Intro to Computer Science and Software Engineering

HTTP and WWW

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HTTP and WWW

- Hypertext Transfer Protocol (HTTP) is a client-server program that is used to access and transfer documents on the World Wide Web.

- Uniform Resource Locator (URL)
  - Addressing a document on WWW.

- WWW (World Wide Web)
  - Hypertext documents (static, dynamic and active)
  - Links (to form a Web)
  - Browsers

WWW

The Web

An infrastructure of information combined and the network software used to access it

Web page

A document that contains or references various kinds of data

Links A connection between one web page and another

What are the links used for?

WWW

Website

A collection of related web pages

Web browser

A software tool that retrieves and displays eb pages

Web server

A computer set up to respond to requests for web pages

WWW

Uniform Resource Locator (URL)

A standard way of specifying the location of a Web page, containing the hostname, "/", and a file
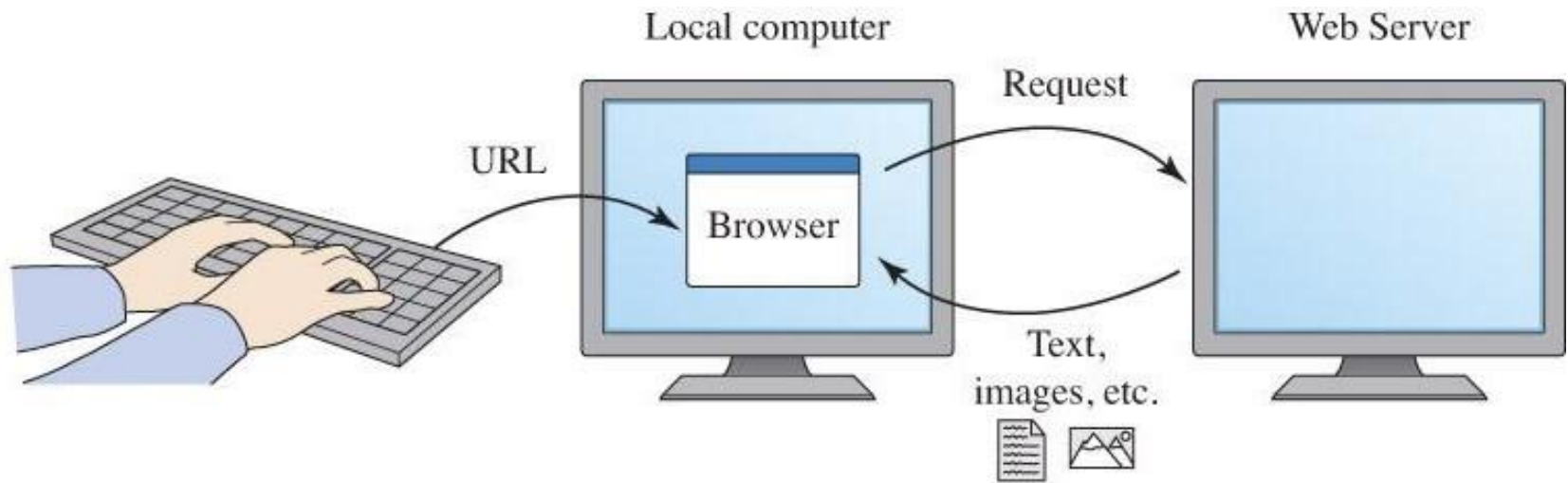

Figure **A browser retrievinga Web page**

What is the relationship between the Internet and the Web?

Search Engines

Search Engine

A website that helps you find other websites

Can you name at least two?

How do they work?

Instant Messaging

Instant messaging (IM)

An application that allows people to send and receive messages in real time

- Both sender and receiver must have an IM running
- Most IM applications use a proprietary protocol that dictates the precise format and structure of the messages sent
- Instant messages are **not** secure

Weblogs

Blog or Weblog

An online journal or newsletter that is frequently updated and intended for public consumption

> *Do you have a blog?*
>
> *Do you read blogs?*

Cookies

Cookie

A small text file that a web server stores on your local computer's hard disk

- A cookie contains information about your visit to the site
- Cookies can be used
  - to determine number of unique visitors to the site
  - to customize the site for future visits
  - to implement shopping carts that can be maintained from visit to visit
- Cookies are **not** dangerous

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HTML

Hypertext Markup Language (HTML)

The language used to create or build a Web page

Markup language

A language that uses tags to annotate the information in a document

Tags

The syntactic element in a markup language that indicates how information should be displayed

HTML

Final Report
European Conference on Expert Systems
boldface
Submitted by Justin Parker
Center

First of all, our thanks go out to the following sponsors for their support of the conference and its supplemental activities.

