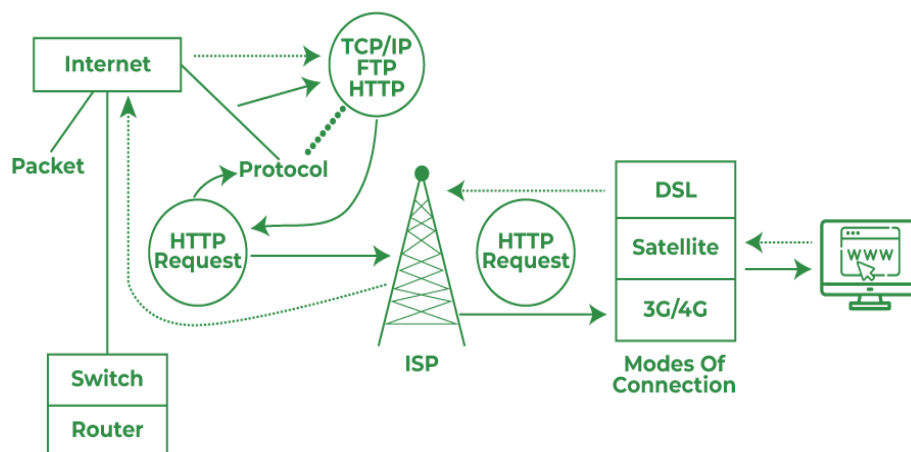


# How Internet Works?



## Key Highlights:

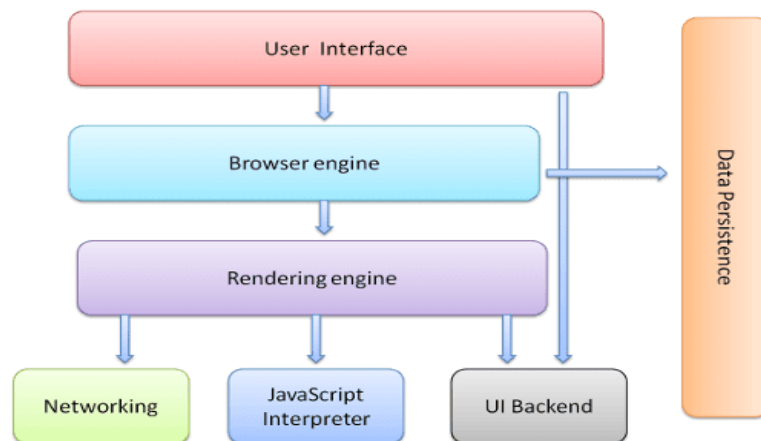
- There are mainly two components present by which the Internet works e.g. Packets and Protocols.
- Ethernet, IP, HTTP, TCP, and UDP comprise the basic infrastructure of the Internet.
- There are only five simple steps involved in the **Working Principle of Internet**.
- Along with 3G/4G/5G, the DSL and Dial-up are other important Connecting Modes.
- There are mainly three protocols involved in the **Internet Working Method** e.g. TCP, HTTP, and FTP.
- Switches and Routers, the Physical Infrastructure are the main pillars of the Internet.



## Internet Working Metrics

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



**1.The user interface:** this includes the address bar, back/forward button, bookmarking menu, etc.

**2.The browser engine:** marshals actions between the UI and the rendering engine.

**3.The rendering engine:** responsible for displaying requested content

**4.Networking:** for network calls such as HTTP requests, using different implementations for different platform behind a platform-independent interface.

