Week 1: Introduction to the Internet and World Wide Web

Topic Objectives

- In this topic, you will learn how to . . .
- Describe the evolution of the Internet and the Web
- Explain the need for web standards
- Describe universal design
- Identify benefits of accessible web design
- Identify reliable resources of information on the Web
- Identify ethical use of the Web
- Describe the purpose of web browsers and web servers
- Identify networking protocols
- Define URIs and domain names
- Describe HTML, XHTML, and HTML5 Describe popular trends in the use of the Web

The Internet and the Web

- **The Internet:** The Internet, the interconnected network of computer networks that spans the globe, seems to be everywhere today. It has become part of our lives. You can't watch television or listen to the radio without being urged to visit a website. Even newspapers and magazines have a place on the Internet.

- **Birth of the Internet:** The Internet began as a network to connect computers at research facilities and universities. Messages in this network would travel to their destination by multiple routes, or paths. This configuration allowed the network to function even if parts of it were broken or destroyed. In such an event, the message would be rerouted through a functioning portion of the network while traveling to its destination. This network was developed by the Advanced Research Projects Agency (ARPA)—and the ARPAnet was born.

Growth of the Internet

- Other networks were created and connected with the ARPAnet.
- The Use of this Internet was originally limited to government, research, and educational purposes. The number of individuals accessing the Internet continues to grow each year. (Check out https://www.internetworldstats.com , to explore more statistics about the usage and growth of the Internet).
- The lifting of the restriction on commercial use of the Internet in 1991 set the stage for future electronic commerce: Businesses were now welcome on the Internet. However, the Internet was still text based and not easy to use. The next set of developments solved this issue.

Birth of the Web

- While working at CERN, a research facility in Switzerland, Tim Berners-Lee envisioned a means of communication for scientists by which they could easily “hyperlink” to another research paper or article and immediately view it. Berners-Lee created the World Wide Web to fulfill this need. In 1991, Berners-Lee posted the code for the Web in a newsgroup and made it freely available. This version of the World Wide Web used Hypertext Transfer Protocol (HTTP) to communicate between the client computer and the web server, used Hypertext Markup Language (HTML) to format the documents, and was text based.

Intranets and Extranets

- The Internet is an interconnected network of computer networks that is globally available but when an organization needs the communication capabilities of the Internet, but doesn't want its information to be available to everyone, either an intranet or extranet is appropriate.

- An **intranet** is a private network that is contained within an organization or business. Its purpose is to share organizational information and resources among coworkers. When an intranet connects to the outside Internet, usually a gateway or firewall protects the intranet from unauthorized access.

- An **extranet** is a private network that securely shares part of an organization's information or operations with external partners such as suppliers, vendors, and customers. Extranets can be used to exchange data, share information exclusively with business partners, and collaborate with other organizations. Privacy and security are important issues in extranet use. Digital certificates, encryption of messages, and virtual private networks (VPNs) are some technologies used to provide privacy and security for an extranet

Web Standards and Accessibility

- The World Wide Web Consortium (http://www.w3.org), referred to as the W3C, takes a proactive role in developing recommendations and prototype technologies related to the Web.
- Topics that the W3C addresses include **web architecture, standards for web design**, and **accessibility**. In an effort to standardize web technologies, the W3C produces specifications called recommendations.
- These recommendations are not rules; they are guidelines. Major software companies that build web browsers, such as Microsoft, do not always follow the W3C Recommendations**. This makes life challenging for web developers because not all browsers will display a web page in exactly the same way**, but there is a convergence toward the W3C Recommendations in new versions of major browsers. Following the W3C Recommendations is the first step toward creating a website that is accessible.

Information on the Web

- These days anyone can publish just about anything on the Web but which ones are reliable sources of information? When visiting websites to find information, it is important not to take everything at face value.
- How recent is the information? Another item to look at is the date the web page was created or last updated. Although some information is timeless, very often a web page that has not been updated for several years is outdated and may not be the best source of information. Are there links to additional resources? Hyperlinks indicate websites with supporting or additional information that can be helpful to you in your research as you explore a topic. Look for these types of hyperlinks to aid your studies. Is it Wikipedia?

Ethical Use of Information on the Web

- This www provides us with information, graphics, and music—all virtually free . But there are issues relating to the ethical use of this information: Is it acceptable to copy someone's graphic to use on your own website? Is it acceptable to copy someone's website design to use on your own site or on a client's site? Is it acceptable to copy an essay that appears on a web page and use it, or parts of it, as your own writing? Is it acceptable to insult someone on your website or link to that person's site in a derogatory manner?
- Copying the website design of another person or company is also a form of stealing. Good Web etiquette requires that you ask permission before using others' work, give credit for what you use.

