Trường Đại học Công nghệ Thông tin – Đại học Quốc gia Hồ Chí Minh
Bộ môn An toàn thông tin

HTML5

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What is HTML?

- HTML is the standard for creating Web pages.
- HTML stands for Hyper Text Markup Language
- HTML describes the structure of Web pages using markup
- HTML elements are the building blocks of HTML pages
- HTML elements are represented by tags
- Browsers do not display the HTML tags, but use them to render the content of the page

HTML Versions

Since the early days of the web, there have been many versions of HTML:

HTML Versions

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Version	Year
HTML	1991
HTML 2.0	1995
HTML 3.2	1997
HTML 4.01	1999
XHTML	2000
HTML5	2014

A Simple HTML Document

Example

```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

Example

```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

Example Explained

- The <!DOCTYPE html> declaration defines this document to be HTML5.
- The <html> element is the root element of an HTML page.
- The <head> element contains meta information about the document.
- The <title> element specifies a title for the document.
- The <body> element contains the visible page content.
- The <h1> element defines a large heading.
- The <p> element defines a paragraph.

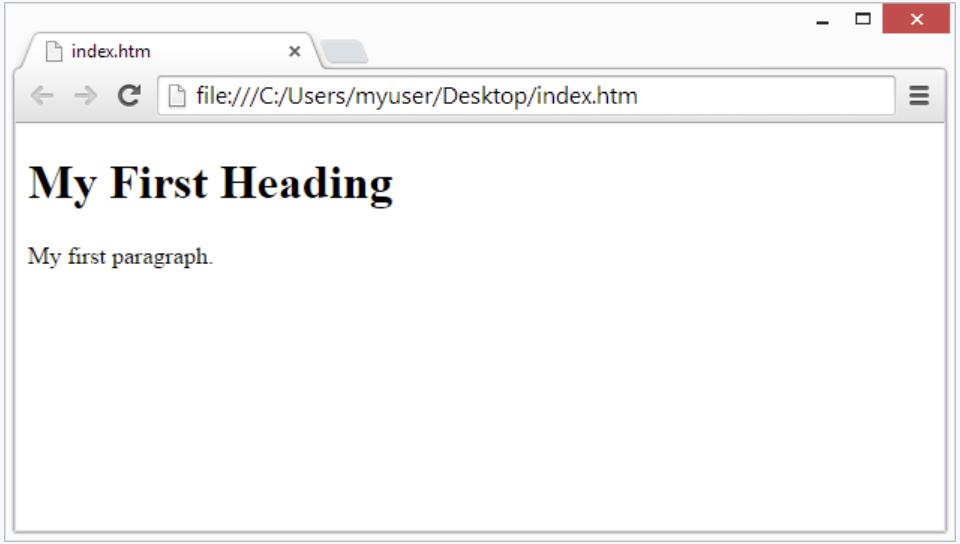
HTML Tags

HTML tags are element names surrounded by angle brackets: <tagname>content goes here...</tagname>

- HTML tags normally come **in pairs** like and
- The first tag in a pair is the **start tag,** the second tag is the **end tag**
- The end tag is written like the start tag, but with a **forward slash** inserted before the tag name
- **Tip:** The start tag is also called the **opening tag**, and the end tag the **closing tag**.

Web Browsers

- The purpose of a web browser (Chrome, IE, Firefox, Safari) is to read HTML documents and display them.
- The browser does not display the HTML tags, but uses them to determine how to display the document:



The <!DOCTYPE> Declaration

The <!DOCTYPE> declaration represents the document type, and helps browsers to display web pages correctly.

- It must only appear once, at the top of the page (before any HTML tags).
- The <!DOCTYPE> declaration is not case sensitive.
- The <!DOCTYPE> declaration for HTML5 is:
- <!DOCTYPE html>

HTML Page Structure

Below is a visualization of an HTML page structure:

```
<html>
  <head>
    <title>Page title</title>
  </head>
  <body>
    <h1>This is a heading</h1>
    <p>This is a paragraph.</p>
    <p>This is another paragraph.</p>
  </body>
</html>
```

HTML Comment Tags

You can add comments to your HTML source by using the following syntax:
<!-- Write your comments here -->
Notice that there is an exclamation point (!) in the opening tag, but not in the closing tag.

Note: Comments are not displayed by the browser, but they can help document your HTML source code.

With comments you can place notifications and reminders in your HTML:

Example

```
<!-- This is a comment -->

<p>This is a paragraph.</p>

<!-- Remember to add more information here -->
```

Write HTML Using Notepad

Step 1: Open Notepad (PC)