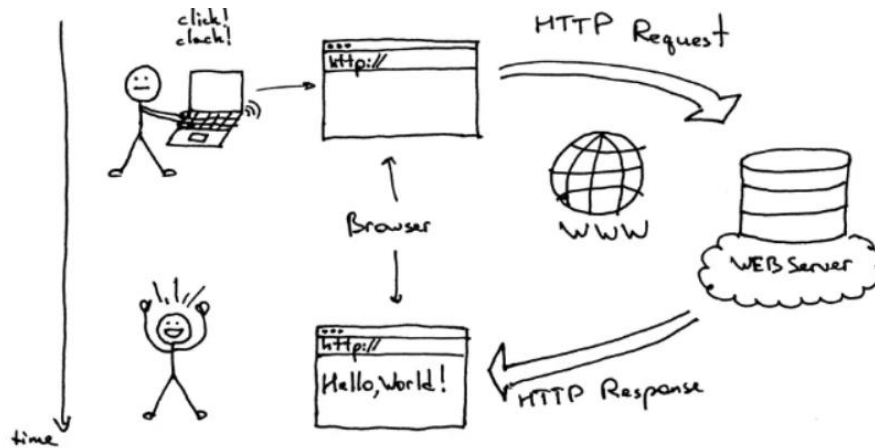
**5.UI backend:** used for drawing basic widgets like combo boxes and windows.

**6.JavaScript interpreter.** Used to parse and execute JavaScript code.

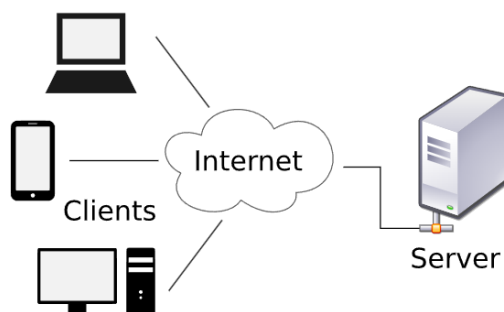
**7.Data storage.** This is a persistence layer. The browser may need to save all sorts of data locally, such as cookies.

1. Handling user input.
2. Sending a URL request.

3. Preparing a renderer process.
4. Committing navigation.
5. Rendering page.



1. A server is a hardware device or software that processes requests sent over a network and replies to them.
2. A client is the device that submits a request and waits for a response from the server.
3. 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.



# Types of Servers in Computing



*SEO stands for “Search Engine Optimization.” In simple terms, SEO means the process of improving your website to increase its visibility in search engines (such as Chrome, Bing, etc).*



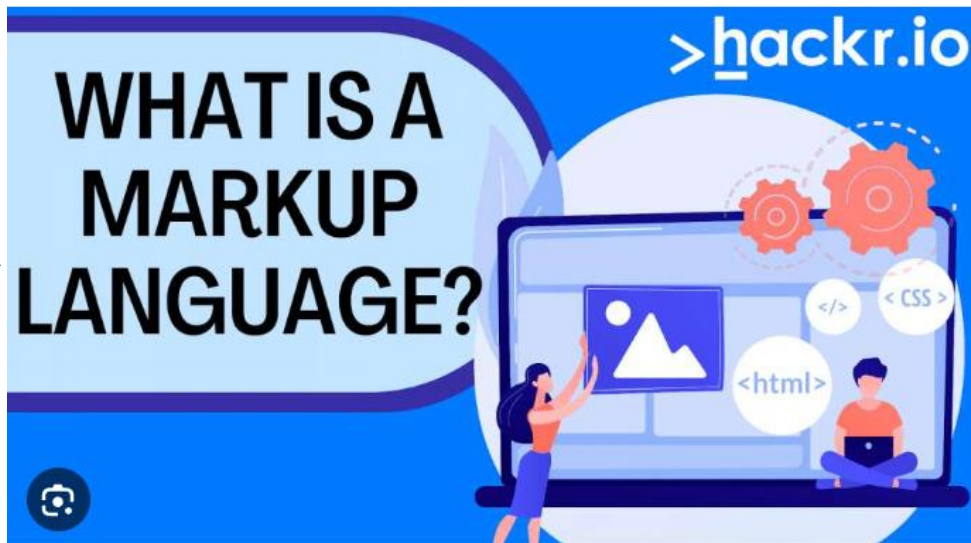


The term accessibility refers to something, which can be accessible, entered, or attained with fewer or no obstacles. Accessibility features on computers make it capable for people with disabilities to use a computer system with the help of using assistive technologies. Computer software, websites, and other technologies may be created by developers that can be more accessible to benefit all users.

