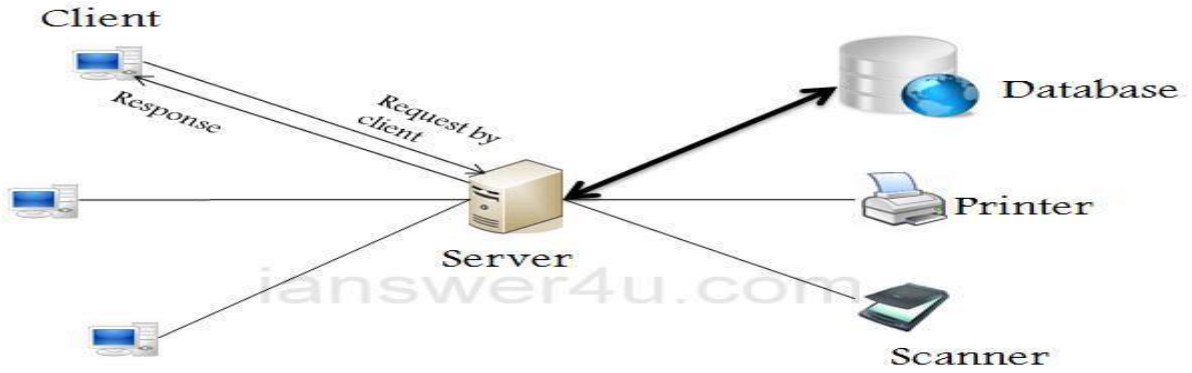
Web Design: Client-Server Architecture

1. Client - Server Architecture

Computers on the Internet use client-server architecture. This means that the remote server machine provides files and services to the user local client machine.



1.1 Web Server

A Web server is a computer purposed to runs special serving software. That software serves HTML pages and the files associated with those pages when requested by a client, usually a Web browser. The computer is secured so that only authorized people can access it to make changes to the data, so, if a person is on the same network as the Web Server, he or she may be able to save the data directly onto theWeb Server computer (if authorized).

Server-side:

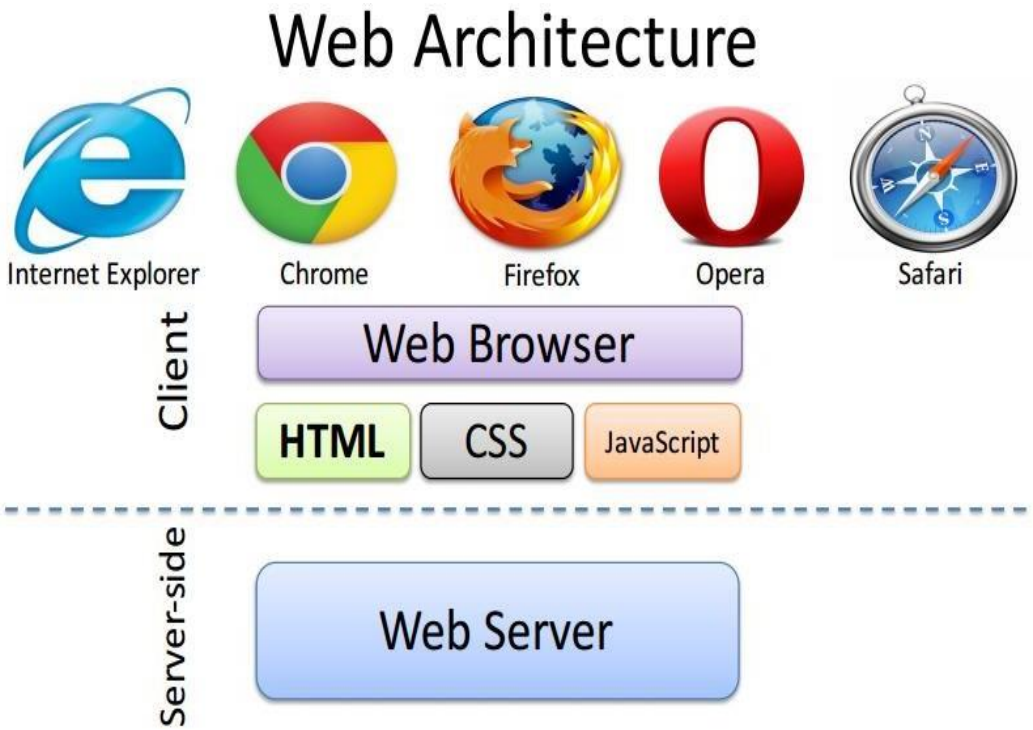
- JSP (Java Server Pages)
- ASP (Active Server Pages)
- ASP.NET (next generation of ASP)
- PHP
- Python

1.2 Client

The Client (front end) or user side of the Web, it typically refers to the Web browserin the user's machine. **Web browser** is a software application or program for retrieving, displaying, and traversing information resources on the World Wide Web. An information resource is identified by a Uniform Resource Identifier (URI) and maybe a web page, image, video, or other piece.