Step 2: Write Some HTML

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

<h1>My First Heading</h1>

<p>My first paragraph.</p>

</body>
</html>
```

Step 3: Save the HTML Page

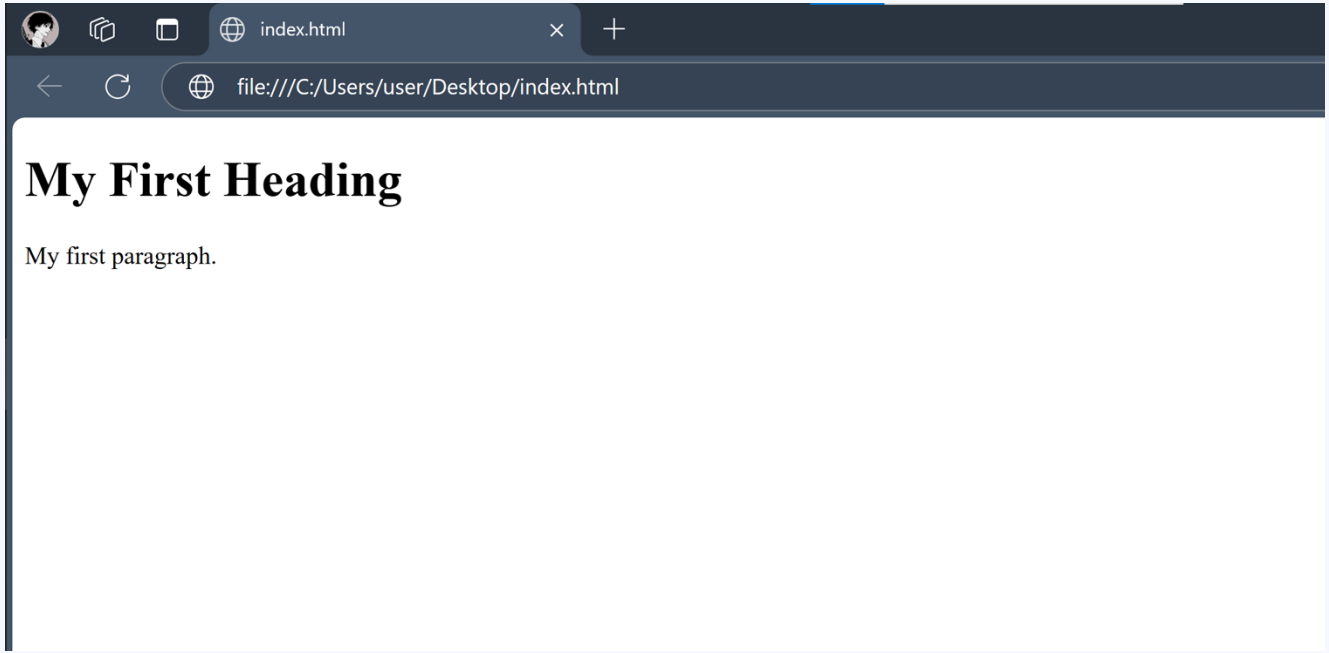
Save the file on your computer.
Select **File > Save as** in the Notepad menu.

Name the file **"index.htm"** and set the encoding to **UTF-8** (which is the preferred encoding for HTML files).

Step 4: View the HTML Page in Your Browser

Open the saved HTML file in your favorite browser (double click on the file, or right-click - and choose "Open with").

The result will look much like this:


index.html
file:///C:/Users/user/Desktop/index.html
My First Heading
My first paragraph.

HTML Basic Example

- All HTML documents must start with a document type declaration:

  <!DOCTYPE html>.

- The HTML document itself begins with **<html>** and ends with **</html>**.
- The visible part of the HTML document is between **<body>** and **</body>**.

```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

The HTML <head> Element

The HTML **<head>** element has nothing to do with HTML headings.

The <head> element is a container for metadata. HTML metadata is data about the HTML document. Metadata is not displayed.

The <head> element is placed between the <html> tag and the <body> tag:

Example

```
<!DOCTYPE html>
<html>
<head>
  <title>My First HTML</title>
  <meta charset="UTF-8">
</head>
<body>
```

Note: Metadata typically define the document title, character set, styles, links, scripts, and other meta information.

Nested HTML Elements

HTML elements can be nested (elements can contain elements).

All HTML documents consist of nested HTML elements.

This example contains four HTML elements:

Example

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

<h1>My First Heading</h1>
<p>My first paragraph.</p>

</body>
</html>
```

Do Not Forget the End Tag

What end tag is missing??

```
<html>
<body>

<p>This is a paragraph
<p>This is a paragraph

</body>
</html>
```

The example above works in all browsers, because the closing tag is considered optional.

Never rely on this. It might produce unexpected results and/or errors if you forget the end tag.

Always Use Lowercase Tags

HTML tags are not case sensitive: <P> means the same as <p>.

The HTML5 standard does not require lowercase tags, but W3C **recommends** lowercase in HTML, and **demands** lowercase for stricter document types like XHTML.

HTML Attributes

- The **title** attribute provides additional "tool-tip" information
- The **href** attribute provides address information for links
- The **width** and **height** attributes provide size information for images
- The **alt** attribute provides text for screen readers
- At W3Schools we always use **lowercase** attribute names
- At W3Schools we always **quote** attribute values with double quotes
- **<tag attr="value">**

Example: Link

HTML Headings

HTML headings are defined with the **<h1>** to **<h6>** tags.

- <h1> defines the most important heading (largest)
- <h6> defines the least important heading (smallest)

Example

