[Lesson 1]

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[Our targets for today]

- Get familiar with Front-end basics
- Learn how HTML and CSS work
- Learn about JavaScript - what it is and what it is used for
- Learn basic HTML tags
- Create a simple web page

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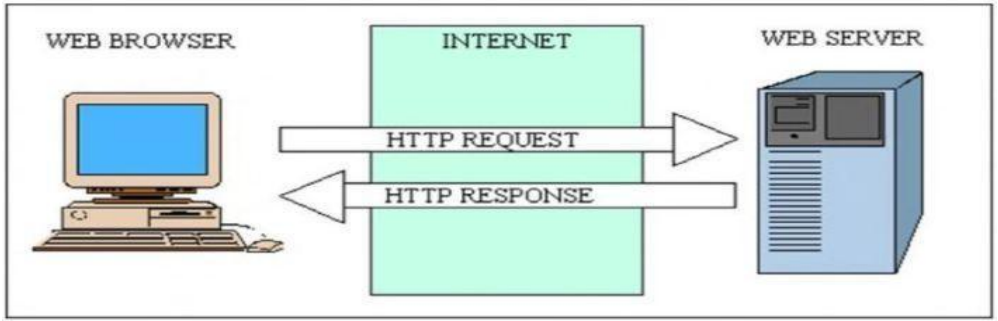
[Basic Web Architecture]

- **World Wide Web (WWW)** – an information space where documents and other web resources and can be accessed via the Internet
- **Web browser** – a software application for retrieving, presenting and traversing information resources on the World Wide Web, such as web pages, images, etc.
- **Web server** – a server software that can serve contents to the World Wide Web



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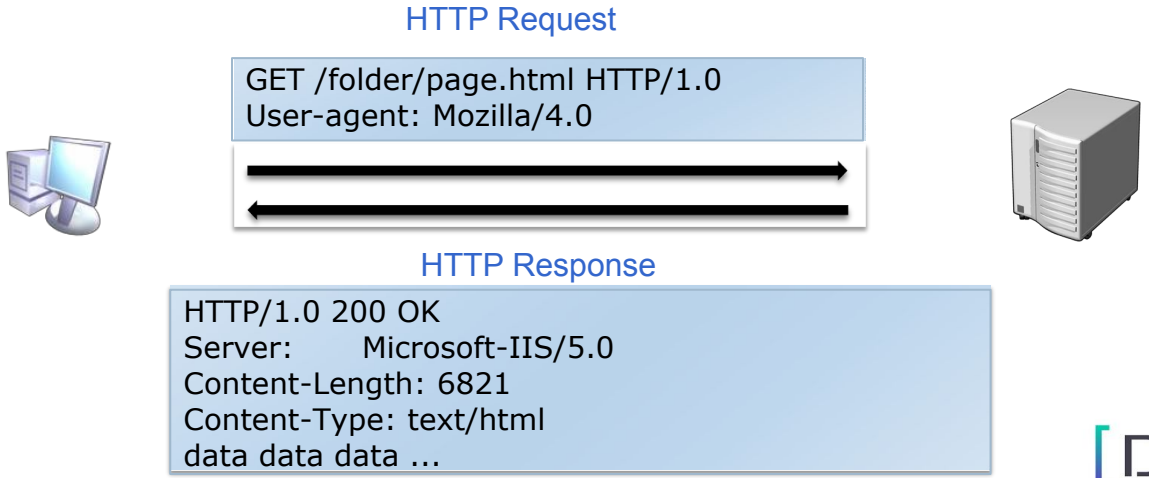
[HyperText Transfer Protocol (HTTP)]

- **Hypertext** is structured text that uses hyperlinks between documents containing text
- HTTP is the protocol to exchange or transfer hypertext
  - Simple - has a Request and Response (header & body)
  - Stateless - each request is independent from the others



