

Interview

Questions Of

Node.js

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Q. What is Node.js? Where can you use it?

→ Node.js is an open-source, cross-platform Javascript runtime environment and library for running web application outside the client's browser.

* Ryan Dahl developed in 2009.

* It is used to create server-side web application.

* It uses an asynchronous.

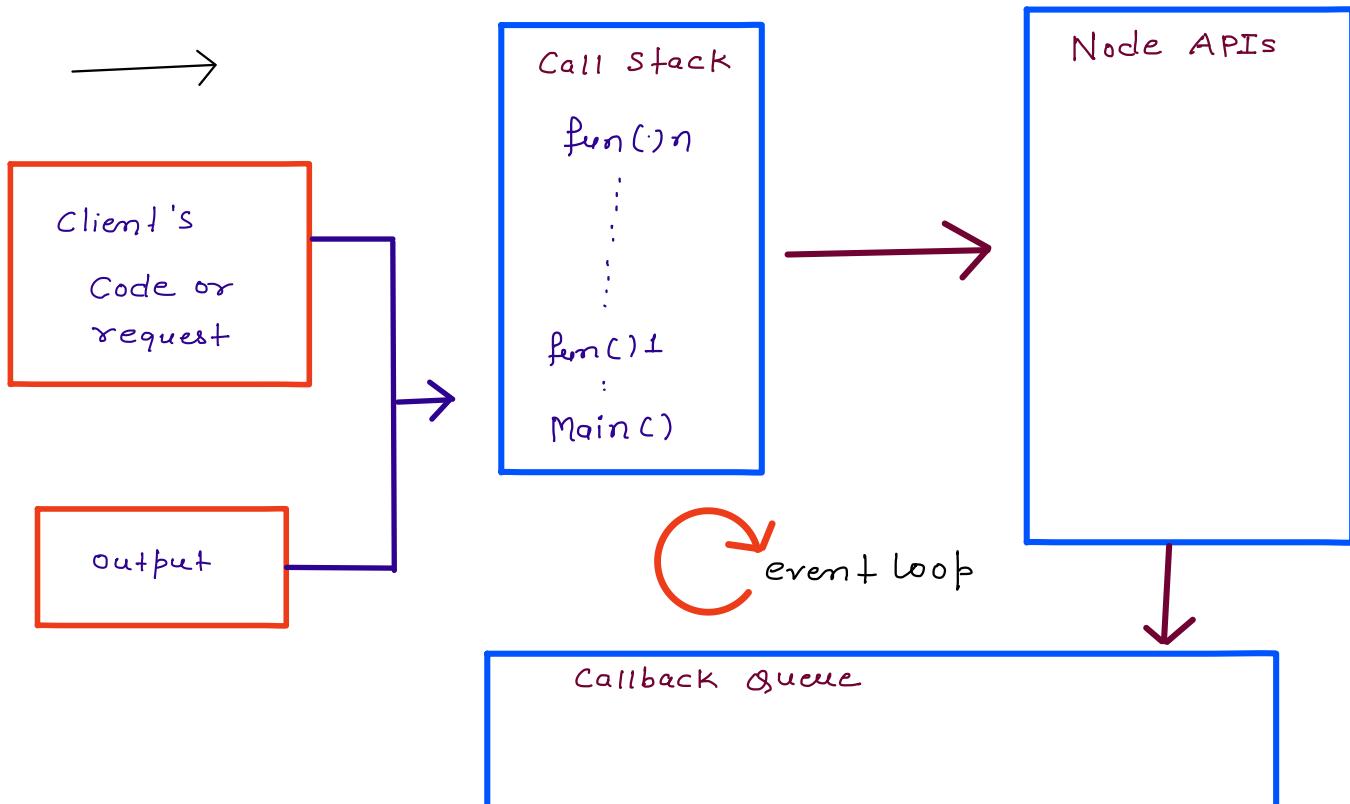
* Node.js uses in web application like video streaming sites, real-time web application, Network application, General-purpose applications and Distributed System.

Q. Why use Node.js?

→ Some advantages of node.js :-

- It is generally fast.
- It rarely blocks.
- It offers a unified programming language and data type.
- Everything is asynchronous.

