Web Development

Introduction to Web Development

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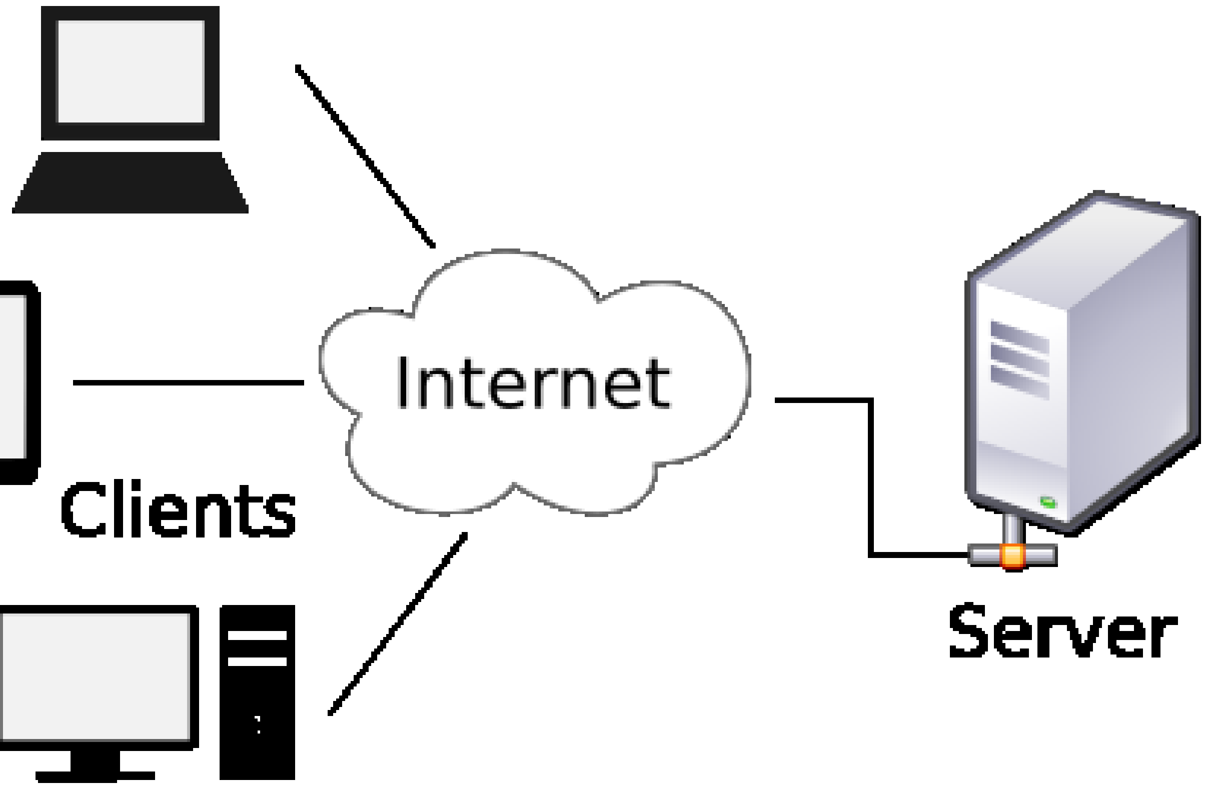
Contents

- Client Server Architecture
- DNS (Domain Name System)
- 3-Tier Architecture
- HTTP (Hyper Text Transfer Protocol)
- HTML Pages and Tags

Client/Server Architecture

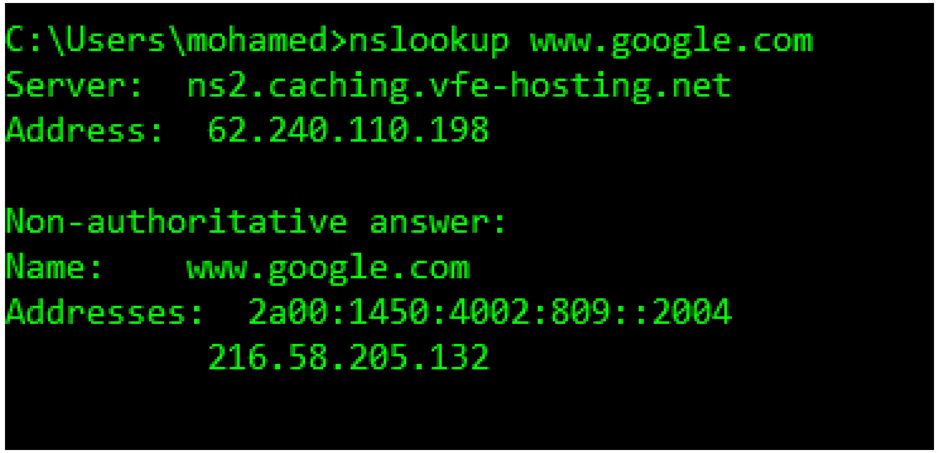
- Distributed Architecture
  - Sever: Provider of resource or service
  - Client: Service or resource or service requester
- Client and Server communicate over network
- Server host runs one or more server programs
- Server can receive multiple requests from different clients
- Example of Client/Server Architecture: Email, Network Printing and World Wide Web

