Node JS

Node JS – It’s a Open Source and JAVASCRIPT RUNTIME ENVIRONMENT

JAVA – It’s a Popular Programming Language

We write the source code and save it in a file with an extension

HelloWorld.java (Java source Code)

HelloWorld.java ---- JAVA Compiler --🡪 HelloWorld.class (Byte Code/ Object Code)

HelloWorld.class is an intermediate file.

We will run this Intermediate Code in a Virtual Machine (JVM)

Java Virtual Machine – JVM (A Computer which is created using only softwares)

In order to Run JAVA code

1. JRE – Java Runtime Environment (Used to run Java code in JVM)
2. JRE is the one which invokes or run the intermediate code in JVM.

JDK – Java Development Kit – Compiling the Java Source code and converting it to Java Byte Code (if no errors)

Only Developers who writes, modifies, updates the source code need JDK.

But end users only need JRE.

JAVASCRIPT – Once upon a time, the purpose of Javascript is only DOM manipulation.

It works with Browser.

Browser consist of 3 Engines

Browser is a Web client software used to interact with the web Servers.

Types of Browsers

1. Google Chrome (v8)
2. Mozilla Firefox
3. Apple Safari
4. Microsoft Edge
5. Netscape Navigator (Very Old)
6. Opera
7. HTML Rendering Engine (Responsible for generating and executing HTML code)
8. Styling Engine (Responsible for adding style by reading the CSS file)
9. Scripting Engine ( Responsible for running the Javascript code)

Node JS = V8 Engine + Additional Modules

NodeJS = Asynchronous Event Driven JavaScript Runtime Environment

<https://nodejs.org/en/about/>

Node JS = Is used to run the javascript code outside the browser.

LTS = Long Term Support

VS Code (It’s a powerful IDE)

IDE – Integrated Development Environment

VS Code – Microsoft

<https://code.visualstudio.com/download>

127.0.0.1 = IP Address of Local Host

Synchronous Operation (Blocking Operation) --- One Operation at a time.

Asynchronous Operation (Non-Blocking Operation) – Multiple Operations at a time.

1. Printing 100 random numbers ( 200 ms)
2. Getting input from users and displaying it (1500 ms)
3. Opening a text file and reading it’s content and updating it (400 ms)
4. Inserting a record into the database table (1000 ms)

Total Time = 200 + 1500 + 400 + 1000 = 3100 ms (Sync mode)

Total Time = Max (200,1500,500,1000) = 1500 ms (Async mode)

Node JS

Contains many modules

Node JS – is cross-platform Environment and Library for running Javascript based Applications.

Installing Node JS

Nodejs.org

Download the LTS version (Long Term Support) 16.17.0 as of 12-Sep-2022

While installing Node JS, it will automatically install NPM.

NPM – Node Package Manager (Project Management Tool for Javascript)

In Java, Maven, Graddle (XML based configuration) pom.xml

In Javascript it is NPM (JSON based configurations) package.json

JAVA CLASS

public class Employee {

private int id;

private String name;

private String email;

constructors & getter, setters

}

XML Representation

<employees>

<employee>

<id>100</id>

<name>ABC</name>

<email>abc@gmail.com</email>

</employee>

<employee>

<id>101</id>

<name>XYZ</name>

<email>xyz@gmail.com</email>

</employee>

</employees>

JSON Representation

Employees = [

{“id”:100, “name”:”ABC”, “email”:”[abc@gmail.com](mailto:abc@gmail.com)”},

{“id”:101, “name”:”XYZ”, “email”:”[xyz@gmail.com](mailto:xyz@gmail.com)”}

];

JSON = JavaScript Object Notation

Node JS = V8 Script Engine + Module

Modules in Node JS

* Buffer
* Debugger
* Streaming
* DNS
* Domain
* Global
* Net
* Error Handling
* File System
* Crypto
* Callback
* Add-ons
* Console
* Cluster
* Http

<https://nodejs.org/dist/latest-v16.x/docs/api/>

* Fat Arrow Syntax [Is used to represent an arrow function]
* By default Arrow functions are Async in nature.

Features

1. Very Fast (In code execution)
2. I/O is Async & Event Driven
3. Single Threaded
4. Scalable
5. No Buffering

Node JS console module

1. console.log()
2. console.error()
3. console.warn()

Ctrl+ C == To stop any running activity/program/application

Ctrl+pause

REPL = Read, Eval, Print & Loop

Read = Reads user Input

Eval = it takes and evaluates the stored data in datastructure

Print = Will print the result

Loop = Continue the same until Ctrl+c is pressed twice.

Simply type node and enter

NPM = Node Package Manager

1. Manage all the dependencies (Adding, removing, updating all the dependent libraries)
2. Package.json is the file name where all the dependencies are mentioned
3. By reading the package.json file it downloads all the required libraries inside a folder named node\_modules
4. After downloading all the dependencies it will automatically create another file called package-lock.json
5. NPM provides a command-line utility namely “npm init” to auto generate package.json file with default/custom values

Npm –v (short) or npm version (full)

Npm install <package/module name>

Two types of installing dependencies using npm

1. Local Installation (Installed inside the current folder)
2. Global Installation (Installed inside app-data/roaming/npm/node\_modules folder)

Local installation will be available only for the particular project.

Global Installation can be accessed by any projects.

-g = Global Installation (C:\Users\syska\AppData\Roaming\npm\node\_modules)