

Introduction to HTML

OBJECTTM
TECHNOLOGIES

What will be covered

- What is internet
- History of internet
- What makes internet work
- Introduction to www
- Web server
- Introduction to HTTP
 - HTTP request and response
- Introduction to HTML
- Structure of web page
- HTML basic tags

What is Internet

- The Internet is what we call a **meta network**, that is, a network of networks that spans the globe.
- It's impossible to give an exact count of the number of networks or users that comprise the Internet, but it is easily in the thousands and millions respectively
- The Internet employs a set of standardized protocols which allow for the sharing of resources among different kinds of computers that communicate with each other on the network.
 - ↳
- Technically, no one runs the Internet. No one acts as administrator of the internet. Everyone can just be the part of the internet

History of Internet

OBJECT

- Internet was originally conceived by the Department of Defense as a way to protect government communications systems in the event of a military strike.
- The original network, dubbed ARPANet (for the Advanced Research Projects Agency that developed it) evolved into a communications channel among contractors, military personnel, and university researchers who were contributing to ARPA projects.
- By the late 1980's, thousands of cooperating networks were participating in the Internet.

What makes the internet work

OBJECT

- It allows many different computers to connect and talk to each other.
- This is possible because of a set of standards, known as **protocols**, that govern the transmission of data over the network: TCP/IP (Transmission Control Protocol/Internet Protocol)
- TCP/IP is normally considered to be a 4 layer system. The 4 layers are as follows :
 - Application layer
 - Transport layer
 - Network layer
 - Data link layer

What makes the internet work

OBJECT

Host (your laptop)



Target (webserver)



Application Layer (HTTP)

Transport Layer (TCP)

Network Layer (IP)

Data Link Layer

Media for data transfer (e.g. Ethernet)

Application Layer (HTTP)

Transport Layer (TCP)

Network Layer (IP)

Data Link Layer

Introduction to www

OBJECT

The Web, or World Wide Web, is basically a system of Internet servers that support specially formatted documents. The documents are formatted in a markup language called HTML (*HyperText Markup Language*) that supports links to other documents, as well as graphics, audio, and video files. *World Wide Web* is not synonymous with *the Internet*. It is a service running on the internet

Web Server

OBJECT

- a web server is a computer that stores web server software and a website's component files. (for example, HTML documents, images, CSS stylesheets, and JavaScript files) A web server connects to the Internet and supports physical data interchange with other devices connected to the web.
- At a minimum, this is an HTTP server. An HTTP server is software that understands URLs (web addresses) and HTTP (the protocol your browser uses to view webpages). An HTTP server can be accessed through the domain names of the websites it stores, and it delivers the content of these hosted websites to the end user's device.

Introduction to http

OBJECT

- HTTP (Hypertext Transfer Protocol) is the set of rules for transferring files (text, graphic images, sound, video, and other multimedia files) on the World Wide Web.
- HTTP is an application protocol that runs on top of the TCP/IP suite of protocols (the foundation protocols for the Internet)
- Web browser is an HTTP client, sending requests to server machines
- the browser builds an HTTP request and sends it to the Internet Protocol address (IP address) indicated by the URL.
- The HTTP daemon in the destination server machine receives the request and sends back the requested file or files associated with the request.

HTTP request and response

OBJECT

- HTTP messages are how data is exchanged between a server and a client. There are two types of messages: requests sent by the client to trigger an action on the server, and responses, the answer from the server.
- Every HTTP request contains three elements which are:- Request Line, Request Header, Body of Request(optional).
- Request line:-
 - It specifies the method, which tells the server what to do with the information or resource.
 - It contains the URL of the request which is used to find the resource on the server.
 - It also specifies HTTP protocol version being used (Ex. HTTP/ 1.0 or HTTP/1.1)
- Request Header:- It consists of 0 or more headers.
 - The headers are used to pass more information about the request so that using the request headers the server knows how to deal with the information the client is demanding.
- Request Body:-
 - This is an optional part of the HTTP request which is used to send additional data to the server.

