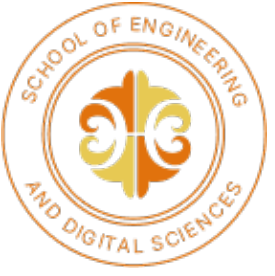




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# Web Programming and Problem Solving

## Basics of HTML

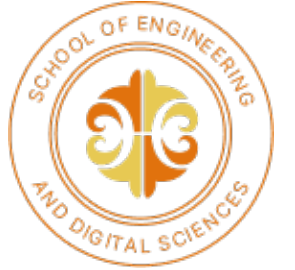
Date: 22.08.2022

Instructor: Zhandos Yessenbayev



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# Content



- Introduction
- History of HTML
- What is HTML?
- HTML Document
- HTML Elements
- HTML Attributes
- Document Object Model
- Useful HTML Resources

# Introduction

- To access a website:
  - Retrieve IP by Domain name (DNS)
  - Access the Web server by IP

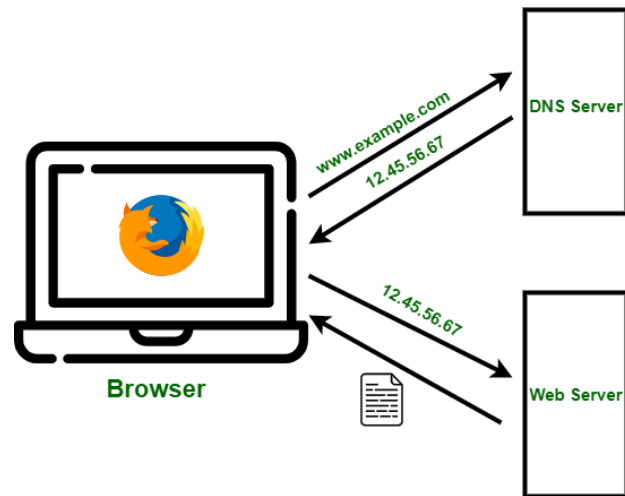


Fig.1 - Before reaching the web server

- To serve the website:
  - Implement **Frontend**: HTML, CSS, JS

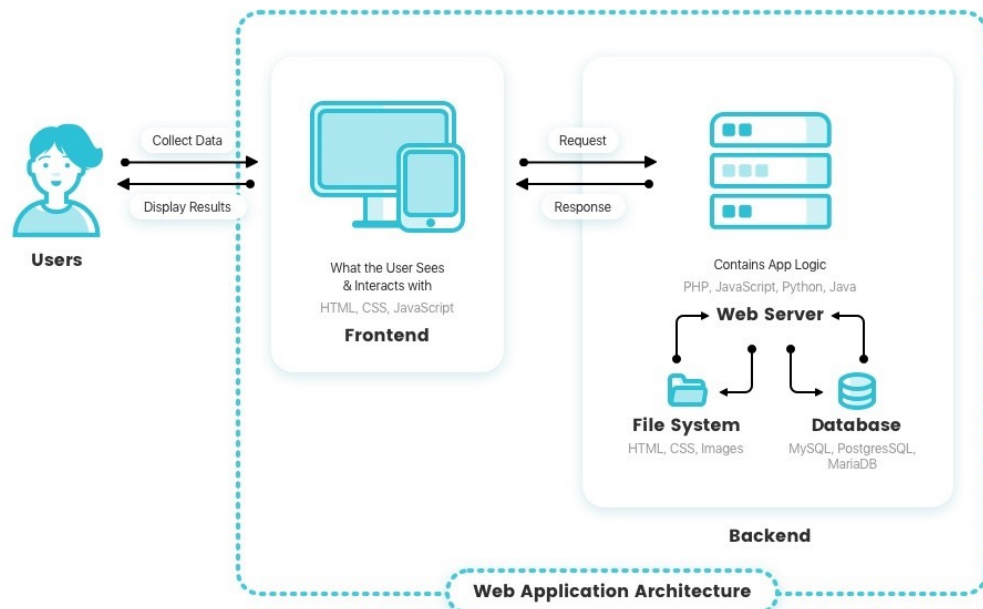
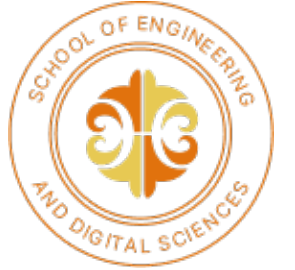