```
<h1>This is heading 1</h1>

<h2>This is heading 2</h2>

<h3>This is heading 3</h3>
```

HTML Headings

Headings Are Important

Search engines use the headings to index the structure and content of your web pages.

Users skim your pages by its headings. It is important to use headings to show the document structure.

<h1> headings should be used for main headings, followed by <h2> headings, then the less important <h3>, and so on.

Note: Use HTML headings for headings only. Don't use headings to make text **BIG** or **bold**.

HTML Paragraphs

HTML paragraphs are defined with the ** ** tag:

Example

This is a paragraph.

This is another paragraph.

HTML Links

HTML links are defined with the **<a>** tag:

Example

This is a link

- The link's destination is specified in the **href attribute**.
- Attributes are used to provide additional information about HTML elements.
- Links are inline elements, so they must be placed inside a block element such as a <p> or

HTML Links - The target Attribute

The **target** attribute specifies where to open the linked document.

The target attribute can have one of the following values:

- blank - Opens the linked document in a new window or tab
- self - Opens the linked document in the same window/tab as it was clicked (this is default)
- parent - Opens the linked document in the parent frame
- top - Opens the linked document in the full body of the window
- framename - Opens the linked document in a named frame

This example will open the linked document in a new browser window/tab:

Example

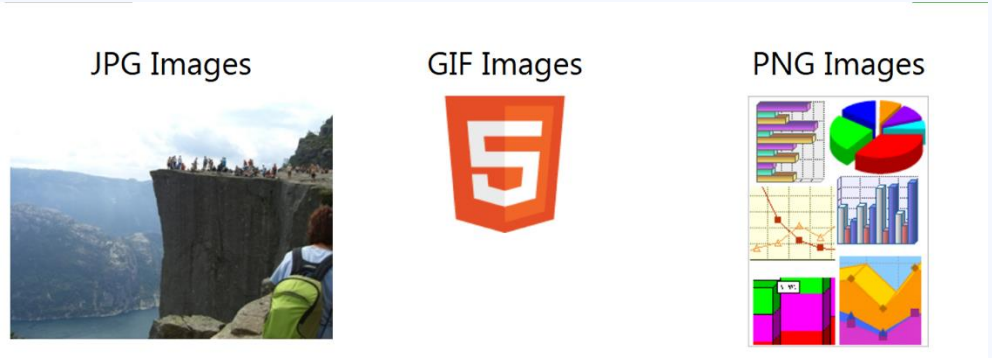
```
<a href="https://www.google.com/" target="_blank">Visit Google</a>
```

HTML Images

HTML images are defined with the **<img>** tag.
The source file (src), alternative text (alt), width, and height are provided as attributes:

Example

<img src="w3schools.jpg" alt="W3Schools.com" width="104“ height="142">



HTML Images - The alt Attribute

The alt attribute provides an alternate text for an image, if the user for some reason cannot view it (because of slow connection, an error in the src attribute, or if the user uses a screen reader).

If a browser cannot find an image, it will display the value of the alt attribute:

Example:

```
<img src="wrongname.gif" alt="HTML5 Icon" style="width:128px;height:128px;">
```

Image Size - Width and Height

You can use the **style** attribute to specify the width and height of an image.

The values are specified in pixels (use px after the value):

Example

```
<img src="html5.gif" alt="HTML5 Icon" style="width:128px;height:128px;">
```

Alternatively, you can use the **width** and **height** attributes. Here, the values are specified in pixels by default:

Example

```
<img src="html5.gif" alt="HTML5 Icon" width="128" height="128">
```

HTML Horizontal Rules

The <hr> tag defines a thematic break in an HTML page, and is most often displayed as a horizontal rule.

The <hr> element is used to separate content (or define a change) in an HTML page:

Example

```
<h1>This is heading 1</h1>
<p>This is some text.</p>
<hr>
<h2>This is heading 2</h2>
<p>This is some other text.</p>
<hr>
```

HTML Horizontal Rules

Adding Attributes

Example

```
<h1>This is heading 1</h1>
<p>This is some text.</p>
<hr size=10 color=red align=left width=
50%>
<h2>This is heading 2</h2>
<p>This is some other text.</p>
<hr>
```

HTML Text Formatting

HTML uses elements like <b> and <i> for formatting output, like **bold** or *italic* text.
Formatting elements were designed to display special types of text:
<b> - Bold text
 - Important text
<i> - Italic text
 - Emphasized text
<mark> - Marked text
<small> - Small text
<del> - Deleted text
<ins> - Inserted text
<sub> - Subscript text
<sup> - Superscript text
See w3schools website

Text Formatting
This text is bold
This text is italic
This is subscript and superscript

- **Bold text**
- **Important text**
- ***Italic text***
- ***Emphasized text***
- **Marked text**
- **Small text**
- ~~**Deleted text**~~
- **Inserted text**
- **Subscript text**
- **Superscript text**

HTML Colors

In HTML, a color can be specified by using:

- a color name
- an RGB value
- a HEX value.

Color Names

In HTML, a color can be specified by using a color name:

Example

Color	Name
	Red
	Orange
	Yellow
	Cyan
	Blue

HTML supports 140 standard color names.

HEX Value

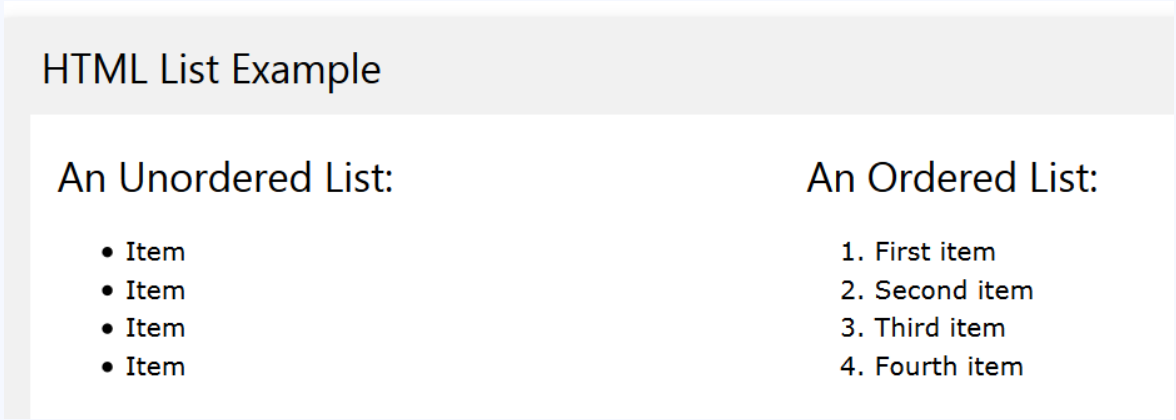
In HTML, a color can also be specified using a hexadecimal value in the form:

For example, #FF0000 is displayed as red, because red is set to its highest value (FF) and the others are set to the lowest value (00).

000000 = black
FFFFFF = white

Color	HEX
	#FF0000
	#FFFF00
	#00FF00
	#00FFFF
	#0000FF

HTML List


HTML List Example
An Unordered List:
Item
Item
Item
Item
An Ordered List:
1. First item
2. Second item
3. Third item
4. Fourth item

Unordered HTML List

An unordered list starts with the **<ul>** tag.
Each list item starts with the **<li>** tag.

The list items will be marked with bullets (small black circles) by default:

Example

