

Introduction to HTML5

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What is HTML?

- ❑ HTML (Hyper Text Markup Language) is the standard markup language for creating Web pages.
 - HTML describes the structure of a Web page
 - HTML consists of a series of elements
 - HTML elements tell the browser how to display the content
 - HTML elements are represented by tags
 - HTML tags label pieces of content such as "heading", "paragraph", "table", and so on
 - Browsers do not display the HTML tags, but use them to render the content of the page

A Simple HTML Document

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

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

</body>
</html>
```

https://www.w3schools.com/html/tryit.asp?filename=tryhtml_intro

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 `<p>` and `</p>`
- 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**.

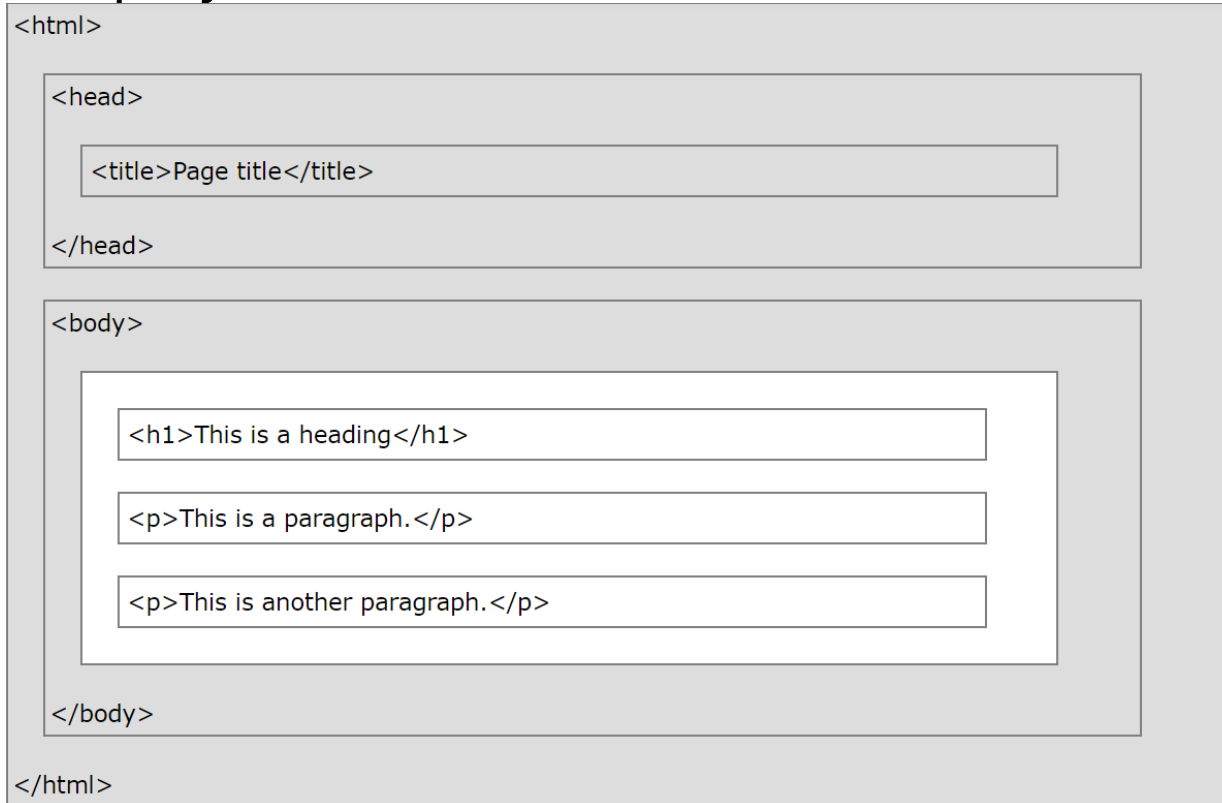
Web Browsers

- ❑ The purpose of a web browser (Chrome, Edge, 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:



HTML Page Structure

- ❑ Only the content inside the `<body>` section (the white area above) is displayed in a browser.



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>

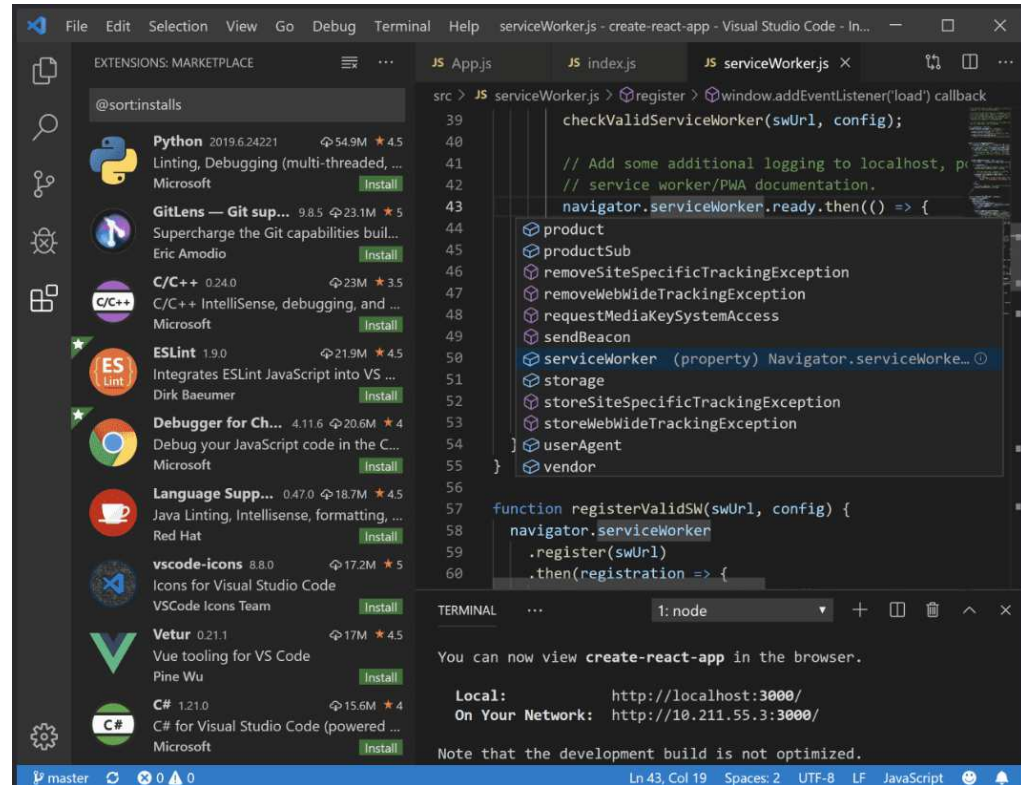
HTML Versions

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

Exercise 1-0

❑ Install Code Editor

1. Visual Studio Code
<https://code.visualstudio.com/>
2. Atom <https://atom.io/>
3. Sublime
<https://www.sublimetext.com/>
4. Notepad++ <https://notepad-plus-plus.org/downloads/>



HTML Editors

❑ Step 1: Open Notepad (PC)

- **Windows 8 or later:**
- Open the **Start Screen** (the window symbol at the bottom left on your screen). Type **Notepad**.
- **Windows 7 or earlier:**
- Open **Start > Programs > Accessories > Notepad**

❑ Step 1: Open TextEdit (Mac)

- Open **Finder > Applications > TextEdit**
- Also change some preferences to get the application to save files correctly. In **Preferences > Format > choose "Plain Text"**
- Then under "Open and Save", check the box that says "Display HTML files as HTML code instead of formatted text".
- **Then open a new document to place the code.**

Step 2: Write Some HTML

