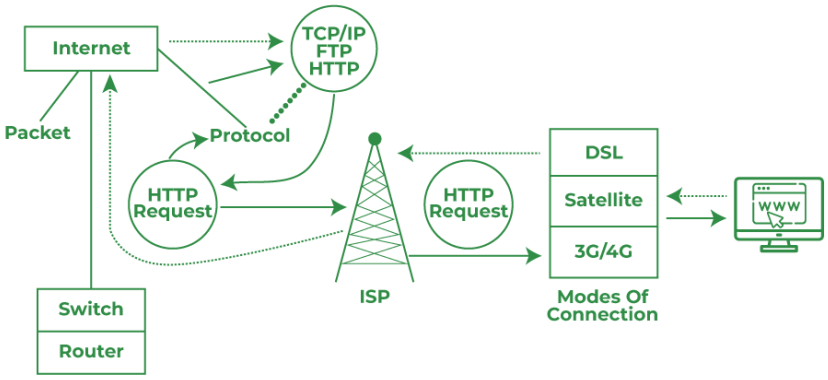
WEB TECHNOLOGY ASSIGNMENT

1.How does the Internet work?

The Internet is a global network of interconnected computers and other devices that communicate with each other using standardized protocols.



- **Devices and Connections**:

Every device connected to the Internet (computers, smartphones, IOT devices, etc.) has a unique identifier called an IP address. This address allows devices to send and receive data to and from each other.

- **Protocols and Standards**:

The Internet operates on a set of protocols, primarily the TCP/IP (Transmission Control Protocol/Internet Protocol) suite. These protocols define how data packets should be formatted, addressed, transmitted, routed, and received across the network.

- **Packet Switching**:

When data is sent over the Internet, it is broken down into small units called packets. Each packet contains a part of the data being sent, along with information about its destination IP address and other necessary routing information.

- **Servers and Clients**:

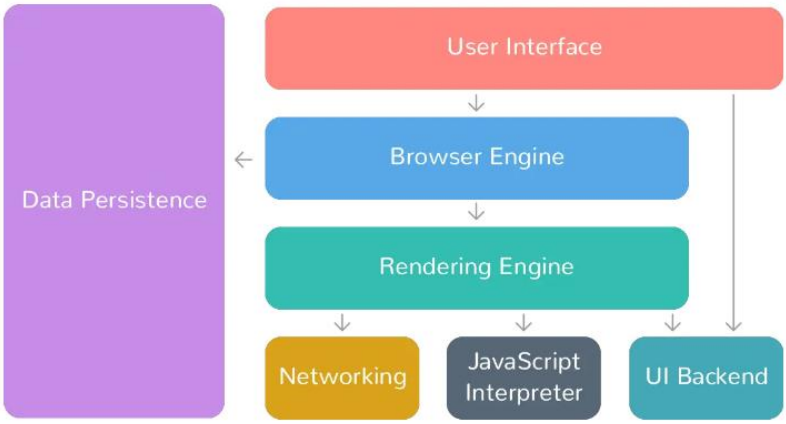
Servers are computers or systems that store and serve resources or services to other computers, known as clients, over the Internet. Examples include web servers that host websites and email servers that handle email communication.

- **Security and Encryption**:

Given the open nature of the Internet, security is crucial. Technologies like SSL/TLS encryption ensure that data transmitted over the Internet is secure and protected from unauthorized access or interception.

2. How does a browser work?

A web browser is software that retrieves and displays content from the World Wide Web. It interprets HTML, CSS, and JavaScript to render web pages as users interact with them. Browsers also manage user input, cookies, and cache to enhance user experience.



- **User Interface (UI)**:

The browser's user interface includes elements like the address bar, back/forward buttons, bookmarks menu, and other controls. It allows users to navigate the web and interact with browser features.

- **Browser Engine**:

At the core of a browser is the browser engine, which manages the rendering of content on web pages. It interprets HTML and CSS code to display the content visually on the screen.

- **Rendering Engine**:

The rendering engine parses the HTML and CSS code received from the server. It constructs the Document Object Model (DOM) for the web page and determines how elements should be displayed based on CSS rules.

- **Networking**:

Browsers use networking protocols like HTTP or HTTPS to fetch resources (HTML, CSS, JavaScript, images, etc.) from web servers. The browser sends requests for these resources and handles responses, ensuring that all necessary content is downloaded.

- **JavaScript Engine**:

JavaScript is a scripting language used for client-side scripting on web pages. The browser includes a JavaScript engine that interprets and executes JavaScript code, enabling dynamic behaviour and interaction on websites.

3.What is a Server?

A server is a computer or a system that provides resources, data, services, or functionality to other computers, known as clients, over a network. Servers respond to requests from clients and can host websites, store data, manage email, etc.

4. What are the types of servers available?

Servers can be categorized based on their function:

- **Web Server**: Hosts websites and serves web pages (e.g., Apache, Nginx).
- **Database Server**: Manages and provides access to databases (e.g., MySQL, PostgreSQL).
- **File Server**: Stores and manages files for network users (e.g., FTP servers).
- **Application Server**: Handles application operations and transactions (e.g., Tomcat, JBoss).
- **Mail Server**: Manages email communication (e.g., Exchange Server, Postfix).