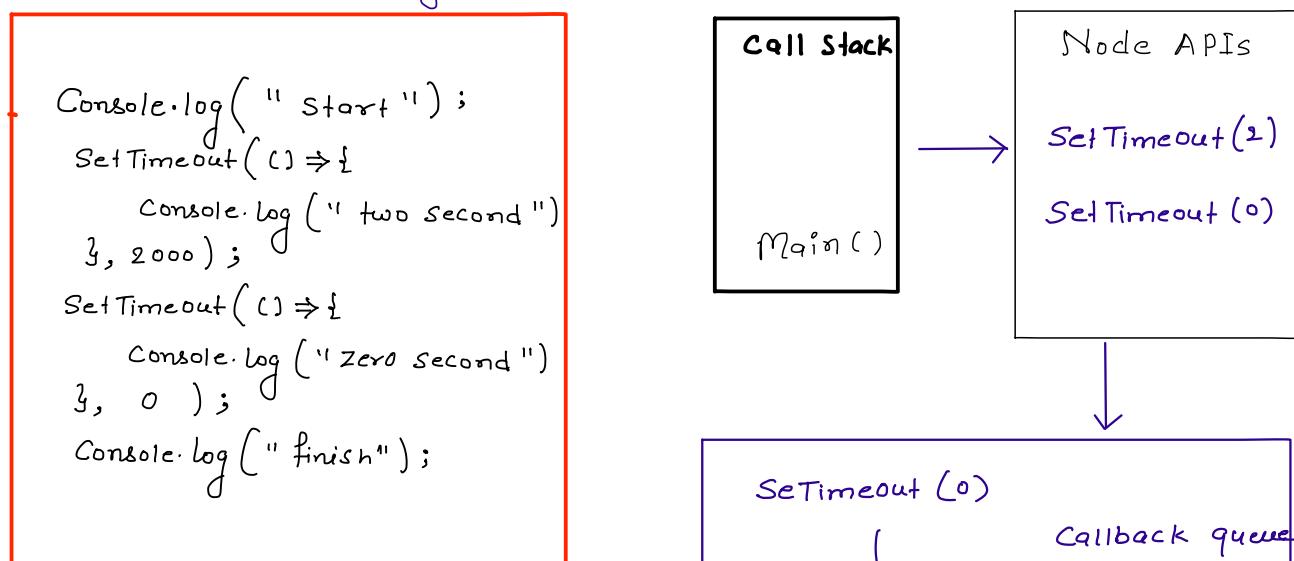
Q. How does node.js Work?



Working of Call stack :

When client or sender send request or write code in node.js. When you execute the code, each function must be register in call stack. To identify or determine which function call firstly.

* By default `Main()` func is already present.



Output :-

- Start
- finish
- zero
- two second

Priority give according to time.

Q. Why Node.js Single-threaded ?

→ Node.js follow Single threaded with event loop model.

because the event loop runs on process at a time. That means it can only execute one function at a time, and since function have multiple instructions, the event loop will execute one instruction at a time.

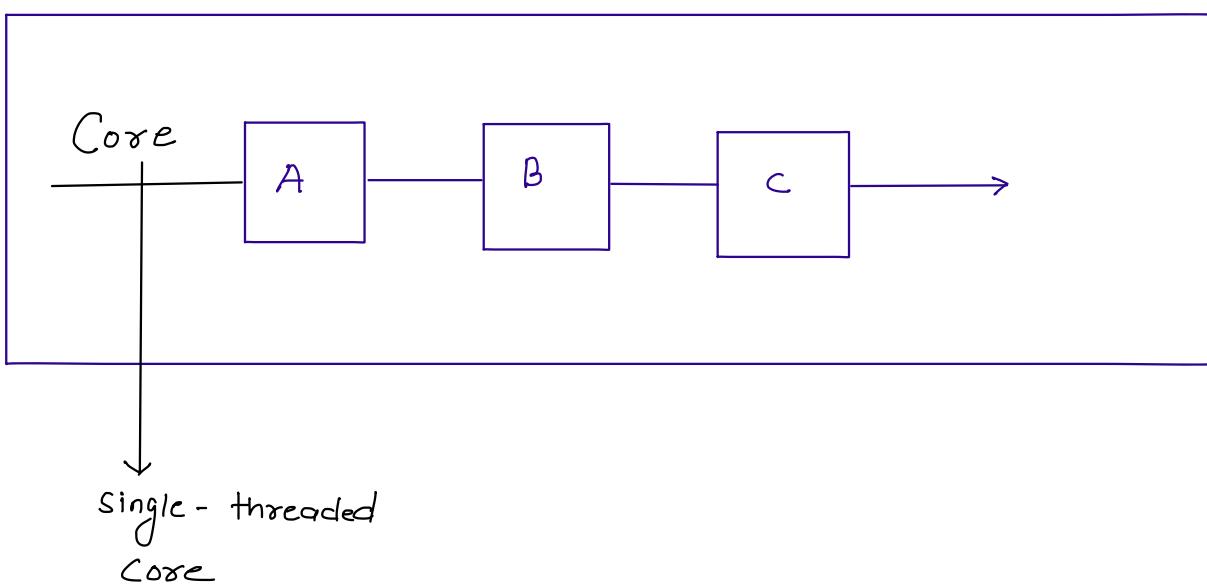
Q. What is Single-threaded process ?