Allied Interactive
Sybernetics, Inc.
Dynamic Solutions of New Jersey
make these bullets

!

The conference was a great success. It ran a full four days, including workshops and special sessions. Subjective feedback from conference attendees was largely positive, and financially the revenues resulted in a surplus of over $10,000.

Figure **A marked-up document**

HTML

Figure The Student Dynamics Web page as displayed in Netscape Navigator

HTML

```html
<HTML>
    <HEAD>
        <TITLE>Student Dynamics</TITLE>
    </HEAD>
    <BODY>
        <CENTER><IMG SRC="stuDynamics.gif"></CENTER>
        <HR>
        <CENTER><I>A student-based community organization.</I></CENTER>
        <HR>
        <P>Plan to participate in our upcoming events:</P>
        <UL>
            <LI>Visit Children's Hospital (March 23)</LI>
            <LI>Help clean renovated school grounds (April 4)</LI>
            <LI>Continue the <a href="outreach.html">K-12 outreach
                program.</a> <IMG SRC="updated.gif"></LI>
        </UL>
        <P><B><I>You should be involved!</B></I> Help our active and
            energetic team make a difference in the lives of people. Our
            <a href="execBoard.html">executive board</a> is always willing
            to answer any questions you may have.</P>
        <P>How can we help you? What suggestions do you have regarding
            new activities? <a href="suggestions.html">Let us know!</a></P>
        <P>We are always in need of donations: equipment, money, or
            (better yet) you!</P>
        <CENTER><H3>Join us for our Spring Picnic in May!</H3></CENTER>
    </BODY>
</HTML>
```
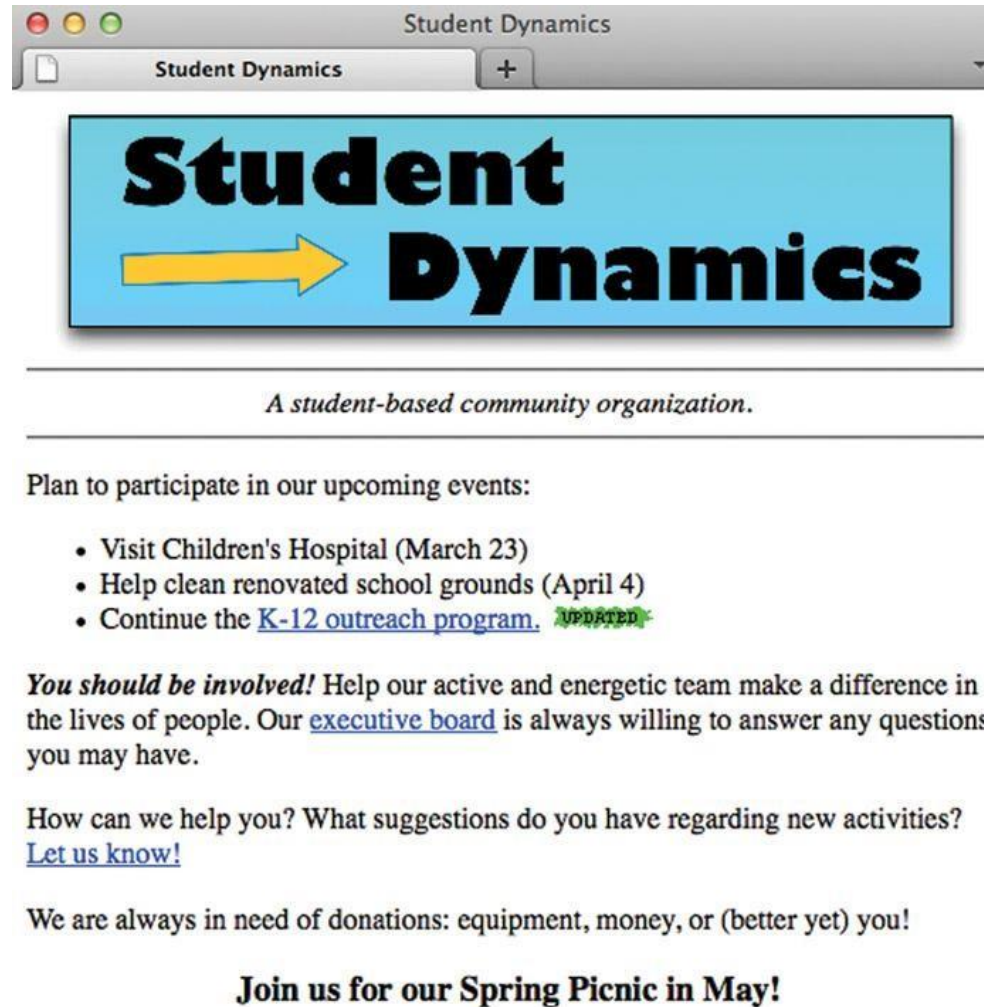
Figure The HTML document defining the Student Dynamics Web page

