

CPE212

INTERNET BASED PROGRAMMING



Assist. Prof. Dr. Kürşat Mustafa KARAOĞLAN

Lecture 1:

Spring 2023

Course logistics in brief

- Instructor** : **Kürşat Mustafa Karaoğlu, PhD.,**
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- Course Lab. Assistant** : **İdris Kahraman,**
idriskahraman@karabuk.edu.tr
- Time** : Check out your system
- Course Materials** :
 - J. Niederst Robbins: Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics (5th ed).
 - Nixon, Robin. Learning PHP, MySQL & JavaScript. " O'Reilly Media, Inc.", 2021.
 - N. C. Zakas: Professional Javascript for Web Developers (2nd ed). Wiley, 2009.
- Office Hours** : Friday 11:00 p.m.-12:00 p.m.

What do we hope to teach? (A.k.a. “learning goals”)

- The aim of this course is to teach students the design and programming fundamentals of Internet-based applications.
- Within the scope of the course, it is aimed to provide basic education on web design and server/client-side programming technologies by using various technologies, languages and tools.

Sıra No	Açıklama
1	İnternet ve web teknolojileri kavramlarını ve kapsamlarını öğrenir.
2	İstemci taraflı diller hakkında bilgi sahibi olur ve programlama becerileri kazanır.
3	Sunucu taraflı diller hakkında bilgi sahibi olur ve programlama becerileri kazanır.
4	PHP ile veri tabanı işlemlerini gerçekleştirerek dinamik web sayfalarını geliştirme becerisine sahip olur.
5	PHP çerçeveleri hakkında bilgi sahibi olur ve uygulama geliştirme becerisi kazanır.

Course work and grading policy

Ara Sınav	1	% 40
Kısa Sınav	0	% 0
Ödev	1	% 20
Devam	0	% 0
Uygulama	0	% 0
Proje	0	% 0
Yarıyıl Sonu Sınavı	1	% 40
Toplam :	3	% 100

1	İnternet Teknolojilerine Giriş: Web Kavramları, Web Tarayıcıları, HTTP, FTP, ISP, İstemci-Sunucu Mimarileri, Site Yapısı, Web tasarım editörleri, XML, Web Servisler.
2	İstemci taraflı betik dil (HTML5): Genel Bakış, Sözdizimi, Kapsam, Özellikler, Olaylar.
3	İstemci taraflı betik dil (HTML5): Web Formları 2.0, MathML öğeleri, Web Depolama.
4	İstemci taraflı betik dil (CSS3): Genel Bakış, Sözdizimi, Kapsam, Renkler, Yazı Tipleri, Metinler.
5	İstemci taraflı betik dil (CSS3): Görüntüler, Bağlantılar, Tablolar, Listeler, Kutu Özellikleri, Katmanlar.
6	İstemci taraflı betik dil (JavaScript): Genel Bakış, Kapsam, Söz Dizimi, Değişken Türleri, Operatörler.
7	İstemci taraflı betik dil (JavaScript): Form Öğeleri, Karşılaştırma Operasyonları, Akış kontrolü ifadeleri, Diziler, Döngüler.
8	İstemci taraflı betik dil (JavaScript): Fonksiyonlar, İteratörler ve Yapıcılar, Nesneler ve Prototipler, Sınıflar, Gelişmiş İşlevler, Hata İşleme.
9	Sunucu taraflı programlama: PHP Teknolojisine Giriş, Kapsam, Yazılım platformları (IDEs).
10	Sunucu taraflı programlama: PHP ile programlamanın temelleri (Değişkenler, diziler, fonksiyonlar, string işlemleri).
11	PHP ile HTML form uygulamaları geliştirme, oturum kullanımı.
12	PHP ile veri tabanı sorguları ve farklı SQL uygulamaları.
13	PHP Çerçeve Teknolojileri: Genel Bakış, Kapsam.
14	PHP Çerçeve Teknolojileri: Uygulama geliştirme.

You can find all the detailed information about the course from the [link](#).

Course Main Plan

We will cover the following languages

- **HTML5/CSS**
- **JavaScript**
- **PHP**
- **Related PHP Framework Technologies**

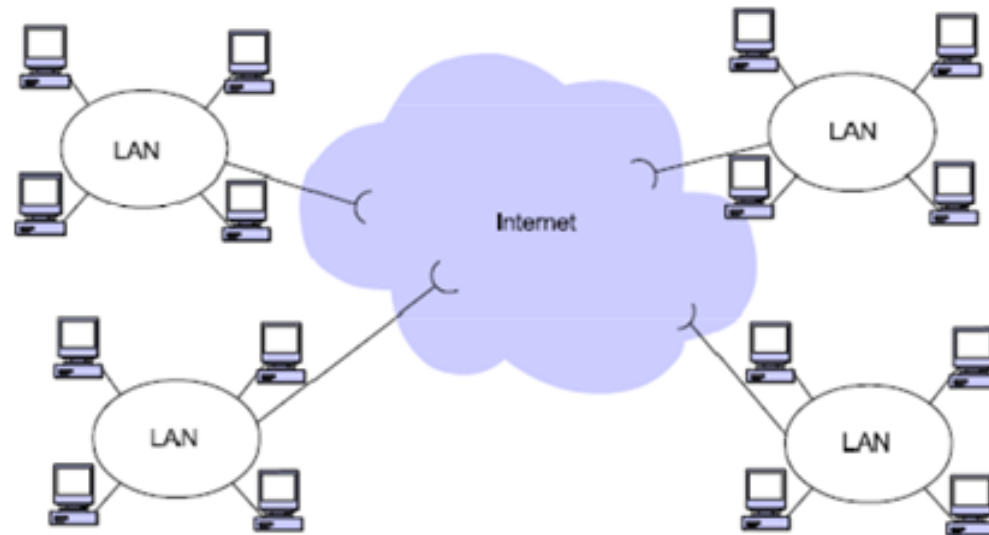
* We will implement our applications with [PhpStorm IDE](#). You can FREE use this application using your student e-mail.

