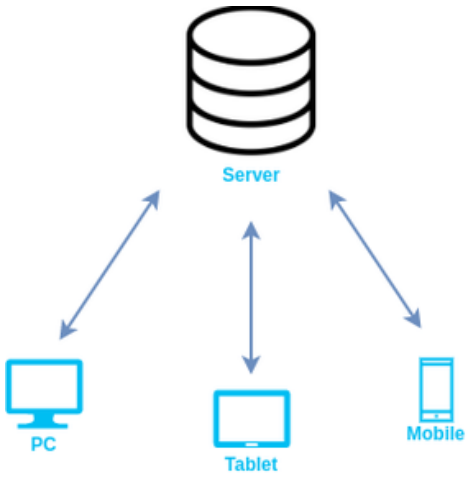
1. How internet works?

- The Internet works by connecting networks together through a series of routers and switches. A router forwards packets of data between different networks while a switch links devices within a single network. This enables computers to communicate with each other and access content stored on remote servers. There are two main concepts that are fundamental to the way the Internet functions: packets and protocols.
- In networking, a packet is a small segment of a larger message. Each packet contains both data and information about that data. The information about the packet's contents is known as the "header." Connecting two computers, both of which may use different hardware and run different software, is one of the main challenges that the creators of the Internet had to solve

2. How browser works?

A web browser fetches and displays web pages. The process begin with domain name system (DNS),where the browser translates the domain name into IP address to locate the server where the web page is stored. The browser then sends an HTTP request to the server, specifying the path and parameters of the requested resource. A web browser is a software that enables users to access and view content on the world wide web.



3. What is Server?

A server is a specialised computer or software system designed to provide services, data, or resources to other computers, known as clients, over a network. These services can range from delivering web pages and email to storing and managing files or running applications. These machines run on a client-server model, where clients request specific services or resources, and the server fulfils these requests.

4. What are the types of server available?

1. Web Server
2. Database Server
3. Email Server
4. Web Proxy Server
5. DNS Server
6. FTP Server
7. File Server
8. DHCP Server
9. Cloud Server
10. Application Server
11. Print Server
12. NTP Server
13. Radius Server
14. Syslog Server
15. Physical Server

5. What is SEO? Importance of SEO?

- SEO is the practice of increasing the quantity and quality of traffic to your website through organic search engine results. A higher rank when someone searches a term in your industry increases your brand's visibility online. The increase in visibility will drive more organic traffic to your site, and this, in turn, gives you more opportunities to convert qualified prospects into customers. When done correctly, SEO can help your brand stand above others as a trustworthy company and further improve the user's experience with your brand and website.
- Importance: SEO is important for brands as it's a highly effective way to improve your brand's visibility through search, drive more traffic to your website, establish your brand as a trusted authority in your industry, sustainably and reliably grow your business, and much more. Here's how each of these factors contributes to the importance of SEO for your brand.

6. What is Accessibility?

Accessibility ensures that websites, applications, and tools are usable by people with disabilities. It involves:

- Perception: Content should be perceivable (e.g., screen readers for visually impaired).
- Operation: Interfaces should be operable (e.g., keyboard navigation).
- Understanding: Information should be understandable (e.g., clear language).
- Robustness: Content should be robust enough to work with assistive technologies.

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 on webpages.

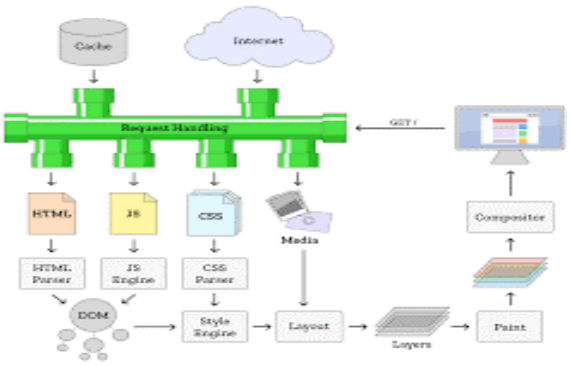
8. What is HTML?

HTML is the standard markup language used for creating and structuring web pages and web applications. It defines the structure and layout of content on the web, including text, images, videos, forms, and other elements. HTML uses a system of tags and attributes to mark up content and specify how it should be displayed in web browsers.