Client/Server Architecture



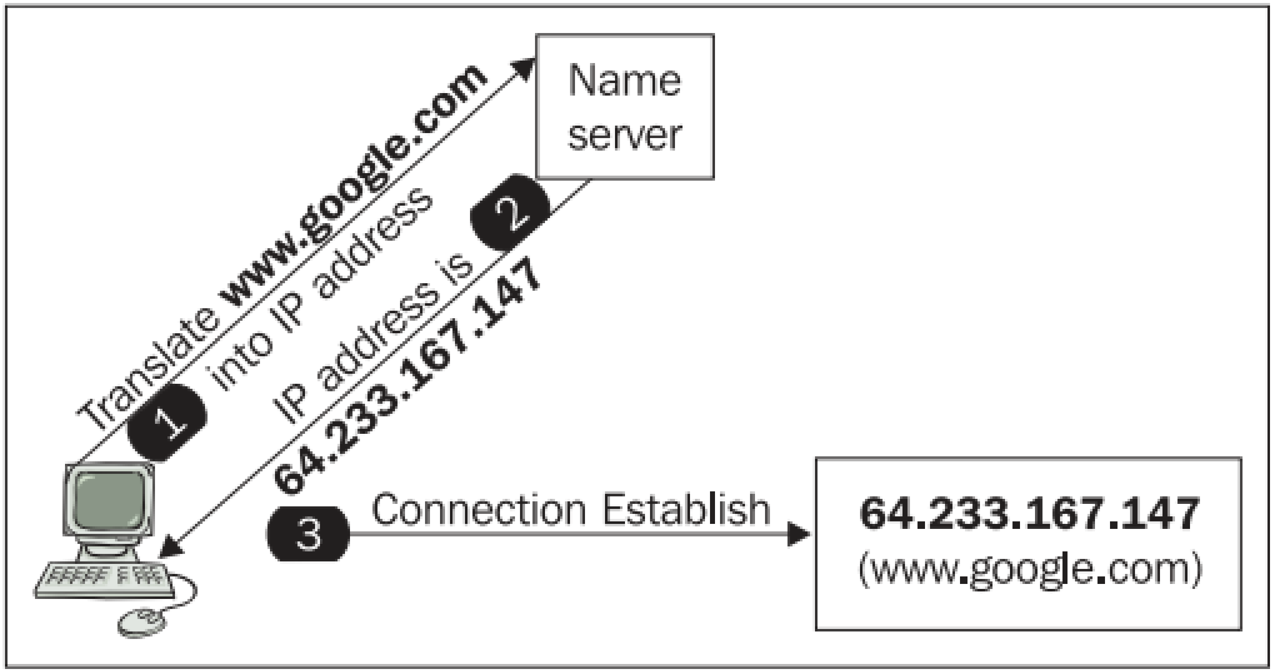
Domain Name System

- Decentralized naming system for computers, services and other resources (either Internet or Private Network)
- Serves like the phone book of the Internet
- Hosts file issues
  - Large file for all Internet sites
  - Impossible for all the computers in the Internet to keep downloading such file every update



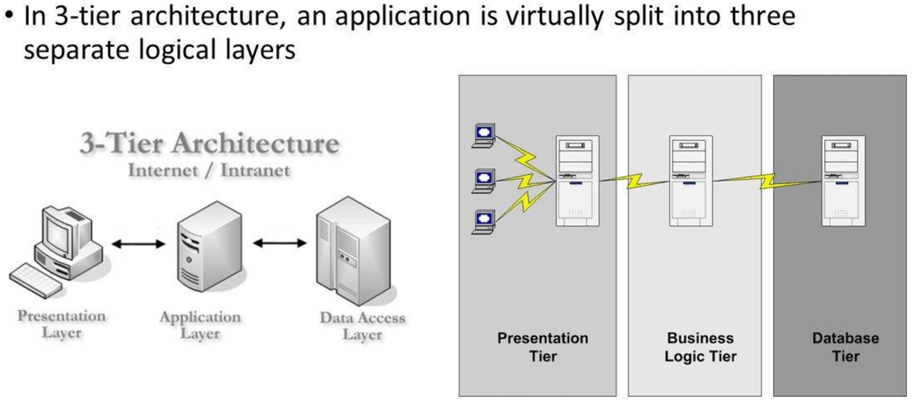
```
C:\Users\mohamed>nslookup www.google.com
Server:  ns2.caching.vfe-hosting.net
Address:  62.240.110.198

Non-authoritative answer:
Name:    www.google.com
Addresses:  2a00:1450:4002:809::2004
          216.58.205.132
```

Domain Name System


Name server
1
Translate www.google.com into IP address
2
IP address is 64.233.167.147
3
Connection Establish
64.233.167.147
(www.google.com)