Key learning today: Introduction to Internet Technology

Introduction to Internet Technology

Introduction to Internet Technology

- The Internet is a collection of computers around the world connected to each other via a high-speed series of networks.
- The Internet becomes the main method in exchanging cultures and transferring knowledge between people.
- All connected computers and networks exchange information and use various services.



Introduction to Internet Technology

- Hence, the Internet is not the World Wide Web (WWW or W3).
- The World Wide Web (or Web) is just one of the services that the Internet offers to its users although it is the most commonly used service.
- The Internet is the global system of interconnected computer networks.
- The Internet carries an unlimited range of information resources and services, such as the interlinked hypertext documents and applications of the Web, electronic mail, telephony, and file sharing.

History (1)

- 1969: ARPANET (precursor of the Internet)
- 1971: First e-mail transmission
- 1971: File Transfer Protocol (FTP)
- 1972: Vadic VA3400 modem (1,200 bit/s over phone network)
- 1977: RSA public-key cryptography
- 1977-79: EPSS/SERCnet (first UK networks
between research institutions)
- 1981: IBM PC 5150
- 1981: Hayes Smartmodem (300 bit/s; computer controlled)
- 1982: TCP/IP standardised
- 1985: FTP on TCP standardised

History (2)

- mid 1980s: Janet (UK network between research institutions with 2 Mbit/s backbone and 64 kbit/s access links)
- 1986: U.S. Robotics HST modem (9600 bit/s)
- late 1980s: TCP/IP networks expand across the world
- 1991: Janet adds IP service
- 1991: Gopher / World Wide Web
- 1991: GSM (second generation cellular network)
digital, circuit switched network for
full duplex voice telephony
- 1995: First public releases of JavaScript and PHP
- 1997: World Wide Web slowly arrives on mobile phones

History (3)

Current Applications:

- Communication via e-mail, Twitter, etc
- Joint manipulation of concepts and actions: Collaborative editing, Crowd sourcing, Wikis (Wikipedia)
- E-Commerce: Online auctions and markets
- Social media, social networks, virtual learning environments



WIKIPEDIA
The Free Encyclopedia

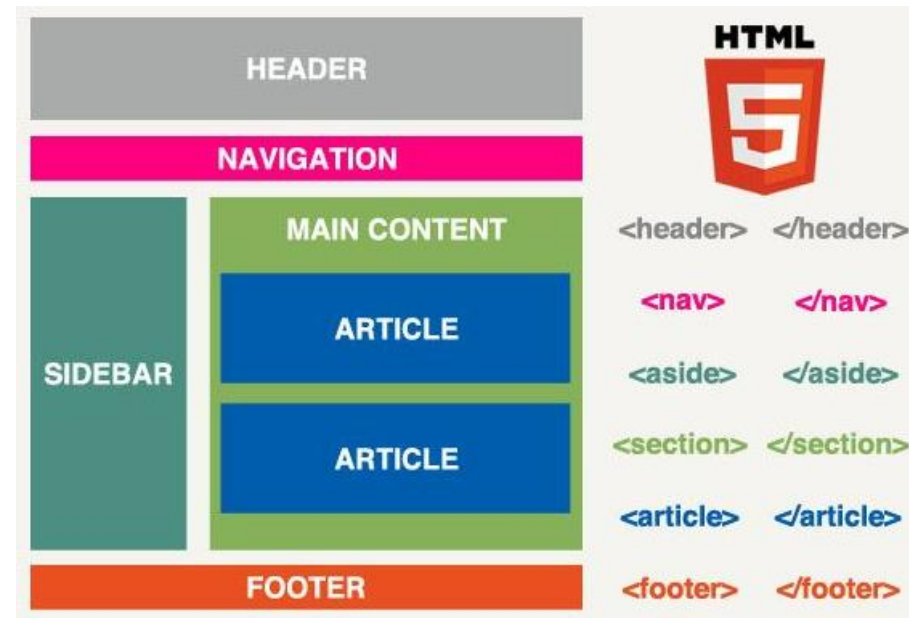
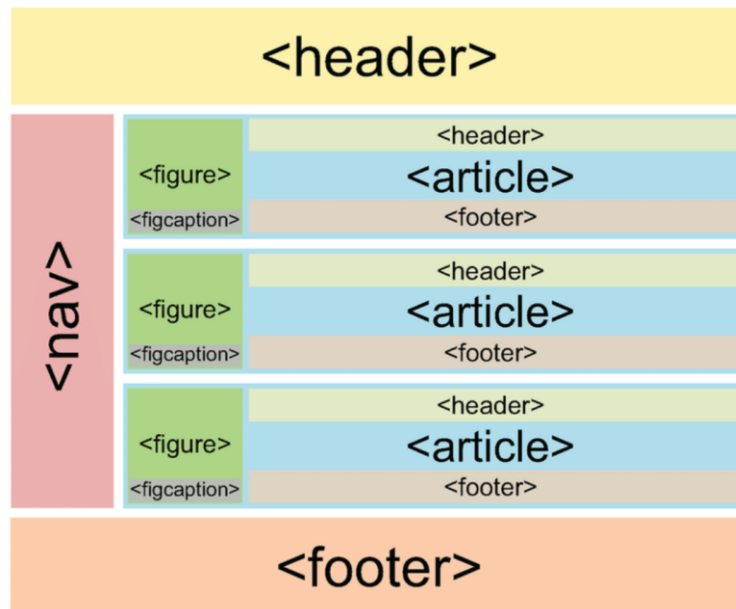


The Web Concepts

- The Web was developed to be a pool of human knowledge, and human culture, which would allow collaborators in remote sites to share their ideas and all aspects of a common project.
- The Web consists of a vast assortment of files and documents that are stored on these computers and written in some form of Hyper Text Markup Language (HTML) that tells browsers how to display the information.
- The computers that store the files are called servers because they can serve requests from many users at the same time.

