CSCD 378 Web Application Development

HTML INTRODUCTION

EASTERN
WASHINGTON UNIVERSITY

History

HTML – Hypertext Markup Language

Developed 1991 by Tim Berners-Lee
◦ Originally developed to share structured documents
◦ Now, used to format web pages

History

Version 2.0 – 1995
◦ First standard HTML specification

Version 4.01 – 1999
◦ Widely used today

HTML-5 – 2012
◦ Extension to HTML 4.01

EASTERN
WASHINGTON UNIVERSITY

Tags

Tags used to format content

Tags are enclosed in angle brackets < >
- MOST tags have closing tag with slash before tag name

Hello, World example

```
<!DOCTYPE html>
<html>

    <head>
        <title>This is the document title</title>
    </head>

    <body>
        <h1>This is a heading</h1>
        <p>Hello, World!</p>
    </body>

</html>
```

EASTERN
WASHINGTON UNIVERSITY

Explanation

`<!DOCTYPE…>`

◦ Defines document type
◦ Defaults to HTML-5

`<html>`

◦ Encloses the compete HTML document

`<head>`

◦ Defines document's header
◦ May have other tags include, e.g., `<title>`, `<link>`

Explanation

`<title>`
- Document title; appears on browser tab

`<body>`
- Defines document body

`<h1>`
- Defines heading

`<p>`
- Defines paragraph

Hello, World example (again)

```html
<!DOCTYPE html>
<html>

    <head>
        <title>This is the document title</title>
    </head>

    <body>
        <h1>This is a heading</h1>
        <p>Hello, World!</p>
    </body>

</html>
```

EASTERN
WASHINGTON UNIVERSITY

HTML Comments

Ignored in the browser

Document code or sections

`<!--`   starts comment

`-->`   ends comment

Can be on single or multiple lines

Hello, World example (commented)

```html
<!DOCTYPE html>
<html>

    <head> <!-- Document Header Section -->
        <title>This is the document title</title>
    </head> <!-- End of Header Section -->

<!-- The
     body
      is
     next -->
    <body>
        <h1>This is a heading</h1>
        <p>Hello, World!</p>
    </body>

</html>
```

Heading Tags

HTML has 6 levels of headings

<h1> <h2> <h3> <h4> <h5> <h6>

Browser puts one line before and one line after each heading

EASTERN
WASHINGTON UNIVERSITY

Paragraph Tags

Structures text into paragraphs
- Like a document

<p>   start paragraph text
</p>   ends paragraph text

Centering Content

`<center>    </center>`

Centers content on page or within table cell

Line Break Tag

```
<br />
```

Adds end-of-line

Anything after tag will be on separate line

Example of EMPTY element
- Does not need closing tag
- Should put space between r and /

EASTERN
WASHINGTON UNIVERSITY

Horizontal Line

```
<hr />
```

Draws line from current position to the right margin
- Adds line break

Visually breakup sections of the document

Preserve Formatting

`<pre>   </pre>`

Used to display text that follows exact formatting as written in HTML
◦ Can be used for code blocks

EASTERN
WASHINGTON UNIVERSITY

HTML Lecture 2

DOM, FORMATTING, ATTRIBUTES

DOM – Document Object Model

When a web page is loaded, browser creates a DOM of the page
- Tree of HTML Elements
  - Content between open tag and close tag
  - Hierarchical
    - Elements can be nested

