

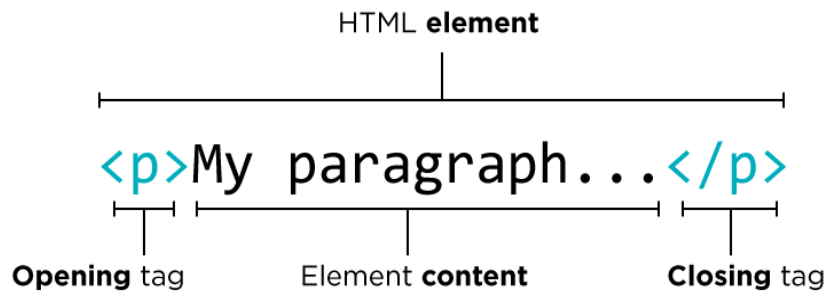
Computer Science Discoveries
Unit 2: Web Development
Chapter 1: Creating Web Pages

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Hyper Text Markup Language

HTML indicates the purpose of different parts of a web page by surrounding them with pairs of opening and closing tags, like in the example below.



Default Tags

All HTML pages include a common set of tags. They're so common, in fact, that all Web Lab projects will start with them added already.

HTML Tag	What it does
<pre>1 <!DOCTYPE html> 2 <html> 3 <head> 4 5 </head> 6 <body> 7 8 </body> 9 </html></pre>	This starter code is included in each Web Lab project. The different tags are explained below.
<code><!DOCTYPE html></code>	Tells the computer that this is a document written in HTML
<code><html></code>	Indicates the beginning of your code written in HTML
<code><head></code>	Contains information about your web page
<code><body></code>	Contains all the main contents of your web page. It should contain the body of the web page, including all text, media, links, etc. that you want people to see on your page.

Doctype

All HTML documents must start with a `<!DOCTYPE>` declaration. This `<!DOCTYPE>` tag tells the browser what version of HTML the page is written in.

Examples

Using `<!DOCTYPE>` to declare the version of HTML the page is written in.

```
<!DOCTYPE html>  
<html>  
<head>  
  <link rel="stylesheet" href="style.css">  
</head>  
<body>  
The content of the document.....  
</body>  
</html>
```

Syntax

`<!DOCTYPE>`

Tips

- The `<!DOCTYPE>` is the very first line in the HTML document.
- The `<!DOCTYPE>` does not need a closing tag.

HTML

The HTML element is the top-level element of an HTML document. This HTML tag `<html>` is the container for all other HTML elements (except for the `<!DOCTYPE>` tag).

Examples

Using the `<html>` tag to write a simple HTML document.

```
<!DOCTYPE html>
<html>
  <head>
    <link rel="stylesheet" href="style.css">
  </head>
  <body>
<p> This is a paragraph </p>
  </body>
</html>
```

Syntax

```
<html></html>
```

Tips

- The `<html>` tag is placed right under the `<!DOCTYPE>` tag.
- The `<html>` tag requires a starting and end tag.
- The `<html>` contains every other tag that makes up the webpage. That's why the closing tag `</html>` is all the way at the bottom.

Head

This tag is used as a container for metadata: metadata is data about the HTML document, such as the style sheets.

Examples

Using `<head>` to contain metadata about the HTML document.

```
<html>
  <head>
    <link rel="stylesheet" href="style.css">
  </head>
</body>
</html>
```

Syntax

```
<head></head>
```

Tips

- Make sure you don't put any content in the `<head>` tag.
- The `<head>` is placed inside the `<html>` tags and before the `<body>` tags.

Body - Lesson 2.5

The **<body>** tag defines the main content of the HTML document that will be directly visible on your web page. This body tag **<body>** contains all the content of an HTML document, such as headings, paragraphs, images, hyperlinks, tables, lists, etc.

Examples

Using **<body>** to create a simple webpage.

```
<html>
<head>
  <title>Title of the document</title>
</head>
<body>
  <h1>This is a heading</h1>
  <p>This is a paragraph.</p>
</body>
</html>
```

Syntax

<body></body>

Tips

- There is only one **<body>** element in an HTML document.
- The **<body>** tag should be placed under the closing **</head>** tag.
- All the contents of an HTML document, such as headings, images, lists, etc should go inside the **<body>** tag.
- No content should be written after the closing **</body>** tag.

Paragraph - Lesson 2.5

The `<p>` tag is used to group together sets of sentences and put some space between that group of text and the next group of text. Paragraphs are marked by opening(`<p>`) and closing(`</p>`) tags.

