HTML, SGML, and XML

January 29, 2009

1 Modern HTML Documents with Math

- Lamport's `"sample2e.tex"` (PDF) (Source) (Lamport's example).

- A calculus handout (PDF) (Source)

- An algebra problem solution handout (PDF) (Source)

- Article from *The New Journal of Mathematics*

2 Picture of HTML with math as bitmap images

from `http://www.ams.org/featurecolumn/archive/pagerank.html`

works. We may write our initial vector I^0 as

$$I^0 = c_1 v_1 + c_2 v_2 + \ldots + c_n v_n$$

Then

$$
\begin{aligned}
I^1 = \mathbf{S}I^0 &= c_1 v_1 + c_2 \lambda_2 v_2 + \ldots + c_n \lambda_n v_n \\
I^2 = \mathbf{S}I^1 &= c_1 v_1 + c_2 \lambda_2^2 v_2 + \ldots + c_n \lambda_n^2 v_n \\
\vdots \quad &\quad \vdots \\
I^k = \mathbf{S}I^{k-1} &= c_1 v_1 + c_2 \lambda_2^k v_2 + \ldots + c_n \lambda_n^k v_n
\end{aligned}
$$

Since the eigenvalues λ_j with $j \geq 2$ have magnitude smaller than one, it follows that $\lambda_j^k \to 0$ if $j \geq 2$ and therefore $I^k \to I = c_1 v_1$, an eigenvector corresponding to the eigenvalue 1.

3 Previous segment using HTML with MathML

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4 A Basic Diagram

$$
\begin{array}{rcl}
 & & \{\text{All Markup Languages}\} \\
 & & \cup \\
\text{HTML} & \in & \{\text{SGML Document Types}\} \\
 & & \cup \\
\text{XHTML} & \in & \{\text{XML Document Types}\}
\end{array}
$$

5 SGML

- Abbreviation for
  "Standard Generalized Markup Language"

- International Standards Organization
  ISO 8879 [1986]

- Principal Reference:

  Charles F. Goldfarb, *The SGML Handbook*,
  Clarendon Press, Oxford, 1990.

6 Advantage of Using SGML

To mark up a document under an SGML document type is to place it under a template for processing by many different programs.

7 Transformations can be Chained

One form of processing is translation from one document type to another. These transformations can be chained. (Analogous to composition of functions.)

8 The Importance of Validation

- For processing of an SGML document to be reliable the document must be structurally correct.

- To ensure structural correctness one may subject a document to a validating parse.

- When chaining transformations between SGML document types, one should validate at each stage in order to protect the integrity of the whole chained process.

9 XML Document Types

- Every XML document type is canonically equivalent to an SGML document type.

- XML is essentially SGML with various restrictions.

- Only XML document types should be served on the web. (Classical HTML is an exception.)

- There is substantially more software capable of handling XML document types than is capable of handling typical SGML document types that are not XML.

10 More Information on SGML

In particular see General Information about XML and SGML, which is also available in PDF format for printing.

11 A First Example

This is a first example.

- The body of an SGML document[1]
- Its document type definition[2]
- Parse of the document in "ESIS" format[3]

12 Acknowledgement

The XHTML + MathML version of these slides uses W3C's *Slidy* by Dave Raggett, a JavaScript/CSS package for sizing and flow control of an HTML or XHTML slide show.
(The slides were generated in a non-standard fashion from GELLMU source.)

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[1]URI: http://math.albany.edu/pers/hammond/course/uslxh/ctg/tinc-sgml.txt
[2]URI: http://math.albany.edu/pers/hammond/course/uslxh/ctg/art-dtd.txt
[3]URI: http://math.albany.edu/pers/hammond/course/uslxh/ctg/tinc-esis.txt