→ A single-threaded process is the execution of programmed instructions in a single sequence.

E.g if application have following set of instruction :-

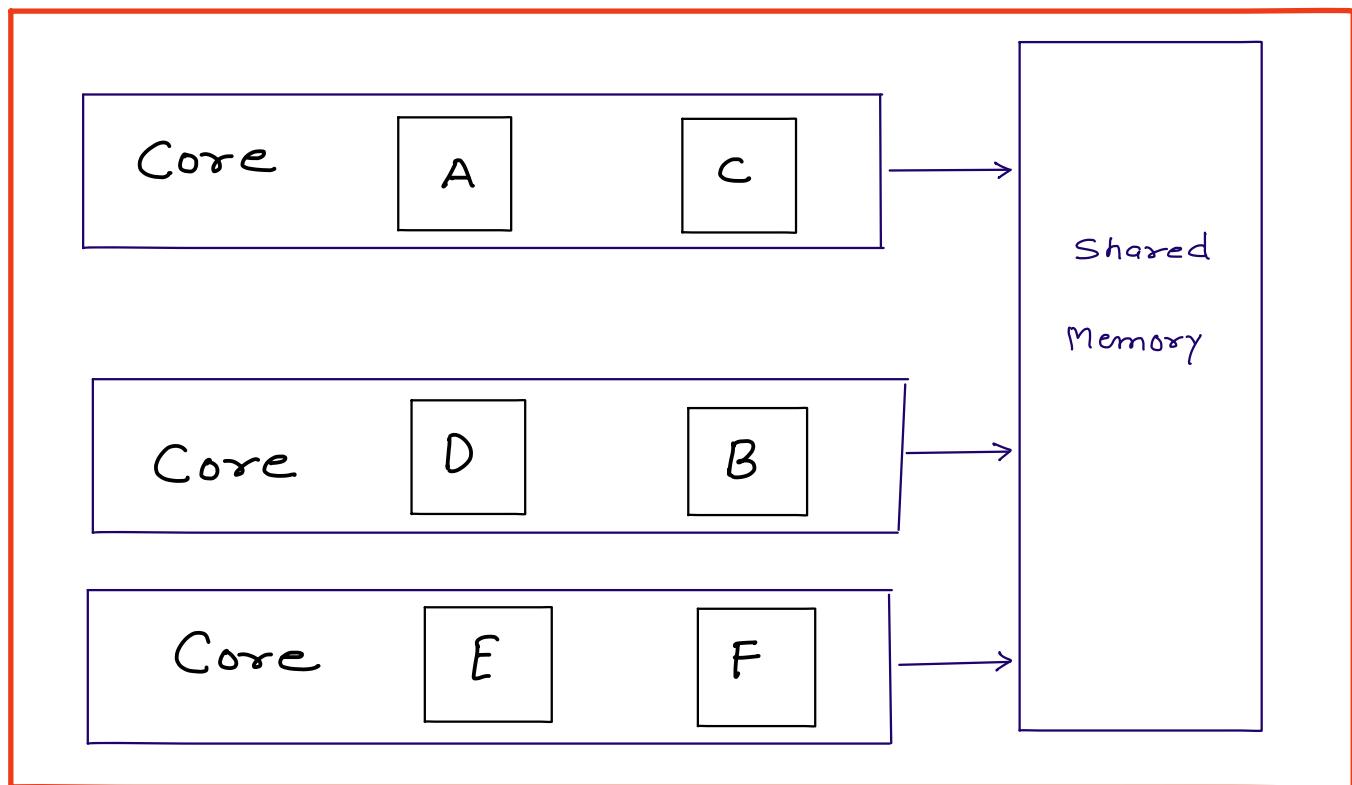
- Instruction A
- Instruction B
- Instruction C

