



Node JS Intro

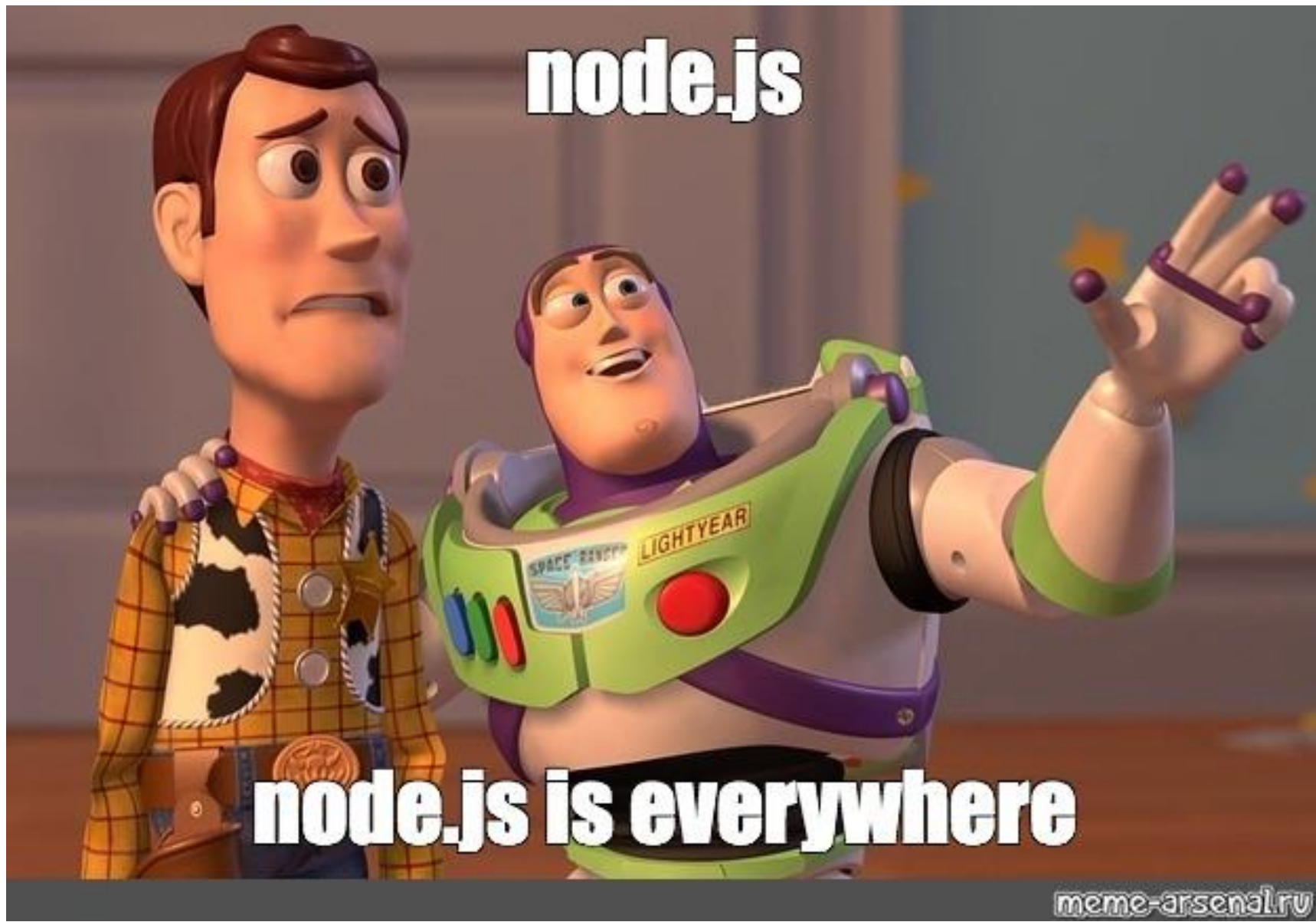
#Node JS Notes

Introduction To Node Js



What is Node JS ?





MEAN STACK



Mongo DB
(database system)



Express
(back-end web
framework)



Angular.js
(front-end
framework)



Node.js
(back-end runtime
environment)



