Basic HTML

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Hypertext Markup Language (HTML)

- ☐ Describes the *content and structure* of information on a web page
- ☐ Not the same as the presentation (appearance on screen) -- not "WYSIWYG"

- ☐ Surrounds text content with opening and closing tags
- ☐ Each tag's name is called an element
  - syntax: \<element\> content \</element\>
  - example: \<p\>This is a paragraph\</p\>

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history

html(1990), **xhtml**(2000), **html5**(2009)

- 1990s (HTML)
  - internet is very slow, few people use it
  - Tim Berners-Lee introduces a markup language while at CERN*

    conseil européen pour la recherche nucléaire

- 2000s (XHTML)
  - internet much faster, much more information is exchanged there
  - attempt to create an extensible language, with better (more rigid) specification
  - Uses a markup format called XML   XML + HTML = XHTML
  - A strict XHTML page uses some different syntax and tags than HTML

    For your information

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- 2010s (HTML 5)
  - smartphones, Internet is quite ubiquitous
  - lots of multimedia information (audio, video, documents, pictures, new articles, etc.)
  - features
    - support for the latest multimedia and other new features
      - drag-and-drop, web messaging…
    - easily readable by humans and consistently understood by computers
    - more flexible than XHTML
    - backwards-compatibility with earlier HTML and XHTML

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Example of a simple web page

Not WYSIWYG

EXAMPLE.html - Notepad

File   Edit   Format   View   Help

WYS

```
<!doctype html>
<html lang="en">
 <head>
    <title>My Web Page</title>
 </head>

 <body>
   <h2>A heading </h2>
   <p>A paragraph ...</p>
   <p>Another paragraph ...</p>
   <img src="http://www/eecs/yorku.ca/~anmdy/Yorku./jpg" width="50">
   <a href="http://yorku.ca">link to York University</a>
   <h3>A sub-heading</h3>
   <p> yet another paragraph ...</p>

 </body>
</html>
```

My Web Page

file:///C:/Users/andy/Desktop/EXAMPLE.html

A heading

WYG

A paragraph ...

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Another paragraph ...   link to York University

A sub-heading

Yet another paragraph ...

A   text file with
.html extension.

Note the URL:
file:///C:/ ...
EXAMPLE.html

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Basic Structure of a Web Page

```
<html>          root
    <head>
                descriptive
    ...         elements
    </head>


    <body>

    ...

    ...

    </body>
</html>
```

- `<html></html>` outline the HTML document
- `<head></head>` contain information about the document (e.g., author, keywords)
- `<body></body>` contain the main content of the web page

- Spacing within the HTML file typically does not affect its correctness or appearance, but is done to aid in human readability
- Significant tags are usually on a line by themselves
- Lines between significant tags are usually indented for human readability

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Some HTML Tags

- Element content
  - Text
  - Other elements
  - empty

`<p>…</p>`	text that should be treated as a separate **paragraph**
` `	forced **line break** Empty tag
`<hr/>`	**horizontal rule** across page Empty tag
`<ul>…</ul>`	**unordered list** (usually bullets)
`<ol>…</ol>`	**ordered list** (e.g. numbered)
`<li>…</li>`	**list item**
`<h1>…</h1>`	**level 1 heading** (also h2, h3,…h6)
`<div>…</div>`	**division** (area) with special characteristics
`<span>…</span>`	texts with special characteristics
`<img />`	displays an **image** file Empty tag
`<a>…</a>`	hypertext link **anchor**
`<!-- … -->`	"…" replaced by any **comment** (i.e., any description, note, or memo for human use)

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Tag Attributes

Provide additional characteristics for a tag

Syntax: `attrName="value"`

Examples:

`<img src="../smile.png" width="300" height="200">`
   Displays the image indicated by `src` (path or URL) and
   restricts the image to 300 pixels wide, by 200 pixels high   Empty tag!