HTML

Tags are enclosed in angle brackets (<. . . >).

Words such as HEAD, TITLE, and BODY are called **elements** and specify the type of the tag Tags are often used in pairs, with a start tag such as <BODY> and a corresponding end tag with a / before the element name, such as </BODY>

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HTML

The browser determines how the page should be displayed based on the tags

The browser

- Ignores the way we format the HTML document using carriage returns, extra spaces, and blank lines

- Takes into account the width and height of the browser window

- Reformats the contents to fit your browser window

Basic HTML Formatting

\<P> . . . \</P> specify that text should be treated as a separate paragraph

\<CENTER> . . . \</CENTER> center information in the browser window

\<B>…\</B> bold information

\<I>…\</I> italicize information

\<HR> insert horizontal rule across page

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Basic HTML Formatting

<UL>…</UL> unordered list

<LI>…</LI> list item

<H1>…</H1> information as H1 head

…

<H8>…</H8> information as H8 head

Image and Links

Attribute

Part of a tag that provides additional information about the element

```
attribute-name = value
```

```
<IMG SRC = "myPicture.gif">
```

inserts the image stored in file "myPicture.gif"

Image and Links

A link is specified using the element A, (which stands for anchor) and attribute HREF that specifies the URL of the destination document.

<P><A
HREF="http://www.cs.utexas.edu/users/ndale/labs/factorial/FactByte. htm">Factorial-Byte</A></P>

HTML5

New Tags

<section> to define section of pages

<header> to define the header of a page

<footer> to define the footer of a page

<nav> to define the navigation elements on a page

<article> to define an article or primary content of a page

<aside> to define secondary content that might appear in a sidebar

<figure> to define images that annotate an article

Java Applets

Java applet

A Java program designed to be embedded into an HTML document, transferred over the Web, and executed in a browser

Example

Contents of FactByte.htm:

<H1>Factorial with Byte Result</H1>

<P>Enter increasing values beginning with 0 and record the results of the Factorial of your input. At some point, the answer will seem strange. Record what seems strange about the answer and return to the previous page. </P>

<P><HR></P>

<P><APPLET code = "FactByte.class" width=250 height=150></APPLET></P>

FactByte.class contains the Java applet

Java Server Pages

JSP Scriptlet

A portion of code embedded in an HTML document designed to dynamically contribute to the content of the web page

Java Server Page

A web page that has a JSP scriptlet interwoven among the HTML content

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Java Server Pages

A JSP scriptlet is encased in special tags beginning with <% and ending with %>

Imagine JSP scriptlets as having the expressive power of a full programming language

```
<H3>
<%
out.println ("hello there");
%>
</H3>
```

Java Server Pages

JSPs are executed on the server side where the web page resides

By the time it arrives at your computer, all active processing has taken place, producing a static (though dynamically created) web page

JSPs are particularly good for coordinating the interaction between a web page and an underlying database