```
<ul>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ul>
```

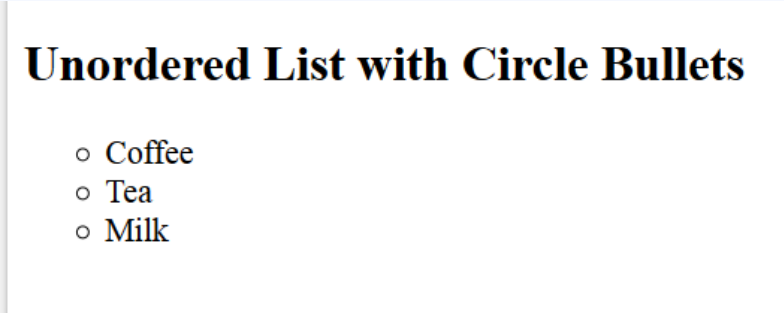
Unordered HTML List

The CSS **list-style-type** property is used to define the style of the list item marker:

Value	*Description*
disc	Sets the list item marker to a bullet (default)
circle	Sets the list item marker to a circle
square	Sets the list item marker to a square
none	The list items will not be marked

Example - Circle

```
<ul style="list-style-type:circle">
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ul>
```



Ordered HTML List

Example

```
<ol>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ol>
```

An ordered HTML list

1. Coffee
2. Tea
3. Milk

- Create an Ordered List using :

```
<ol type="1">
  <li>Apple</li>
  <li>Orange</li>
  <li>Grapefruit</li>
</ol>
```

- Attribute values for type are 1, A, a, I, or i

1. Apple
2. Orange
3. Grapefruit

a. Apple
b. Orange
c. Grapefruit

i. Apple
ii. Orange
iii. Grapefruit

A. Apple
B. Orange
C. Grapefruit

I. Apple
II. Orange
III. Grapefruit

- Create an Unordered List using :

```
<ul type="disk">
  <li>Apple</li>
  <li>Orange</li>
  <li>Grapefruit</li>
</ul>
```

- Attribute values for type are:
  - disc, circle or square

- **Apple**
- **Orange**
- **Pear**

- **Apple**
- **Orange**
- **Pear**

- **Apple**
- **Orange**
- **Pear**

HTML Tables

- Tables represent tabular data
  - A table consists of one or several rows
  - Each row has one or more columns
- Tables comprised of several core tags: <table></table>:

  begin / end the table

  <tr></tr>: create a table row

  <td></td>: create tabular data (cell)
- Tables should not be used for layout. Use CSS floats and

  positioning styles instead

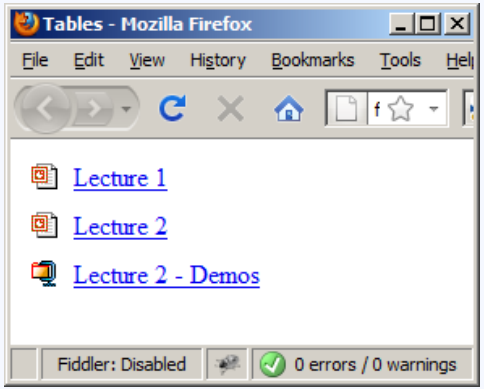
HTML Tables

- Start and end of a table
  <table> ... </table>
- Start and end of a row
  <tr> ... </tr>
- Start and end of a header
  <th> ... </th>
- Start and end of a cell in a row
  <td> ... </td>

HTML Tables – Example

```
<table cellspacing="0" cellpadding="5">
  <tr>
    <td><img src="ppt.gif"></td>
    <td><a href="lecture1.ppt">Lecture 1</a></td>
  </tr>
  <tr>
    <td><img src="ppt.gif"></td>
    <td><a href="lecture2.ppt">Lecture 2</a></td>
  </tr>
  <tr>
    <td><img src="zip.gif"></td>
    <td><a href="lecture2-demos.zip">
      Lecture 2 - Demos</a></td>
  </tr>
</table>
```

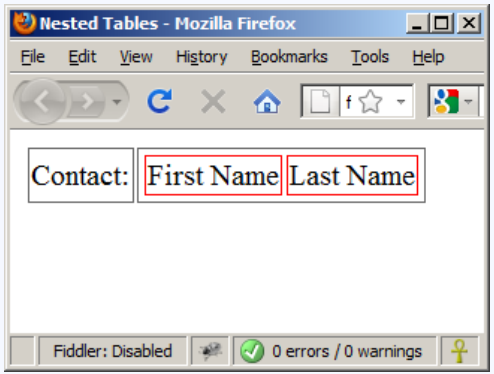
```
<table cellspacing="0" cellpadding="5">
  <tr>
    <td><img src="ppt.gif"></td>
    <td><a href="lecture1.ppt">Lecture 1</a></td>
  </tr>
  <tr>
    <td><img src="ppt.gif"></td>
    <td><a href="lecture2.ppt">Lecture 2</a></td>
  </tr>
  <tr>
    <td><img src="zip.gif"></td>
    <td><a href="lecture2-demos.zip">
      Lecture 2 - Demos</a></td>
  </tr>
</table>
```



Nested Tables

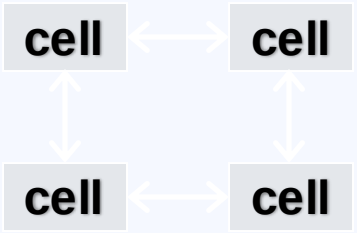
Table data "cells" (<td>) can contain nested tables (tables within tables):