Web Page

- The Web page is a space of information on the Internet that presents information about a particular person, business, or organization or cause.
- The Web consists of files, called Web pages (documents). It is containing links to resources (text, images, audios, videos, and other data), throughout the Internet



Web Site

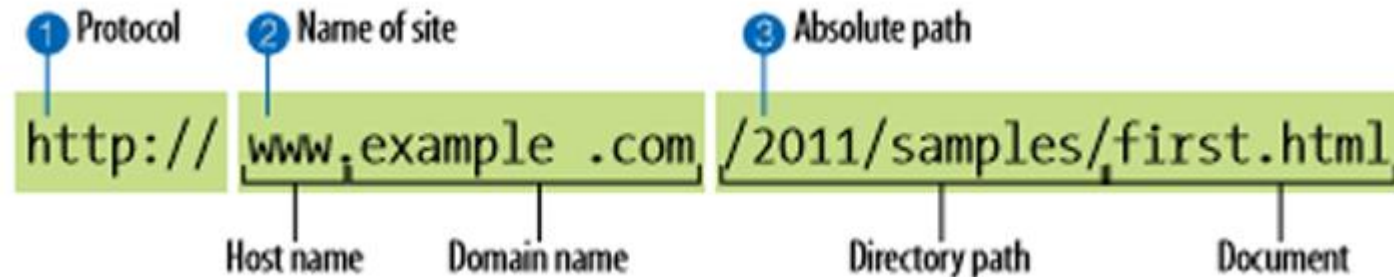
- Web site can be defined as a collection of web pages which are grouped together and usually connected together in various ways. Often called a "web site" or simply a "site."
- The web site usually presents information about a particular person, business, organization or cause.
- Generally there are two
 - A static Website types of website styles, Static and Dynamic website: is one that has web pages stored on the server in the same form as the user will view them.
 - A dynamic Website is one that does not have web pages stored on the server in the same form as the user will view them. Instead, the web page content changes automatically and/or frequently based on certain criteria.

There are two meaning for dynamic website. The first is that the web page code is constructed dynamically, piece by piece. The second one is that the web page content displayed varies based on certain criteria. The criteria may be pre defined rules or may be based on variable user input.

The Web Terms (Uniform Resource Locator-URL)

- It is the complete address of World Wide Web page and consists of a three components that identifies where the web page is stored on the Internet.

These parts are: the protocol, the site name, and the absolute path to the document or resource as shown in the following example



The Web Terms (Uniform Resource Locator-URL)

- Protocol name (e.g., HTTP) http:// The first thing the URL does is define the protocol that will be used for that particular transaction. The letters HTTP let the server know to use Hypertext Transfer Protocol, or get into “web mode.”
- domain name/ hostname (servers address that a user wan with), for example, www.google.com . www.example.com.
- The next portion of the URL identifies the website by its domain name. In this example, the domain name is example.com. The “www.” part at the beginning is the particular host name at that domain. For example, there might also be development.example.com, clients.example.com

The Web Terms (Uniform Resource Locator-URL)

- File, and so on. name is optional, implies the access to a file/directory into the principal webpage.

/2012/samples/first.html This is the absolute path through directories on the server to the requested HTML document, first.html.

- The words separated by slashes are the directory names, starting with the root directory of the host.

The Web Terms (Uniform Resource Locator-URL)

Example: <http://www.icci.org/studies/ips.html> .

1. Protocol: http.
2. Host computer name: www.
3. Second-level domain name: icci.
4. Top-level domain name: org.
5. Directory name: studies.
6. File name: ips.html.

The Web Terms (Uniform Resource Locator-URL)

Several Top-level domain are common:

com: commercial enterprise. شركات

edu: educational institution. للمؤسسات التعليمية

gov: government entity. للمؤسسات الحكومية

mil: military entity. للمواقع العسكرية

net: network access provider. للمواقع ذات النشاط الخاص

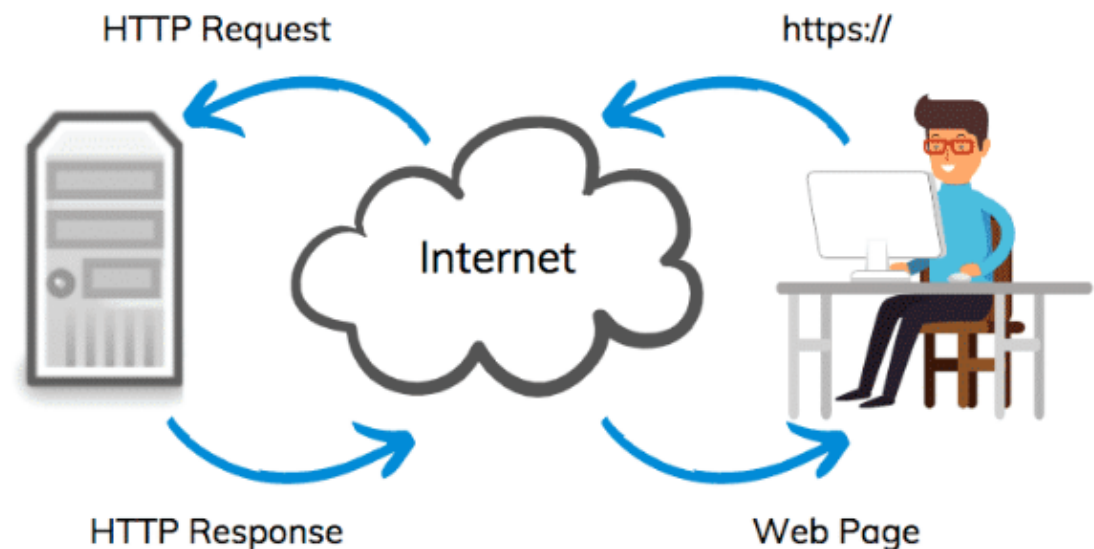
org: usually nonprofit organizations منظمة رسمية غير حكومية

biz: Businesses مواقع الاعمال التجارية

pro: Professionals, such as doctors and attorneys

The Web Terms (Web Hosting)

- After we create a website, it is necessary to store it in a place where it is always available for users.
- We use Web hosting services/companies for this purpose. They own web servers that have the ability to store content.