M



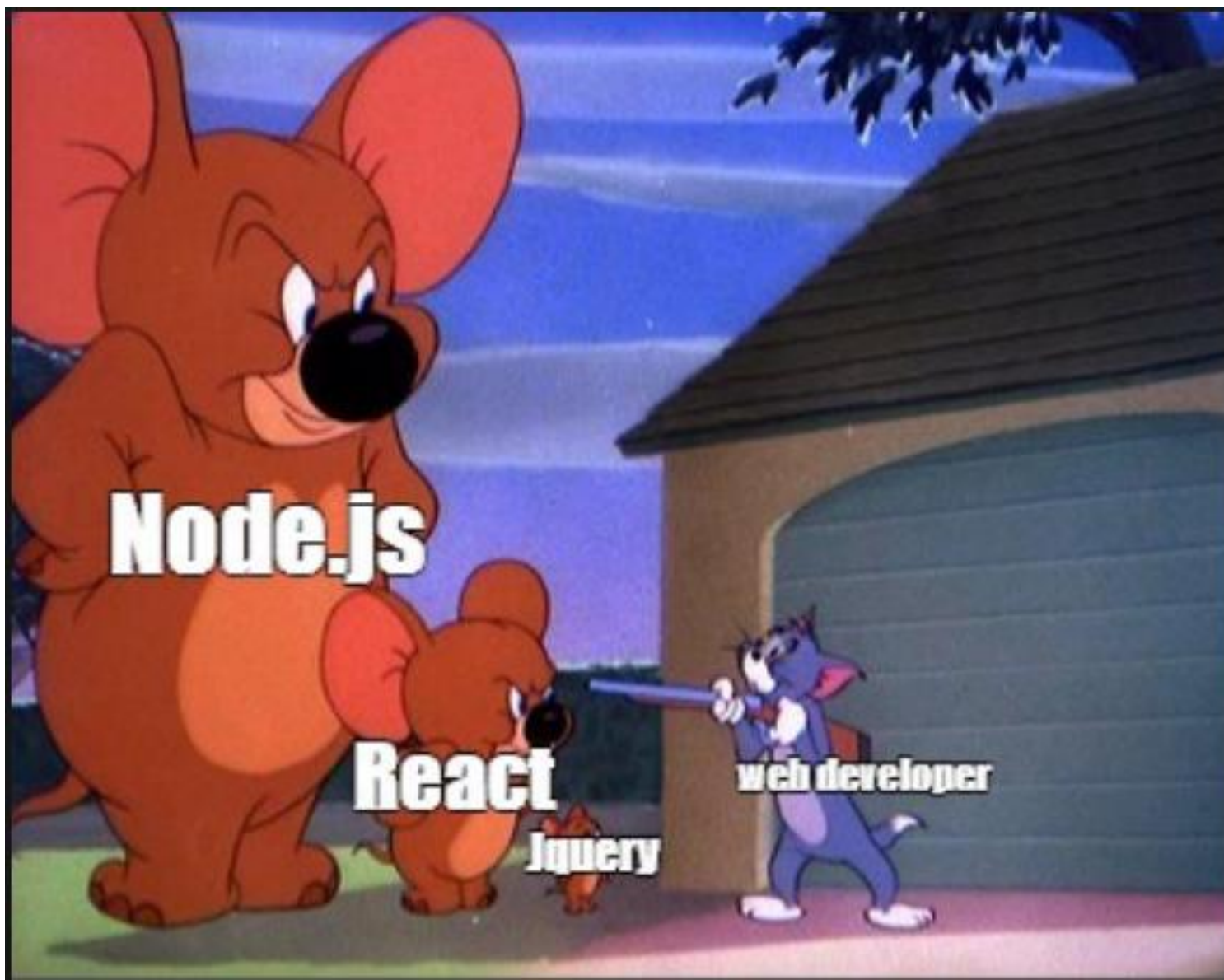
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What is Node.js

- Node.js is an open-source server side runtime environment built on Chrome's V8 JavaScript engine.
- It provides an event driven, non-blocking (asynchronous) I/O and cross-platform runtime environment for building highly scalable server-side applications using JavaScript.
- Node js can be run on OS X, Windows, and Linux.



What we can make with Node js ?

- Real Time Chat Application
- Data Streaming Application
- Application that can handle millions of Concurrent Connections.
- JSON APIs based Applications
- Single Page Applications (SPA)