Executed in single-threaded process.
}



Q. What is Multi-threaded Process?

→ A multi-threaded process is the execution of programmed instructions in multiple sequences. Therefore instruction won't have to wait to execute unless multiple instruction.



Q. Explain Callback in node.js

→ A callback function is called after a given task. It allows other code in a meantime and prevent any blocking. All APIs of Node are written to support callback.

Q. What are the advantages of using Promises instead of callback?

- * The control flow of asynchronous logic is more specified and structured.
- * The coupling is low.
 - { lower coupling means that the component or function involved in asynchronous operations are less tightly coupled or connected to each other }.
- * We have built-in error handling.
- * Improved readability.

Q. How would you define the term I/O?

- I/O is used to describe any program, operation or device that transfer data to or from one medium and to or from another medium.
- * Every transfer is an output from one medium and an input into another. The medium can be physical device, network, or file within the system.

Q. How is Node.js most frequently used?

- Node.js widely used in :-
- * Real-time chats.
- * IoT

- * Single Page applications.
 - * Real-time Collaboration tools.
 - * Streaming applications.
 - * Microservices architecture.
- * Java, PHP, Python, and Node.js are some backend technology development technology.

Q. What is NPM?

→ NPM stands for Node Package Manager, responsible for managing all the package and modules for Node.js.

NPM provide two main functionalities:-

- Provide online repositories for node.js package/module which are searchable on search.nodejs.org.
- Provide Command Line Utility to install Node.js packages and also manages Node.js versions and dependencies.

Q. What are the modules in Node.js?

→ Modules are like Javascript libraries that can be used in node.js application to include a set of functions.

* To include Module in a Node.js applications, use `require()` function with the parenthesis containing the module's name.

* Some important Core Modules are :-

- HTTP :- include classes, methods, and events to create a Node.js HTTP Server.
- util :- includes utility functions useful for developers.
- fs :- includes events, classes, and Methods to deal with file I/o operations.
- url :- includes Methods for URL parsing.
- query string :- includes Methods to work with query string.
- stream :- includes Methods to handle streaming data.
- zLib :- includes Methods to compress or decompress file.

Q. What is the purpose of the module.exports ?

→ In Node.js, a module encapsulates all related codes into a single unit of code that can be parsed by moving all relevant functions into a single file.

Q. Why is Node.js preferred over other backend technologies like Java and PHP ?

→ Some reason :-

- Node.js is very fast.
- NPM has over 50,000 bundles available at the developer's disposal.
- Perfect for data-intensive, real-time web application, as Node.js never wait for an API to return data.
large volume of data
- Better synchronization of code between server and client due to same code base.
- It is a Javascript Library.

* MONGODB is the most common database used with Node.js. It is NoSQL, cross-platform, document oriented database that provide high performance, high availability, and easy scalability.

Q. Difference between Angular and Node.js.

Angular	Node.js
<ul style="list-style-type: none">• frontend development framework.• It is written in TypeScript.• used for building single page, client-side web applications.• split a web application into MVC Component.	<ul style="list-style-type: none">• It is server-side environment.• It is written in C, C++ Language.• used for building fast and scalable server-side networking application.• generates database queries.

* Express.js and Mongoose Most Commonly used library in node.js.

Q. What are the command used to import external Libraries ?

→ The "require" Command is used to import external libraries.

E.g. `var http = require('http');`



This will load the http library

* Some Pros of Node.js :-

- fast processing and event based model.
- use JavaScript, which is known almost developers.
- NPM has over 50,000 package.
- Best Suited for streaming huge amount of data.

* Some Cons of Node.js :-

- Not Suitable for heavy Computational task. e.g
image processing,
video encoding, video decoding,
Machine learning, blockchain mining, etc

- Dealing with relational database is not good option for node.js.
- since, Node.js is single threaded.