## Examples of accessibility features

- On-screen keyboard
- Sticky Keys
- Text-to-speech
- Gesture recognition
- Hands-free
- Narrator
- Toggle Keys
- Cursor trails
- Filter Keys
- Voice recognition

- High contrast
- Mouse Keys



**Markup languages** are computer languages that are used to structure, format, or define relationships between different parts of text documents with the help of symbols or tags inserted in the document. These languages are more readable than usual programming languages with strict syntax. There are several markup languages.

The most common markup language is HTML (HyperText Markup Language). HTML is used to create web pages. It uses tags to indicate the structure of the document, such as headings, paragraphs, and lists.



HTML stands for **HyperText Markup Language** and it is used to create webpages. It uses **HTML tags** and **attributes** to describe the structure and formatting of a web page. HTML consists of various elements that are responsible for telling search engines how to display page content. For example, headings, lists, images, links, and more.

Features of HTML

- It is easy to learn and easy to use.
- It is platform-independent.
- Images, videos, and audio can be added to a web page.
- Hypertext can be added to the text.
- It is a markup language.





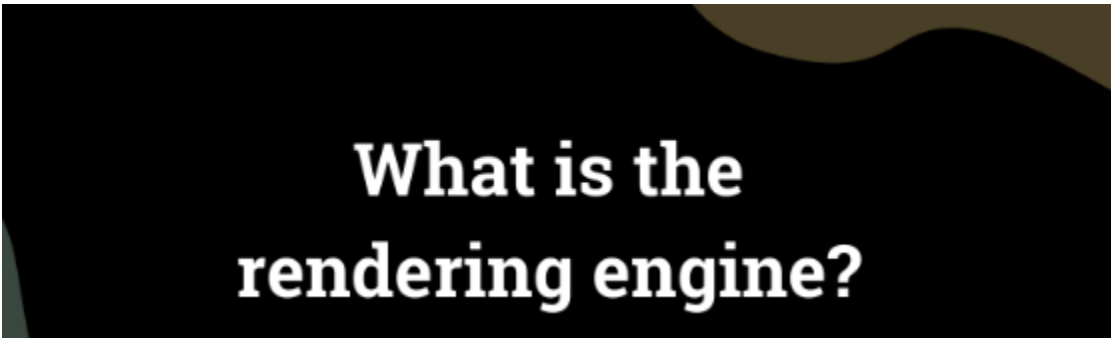

# what is browser engine?



A browser engine is a software component that is responsible for rendering web pages in a web browser. It is the core part of a browser that interprets HTML, CSS, JavaScript, and other web technologies to display the content of a website to the user.

(or)

**It is the essential software that acts as a bridge between the web page's code (HTML, CSS, JavaScript) and the visual experience you see on your screen.**



## What is the rendering engine?

A rendering engine is the component of a web browser that translates the code of a web page (written in languages like HTML, CSS, and JavaScript) into what you see and interact with on your screen. It's like a translator that takes instructions about how content should be displayed and turns them into visual elements like text, images, and buttons.

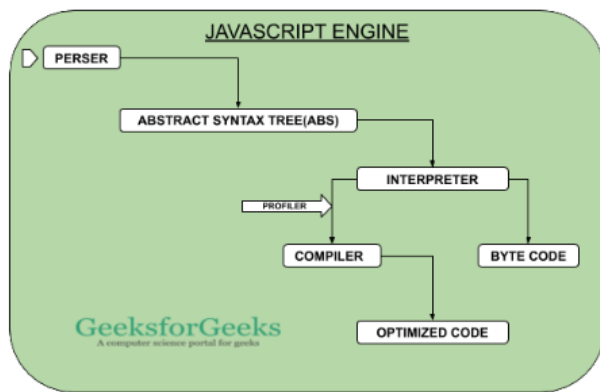
Here are some popular rendering engines:

1. **Blink:** Used in Google Chrome and Microsoft Edge.
2. **WebKit:** Powers Safari, Brave, and older versions of Opera.
3. **Gecko:** Runs Firefox.
4. **Trident:** Formerly used in Internet Explorer.
5. **EdgeHTML:** Formerly used in older versions of Microsoft Edge.
6. **KHTML:** Used in Konqueror.
7. **Servo:** An experimental engine by Mozilla, not widely used yet.