`<a href="http://www.yorku.ca">York University</a>`
   Displays "York University" as a hyperlink to the path or
   URL indicated by `href` (in this case, www.yorku.ca)

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A full reference of HTML tags and attributes are available at w3schools.com

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Comments <!-- … -- >

```html
<!-- My web page, by Bob Student
EECS 1012, W 2022 -->
<p>EECS 1012 courses are <!-- NOT --> a lot of fun!</p>

<!-- <p>CS courses are <!-- NOT --> a lot of fun!</p>
      -->      ✖
```
HTML

EECS 1012 courses are a lot of fun!

output

- □ Comments are useful for disabling sections of a page
- □ Comments cannot be nested and cannot contain a --

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html: elements for head

- □ **descriptive element examples:**
  <meta> data about the document: e.g., what the character encoding for the doc is
  <title> the document title
  <link>   to (implicitly) link the document to another resource, e.g. to a css file
  <script> to run a script file, such as javascript file

```html
<head lang="en">
  <meta charset="utf-8">
  <title>my first HTML doc</title>
  <link rel="stylesheet" href="cssFiles/main.css" type="text/css">
  <script src="js/first.js"></script>
</head>

<body>
  …
</body>
```
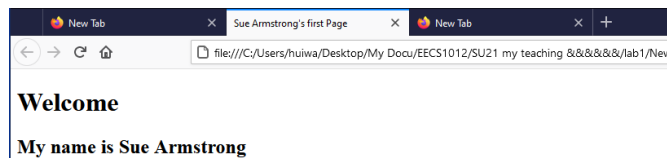
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Page Title <title>

```html
…
      <head>
            <title> Sue Armstrong's first Page </title>
      </head>
…                                                        HTML
```

- ☐ Placed within the head of the page
- ☐ Displayed in web browser's title mark and when bookmarking the page

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Web page metadata <meta>

```html
<head>
 <meta charset="UTF-8">          <!-- international char set used -->
 <meta name="Generator" content="">    <!-- software used -->
 <meta name="Author" content="">              Empty tag
 <meta name="Keywords" content="">     <!-- suggest search engine -->
 <meta name="Description" content=""> <!-- description of page -->
 <meta name="viewport" content="width=device-width,
                                        initial-scale=1.0">
 <title>Document</title>
</head>
                                                              HTML
```

- ☐ information about your page (for a browser, search engine, etc.)
- ☐ placed in the head of your HTML page
- ☐ meta tags often have both the name and content attributes

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Some HTML Tags in body
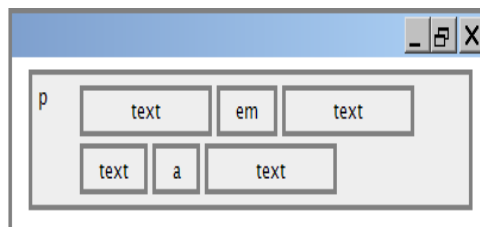
- Element content
  - Text
  - Other elements
  - empty

`<p>…</p>`	text that should be treated as a separate **paragraph**
` `	forced **line break** Empty tag
`<hr />`	**horizontal rule** across page Empty tag
`<ul>…</ul>`	**unordered list** (usually bullets)
`<ol>…</ol>`	**ordered list** (e.g. numbered)
`<li>…</li>`	**list item**
`<h1>…</h1>`	**level 1 heading** (also h2, h3,…h6) block tag
`<div>…</div>`	**division** (area) with special characteristics block tag
`<span>…</span>`	**inline** texts with special characteristics Inline tag
`<img />`	displays an **image** file Empty tag inline tag
`<a>…</a>`	hypertext link **anchor** inline tag
`<!-- … -->`	"…" replaced by any **comment** (i.e., any description, note, or memo for human use)

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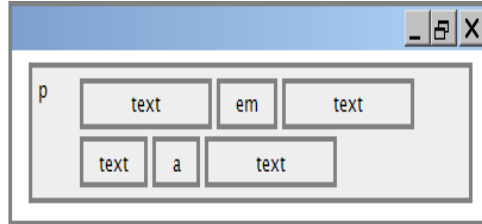UNIVERSITÉ

