**Node.js Explained – Summary Notes**

**💡 What is Node.js?**

* **Node.js is a JavaScript runtime.**
* It allows you to **run JavaScript outside the browser**, like on a server or your local machine.

**🌐 JavaScript Basics**

* Typically used in the **browser** to:
  + Manipulate the **DOM**.
  + Create interactive UI (popups, modals, animations).
* JavaScript in the browser is focused on the **user interface** and **client-side** interactions.

**🚀 What Makes Node.js Special?**

* **Built on JavaScript**, but extends it.
* Enables JavaScript to run **outside the browser**, like:
  + On a **server**.
  + On any **computer**.
* Great for **building web applications** that need to run on servers.

**⚙️ How Does Node.js Work?**

* Uses **V8 engine** (developed by Google) to run JavaScript.
  + **V8** compiles JavaScript to **machine code** for efficient execution.
* **V8 in Node.js** is the same as in Chrome but with additional capabilities.

**🧩 Node.js Adds Features to JavaScript**

* Extends V8 to allow access to:
  + Local **file system** (read, write, delete files).
  + Other low-level operations not possible in the browser (due to **security restrictions**).
* These features are **not available in browser JavaScript**.

**❌ What You Lose in Node.js**

* You **can't interact with the DOM** or browser-specific APIs.
  + No access to HTML elements since there’s no webpage attached.

**✅ Main Takeaway**

* Node.js allows JavaScript to be used like other **general-purpose programming languages** (e.g., Python, Java).
* It's **not meant for frontend tasks**, but for building **server-side logic** and tools.