3 Tier Architecture

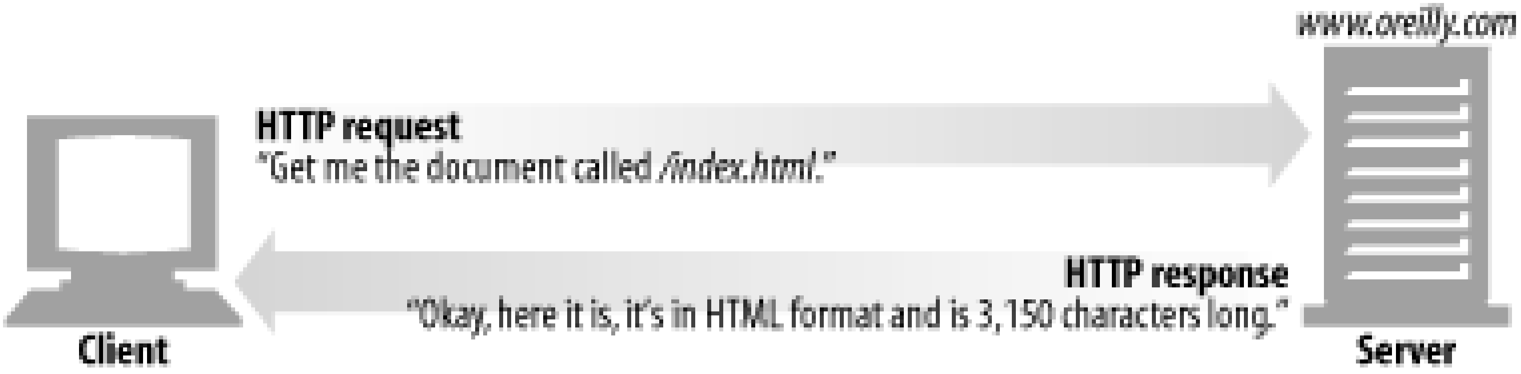
- Consists of 3 Tiers/Layers
  - Presentation Layer: User Interface (Graphical Interface accessible from web browsers (e.g. HTML, Java Script, CSS, etc.))
  - Application/Business Tier Layer: Business logic that drives the core capabilities (e.g. Java, C#, etc.)
  - Data Layer: Data access layer including the Database and the data storage systems (e.g. MySql, MongoDB, etc.)



- In 3-tier architecture, an application is virtually split into three separate logical layers

HTTP (Hyper Text Transfer Protocol)

- Application Protocol
- Common Language between the Web Client and Web Server
- Web content resides on the web server


www.oreilly.com
HTTP request
"Get me the document called /index.html."
HTTP response
"Okay, here it is, it's in HTML format and is 3,150 characters long."
Client
Server

HTTP (Hyper Text Transfer Protocol)

- Web resources varies from static file (HTML files, Word files, Images, etc.) to programs that generate content on demand.
- Each resource has a name, so clients can point out what resources they are interested in
  - URI (Uniform Resource Identifier)
- HTTP Methods:
  - GET: send named resource from the server to the client
    - Can be used in forms but the sent form data - from client to server - are shown in URL (plain text)
  - PUT: Store data from client into a named server resource
  - DELETE: Delete the named resource from server
  - POST: Send client data into a server gateway application
    - Send the data in binary format

HTTP (Hyper Text Transfer Protocol)

- Responses:
  - 200: Ok resource returned correctly
  - 404: Not found
  - 302: redirect (go to another place to get the resource)
  - 500: Internal server error
- Web Pages can consist of multiple object:
  - A separate transaction (request/response) for each resource (e.g. HTML page, image, etc)

HTML (Hypertext Markup Language)

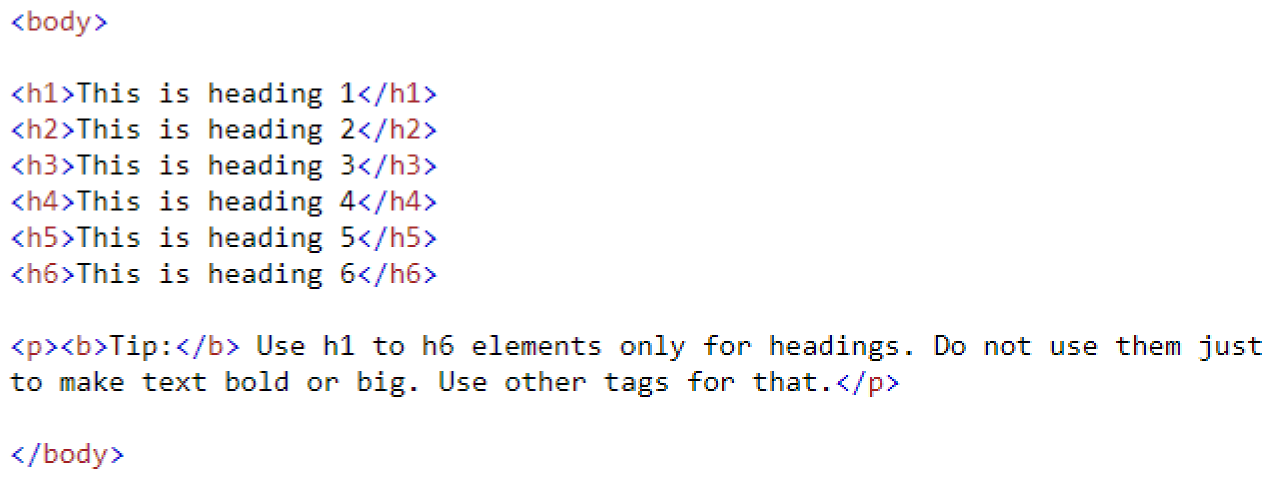
- HTML page is just a text file marked up by HTML codes/tahs
- HTML codes tells the browser how to display the text
- The extension of the file normally is .html
- Mandatory tags:
  - <!DOCTYPE> → document type (not html tag but tells the browser)
  - <html></html> → start of the html tags (container)
  - <head></head> → container for all head elements (title, script, etc.)
  - <title></title> → defines the title in the browser toolbar
  - <body></body> → container for all the body elements (text, images, etc.)