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Block and Inline Statements

☐ **Block** elements contain an entire large region of content

- examples: paragraphs, lists, table cells
  `<h1>-<h6> <div> <p> <ul> <ol>`

- the browser places a margin of whitespace between block elements for separation

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Block and Inline Statements (cont.)

```
                                      _ ⊟ X
   p
        ┌──────────┬──────┬──────────┐
        │   text   │  em  │   text   │
        └──────────┴──────┴──────────┘
        ┌──────┬───┬──────────┐
        │ text │ a │   text   │
        └──────┴───┴──────────┘
```
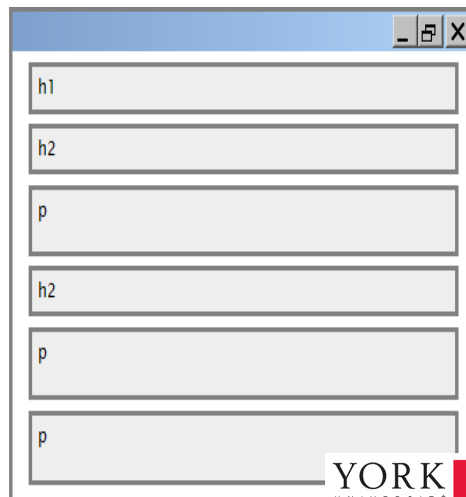
- ☐ Inline elements affect a small amount of content
  - examples: bold text, code fragments, images
    `<span> <a> <img> <em>`…
  - the browser allows many inline elements to appear on the same line
  - should be nested inside a block element

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Document Flow – block elements

```
<body>
   <h1>…</h1>
   <h2>…</h2>
   <p>…</p>
   <h2>…</h2>
   <p>…</p>
   <p>…</p>

</body>
```

```
                                      _ ⊟ X
   ┌────────────────────────────────┐
   │ h1                             │
   └────────────────────────────────┘
   ┌────────────────────────────────┐
   │ h2                             │
   └────────────────────────────────┘
   ┌────────────────────────────────┐
   │ p                              │
   └────────────────────────────────┘
   ┌────────────────────────────────┐
   │ h2                             │
   └────────────────────────────────┘
   ┌────────────────────────────────┐
   │ p                              │
   └────────────────────────────────┘
   ┌────────────────────────────────┐
   │ p                              │
   └────────────────────────────────┘
```

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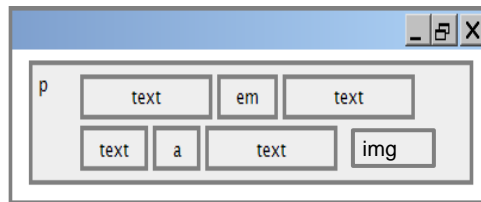
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Document flow - inline elements
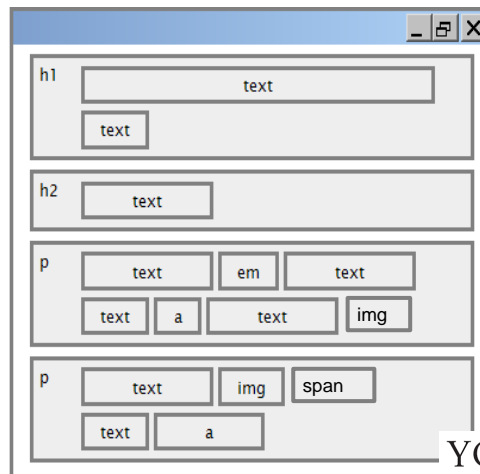
```
<body>
   <p>
 Today, <em> 24 hrs only </em>, blowout sale!
See our <a href="…"> products </a> page for
more info. And the image here <img src=… \>
   </p>

</body>
```


