Introduction to XML

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Before we begin

Launch <oXygen/>

If you haven't yet installed <oXygen/>:

- Go to http://www.oxygenxml.com
- Download and install
- Follow instructions to request free 30-day evaluation license

Session 1: Introduction to XML

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Outline

Sample projects

- Manuscript description: Repertorium
- Manuscript transcription: Codex Suprasliensis

XML and text

- Overview
- Pseudo-markup and markup
- Elements
- Attributes
- Well-formedness

The creation of a digital text

Editing XML in <oXygen/>

Hands-on practice editing XML

Sample projects

Manuscript description

- Repertorium of Old Bulgarian literature and letters
- Institute of Literature, Bulgarian Academy of Sciences
- http://repertorium.obdurodon.org

Codex Suprasliensis

- Institute of Literature, BAS
- http://suprasliensis.obdurodon.org (edition)
- http://csup.ilit.bas.bg/ (project)

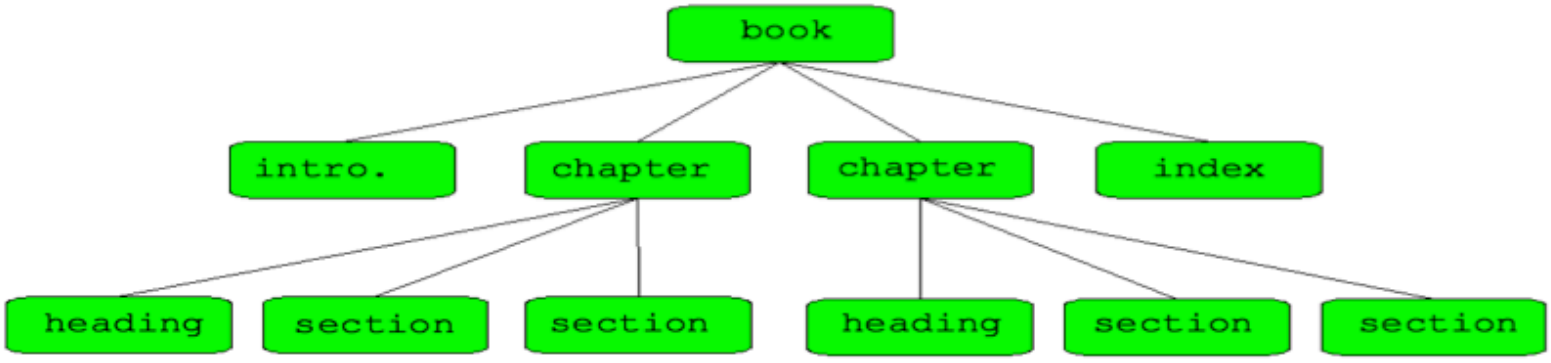
Overview

OHCO: ordered hierarchy of content objects

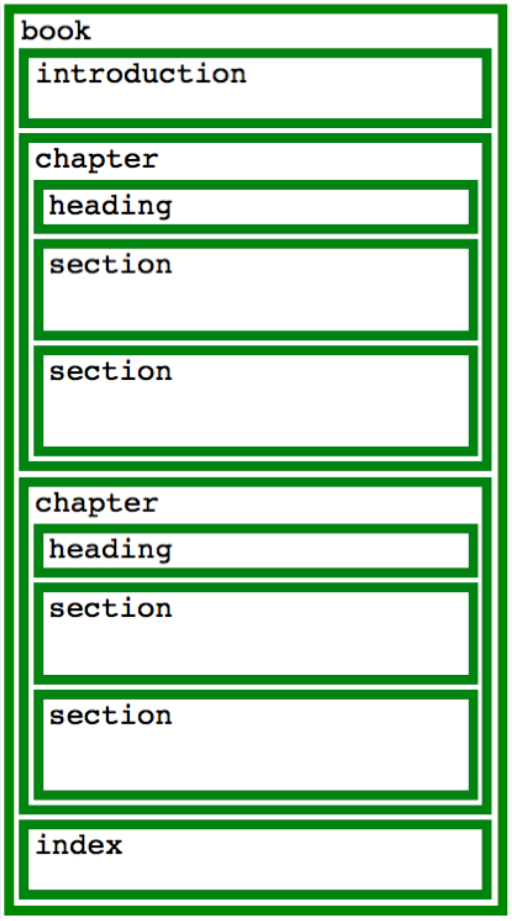
Three views of XML

- Tree (hierarchy of objects)
- Nested boxes (objects contain other objects)
- Serialization (string of characters)