Client-side:

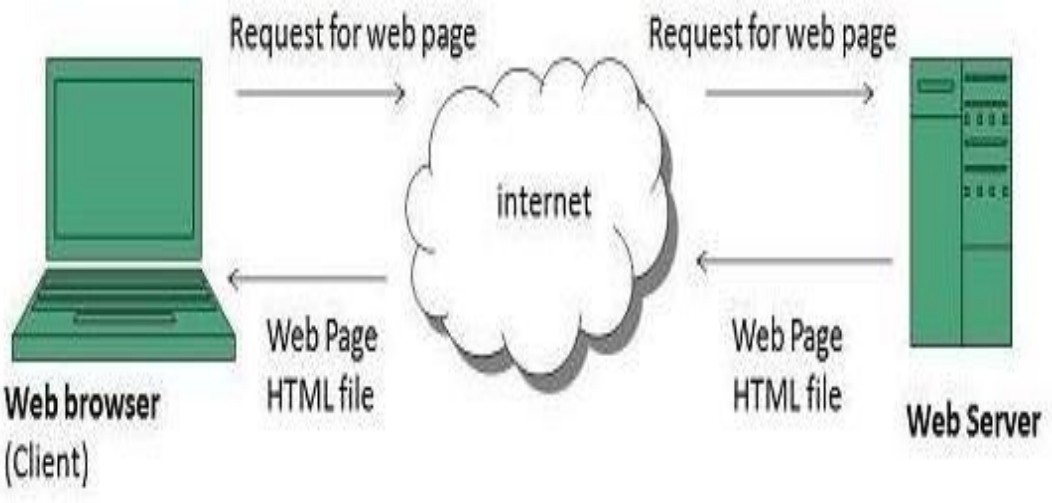
- HTML / XHTML (Extensible Hyper Text Markup Language)
- CSS (Cascading Style Sheets)
- JavaScript / VBScript (client-side scripting).



1.3 Web Operations

The Web works on client- server approach. Following steps explains how the web works:

1. User enters the **URL** for example, **http://www.inf.com** of the web page in the address bar of web browser.
2. Then browser requests the **Domain Name Server** for the **IP address** corresponding to **www.inf.com**.
3. After receiving IP address, browser sends the request for web page to the web server using **HTTP protocol** which specifies the way the browser and web server communicates.
4. Then web server receives request using **HTTP protocol** and checks its search for the requested web page. If found it returns it back to the web browser and close the HTTP connection.
5. Now the web browser receives the web page, **it interprets it and displays the contents of web page** in web browser's window.



2. Hyperlinks

Hyperlinks are **the primary method used to navigate between pages** and Web sites. Links can point to other web pages, web sites, graphics, files, sounds, e-mail addresses, and other locations on the same web page. When text is used as a hyperlink, it is usually underlined and appears as a different color.

There are four types of hyperlinks:

- **Text hyperlink**: Uses words to take visitors to another page, file or document.
- **Image hyperlink**: Uses an image to take visitors to another page, file or document.
- **Bookmark hyperlink**: Uses text or image to take visitors to another part of web page.
- **E-mail hyperlink**: Allows visitors to send an e-mail message to the displayed e-mail address.

3. Types of Web Sites

There are many types of Web sites, each catering to a particular type of content or use. Hence, few illustrative but not exhaustive cases are given below:

- **Blog (Web Log):** Sites generally used to post online diaries.
- **Wiki:** Site which users collaboratively edit (such as Wikipedia and Wikihow).
- **Web Portal:** Site that provides a a gateway to other resources on the Internet.
- **Education:** Site where teachers, students, or administrators can post information about current events at or involving their school.
- **Social Networking:** Sits where users could communicate with one another and share media, such as pictures, videos, music and blogs with other users.

4. Programming, Scripting, Markup Languages

- **Programming Language**

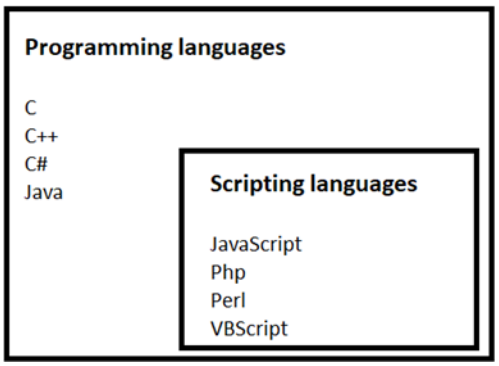
It is set of instructions which tells a computer what it needs to perform task and get the desired output from it. Programming languages are high-level languages that need to be converted into machine level language because a computer can only understand machine level language or binary language (0 and 1). This conversion is done by the compiler which scans the complete code in one go and if it finds any error it immediately throws all errors. Examples are Java, C, C++, C#.