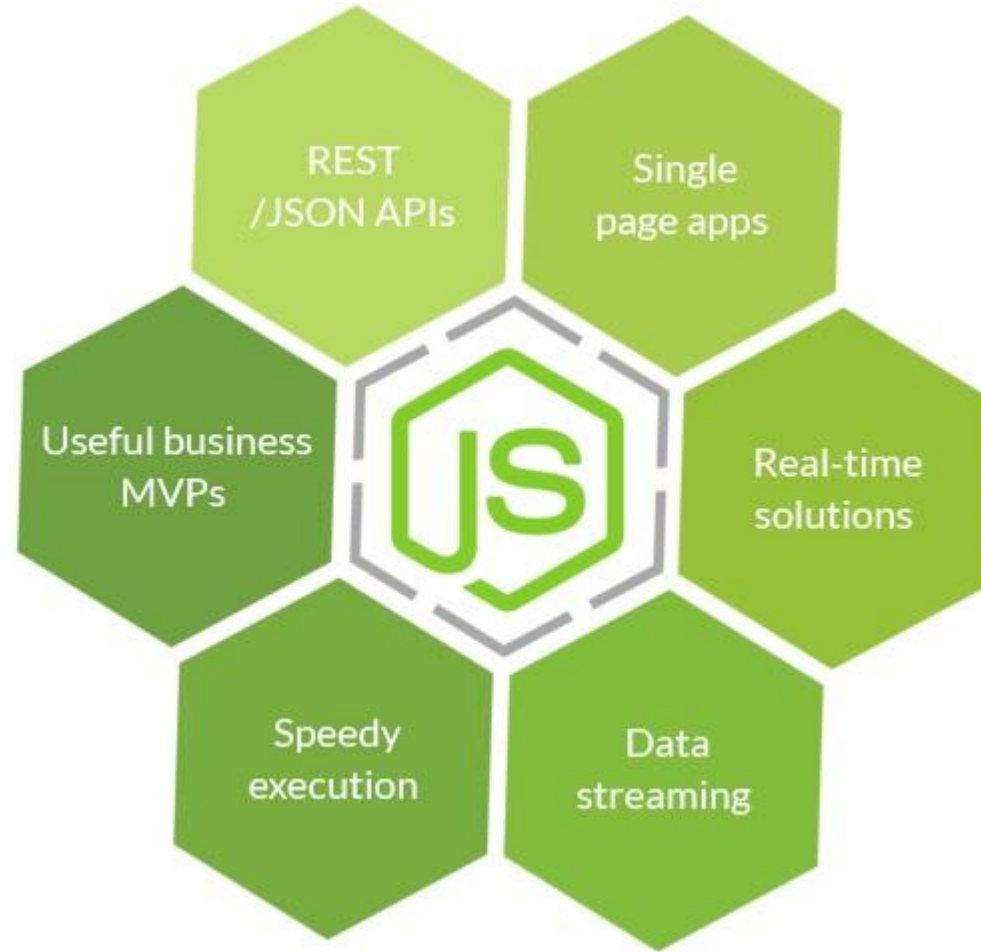


Founder of Node.js

- Ryan Dahl
- Initial release May 27, 2009
- Written in C,C++,JavaScript



Why Node js



Node.js pros

- **Node.js is fast**
- Non-Blocking I/O Model
- JavaScript Present Everywhere
- Real-Time Web Applications
- Solves All Database Queries
- NPM (Dependency Management)
- Provides faster page loading within a website
- Asynchronous by default. So it performs faster than other frameworks.
- Cross-platform framework that runs on Windows, MAC or Linux



Node.js cons

- **Application Programming Interface (API) is Not Stable**
- Lack of developers on the market since it is relatively new



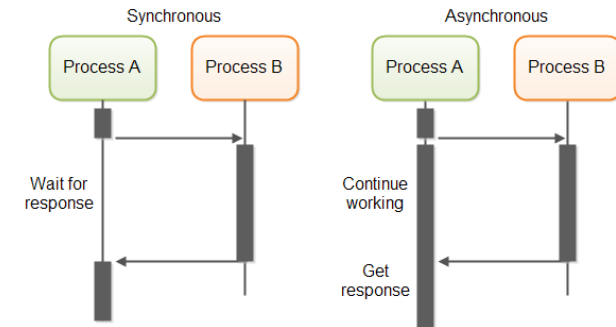
Node.js will be your ideal choice

- If you're looking to create real time web apps (chats apps)
- If you're looking to build APIs It's perfect for handling lots of requests that are I/O driven
- If you want to build streaming applications



Blocking I/O

- Blocking I/O takes time and hence block other function. Consider the scenario where we want to fetch data from the database for two different users.
- Here we can not get the data of the second user until we did not complete the first user process.
- Since javascript is a single threaded and here we would have to start a new thread every time we want to fetch user data.



Who is Using Node.js

StrongLoop 

LinkedIn 

Walmart 

SAP 

ebay 

PayPal 

Trello 

YAHOO! 

NETFLIX 



Who is using Node js ?

- Netflix

- Netflix is the world's leading provider of streaming media and video-on-demand. It's a data-driven platform that uses a massive amount of A/B testing to build rich experience for its 93 million subscribers worldwide. Great numbers of unique packages every push cycle create a problem of conditional dependencies and app scalability.

- Trello

- The server side of Trello was built in Node.js.

- PayPal

- PayPal, a worldwide online payments system, has also moved their backend development from Java to JavaScript and Node.js.





■ LinkedIn

- LinkedIn, the world's biggest business and employment-oriented social networking service, also trusted Node.js, and last year they moved their mobile app backend from Ruby on Rails to Node.js.

■ Medium

- Medium is an online publishing platform that uses Node.js for their web servers. Even though at first glance the web app might seem like a simple HTML page, there is much more technology behind it



What is Framework ?

- A **framework** provides a standard way to build and deploy applications.



Benefits of using Framework

- **Time Savings -**

- Same reason why you use variables and functions/classes. You try your very best to not have to repeat yourself. Why create an entire system if someone else already has done it, and is willing to share it?

- **Scale-ability**

- Something that has been used and tested by a bunch of other developers, is far more likely to scale better than something you come up with alone.

- **Robustness -**

- Much like scaling, it's more likely that the collective of developers is going to come up with the most efficient way to do something than you are alone.

- **Security -**

- Same as the others. Security best practices is an ever-changing topic with constantly new issues. When you make a system from scratch, it's a major challenge to consider all security holes.



Framework of Node JS

- Express
- Hapi
- Total
- Koa
- Flatiron
- Locomotive

Express



Node Package Manager

- npm is a package manager for the JavaScript programming language.
 - It is used to install new packages and manage them in useful ways
 - It is the default package manager for the JavaScript runtime environment Node.js.
 - 60,000+ Modules
 - Check NPM Version using below command
-
- `npm -v`



Node Package Execute

- The npx stands for Node Package Execute and it comes with the npm, when you installed npm above 5.2.0 version then automatically npx will installed.
- It is an npm package runner that can execute any package that you want from the npm registry without even installing that package.
- The npx is useful during a single time use package.
- If you have installed npm below 5.2.0 then npx is not installed in your system. You can check npx is installed or not by running the following command:
 - `npx -v`



Differences between npm and npx:

npm	npx
Npm is a tool that use to install packages.	Npx is a tool that use to execute packages.
If you wish to run package through npm then you have to specify that package in your package.json and installed it locally.	A package can be executable without installing the package, it is an npm package runner so if any packages that aren't already installed it will installed automatically.
To use create-react-app in npm the commands are npm install create-react-app then create-react-app myApp(Installation required).	But in npx you can use that without installing like npx create-react-app myApp, this command is required in every app's life cycle only once.



