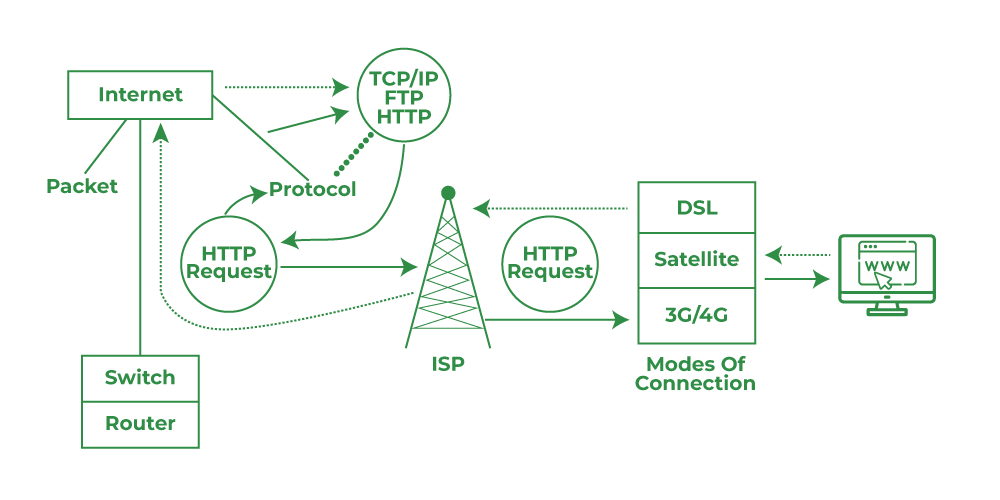
**Assignment 1:**

**1. How internet works?**



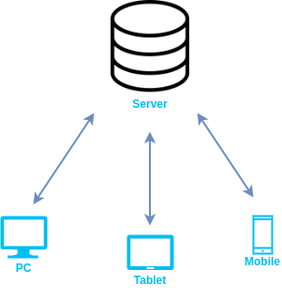
From opening a web browser to visiting a website, it all happens with specific methods that we’re going to check in these ***5 easy steps***.

1. Firstly, you’ll be required to connect your system or PC with any router or modem to establish a connection. This connection is the base of the internet connection.
2. When you open the browser and start typing something like “www.google.com”, your system will push a query command to your ISP (Internet Service Provider) that is connected with other servers that store and process data.
3. Now, the web browser will start indexing the URL that you’ve entered and will fetch the details in numeric format (in their language to identify the address *(unique)* that you’re trying to reach.
4. Next, now your browser will start sending the HTTP request where you’re trying to reach and send a copy of the website on the user’s system. **Note:***The server will send data in the form of small packets (from the website to the browser)*
5. Once all the data (of small packets) is received at the user’s end (PC/Laptop), the browser will start arranging all those small packets and later will form a collective file (here, the browser will gather all the small packets and rearrange them just like a puzzle) and then you’ll be able to see the contents of that website

**2. How browser works?**

A web browser helps us find information anywhere on the internet. It is installed on the client computer and requests information from the web server such a type of working model is called a client-server model.

The browser receives information through HTTP protocol. In which transmission of data is defined. When the browser received data from the server, it is rendered in HTML to user-readable form and, information is displayed on the device screen.



**3. What is Server?**

A server is a hardware device or software that processes requests sent over a network and replies to them. A client is the device that submits a request and waits for a response from the server. The computer system that accepts requests for online files and transmits those files to the client is referred to as a “server” in the context of the Internet.

A single overall computation is distributed across multiple processes or devices. Servers can provide various functionalities called services. These services include sharing data or resources among multiple clients or performing computations for a client. Multiple clients can be served by a single server, and a single client can use multiple servers.