HTML (Hypertext Markup Language)

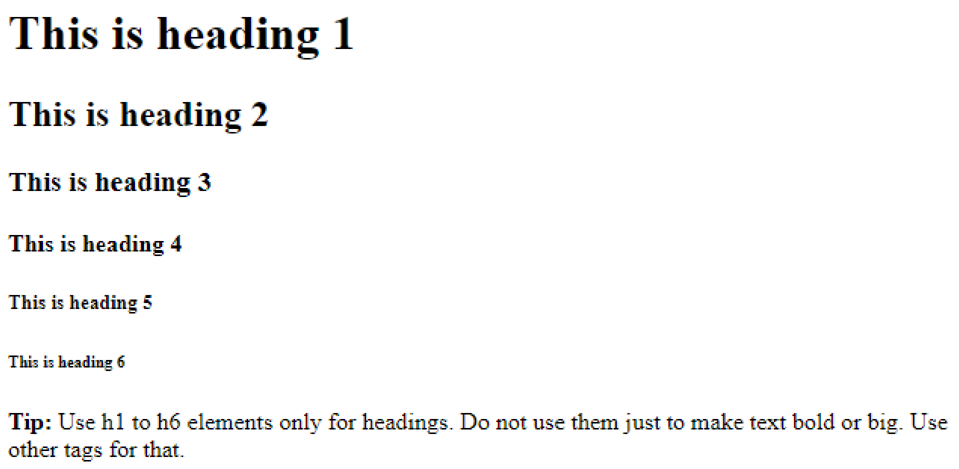
- <h1> (from 1 to 6)
- <p>
- <br>
- <hr> horizontal rule
- <a href="http://www.google.com"> google.com</a>
- <img src="bird.jpg" alt="flying bird" width="100" height="200">
- <ul>
- <ol start="50">

HTML (Hypertext Markup Language)

- Header
  - <h1> (from 1 to 6)



```
<body>

<h1>This is heading 1</h1>
<h2>This is heading 2</h2>
<h3>This is heading 3</h3>
<h4>This is heading 4</h4>
<h5>This is heading 5</h5>
<h6>This is heading 6</h6>

<p><b>Tip:</b> Use h1 to h6 elements only for headings. Do not use them just
to make text bold or big. Use other tags for that.</p>

</body>
```



This is heading 1

This is heading 2

This is heading 3

This is heading 4

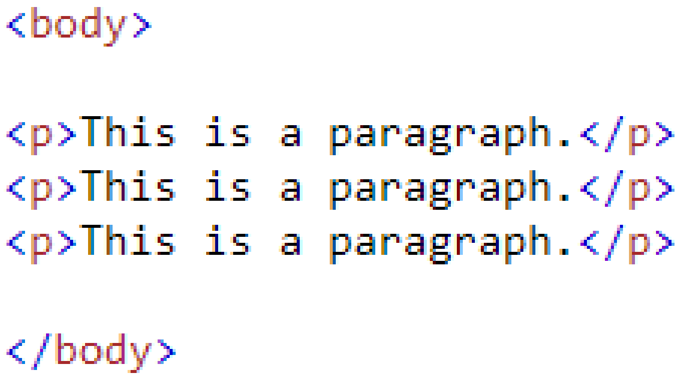
This is heading 5

This is heading 6

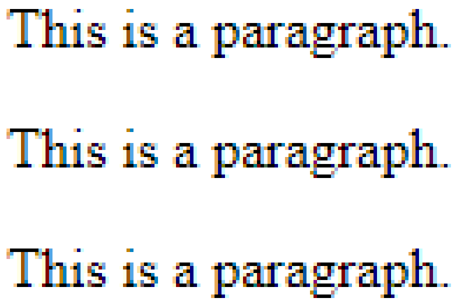
Tip: Use h1 to h6 elements only for headings. Do not use them just to make text bold or big. Use other tags for that.