EASTERN
WASHINGTON UNIVERSITY

DOM Example

```
<!DOCTYPE html>
<html>

    <head>
        <title>Nested Elements Example</title>
    </head>

    <body>
        <h1>This is <i>italic</i> heading</h1>
        <p>This is <u>underlined</u> paragraph</p>
    </body>

</html>
```
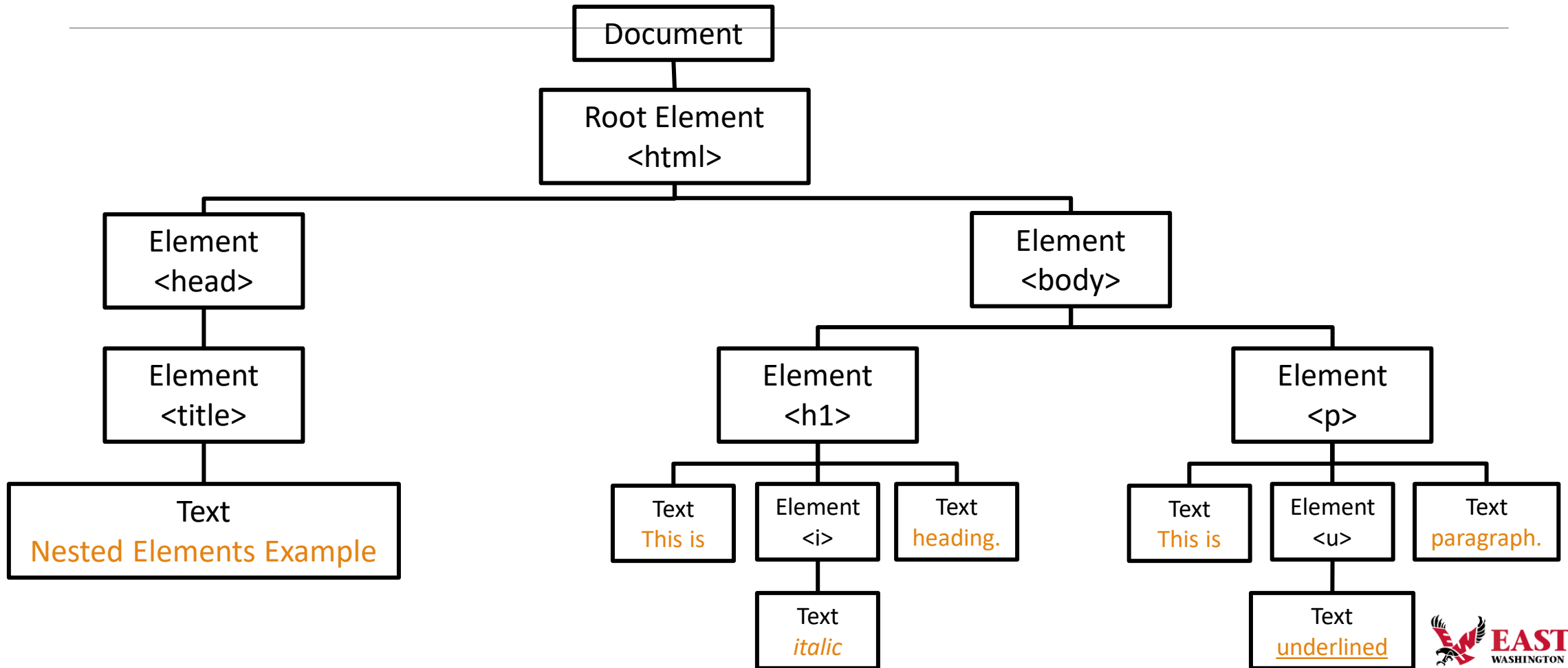
EASTERN
WASHINGTON UNIVERSITY

DOM Tree from example

What is the DOM for?

Specifies how HTML documents are built and displayed
- How to place elements
- Locate items to be modified with the page

HTML Formatting

Bold Text	`<b> </b>`	Superscript	`<sup> </sup>`
Italic text	`<i> </i>`	Subscript	`<sub> </sub>`
Underlined text	`<u> </u>`		
Strike text	`<strike> </strike>`	Larger text	`<big> </big>`
Monospaced font	`<tt> </tt>`	Smaller text	`<small> </small>`

Grouping Content

Logical containers
- Group together several elements
- Apply formatting
- Create sections or subsections

```
<div>  </div>        -- group multiline elements
<span>  </span>      -- group inline elements
```

Attributes

Applied to HTML tags

Extra information & control of format
- Defines characteristics of HTML Elements

Attribute Specification

Two parts:

- NAME
  - Property to be set
  - Allowed names defined by HTML spec
- VALUE
  - Value to set property to
  - Always in quotation marks

Both are case insensitive
- Recommend lower case by W3C

Attribute Example

```
<body>

    <p align="left">This is left aligned</p>

    <p align="center">This is center aligned</p>

    <p align="right">This is right aligned</p>

</body>
```

EASTERN
WASHINGTON UNIVERSITY

Core Attributes

Four core attributes that can be used on most HTML Elements:

```
id
title
class
style
```

`id` Attribute

Uniquely identify any element in a page

WHY?
- Can identify <u>just</u> that element
- Can be used to differentiate between two elements with the same name

id Attribute Example

```
<p id="first">This is first paragraph.</p>

<p id="second">This is second paragraph.</p>
```

`title` Attribute

Gives a suggested title to an element

Behavior will depend on element that has title
◦ Often displayed as a tooltip

`title` Attribute Example

```
<body>

    <h3 title="Third level head">Example Heading</h3>

. . .

</body>
```

EASTERN
WASHINGTON UNIVERSITY

`class` Attribute

Associate an element with a style sheet

AND specifies the class of element

Note: The value of the class attribute may be a space-separated list of class names

class Attribute Example

```
<p class="class1 class2 class3">

   Ut enim ad minim veniam, quis nostrud exercitation
ullamco laboris nisi ut aliquip ex ea commodo
consequat. Duis aute irure dolor in reprehenderit in
voluptate velit esse cillum dolore eu fugiat nulla
pariatur.

</p>
```

`style` Attribute

Allows specification of Cascading Style Sheet (CSS) rules within the element

Note: We will be exploring CSS in more detail later

style Attribute Example

```
<p style="font-family:arial; color:#FF0000;">

   Ut enim ad minim veniam, quis nostrud exercitation
ullamco laboris nisi ut aliquip ex ea commodo
consequat. Duis aute irure dolor in reprehenderit in
voluptate velit esse cillum dolore eu fugiat nulla
pariatur.

</p>
```

EASTERN
WASHINGTON UNIVERSITY

Other Useful/Generic Attributes

`valign (top, middle, bottom)`

    Vertically align within element

`bgcolor`
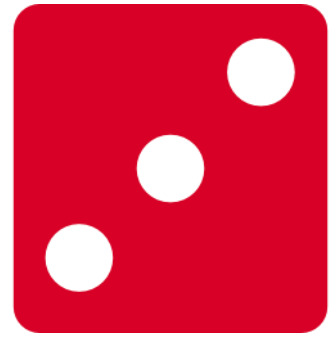
    Sets background color in element

`width (`*`<numeric value>`*`)`

    Specifies width of tables, images, cells in tables, etc.

`height (`*`<numeric value>`*`)`

    Specifies height of tables, images, cells in tables, etc.

HTML Lecture 3

PHRASE TAGS, TABLES, LISTS

HTML Phrase Tags

Designed for specific purposes

Displayed in similar ways to formatting tags

Default formatting can be overridden with CSS

HTML Phrase Tags

Strong Text   `<strong>` `</strong>`

Emphasized text   `<em> </em>`

<mark>Marked text</mark>   `<mark>` `</mark>`

Computer Code   `<code>` `</code>`

Programming Variables   `<var> </var>`

Program Output   `<samp>` `</samp>`

EASTERN WASHINGTON UNIVERSITY

Quotation `<blockquote>`

Quotation `<blockquote> </blockquote>`

Citation `<cite> </cite>`

```
<blockquote cite="https://brainyquote.com/topics/quotation-quotes">
    <p>It is my belief that nearly any invented quotation,
       played with confidence, stands a good chance to deceive.</p>
    <cite>-- Mark Twain</cite>
</blockquote>
```

EASTERN
WASHINGTON UNIVERSITY

HTML Tables

Arrange data into rows and columns of cells

Create a table   `<table>  </table>`

Create a table row   `<tr>  </tr>`

Create a table data cell   `<td>  </td>`

table Example

```
<table border = "1" >
    <tr>
        <td>Aaron Rodgers</td>
        <td align = "right">$33,500,000</td>
    </tr>
    <tr>
        <td>Jordan Love</td>
        <td align = "right">$3,095,863</td>
    </tr>
</table>
```