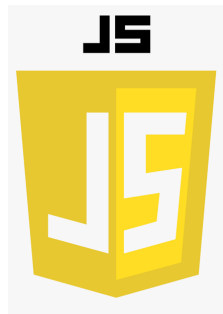
Fig.2 - After reaching the web server



# HTML, CSS, Javascript

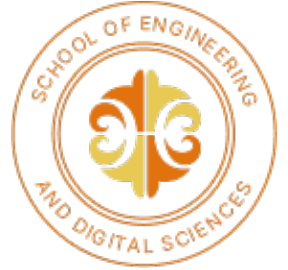


- **Hyper-Text Markup Language (HTML)** is the standard markup language for documents designed to be displayed in a web browser.
  - It describes the **structure** of the web page
- **Cascading Style Sheets (CSS)** is a stylesheet language used to describe the presentation of a document written in HTML.
  - It describes the **style** of the web page
- **JavaScript (JS)** is a lightweight and interpreted programming (or scripting) language for Web pages.
  - It adds **behavior** to the web page





# History of HTML



1989

- Invention of WWW, HTTP, HTML
  - **Tim Berners-Lee** (CERN)

1993

- Release of WWW software (CERN)

1994

- World Wide Web Consortium (W3C)

2000

- XHTML 1.0 based on XML (W3C)

2004

- WHATWG (Mozilla, Opera, and Apple)

2007

- HTML5 release (WHATWG, W3C)

2011

- HTML5.1, HTML5.2 and HTML5.3



## Sir Timothy John Berners-Lee

(8 June 1955), TimBL, is an English computer scientist, professor at MIT, and the director of the World Wide Web Consortium (W3C).

<http://info.cern.ch/> - home of the first website

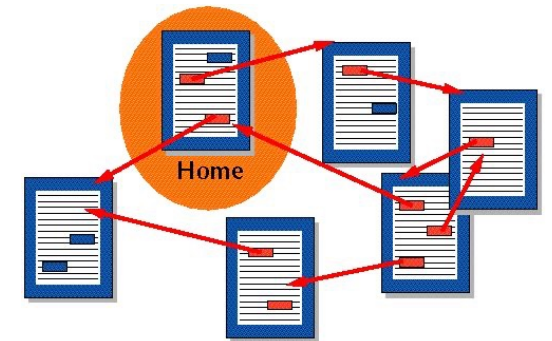


# What is HTML?

## Hyper-Text Markup Language

- **Hyper-Text** – a document with hyperlinks (references) to other documents
- **Markup** – a system (set of tags) of text annotation to control its structure, formatting and relationships between its parts

MS Word:	<b>Bold Text</b>
Markdown:	<b>** Bold Text **</b>
LaTeX:	<code>\textbf{ Bold Text }</code>
HTML:	<code>&lt;strong&gt; Bold Text &lt;/strong&gt;</code>



- **Language** - a structured system of communication with its alphabet, vocabulary and a grammar (specific set of rules)

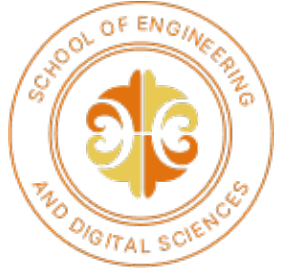
## What is a HTML document?

- **Text file** with an extension “.htm” or “.html”
- Can be created in a **text editor**
  - Ex.: Notepad, TextEdit, Sublime, VS Code, Atom
- Contains **markup tags (elements)** which direct how a page is to be displayed by browsers
- Must have proper text **encoding (UTF-8)**
- HTML is **not** case sensitive (**head** = **HEAD**)