1. Tree (hierarchy of objects)



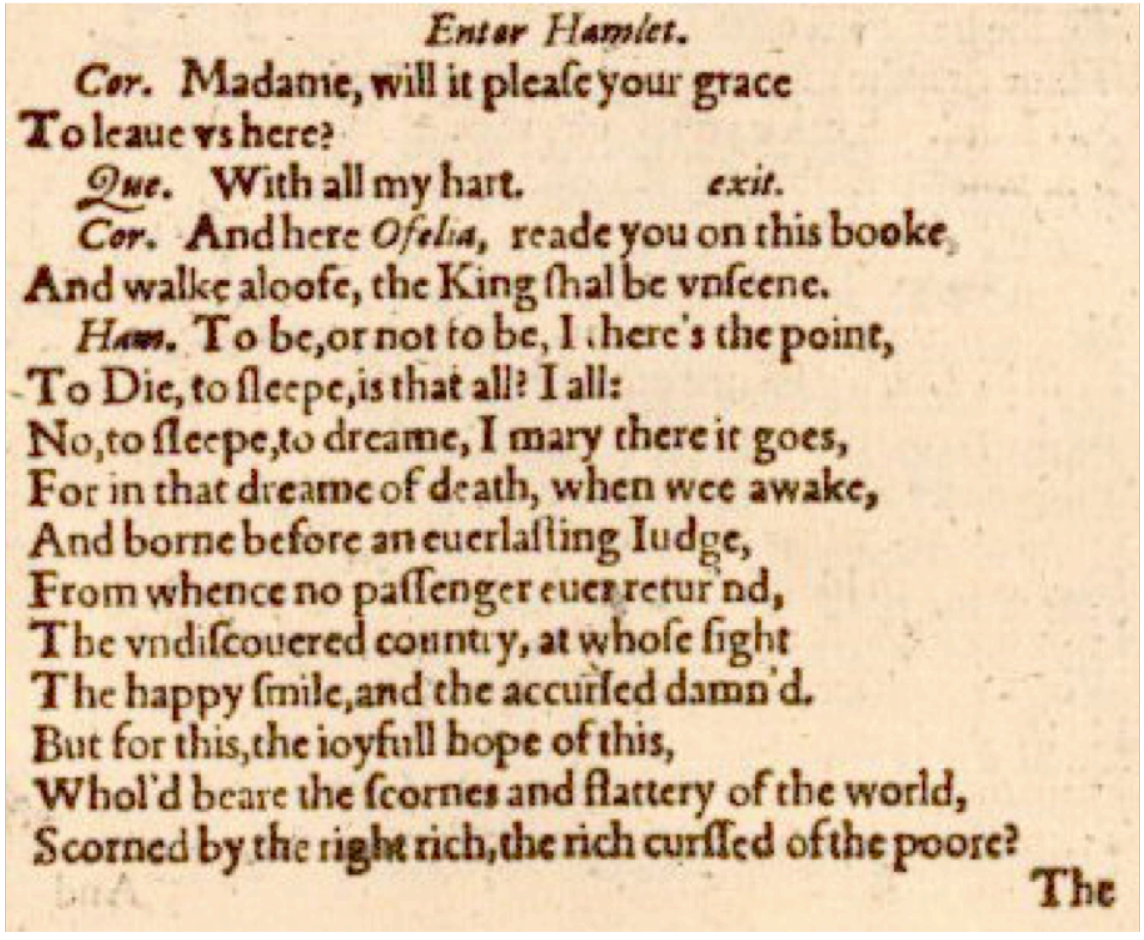
2. Nested boxes (objects contain other objects)



3. Serialization (string of characters)

```
<book>
  <introduction> …</introduction>
  <chapter>
    <heading> …</heading>
    <section> …</section>
    <section> …</section>
  </chapter>
  <chapter>
    <heading> …</heading>
    <section> …</section>
    <section> …</section>
  </chapter>
  <index> …</index>
</book>
```

Hamlet, First quarto, 1603



Enter Hamlet.