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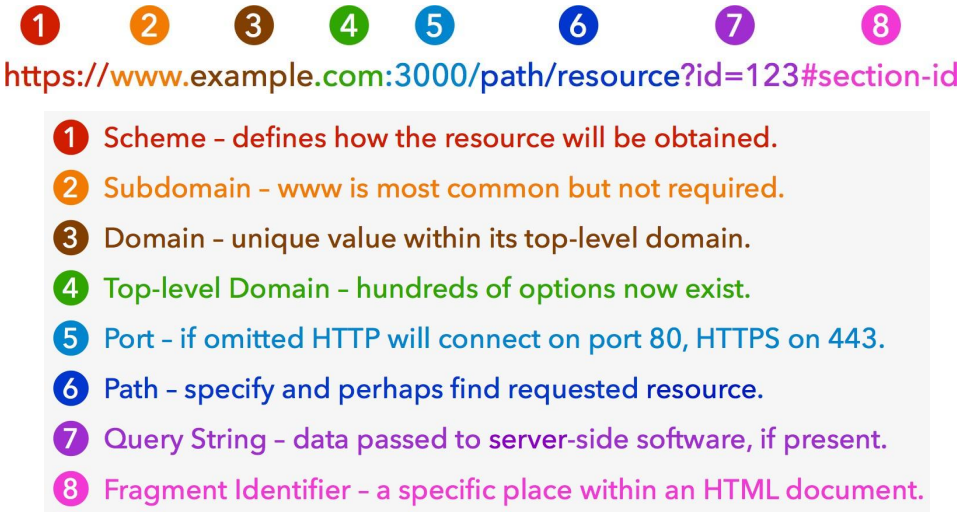
[Uniform Resource Locator (URL)]

- Specifies the location of a web resource on a computer network
- The structure of a URL:



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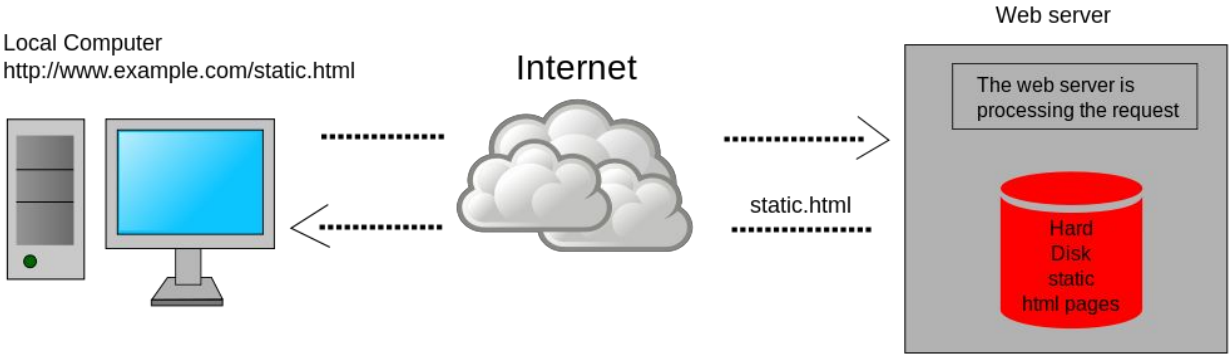
Static Web Pages

- A static web page is a web page that is delivered to the user exactly as stored

```
<html>
<head>
    <title>This is a static page</title>
</head>
<body>
    <h1>Hello world</h1>
</body>
</html>
```



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Sample Dialog Between the Browser and the Server

- The user enters the following URL in his browser: `http://www.example.com/path/file.html`
- The browser translates it into a connection to www.example.com with the following HTTP request:

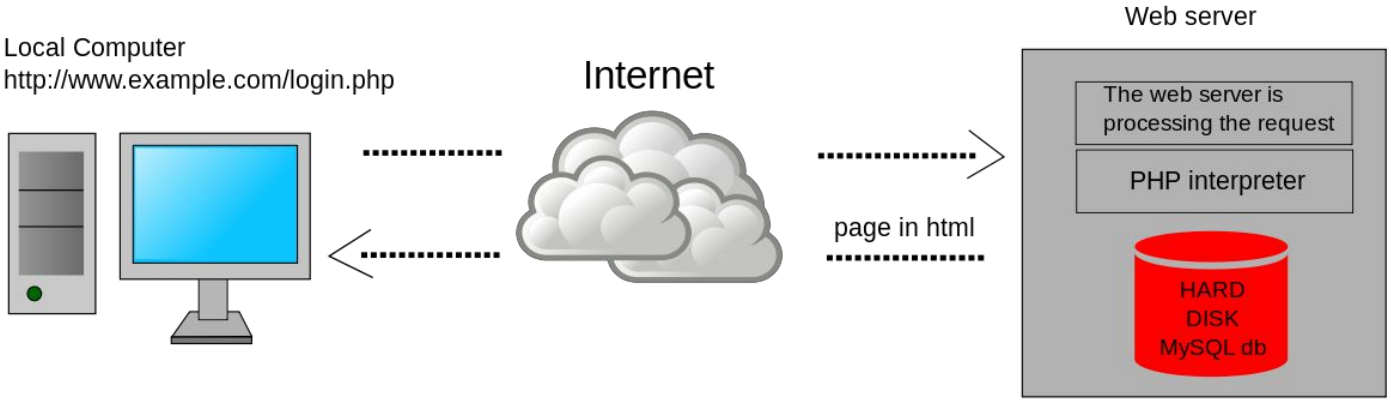
```
GET /path/file.html HTTP/1.1
Host: www.example.com
```

- The web server on www.example.com appends the given path to its root directory
  - e.g., on Apache server, this is commonly /home/www
- The result is the local file system resource: `/home/www/**path/file.html**`

- The web server then reads the file, and sends a response to the client's web browser
- The response describes the content of the file and contains the file itself or an error message if the file does not exist or is unavailable

Server Side Dynamic Web Pages

- Server-side processing allows dynamic page creation
- There are many server-side languages for creating dynamic pages such as PHP, Perl, ASP, ASP.NET, JSP, and others



Source: Wikipedia

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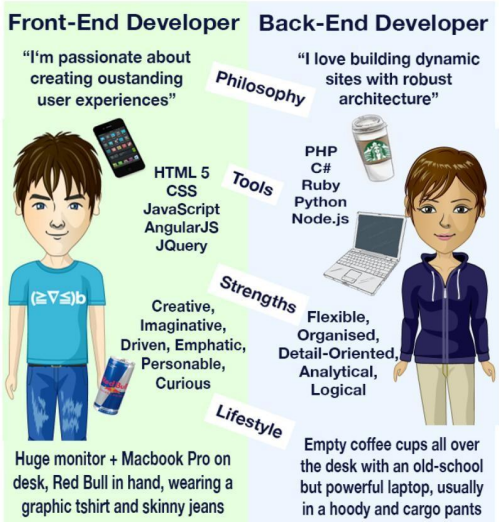
[Front-End vs Back-End Development]

- The front-end of a website is everything the user sees, touches and experiences
- The back-end of a website works behind the scenes to enable the front-end



Source: https://www.pinterest.com/pin/541628292667889162

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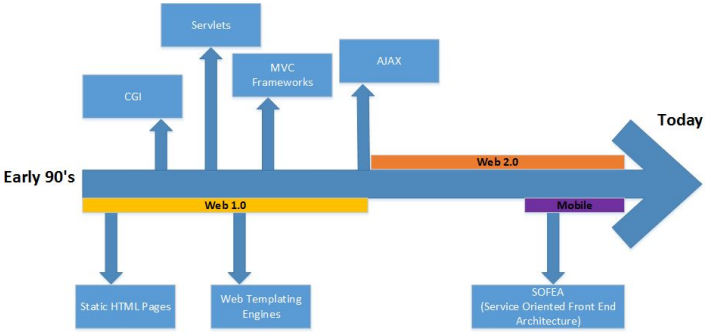
[The Big Three]

- While the server can process information in many different languages, the file that it serves to the client must be some combination of the following 3 languages:
- **HTML** – content
  - Different HTML tags describe the structure of content, like paragraphs, blocks, lists, images, tables, forms, etc.
- **CSS** – styling and positioning
  - Tells the browser how each type of element should be displayed, which may vary for different media (like screen, print or mobile device)
- **JavaScript** – application logic
  - Tells the browser how to change the web page in response to events that happen (like clicking on something, or changing the value in a form input)