Markup Languages

- Markup languages consist of sets of directions that tell the browser software (and other user agents such as mobile phones) how to display and manage a web document. These directions are usually called tags and perform functions such as displaying graphics, formatting text, and referencing hyperlinks.

1. **Standard Generalized Markup Language (SGML):** This is a standard for specifying a markup language or tag set. Its not a document language, but a description of how to specify one and create a document type definition (DTD). When Tim Berners-Lee created HTML, he used SGML to create the specification.
2. **Hypertext Markup Language (HTML):** HTML is the set of markup symbols or codes placed in a file intended for display on a web browser. The web browser renders the code in the HTML file and displays the web page document and associated files. The W3C (http://www.w3.org) sets the standards for HTML.
3. **Extensible Markup Language (XML):** XML was developed by the W3C as a flexible method to create common information formats and share the format and the information on the Web. It is a text-based syntax designed to describe, deliver, and exchange structured information. It is not intended to replace HTML, but to extend the power of HTML by separating data from presentation. Using XML, developers can create whatever tags they need to describe their information.

- **Extensible Hypertext Markup Language (XHTML)** : XHTML uses the tags and attributes of HTML4 along with the more rigorous syntax of XML. XHTML was used on the Web for over a decade and you'll find many web pages coded with this markup language. At one point the W3C was working on a new version of XHTML, called XHTML 2.0. However, the W3C stopped development of XHTML 2.0 because it was not backward compatible with HTML4. Instead, the W3C decided to move forward with HTML5.

- **HTML5—the Newest Version of HTML :** HTML5 is the successor to HTML4 and replaces XHTML. HTML5 incorporates features of both HTML and XHTML, adds new elements, provides new features such as form edits and native video, and is intended to be backward compatible. The W3C approved HTML5 for final Recommendation status in late 2014. The W3C continued its development of HTML and added more new elements, attributes, and features in an update to HTML5 called HTML5.1. HTML5.1 reached final Recommendation status in late 2016 and work has already begun on HTML5.2

Hands-on Exercise

- Create a blog to document your learning experiences as you study web development. Visit one of the many sites that offer free blogs, such as https://www.blogger.com, https://www.wordpress.com. Follow the site's instructions to establish your own blog. Your blog could be a place to note websites that you find useful or interesting. You might report on sites that contain useful web design resources. You might describe sites that have interesting features, such as compelling graphics or easy-to-use navigation. Write a few sentences about each site that you find intriguing. After you begin to develop your own sites, you could include the URLs and reasons for your design decisions. Share this blog with your fellow students and friends. Display your page in a browser, and print the page. Hand in the printout to your instruction

To Do: Web Research

1. The World Wide Web Consortium creates standards for the Web. Visit its site at http://www.w3c.org and then answer the following questions:

i. How did the W3C get started?

ii. Who can join the W3C?

iii. What does it cost to join?

2. The W3C home page lists a number of technologies. Choose one that interests you, click on its link, and read the associated pages. List three facts or issues you discover.

2. What are the popular uses of the web?

- Visit a website that interests you. Print the home page or one other pertinent page from the site. Write a one-page summary of the site that addresses the following topics:

i. What is the URL of the site?

ii. What is the purpose of the site?

iii. Who is the intended audience?

iv. Do you think that the site reaches its intended audience? Why or why not?

v. Is the site useful to you? Why or why not?

vi. Does the site appeal to you? Why or why not? Consider the use of color, images, multimedia, organization, and ease of navigation.

vii. Would you encourage others to visit this site? Why or why not?

viii. How could this site be improved

Week 2: HTML Basics

Objectives

- Describe HTML, XHTML, and HTML5
- Identify the markup language in a web page document
- Use the html, head, body, title, and meta elements to code a template for a web page
- Configure the body of a web page with headings, paragraphs, line breaks, divs, lists, and blockquotes
- Configure text with phrase elements
- Configure special characters
- Use the new HTML5 header, nav, main, and footer elements
- Use the anchor element to link from page to page
- Create absolute, relative, and e-mail hyperlinks
- Code, save, and display a web page document
- Test a web page document for valid syntax

HTML Overview

- Markup languages consist of sets of directions that tell the browser software (and other user agents such as mobile phones) how to display and manage a web document. These directions are usually called tags and perform functions such as displaying graphics, formatting text, and referencing hyperlinks. The World Wide Web is composed of files containing Hypertext Markup Language (HTML) and other markup languages that describe web pages.
- (Note: This has been taught in the last section)

Document Type Definition (DTD)

Because multiple versions and types of HTML and XHTML exist, the W3C recommends identifying the type of markup language used in a web page document with a Document Type Definition (DTD). The DTD identifies the version of HTML contained in your document.