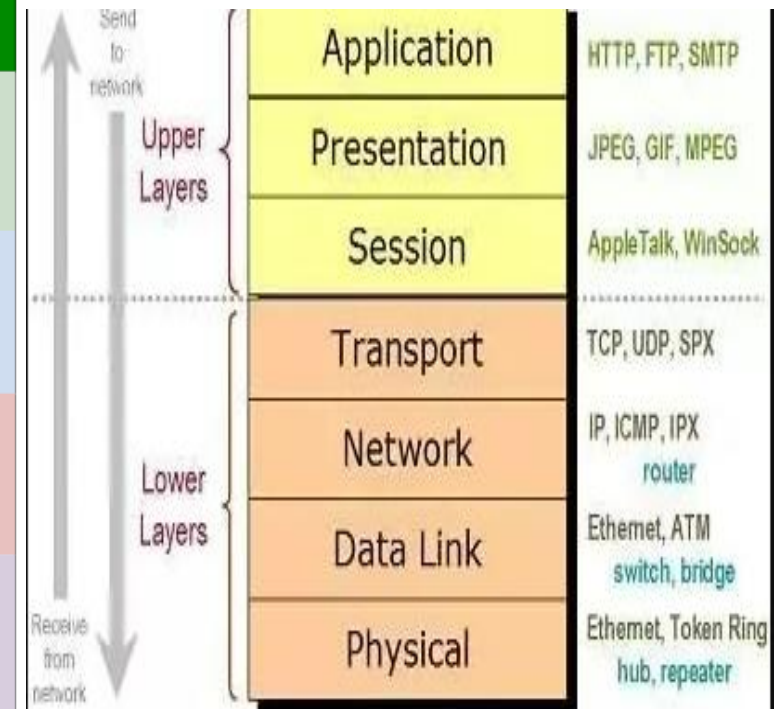
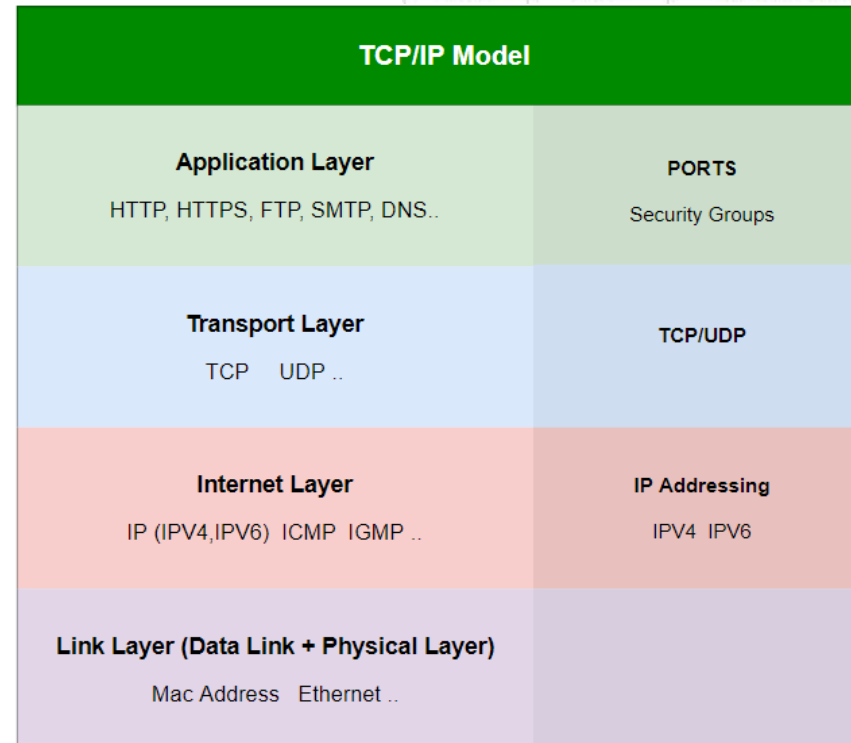
The Web Terms (Search engine)

- Search engines allow us to search in the Internet for information, images and other types of files stored in various locations available throughout the network. Search engines work according to certain algorithms that show the user relevant, requested search results.
- At first, information from the various websites is collected and stored and then analyzed to organize and save them in the database for future use. When a user enters an inquiry into the search engine, the database is organized by an index and the user is presented with results that match best the entered search terms. Therefore, it is important to understand that by using the search engine one does not search the entire Internet but the search engine's database. different results each time we use different.