[Web Development Evolution]

- Static content
- Dynamic content using server side processing
  - Servlets, ASP.NET, PHP
- Desktop like development
  - Rich client libraries, e.g., jQuery, Dojo
  - AJAX - Asynchronous HTTP requests
- MVC frameworks
  - KnockoutJS, EmberJS, AngularJS, Backbone, etc.
- Mobile Web apps
  - HTML5, CSS3, jQuery Mobile
- SOA – service oriented architecture
  - Server delivers data, not content



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[HyperText Markup Language (HTML)]

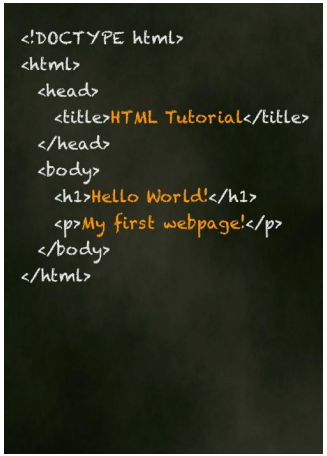
→ The standard markup language for creating Web pages

→ HTML describes the structure of web pages using markup

→ The purpose of a web browser is to read HTML documents and display them

→ Latest version of the standard is HTML5

→ Completed and standardized on October 2014



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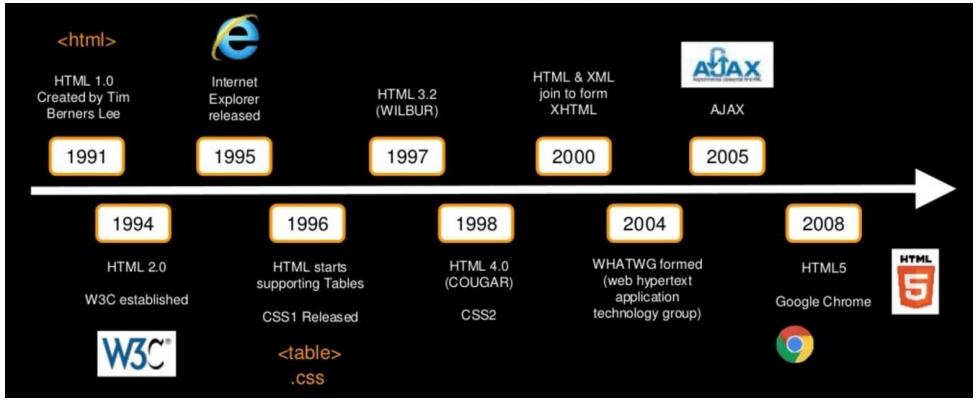
[HTML Versions]



→ XHTML – HTML written as XML

→ XML is a markup language where documents must be marked up correctly (be "well-formed“)

→ XHTML is almost identical to HTML but stricter than HTML

→ ensures consistency between browsers

[HTML Editors]

→ Web pages can be created and modified by using professional HTML editors
→ However, for learning HTML we recommend a simple text editor like Notepad (PC) or TextEdit (Mac)
→ We believe using a simple text editor is a good way to learn HTML

→ In Windows:
  → Open the **Start Screen** (the window symbol at the bottom left on your screen)
  → Type **Notepad**

→ In 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"

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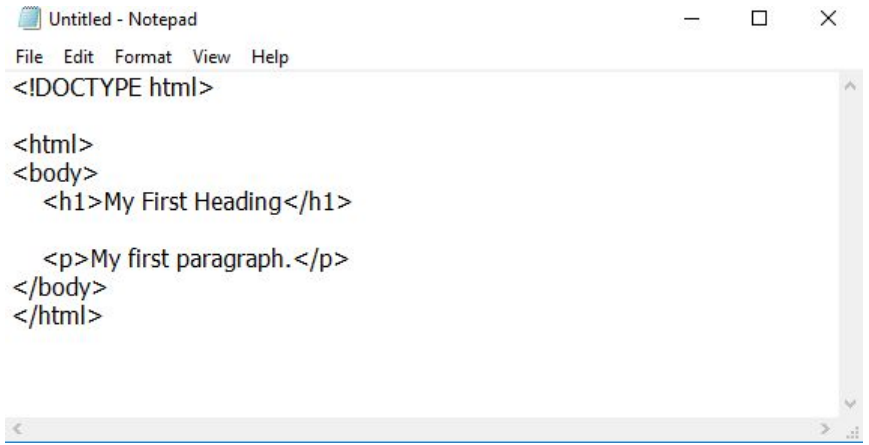
[Write Some HTML]