Browsers and HTML code validators can use the information in the DTD when processing the web page. The DTD statement, commonly called a doctype statement, is the first line of a web page document.

The DTD for HTML5 is:

```
<!DOCTYPE  html>
```

Web Page Template

- Every single web page you create will include the DTD and the html, head, title, meta, and body elements. Follow the coding style to **use lowercase letters** and **place quotes around attribute values**.

Purpose of the ‘html’, ‘head’, ‘title’, ‘meta’, and ‘body’ Elements.

HTML Element : The purpose of the html element is to indicate that the document is HTML formatted. The html element tells the browser how to interpret the document. The opening tag is placed on a line below the DTD. The closing tag indicates the end of the web page and is placed after all other HTML elements in the document.

Head, Title, Meta, and Body Elements: There are two sections on a web page: the head and the body. The head section contains information that describes the web page document. The body section contains the actual tags, text, images, and other objects that are displayed by the browser as a web page.

Head Section

The Head Section Elements that are located in the head section include the title of the web page, meta tags that describe the document (such as the character encoding used and information that may be accessed by search engines), and references to scripts and styles. Many of these features do not show directly on the web page. The head element contains the head section, which begins with the tag and ends with the tag.

NB: You will always code at least two other elements in the head section: a title element and a meta element.

Title and Meta Element

The first element in the head section, the title element, configures the text that will appear in the title bar of the browser window. The text between the `<title>` and **`</title>`** tags is called the title of the web page and is accessed when web pages are bookmarked and printed. Popular search engines, such as Google, use the title text to help determine keyword relevance and even display the title text on the results page of a search. A descriptive title that includes the website or organization name is a crucial component for establishing a brand or presence on the Web.

The **meta element** describes a characteristic of a web page, such as the character encoding. Character encoding is the internal representation of letters, numbers, and symbols in a file such as a web page or other file that is stored on a computer and may be transmitted over the Internet. There are many different character-encoding sets. However, it is common practice to use a character-encoding set that is widely supported, such as utf-8, which is a form of Unicode (http://www.unicode.org). The meta tag is not used as a pair of opening and closing tags. It is considered to be a stand-alone, or self-contained, tag (referred to as a **void element** in HTML5). The meta tag uses the **charset attribute** to indicate the character encoding. An example meta tag is as follows:

```
<meta charset="utf-8">
```

The Body Section

The body section contains text and elements that display directly on the web page in the browser window, also referred to as the browser viewport. The purpose of the body section is to configure the contents of the web page. The body element contains the body section, which begins with the tag **<body>** and ends with the tag **</body>.** Text and elements typed between the opening and closing body tags will display on the web page in the browser

HANDS ON: Your first web page

```
<!DOCTYPE html>
<html lang="en">
<head>
<title>My First HTML5 Web Page</title>
<meta charset="utf-8">
</head>
<body>
Hello World
</body>
</html>
```