HTTP request and response

OBJECT

- HTTP Response
- The response from the server with the target to provide the client with the desired resources is HTTP Response.
- HTTP Response received from the server consists of:-
 - Status line:- HTTP/1.1 302 Found This is how the status line of the response header looks like. It contains the HTTP protocol version, status code, Reason phrase (known as status text).
 - Response Header:- There can be one or more response header lines and they are used to pass additional information to the client from the server.
 - Response Body:- The response body contains the resource demanded by the client. If the request is unsuccessful then the response body contains the reason for the error, it may also contain the steps to be done by the client to complete the request successfully.

Introduction to HTML

OBJECT

- HTML stands for Hypertext Markup Language, and it is the most widely used language to write Web Pages.
- Hypertext refers to the way in which Web pages (HTML documents) are linked together. Thus the link available on a webpage are called Hypertext.
- As its name suggests, HTML is a **Markup Language** which means you use HTML to simply "mark up" a text document with tags that tell a Web browser how to structure it to display.

Introduction to HTML

OBJECT

- HTML elements are the building blocks of HTML pages
- 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

Structure of web page

OBJECT

A web page is structured as follows.

- **The Doctype**

The first item to appear in the source code of a web page is the doctype declaration. This provides the web browser (or other user agent) with information about the type of markup language in which the page is written

- **html**

Immediately after the doctype comes the html element—this is the root element of the HTML document and everything that follows is a descendant of that root element.

- **head**

The head element contains metadata—information that describes the document itself, or associates it with related resources, such as scripts and style sheets.

Structure of web page

OBJECT

- **body**

This is where the bulk of the page is contained. Everything that you can see in the browser window (or viewport) is contained inside this element, including paragraphs, lists, links, images, tables, and more.

HTML basic tags

OBJECT

- A HTML heading or HTML h tag can be defined as a title or a subtitle which you want to display on the webpage. When you place the text within the heading tags <h1>.....</h1>, it is displayed on the browser in the bold format and size of the text depends on the number of heading.
- There are six different HTML headings which are defined with the <h1> to <h6> tags.
- **Heading elements (h1....h6) should be used for headings only.**
They should not be used just to make text bold or big.

HTML Basic Tags : HTML Heading

OBJECT

```
<h1>Heading no. 1</h1>  
<h2>Heading no. 2</h2>
```

HTML design

```
<h3>Heading no. 3</h3>
```

```
<h4>Heading no. 4</h4>
```

```
<h5>Heading no. 5</h5>
```

```
<h6>Heading no. 6</h6>
```

Heading no. 1

Heading no. 2

Heading no. 3

Heading no. 4

Output :

Heading no. 5

Heading no. 6

HTML Basic Tags : Paragraphs

OBJECT

- HTML paragraph or HTML p tag is used to define a paragraph in a webpage.
- Browser itself add an empty line before and after a paragraph.

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

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

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



Output:

This is first paragraph.

This is second paragraph.

This is third paragraph.

HTML Basic tags : break

OBJECT

- Browser by default trims all the spaces and converts it to single space.
- Whenever you use the `
` element, anything following it starts from the next line.
- This tag is an example of an **empty element**, where you do not need opening and closing tags, as there is nothing to go in between them.

HTML Basic tags : break

OBJECT

```
<p>Hello<br />  
You delivered your assignment ontime.<br />  
Thanks<br />  
Mahnaz</p>
```

This produces following output:

```
Hello  
You delivered your assignment ontime.  
Thanks  
Mahnaz
```

HTML Basic Tags : anchors

OBJECT

- The **HTML anchor tag** defines a *hyperlink that links one page to another page.*

- The "href" attribute is the most important attribute of the HTML a tag. The href attribute is used to define the address of the file to be linked. In other words, it points out the destination page.

- The syntax of HTML Anchor tag is given below.

 Link Text

- Let's see an example of HTML Anchor tag.