Examples

Multiple Short Paragraphs

Using `<p>` to define a paragraph

```
<p>My favorite animals are birds.</p>  
<p>My favorite sport is baseball.</p>
```

Single Longer Paragraph

Using `<p>` to define a paragraph of multiple lines.

```
<p>  
    Soccer is an awesome sport because you get to play on a team  
    with all your friends. My favorite players are Megan Rapinoe  
    from the United States, and Marta from Brazil.  
</p>
```

Syntax

```
<p></p>
```

Tips

- We can use the `<p>` tag to write several paragraphs.
- We can use the `<p>` tag to write a paragraph of multiple lines.

HTML Tag	Tag Name	What it does
<code><p></code>	Opening Paragraph Tag	Start of a paragraph. Paragraphs are just blocks of text in your web page.
<code></p></code>	Closing Paragraph Tag	Marks the end of a paragraph. An end tag is always just the opening tag with a <code>/</code> at the beginning.

Heading - Lesson 3.3

This tag creates different-sized section titles throughout a web page. Headings add structure to your web page by breaking it up so it's easier for a user to read. There are six different heading tags: `<h1>`, `<h2>`, `<h3>`, `<h4>`, `<h5>` and `<h6>`. The most common type of heading is `<h1>`. To use it, you put the text you want to display between the opening tag (`<h1>`) and the closing tag (`</h1>`).

The code for a heading will look like `<h1>My Heading Text</h1>`.

Example

Code	Preview
<pre><h1>Shoulders</h1> > <h2>Knees</h2> <h3>Toes</h3></pre>	<p>Shoulders</p> <p>Knees</p> <p>Toes</p>

Syntax

```
<h1></h1>
```

Tips

- There are different sized headings which are marked by the number in the heading tag. They go from `<h1>` to `<h6>`.
- The `<h1>` tag is the largest font size.
- The `<h6>` tag is the smallest font size.

List Item - Lesson 4.2

This tag is used to create a list. The list tag `` must be contained in an ordered list (`` with bullets) or an unordered list (`` with numbers).

Examples

Ordered List

Using `` within an ordered list

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

Unordered List

Using `` within an unordered list

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

Syntax

```
<li></li>
```

Tips

- Try to indent your `` tags so it's clear they are contained in the `` or `` tags.
- Make sure to start your list with either a `` or a ``. If you just use `` without `` or `` the rendered result will be an unordered list with bullet icons preceding each list item.
- The list items can contain content other than text such as lists of videos, images, songs, or hyperlinks.

Unordered List - Lesson 4.2.a

This tag is used to create a set of bulleted items. An unordered list element has the tag ``. This is an abbreviation for Unordered List. Each item in the list is marked by a list item element ``.

Example

Unordered List

Using `` to make an unordered list

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

- Tea
- Milk
- Water

Syntax

```
<ul></ul>
```

Tips

- To make the unordered list, write the unordered list tags `` ``. Next, add your list items inside the unordered list tags. To make each list item, use the list item tags `` `` and write the list item inside the tags.
- Try to indent your `` tags so it's clear they are contained in the `` tag.
- The list items can contain content other than text such as lists of videos, images, songs, or hyperlinks.

Ordered List - Lesson 4.2.b

This tag is used to create a set of numbered items. An ordered list element has the tag ``. This is an abbreviation for Ordered List. Each item in the list is marked by a list item element ``.

Example

Ordered List

Using `` to make an ordered list

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

1. Tea
2. Milk
3. Water

Syntax

```
<ol></ol>
```

Tips

- To make the ordered list, write the ordered list tags `` ``. Next, add your list items inside the ordered list tags. To make each list item, use the list item tags `` `` and type your content inside the tags.
- Try to indent your `` tags so it's clear they are contained in the `` tag.
- The list items can contain content other than text such as lists of videos, images, songs, or hyperlinks.

Link - Lesson 6.8

This link tag `<link>` is typically used to link an HTML document to a stylesheet ("style.css").

The link tag is used to define a link between a HTML document and an external resource.

Examples

Linking to a Stylesheet

```
<head>  
  <link rel="stylesheet" href="style.css">  
</head>
```



```
1 <html>  
2   <head>  
3     <link rel="stylesheet" href="style.css">  
4   </head>  
5   <body>  
6     <p>My Webpage</p>  
7   </body>  
8 </html>
```

Syntax

```
<link></link>
```

Tips

- The link tag `<link>` goes inside the `<head>` tag.
- The link tag `<link>` allows you to import a stylesheet into your HTML document to control the appearance of all web pages.