9. What is browser engine?

The underlying software that turns HTML pages into the Web page the user sees. A browser engine includes the programming interface (API) and the rendering engine, which converts HTML and JavaScript into text and images for the screen and printer. Also called a "layout

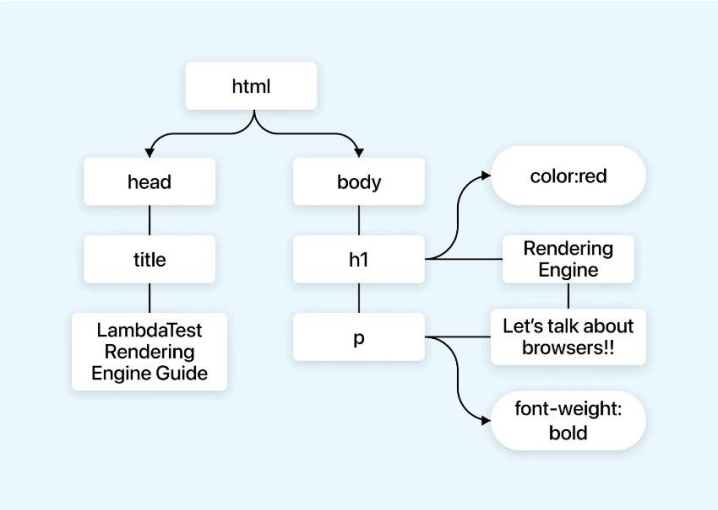
engine," a browser engine is also used by email programs that support HTML (most do), as well as other applications that render Web content.



10. What is rendering engine? Share the available rendering engines.

- A rendering engine is software that draws text and images on the screen. The engine draws structured text from a document , and formats it properly based on the given style declarations .

- There are different rendering engines such as Gecko, Web Kit, and Trident. Most widely used rendering engine is Web Kit or its variant version. Gecko and Web Kit are open source rendering engines while Trident is not. Firefox uses Gecko, Safari uses Web Kit, Internet Explorer uses Trident, Chrome and Opera uses Blink, which is a variant of Web Kit. Different rendering engines use different algorithms and also have their different approaches to parse a particular request.



11. What is JavaScript Engine? Share the available JS engines? Purpose of JS Engine?

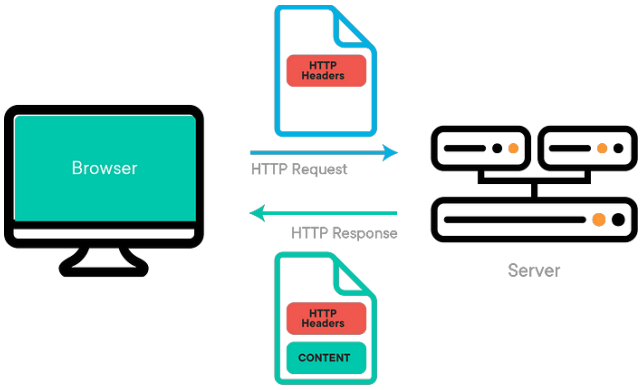
A JavaScript engine is a program or interpreter that executes JavaScript code. It takes JavaScript code, compiles it into machine code, and executes it within a web browser. Popular JavaScript engines include:

- V8 (used in Google Chrome and Node.js)
- SpiderMonkey (used in Mozilla Firefox)
- JavaScriptCore (used in Safari)

Purpose of JS Engine: The main purpose of a JavaScript engine is to interpret and execute JavaScript code so that web developers can create dynamic and interactive web pages and web applications.

12. How website works?

- The process is quite simple. Firstly, you enter a domain name or a website address in the search bar. Then the browser passes the request to DNS Server. DNS server acts as an address directory. It converts the human-readable address to a machine-readable address i.e. the IP address of the Website address to a machine-readable address i.e. the IP address of the website.
- Then it passes the request to the main server or the server where your site is stored. Then the server provides the response to the browser and now you are able to access the website. The whole process takes hardly 1 or 2 seconds.