```
<!DOCTYPE html>
```

```
<html>
```

```
<body>
```

```
<h1>My First Heading</h1>
```

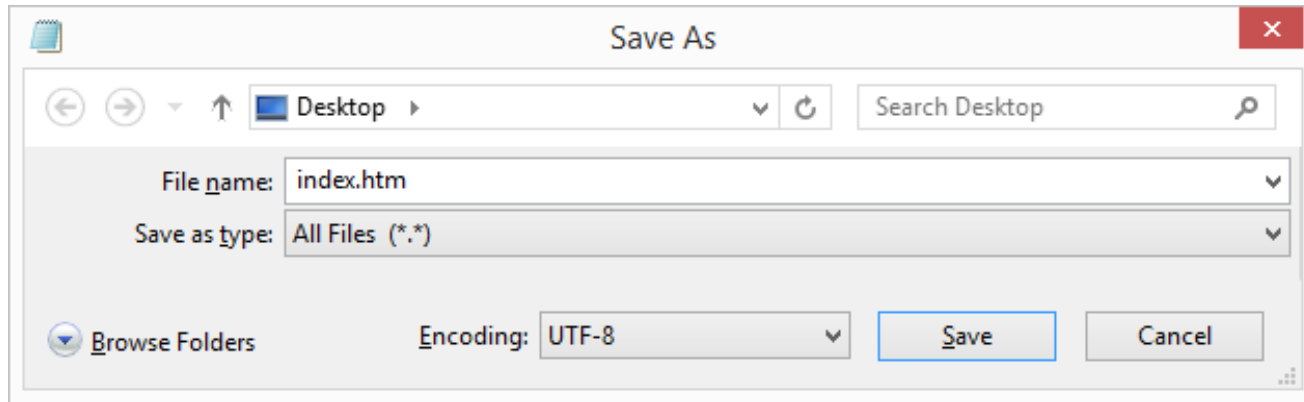
```
<p>My first paragraph.</p>
```

```
</body>
```

```
</html>
```

Step 3: Save the HTML Page

1. Save the file on your computer. Select **File > Save as** in the Notepad menu.
2. Name the file "**index.htm**" and set the encoding to **UTF-8** (which is the preferred encoding for HTML files).



You can use either .htm or .html as file extension.
There is no difference, it is up to you.

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").



HTML Elements

Start tag	Element content	End tag
<code><h1></code>	My First Heading	<code></h1></code>
<code><p></code>	My first paragraph.	<code></p></code>
<code>
</code>		

HTML elements with no content are called empty elements. Empty elements do not have an end tag, such as the `
` element (which indicates a line break).

HTML Headings

- Headings are defined with the `<h1>` to `<h6>` tags.
- `<h1>` defines the most important heading. `<h6>` defines the least important heading.

```
<h1>Heading 1</h1>  
<h2>Heading 2</h2>  
<h3>Heading 3</h3>  
<h4>Heading 4</h4>  
<h5>Heading 5</h5>  
<h6>Heading 6</h6>
```


Headings Are Important

- ❑ Search engines use the headings to index the structure and content of your web pages.
- ❑ Users often skim a page 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**.

Bigger Headings

- ❑ Each HTML heading has a default size.
 - you can specify the size for any heading with the style attribute, using the CSS font-size property:

```
<h1 style="font-size:60px;">Heading 1</h1>
```

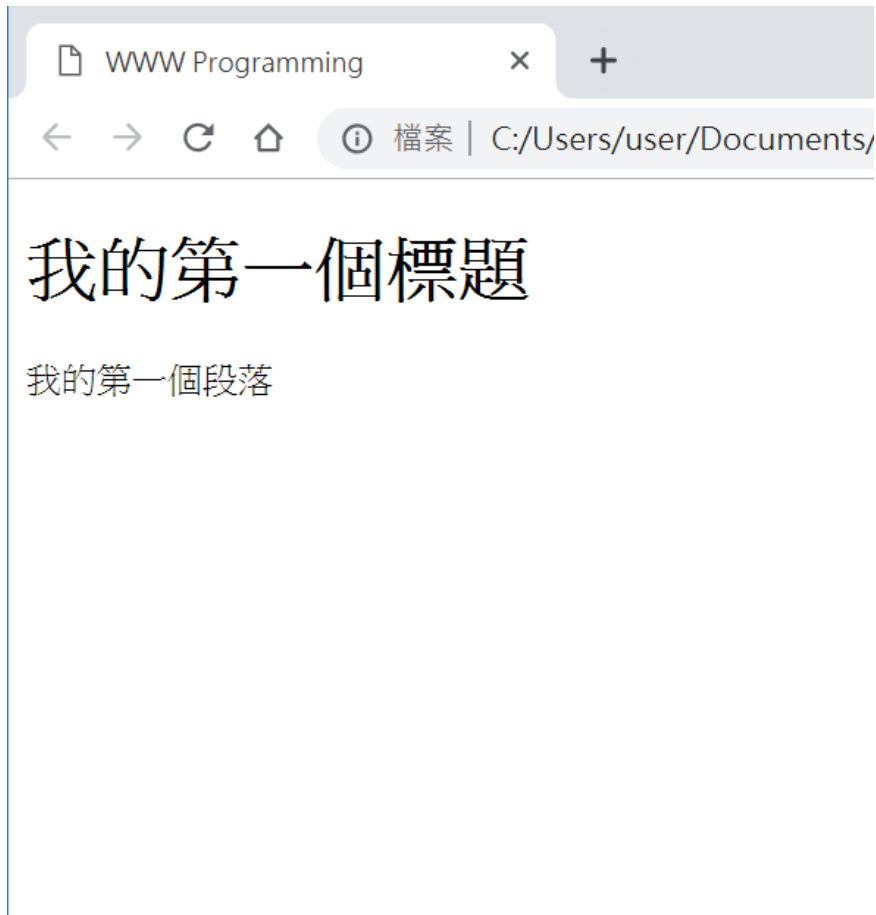
An HTML5 Example

Example