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Document flow - a larger example

• Both block and inline elements can be nested inside block elements;

• Inline element can be nested inside block and inline element;

• Block element *cannot* be nested inside an inline element;

https://www.w3schools.com/html/html_blocks.asp

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Paragraph <p>

```
…
        <body>
                <p> Harry Potter and the Deathly Hallows,
the last book in the series, begins directly after the
events of the sixth book.
Voldemort      has completed his ascension to power and
gains       control of the Ministry of Magic </p>
        </body>
…                                                      HTML
```

Harry Potter and the Deathly Hallows, the last book in the series, begins
directly after the events of the sixth book. Voldemort has completed his
ascension to power and gains control of the Ministry of Magic

output

□ Placed within the body of the page

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block

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Headings <h1>, <h2>, … <h6>

```
<h1> Harry Potter </h1>
<h2> Books </h2>
<h3> Harry Potter and the Philosopher's Stone </h3>
                                                      HTML
```

Harry Potter
Books
Harry Potter and the Philosopher's Stone

output

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Horizontal rule <hr />

```
<h1> Harry Potter </h1>  <hr />
<h2> Books </h2>
<h3> Harry Potter and the Philosopher's Stone </h3>
                                                    HTML
```

Harry Potter

Books

Harry Potter and the Philosopher's Stone

output

- <hr> or

preferred

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Line Break

```
<p>One Ring to rule them all, One Ring to find them, <br />
One Ring to bring them all and in the darkness bind
them.</p>
<p> In the Land of Mordor where the Shadows lie. </p>
                                                    HTML
```

One Ring to rule them all, One Ring to find them,
One Ring to bring them all and in the darkness bind them

In the Land of Mordor where the Shadows lie.

output

-
 or

- br should not be used to separate paragraphs or used multiple times in a row to create spacing

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Phrase elements <em>, <strong>

```
<p>
HTML is <em>really</em>,
<strong>REALLY</strong> fun!
</p>
```
HTML

HTML is *really* **REALLY** fun!

output

- □ **em**: emphasized text (usually in italic)
- □ **strong**: strongly emphasized text (usually in bold)
- □ The tags must be properly nested for a valid page
- □ Discouraged. Should be done in CSS

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Lab2 +

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Unordered list: <ul>,

```
<ul>
    <li>No shoes</li>
    <li>No shirt</li>
    <li>No problem!</li>
</ul>
```
HTML

- No shoes
- No shirt
- No problem!

output

- □ **ul** represents a bulleted list of items (block)
- □ **li** represents a single item within the list (block)

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- □ can make lists with other bullets using CSS

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More about unordered lists

```
<ul>
 <li>Harry Potter characters:
    <ul>
    <li>Harry Potter</li>
    <li>Hermione</li>
    <li>Ron</li>
    </ul>
 </li>
 <li>LOTR characters:
    <ul>
    <li>Frodo</li>
    <li>Bilbo</li>
    <li>Sam</li>
    </ul>
 </li>
</ul>              HTML
```

- Harry Potter characters:
  - Harry Potter
  - Hermione
  - Ron
- LOTR characters:
  - Frodo
  - Bilbo
  - Sam

output

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Ordered list

```
<p>Apple business model:</p>
<ol>
    <li>Beat Microsoft</li>
    <li>Beat Google</li>
    <li>Conquer the world!</li>
</ol>                              HTML
```

Apple business model:
1. Beat Microsoft
2. Beat Google
3. Conquer the world   *output*

- □ **ol** represents a numbered list of items
- □ Can also be nested and/or mixed with
- □ we can make lists with letters or Roman numerals using CSS

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Sections of a page <div>

block

```
<div class="shout">
<h2>Coding Horror! Coding Horror!</h2>
<p> See our special deal on Droids!</p>
<p>We'll beat any advertised price!</p>
</div>                                                    HTML
```

Coding Horror! Coding Horror!