HTML (Hypertext Markup Language)

- Paragraph
  - <p>



```
<body>

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

</body>
```



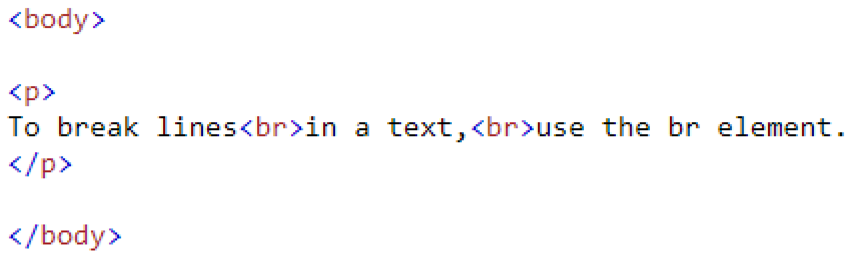
This is a paragraph.

This is a paragraph.

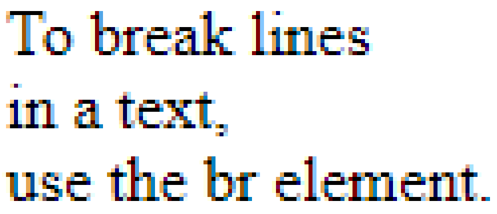
This is a paragraph.

HTML (Hypertext Markup Language)

- Line Break
  -



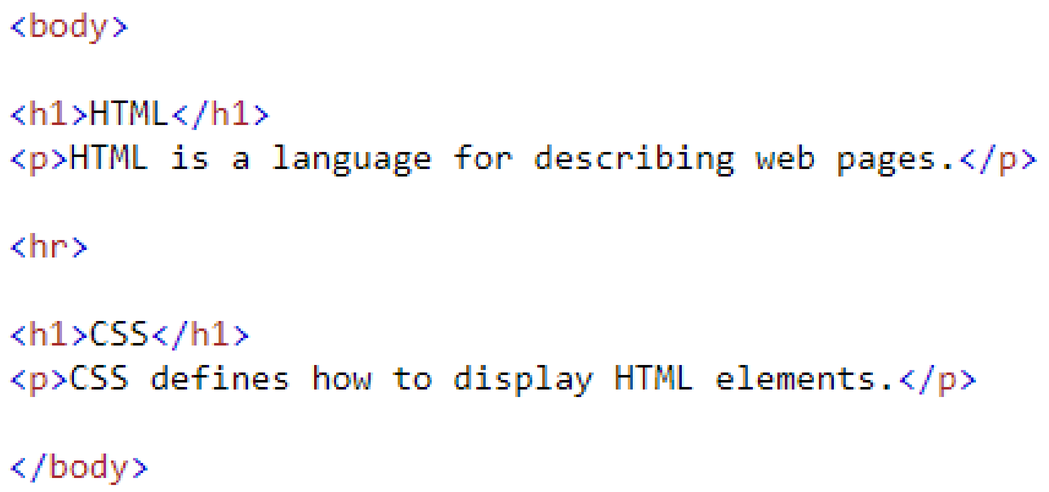
```
<body>

<p>
To break lines<br>in a text,<br>use the br element.
</p>

</body>
```



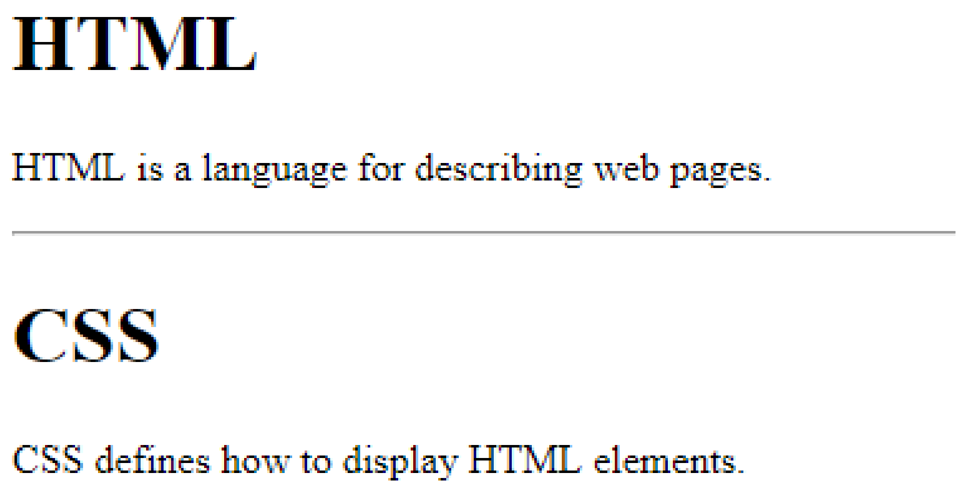
To break lines
in a text,
use the br element.