Click for Second Page

- Appearance of HTML Anchor tag

An unvisited link is displayed underlined and blue.

A visited link displayed underlined and purple.

An active link is underlined and red.

HTML Basic Tags: anchors

OBJECT

Create a Bookmark

- HTML bookmarks are used to allow readers to jump to specific parts of a Web page.
- Bookmarks can be useful if your webpage is very long.
- To make a bookmark, you must first create the bookmark, and then add a link to it.
 - When the link is clicked, the page will scroll to the location with the bookmark.
 - To create a bookmark href value should be #bookmakname

HTML Basic Tags : anchors

OBJECT

- Example

- First, create a bookmark with the id attribute:

```
| <h2 id="tips">Useful Tips Section</h2>
```

- Then, add a link to the bookmark ("Useful Tips Section"), from within the same page:

```
 ↗ <a href="#tips">Visit the Useful Tips Section</a>
```

- Or, add a link to the bookmark ("Useful Tips Section"), from another page:

```
| <a href="html_tips.html#tips">Visit the Useful Tips Section</a>
```

Introduction to HTML

In this topic we will learn about basics of web application, request response cycle, web server etc. We will even learn about purpose of HTML, structure of HTML and very basic tags of HTML.

Introduction to web

Web programming, also known as web development, is the creation of dynamic web applications.

Web Application

A website is a collection of static files(webpages) such as HTML pages, images, graphics etc. A Web application is a web site with dynamic functionality on the server. Examples of web applications include blogs, online shopping, search engines, Google, Facebook, Twitter are examples of web applications.

Static web pages are stored in the file system of web server usually displays the same information to all visitors. Whereas dynamic pages are constructed by a program that produce the HTML. This type of web application provide individual information to the user and let them personalize the content according to their preferences.

How the (static) web work?

1. We already know that to open a web page we enter URL or click on link and web browser displays web page that we request. Let's discuss the steps that happen behind the scene.
 2. The user enters a URL in the browser.
 3. The browser sends a request to the web server over the internet.
 4. Web Server examines the request and based on the request server finds the requested page already stored in its local drive.
 5. Web Server sends the response to the web client (browser).
 6. Browser gets the HTML and renders it into a display for the user.

client request contains URL
of the resource the client is
looking for

request

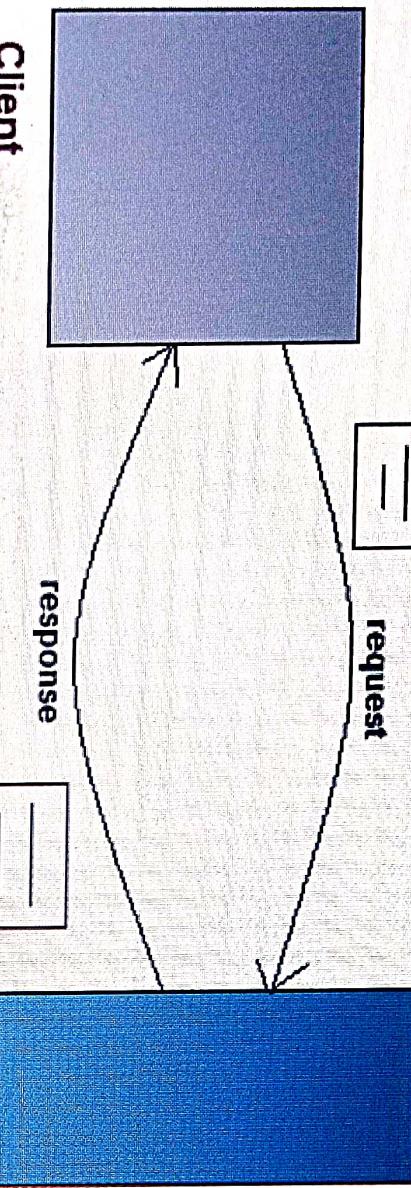


Fig:Client-Server Architecture

Web Server

Definition: A web server is a computer that runs websites. It's a computer program that distributes web pages as they are requisitioned. The basic objective of the web server is to store, process and deliver web pages to the users. This intercommunication is done using Hypertext Transfer Protocol (HTTP).