```
<!DOCTYPE html>
<html>
<head>
<title>WWW Programming</title>
</head>
<body>


<h1>我的第一個標題</h1>
<p>我的第一個段落</p>

</body>
</html>
```



HTML 5 Validator

□ <http://validator.w3.org>

**Markup Validation Service**
Check the markup (HTML, XHTML, ...) of Web documents

Validate by URI | **Validate by File Upload** | **Validate by Direct Input**

Validate by URI
Validate a document online:
Address:
[▶ More Options](#)

HTML Attributes

- ❑ All HTML elements can have **attributes**
- ❑ Attributes provide **additional information** about an element
- ❑ Attributes are always specified in **the start tag**
- ❑ Attributes usually come in name/value pairs like: **name="value "**

- ❑ The style Attribute
 - The style attribute is used to specify the styling of an element, like color, font, size etc.

```
<p style="color:red">This is a paragraph.</p>
```

The HTML Style Attribute

□ Setting the style of an HTML element, can be done with the style attribute.

➤ The HTML style attribute has the following syntax:

```
<tagname style="property:value;">
```

➤ The *property* is a CSS property. The *value* is a CSS value.

What is CSS?

❑ Cascading Style Sheets 3 (CSS3)

- is a language that describes the style of an HTML document.
- describes how HTML elements should be displayed on screen, paper, or in other media.

CSS in 3 ways

- ❑ Inline - by using the style attribute in HTML elements
- ❑ Internal - by using a `<style>` element in the `<head>` section
- ❑ External - by using an external CSS file

What is CSS?

Internal
CSS

```
<!DOCTYPE html>
<html>
<head>
<style>
  body {
    background-color: Orange;
  }
  p {
    color: navy;
    margin-left: 40px;
    font-size: 28px;
  }
</style>
<title>WWW Programming</title>
</head>
<body>
<h1>我的第一個標題</h1>
<p>我的第一個段落</p>
</body>
</html>
```



Background Color

- ❑ The CSS background-color property defines the background color for an HTML element.
 - This example sets the background color for a page to powderblue:

```
<body style="background-color:powderblue;">  
  
<h1>This is a heading</h1>  
<p>This is a paragraph.</p>  
  
</body>
```

HTML Color Names

- ❑ All modern browsers support the following 140 color names (click on a color name, or a hex value, to view the color as the background-color along with different text colors):
 - https://www.w3schools.com/colors/colors_names.asp
 - https://www.w3schools.com/colors/colors_hex.asp

HTML Paragraphs

- ❑ The HTML `<p>` element defines a paragraph:
 - **Note:** Browsers automatically add some white space (a margin) before and after a paragraph.

- ❑ HTML Display

- You cannot be sure how HTML will be displayed.
- Large or small screens, and resized windows will create different results.
- With HTML, you cannot change the output by adding extra spaces or extra lines in your HTML code.
- The browser will remove any extra spaces and extra lines when the page is displayed:

`<p>`

This paragraph
contains a lot of lines
in the source code,
but the browser
ignores it.

`</p>`

`<p>`

This paragraph
contains a lot of spaces
in the source code,
but the browser
ignores it.

`</p>`

The Poem Problem

- ❑ This poem will display on a single line:

```
<p>
```

```
My Bonnie lies over the ocean.
```

```
My Bonnie lies over the sea.
```

```
My Bonnie lies over the ocean.
```

```
Oh, bring back my Bonnie to me.
```

```
</p>
```

The HTML `<pre>` Element

- ❑ The HTML `<pre>` element defines preformatted text.
 - The text inside a `<pre>` element is displayed in a fixed-width font (usually Courier), and it preserves both spaces and line breaks:

```
<pre>
```

```
My Bonnie lies over the ocean.
```

```
My Bonnie lies over the sea.
```

```
My Bonnie lies over the ocean.
```

```
Oh, bring back my Bonnie to me.
```

```
</pre>
```

HTML Text Formatting

- ❑ HTML also defines special elements for defining text with a special meaning.
 - HTML uses elements like `` and `<i>` for formatting output, like bold or italic text.
- ❑ Formatting elements were designed to display special types of text:

- `` - Bold text
- `` - Important text
- `<i>` - Italic text
- `` - Emphasized text
- `<mark>` - Marked text
- `<small>` - Small text
- `` - Deleted text
- `<ins>` - Inserted text
- `<sub>` - Subscript text
- `<sup>` - Superscript text

HTML Comments

- ❑ Comment tags are used to insert comments in the HTML source code.

```
<!-- Write your comments here -->
```

- ❑ **Note:** Comments are not displayed by the browser, but they can help document your HTML source code.
- ❑ Comments are also great for debugging HTML, because you can comment out HTML lines of code, one at a time, to search for errors:

```
<!-- Do not display this image at the moment  
  
-->
```


HTML Links

❑ HTML links are hyperlinks.

- You can click on a link and jump to another document.
- When you move the mouse over a link, the mouse arrow will turn into a little hand.
- **Note:** A link does not have to be text. It can be an image or any other HTML element.

❑ Hyperlinks are defined with the HTML <a> tag:

❑ Syntax

```
<a href="url">Link text</a>
```

```
<a href="https://www.w3schools.com/html/">  
Visit our HTML tutorial</a>
```

HTML Links - The target Attribute

- ❑ 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

```
<a href="https://www.w3schools.com/" target="_blank">Visit W3Schools!</a>
```

Link Titles

- ❑ The title attribute specifies extra information about an element. The information is most often shown as a tooltip text when the mouse moves over the element.