Image - Lesson 9.1

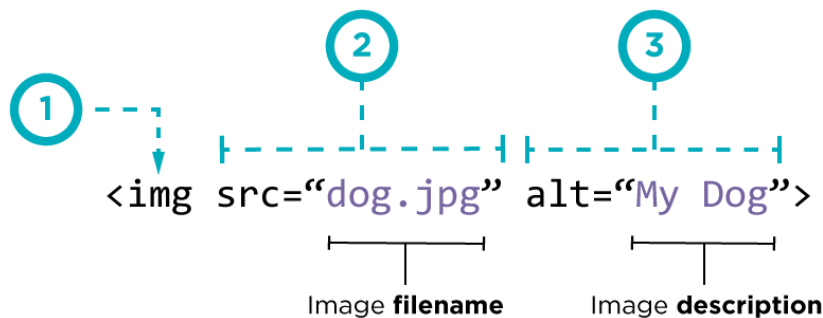
This tag allows you to add images to your page. In order to tell the browser which file to use, extra information, called an attribute, is added to the image tag inside the brackets. The attribute `src` stands for source and tells the name of the image, and the attribute `alt` specifies an alternative text for the image, if the image cannot be displayed. It provides a backup in case your image doesn't download properly or for the visually impaired.

The image tag `` has two required attributes:

- `src` - Specifies the path to the image
- `alt` - Specifies an alternate text for the image, if the image for some reason cannot be displayed.

The image tag `` has two optional attributes:

- `Height` - Specifies the height of the image in pixels.
- `Width` - Specifies the width of the image in pixels.



Example

```

```

Syntax

```
<img >
```

Tips

- This `` tag does not contain any content, and it does not require a closing tag.
- Make sure to put quotation marks around your image filename.
- The common extensions of an image file are `.jpg`, `.jpeg`, and `.png`, and the source of an image could also be a URL.
- Make sure to give your image file a name that describes what the image is about.

Cascading Style Sheets

CSS is a language that controls the way content on a website appears. A style sheet is a document that controls how a web page will appear. External style sheets are separate files that are linked to the HTML page.

Adding a style sheet



1. To add CSS style rules to an HTML page, you need to create a style sheet document.
2. This is the style sheet.
3. Link to your style sheet. The link goes inside the `head` tag and looks like this:

```
<link rel="stylesheet" href="style.css">
```

CSS rule-sets

CSS rule-sets consist of two main parts: the selector and the rules. The selector is which elements on the page will be affected. The rules explain how to display the elements. Each rule consists of a property and value for that property.

Example

A rule-set that makes the text in an h2 tag blue and cursive:

```
h2 {
color: blue;
font-family: cursive;
}
```

In this example, h2 is the selector, color and font-family are properties, and blue and cursive are the values for those properties. The punctuation in the rule-set is very important, because that's the way the computer knows where each rule starts and stops.

Color - Lesson 6.4

The `color` property specifies the color of text. There are 140 color names predefined in the HTML and CSS color specification, such as blue, red, coral, brown, etc. Colors also can be specified in various formats; the RGB colors and the HEX colors are the most used ones.

Examples

Color in HEX

Setting the text color for a `<h1>` element to polo blue using a HEX value.

```
h1 {  
  color: #92a8d1;  
}
```

RGB Color

Setting the text color of a `<h1>` to crimson using an RGB value.

```
h1 {  
  color: rgb(220, 20, 60);  
}
```

Color Name

Setting the text color for a `<p>` element to green.

```
p {  
  color: green;  
}
```

Syntax

```
color: value;
```

Tips

- Make sure to choose a background color combined with a text color that makes the text readable

Font Size - Lesson 6.4

The `font-size` property specifies the size of a font.

Examples

Changing the Font Size

Setting the font size of a `<p>` element to 12px.

```
p {  
  font-size: 12px;  
}
```

Syntax

```
font-size: value;
```

Tips

- The default font size is medium (16px).

Font Family - Lesson 6.11.a

The `font-family` property specifies the font for an element. There are two types of font family names:

- `family-name` - The name of a font-family, like `times`, `courier`, `arial`, etc.
- `generic-family` - The name of a generic-family, like `serif`, `sans-serif`, `cursive`, `fantasy`, `monospace`.

Examples

Multiple Font Families

Setting the font of a `<p>` element.

```
p{
  font-family: Arial, Helvetica, sans-serif;
}
```

Syntax

```
font-family: value;
```

Tips

- You can specify a list of fonts, from highest priority to lowest. If the browser does not support the first font, it tries the next font.
- When listing multiple font families, make sure to separate each value with a comma.

