What is Node.js?

Node.js is a **cross-platform**, **open-source**, **javascript engine** that runs on the **V8 JavaScript engine** by google. It allows developers to run **javascript on the server-side** and creates a **server using the non-blocking, event-driven I/O model**.

Note: Node.js is not a programming language or a framework but rather a JavaScript runtime enveronment that allows deverlopers to run JavaScript outside of a browser.

Open-Source, Server-Side JavaScript runtime it allows you to run JavaScript on your machine or servers. Built on the V8 JavaScript engine for speed. Robust ecosystem with npm.

**Open-Source**

Open-Source menas that the source code of Node.js is publicly avaiblable.

Anyone can

1. View: You can see how Node.js is built under the nood.
2. Modify: If you want to customize or improve Node.js, you can do it.
3. Contrubute: Developers around the world actively contrubute to improving Node.js.

**Cross-Platform**

Cross-Platform means Node.js can run on multiple OS without needing major changes.

What is JavaScript Runtime Enveronment?

JavaScript runtime enveronment refers to the enveronment where your JavaScript code runs.

JavaScript typiically runs in the browser (like Chrome, Firefox) to hangle frontend tasks.

Node.js allows JavaScript to run outside the browser that is on the server side. It provides tools to interact with the system, like:

1. File System (Read/Write files).
2. Network (Handle HTTP request).
3. Database (Connect to databases like MongoDB or MySQL).

Note: JavaScript it does not have that much of capability to run outside of the browser so Node.js it provide an enveronment so that via this enveronment it can run outside the browser like server side etc.

Why is Node.js special as a runtime?

V8 Engine:

Node.js uses Google Chrome’s V8 engine to compile JavaScript into machine code, making it lightning fast.

Built-in-APIs:

Node.js comes with built-in\_APIs (like for file systems or http for servers) so you can build powerful applications without extra libraries.

Self-Contained Code Unit

Each file Node.js is treated as aseparate module.

Variables, function, or objects defined in one file are not accessible in anothere file by default unless you explicitly export them.

File by default unless you explicitly export them.

Encaptulation

Node.js uese the commonJS moudle system (moudle.exports and require) to ensure the code in one file does not pullute or interfere with the blobal scpoe. This makes your code modular, maintainable and easier to dubug.

What is moudle in nodejs?

A moudle in Node.js represents a file containing code that is self contained reusable and encapsulated. Node.js uses the commonJS module system. Module in Node.js are created defining separate files for different functionalites. You must export anything you want to make accessible to other modules.

Types of Export moudles:

1. . module.exports Example: moudle.exports = {property1, property2,………}

Note: property means function etc which are more then one you wan to export to another page.

1. . Exports.property Example: property.export