Table Headings

Use `<th>` tag in place of `<td>` to define special heading cells

Table Headings Example

```html
<table border = "1" >
    <tr>
        <th>Name</th>
        <th>Salary</th>
    </tr>
    <tr>
        <td>Aaron Rodgers</td>
        <td align = "right">$33,500,000</td>
    </tr>
    <tr>
        <td>Jordan Love</td>
        <td align = "right">$3,095,863</td>
    </tr>
</table>
```

Control Whitespace in Cells

`<table>` attributes – measured in pixels

`cellpadding`	Distance between cell borders and cell contents
`cellspacing`	Distance between table cells

```
<table border="1" cellpadding="5" cellspacing="10">
```

EASTERN
WASHINGTON UNIVERSITY

Table Cell Merging Attributes

Attributes to combine rows or columns

rowspan   Merge two or more rows

colspan   Merge two or more columns

```
<th colspan = "3">NFL Average Salaries</th>
```

```
<td rowspan = "2">Green Bay Packers</th>
```

Table Height and Width Attributes

Attributes to set height/width of table or cells

`height`   Set height of table element

`width`   Set width of table element

```
<table border="1" width= "400" height="200">
```

```
<table border="1" width= "100%" height="200">
```

EASTERN
WASHINGTON UNIVERSITY

Table Caption

`<caption>` tag to put caption at top of table

```
<table border="1" cellpadding="5" cellspacing="10">
  . . .
  <caption>Table 3. This is the salary table</caption>
</table>
```

Note: Tag is deprecated in newer versions of HTML

HTML Lists

Three ways to arrange information in a list
- Unordered List (bullets)
- Ordered List (labeled)
- Definition List (arranged like dictionary)

Unordered List

Use `<ul>` tags to define unordered list

Use `<li>` tags for each item on the list

```
<ul>
    <li> Butcher </li>
    <li> Baker </li>
    <li> Candlestick Maker </li>
</ul>
```

Bullet Selection

Use `<ul> type` attribute to select type of bullet

```
<ul type="square">
<ul type="disc">
<ul type="circle">
```

Ordered List

Use `<ol>` tags to define ordered list

Use `<li>` tags for each item on the list

```
<p>Chronological Captains of <em>USS Enterprise</em></p>
<ol>
    <li> Archer </li>
    <li> Kirk </li>
    <li> Picard </li>
</ol>
```

Numbering Selection

Use `<ol> type` attribute to select type of numbering

Use `<ol> start` attribute to select starting point of numbering

`<ol type="1">`   Default-case numerals

`<ol type="I">`   Upper-case Roman numerals

`<ol type="i">`   Lower-case Roman numerals

`<ol type="A">`   Upper-case Letters

`<ol type="a">`   Lower-case Letters

`<ol type="1" start="4">`

EASTERN
WASHINGTON UNIVERSITY

Definition List

Use `<dl>` tags to define start of the list

Use `<dt>` tags for each term being defined

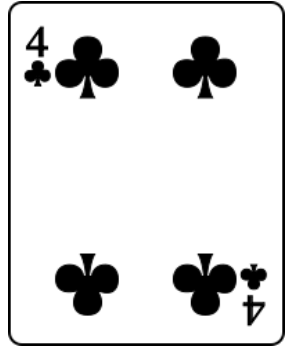Use `<dd>` tags the definition of the term

Definition List Example

```
<dl>
   <dt><em>Infinite loop</em></dt>
   <dd>See "Loop, infinite"</dd>

   <dt><em>Loop, infinite</em></dt>
   <dd>See "Infinite loop"</dd>

   <dt><em>Recursion</em></dt>
   <dd>See "Recursion"</dd>
</dl>
```

HTML Lecture 4

IMAGES, LINKS, STYLE SHEETS

HTML Images

Use `<img>` tag to place images in document
◦ Empty tag, so no matching closing tag
◦ Attributes in tag control
  ◦ Which image to display
  ◦ Placement
  ◦ Border, etc.