```
<table>
  <tr>
    <td>Contact:</td>
    <td>
      <table>
        <tr>
          <td>First Name</td>
          <td>Last Name</td>
        </tr>
      </table>
    </td>
  </tr>
</table>
```

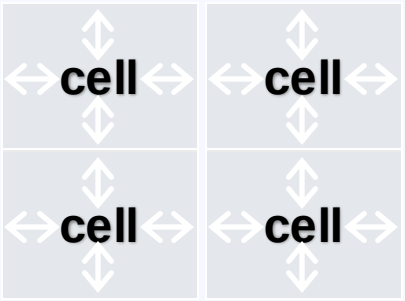


Cell Spacing and Padding

- Tables have two important attributes:
  - **cellspacing**



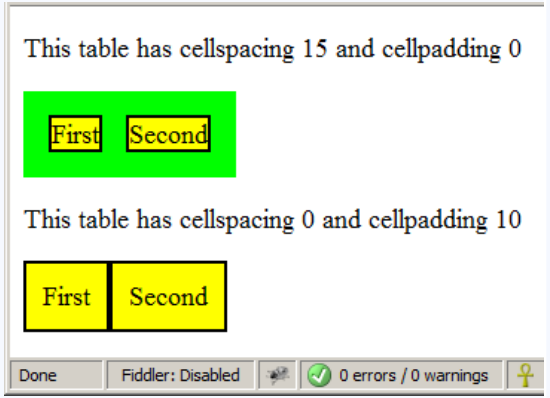
  - Defines the empty space between cells
  - **cellpadding**



  - Defines the empty space around the cell content

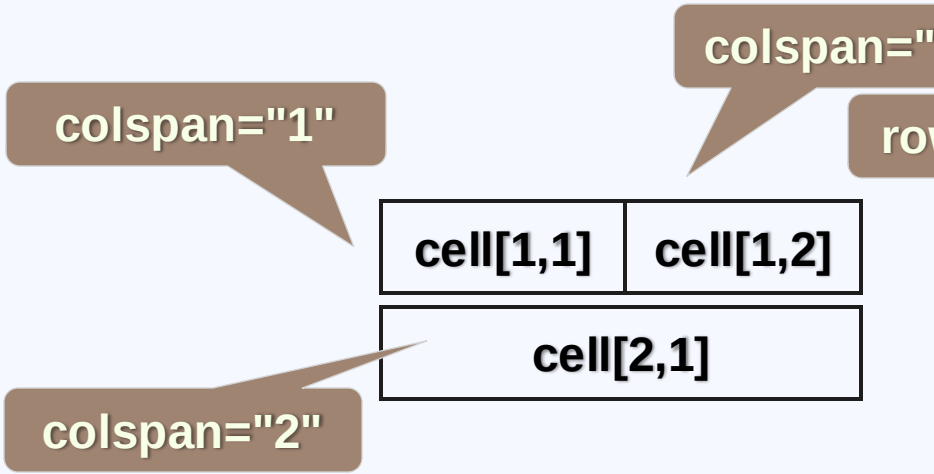
Cell Spacing and Padding – Example

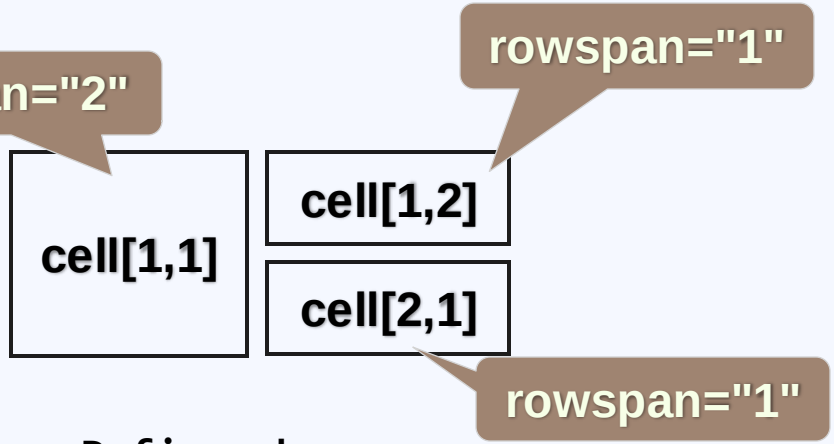
```
<html>
  <head><title>Table Cells</title></head>
  <body>
    <table cellspacing="15" cellpadding="0">
      <tr><td>First</td>
      <td>Second</td></tr>
    </table>
    <br/>
    <table cellspacing="0" cellpadding="10">
      <tr><td>First</td><td>Second</td></tr>
    </table>
  </body>
</html>
```



Column and Row Span

- Table cells have two important attributes:
  - colspan
  - rowspan

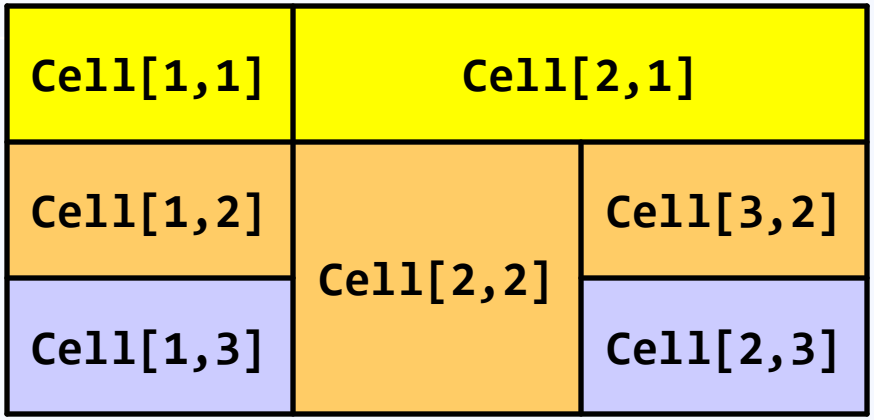




- Defines how many columns the cell occupies
- Defines how many rows the cell occupies

Column and Row Span