Internet protocols (TCP/IP)

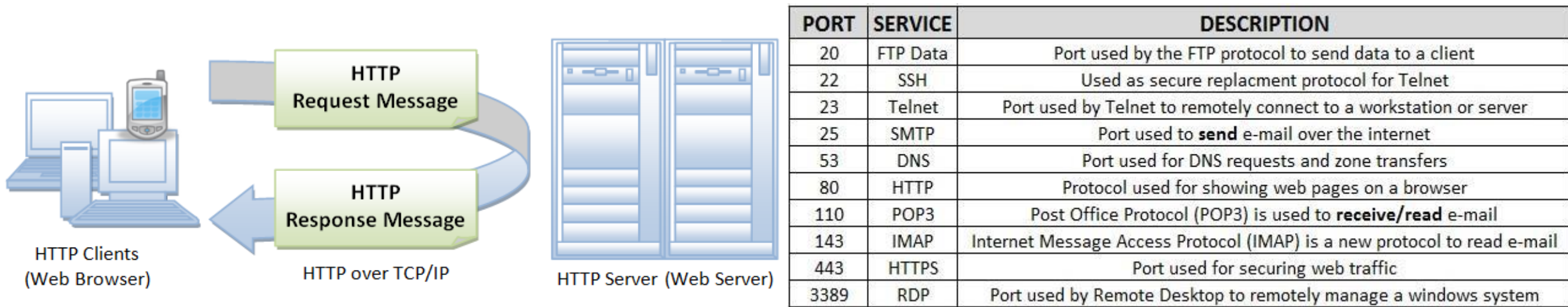
- This protocol is the main protocol for Internet communication.
- It defines the rules that computers need to follow to communicate with other computers via a network.

PORT	SERVICE	DESCRIPTION
20	FTP Data	Port used by the FTP protocol to send data to a client
22	SSH	Used as secure replacement protocol for Telnet
23	Telnet	Port used by Telnet to remotely connect to a workstation or server
25	SMTP	Port used to send e-mail over the internet
53	DNS	Port used for DNS requests and zone transfers
80	HTTP	Protocol used for showing web pages on a browser
110	POP3	Post Office Protocol (POP3) is used to receive/read e-mail
143	IMAP	Internet Message Access Protocol (IMAP) is a new protocol to read e-mail
443	HTTPS	Port used for securing web traffic
3389	RDP	Port used by Remote Desktop to remotely manage a windows system



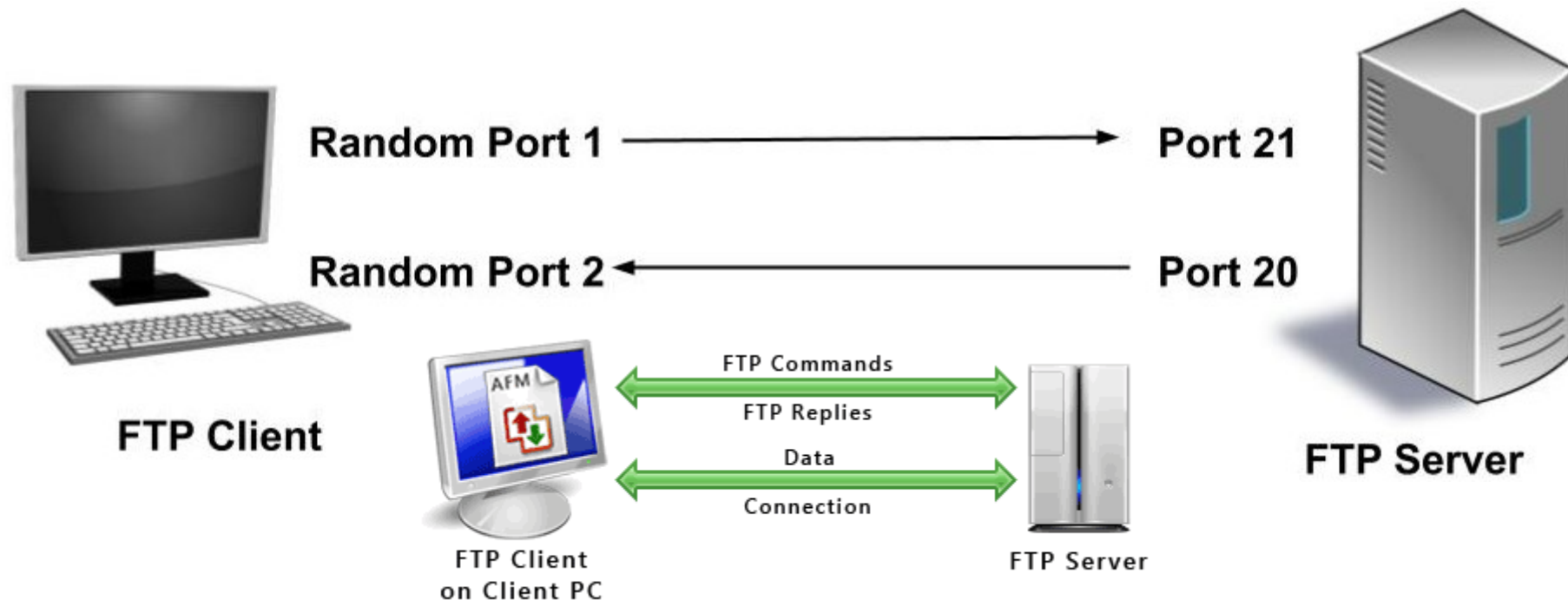
HTTP (Hypertext Transfer protocol)

- HTTP is a network protocol that ensures the exchange of almost all types of resources on the web.
- With resources, we mean files, pages, images, search results, etc. It is basically, the web browsers language to send requests to the server. There is also the HTTPS version, which is a secure and encrypted version for HTTP communications.