HTML Image Requirements

Must have `src` attribute to reference image file
- ◦ Can be PNG, JPEG, GIF format

Must have `alt` attribute to specify alternate text if image can't be displayed

Image Example

```
<body>

    <p>Image Example</p>
    <img src="clank2.jpg" alt="Clank Image" />

</body>
```

Case-sensitive name

Can have path (absolute or relative to .html file)

Setting Image Width/Height

Set image display width using `width` attribute

Set image display height using `height` attribute

```
<img src="images/GreenForest.jpg" alt="Summer Image"
    width="395" height="222" />
```

Can use either pixels of percentage of display area

EASTERN
WASHINGTON UNIVERSITY

HTML Images

Use `border` attribute to specify pixel thickness of border

Use `align` attribute to place image in `center` or to `right`

EASTERN
WASHINGTON UNIVERSITY

HTML Text Links

Add hyperlinks to documents
◦ Navigate to other websites

Specified by anchor tags `<a>  </a>`
◦ Text between tags becomes part of the link
◦ `href` attribute is where to go when link is clicked

Link Example

```
<body>
    <p>Click this link:</p>
    <a href="https://www.google.com">Google</a>
</body>
```

`target` attribute specifies where linked document is opened

`_blank`   – open in new window or tab

`_self`   – open in same frame (default)

Link to Page Section

Use `#` on URL (in `href`) to reference `id` or `title` names in document

- Will focus on names section at top of frame displayed

```
<body>
    <div id="Top"> . . . </div>
    . . .
    <a href="TableExample.htm#Top">Go to Top</a>
</body>
```

Link Colors

Use `link`, `alink`, `vlink` attributes in `<body>` tag to set colors

- `link` – original link color
- `alink` – color when activated
- `vlink` – color after link has been visited

EASTERN
WASHINGTON UNIVERSITY

Images as Links

Simply put `<img>` inside hyperlink in place of text

```
<body>

    <p>Click the picture</p>
    <a href="https://imdb.com/title/tt0043456">
        <img src="images\gort.jpg" alt="Gort" />
    </a>


</body>
```

HTML Style Sheets

Cascading Style Sheets (CSS)
- Describes how documents are presented on screen
- Specify various attributes for tags

Specify a number of style properties for a given HTML Element
- Name and value, separated by ':'
- Multiple properties separated by ';'

Inline Style Sheet Example

Use `style` attribute within Element tag

```
<body>

    <p style="color:green; font-size:24px;">
    Ut enim ad minim veniam, quis nostrud exercitation
ullamco laboris nisi ut aliquip ex ea commodo
consequat.</p>

</body>
```

EASTERN
WASHINGTON UNIVERSITY

Internal Style Sheet

Applies to containing document

Define rules/styles in header section within `<style>` tag

Inline Style Sheet Example

```
<head>
    <title>Internal CSS</title>
    <style type="text/CSS">
        .red {
            color:red;
        }
        .thick {
            font-size:20px;
        }
    </style>
</head>
```

. indicates the definition of a class name

Inline Style Sheet Example (cont'd)

```
<body>
    <p class="red">This is red.</p>
    <p class="thick">This is Big.</p>
    <p class="red thick">This is Big and red.</p>
</body>
```

Type Selector

Define the default format of specific HTML Elements

```
<style type="text/CSS">

   h1 {
      color:#36CFFF;
   }
```

Descendant Selector

Apply a style rule to a given element within another given element

```
<style type="text/CSS">

    ul strong {
        color:#00FF94;
    }
```

Universal Selector

Affects all elements

```
<style type="text/CSS">

  * {
    color:#0000FF;
  }
```

Multiple Style Rules

Define multiple style rules for single element
- Separate by ';'

```
<style type="text/CSS">

    h1 {
        color: #36C000;
        font-weight: normal;
        letter-spacing: .4em;
        margin-bottom: 1em;
        text-transform: lowercase;
    }
```