```
<table cellspacing="0">
    <tr class="1"><td>Cell[1,1]</td>
        <td colspan="2">Cell[2,1]</td></tr>
    <tr class="2"><td>Cell[1,2]</td>
        <td rowspan="2">Cell[2,2]</td>
        <td>Cell[3,2]</td></tr>
    <tr class="3"><td>Cell[1,3]</td>
        <td>Cell[2,3]</td></tr>
</table>
```



HTML Forms

- Forms are the primary method for gathering data from site visitors
- Create a form block with

```
<form></form>
```

- Example:

```
<form name="myForm" method="post"
action="path/to/some-script.php">
   ...
</form>
```

Form Fields

- Single-line text input fields:

```
<input type="text" name="FirstName" value="This is a text field" />
```

- Multi-line textarea fields:

```
<textarea name="Comments">This is a multi-line text field</textarea>
```

- Hidden fields contain data not shown to the user:

```
<input type="hidden" name="Account" value="This is a hidden field" />
```

  - Often used by JavaScript code

Form Input Controls

- Checkboxes:

```
<input type="checkbox" name="fruit" value="apple”/>
```

- Radio buttons:

```
<input type="radio" name="title" value="Mr." />
```

- Radio buttons can be grouped, allowing only one to be selected from a group:

```
<input type="radio" name="city" value="Lom" />
<input type="radio" name="city" value="Ruse" />
```

- Dropdown menus:

```
<select name="gender">
  <option value="Value 1"
    selected="selected">Male</option>
  <option value="Value 2">Female</option>
  <option value="Value 3">Other</option>
</select>
```

- Submit button:

```
<input type="submit" name="submitBtn"
value="Apply Now" />
```

- Reset button – brings the form to its initial state

```
<input type="reset" name="resetBtn" value="Reset the form" />
```

- Image button – acts like submit but image is displayed and click coordinates are sent

```
<input type="image" src="submit.gif" name="submitBtn" alt="Submit" />
```

- Ordinary button – used for JavaScript, no default action

```
<input type="button" value="click me" />
```

- File input – a field used for uploading files

```
<input type="file" name="photo" />
```

  - When used, it requires the form element to have a specific attribute:

```
<form enctype="multipart/form-data">
...
  <input type="file" name="photo" />
...
</form>
```

Labels

- Form labels are used to associate an explanatory text to a form field using the field's ID.

```
<label for="fn">First Name</label>
<input type="text" id="fn" />
```

- Clicking on a label focuses its associated field (checkboxes are toggled, radio buttons are checked)
- Labels are both a usability and accessibility feature and are required in order to pass accessibility validation.

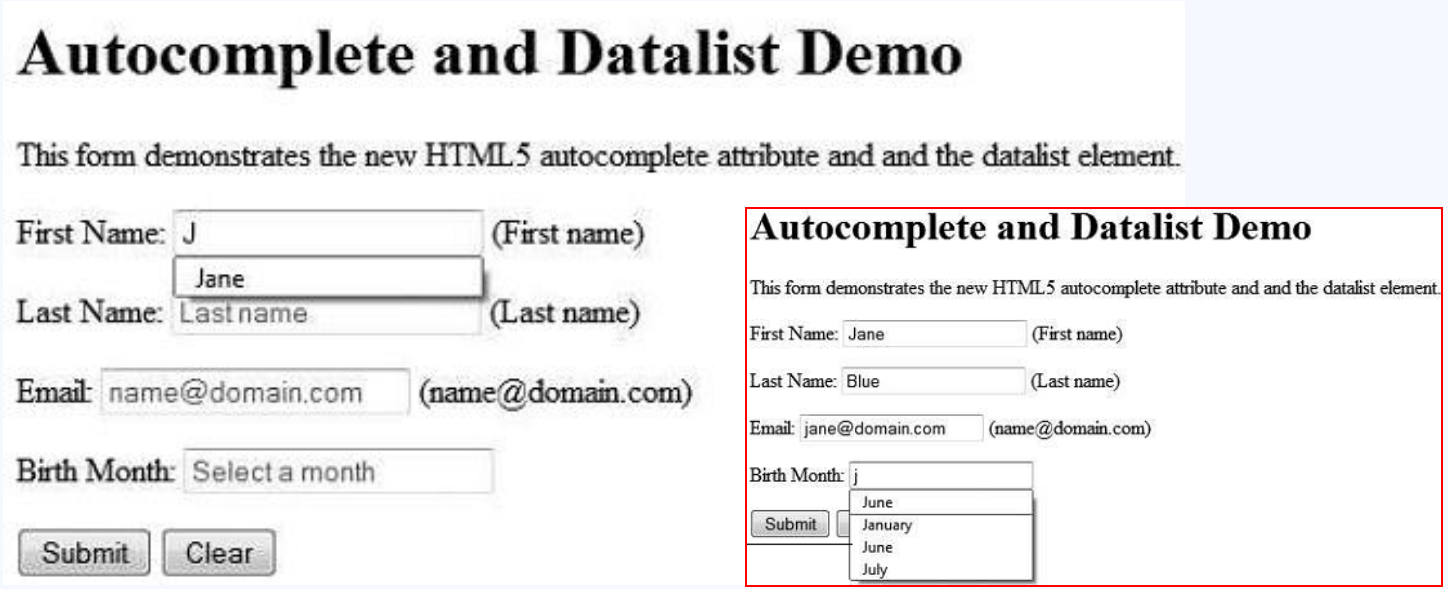
```
<form method="post" autocomplete="on">
    <p><label>First Name:
      <input type="text" id="firstName" placeholder="First name" /> (First name)
    </label></p>