See our special deal on Droids!

We'll beat any advertised price!   output

- □ Tag used to indicate a logical section or area of a page
- □ Has <mark>no appearance by default,</mark> but you can apply styles to it

- □ HTML5   semantic tags <header> <footer> <section> ......

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Inline Sections <span>

```
<h2>Coding Horror! Coding Horror!</h2>
<p>See our <span class="special">special</span> deal on
Droids!</p>
<p>We'll beat <span class="shout"> any advertised
price</span>!</p>
                                                          HTML
```

Coding Horror! Coding Horror!

See our special deal on Droids!

We'll beat any advertised price!   output

- □ <mark>has no appearance by default,</mark> but you can apply a style or ID
  to it, which will be applied to the text inside the span

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More HTML tags

□ Some tags can contain additional information called attributes

- syntax:
  <element attribute="value" attribute="value"> content </element>

- example: `<a href="page2.html">Next page</a>`

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More HTML tags

□ Some tags don't contain content; can be opened and closed in one tag

- syntax:
  <element attribute="value" attribute="value" />

- example: <hr />

- example:
  `<img src="Harry.jpg" alt="pic of Harry Potter" />`

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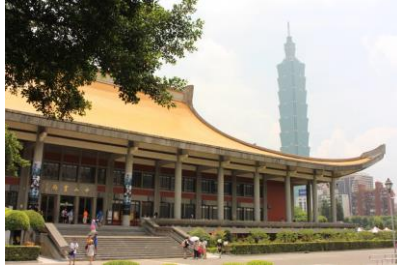# Images <img>

```html
<img src="images/tobby.jpg" alt="Taipei101" />
```
HTML

☐ The **src** attribute specifies source of the image URL
  ▪ Can be local or on the web   ./images   ../images
☐ HTML5 also requires an **alt** attribute describing the image

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More about images

```html
<figure>
  <img src="images/dumbledore.jpg" alt="Hanoi" width="200" />
  <figcaption>A place to visit</figcaption>
</figure>
```
HTML

    A place to visit

☐ HTML5

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Links <a>

```
<p>
Search
<a href="http://www.google.com/">Google</a> now!
</p>                                                    HTML
```

Search Google now!

output

☐ The **href** attribute specifies the destination URL

☐ Links or *anchors* are inline elements, so they must be placed inside a block element such as a `<p>` or `<h1>`

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More about anchors

```
<p>book <a href="deathlyHallows-book.html">Harry Potter
and the Deathly Hallows Book</a> </p>

<p>search <a href="http://en.wikipedia.org"
title="Search">Wikipedia</a> frequently</p>
                                                       HTML
```

Book Harry Potter and the Deathly Hallows

Search Wikipedia frequently

output

☐ Types of URLs that can appear in anchors:

▪ Absolute: to another web site

▪ Relative: to another page on <u>this</u> web site

```
href="others/other.html"
```

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images as link

```html
<a href="http://www.yorku.ca/">
   <img src="images/dumbledore.jpg" alt="Yorku"/>
</a>
```
HTML

☐ If placed inside an anchor, the image will become a link

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"Inline inside block"

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> Users > huiwa > Desktop > My Docu > EECS1012 > 1012M N 2022W 22W 22W 22W > L1 > <> Untitled-2.html > ⊘ html > ⊘ body > ⊘ h2 > ⊘ h2 > ⊘ br

```html
1  <html>
2      <head>
3          <title> first page </title>
4      </head>
5
6  <body>
7      <h1> hello world! </h1>
8      <hr>
9
10     <h2>xxxx2 <h2>
11
12     <hr>
13     <h3>xxxx3 </h3>
14
15     <p> a pargraph </p>
16     <p> another paragraph </p>
17
18
19     I like
20     <ul>
21         <li> hiking
22         <li> talking
23         <li> reading
24     </ul>
25
26     <ol>
27         <li> EECS1550
28         <li> EECS1022
29         <li> MATH1090
30
31     </ol>
32
33     <img src="images/YorkU.jpg" width="300" height="200">  <!--  assume a local image Yorku.jpg in sub-directory 'images' -->  <br>
34
35     <img src="https://upload.wikimedia.org/wikipedia/commons/6/65/Toronto_Skyline_Summer_2020.jpg" width="300" height="200"> <br>
36
37     Please visit <a href="http://www.yorku.ca"> this</a> website of my university
38
39     </body>
```