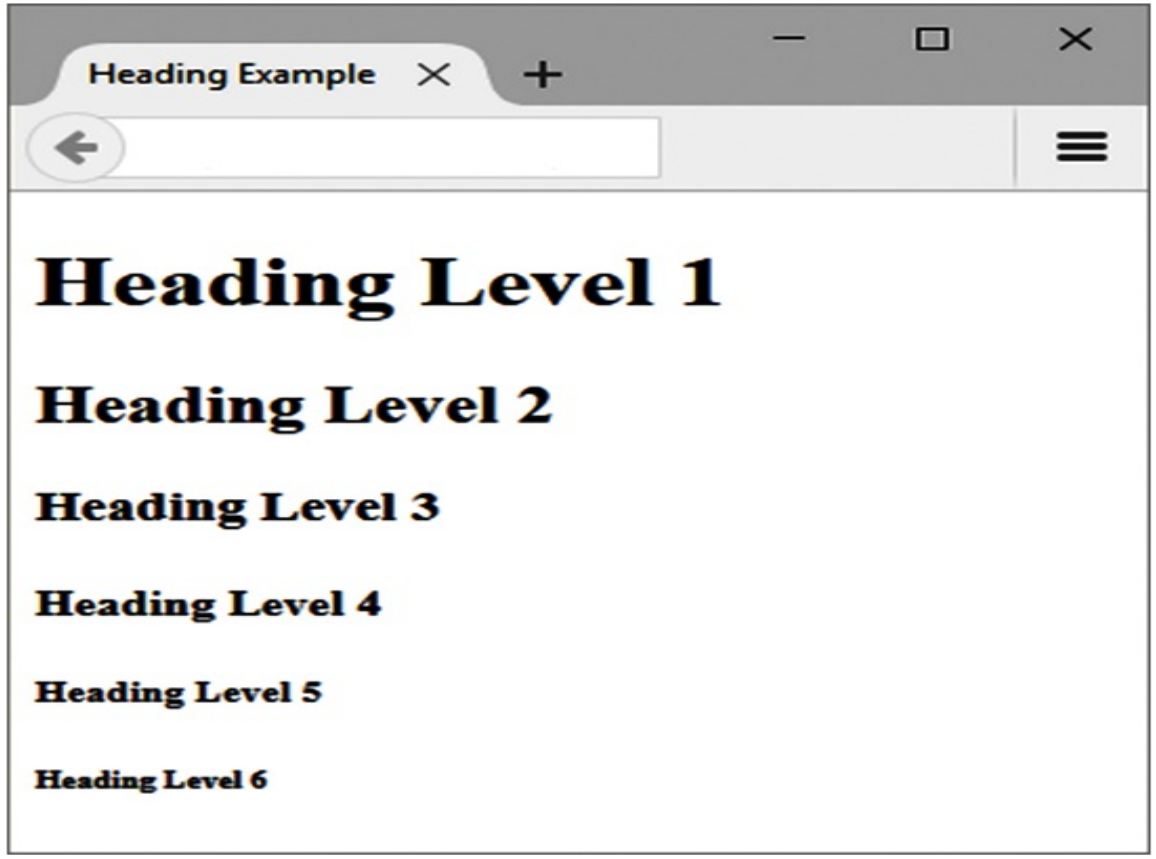
SRQ

1. Describe the origin, purpose, and features of HTML.
2. Describe the software needed to create and test web pages.
3. Describe the purpose of the head and body sections of a web page

Heading Element

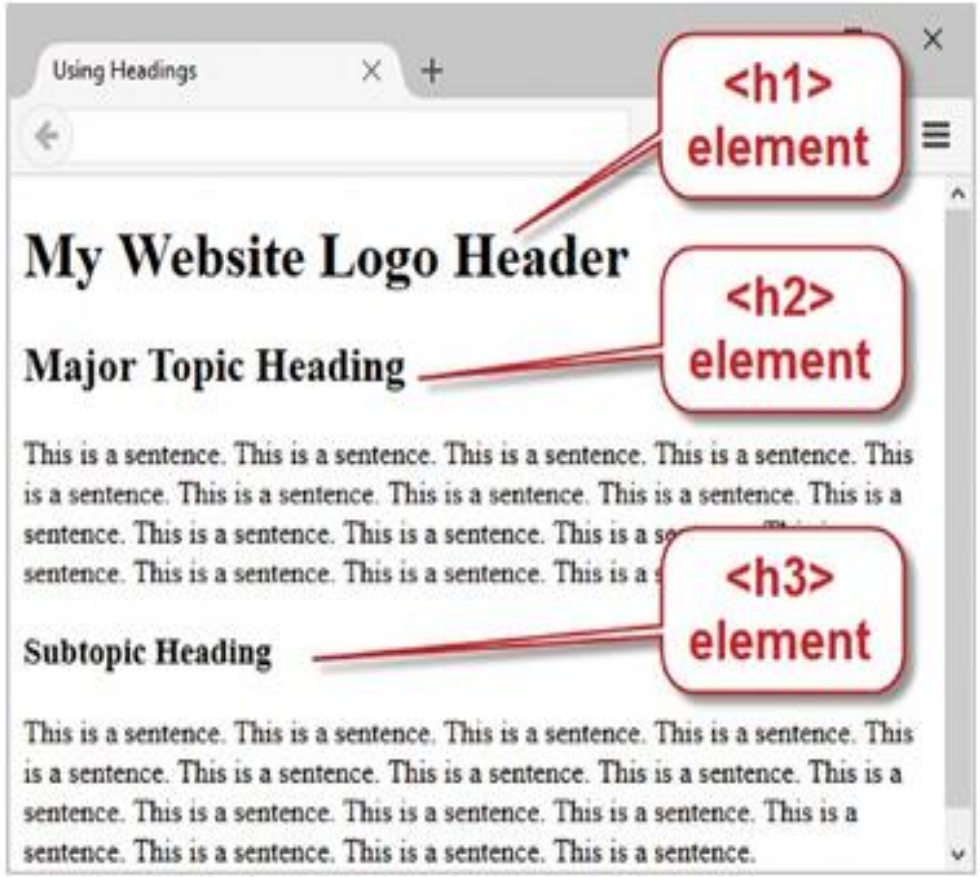
- Heading elements are organized into six levels: **h1 through h6**.
- The text contained within a heading element is rendered as a “block” of text by the browser (referred to as block display) and displays with empty space (sometimes called “white space”) above and below. The size of the text is largest for **(called the heading 1 tag)** and smallest for **(called the heading 6 tag).**
- The figure in the next slide shows a web page document with six levels of headings.