    <p><label>Last Name:
      <input type="text" id="lastName" placeholder="Last name" /> (Last name)
    </label></p>

    <p><label>Email:
      <input type="email" id="email" placeholder="name@domain.com" /> (name@domain.com)
    </label></p>

    <p><label for="txtList">Birth Month:
      <input type="text" id="txtList" placeholder="Select a month" list="months" />
      <datalist id="months">
        <option value="January">
        <option value="February">
        <option value="March">
        <option value="April">
        <option value="May">
        <option value="June">
        <option value="July">
```

```
        <option value="August">
        <option value="September">
        <option value="October">
      </datalist>
    </label></p>
    <p>
        <input type="submit" value="Submit" />
        <input type="reset" value="Clear" />
    </p>
  </form>
</body>
```

Error-Prevention Tip :

- The autocomplete attribute works only if you specify a name or id attribute for the input element.

Output



- Once you fill a data in the text box. HTML5 can recover the previous input.

HTML Entities

- Some characters are reserved in HTML
- If you use the less than (<) or greater than (>) signs in your HTML text, the browser might mix them with tags
- Entity names or entity numbers can be used to display reserved HTML characters

Entity name	Entity number
&entity_name;	*&#entity_number*;

HTML Entities

Result	Description	Name	Number
	non-breaking space		
<	less than	&lt;	&#60;
>	greater than	&gt;	&#62;
&	ampersand	&amp;	&#38;
"	double quotation mark	&quot;	&#34;
'	single quotation mark	&apos;	&#39;
¢	cent	&cent;	&#162;
£	pound	&pound;	&#163;
¥	yen	&yen;	&#165;
€	euro	&euro;	&#8364;
©	copyright	&copy;	&#169;
®	trademark	&reg;	&#174;

HTML Character Entities (w3schools.com)

HTML Classes & IDs

- The HTML **class** attribute is used to specify a class for an HTML element.
  - Multiple HTML elements can share the same class
- The HTML **id** attribute is used to specify a unique id for an HTML element
  - You cannot have more than one element with the same id in an HTML document.
- A class name can be used by multiple HTML elements, while an id name must only be used by one HTML element within the page

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- A class name can be used by multiple HTML elements, while an id name must only be used by one HTML element within the page
- ID can be used to identify the corresponding element in some functions

HTML Classes & IDs

This will tell the browser to focus to the input when user clicks on the label

```
<label for=“password">Password</label>
<input type="password" id=" password " />
```

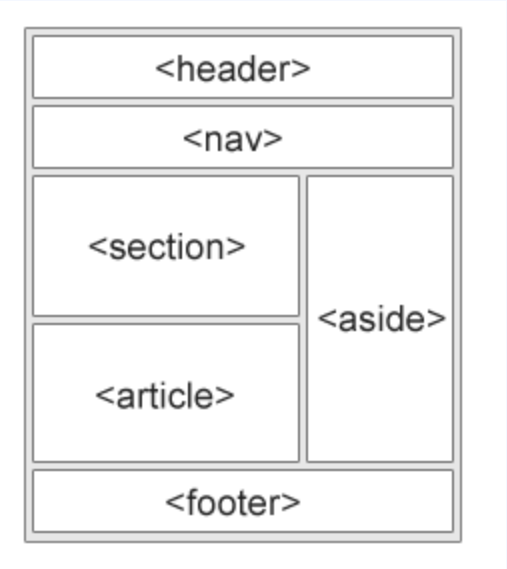
This will tell the browser to jump to the section with corresponding ID