## What is JavaScript Engine?

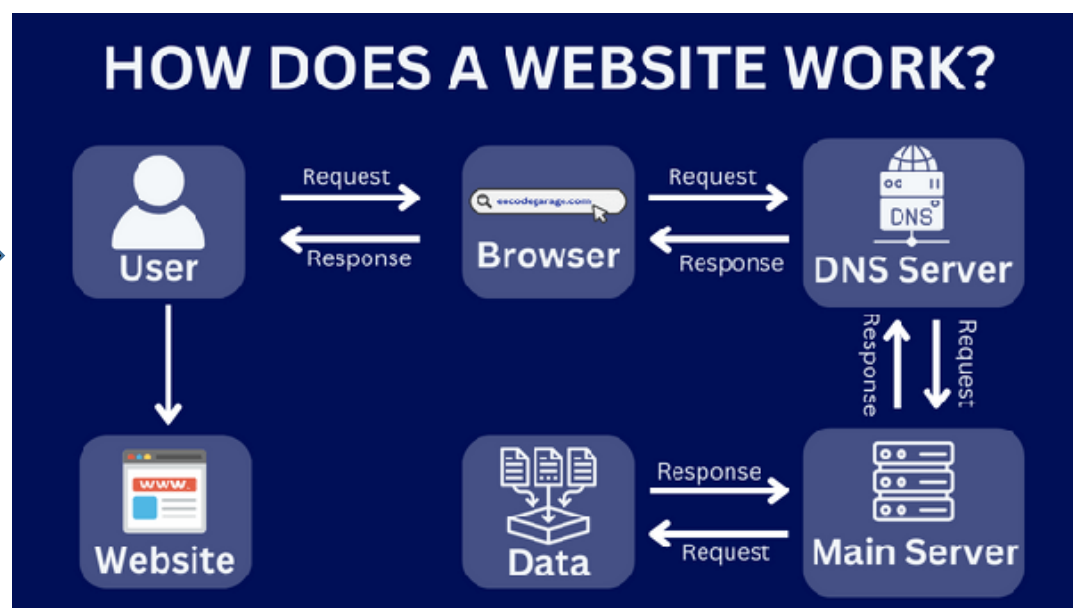
A JavaScript engine is a program that interprets and executes JavaScript code. It takes the JavaScript code you write and translates it into actions that your computer can understand and execute



### List of JavaScript Engines:

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

**Purpose of a JavaScript Engine:** The main purpose of a JavaScript engine is to enable web browsers and other applications to run JavaScript code. It processes the code line by line, converting it into machine-level instructions that the computer's processor can execute.



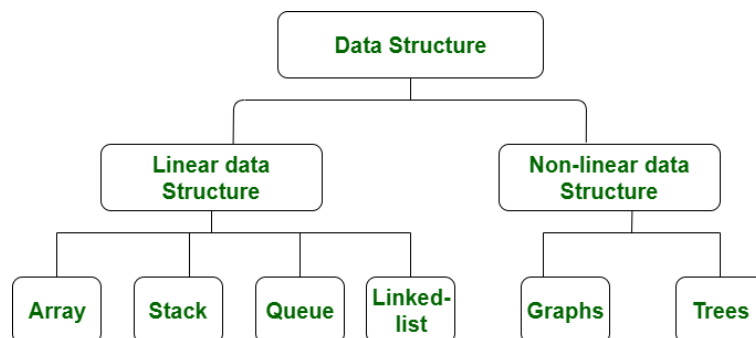


A website works by browsers sending requests to servers for web pages. Servers process these requests, gather necessary content (like HTML, CSS, JavaScript, images), and send it back to browsers. Browsers then render these elements into the visible web pages users interact with.