Cor. Madame, will it pleaſe your grace
To leaue vs here?

Que. With all my hart. *exit.*

Cor. And here *Ofelia*, reade you on this booke,
And walke aloofe, the King ſhal be vnſeene.

Ham. To be, or not to be, I there's the point,
To Die, to ſleepe, is that all? I all:
No, to ſleepe, to dreame, I mary there it goes,
For in that dreame of death, when wee awake,
And borne before an euerlaſting Iudge,
From whence no paſſenger euer retur nd,
The vndiſcouered country, at whoſe ſight
The happy ſmile, and the accurſed damn'd.
But for this, the ioyfull hope of this,
Whol'd beare the ſcornes and flattery of the world,
Scorned by the right rich, the rich curſſed of the poore?

The

Enter Hamlet.
Cor. Madame, will it please your grace
To leaue vs here?
Que. With all my hart. *exit.*
Cor. And here Ofelia, reade you on this booke,
And walke aloofe, the King shal be vnseene.
Ham. To be, or not to be, I here's the point,
To Die, to sleepe, is that all? I all:
No, to sleepe, to dreame, I mary there it goes,
For in that dreame of death, when wee awake,
And borne before an euerlasting Iudge,
From whence no passenger euer retur'nd,
The vndiscouered country, at whose sight
The happy smile, and the accursed damn'd.
But for this, the ioyfull hope of this,
Whol'd beare the scornes and flattery of the world,
Scorned by the right rich, the rich cursed of the poore?
The

Pseudo-markup

Hamlet

- Stage directions
- Speeches
- Speakers
- Other characters
- Metrical lines

General

- Paragraph spacing and indentation
- Centering and bolding of titles
- Hanging indentation for bibliographic lists
- Italics for emphasis, foreign words, book titles, etc.

The XML view of content and markup

Content is the textual data

- Transcribed from source (e.g., a manuscript)
- Created by the editor (e.g., manuscript catalogue)

Markup describes the role of different data components

No *pseudo markup* in your content

- No editorial parentheses, square brackets, angle brackets, slashes and backslashes, italics, etc.

XML building blocks

Textual (character data) content

Elements

- Structural components of the document

Attributes

- Properties of elements

Elements

Elements have matching start and end tags

- <title> … <title/>

Some elements are empty and self-closing, e.g., <bookmark/>

Element names must begin with a letter and may contain letters, digits, and underscores (no spaces; no other punctuation)

- Underscore: <personal_name>
- Camel case: <personalName>

Attribute names have the same contraints as element names

The “X” in XML

eXtensible Markup Language

- The user determines the tag set
- Pro: you determine how to characterize your data
- Con: you are responsible for determining how to characterize your data

You decide

- What to tag
- How to tag it (what to call it)

Three types of markup

Descriptive: what the object is

- E.g., emphasized
- yes!

Presentational: what the object looks like

- E.g., italicized
- yes!

Procedural

- What the machine should do
- E.g., unload the Roman font film strip and load the italic one

Why Digital Humanities projects use descriptive markup

Same formatting may represent various semantics

- Italics: emphasis, foreign, book title, etc.

Same semantics may be formatted variously

- Emphasis: italic, bold, loud (audio device), etc.

Separation of levels: content and presentation

- Encode descriptively
- Transform to presentational final form for rendering (HTML, PDF, etc.)

Multipurposing

- Format the same content objects in different ways for different purposes

Texts and trees

Why XML looks at texts as trees

- Computers can traverse trees quickly
- Documents *are* hierarchical, right?