HTML (Hypertext Markup Language)

- Horizontal Rule
  - <hr>



```
<body>

<h1>HTML</h1>
<p>HTML is a language for describing web pages.</p>

<hr>

<h1>CSS</h1>
<p>CSS defines how to display HTML elements.</p>

</body>
```



HTML

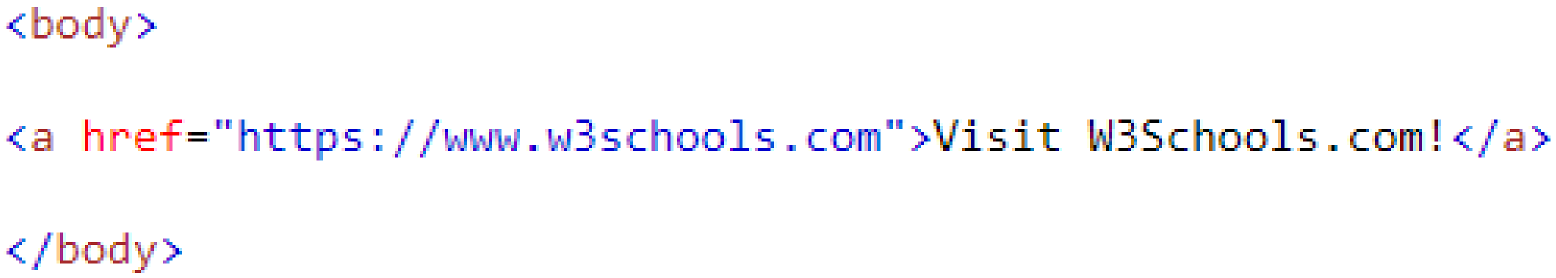
HTML is a language for describing web pages.

CSS

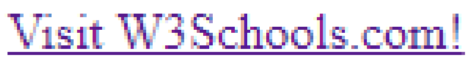
CSS defines how to display HTML elements.

HTML (Hypertext Markup Language)

- Hyper Link
  - <a>



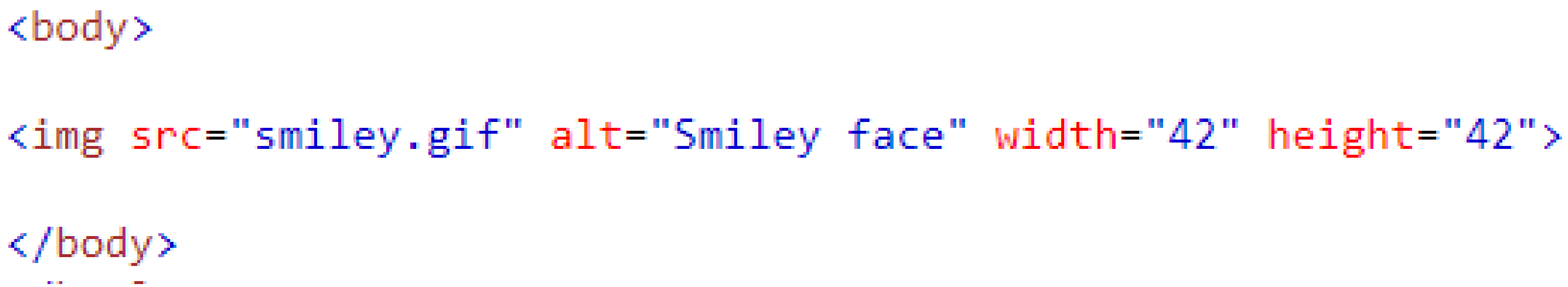
```
<body>

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

</body>
```



Visit W3Schools.com!

HTML (Hypertext Markup Language)