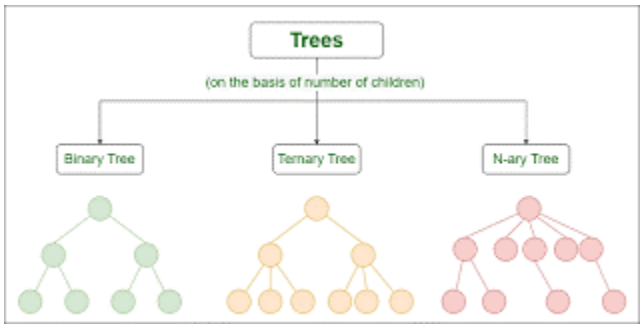
13. What is Data Structure?

Data Structure is a particular way of storing and organising data in the memory of the computer so that this data can easily be retrieved and efficiently utilised in the future when required. The data can be managed in various ways, like the logical or mathematical model for a specific organisation of data is known as a data structure.

14. Explain Tree Data Structure?

A tree is a hierarchical data structure consisting of nodes, where each node can have zero or more child nodes. It is used to represent hierarchical relationships between elements. Trees

are widely used in computer science for organizing data efficiently, such as in hierarchical file systems, XML/HTML document structures, and in database indexing.



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

A user agent acts as an intermediary between a user and the internet, or more precisely, between the user application and the web servers. In its core function, the user agent sends requests to servers and receives responses, which it presents to the user. These software agents can appear in various formats, including as web browsers, which are widely known and used, search engine crawlers, which crawl the Internet for search indexes, and specialised applications such as API-clients and e-mail clients.

1. Web Browsers:

- Google Chrome: A popular web browser developed by Google.
- Mozilla Firefox: An open-source web browser developed by Mozilla Foundation.
- Microsoft Edge: A web browser developed by Microsoft.
- Safari: A web browser developed by Apple.
- Opera: A web browser developed by Opera Software.

2. Mobile Browsers:

- Mobile Safari (iOS): A mobile web browser developed by Apple for iOS devices.
- Google Chrome for Android: A mobile web browser developed by Google for Android devices.
- Samsung Internet: A mobile web browser developed by Samsung for Android devices.

3. Desktop Applications:

- Microsoft Office: A suite of productivity applications developed by Microsoft.
- Adobe Acrobat: A software application for viewing and editing PDF files developed by Adobe.
- Skype: A video conferencing application developed by Microsoft.

4. Scripts and Bots:

- Web scraping scripts: Scripts that extract data from websites, often used for data mining or automation.

- Chatbots: Computer programs that simulate human-like conversations, often used in customer service or tech support.
- Crawlers: Programs that automatically browse the web to index web pages for search engines.

16. What is Hypertext?

Hypertext is text displayed on a computer or other electronic device with references (hyperlinks) to other text that the reader can immediately access. It allows non-linear navigation of information by linking related information together.

17. What is HTML Tags?

HTML tags are essential building blocks that define the structure and content of a webpage. 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 . Here's the basic structure of an HTML tag:

<tagname> Content... </tagname>

18. What is HTML Attributes?

HTML attributes provide additional information about HTML elements. They are always included in the opening tag and are used to modify the element's behavior or appearance. Examples include `src` attribute in `<img>` tags for specifying image source, `href` attribute in `<a>` tags for specifying link destinations, `class` attribute for specifying CSS classes, etc.

19. What is HTML Elements?

HTML elements are the building blocks of HTML pages. They represent various components such as headings (`<h1>`), paragraphs (`<p>`), images (`<img>`), links (`<a>`), forms (`<form>`), etc.

20. How do you convert elements to a tree?

Converting elements to trees is a fundamental concept in data structures, and it's a crucial step in various algorithms and applications. It involves transforming a linear sequence of elements into a hierarchical tree-like structure, where each element becomes a node, and the relationships between elements are represented by edges.

Methods used are:

- ❖ Recursive Function
- ❖ Tree Construction Algorithms.

- ❖ Graph-Based Methods

21. What is DOCTYPE?

The HTML document type declaration, also known as DOCTYPE, is the first line of code required in every HTML or XHTML document. The DOCTYPE declaration is an instruction to the web browser about what version of HTML the page is written in. This ensures that the web page is parsed the same way by different web browsers.