Hierarchical challenges

- Multiple, overlapping hierarchies
  - Physical hierarchy: folios, lines
  - Intellectual hierarchy: texts (with subelements: chapters, sections, paragraphs, etc.)
- Relationships at a distance
  - Cross-references and other internal pointers
  - References and pointers to other (external) documents

Attributes

Qualifying information about elements

Encoded inside the start tag, after the element name

- Attribute name="value" pair
- <place xml:lang="fr">Paris</place>
- <title type="journal">Scripta & e-Scripta</title>

Attribute names are subject to the same rules as element names

Attribute values must be quoted (matching single or double straight quotation marks)

An XML document must be *well-formed*

Single root element

Proper nesting (no overlapping tags)

- Good: <foreign>oui!</foreign>
- Bad: <foreign>oui!</foreign>

Name and name start characters for element and attribute names

Attribute values must be quoted (single or double)

Reserved characters must be encoded as entities

- & = &
- < = <
- > = >

Indentation is for human convenience

Sample

```
<book>
  <author>Michael Kay</author>
  <title   edition="4">XSLT 2.0 and XPath 2.0 Programmer's Reference</title>
  <published   date="2008">
    <publisher>John Wiley & Sons, Inc.</publisher>
    <pubPlace>10475 Crosspoint Boulevard, Indianapolis, IN 46256</pubPlace>
  </published>
  <ISBN   num="978-0-470-19274-0"/>
  <dedication>
    <i>
      <b>To Anyone Who Uses This Book To Make the World a Better Place</b>
    </i>
  </dedication>
</book>
```

What's wrong?

```
<author>Michael Kay</author>
<title edition = 4>XSLT 2.0 and XPath 2.0
   Programmer's Reference</title>
<published date = 2008>
   <publisher>John Wiley & Sons, Inc.<publisher>
   <pubPlace>10475 Crosspoint Boulevard, Indianapolis,
    IN 46256</pubPlace>
</published>
<ISBN num="978-0-470-19274-0">
<dedication>
   <i><b>To Anyone Who Uses This Book
   To Make the World a Better Place</i></b>
</dedication>
```

Creating a digital text

In theory

- Document analysis, then …
- Schema development, then …
- Markup

In practice

- The preceding is a cycle, and not a sequence
- Markup is part of the process of document analysis

Nonetheless

- Start with document analysis, not with angle brackets

Why use an XML editor?

<oXygen/> (http://www.oxygenxml.com)

XML-aware

- Real-time and on-demand validation
- Completion hinting
- Multiple views
- (Schema-aware … stay tuned)

IDE (integrated development environment)

- XSLT (eXtensible stylesheet language transformations)
- Debugger
- Other development tools

Editing XML in <oXygen/>, p. 1

Create a new file

- File -> New -> New document -> XML document
- Short cuts: Ctrl+n; leftmost icon at top of screen

Create an element

- Type a start tag (in angle brackets)
- <oXygen/> automatically creates the matching end tag

Change an element

- Change the start tag; the end tag changes automatically to match

Editing XML in <oXygen/>, p. 2

Wrap text in an element

- Select the text, type Ctrl+e (for ‘element’), type the element name
- To use the same wrapper as last time, select and type Ctrl+/

Split an element

- Put the cursor at the split point and type Shift+Alt+d

Pretty-print (wrap) the text

- Shift +Ctrl+p; pretty-print (indentation) icon

Hands on

- Choose a document with a regular structure
- Copy into a new XML document in <oXygen/>
- Mark it up in XML

Choose a document with a regular structure

Google a recipe for your favorite food

Find a menu from your favorite restaurant

Encode a letter by Oscar Wilde
http://law2.umkc.edu/faculty/projects/ftrials/wilde/lettersfromwilde.html

Encode a sonnet by William Shakespeare
http://www.shakespeares-sonnets.com/all.php

… or choose your own text

Copy into a new XML document in <oXygen/>

- Select all of the text (Ctrl+a, or use the mouse)
- Copy (Ctrl+c)
- Open a new document in <oXygen/> (Ctrl+n, select “XML document”)
- Paste (Ctrl+v)

Mark it up in XML

- Imagine a research or other context where you're marking up your text for a reason
- Identify and tag *major structural components*
- Identify and tag *small, in-line items* that might be useful