, XMIR :)

Chapter #2:

XSD, XPath, XSLT, XQuery, etc.



## XML Schema Definition (XSD)

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
3   <xs:complexType name="book">
4     <xs:sequence>
5       <xs:element name="author" minOccurs="1" maxOccurs="1"/>
6       <xs:element name="title" minOccurs="1" maxOccurs="1"/>
7     </xs:sequence>
8     <xs:attribute name="id" type="xs:decimal"/>
9   </xs:complexType>
10  <xs:element name="library">
11    <xs:complexType>
12      <xs:sequence>
13        <xs:element name="book" type="book" minOccurs="0"/>
14      </xs:sequence>
15    </xs:complexType>
16  </xs:element>
17 </xs:schema>
```

## XML Path Language (XPath)

```
<library><book id=42><author>David West</..></..></..>
```

```
/library/book[@id='42']
```

```
//book[@id='42']
```

```
//book[first()]
```

```
//book[author='David West']
```

```
//book[author[text()='David West']]
```

## XSL Transformations (XSLT)

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <xsl:stylesheet version="2.0"
3   xmlns:xsl="http://www.w3.org/1999/XSL/Transform">
4   <xsl:template match="book">
5     <item>
6       <xsl:value-of select="title"/>
7       <xsl:text> by </xsl:text>
8       <xsl:value-of select="title"/>
9     </item>
10  </xsl:template>
11  <xsl:template match="node()|@*">
12    <xsl:copy>
13      <xsl:apply-templates select="node()|@*" />
14    </xsl:copy>
15  </xsl:template>
16 </xsl:stylesheet>
```

Chapter #3:

# JavaScript Object Notation (JSON)

## JSON for the Library

```
1 [
2   {
3     "author": "David West",
4     "id": 42,
5     "title": "Object Thinking"
6   },
7   {
8     "author": "Martin Fowler",
9     "id": 43,
10    "title": "Refactoring"
11  }
12 ]
```



<https://www.yegor256.com/2015/11/16/json-vs-xml.html> ➞

## JSON to JavaScript Object and Backwards

```
var a = JSON.parse('{"age": 25}').age;
```

```
JSON.stringify({age: 25});
```

Chapter #4:

**YAML, TOML, CSV**

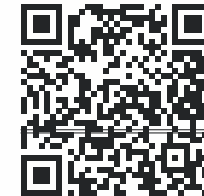
## Yet Another Markup Language (YAML)

```
1 library:
2   - id: 42
3     author: David West
4     title: Object Thinking
5   - id: 43
6     author: Martin Fowler
7     title: Refactoring
```



## TOML

```
1 [library.a]
2   id = 42
3   author = "David West"
4   title = "Object Thinking"
5 [library.b]
6   id = 43
7   author = "Martin Fowler"
8   title = "Refactoring"
```



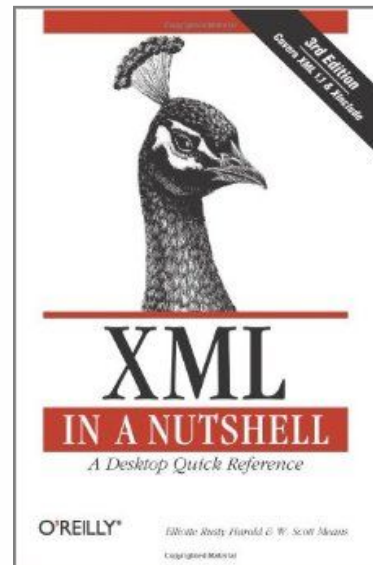
[https://en.wikipedia.org/wiki/List\\_of\\_file\\_formats](https://en.wikipedia.org/wiki/List_of_file_formats) ➞

## Comma-Separated Values (CSV)

```
1 Id,Author,Title
2 42,David West,Object Thinking
3 43,"Martin Fowler","Refactoring"
```

Chapter #5:

## Books, Venues, Call-to-Action



Elliotte Rusty Harold and W. Scott Means. *XML in a Nutshell: A Desktop Quick Reference*. O'Reilly Media, 2000. doi:[10.5555/557805](https://doi.org/10.5555/557805)



Michael Fitzgerald. *Learning XSLT: A Hands-on Introduction to XSLT and XPath*. O'Reilly Media, 2003

### Call to Action:

In your application, make sure your data is represented in XML, at least in one place, and being transformed by XSLT.

Design your own data format.

### Still unresolved issues:

- How to map XML/JSON to objects?
- How to print object to XML/JSON?
- How to create a common binary format?
- How to restore the popularity of XSLT?

# Bibliography

Michael Fitzgerald. *Learning XSLT: A Hands-on Introduction to XSLT and XPath*. O'Reilly Media, 2003.

Elliote Rusty Harold and W. Scott Means. *XML in a Nutshell: A Desktop Quick Reference*. O'Reilly Media, 2000. doi:[10.5555/557805](#).