22. What are the ways we can save an HTML file?

The HTML files can be saved using:

- Text editors like :- Notepad++, Sublime Text
- Integrated development environments (IDEs) like Visual Studio Code, Atom
- Browser developer tools [Save Page As]
- Command-line tools [wget, curl]

23. What is charset? Why do we need to use this?

Charset (Character Set) defines the encoding standard used to represent characters in a web document. It specifies how characters are mapped to byte sequences. Common charsets include UTF-8, ISO-8859-1, and others. It is important to specify the correct charset in HTML documents to ensure that text displays correctly and special characters are rendered properly across different browsers and devices.

24. What is metadata? What is the purpose of it?

Metadata provides information about other data. In web development, metadata is often included in `<meta>` tags within the `<head>` section of HTML. Metadata is frequently described as “data about other data.” Whether detailing the contents of a web page, the technical details of an image, or information about an asset's usage rights, metadata provides additional information that facilitates data management so assets can be located and used more efficiently.

25. Explain simple Web Application Architecture?

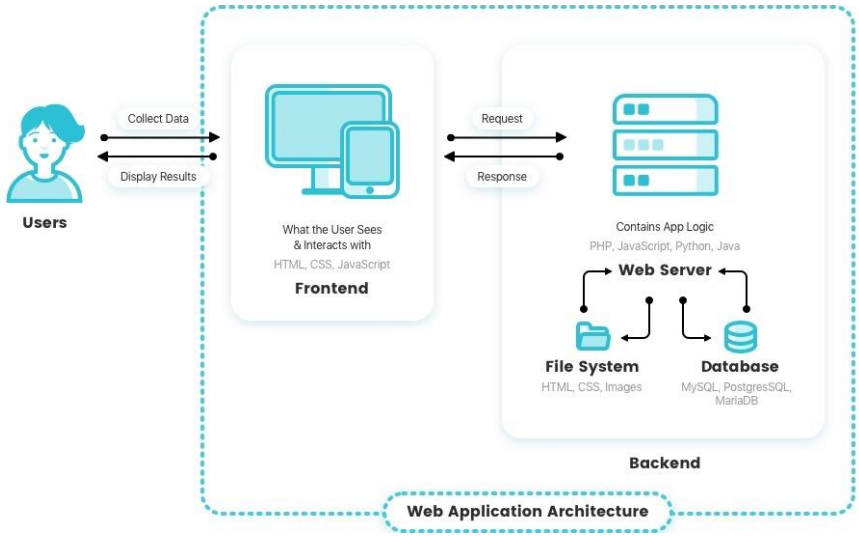
Web application architecture is a mechanism that gives us a clarification that how the connection is established between the client and the server. It determines how the components in an application communicate with each other. It doesn’t matter what is the size and the complexity level of the application is, they all follow the same principle only the details may differ.

<u>How does it works?</u>

All the web applications run on the client-side and the server-side. When a user makes a request there are mainly two programs run on both sides.

While working on the web application, a web developer decides the functions of the code on the server and the functions of the code on the browser. They also define how these two will function in relation to each other. Server-side code can be written using the languages Python, JavaScript, C#, PHP, Ruby on Rails, etc.

Web Application Three Tier Architecture Layers



Web application architectural patterns are separated into many different layers or tiers which is called Multi- or Three-Tier Architecture. You can easily replace and upgrade each layer independently.

- Presentation Layer: This layer is accessible to the client via a browser and it includes user interface components and UI process components. As we have already discussed that these UI components are built with HTML, CSS, and JavaScript (and its frameworks or library) where each of them plays a different role in building the user interface.

- Business Layer: It is also referred to as a Business Logic or Domain Logic or Application Layer. It accepts the user's request from the browser, processes it, and regulates the routes through which the data will be accessed. The whole workflow is encoded in this layer. You can take the example of booking a hotel on a website. A traveler will go through a sequence of events to book the hotel room and the whole workflow will be taken care of by the business logic.

- Persistence Layer: It is also referred to as a storage or data access layer. This layer collects all the data calls and provides access to the persistent storage of an application. The business layer is closely attached to the persistence layer, so the logic knows which database to talk to and the process of retrieving data becomes more optimized. A server and a database management system software exist in data storage infrastructure which

is used to communicate with the database itself, applications, and user interfaces to retrieve data and parse it.