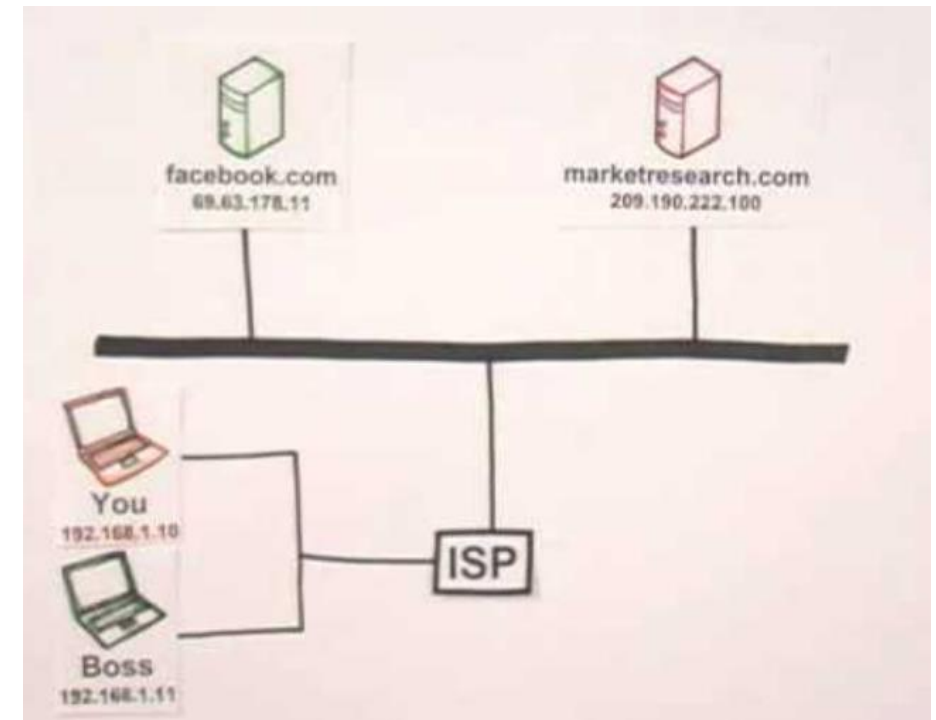
FTP (File Transfer Protocol)

- FTP is used to load (upload) or retrieve (download) files between the client and server communication, or between two computers on the Internet.
- In other words, this protocol is responsible for file transfer on the Internet.



Internet Service Provider (ISP):

- ISP is an organization that provides individuals and other companies' access to the Internet and other related services such as e mail.



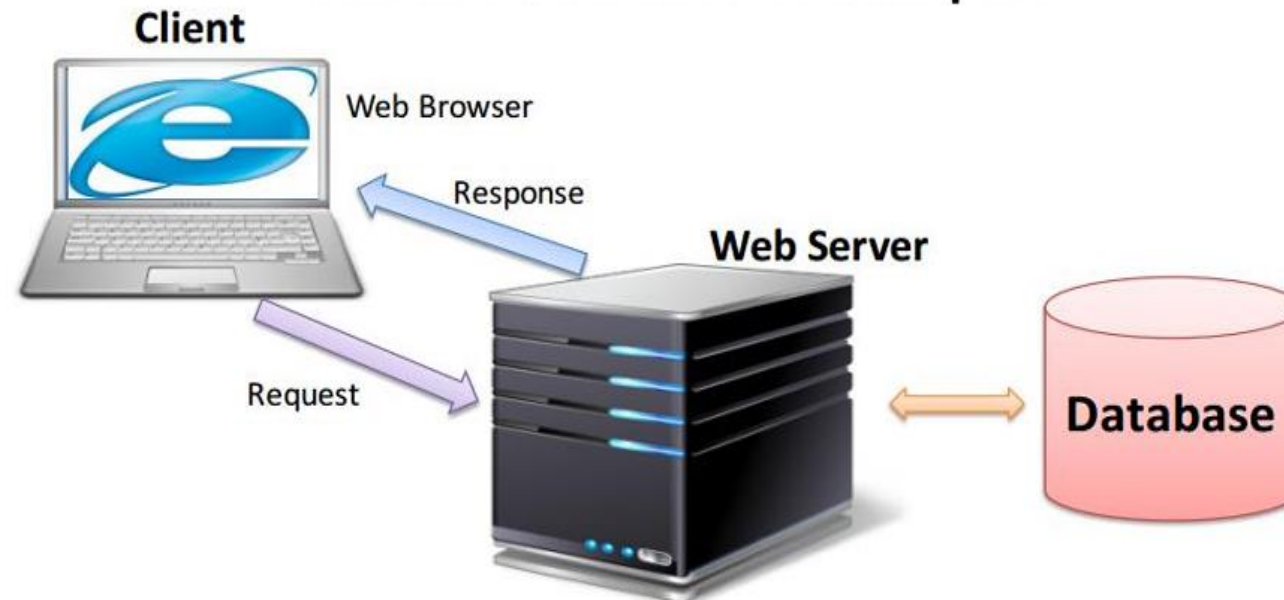
Web Design

Client Server Architecture

Client Server Architecture

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

Client-Server Example



Server-side

- 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 the Web Server computer (if authorized).

Server-side:

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

Client-side

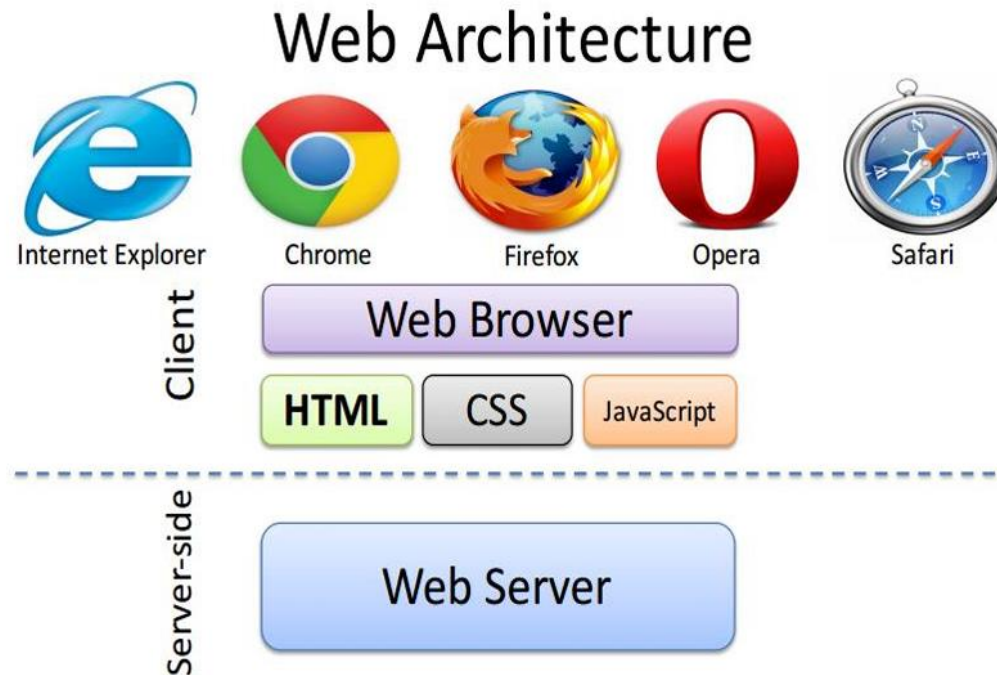
- The Client (front end) or user side of the Web, it typically refers to the Web browser in the user's machine. It may also refer to plug-ins and helper applications that enhance the browser to support special services from the site.
- The term may imply the entire user machine or refer to a handheld device that provides Web access.
 - HTML / XHTML (Extensible Hyper Text Markup Language)
 - CSS (Cascading Style Sheets)
 - JavaScript / VBScript (client-side scripting).