Output of Six levels of headings



Accessibility and Headings

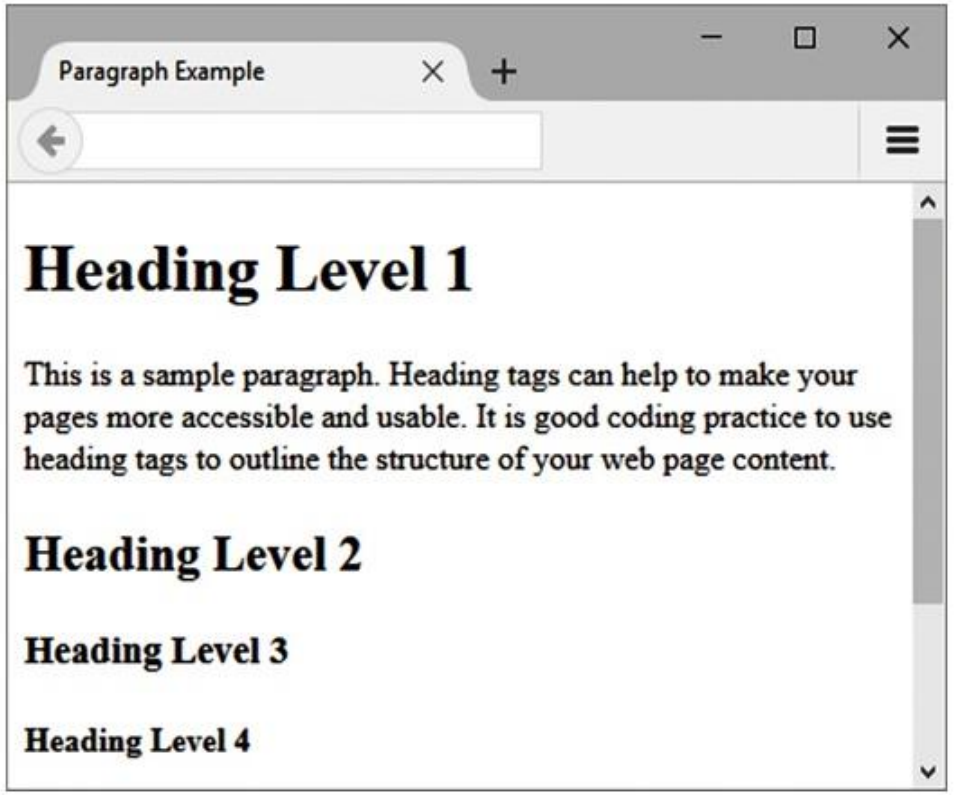
- Heading tags can help to make your pages more accessible and usable. It is good coding practice to use heading tags to **outline the structure** of your web page content. To indicate areas within a page hierarchically, code heading tags numerically as appropriate (h1, h2, h3, and so on), and include page content in block display elements such as paragraphs and lists.



Heading tags outline the page

Paragraph Element

- Paragraph elements are used to group sentences and sections of text together. Text that is contained by and tags display as a “block” (referred to as block display) and will appear with empty space above and below it.



Web page using headings and a paragraph

Alignment

- The headings and text always begin near the left margin. This placement is called **left alignment** and is the **default** alignment for web pages. If you want a paragraph or heading to be centered or right aligned. The align attribute can be used for this purpose. **The purpose of an attribute is to modify the properties of an HTML element.**
- The align attribute modifies the element's horizontal alignment (left, center, or right) on a web page.
- To center an element on a web page, use the attribute **align="center".** To right-align the text within an element, use the **align="right"** attribute. In XHTML syntax, the align attribute can be used with a number of block display elements, including the paragraph and headings(H1-H6) .