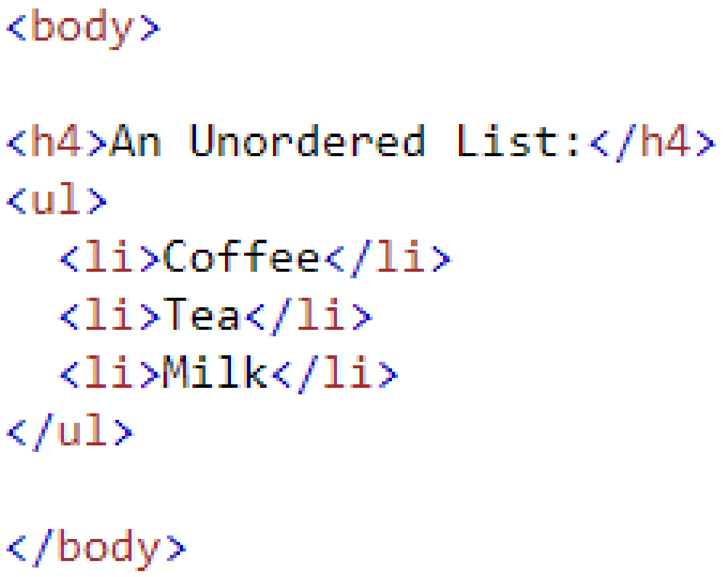
- Image
  - <img>



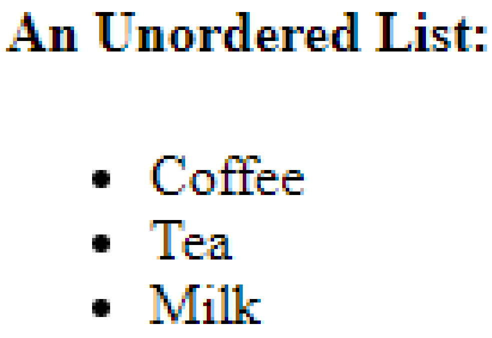
```
<body>

<img src="smiley.gif" alt="Smiley face" width="42" height="42">

</body>
```

HTML (Hypertext Markup Language)

- Unordered List
  - <ul>



```
<body>

<h4>An Unordered List:</h4>
<ul>
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ul>

</body>
```

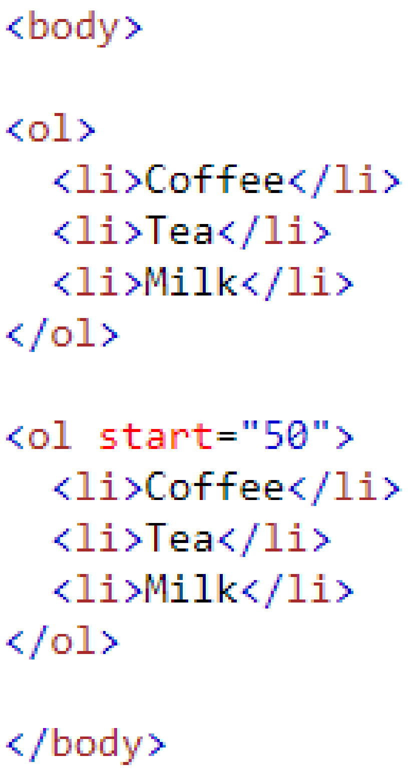


An Unordered List:

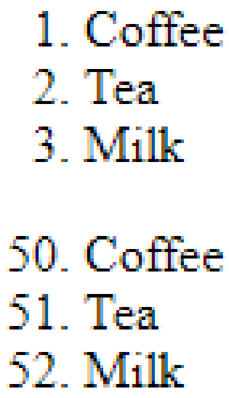
- Coffee
- Tea
- Milk

HTML (Hypertext Markup Language)

- Ordered List
  - <ol>

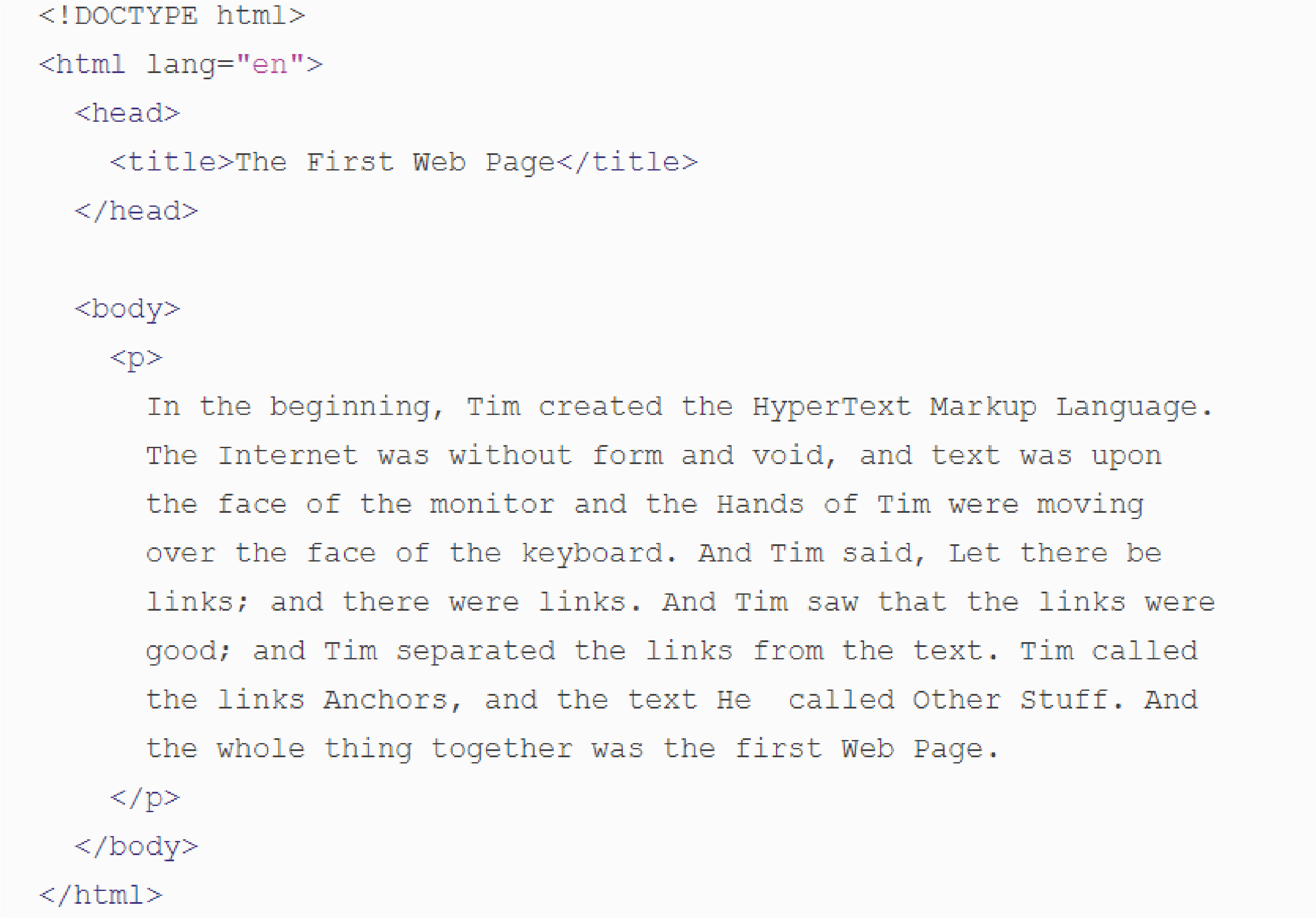


```
<body>

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

<ol start="50">
  <li>Coffee</li>
  <li>Tea</li>
  <li>Milk</li>
</ol>

</body>
```



```
 1. Coffee
 2. Tea
 3. Milk

50. Coffee
51. Tea
52. Milk
```