Difference between Server Side Scripting and Client Side Scripting

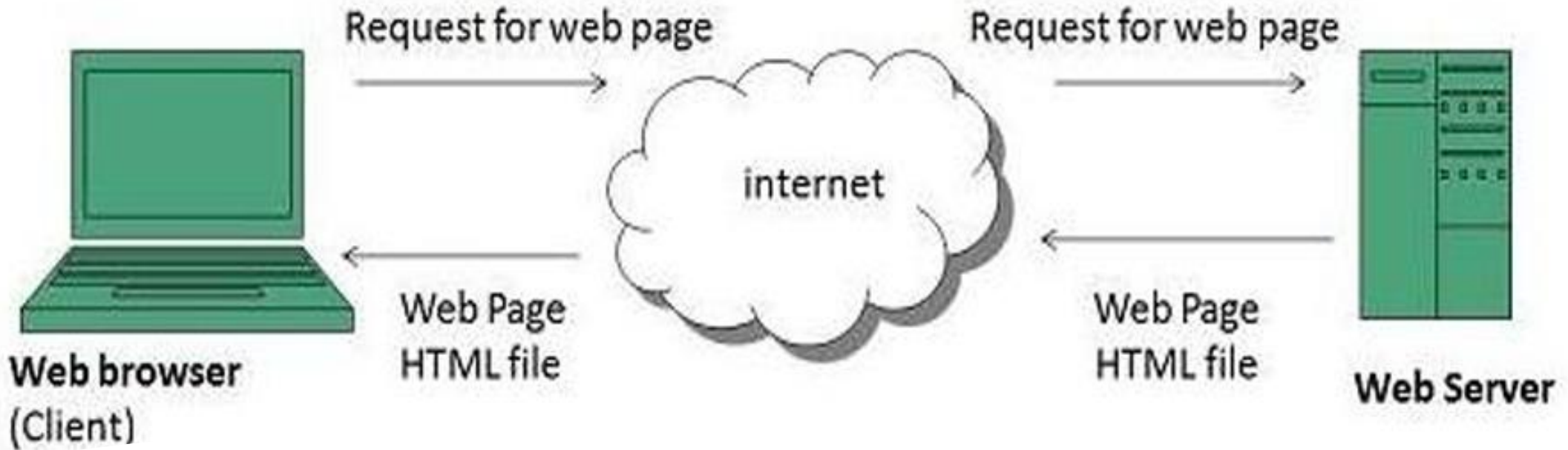
Client-side scripting	Server-side scripting
Source code is visible to the user.	Source code is not visible to the user because its output of server-side is an HTML page.
Its main function is to provide the requested output to the end user.	Its primary function is to manipulate and provide access to the respective database as per the request.
It usually depends on the browser and its version.	In this any server-side technology can be used and it does not depend on the client.
It runs on the user's computer.	It runs on the webserver.
There are many advantages linked with this like faster response times, a more interactive application.	The primary advantage is its ability to highly customize, response requirements, access rights based on user.
It does not provide security for data.	It provides more security for data.
It is a technique used in web development in which scripts run on the client's browser.	It is a technique that uses scripts on the webserver to produce a response that is customized for each client's request.
HTML, CSS, and javascript are used.	PHP, Python, Java, Ruby are used.
No need of interaction with the server.	It is all about interacting with the servers.
It reduces load on processing unit of the server.	It surge the processing load on the server.

Web Browsers

- Generally, a 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 may be a web page, image, video, or other piece.