NVM

- NVM stands for **Node Version Manager**. As the name suggests, it helps you manage and switch between different Node versions with ease.
- It provides a command-line interface where you can install different versions with a single command, set a default, switch between them and much more

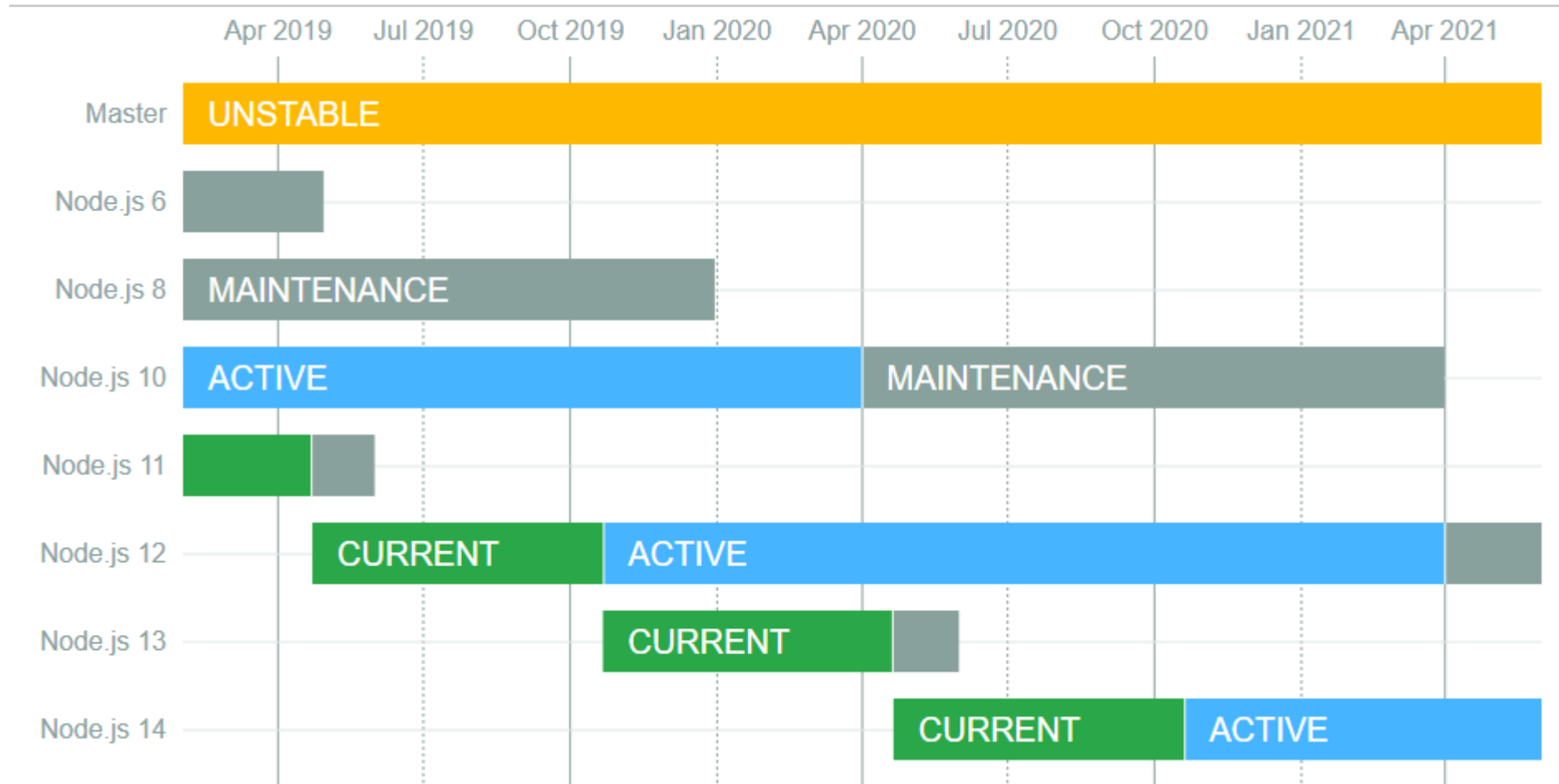


Installation

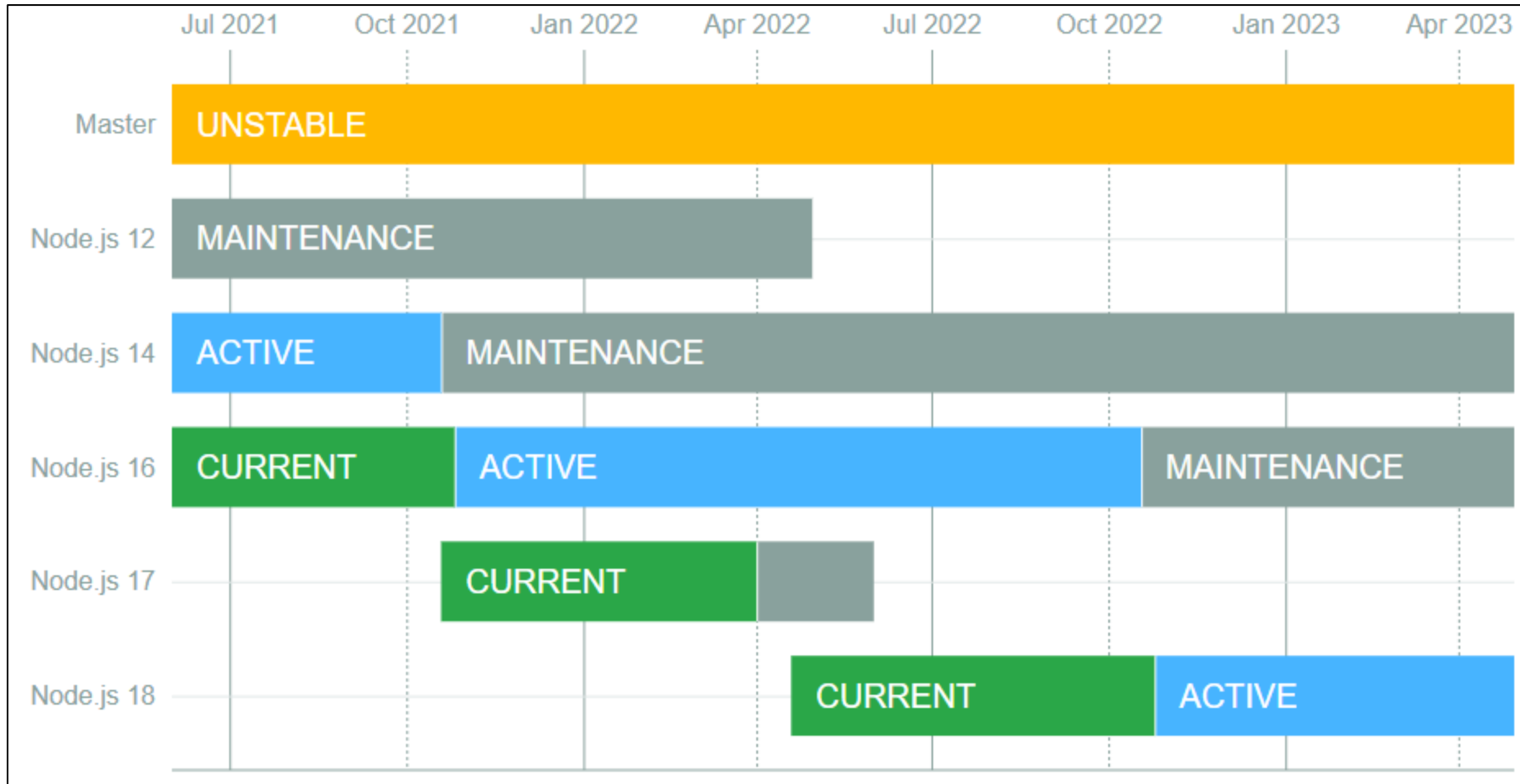
- Download NVM
 - <https://github.com/coreybutler/nvm-windows>
- uninstall any existing versions of Node.js
- delete any existing Node.js installation directories (such as C:\Program Files\nodejs)
- delete the existing npm install location (such as C:\Users\<user>\AppData\Roaming\npm)



Node JS Version History



Node js 15 - 18



LTS

RELEASE	STATUS	CODENAME	INITIAL RELEASE	ACTIVE LTS START	MAINTENANCE LTS START	END-OF-LIFE
v12	Maintenance LTS	Erbium	2019-04-23	2019-10-21	2020-11-30	2022-04-30
v14	Maintenance LTS	Fermium	2020-04-21	2020-10-27	2021-10-19	2023-04-30
v16	Active LTS	Gallium	2021-04-20	2021-10-26	2022-10-18	2024-04-30
v17	Current		2021-10-19		2022-04-01	2022-06-01
v18	Pending		2022-04-19	2022-10-25	2023-10-18	2025-04-30




Download Node JS


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


<https://nodejs.org/dist/>

LTS
Recommended For Most Users