first page ×   🌑 New Tab   ×   +

← → C   🗋 file:///C:/Users/huiwa/Desktop/My Docu/

hello world!

xxxx2

xxxx3

a pargraph

another paragraph

I like
- hiking
- talking
- reading

1. EECS1550
2. EECS1022
3. MATH1090

Please visit this website of my university

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HTML Character Entities

Symbols	Character Code	HTML Code	Character Entity Name
&	&	&	Ampersand
<	<	<	Less-than
>	>	>	Greater-than
©	©	©	Copyright sign
®	®	®	Registered Trade Mark
♠	♠	♠	Black Spade Suit
♣	♣	♣	Black Club Suit
♥	♥	♥	Black Heart Suit
♦	♦	♦	Black Diamond Suit (except Verdana font)

```
<p>I will display &euro;</p>          I will display €
<p>I will display &#8364;</p>         I will display €
```

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HTML forms

- **form:** a group of UI controls that accepts information from the user and sends the information to a web server
- the information is sent to the server as a query string

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HTML form: `<form>`

```
<form action="Server URL">
  form controls
   …
</form>
```
HTML

- □ required action attribute gives the URL of the page that will process this form's data

- □ when form has been filled out and **submitted,** its data will be sent to the action's URL

Input field	(text box): a single line of alphanumeric input
Text area:	a multi-line area for alphanumeric input
Selection box:	a pull-down menu of options
Radio button:	select only one of multiple options
Checkbox:	select any number of options
Button:	a clickable area to trigger an action

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Form controls: `<input>`

```
<input type="text" name="p" />
<input type="text" name="q" value="Colbert Report" />
<br><br>
<input type="submit" value="OK" />
```
HTML

[ ] [Colbert Report]

[OK]

- □ input **element is used to create many UI controls**
  - ▪ an inline element that MUST be self-closed
- □ name **attribute specifies name of query parameter to pass to server**
- □ type **can be** `text, checkbox, file, hidden, password, radio, reset, submit, button,` **…**
- □ value **attribute specifies control's initial text**

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Check boxes: `<input>`

```html
<input type="checkbox" value="lettuce" /> Lettuce
<input type="checkbox" value="tomato" checked="checked" /> Tomato
<input type="checkbox" value="pickles" /> Pickles
                                                    HTML
```

☐ Lettuce ☑ Tomato ☐ Pickles

- none, 1, or many checkboxes can be checked at same time

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Radio buttons: `<input>`

```html
<input type="radio" name="cc" value="visa" checked="checked" /> Visa
<input type="radio" name="cc" value="mastercard" /> MasterCard
<input type="radio" name="cc" value="amex" />      American Express

                          HTML
```
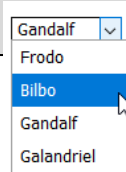
◉ Visa ○ MasterCard ○ American Express

- grouped by name attribute (only one can be checked at a time)
- must specify a value for each one or else it will be sent as value on

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Drop down lists: `<select>`,`<option>`

```html
<select name="favoritecharacter">
  <option value="frodo">Frodo</option>
  <option value="bilbo">Bilbo</option>
  <option value="Gan" selected="selected">Gandalf</option>
  <option value="Gal">Galandriel</option>
</select>
```
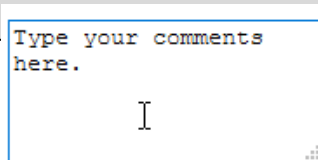
HTML