**4. what are the types of server available?**

**1. Application Server**

These servers host web apps (computer programs that run inside a web browser) allowing users in the network to run and use them preventing the installation of a copy on their own computers. These servers need not be part of the [World Wide Web](https://www.geeksforgeeks.org/world-wide-web-www/). Their clients are computers with a [web browser](https://www.geeksforgeeks.org/web-browser/).

**2. Catalog Server**

These servers maintain an index or table of contents of information that can be found across a large distributed network. Distributed networks may include computers, users, files shared on file servers, and web apps. Examples of catalog servers are directory servers and name servers. Their clients are any computer program that needs to find something on the network. An example can be a domain member attempting to log in, an email client looking for an [email address](https://www.geeksforgeeks.org/what-is-an-email-address/), or a user looking for a file

**3. Communication Server**

These servers maintain an environment needed for one communication endpoint to find other endpoints and then communicate with them. These servers may or may not include a directory of communication endpoints and a presence detection service, depending on the openness and security parameters of the network. Their clients are communication endpoints.

**4. Computing Server**

These servers share vast amounts of computing resources which include CPU and random-access memory over a network. Any computer program that needs more CPU power and [RAM](https://www.geeksforgeeks.org/different-types-ram-random-access-memory/) than a personal computer can probably afford can use these types of servers. The client must be a networked computer to implement the client–server model which is a necessity.

**5. Database Server**

These servers maintain and share any form of database over a network. A database is an organized collection of data with predefined properties that may be displayed in a table. Clients of these servers are [spreadsheets](https://www.geeksforgeeks.org/introduction-to-excel-spreadsheet/), [accounting software,](https://www.geeksforgeeks.org/sourcing-of-accounting-software/) asset management software, or virtually any computer program that consumes well-organized data, especially in large volumes.

**6. Fax Server**

These servers share one or more fax machines over a network which eliminates the hassle of physical access. Any fax sender or recipient is the client of these servers.

**7. File Server**

Shares files and folders, storage space to hold files and folders, or both, over a network. Networked computers are the intended clients, even though local programs can be clients.

**8. Game Server**

These servers enable several computers or gaming devices to play multiplayer games. Personal computers or gaming consoles are their clients.

**9. Mail Server**

These servers make email communication possible in the same way as a post office makes snail mail communication possible. Clients of these servers are senders and recipients of email.

**10. Print Server**

These servers share one or more [printers](https://www.geeksforgeeks.org/what-is-a-printer/) over a network which eliminates the hassle of physical access. Their clients are computers in need of printing something.

**11. Proxy Server**

 This server acts as an intermediary between a client and a server accepting incoming traffic from the client and sending it to the server. Reasons to use a proxy server include content control and filtering, improving traffic performance, preventing unauthorized network access, simply routing the traffic over a large and complex network. Their clients are any networked computer.

**12. Web Server**

These servers host web pages. A web server is responsible for making the World Wide Web possible. Each website has one or more web servers. Their clients are computers with a web browser.

**5. What is SEO? Importance of SEO?**

SEO stands for Search engine optimization. It is a set of rules for optimizing your website to achieve higher rankings in search engine’s organic results. With SEO, you increase the visibility of your website for searches related to your content. The most important SEO tasks involve creating helpful content that will make users happy, promoting your website to gain search engines’ trust, and offering a great user experience.

SEO is important because it can help you get free targeted traffic from search engines. Search engines serve billions of users per day and if you want to get a portion of the traffic, your website should appear in the top positions for related searches. According to studies, more than 70% of search engine users are more likely to click on one of the top 5 suggestions in the search engine results pages (SERPS).

**6. What is Accessibility?**

Accessibility is the practice of making your websites usable by as many people as possible. We traditionally think of this as being about people with disabilities, but the practice of making sites accessible also benefits other groups such as those using mobile devices, or those with slow network connections.

You might also think of accessibility as treating everyone the same, and giving them equal opportunities, no matter what their ability or circumstances. Just as it is wrong to exclude someone from a physical building because they are in a wheelchair (modern public buildings generally have wheelchair ramps or elevators), it is also not right to exclude someone from a website because they have a visual impairment. We are all different, but we are all human, and therefore have the same human rights.