The content can be static (for example, text and images) or dynamic (for example, a computed price or the list of items a customer has marked for purchase). To deliver dynamic content, most web servers support server side scripting languages to encode business logic into the communication. Commonly supported languages include java, Javascript, PHP, Python, and Ruby.

HTTP (Hyper Text Transfer Protocol)

1. HTTP is a protocol that clients and servers use on the web to communicate.
2. It is similar to other internet protocols such as SMTP(Simple Mail Transfer Protocol) and FTP(File Transfer Protocol) but there is one fundamental difference.
3. HTTP is a stateless protocol i.e HTTP supports only one request per connection. This means that with HTTP the clients connect to the server to send one request and then disconnects. This mechanism allows more users to connect to a given server over a period of time.
4. The client sends an HTTP request and the server answers with an HTML page to the client, using HTTP.

HTTP Methods and Descriptions

GET	Request to retrieve information from server using a given URL.
POST	Request for server to accept the entity enclosed in the body of HTTP method.
PUT	This is same as POST, but POST is used to create, PUT can be used to create as well as update. It replaces all current representations of the target resource with the uploaded content.
DELETE	Request for the Server to delete the resource.
HEAD	Identical to GET except that it does not return a message-body, only the headers and status line.
OPTIONS	Request for communication options that are available on the request/response chain.
CONNECT	Reserved for use with a proxy that can switch to being a tunnel.

What does Uniform Resource Locator (URL) mean?

1. A Uniform Resource Locator (URL), otherwise known as a Universal Resource Locator, is the address of a resource on the Internet and the protocol used to access it.
2. It indicates the location of a web resource like a street address indicates where a person lives physically ? because of this an URL is often referred to as: ?web address?

A URL contains the following information:

1. The protocol used to access the resource.
2. The location of the server (whether by IP address or domain name).
3. The port number on the server (optional).
4. The location of the resource in the directory structure of the server.
5. A fragment identifier (optional).
6. A URL is a type of uniform resource identifier (URI).
7. Given this, the following URLs are much simpler to understand:

<https://www.google.com/default.htm>

Both these URLs indicate that there is a file named default.htm on a server with the address of "google.com".

HTTP vs. HTTPS

Both HTTP and HTTPS are used to retrieve data from a web server to view content in a browser. The difference between them is that HTTPS uses a Secure Sockets Layer (SSL) certificate to encrypt the connection between the end user and the server.

Structure of HTML

The basic structure of an HTML document consists of **5 elements**:

1. <!DOCTYPE>
2. <html>
3. <head>
4. <title>
5. <body>

The DOCTYPE

A DOCTYPE declaration must be specified on the first line of each web document. The DOCTYPE tells the web browser which version of HTML the page is written in. <!DOCTYPE html> declaration indicates that we are following HTML 5 version. It is not compulsory to write this declaration

The <html> Element

Immediately following the DOCTYPE declaration is the <html> element:

The <html> element tells the browser that the page will be formatted in HTML and, optionally, which world language the page content is in.

The <head> and <body> Elements

The <head> element surrounds all the special elements of a web document. Most of these elements do not get displayed directly on the web page. But elements in the head section help the browser in understanding the requirements of the current web page.

The <body> element surrounds all the actual content (text, images, videos, links, etc.) that will be displayed on our web page.

The <meta> Element

Immediately after the <head> line, we place this <meta> element. This line declares that the document is encoded in the UTF-8 (Unicode) character set.

There can be multiple <meta> lines in the same web page. The <meta> element is often used to provide additional information such as page keywords, a page description, and the author(s) of a web document. We will use <meta> element when we use bootstrap for the web pages.