→ Write or copy some HTML into Notepad

```
<!DOCTYPE html>

<html>
<body>
      <h1>My First Heading</h1>

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



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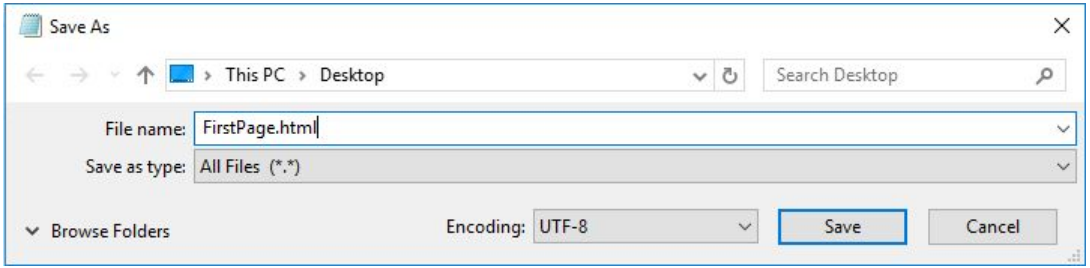
Save the HTML Page

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

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



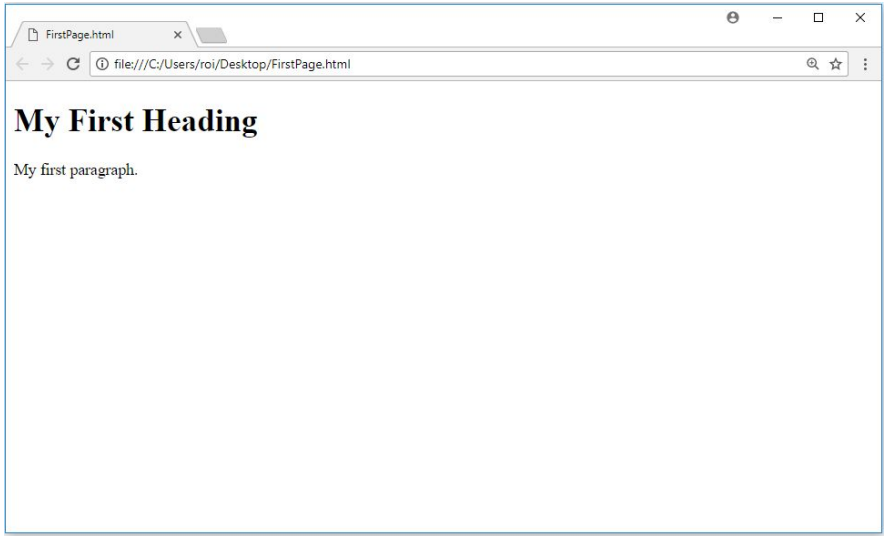
→ You can use either .htm or .html as file extension

→ There is no difference, it is up to you

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:



[HTML Tags]

→ HTML tags are element names surrounded by angle brackets:

<tagname>content goes here...</tagname>

→ Example: tag creates a paragraph

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

→ 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

→ HTML tags are not case sensitive

→ <P> means the same as

→ The HTML5 standard does not require lowercase tags, but W3C **recommends** lowercase tags , and **demands** lowercase for XHTML document types

→ A complete list of HTML tags is available at https://www.w3schools.com/tags/

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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“**