5. What is SEO? Importance of SEO?

SEO (Search Engine Optimization) is the practice of optimizing websites to rank higher in search engine results pages (SERPs). It helps increase visibility and organic traffic to websites, improving their chances of being found by potential customers or users.

Importance of SEO:

1. Better User Experience
2. Builds Credibility and Trust
3. Cost-Effective Marketing
4. Long-term Results
5. Targeted Traffic
6. Competitive Advantage

6.What is Accessibility?

Accessibility refers to designing websites and applications so that people with disabilities can perceive, understand, navigate, and interact with them effectively. It ensures equal access to information and functionality for all users.

7. What is Markup Language?

A markup language is a set of markup tags used to define the structure and presentation of text and other content on web pages. HTML (HyperText Markup Language) is the most common markup language used to create web pages.

8. What is HTML?

HTML (HyperText Markup Language) is the standard markup language for creating web pages and web applications. It defines the structure of content on a web page using a set of tags and attributes.'

9. What is a Browser Engine?

A browser engine (or layout engine) is a software component that renders HTML documents and interprets CSS styles. It processes content received from the server and displays it visually to the user.

10.What is a Rendering Engine? Share available rendering engines.

A rendering engine is part of a browser engine that interprets HTML, CSS, and JavaScript and renders the content on the screen. Examples include:

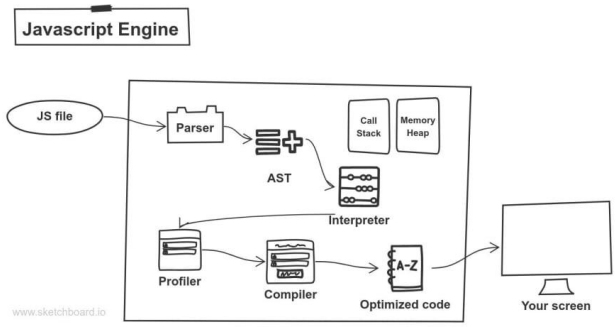
- **Blink (used in Chrome and Edge)**
- **WebKit (used in Safari)**
- **Gecko (used in Firefox)**

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

A JavaScript engine executes JavaScript code in web browsers. Examples include:

- **V8 (used in Chrome and Edge)**
- **SpiderMonkey (used in Firefox)**
- **JavaScriptCore (used in Safari)**

The purpose of a JS engine is to parse and execute JavaScript code to enable dynamic behavior and interactivity on web pages.



12.How does a website work?

Websites work by serving content stored on servers to users' browsers via the Internet. Browsers interpret HTML, CSS, and JavaScript received from the server to display web pages and enable user interaction.

13. What is Data Structure?

A data structure is a way of organizing and storing data so that it can be accessed and used efficiently. Examples include arrays, linked lists, stacks, queues, trees, graphs, etc.

14. **Explain Tree Data Structure.**

A tree data structure is a hierarchical structure composed of nodes, where each node has a value and zero or more child nodes. It starts with a root node and branches out into subtrees. Trees are used to represent hierarchical relationships.

15. **What is a User Agent? Share the list and its purpose?**

A user agent is software acting on behalf of a user. In web browsing, it refers to the browser (and its version) that a user is using to access the Internet. Example user agents include:

- **Chrome**
- **Firefox**
- **Safari**
- **Edge**
- **Opera**

User agents help servers deliver content optimized for specific browsers and devices.

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.

17. What are HTML Tags?

HTML tags are keywords (enclosed in angle brackets) used to define elements within an HTML document. Tags indicate how content should be displayed or structured on a web page.

18. What are HTML Attributes?

HTML attributes provide additional information about HTML elements. They are included within a tag and modify the element's behavior or appearance.

19.What are HTML Elements?

HTML elements are building blocks of HTML pages. An element consists of a start tag, content, and an end tag. Examples include headings, paragraphs, images, links, etc.

20. How do you convert elements to a tree?

Elements in an HTML document are structured into a tree-like hierarchy known as the Document Object Model (DOM). This representation organizes HTML elements as nodes in a tree, reflecting their parent-child relationships.

21.What is a DOCTYPE?

A DOCTYPE declaration is an instruction that specifies the version of HTML (or XHTML) used in a web document. It helps browsers to render content correctly by determining the document type and its associated rules.

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

HTML files can be saved in various ways:

- **Locally on a computer**: Save from a text editor or browser.
- **Remotely on a server**: Upload via FTP or file manager in a hosting service.

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

Charset (character set) specifies the encoding standard used to represent characters in an HTML document. It ensures that text is displayed correctly, especially when dealing with international characters and different languages.

24. What is metadata? What is its purpose?

Metadata provides information about other data. In the context of web pages, metadata includes tags in the <head> section of HTML documents that describe the page's content, keywords, authorship, etc. It helps search engines and browsers understand and categorize the page.

25.Explain Web Application Architecture.

Web Application Architecture refers to the structure or framework of a web application. It typically includes:

- **Client-side**: User interface and interaction (HTML, CSS, JavaScript).
- **Server-side**: Processing logic, database operations (application servers, databases).
- **Networking**: Communication protocols (HTTP, WebSocket).
- **Data storage**: Persistence layers (databases, file systems).

Architectures can vary from simple client-server setups to more complex models like MVC (Model-View-Controller) or microservices architectures.