Accessibility is the right thing to do. Providing accessible sites is part of the law in some countries, which can open up some significant markets that otherwise would not be able to use your services or buy your products.

**7. What is Markup Language?**

A markup language is a set of rules that defines how the layout and presentation of text and images should appear in a digital document. It allows structuring documents, adding formatting, and specifying how different elements should be displayed (or “rendered”) on webpages.

This structuring helps search engines like Google understand the information on websites better. If search engines know more about what a page is about, they are more likely to show it to people who are looking for its content. Which, in result, can bring more people to websites with the right markup.

An example of a markup language—and the one most people know—is HTML.

**8. What is HTML?**

**HTML,**or **Hypertext Markup Language,**is the standard language for creating web pages. It defines the structure and content of web documents using tags and attributes to format text, embed images, create links, and build interactive elements, facilitating communication between web browsers and servers.

HTML was invented by **Tim Berners-Lee** who was founded in 1990, a physicist at the CERN research institute in Switzerland. When working with HTML, we just use a simple code structure that contains tags and attributes to build the structure of a webpage, and it is displayed as such by the browser.

**9. What is browser engine?**

**A web browser is a software application that lets you explore the internet.** It retrieves and displays web pages, images, videos, and other content from web servers. Each piece of content has a unique address called a URL (Uniform Resource Locator), which tells the browser where to find it.

While we often focus on the browser itself (**Chrome, Firefox, Edge, etc.**), each choice also determines the underlying browser engine and rendering engine. These core components work together to create the web experience we see. Though sometimes used interchangeably, they have distinct roles. Here, In this article, we are going to study the browser engine and how it works under the hood.

**10. What is rendering engine? share the available rendering engine?**

Browsers are often overlooked, yet they play a crucial role as gateways to the Internet, enabling users to access vast information on any topic within seconds from the comfort of their homes. However, browsers have evolved significantly since their inception. Developers like those at Google have recognized that modern browsers must do more than simply display web applications.

With the increasing complexity of web technologies and the growing size of applications, browsers have had to divide into various components, each performing its task to ensure faster processing. This includes browser and rendering engines, which work together to navigate the complexities of the Internet.

**11. What is JavaScript Engine? share the available JS engine? Purpose of JS Engine?**

The JavaScript engine is the software component that runs JavaScript code. It translates source code to machine code, maintains a call stack, and uses a microtask queue to execute the code. There are several different JavaScript engines. In this article, we’ll discuss the basics of the JavaScript engine. Regardless of the platform you’re using, you’ll learn what this important piece of software does and why it’s so important.

**List of JavaScript Engines:**

| **Browser** | **Name of Javascript Engine** |
| --- | --- |
| Google Chrome | V8 |
| Edge (Internet Explorer) | Chakra |
| Mozilla Firefox | Spider Monkey |
| Safari | Javascript Core Webkit |

**12. How website works?**

All websites are identified by a unique address, which tells browsers where they are located.

Simply put, when you enter a web address into your browser, it goes to that specified location and retrieves the web page. The process of retrieving this information is carried out by a web service using technologies such as [**Hypertext Transfer Protocol (HTTP)**](https://www.techtarget.com/whatis/definition/HTTP-Hypertext-Transfer-Protocol#:~:text=Kevin%20Ferguson-,What%20is%20HTTP%3F,-HTTP%20(Hypertext%20Transfer) and [**File Transfer Protocol (FTP)**](https://www.hostinger.in/tutorials/what-is-ftp), which essentially define how information and files are transmitted over the web.

The browser then displays the retrieved web page on your screen using technologies such as **[HyperText Markup Language (HTML)](https://www.hostinger.in/tutorials/what-is-html)** and [**Cascading Style Sheet (CSS)**](https://www.hostinger.in/tutorials/what-is-css). They structure and present the web page’s information to the visitor by telling the browser exactly where to put what on the screen.