External Style Sheet

Used to define a common set of styles
- Can be used in multiple documents

Set up separate file with .css extension
- Use `<link>` tag to include in document

In `style.css`

```css
.red {
    color:red;
}
.thick {
    font-size:20px;
}
```

EASTERN
WASHINGTON UNIVERSITY

External Style Sheet Example

```
<head>
    <title>External CSS</title>
    <link rel="stylesheet" type="text/CSS"
        href="style.css">
</head>

<body>
    <p class="red">This is red.</p>
    <p class="thick">This is Big.</p>
    <p class="red thick">This is Big and red.</p>
</body>
```

EASTERN
WASHINGTON UNIVERSITY

Precedence of Style Sheets

External Style Sheet can be overridden by INTERNAL STYLE SHEET

Internal Style Sheet can be overridden by INLINE STYLE SHEET

EASTERN
WASHINGTON UNIVERSITY

HTML Lecture 5

FORMS

HTML Forms

Used to collect data/interact with site visitor
- Enter name, email address, credit card, login, etc.
- Make some choices before "submit"

Popular forms
- Text field
- Textarea field
- Checkboxes
- Radio button
- Pull-down menu

Form Attributes

`action` - script to process passed data

`method` - method to upload data (frequently GET and POST)

Single-line Text Input

Use `<form>` tag with nested `<input>` tag to define one-line input box

```
<body>

    <form>
        First Name: <input type="text" name="first_name">
        Last Name: <input type="text" name="last_name">
    </form>
```

EASTERN
WASHINGTON UNIVERSITY

`<input>` Tag Attributes

`type`	Type of input control
`name`	Name of control which is sent to server and to get the value
`value`	May provide an initial value
`size`	Width, in terms of characters
`maxlength`	Maximum number of characters allowed

Multiple Line Text Input Control

`<textarea>` tag used

Attributes:

name	Name of control value
rows	Number of text box rows
cols	Number of text box columns (max number of characters in row)

`<textarea>` Example

```
<body>

    <form>
        Description: <br />
        <textarea rows="5" cols="50" name="description">
            Enter description here...
        </textarea>
    </form>

</body>
```

EASTERN
WASHINGTON UNIVERSITY

Checkbox Example

```
<form>
   <input type="checkbox"        <!-- type -->
          name="maths"           <!-- name -->
          value="on" />          <!-- value if checked -->
     Maths    <!-- printed value near box -->

  <input type="checkbox"
          name="physics"
          value="on" /> Physics

</form>
```

EASTERN
WASHINGTON UNIVERSITY

Radio Button Control

Much the same as Checkbox
- ◦ Only **one** option can be chosen

Specific attributes:

value	Value to be returned to server
checked	To select default choice

EASTERN
WASHINGTON UNIVERSITY

Radio Button Example

```
<form>
    <input type="radio"
            name="subject" value="maths" /> Maths

    <input type="radio"
            name="subject" value="physics" /> Physics
</form>
```

Same `name` since only one value is possible

EASTERN
WASHINGTON UNIVERSITY

Select Box (Pull-Down Menu)

Use `<select name="`*name*`">` to create

Then add

  `<option value="`*item*`">`*Item*`</option>`

  to set up each individual item in menu

`<select>` Tag Attributes

`name`	Name of control
`size`	Visible options, can set up scrolling box
`multiple`	If set, allow one or more options to be selected

EASTERN
WASHINGTON UNIVERSITY

`<option>` Tag Attributes

`value`	Value to be used if option selected
`selected`	Set as default

Select Box Example

```
<form>
    <select name="subject">
        <option value="Maths" selected>Maths</option>
        <option value="Physics">Physics</option>
    </select>
</form>
```

EASTERN
WASHINGTON UNIVERSITY

Default Submit button

Use `type="submit"` attribute within `<input>` tag to create button to launch script with inputs

```
<body>

    <form action="formScript.php">
        . . .
        <input type="submit" value="Submit">
    </form>
```

EASTERN WASHINGTON UNIVERSITY