## What is data structure?

- The logical and mathematical model of a particular organization of data is called data structure.
- There are two types of data structure
  - Linear
  - Nonlinear

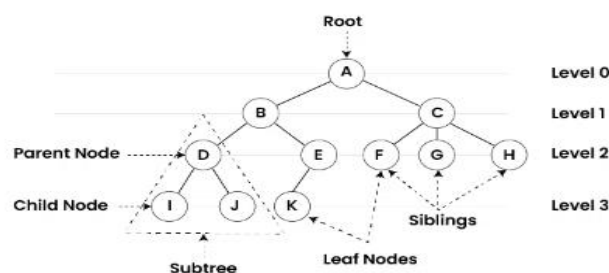
A data structure is a way to organize and store data in a computer so that it can be used efficiently. It defines how data is stored, accessed, and manipulated. Examples include arrays, linked lists, stacks, queues, and trees.



## Explain Tree Data Structure?

**Tree Data Structure** is a non-linear data structure in which a collection of elements known as nodes are connected to each other via edges such that there exists exactly one path between any two nodes.

## Tree Data Structure



## ➡ What is user agent? Share the list and its purpose?

A user agent is a software application (like a web browser) that sends requests to servers on behalf of a user. It identifies itself to servers, allowing websites to provide content tailored to different devices or browsers. Here are common user agents and their purposes:

1. **Mozilla Firefox:** Open-source browser focused on privacy and customization.
2. **Google Chrome:** Fast browser known for Google integration and extensive extensions.
3. **Safari:** Apple's browser optimized for macOS and iOS devices.
4. **Microsoft Edge:** Microsoft's browser, now based on Chromium, offering compatibility and performance.
5. **Opera:** Feature-rich browser with built-in ad blocking and customization options.
6. **Internet Explorer:** Legacy browser used for compatibility, largely replaced by Microsoft Edge.

## ➡ What is Hypertext?



Hypertext typically refers to a test or assessment that involves hypertext, which is text on a computer that contains links to other texts. In simple terms, it's like taking a quiz or exam where you might click on links or interact with different parts of a text or webpage to answer questions or explore more information. It's often used in online learning and can be a more interactive way to test knowledge or understanding compared to traditional paper tests.

## ➡ What is HTML Tags?

HTML tags are codes used to structure and define content on web pages. They appear within angle brackets (< >) and instruct web browsers on how to display text, images, links, and other elements.



# Attributes In HTML

- class
- title
- href
- id
- src
- alt
- height
- width



## What is HTML Elements?

HTML (HyperText Markup Language) elements are the building blocks of web pages. They are used to structure and present content on the web. Each element is represented by a tag, which is enclosed in angle brackets (<>). An HTML element typically consists of a start tag, content, and an end tag. Here's a basic overview:

1. **Start Tag:** This marks the beginning of an HTML element. For example, `<p>` is the start tag for a paragraph element.
2. **Content:** This is the content that the element contains. For example, the text within a paragraph element.
3. **End Tag:** This marks the end of an HTML element. For example, `</p>` is the end tag for a paragraph element.

## How do convert elements to tree?

To convert HTML elements to a tree:

1. **Start with the Root Element:** The `<html>` element is the root.
2. **Create Nodes for Each Element:** Each HTML tag becomes a node.
3. **Nest Child Elements:** Place child elements inside their parent element's node.
4. **Repeat for All Elements:** Continue this process for all elements.

```
html
├── body
│   ├── h1
│   └── p
```

In this tree:

- html is the root.
- body is a child of html.
- h1 and p are children of body.

## ➡ What is DOCTYPE?

DOCTYPE is a declaration at the beginning of an HTML document that tells the web browser which version of HTML the document is using. It helps the browser render the page correctly. For example, `<!DOCTYPE html>` is used for HTML5.