Windows Installer
node-v8.11.3-x64.msi

Current
Latest Features


macOS Installer
node-v8.11.3.pkg


Source Code
node-v8.11.3.tar.gz

Windows Installer (.msi)

Windows Binary (.zip)

macOS Installer (.pkg)

macOS Binary (.tar.gz)

Linux Binaries (x86/x64)

Linux Binaries (ARM)

Source Code

32-bit		64-bit	
32-bit		64-bit	
64-bit			
64-bit			
32-bit		64-bit	
ARMv6	ARMv7		ARMv8
node-v8.11.3.tar.gz			



NVM List

- nvm install 12.14.1
- nvm ls available
- nvm uninstall 13.6.0
- nvm ls
- nvm use 13.6.0
- nvm use 12.14.1
- nvm current



Node JS Version

- Latest LTS Version : 16.X.X (includes npm 8.X.X)
 - Long Term Support

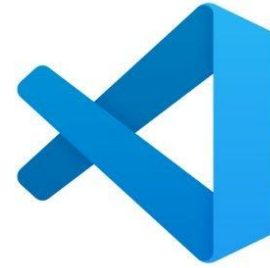
- Latest Current Version : 17.X.X (includes npm 8.X.X)

- Major Node.js versions enter *Current* release status for six months, which gives library authors time to add support for them.
- After six months, odd-numbered releases (9, 11, etc.) become unsupported, and even-numbered releases (10, 12, etc.) move to *Active LTS* status and are ready for general use.
- *LTS* release status is "long-term support", which typically guarantees that critical bugs will be fixed for a total of 30 months. Production applications should only use *Active LTS* or *Maintenance LTS* releases.