Text Decoration - Lesson 6.11.b

The `text-decoration: value;` property specifies the appearance of decorative lines on text. The most common text-decoration are:

- `text-decoration-line` - Sets the kind of text decoration to use such as, `underline`, `overline`, `line-through`.
- `text-decoration-color` - Sets the color of the text decoration.
- `text-decoration-style` - Sets the style of the text decoration such as `solid`, `wavy`, `dotted`, `dashed`, **or** `double`.

Examples

Multiple Text Decorations

Setting different text decorations for a `<h1>` element.

```
h2 {
  text-decoration: underline overline wavy blue;
}
```

Overline text decoration

Setting an overline text decoration for a `<h1>` element.

```
h1 {
  text-decoration: overline;
}
```

Syntax

```
text-decoration: value;
```

Tips

- You may combine different kinds of text decoration in one statement.
- The default value is no text decoration.

Text Align - Lesson 6.11.c

The alignment of your text

Example

```
text-align: center;
```

Syntax

```
text-align: value;
```

Background Color - Lesson 11.3

The `background-color` property specifies the background color of an element. Color values can be defined with HEX, RGB, or color name.

Examples

Background with Color Names

Setting the background with a color name.

```
body {  
  background-color: blue;  
}
```

Background Color in RGB

Setting the background color with an RGB value.

```
body {  
  background-color: rgb(100, 70, 200);  
}
```

Background Color in Hex

Setting the background color with a HEX value.

```
body {  
  background-color: #92a8d1;  
}
```

Syntax

```
background-color: value;
```

Tips

- The default background color is transparent.
- The background of an element is the total size of the element, including padding and border (but not the margin).
- Use a background color and a text color that makes the text readable.

Float - Lesson 11.5

The `float` property places an element on the left or right side of the screen and allows text and other elements to wrap around it.

Examples

Setting an image to float to the right.

```
img {  
  float: right;  
}
```

Syntax

```
float: value;
```

Tips

- The float's default value is `none` (no float); the element will follow the normal flow of the page.
- The float property can be used for web page layouts and wrapping text around images.

Height - Lesson 11.6

The `height` property specifies the height of the content area of an element. The height of an element does not include padding, borders, or margins. Height can be defined in percentage (of the width of the containing block), pixels, cm, etc.

Examples

Height in pixels

Set the height of a `<p>` element to 100 px.

```
p{
  height: 100px;
}
```

Height as a percentage

Setting the height of an `` element using a percent value.

```
img {
  width: 50%;
}
```

Syntax

```
height: value;
```

Tips

- The height property does not include padding, borders, or margins.
- The default value of the height is `auto`: the element will automatically adjust its height to allow its content to be displayed correctly.

Width - Lesson 11.6

The `width` property specifies the width of the content area of an element. The width of an element does not include padding, borders, or margins. Width can be defined in percent of the containing block, pixels, cm, etc.

Examples

Width as a percentage

Set the width of an `` element using a percent value.

```
img {  
  width: 50%;  
}
```

Width in pixels

Setting the width of a `<p>` element to 300 pixels.

```
p {  
  width: 300px;  
}
```

Syntax

```
width: value;
```

Tips

- The `width` property does not include padding, borders, or margins.
- The default value of the width is `auto`: The element will automatically adjust its width to allow its content to be displayed correctly

Border Width - Lesson 11.9

The `border-width` property specifies the width of all four sides of an element's border. It is a shorthand for top, right, bottom, and left border width respectively. When one value is specified, it applies the same width to all four sides. The width can be set as a specific size (in px, pt, cm, em, etc) or by using one of the three predefined values: `thin`, `medium`, or `thick`.

Examples

Width Using a Predefined Value

Setting the width of the four sides of a `<h1>` element border to `thick`.

```
h1 {  
  border-style: solid;  
  border-width: thick;  
}
```

Different Border Widths

Setting the width of the four sides of a `<h1>` element border to four values (top border, right border, bottom border, and the left border respectively).

```
h1 {  
  border-style: solid;  
  border-width: 25px 10px 4px 35px;  
}
```

Syntax

```
border-width: value;
```

Tips

- The default border width is `medium`.
- The border width property can take one to four values at a time.
- Always set the `border-style` property before the `border-width` property.

Border - Lesson 11.9.a

The `border` property specifies the style, width, and color of an element's border. It is a shorthand property for `border: border-width border-style border-color;`.