```
<a href=“#aboutme">About Me</a>
<section id=“aboutme”>About Me<section>
```

HTML Semantics

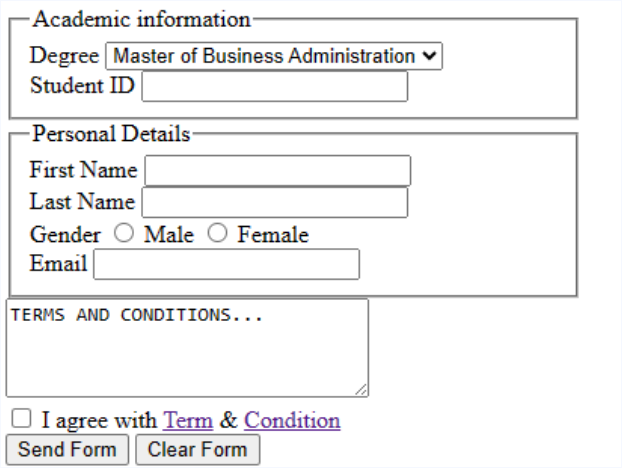
- A semantic element clearly describes its meaning to both the browser and the developer.
- In HTML there are some semantic elements that can be used to define different parts of a web page

•<article>
•<aside>
•<details>
•<figcaption>
•<figure>
•<footer>
•<header>
•<main>
•<mark>
•<nav>
•<section>
•<summary>
•<time>



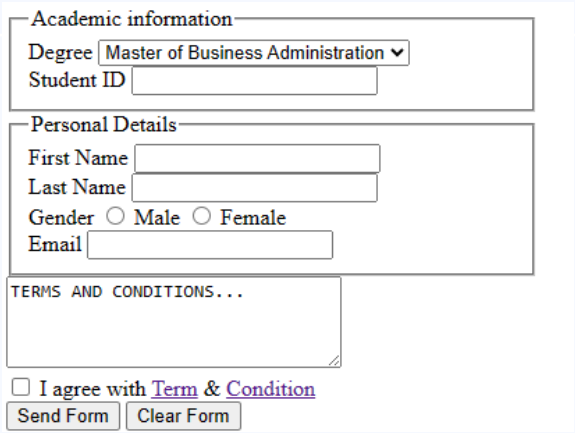
Forms – Example

```
<form method="post" action="/">
    <fieldset>
      <legend>Academic information</legend>
      <label for="degree">Degree</label>
      <select name="degree" id="degree">
        <option value="BA">Bachelor of Art</option>
        <option value="BS">Bachelor of Science</option>
        <option value="MBA" selected="selected">Master of
          Business Administration</option>
      </select>
      <br />
      <label for="studentid">Student ID</label>
      <input type="password" name="studentid" required />
    </fieldset>
    <fieldset>
      <legend>Personal Details</legend>
      <label for="fname">First Name</label>
      <input type="text" name="fname" id="fname" />
      <br />
      <label for="lname">Last Name</label>
      <input type="text" name="lname" id="lname" required />
      <br />
```



Forms – Example (cont)

```
    <label for="">Gender</label>
      <input name="gender" type="radio" id="gm" value="m" />
      <label for="gm">Male</label>
      <input name="gender" type="radio" id="gf" value="f" />
      <label for="gf">Female</label>
      <br />
      <label for="email">Email</label>
      <input type="text" name="email" id="email" required />
    </fieldset>
    <div>
      <textarea name="terms" cols="30" rows="4" readonly="readonly">...</textarea>
    </div>
    <div>
      <input type="checkbox" name="agree" id="agree" required>
      <label for="agree">I agree with <a href="/">Term</a> & <a href="/">Condition</a></label>
    </div>
    <div>
      <input type="submit" name="submit" value="Send Form" />
      <input type="reset" value="Clear Form" />
    </div>
</form>
```



HTML5: New form elements

<input type="text">

<input type="email">

<input type="URL">

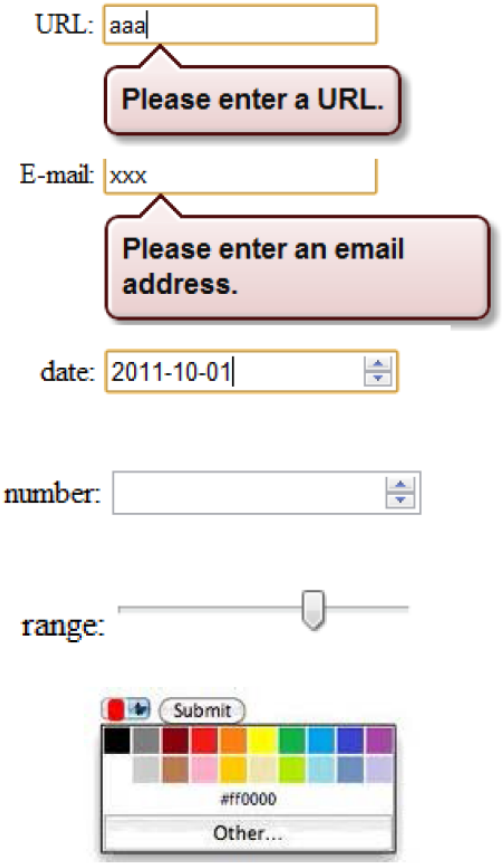
<input type="date">

type={time, month, week}

<input type="number">

<input type="range">

<input type="color">



Exercises

1. Replace **“?”** with correct tags and attributes to create **radio buttons group**

```
<form>
<? value="html"> HTML
<? value="css"> CSS
</form>
```

2. Using HTML, recreate this text, in the text only “inorganic compound” and solvent are hyperlinks

Water is an inorganic compound with the chemical formula H_2O. It is a transparent, tasteless, odorless,[c] and nearly colorless chemical substance, and it is the main constituent of Earth's hydrosphere and the fluids of all known living organisms (in which it acts as a solvent[19]). It is vital for all known forms of life, despite not providing *food energy* or organic ~~micronutrients~~.

Exercises – Homework

Using **HTML Only**, create simple academic information form (image below)