Editor

- Visual Studio Code Editor
- Sublime Editor
- Atom Editor
- WebStorm IDE



VS Code Extension

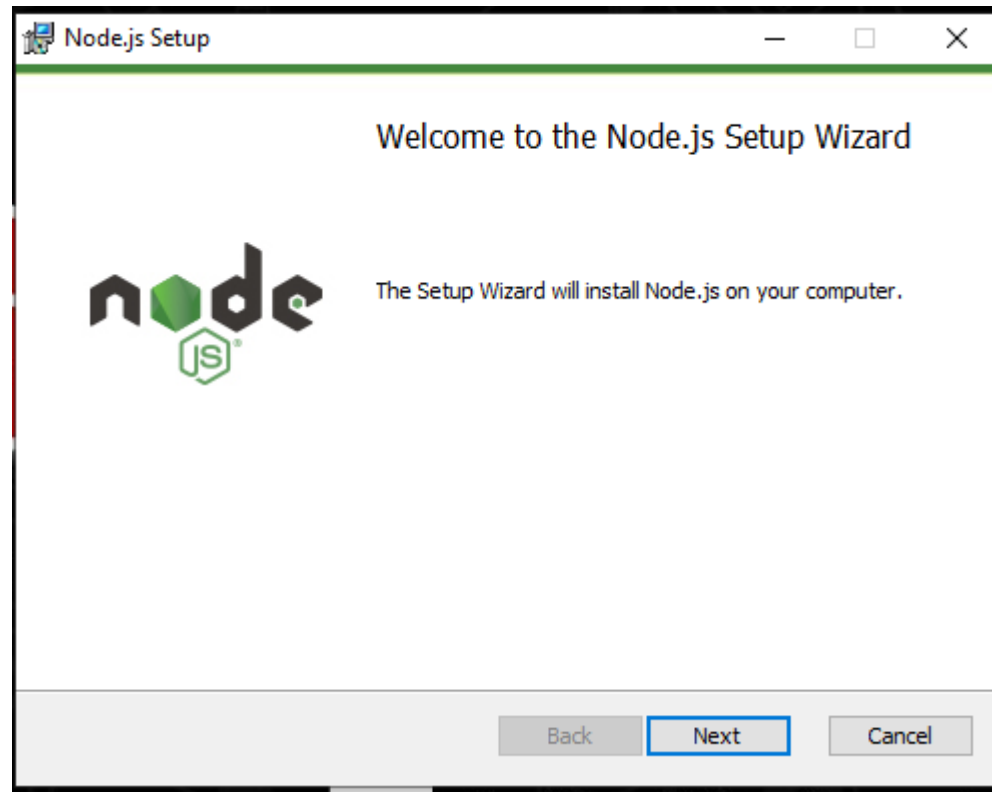
- Material Icon Theme
- Live Server
- ES Code Snippet
- Bracket pair Colorizer
- Tab Nine