```
<p title="Tooltip text">This is a paragraph.</p>
```

→ The HTML5 standard does not require lowercase attribute names

→ The title attribute can be written with uppercase or lowercase like **title** or **TITLE**

→ W3C **recommends** lowercase in HTML, and **demands** lowercase for XHTML document types

→ Double quotes around attribute values are the most common in HTML

→but single quotes can also be used

```
<p title='John "ShotGun" Nelson'>This is a paragraph.</p>
```

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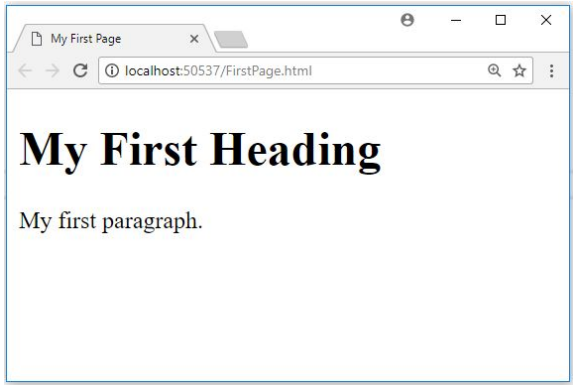
[HTML Documents]

- All HTML documents must start with a document type declaration: <!DOCTYPE html>
- The HTML document itself begins with <html> and ends with </html>
- The <head> element contains meta information about the document
- The <title> element specifies a title for the document
- The visible part of the HTML document is between <body> and </body>

```
<!DOCTYPE html>
<html>
<head>
    <title>My First Page</title>
</head>
<body>
    <h1>My First Heading</h1>
    <p>My first paragraph.</p>
</body>
</html>
```



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HTML Comments

- You can add comments to your HTML source by using the following syntax:

```
<!-- This is a comment -->
<p>This is a paragraph.</p>
```

- 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 at the moment
<img border="0" src="pic_mountain.jpg" alt="Mountain">
-->
```

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Paragraphs

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

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

This is a paragraph.

This is another paragraph.

- Use
 if you want a line break (a new line) without starting a new paragraph
  - The
 tag is an empty tag, which means that it has no end tag

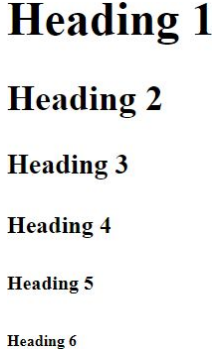
```
<p>This is<br/>a paragraph<br/>with line breaks.</p>
```

This is
a paragraph
with line breaks.

[Headings]

- Headings are defined with the <h1> to <h6> tags
  - <h1> defines the most important heading
  - <h6> defines the least important heading
- Search engines use the headings to index the content of your web pages
- Use HTML headings for headings only. Don't use headings to make text **BIG** or **bold**.

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



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Links

- Links are defined with the <a> tag:

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

- Example:

```
<a href="http://www.google.com">To google</a>
```

To google

  - The href attribute specifies the destination address (https://www.google.com) of the link
  - The **link text** is the visible part (To google)
  - Clicking on the link text will send you to the specified address
- A local link (link to the same web site) is specified with a relative URL (without http://www....)

```
<a href="Page2.html">To Page2</a>
```

[Links]

- The target attribute specifies where to open the linked document
  - _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)

```
<a href="http://www.google.com" target="_blank">To google</a><br />
```

- By default, a link will appear like this (in all browsers):
  - An unvisited link is underlined and blue
  - A visited link is underlined and purple
  - An active link is underlined and red

- You can change the default colors, by using CSS
  - More on this in the CSS module

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[Images]

- Images are defined with the <img> tag
- The <img> tag is empty, it contains attributes only:
  - The src attribute specifies the URL (web address) of the image
  - 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 alt attribute is required. A web page will not validate correctly without it.
- You can use the style attribute to specify the width and height of an image

```
<img src="img_girl.png" alt="Girl in a jacket" style="width:200px;height:300px;" />
```

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Control questions

1. What is Front-end development?
2. What Front-end is responsible for?
3. Where does Front-end code gets executed?
4. What aspects of web page are done with HTML, CSS and JavaScript?
5. Which HTML tags do you know?
6. How to create a link in HTML?
7. How do you include and image in HTML page?