Fortunately, you don’t need to know how to write computer code or have in-depth knowledge of these technologies to make a website. In fact, you can turn your [**website idea**](https://www.hostinger.in/tutorials/website-ideas) into a fully functional site in a matter of minutes using a website builder.

For example, Hostinger’s website builder lets you [**create a website with AI**](https://www.hostinger.in/ai-website-builder). You only need to input a few sentences, like your brand name and website description, and the tool will generate the template in a few minutes. Then, use the drag-and-drop editor, which lets you intuitively edit all the elements of a website.

**13. What is Data Structure?**

A data structure serves as a foundational framework for efficiently organizing and managing data within a computer system. It encompasses both the conceptual representation of data and its practical implementation in computer programs, ensuring that information can be accessed, manipulated, and utilized effectively.

**14. Explain Tree Data Structure?**

**Tree data structure** is a hierarchical structure that is used to represent and organize data in a way that is easy to navigate and search. It is a collection of nodes that are connected by edges and has a hierarchical relationship between the nodes.

The topmost node of the tree is called the **root**, and the nodes below it are called the child nodes. Each node can have multiple child nodes, and these child nodes can also have their own child nodes, forming a recursive structure.

**15. What is user agent? share the list and its purpose?**

A User-Agent (also known as UA string) is an alphanumeric string that identifies the ‘agent’ or program making a request to a web server for an asset such as a document, image or web page. It is a standard part of web architecture and is passed by all web requests in the HTTP headers. The User-Agent string is very useful because it gives you information about the software and hardware running on the device making the request. You can make important decisions on how to handle web traffic based on the User-Agent string, ranging from simple segmentation and redirection, to more complex content adaptation and device targeting decisions. Even more information, such as screen resolution, CPU and storage capacity can be returned when the User-Agent string is mapped to an additional set of data, returned in real-time. The User-Agent string is one element in the set of HTTP Headers, which form the handshaking process between the browser and the web server. These consist of request headers and response headers. Other request headers which are used to understand the user device or context include the Accept Header, which identifies the language and locale setting of the browser. This allows the web server to know the end user’s preferred language, so if content is available in this language it can be served by default.

**16. What is Hypertext?**

A hypertext is a term that has emerged as a new concept in the field of Information Technology and Computer Science as a way to facilitate the retrieval of information and as a means to providing access to information. The term was first used by **Ted Nelson** in the early 1960s to describe a system of structuring and displaying text in a manner that is not linear in which the reader can go from one text to another within a few clicks. Through this technology, we can link documents and the entire information infrastructure of the World Wide Web we encounter daily.

**17. What is HTML Tags?**

[HTML](https://www.geeksforgeeks.org/html-tutorial/) (HyperText Markup Language) is the standard markup language used to create the structure and layout of web pages. HTML documents consist of a series of elements, and these elements are defined using HTML tags. HTML tags are essential building blocks that define the structure and content of a webpage. In this article, we’ll explore what HTML tags are, how they work, and provide detailed examples of common HTML tags.

## **Understanding HTML Tags**

HTML tags are composed of an opening tag, content, and a closing tag. The opening tag marks the beginning of an element, and the closing tag marks the end. The content is the information or structure that falls between the opening and closing tags.

**18. What is HTML Attributes?**

**HTML attributes** provide additional information about elements within an HTML document. Every HTML element can have attributes. Attributes are always defined in the start tag**.**They are specified using a name/value pair format, where the attribute name defines the property, and its value provides specific details, like **name=”value”**. These attributes impact content display and interaction on web pages.

**19. What is HTML Elements?**

An **HTML Element** is a collection of start and end tags with the content inserted between them. HTML elements are building blocks of web pages, representing different types of content such as **headings**, **paragraphs**, **links**, and **images**.

**20. How do convert elements to tree?**

Given an array of elements, the task is to insert these elements in level order and construct a tree.