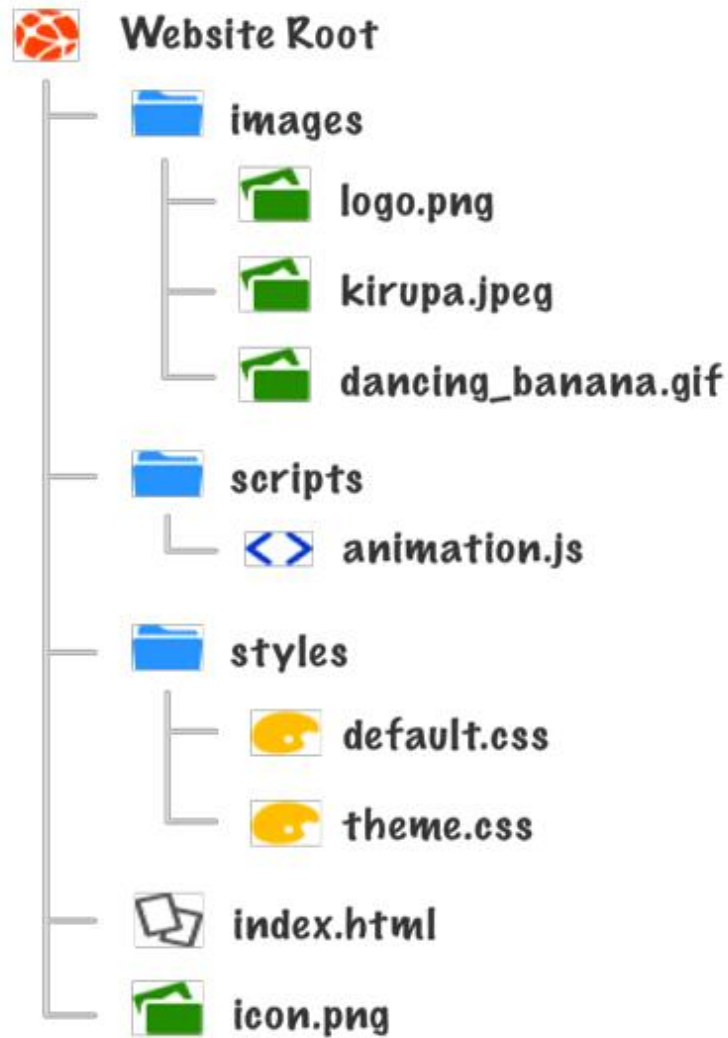
Web Operations



Web Operations

- The Web works on client-server approach. Following steps explain how the web works.
 1. User enters the URL (say, <http://www.tutorialspoint.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.tutorialspoint.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 communicate.
 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 closes 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.

Website Structure



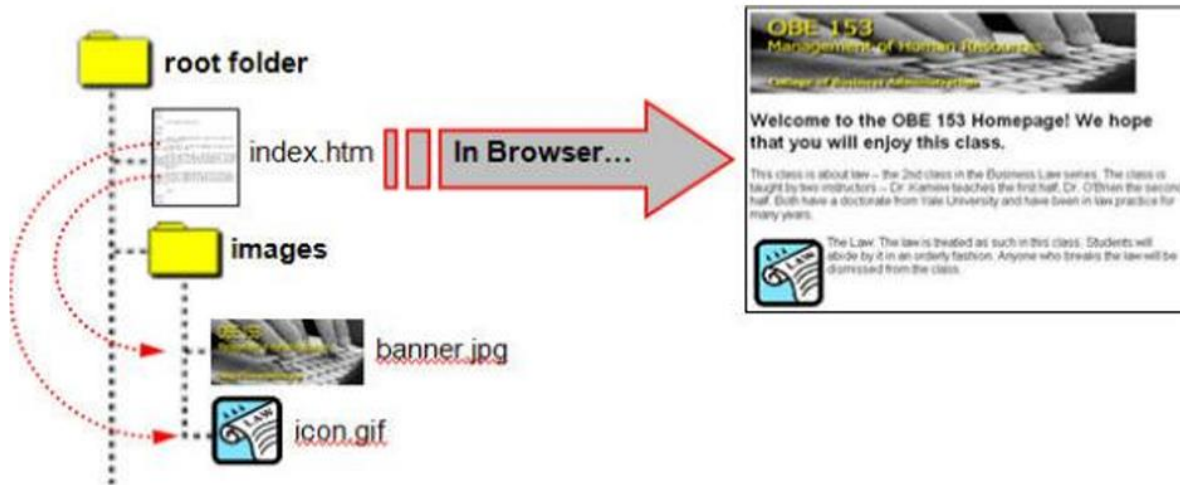
Site Structure

- Every Web site was built in inherits structure and should have a consistent and simple organization called a site structure. A site is a collection of HTML files, documents and images contained in a single master folder (the root folder).
- Within this root folder you can save your documents and subfolders organized in a manner that makes sense to you, as well as to others in your department that may need to edit the information.
- Therefore, it is recommended that the structure of Web site include:
 1. A root folder that contains the Web site .
 2. A Web page entitled index.htm (or index.html) that resides within the root folder to represent the default homepage for the Web site.
 3. May be images folder that contains the graphics, illustrations, images and photographs used in the Web pages.
 4. Additional folders for organizing the content.

Site Structure (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 addresses, and other mail 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 document.
 - Image hyperlink Uses a word or phrase to take visitors to another page, file or Uses an image to take visitors to another page, file or document.
 - Bookmark hyperlink Uses text or an image to take visitors to another part of a web page.
 - Email hyperlink mail address.

How Browsers Display Web pages



- When a Web page is opened in a browser, the browser reads and interprets the HTML file and formats the Web page for display.
- If there are references to external files, such as images or multimedia, the se files are downloaded from the server and displayed in the browser window.
- It is important to note that HTML files are text files that only contain references to the external files --you do not “embed” these files into the Web page.

Types of Web Sites

- There are many types of Web sites, each catering to a particular use. Hence, a few illustrative but not exhaustive cases are the type of content or given below:
 - **Blog (Web Log):** site generally used to post online diaries which may include discussion forums.
 - **Social Networking Site:** where users could communicate with one another and share media, such as pictures, videos, music and blogs with other users. These may include games and Web applications.
 - **Wiki Site:** which users collaboratively edit (such as Wikipedia and Wikihow).
 - **Web Portal:** that provides a starting point or a gateway to other resources on the Internet.
 - **Search Engine Site:** a site that provides general information and is intended as a gateway or lookup for other sites like Google, Yahoo, Bing search engines.
 - **Education Site:** where teachers, students, or administrators can post information about current events at or involving their school.

References

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3. <https://cgi.csc.liv.ac.uk/~ullrich/COMP519/notes/>
4. Nixon, Robin. *Learning PHP, MySQL & JavaScript*. " O'Reilly Media, Inc.", 2021.
5. Zakas, Nicholas C. *Professional JavaScript for web developers*. John Wiley & Sons, 2009.