Example: *index.html* file

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="UTF-8">
    <title>My Website</title>
  </head>
  <body>
    <h1>Hello, World!</h1>
  </body>
</html>
```

# HTML Document



HTML document consists of **elements**

- **DOCTYPE** – type of document
  - `<!DOCTYPE html>` – stands for HTML5
- **html** – root element of a HTML document
- **head** – section for **meta** information (encoding, display settings, other resources)
- **title** – title of a document, shown in browser's Tab
- **body** – section for main content of a webpage
- **h1** – defines a heading [may be **h1** – **h6**]
- **p** – defines a paragraph

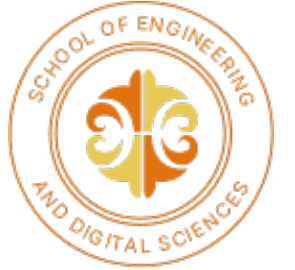
```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="UTF-8">
    <title>My Website</title>
  </head>
  <body>
    <h1>Hello, World!</h1>
    <p>Some paragraph</p>
  </body>
</html>
```



HTML elements must follow specific **structure** and **rules** to be correctly processed and shown in browsers

- Elements consist of **opening** tag, **content** and **closing** tags (except for some elements):
  - `<h1>Hello, World!</h1>` - no spaces after `<` and `</`
  - `<hr>`, `<br>` `<meta>` - no closing tags, no content
- Elements must be correctly **nested**
  - **CORRECT:** `<body> <h1> Hello, World! </h1> </body>`
  - **WRONG:** `<body> <h1> Hello, World! </body> </h1>`
- Special element for **comments**: `<!-- Browsers don't show this content -->`

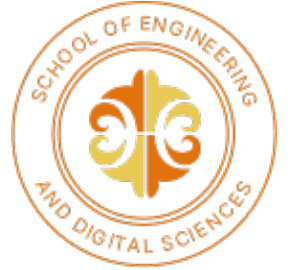
# HTML Attributes



- Elements may have **attributes** that come in **name="value"** pairs
  - `<meta charset="UTF-8">`
- Attributes provide **additional information** about elements
- Attributes are always specified in the **opening** tag
  - `<h1 color='blue'> Hello, World! </h1>`
- Attribute values must be in **quotes** (single or double)

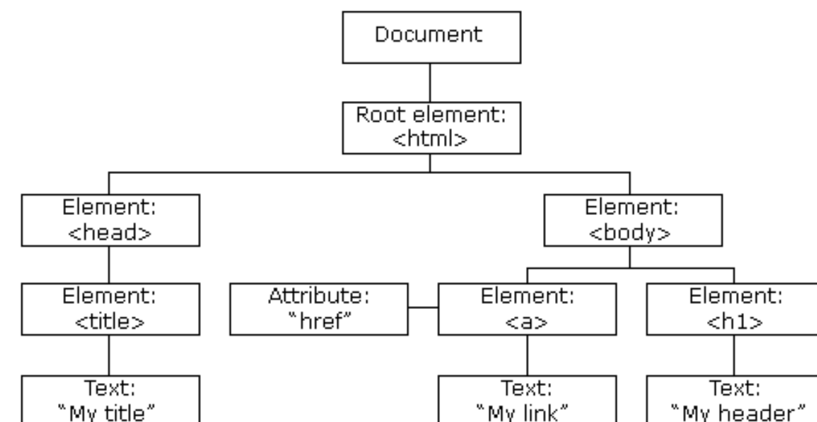


# Document Object Model



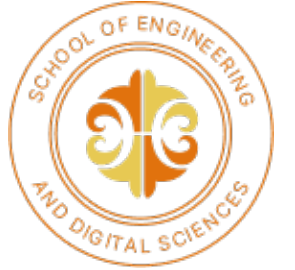
- When a web page is loaded, the browser creates a **Document Object Model (DOM)** of the page.
- The HTML DOM model is constructed as a **Tree of Objects**.
- HTML Elements can be found and accessed with JavaScript:
  - Finding elements by id
  - Finding elements by tag name
  - Finding elements by class name
  - Finding elements by CSS selectors

The HTML DOM Tree of Objects





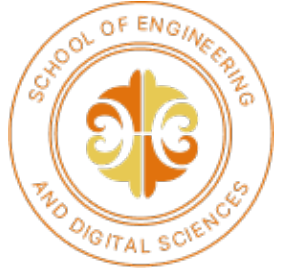
# HTML Resources



- HTML Living Standard: <https://html.spec.whatwg.org/multipage/>
- W3C Markup Validation Service: <https://validator.w3.org/>
- W3Schools Code Editor:  
[https://www.w3schools.com/tryit/tryit.asp?filename=tryhtml\\_default](https://www.w3schools.com/tryit/tryit.asp?filename=tryhtml_default)
- Can I use (Browser compatibility): <https://caniuse.com/>



# Summary



- Key takeaways:
  - Web technology (frontend) is based on HTML5, CSS3 and JavaScript
  - HTML Documents are specially written text files
  - HTML elements and attributes direct browsers how to display a web page
  - Document Object Model is a tree like structure associated with HTML document

Thanks for Attention!