## ➡ What are the ways we can save html file?

- **Use a Text Editor:**
  - Open Notepad, TextEdit (plain text mode), or a code editor (VS Code, Sublime Text).
  - Write your HTML code.
  - Save the file with a `.html` extension (e.g., `mypage.html`).
- **Use an IDE:**
  - Open the IDE (e.g., Visual Studio Code).
  - Create a new file.
  - Write your HTML code.
  - Save with a `.html` extension.
- **Use Online HTML Editors:**
  - Go to a site like CodePen, JSFiddle, or HTML5 Editor.
  - Write your HTML code.
  - Download the file as an HTML file.

## ➡ What is charset? why we need to use this?

**Charset (Character Set)** defines the set of characters that can be used in an HTML document. It specifies how characters are encoded, ensuring that text is displayed correctly in the browser.

### Why We Use Charset

- **Correct Display:** Ensures special characters (like accented letters, symbols) display properly.
- **Compatibility:** Makes sure the webpage looks the same across different browsers and devices.
- **Internationalization:** Supports multiple languages and scripts.

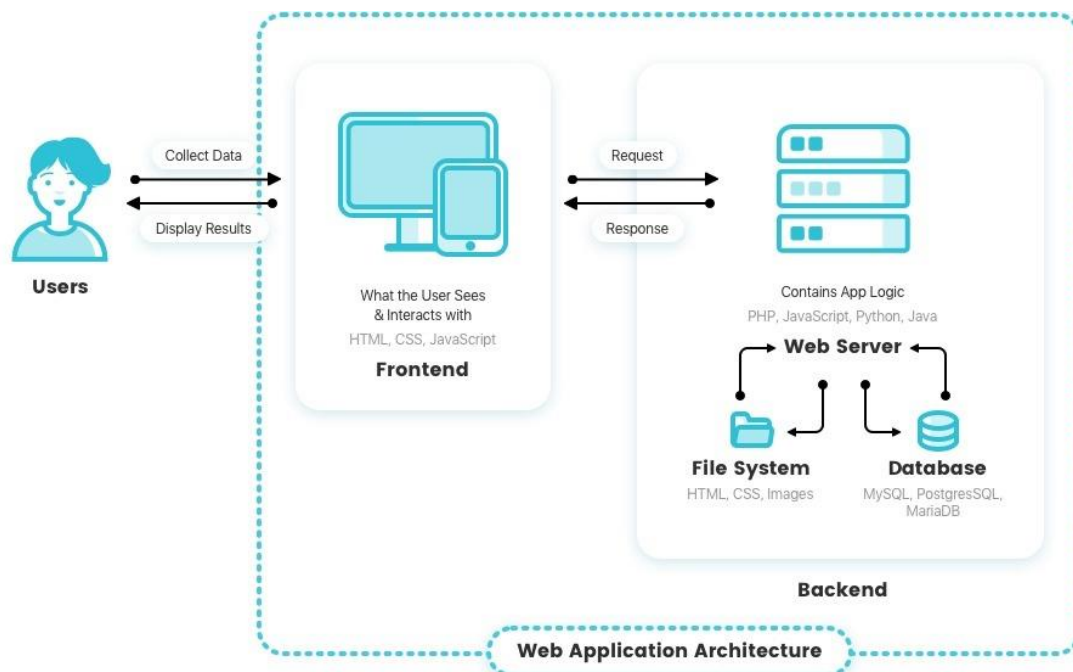
## ➡ What is meta data? what is the purpose of it?

**Metadata** is information about an HTML document that is not visible on the page itself but is used by browsers and search engines.

### Purpose of Metadata

1. **SEO (Search Engine Optimization):** Helps search engines understand the content and rank the page.
2. **Browser Instructions:** Provides instructions to the browser, such as character set and viewport settings.
3. **Social Media:** Enhances how the page appears when shared on social platforms.

## ➡ Explain Web Application Architecture?



**Web Application Architecture** refers to the structure of components and their interactions in a web application. It determines how the web application is organized and how it functions.