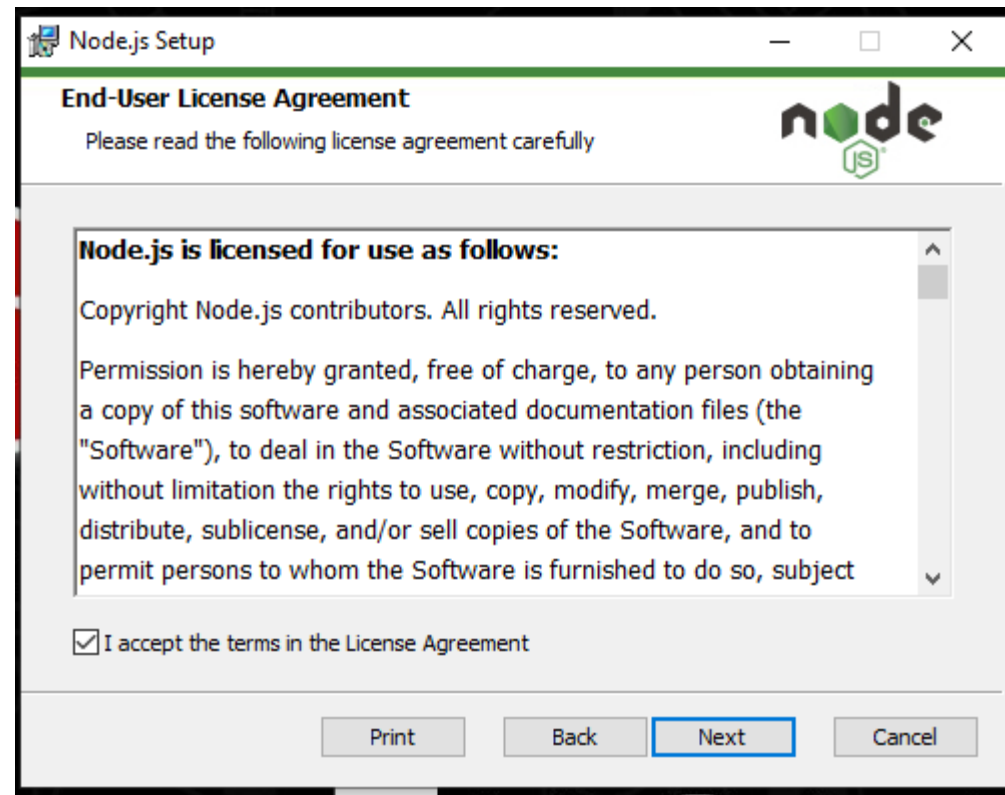


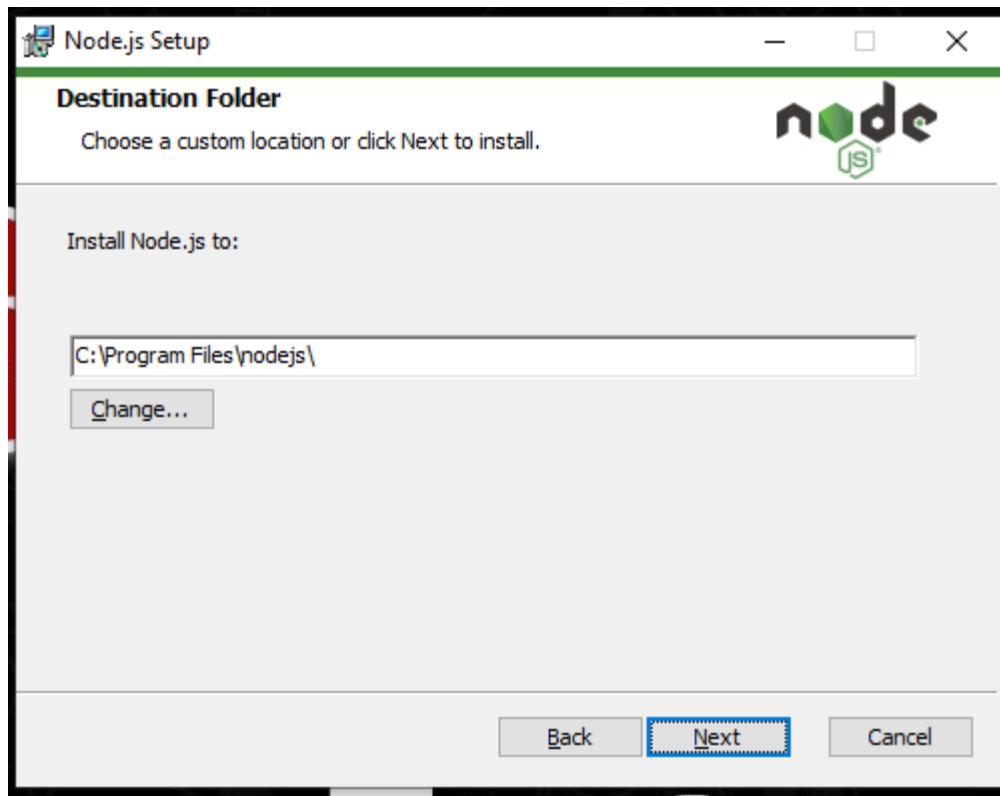
Installation steps :

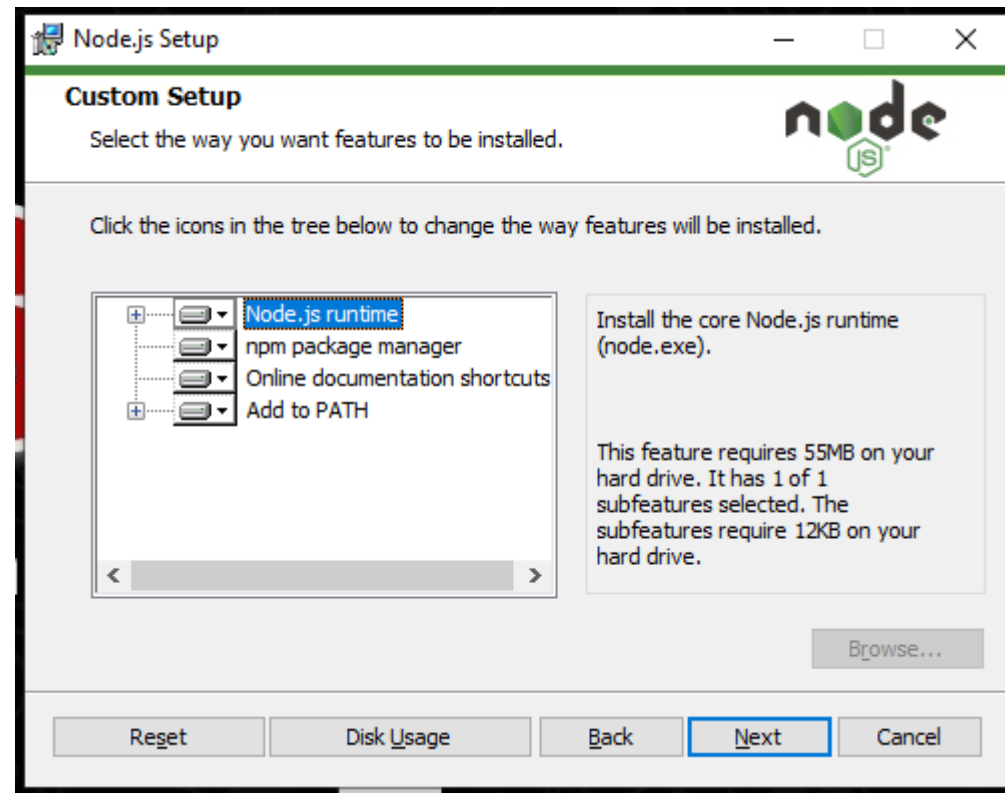
1. Download the installer from the official Node.js site
link : <https://nodejs.org/en/download/> based on your machine **OS**.
2. Run the installer. Follow the installer steps, agree the license agreement and follow the instructions by clicking next button.
3. Restart your system/machine to finish the installation process .
4. Set Path in Environment variable .