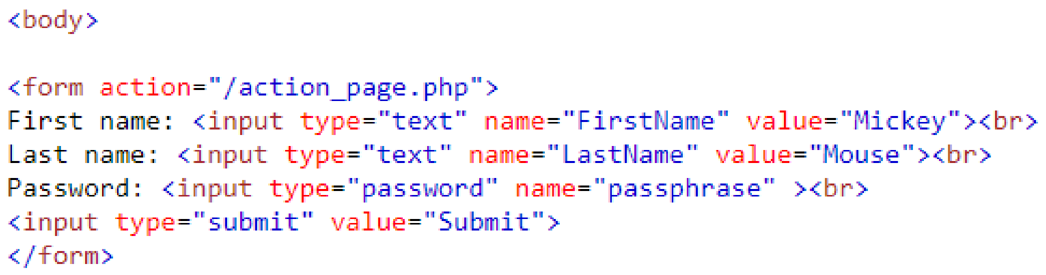
HTML (Hypertext Markup Language)



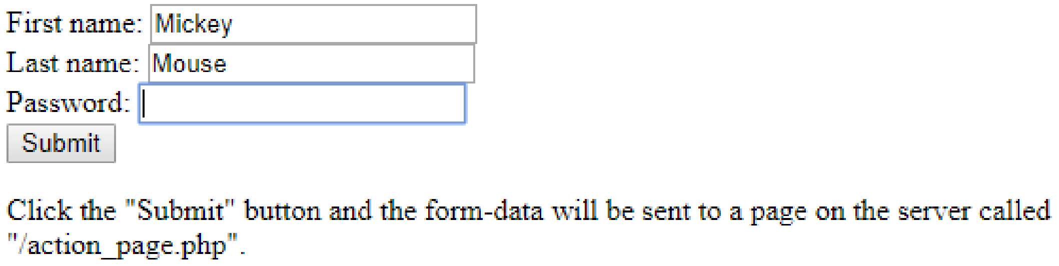
```
<!DOCTYPE html>
<html lang="en">
  <head>
    <title>The First Web Page</title>
  </head>

  <body>
    <p>
      In the beginning, Tim created the HyperText Markup Language.
      The Internet was without form and void, and text was upon
      the face of the monitor and the Hands of Tim were moving
      over the face of the keyboard. And Tim said, Let there be
      links; and there were links. And Tim saw that the links were
      good; and Tim separated the links from the text. Tim called
      the links Anchors, and the text He  called Other Stuff. And
      the whole thing together was the first Web Page.
    </p>
  </body>
</html>
```

HTML (Hypertext Markup Language)

- Forms
  - Method attribute is used with the form to determine the method to take the actions:
    - POST
    - GET



```
<body>

<form action="/action_page.php">
First name: <input type="text" name="FirstName" value="Mickey"><br>
Last name: <input type="text" name="LastName" value="Mouse"><br>
Password: <input type="password" name="passphrase" ><br>
<input type="submit" value="Submit">
</form>
```



First name: Mickey

Last name: Mouse

Password:

Click the "Submit" button and the form-data will be sent to a page on the server called "/action_page.php".

References:

- https://www.w3schools.com
- https://www.jinfonet.com
- http://apachebooster.com
- https://dhavalkapil.com

Thank you