Examples

Border Property

Setting a `<h1>` element to a solid red border of 5 pixels width.

```
h1 {  
  border: 5px solid red;  
}
```

Syntax

`border: border-width border-style border-color;`

Tips

- If `border-style` value is not provided, the default is no border.
- If no `border-color` value is chosen, the border color will match the color of the text.
- If `border-width` value is not provided, the default is medium.

Border Color - Lesson 11.9.a

The `border-color` property specifies the color of an element's four borders. It is a shorthand for choosing the top, right, bottom, and left border color simultaneously. When one value is specified, it applies the same color to all four sides.

Examples

Red Borders

Set all four borders of a `<h1>` element to red.

```
h1{
  border-style: solid;
  border-color: red;
}
```

Different Border Colors

Setting the four borders of a `<h1>` Element to different colors.

```
h1{
  border-style: solid;
  border-color: red green blue purple;
}
```

Syntax

```
border-color: value;
```

Tips

- Always declare the `border-style` property before the `border-color` property.

Border Style - Lesson 11.9.a

The `border-style` property specifies the line style for all four sides of an element's border. When one value is specified, it applies the same border style to all four sides. There are various border style values, such as `solid`, `dashed`, `dotted`, `double`, `groove`, `etc.`

Examples

Dashed Border

Setting a dashed border for all four sides of a `<h1>` element.

```
h1 {  
  border-style: dashed;  
}
```

Syntax

```
border-style: value;
```

Tips

- The default value specifies no border.
- The border style property can take one to four values at a time.
- Always declare the border style property before applying any other CSS border properties.

Border Radius - Lesson 11.9.b

The `border-radius` property specifies the radius of the element's corners; it allows you to add rounded corners to elements. This property can have from one to four values. The four values for each radius are given in the order `top-left`, `top-right`, `bottom-right`, `bottom-left`. When one value is specified, it applies the same radius to all four corners.

Examples

Rounded Corners in Pixels

Set rounded corners in pixels for a `<h1>` element.

```
h1 {  
  border: 2px solid red;  
  border-radius: 25px;  
}
```

Rounded Corners as a Percentage

Set rounded corners in percent for a `<h1>` element.

```
h1 {  
  border: 2px solid red;  
  border-radius: 20%;  
}
```

Syntax

```
border-radius: value;
```

Tips

- You can give any element "rounded corners" by applying a `border-radius`.
- The default value is 0.
- The shape of the corners can be defined in pixels or percent.

Margin - Lesson 11.9.c

The `margin` property specifies the margin area on all four sides of an element. It is a shorthand for `margin-top`, `margin-right`, `margin-bottom`, and `margin-left`. When one value is specified, it applies the same margin to all four sides.

Examples

Single Margin Value

Using the shorthand property to set the margin for all four sides of a `<p>` element to 40 pixels.

```
p {  
  margin: 40px;  
}
```

Multiple Margin Values

Setting multiple margin values for the four sides of a `<p>` element.

- The top margin is 10px.
- The right margin is 5px.
- The bottom margin is 15px.
- The left margin is 20px.

```
p {  
  margin: 10px 5px 15px 20px;  
}
```

Syntax

```
margin: value;
```

Tips

- Margins create extra space around an element. In contrast, padding creates extra space inside an element. The default margin value is 0.
- You can specify the margin for the individual sides of an element using the CSS `margin-top`, `margin-right`, `margin-bottom`, and `margin-left` properties, respectively.

Padding

The `padding` property specifies how much space should appear between the content of an element and its border. It is a shorthand for `padding-top`, `padding-right`, `padding-bottom`, and `padding-left`.

Examples

Single Padding Value

Using the shorthand property to set the padding for all four sides of a `<p>` element to 40 pixels.

```
p {  
  padding: 40px;  
}
```

Multiple Padding Values

Setting multiple padding values for the four sides of a `<p>` element.

- The top padding is 10px.
- The right padding is 5px.
- The bottom padding is 15px.
- The left padding is 20px.

```
p {  
  padding: 10px 5px 15px 20px;  
}
```

Syntax

```
padding: value;
```

Tips

- The default padding value is 0.
- When one value is specified, it applies the same padding to all four sides.
- You can specify the paddings for the individual sides of an element using the CSS `padding-top`, `padding-right`, `padding-bottom`, and the `padding-left` properties, respectively.

Disclaimer

All information contained in this document is taken from Code.org's Computer Science Discoveries. It is intended

to be used as a code booklet for students in an Introductory to Computer Science course. The sole purpose is to provide a printed reference for students to take notes and find information easily while working through the various lessons.

It is recommended students use compatible pair programming while working through Unit 2: Web Development, Chapter 1: Creating Web Pages.

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