```
<a href="https://www.w3schools.com/html/" title="Go to  
W3Schools HTML section">Visit our HTML Tutorial</a>
```

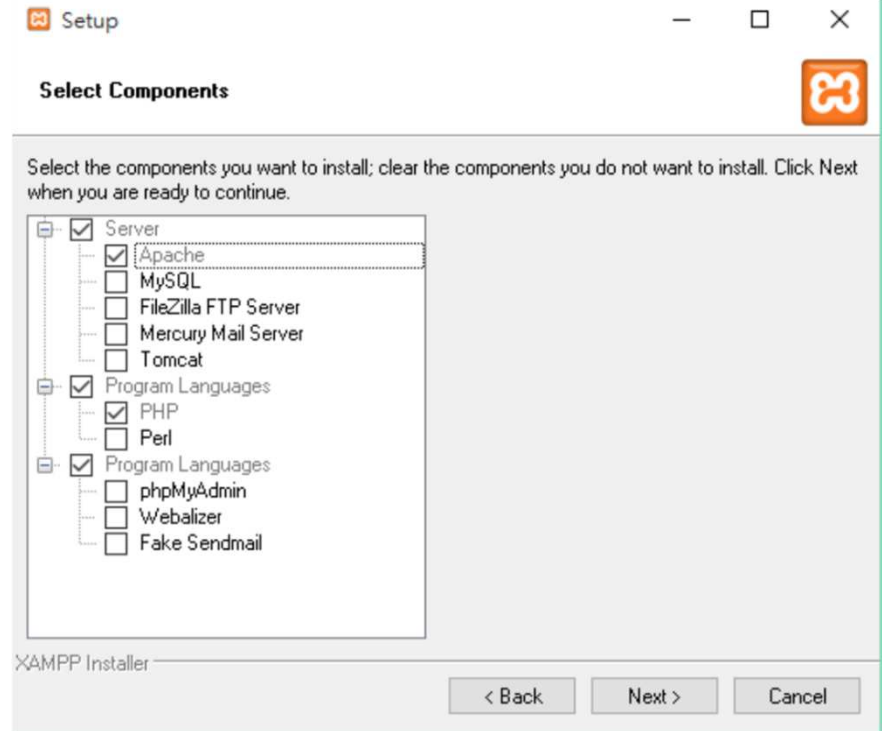
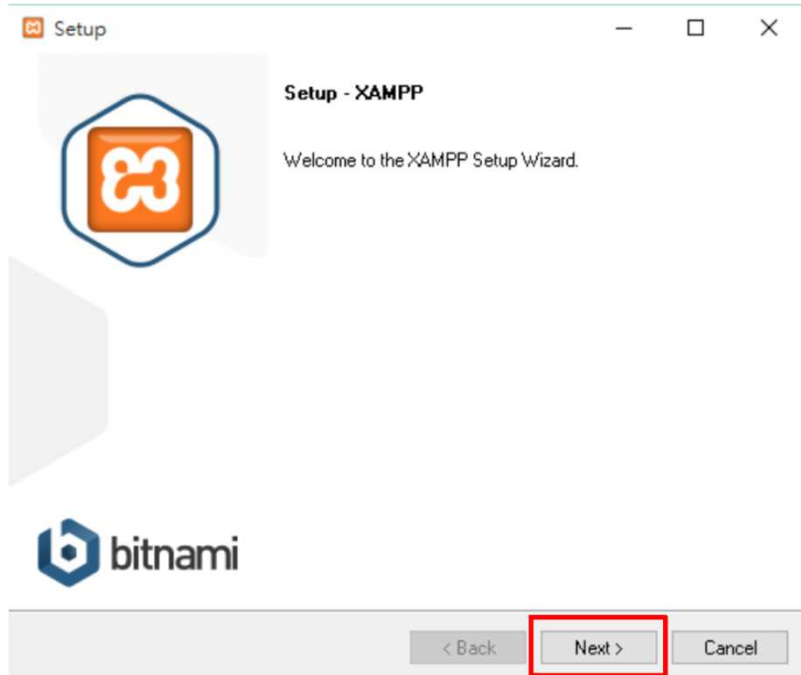
Set Up HTML on Your Own PC₁

❑ Install Apache Server

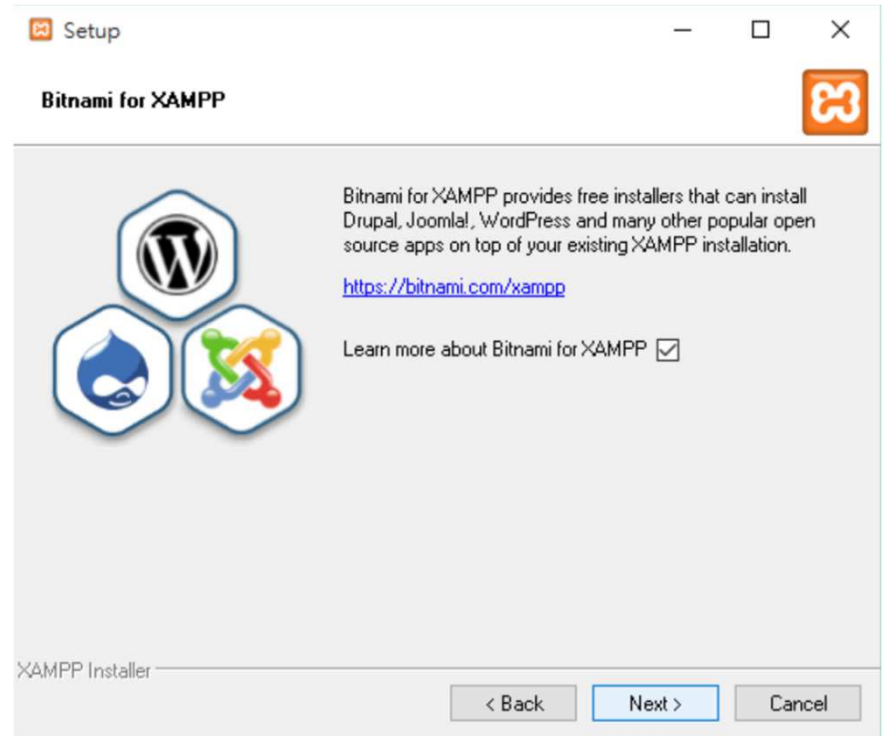
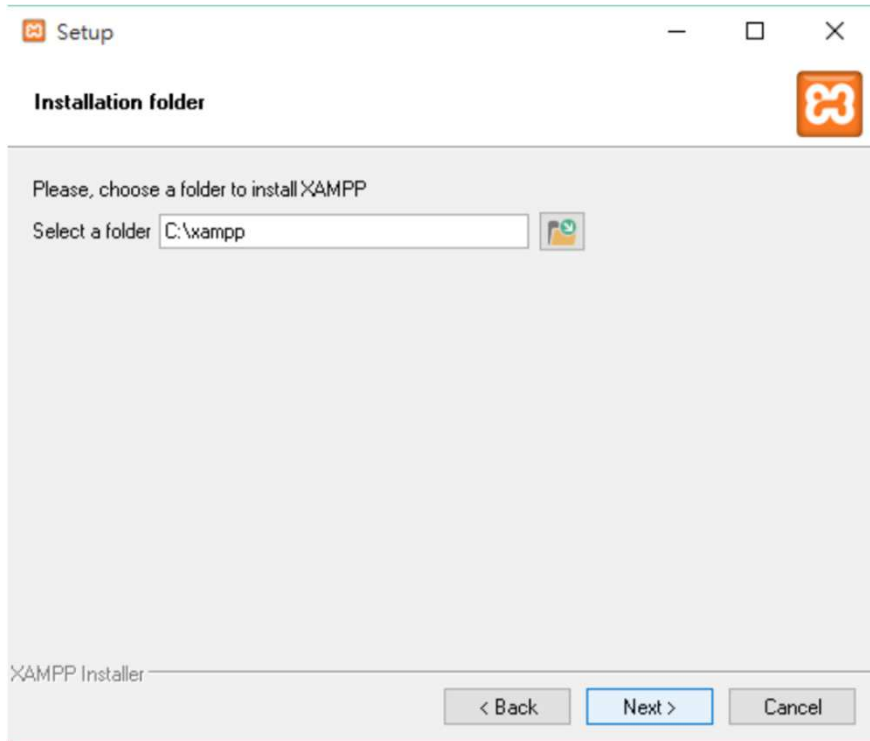
➤ <https://www.apachefriends.org/index.html>



