The term "**XML**" **is used to mean**

- An open standard (a W3C Recommendation) that provides
  – a data format
  – a data modeling language
- The use of XML-formatted data in an application (like a browser)
- A meta-language for creating markup languages
- A set of associated recommendations and specifications (style, transformation, query, link, APIs, etc.)

XML Is Not

- A programming language (does not replace C++, Java, Perl, Python, ...)
- A user interface
- A presentation format
- A formatting or processing system
- A standard set of tags
- A recommended set of tags

Why Use XML?

- Encode (mark up) data only once
- Produce many products from that markup
- Enable semantically complex searching
- Reuse data (in whole or part) many times
- Interchange data freely
- Enable machine-to-machine communication
- Let whole communities agree on data content
- Preserve data for a long time

XML Elements

An element is an identifiable, named component of a document (paragraph, author's name, article title, unit price, bulleted list)

- Can have content (data, other elements)
- Can be a pointer to information (hypertext link, table reference)
- Must be contiguous (one start and one end)

Elements Identify Content

(No limit to the number of possible elements)

Structure	What part of the document? (article, title, paragraph, list, footnote)
Metadata	About the document (issue number, first page, article title, DOI, journal abbreviation)
Named content	What is this text/data? (genus-species, surname, glossary, gene, question and answer)
Navigation/Links	Value-added for searching/linking (bibliographic citations; links to other articles, index terms, related material; figure references)
Presentation	How text should look (typographic emphasis, superscript, forced line breaks)

XML Documents

- In XML jargon, your data (no matter what form) is called a "document", "document instance" or just "instance"
- A document is a coherent, ordered collection of information, such as
  – journal article
  – invoice
  – reference book
  – chapter in a reference book
  – sales catalog
  – drug monograph

Editing XML Documents

XML Files are

- "plain text" underneath
  – use any text editor or any word processor that can handle plain text
  – built on Unicode (represents all major scripts of the world)
- "human readable"
- machine processable

XML separates content from format/behavior

XML does not say

  – how it looks (16 point Helvetica Bold)
  – what it does (starts a Javascript)

A specification must provide format mapping (usually called a stylesheet, display specification, or output spec)

Stylesheets

- One stylesheet, many documents
  – maintains consistency of format ("look and feel") across documents
  – is easy to develop, maintain, and apply (house style)
- One document, many stylesheets
  – allows for different media types: print, on-line, etc.
  – is easy to produce derivative documents: selections, summaries, indexes, catalogs, ...

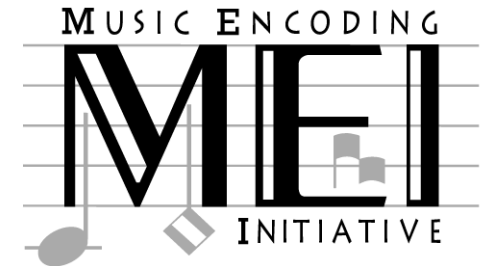**You (and Your Software) Can Do a Lot with XML**

- Make formatted documents
- Make web sites
- Make spin-off, sub-set, and superset documents
- Make rich search and discovery tools, such as detailed indices and navigable tables of contents
- Archive content for re-use
- Internationalization and localization

Example of MEI XML


```
<score>
  <scoredef>
    <staffgrp>
      <staffdef n="1" lines="5"
clef.line="2" clef.shape="G" ppq="4"
key.sig="1f" key.mode="major"/>
      <staffdef n="2" lines="5"
clef.line="4" clef.shape="F" ppq="4"
key.sig="1f" key.mode="major"/>
    </staffgrp>
  </scoredef>
  <section>
    <scoredef meter.count="2"
meter.unit="4" key.sig="1f"
key.mode="major"/>
    <measure n="1" xml:id="d1e67">
      <staff n="1">
        <layer n="1">
          <beam>
            <note xml:id="d1e113" tstamp="0"
pname="c" oct="6" dur="16" dur.ges="1"
stem.dir="up"/>
            <note xml:id="d1e133" tstamp="1"
pname="a" oct="5" dur="16" dur.ges="1"
stem.dir="up"/>
            <note xml:id="d1e153" tstamp="2"
pname="g" oct="5" dur="16" dur.ges="1"
stem.dir="up"/>
            <note xml:id="d1e173" tstamp="3"
pname="f" oct="5" dur="16" dur.ges="1"
tie="i" stem.dir="up"/>
          </beam>
          <beam>
            <note xml:id="d1e196" tstamp="4"
pname="f" oct="5" dur="16" dur.ges="1"
tie="t" stem.dir="up"/>
            <note xml:id="d1e219" tstamp="5"
pname="a" oct="5" dur="16" dur.ges="1"
stem.dir="up"/>
            <note xml:id="d1e239" tstamp="6"
pname="g" oct="5" dur="16" dur.ges="1"
stem.dir="up"/>
            <note xml:id="d1e259" tstamp="7"
pname="f" oct="5" dur="16" dur.ges="1"
stem.dir="up"/>
          </beam>
        </layer>
...
```

MUSIC ENCODING MEI INITIATIVE

What is XML?

Adapted from "What is XML and Why Should You Care? " by permission of

Mulberry Technologies, Inc.

www.mulberrytech.com