Q. What is the difference between Asynchronous and non-blocking?

→ Asynchronous :-

Using these we can make asynchronous http request that do not wait for the server to respond.

- These functions continue to respond to the request for which it has already received the server request.

Non-Blocking :-

Non-blocking functions are used in regards with I/o operation

They immediately respond with whatever data is available and keeps on running as per the request.

Q. What is package.json?

→ The package.json file in node.js is the heart of the entire applications.

* This file holds the metadata for a particular project.

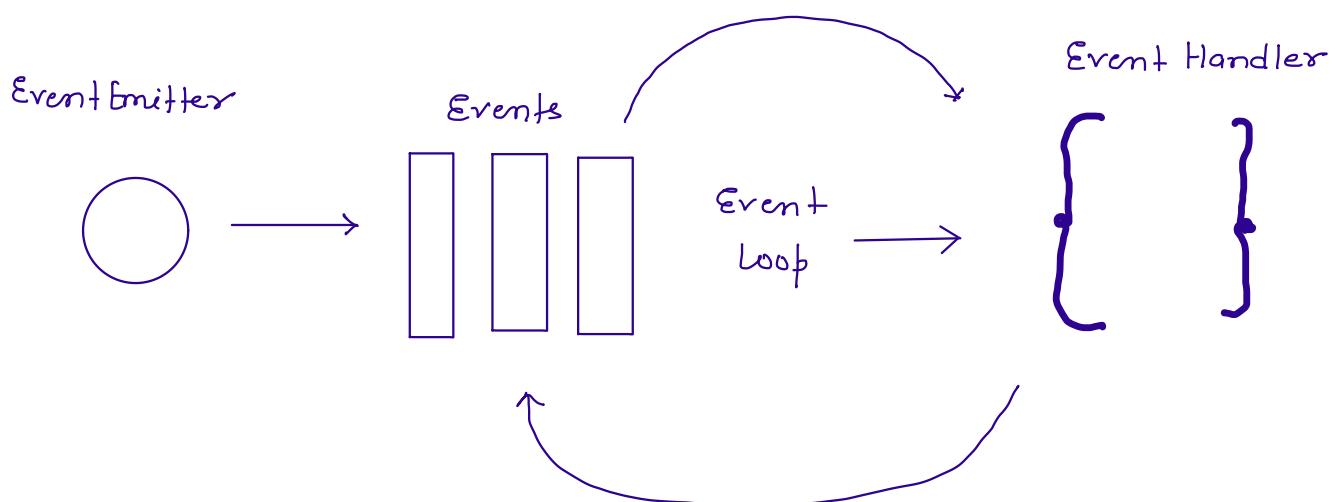
* The package.json file is found in the root directory of any Node application.

Q. What is Event Loop in node.js?

→ Event loop handle asynchronous callbacks in node.js. It is the foundation of the non-blocking input/output in node.js.

* Event loop handle all the asynchronous callback in application.

* This approach mainly follow the Publish-Subscribe pattern.