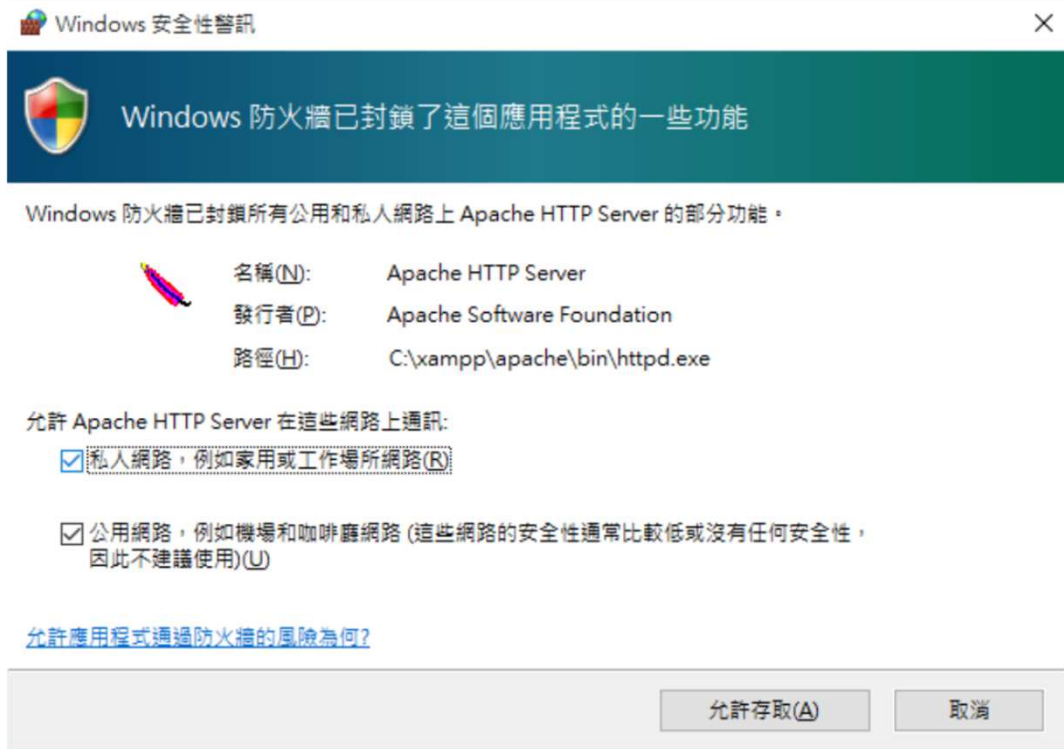
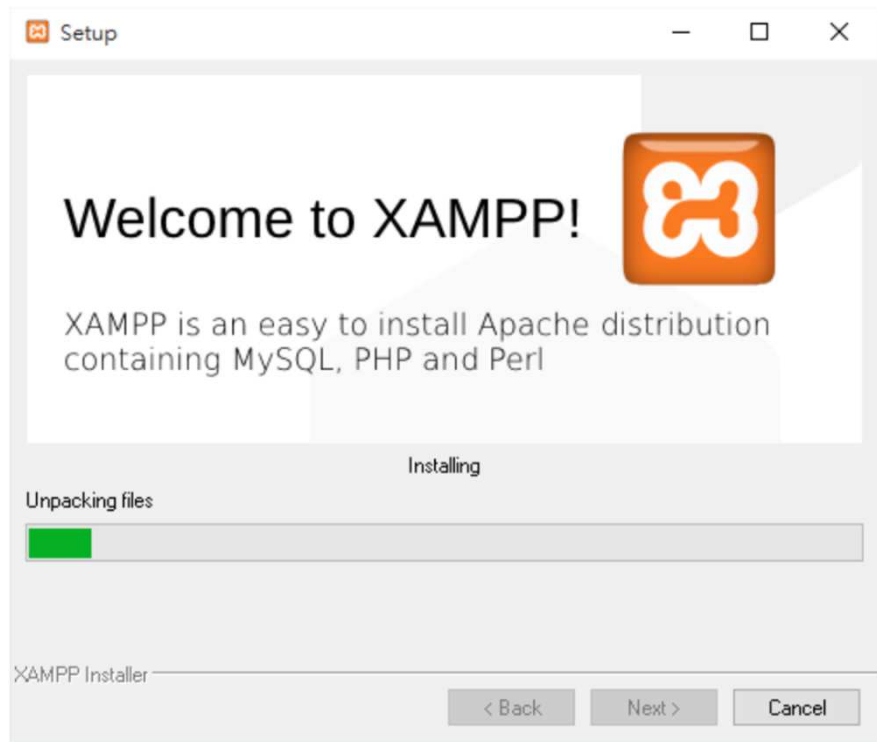
Set Up HTML on Your Own PC₂



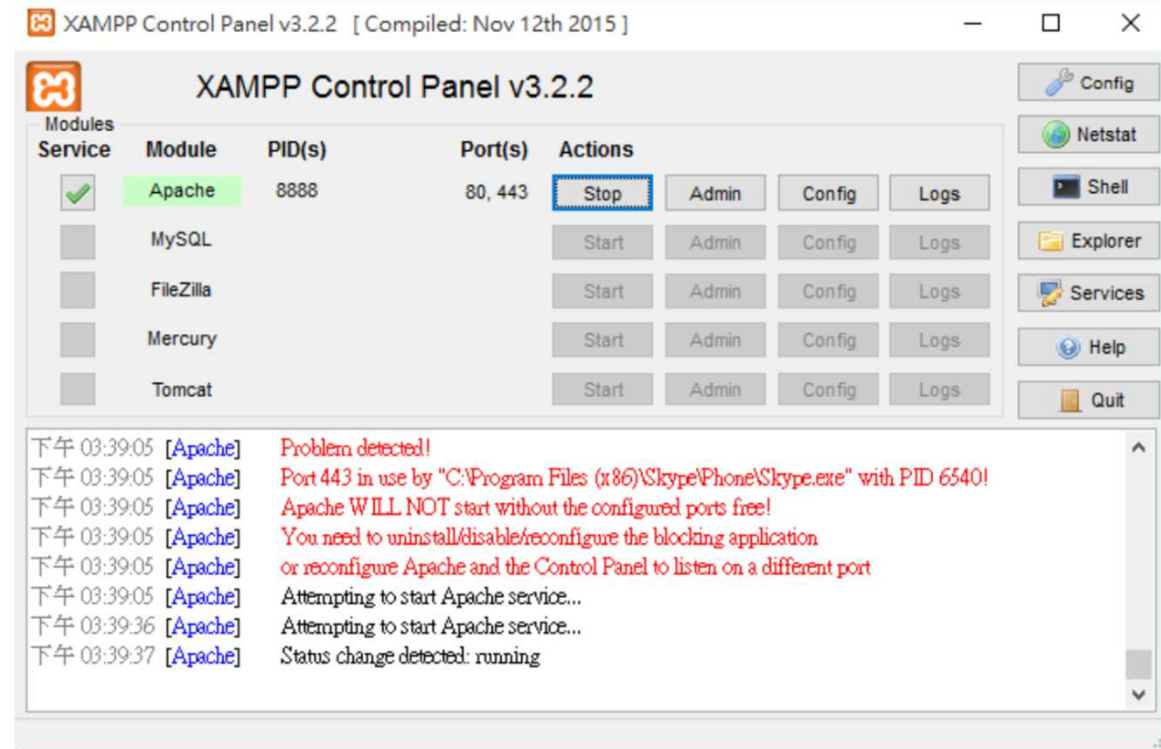
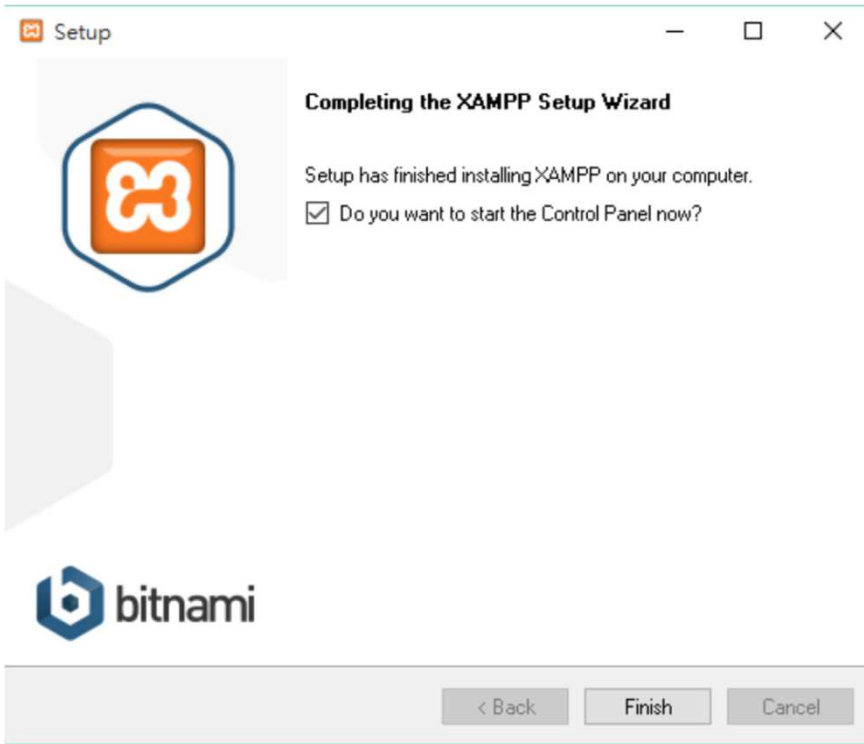
Set Up HTML on Your Own PC₃



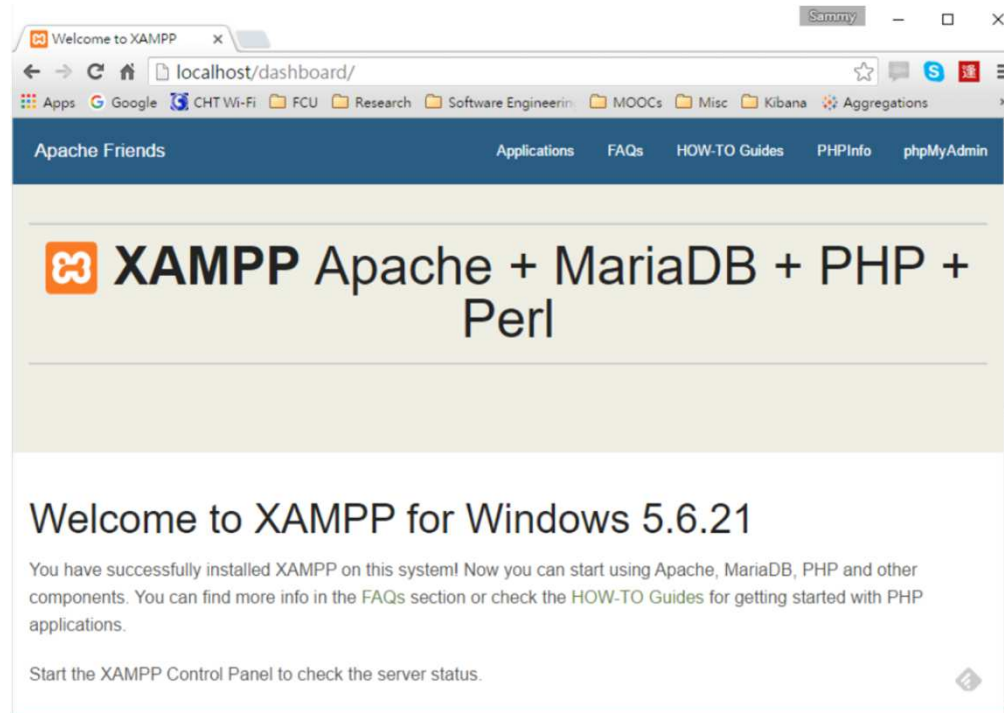
Set Up HTML on Your Own PC₄



Set Up HTML on Your Own PC₅



Set Up HTML on Your Own PC₆



Exercise 1-1

1. Install the XAMPP server
2. Put your web pages into **htdocs** directory
3. See your web pages in the Browser

HTML Tables

- ❑ An HTML table is defined with the `<table>` tag.
 - Each table row is defined with the `<tr>` tag. A table header is defined with the `<th>` tag. By default, table headings are bold and centered. A table data/cell is defined with the `<td>` tag.