Compare and contrast Java applets and JSP scriptlets

XML

Extensible Markup Language (XML)

A language that allows the user to describe the content of a document

- HTML describes how a document should look
- XML describes a document's meaning

Metalanguage

A language for talking about, or defining, other languages

XML is a metalanguage

XML

```xml
<?xml version="1.0" ?>
<!DOCTYPE books SYSTEM "books.dtd">
<books>
<book>
<title>The Hobbit</title>
<authors>
   <author>J.R.R. Tolkien</author>
</authors>
<publisher>Ballantine</publisher>
<pages>287</pages>
<isbn>0-345-27257-9</isbn>
<price currency="USD">7.95</price>
</book>
<book>
<title>A Beginner's Guide to Bass Fishing</title>
<authors>
   <author>J. T. Angler</author>
   <author>Ross G. Clearwater</author>
</authors>
<publisher>Quantas Publishing</publisher>
<pages>750</pages>
<isbn>0-781-40211-7</isbn>
<price currency="USD">24.00</price>
</book>
</books>
```

Like HTML, an XML document is made up of tagged data

Figure **An XML document containing data about books**

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XML

Document Type Definition (DTD)

A specification of the organization of the document

The structure of a particular XML document is described by its corresponding DTD document

```
<!ELEMENT books (book*) >
<!ELEMENT book (title, authors, publisher, pages, isbn, price)>
<!ELEMENT authors (author+)>
<!ELEMENT title (#PCDATA)>
<!ELEMENT author (#PCDATA)>
<!ELEMENT publisher (#PCDATA)>
<!ELEMENT pages (#PCDATA)>
<!ELEMENT isbn (#PCDATA)>
<!ELEMENT price (#PCDATA)>
<!ATTLIST price currency CDATA #REQUIRED>
```

Figure The DTD document corresponding to the XML books document

XML

XML represents a standard format for organizing data without tying it to any particular type of output

Extensible Stylesheet Language (or XSL)

A language for defining transformations from XML documents to other output formats
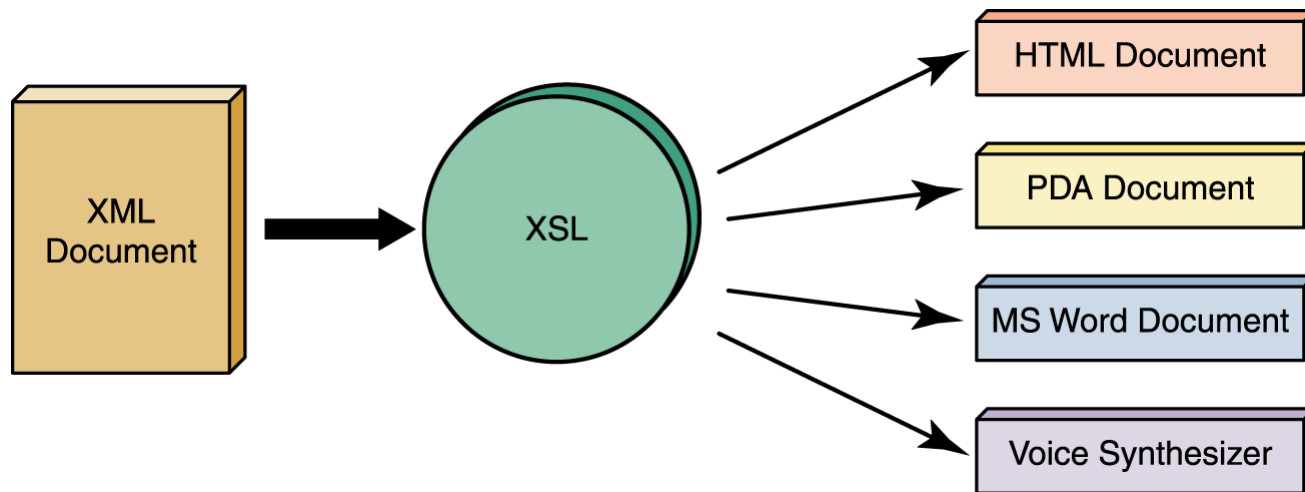

Figure **An XML document can be transformed into many output formats**