Q. What is REPL in the context of Node.js?

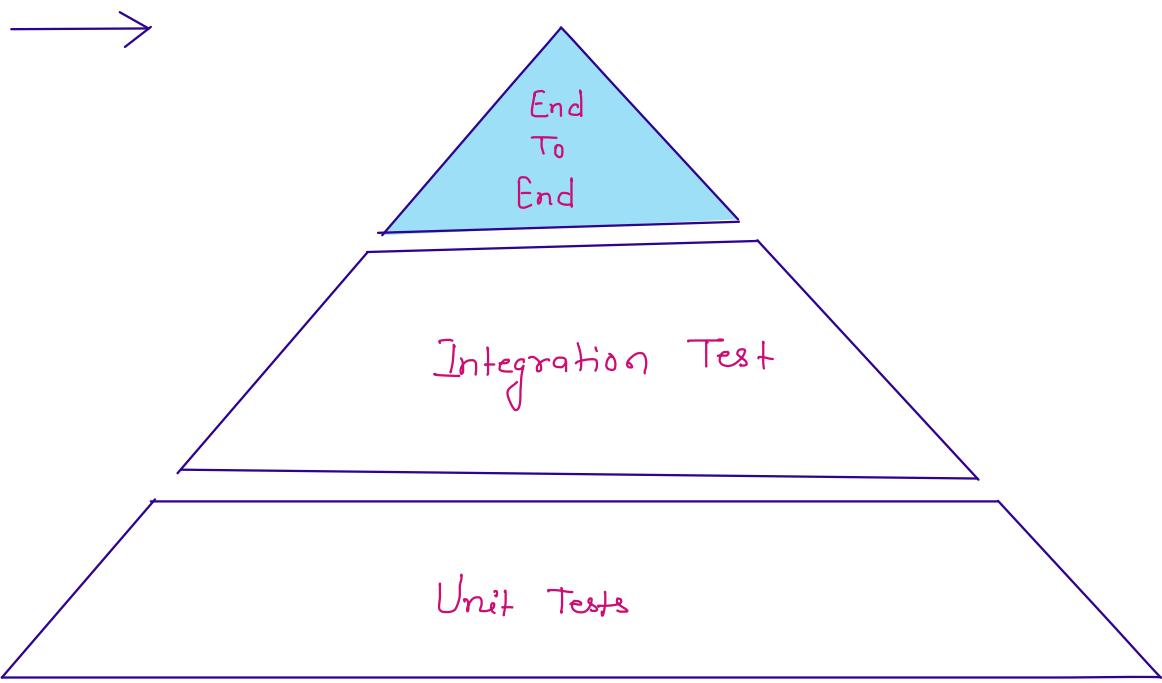
→ Read :- Read the User's input.

Eval :- Receive and Evaluates the ds.

Print :- Print the final result.

Loop :- Loop the provided command until CTRL+C is pressed twice.

Q. What do you understand by test Pyramid?



Q. What is Express.js package?

→ Express is a flexible Node.js web application framework that provides a wide set of features to develop both web and mobile applications.

Q. What are streams in Node.js?

→ Streams are objects that enable you to read data or write data continuously.

- There are four types of streams :-

Readable :- Used for reading operations.

Writable :- Used for Write operations.

Duplex :- Can be used for both reading and write operation.

Transform :- A type of duplex Stream where the output is computed based on input.

Q. How do you install, update, and delete dependency?

→ install dependency :

npm i express

Update dependency :

npm update

Uninstall dependency :

npm Uninstall express

Q. How to Create Simple Server in node.js ?



- import the http module.
- Using createServer function with a callback function using request and response as parameters.
- Set the server to the listen to the port.

```
var http = require('http');

var server = http.createServer(function(req, res) {
    res.writeHead(200, { "Content-type": "text/plain" });
    res.end("Hello world\n");
});

server.listen(3000, function() {
    console.log('Server is running at 3000')
});
```

Q. What is an EventEmitter in Node.js ?

→ EventEmitter is a class that holds all the objects that can emit events.

Q. What are the two types of API functions in Node.js ?

→ There are two types of API function in node.js are :-

- Asynchronous , non-blocking function.
- Synchronous , blocking function.

Q. What is Control flow function ?

→ Control flow function is a piece of code that runs in between several asynchronous functions calls.

Q. How does Control flow Manage the function calls?

→ The control flow does the following :-

- Control the order of execution.
- Collect data.
- Limit Concurrency.
- Call the next step in a Program.

Q. What is the buffer class in Node.js ?

→ Buffer class stores the raw data similar to an array of integers but corresponds to a raw memory allocation outside the V8 heap.

Buffer class is used because pure Javascript is not compatible with binary data.

Q. What is Pipping in Node.js ?

→ Pipping is a mechanism used to connect the output of one stream to another stream. It is normally used to retire data from one stream and pass output to another stream.

Q. What are LTS releases of Node.js?

→ Long Term Support. This version of node.js receive all the critical bug fixes along with security updates and performance improvement. It is supported for at least 18 months and mainly focus on stability and security.

Q. What do you understand by callback hell?

→ Callback hell is also known as the Pyramid of Doom.

- It is pattern caused by intensively nested callbacks which are Unreadable and Unwidely.

- It typically contain multiple nested callback functions which in turn make the code hard to read and debug.

Q. Explain the concept of middleware in node.js?

→ Middleware is a function that receive the request and response objects. Most task that middleware function perform are:-

- Execute any code.