**Input :** arr[] = {10, 20, 30, 40, 50, 60}

**Output :** 10

/ \

20 30

/ \ /

40 50 60

The task is to construct a whole tree from a given array. To insert in level order in an already constructed tree, please see [Insertion in a Binary Tree in level order](https://www.geeksforgeeks.org/insertion-in-a-binary-tree-in-level-order/)  
The task is to store data in a binary tree but in level order.

To do so, we will proceed as follows:

1. Whenever a new Node is added to the binary tree, the address of the node is pushed into a queue.
2. Node addresses will stay in the queue until both its children’s Nodes do not get filled.
3. Once both the children’s Nodes get filled up, the parent Node is popped from the queue.

**21. What is DOCTYPE?**

The [*HTML document type*](https://www.geeksforgeeks.org/document-type-definition-dtd/?ref=gcse)*declaration* or **Doctype**is an instruction used by web browsers to fetch what version of[HTML](https://www.geeksforgeeks.org/html-introduction/?ref=gcse)the website is written in. It helps browsers in understanding how the document should be interpreted thus eases the rendering process. It is neither an element nor a tag. The doctype should be placed on the *top* of the document. It must not contain any content and does not need a closing tag.

**22. What are the ways we can save html file?**

**23. What is charset? why we need to use this?**

**HTML charsets** define character encodings used by the document. The charset attribute within the <meta> tag specifies the character encoding for the HTML document, ensuring proper interpretation of text. Common values include UTF-8 and ISO-8859-1.

## **ASCII**

The American Standard Code for Information Interchange (ANSII) created this character encoding. This character encoding is used in C/C++ programming. It has 128 alphanumeric characters consisting of alphabets(A-Z) and (a-z) and some special symbols like + – \* / ( ) @ etc.

## **ANSI(Windows-1252)**

American National Standards Institute (ANSI) created character encoding supported 256 characters. It is used as the default character set in Microsoft Windows.

## **ISO-8859-1**

It is used as the default character set of HTML4 and also supports 256 characters. The International Standards Organization (ISO) defines the standard character sets for different alphabets/languages. It contains numbers, upper and lowercase English letters, and some special characters.

## **UTF-8**

UTF-8 and UTF-16 standards was developed by Unicode Consortium, because the ISO-8859 character-sets are limited, and not compatible a multilingual environment. It consists all the character and punctuation symbols.

**24. What is meta data? what is the purpose of it?**

Metadata is simply called as data about the data, it is used to organize the information, manage the information and understand the information. Metadata was found in different contexts, including digital files, libraries, websites and databases. It plays a major role in management the data, retrieving the information, organization of the content with different domains.

Metadata includes a wide range of information depends upon the content which they are used. Let us consider an example in the real world, in digital photography context, metadata can include the details like time of the photo, the date of the photo was taken, coordination of the [GPS](https://www.geeksforgeeks.org/gps-full-form/), it indicates where the photo was taken and even the data or information about the photographer. In document context, metadata includes the details like author of the document, title of the document, creation date of the document and keywords of the document.

**25. Explain Web Application Architecture?**

Web application architecture defines the interactions between applications, middleware systems and databases to ensure multiple applications can work together. When a user types in a URL and taps “Go,” the browser will find the Internet-facing computer the website lives on and requests that particular page.

The server then responds by sending files over to the browser. After that action, the browser executes those files to show the requested page to the user. Now, the user gets to interact with the website. Of course, all of these actions are executed within a matter of seconds. Otherwise, users wouldn’t bother with websites.

What’s important here is the code, which has been parsed by the browser. This very code may or may not have specific instructions telling the browser how to react to a wide swath of inputs. As a result, web application architecture includes all sub-components and external applications interchanges for an entire software application.

Of course, it is designed to function efficiently while meeting its specific needs and goals. Web application architecture is critical since the majority of global network traffic, and every single app and device uses web-based communication. It deals with scale, efficiency, robustness, and security.