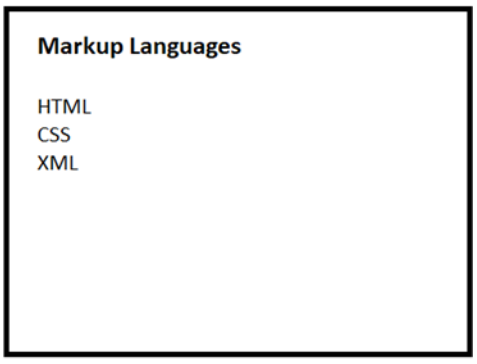
- **Scripting Language**

It is designed for specific runtime environments to provide additional functions. It integrates with other programming languages and doesn't work standalone. JavaScript, PHP, Perl, VBScript these all are the examples of scripting language. Scripting languages need to be interpreted (scanning the code line by line), insteadof compiled. Scripting languages are most widely used to create a website.

- **Markup Language**

It is a set of rules for describing the structure and presentation of a document thatare interpreted by browser. It tells the browser how to structure data for a specificpage, layout, headings, title, table or styling a page. Examples of Markup languagesare HTML, CSS or XML. These languages are most widely used to design a website.

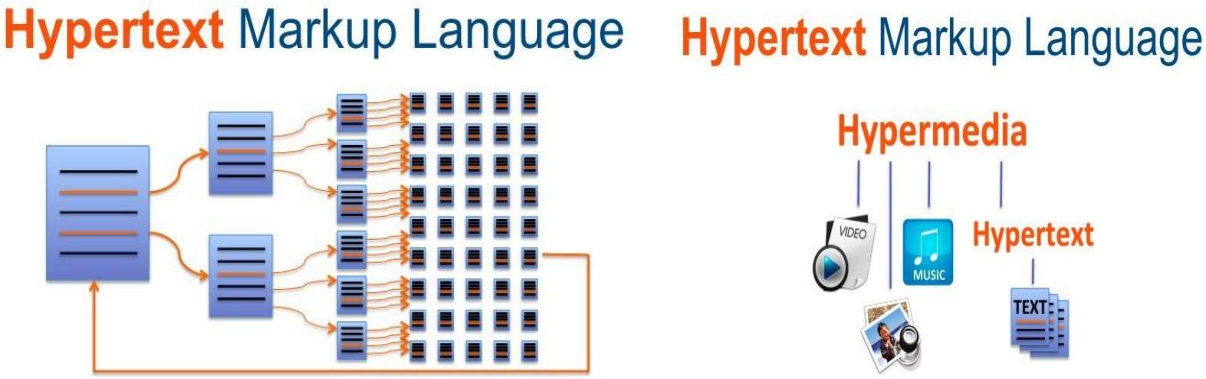




5. What is the HTML?

Documents on the web are generally coded in a markup language called Hypertext Markup Language (HTML). HTML is used to describe the structure of a document andlinks in a hypertext document. The primary focus of HTML is the content of the document, not its appearance.

HTML stands for **Hyper Text** Markup Language. Its makes parts of a document into links to other documents.



- HTML describes the content of Web pages using **markup** represented by tags.

- HTML is the markup **language** for creating Web pages.

Hypertext Markup Language

```
<h1>
  <div>Hello World!</h1>
</div>
```

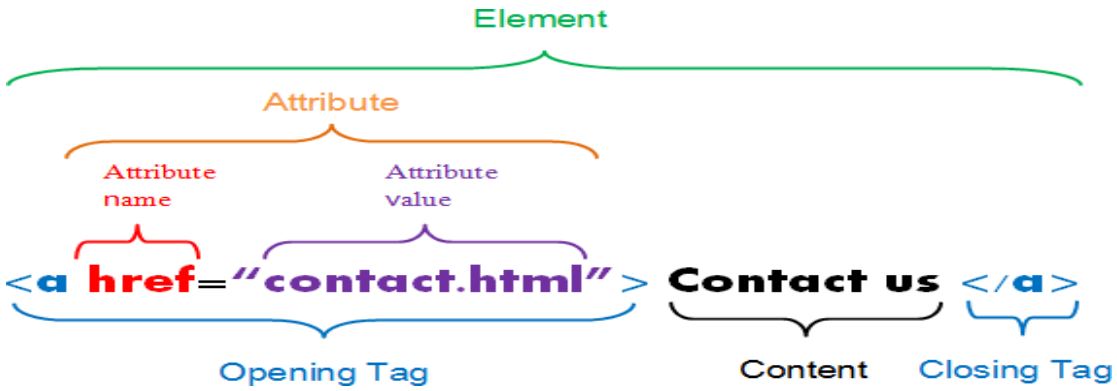
✗

```
<h1>
  <div>Hello World!</div>
</h1>
```

✓

6. HTML Element

Elements are the bits that make up web pages. They consist of some kind of structure or expression. The HTML element is shown in following Figure:



- **HTML Tags**

HTML Tags are used to mark up the start and the end of HTML element and are usually surround content and apply meaning to it. Each tag consists of an opening angled bracket (<) and a closing bracket (>). They are normally come in pairs like <head> and </head> and nothing within the brackets will be displayed in the browser. The tag name is generally abbreviation to the tag function.

Example: **<h1>** **</h1>**