The <title> Element

The <title> element defines what text will show in the web browser's title bar.

```
<!DOCTYPE html>
<html>
<head>
<title>Title here</title>
</head>
<body>
    Web Page content goes here.
</body>
</html>
```

Every web document must include one and only one instance of DOCTYPE, <html>, <head>, <body>, and <title>.

HTML Basic Tags

There are few elements that every web page needs to make use of. We will see details of such basic elements

Heading tags :

A HTML heading or HTML h tag can be defined as a title or a subtitle which you want to display on the webpage. When you place the text within the heading tags <h1>.....</h1>, it is displayed on the browser in the bold format and size of the text depends on the level of heading.

There are six different HTML headings which are defined with the <h1> to <h6> tags. Heading elements (h1....h6) should be used for headings only. They should not be used just to make text bold or big.

Heading tags are very important tags that are searched by search engines.

Heading no. 1

```
<h1>Heading no. 1</h1>
```

Heading no. 2

```
<h2>Heading no. 2</h2>
```

Heading no. 3

```
<h3>Heading no. 3</h3>
```

Heading no. 4

```
<h4>Heading no. 4</h4>
```

Heading no. 5

```
<h5>Heading no. 5</h5>
```

<h6>Heading no. 6</h6>

Heading no. 6

Paragraph tags

The <p> tag defines a paragraph of text. It is a block-level element and always starts on a new line. Before and after each paragraph, browsers add margin automatically.

Output:

```
<p>This is first paragraph.</p>
<p>This is second paragraph.</p>
<p>This is third paragraph.</p>
```

This is first paragraph.

This is second paragraph.

This is third paragraph.

Line breaking tags

Browser by default trims all the spaces and converts it to single space. Whenever you use the
 element, anything following it starts from the next line. This tag is an example of an empty element, where you do not need opening and closing tags, as there is nothing to go in between them.

```
'<p>Hello<br />
You delivered your assignment on time.<br />
Thanks<br />
Mahnaz</p>
```

Output:

Hello

You delivered your assignment on time.

Hello

You delivered your assignment on time.

Thanks

Mahnaz

Anchor tags

The HTML anchor tag defines a hyperlink that links one page to another page. The "href" attribute is the most important attribute of the HTML anchor tag. The href attribute is used to define the address of the file to be linked. In other words, it points out the destination page. The syntax of HTML anchor tag is given below.

```
<a href = "....."> Link Text </a>
```

Let's see an example of HTML anchor tag.

```
<a href="second.html">Click for Second Page</a>
```

Appearance of HTML anchor tag

- An unvisited link is displayed underlined and blue.
- A visited link displayed underlined and purple.
- An active link is underlined and red.

Create a Bookmark

HTML bookmarks are used to allow readers to jump to specific parts of a Web page. Bookmarks can be useful if your webpage is very long. To make a bookmark, you must first create the bookmark, and then add a link to it. When the link is clicked, the page will scroll to the location with the bookmark. To create a bookmark href value should be #bookmakname Example First, create a bookmark with the id attribute:

```
<h2 id="tips">Useful Tips Section</h2>
```

Then, add a link to the bookmark ("Useful Tips Section"), from within the same page:

```
<a href="#tips">Visit the Useful Tips Section</a>
```

Or, add a link to the bookmark ("Useful Tips Section"), from another page:

Assignments

```
<a href="html-tips.html#tips">Visit the Useful Tips Section</a>
```

Or, add a link to the bookmark ("Useful Tips Section"), from another page:

```
<a href="#tips">Visit the Useful Tips Section</a>
```

1. Display the title "My First Web Page" and display the message Hello from HTML on the web page.

2. Create a web page to implement the following formatting:

Welcome to Web Programming

Welcome to Web Programming

Welcome to Web Programming

Welcome to Web Programming

- 3. Create hyperlinks like following on the page :
OOB Concepts
- Use of Interfaces
- Use of Operator
- Exception handling

4. Refer the assignment no.3 given above. Each hyperlink should take you to the respective descriptive description written on same page.

Each hyperlink should take you to the another page which explains about the topic.