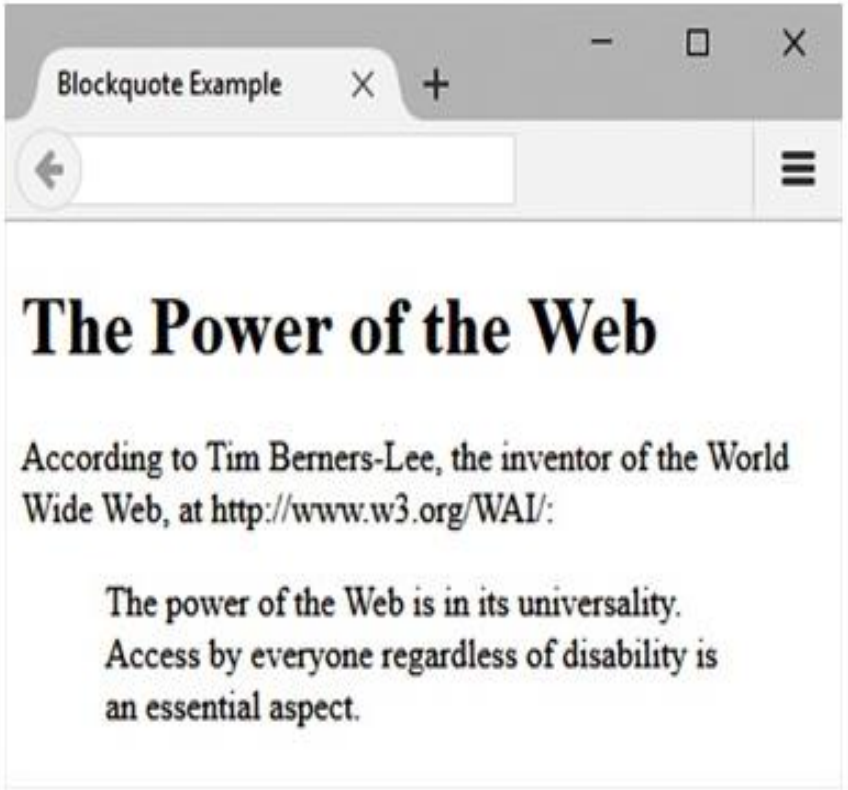
- **NB: The align attribute is obsolete in HTML5, which means that while it may be used in XHTML, the attribute has been removed from the W3C HTML5 specification and is invalid.**

Line Break Element

- The line break element causes the browser to advance to the next line before displaying the next element or portion of text on a web page. The line break tag is not coded as a pair of opening and closing tags. It is a stand-alone, or void element.

Blockquote Element

To add a quotation to a web page. The blockquote element is used to display a block of quoted text in a special way—indented from both the left and right margins. A block of indented text begins with a tag and ends with a tag.
The figure here shows a web page document with a heading, a paragraph, and a blockquote.



Phrase Elements

- Phrase elements indicate the context and meaning of the text between the container tags. It is up to each browser to interpret that style. Phrase elements are displayed right in line with the text (referred to as inline display) and can apply to a section of text or even just a single character of text. For example, the ** element** indicates that the text associated with it has strong importance and should be displayed in a “strong” manner in relation to normal text on the page.
- Each phrase element is a container element, so an opening and a closing tag must be used.

Element	Example	Usage
<abbr>	WIPO	Identifies text as an abbreviation; configure the title attribute with the full name
<b>	**bold** text	Text that has no extra importance, but is styled in bold font by usage and convention
<cite>	*cite* text	Identifies a citation or reference; usually displayed in italics
<code>	code text	Identifies program code samples; usually a fixed-space font
<dfn>	*dfn* text	Identifies a definition of a word or term; usually displayed in italics
	emphasized text	Causes text to be emphasized in relation to other text; usually displayed in italics
<i>	*italicized* text	Text that has no extra importance, but is styled in italics by usage and convention
<kbd>	kbd text	Identifies user text to be typed; usually a fixed-space font
<mark>	mark text	Text that is highlighted in order to be easily referenced
<samp>	samp text	Shows program sample output; usually a fixed-space font
<small>	small text	Legal disclaimers and notices (“fine print”) displayed in small font size