- update or modify the request and the response object.
- finish the request-response cycle.
- invoke the next middleware in the stack.

Q. Explain Libuv :

→ Libuv is a multi-platform support library of Node.js which majorly used for async I/O.

- It is full-featured event-loop backed
- It is file system events.
- Async file & file system operation.
- It is Async TCP & UDP Sockets.
- It is child process.

Q. Different types of HTTP request ?

→ GET : Used to retrieve the data.

POST : Used to make change in state or reactions on the server.

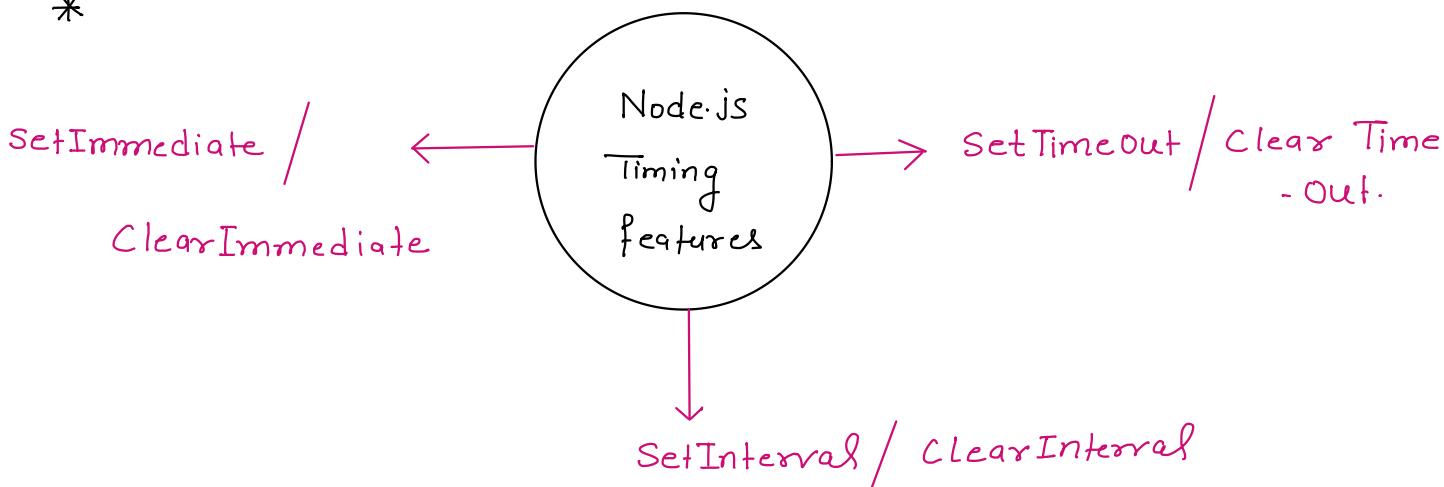
HEAD : Similar to GET methods, but ask for response without response body.

DELETE :- Used to delete the predetermined resources.

Q. What is the purpose of NODE_ENV?

- NODE_ENV is an environment Variable that Stands for node environment in express Server.
- It is how we set and detect which environment we are in.

*



* DOM Cannot be accessed in node.js. DOM is a browser specific API that allows for manipulation of HTML or XML documents. Since, Node.js does not run in a browser, it does not have access to DOM.

Q. Why ExpressJS used ?

→ Express is a great choice for building web apps in node.js, and its popularity and active community make it safe and reliable choice for developers of all levels.

Q. What is ESLint ?

→ It is a popular open source tool that is used to analyze and flag errors and potential problems in JS code.

Q. What is Passport in Node.js ?

→ Passport is a popular authentication middleware for node.js. It provides a simple and modular way to implement authentication in node.js applications.

Passport supports many authentication mechanisms, including username/password, social login like Facebook, Google and JWT (JSON Web Token).

Q. Does Node.js provide any debugger ?

→ Yes, built-in debugger.

Q. Is Cryptography supported in Node.js ?

→ Yes, Node.js provides built-in support for Cryptography through Crypto module.

Q. For Node.js, why Google use V8 engine?

→ Google use V8 engine. It is Chrome runtime engine that converts Javascript code into native machine code.

* It speeds up the application execution and response process and give you a fast running applications.