```
<table style="width:100%">
  <tr>
    <th>Firstname</th>
    <th>Lastname</th>
    <th>Age</th>
  </tr>
  <tr>
    <td>Jill</td>
    <td>Smith</td>
    <td>50</td>
  </tr>
  <tr>
    <td>Eve</td>
    <td>Jackson</td>
    <td>94</td>
  </tr>
</table>
```

Cells that Span Many Columns

- ❑ To make a cell span more than one column, use the **colspan** attribute:

```
<table style="width:100%">
  <tr>
    <th>Name</th>
    <th colspan="2">Telephone</th>
  </tr>
  <tr>
    <td>Bill Gates</td>
    <td>55577854</td>
    <td>55577855</td>
  </tr>
</table>
```

Cells that Span Many Rows

- ❑ To make a cell span more than one row, use the **rowspan** attribute:

```
<table style="width:100%">
  <tr>
    <th>Name:</th>
    <td>Bill Gates</td>
  </tr>
  <tr>
    <th rowspan="2">Telephone:</th>
    <td>55577854</td>
  </tr>
  <tr>
    <td>55577855</td>
  </tr>
</table>
```

HTML Table - Adding a Caption

❑ To add a caption to a table, use the <caption> tag:

```
<table style="width:100%">
  <caption>Monthly savings</caption>
  <tr>
    <th>Month</th>
    <th>Savings</th>
  </tr>
  <tr>
    <td>January</td>
    <td>$100</td>
  </tr>
  <tr>
    <td>February</td>
    <td>$50</td>
  </tr>
</table>
```

A Special Style for One Table

- ❑ To define a special style for a special table, add an **id** attribute to the table:

```
<table id="t01">
  <tr>
    <th>Firstname</th>
    <th>Lastname</th>
    <th>Age</th>
  </tr>
  <tr>
    <td>Eve</td>
    <td>Jackson</td>
    <td>94</td>
  </tr>
</table>
```

```
<style>
table, th, td {
  border: 1px solid black;
  border-collapse: collapse;
}
th, td {
  padding: 15px;
  text-align: left;
}
table#t01 {
  width: 100%;
  background-color: #f1f1c1;
}
```

Exercise 1-2

- Write an HTML5 document as follows:

Table Example Page

Here is a small sample
table

This is the table head	
This is the body	
Facebook	
Twitter	
Google	
This is the table	foot.

- Try to use HTML table to arrange your data.

HTML Images

- ❑ Images can improve the design and the appearance of a web page.
- ❑ HTML Images Syntax
 - In HTML, images are defined with the `` tag.
 - The `` tag is empty, it contains attributes only, and does not have a closing tag.
 - The `src` attribute specifies the URL (web address) of the image:
``

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).

- ❑ The value of the **alt** attribute should describe the image:

```

```

[Try it Yourself »](#)

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

➤ Note: The alt attribute is required. A web page will not validate correctly without it.

Image Size - Width and Height

- ❑ Use the **style** attribute to specify the width and height of an image.