□ option element represents each choice

□ select optional attributes: disabled, multiple, size

□ optional selected attribute sets which one is chosen

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Text boxes: `<textarea>`

```html
<textarea rows="4" cols="20" name="comment">
  Type your comments here.
</textarea>
```

HTML

□ initial text is placed inside textarea tag (optional)

□ required rows and cols attributes specify height/width in characters

□ optional read only attribute means text cannot be modified

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Text labels: `<label>`

```html
<label> <input type="radio" name="cc" value="visa"
checked="checked" /> Visa </label>
<label> <input type="radio" name="cc" value="mastercard"
/> MasterCard</label>
<label> <input type="radio" name="cc" value="amex" />
American Express </label>
                                                    HTML
```

◉ Visa ○ MasterCard ○ American Express

- □ associates nearby text with control, so you can click text to activate control
- □ can be used with checkboxes or radio buttons
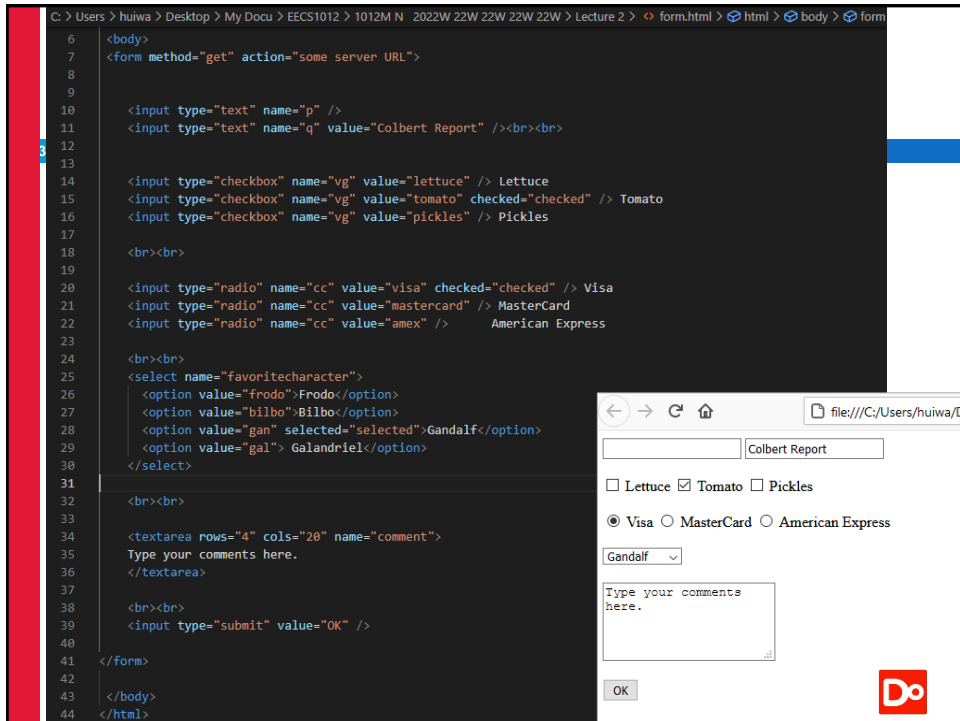- □ *label element can be targeted by CSS style rules*

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Password input field, submit button: `<input>`

```html
<input type="text" size="10" maxlength="8" /> NetID <br />

<input type="password" size="16" /> Password
<input type="submit" value="Log In" />
                                                    HTML
```

| abcde | NetID |
| •••••• |
| OK |

- □ **input attributes:** `disabled, maxlength, readonly, size, value`
- □ `size` attribute controls onscreen width of text field
- □ `maxlength` limits how many characters user is able to type into field

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Tables <table>, <tr>, <td>

```html
<table style="width:100%" >
        <tr><td>1,1</td> <td>1,2 okay</td> </tr>
        <tr><td>2,1 real wide</td> <td>2,2</td> </tr>
</table>                                                    HTML
```