```

```

[Try it Yourself »](#)

- ❑ Alternatively, you can use the **width** and **height** attributes

```

```

[Try it Yourself »](#)

Width and Height, or Style?

- ❑ The width, height, and style attributes are valid in HTML.
- ❑ However, we suggest using the **style** attribute. It prevents styles sheets from changing the size of images:

```
<!DOCTYPE html>
<html>
<head>
<style>
img {
  width: 100%;
}
</style>
</head>
<body>




</body>
</html>
Try it Yourself »
```

Images in Another Folder

- ❑ If not specified, the browser expects to find the image in the same folder as the web page.
- ❑ However, it is common to store images in a sub-folder. You must then include the folder name in the src attribute:

```

```

[Try it Yourself »](#)

❑ Images on Another Server

- Some web sites store their images on image servers.
- Actually, you can access images from any web address in the world:

```

```

Image as a Link

- ❑ To use an image as a link, put the `` tag inside the `<a>` tag:

```
<a href="default.asp">  
    
</a>
```

[Try it Yourself »](#)

- Note: `border:0;` is added to prevent IE9 (and earlier) from displaying a border around the image (when the image is a link).

Image Floating

- ❑ Use the CSS float property to let the image float to the right or to the left of a text

```
<p>  
The image will float to the right of the text.</p>
```

```
<p>  
The image will float to the left of the text.</p>
```

[Try it Yourself »](#)

Image Maps₁

- ❑ The `<map>` tag defines an image-map.
 - An image-map is an image with clickable areas.
 - With image maps, you can add clickable areas on an image.

```
  
  
<map name="workmap">  
  <area shape="rect" coords="34,44,270,350" alt="Computer" href="computer.htm">  
  <area shape="rect" coords="290,172,333,250" alt="Phone" href="phone.htm">  
  <area shape="circle" coords="337,300,44" alt="Coffee" href="coffee.htm">  
</map>
```

[Try it Yourself »](#)

- ❑ To create an image map you need an image, and a map containing some rules that describe the clickable areas.

Image Maps₂

- ❑ The image is inserted using the `` tag. The only difference from other images is that you must add a `usemap` attribute:

```

```

- ❑ The `usemap` value starts with a hash tag `#` followed by the name of the image map, and is used to create a relationship between the image and the image map.
- ❑ The `<map>` element is used to create an image map, and is linked to the image by using the name attribute:

Image Maps₃

- ❑ The `<map>` element is used to create an image map, and is linked to the image by using the name attribute:

```
<map name="workmap">
```

- ❑ The `name` attribute must have the same value as the `usemap` attribute.

Image Maps₃

- ❑ A clickable area is defined using an `<area>` element.
- ❑ Shape
 - `rect` - defines a rectangular region
 - `circle` - defines a circular region
 - `poly` - defines a polygonal region
 - `default` - defines the entire region

Coordinates₁

- ❑ The coordinates come in pairs, one for the x-axis and one for the y-axis.
- ❑ The coordinates **34, 44** is located 34 pixels from the left margin and 44 pixels from the top:



Coordinates₂

- The coordinates 270, 350 is located 270 pixels from the left margin and 350 pixels from the top:

```
<area shape="rect" coords="34, 44,  
270, 350" href="computer.htm">
```



Coordinates₃

□ Circle

- To add a circle area, first locate the coordinates of the center of the circle:

337, 300

Then specify the radius of the circle:

44 pixels

```
<area shape="circle" coords="337, 300, 44" href="coffee.htm">
```



Exercise 1-3

- ❑ Add the coordinates of computer, cell phone and coffee in HTML Image Maps.html to open the computer.htm, phone.htm and coffee.htm correctly.
- ❑ Try to use Image Maps in your own pictures.

Background Images

- ❑ To add a background image in HTML, use the CSS property **background-image**.

- To add a background image on an HTML element, you can use the **style** attribute:

```
<div style="background-image: url('background_1.jpeg');">
```

- You can also specify the background image in the **<style>** element:

```
<style>
div {
  background-image: url('background_1.jpeg');
}
</style>
```


Background Image on a Page

- ❑ If you want the entire page to have a background image, then you must specify the background image on the `<body>` element:

```
<style>
body {
  background-image: url('background_1.jpeg');
}
</style>
```

Background Cover

- ❑ If you want the background image cover the entire element, you can set the **background-size** property to **cover**.
- ❑ Also, to make sure the entire element is always covered, set the **background-attachment** property to **fixed**:

```
<style>
body {
  background-image: url('img_girl.jpg');
  background-repeat: no-repeat;
  background-attachment: fixed;
  background-size: cover;
}
</style>
```

Background Stretch

- ❑ If you want the background image stretch to fit the entire image in the element, you can set the background-size property to **100% 100%**:

```
<style>
body {
    background-image: url('img_girl.jpg');
    background-repeat: no-repeat;
    background-attachment: fixed;
    background-size: 100% 100%;
}
</style>
```

HTML Picture Element

- ❑ The picture element allows us to display different pictures for different devices or screen sizes.
- ❑ The `<picture>` element contains a number of `<source>` elements, each referring to different image sources. This way the browser can choose the image that best fits the current view and/or device.
- ❑ Each `<source>` element have attributes describing when their image is the most suitable.

```
<picture>  
  <source media="(min-width: 650px)" srcset="img_food.jpg">  
  <source media="(min-width: 465px)" srcset="img_car.jpg">  
    
</picture>
```

[Try it Yourself »](#)

When to use the Picture Element

❑ Bandwidth

- If you have a small screen or device, it is not necessary to load a large image file. The browser will use the first <source> element with matching attribute values, and ignore any of the following elements.

❑ Format Support

- Some browsers or devices may not support all image formats. By using the <picture> element, you can add images of all formats, and the browser will use the first format it recognizes and ignore any of the following.

```
<picture>
  <source srcset="img_avatar.png">
  <source srcset="img_girl.jpg">
  
</picture>
```

Exercise 1-4

- ❑ Add the background images (background_1 ~ background_15) in HTML Image Maps.html, computer.htm, phone.htm and coffee.htm.
- ❑ Try to use Background images in your own web pages.

HTML5, CSS3 and jQuery Demos

- ❑ <https://developer.mozilla.org/en-US/demos/>
- ❑ <http://www.paulbrunt.co.uk/bert/>
- ❑ <http://pasjans-online.pl/>
- ❑ <http://andrew-hoyer.com/experiments/cloth/>
- ❑ <http://www.benjoffe.com/code/games/torus/>
- ❑ <http://css-tricks.com/examples/Circulate/>
- ❑ <https://tutorialzine.com/>
- ❑ <http://jqueryui.com/demos/>

Reference Sites

- ❑ <https://www.w3schools.com>
- ❑ <https://www.w3schools.com/html/>