1,1	1,2 okay
2,1 real wide	2,2

output

- □ `table` defines the overall table, `tr` each row, and `td` each cell's data
- □ Useful for displaying large row/column data sets
- □ Can be formatted (CSS) fancy

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My Multi Level Table				
	Column 0	Column 1	Column 2	
			Column 2a	Column 2b
Row 1	Row 1a	123	456	789
	Row 1b	123	456	789
Row 2		123	456	789

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Tables <table>, <tr>, <td>

```
<table style="width:100%" border=1>
      <tr><td>1,1</td> <td>1,2 okay</td> </tr>
      <tr><td>2,1 real wide</td> <td>2,2</td> </tr>
</table>                                              HTML
```

1,1	1,2 okay
2,1 real wide	2,2

output

□ border=1 =0 for no

□ This attribute has been deprecated in favor of CSS.

```
<style>
table, th, td {
  border:1px solid black;
}
</style>
```

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Tables <table>, <tr>, <td>

```
<table style="width:100%" border=1>
      <tr><td>1,1</td> <td>1,2 okay</td> </tr>
      <tr><td>2,1 real wide</td> <td>2,2</td> </tr>
</table>                                              HTML
```

1,1	1,2 okay
2,1 real wide	2,2

output

□ border=1 =0 for noborder

□ This attribute has been deprecated in favor of CSS.

```
<style>
table, th, td {
  border:1px solid black;
  border-collapse: collapse;
}
</style>
```

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Summary so far

- □ <head>
  - ▪ <title> <meta/> <link/> <script>
- □ <body>
  - ▪ <p>
<hr>
<h1-6> <div><span><img><a> <header><footer>
  - ▪ <form>: <input><select><textarea> …
  - ▪ <table>: <th> <tr> <td>

- □ Lots more tags
  - ▪ <pre> <code> <blockquote>
  - ▪ <aside> <nav>

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Computer code <code>

```
<p>
  The <code>ul</code> and <code>ol</code>
  tags make lists.
</p>
```
HTML

The ul and ol tags make lists.
output

- □ code: a short section of computer code

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Preformatted text <pre>

```
<pre>
Bill Gates speaks
     You will be assimilated
  Microsoft fans delirious
</pre>                                          HTML
```

```
Bill Gates speaks
     You will be assimilated
  Microsoft fans delirious
                                              output
```

- ☐ Displayed with exactly the whitespace / line breaks given in the text
- ☐ Shown in a fixed-width font by default

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Preformatted text <code>+<pre>

```
<pre><code>
     public static void main(String[] args) {
         System.out.println("Hello, world!");
     }
</code></pre>                                   HTML
```

```
public static void main(String[] args) {
         System.out.println("Hello, world!");
     }
                                              output
```

- ☐ When showing a large section of computer code, enclose it in a `pre` to preserve whitespace and a `code` to describe the semantics of the content

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Some (html5) style guide tips

- declare the document type
- use **lower case** for elements, attributes, etc.
- **close** empty elements too   <hr\>
- use **quote** for attribute values
- do not use space in attribute values or around **=**
- provide **alt** attribute for **img** element
- separate long/logical blocks with **blank line**
- indent properly

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Some (html5) style guide tips

- do not omit **html, body,** or **head**
- set a meaningful **title**
- set a **viewport**

      meta name="viewport" content="width=device-width, initial-scale=1.0">

- provide comments when needed
- use style sheets properly
- use javascript properly
- use html validator

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W3C HTML Validator

☐ checks your HTML code to make sure it meets the official strict HTML specifications

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references & more reading

☐ HTML validator
https://validator.w3.org/

☐ HTML5 tutorial
https://www.w3schools.com/html/

☐ HTML5 semantic Elements
https://www.w3schools.com/html/html5_semantic_elements.asp

☐ HTML colour names
https://www.w3schools.com/colors/colors_names.asp

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