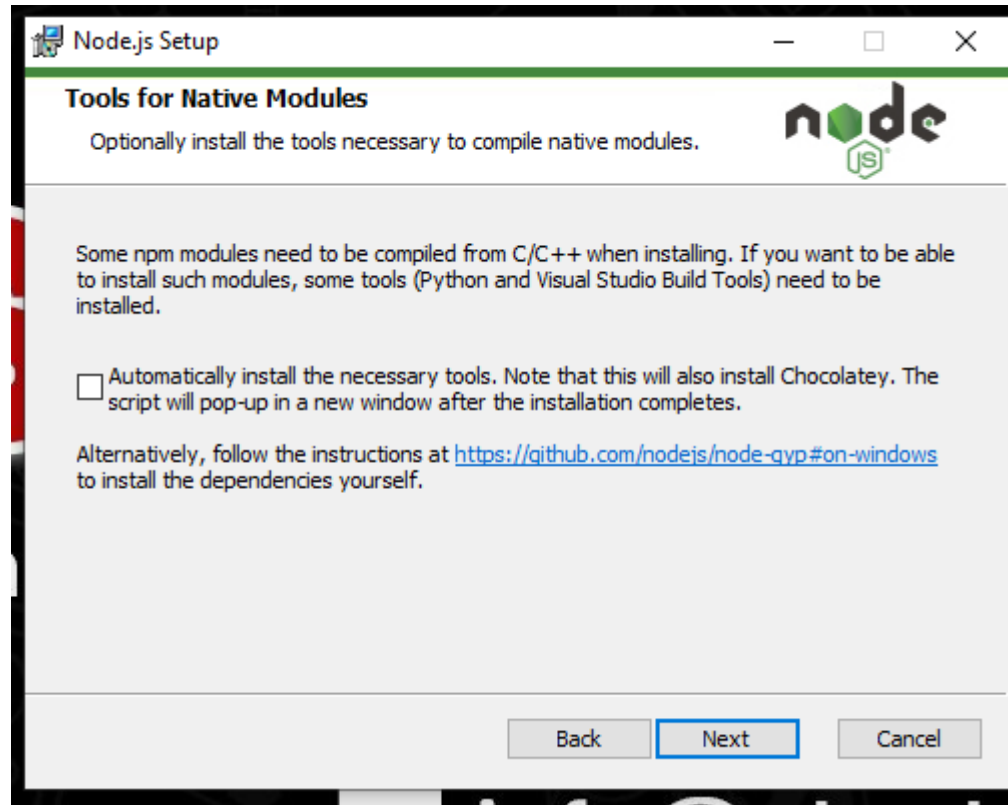


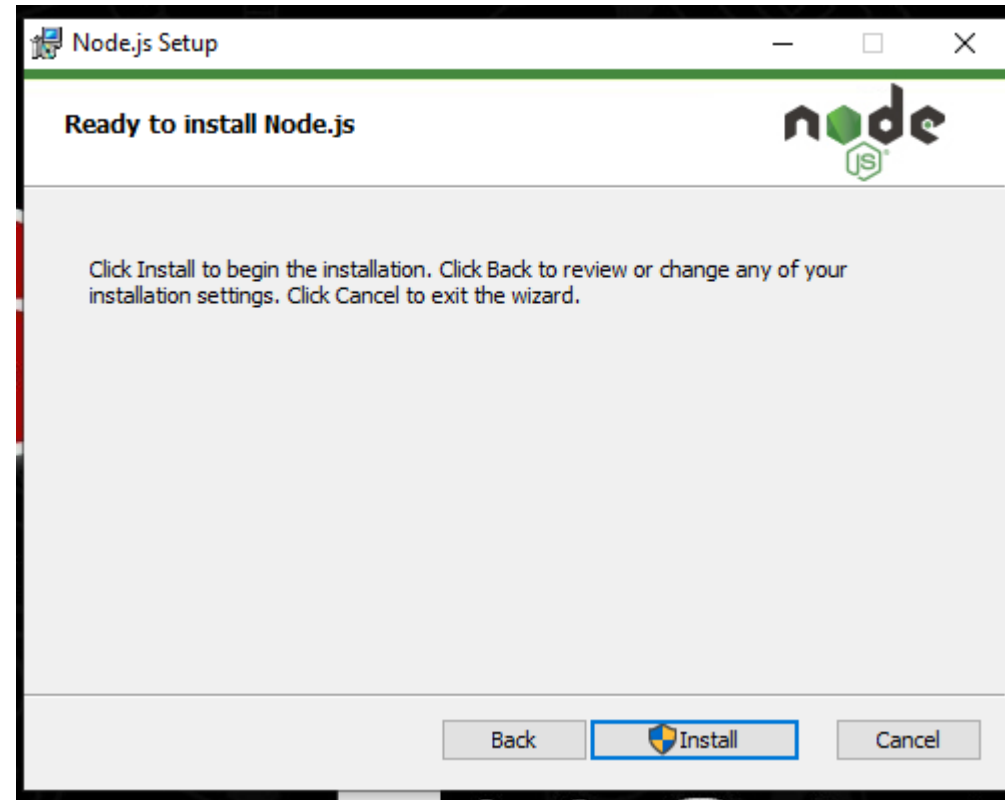


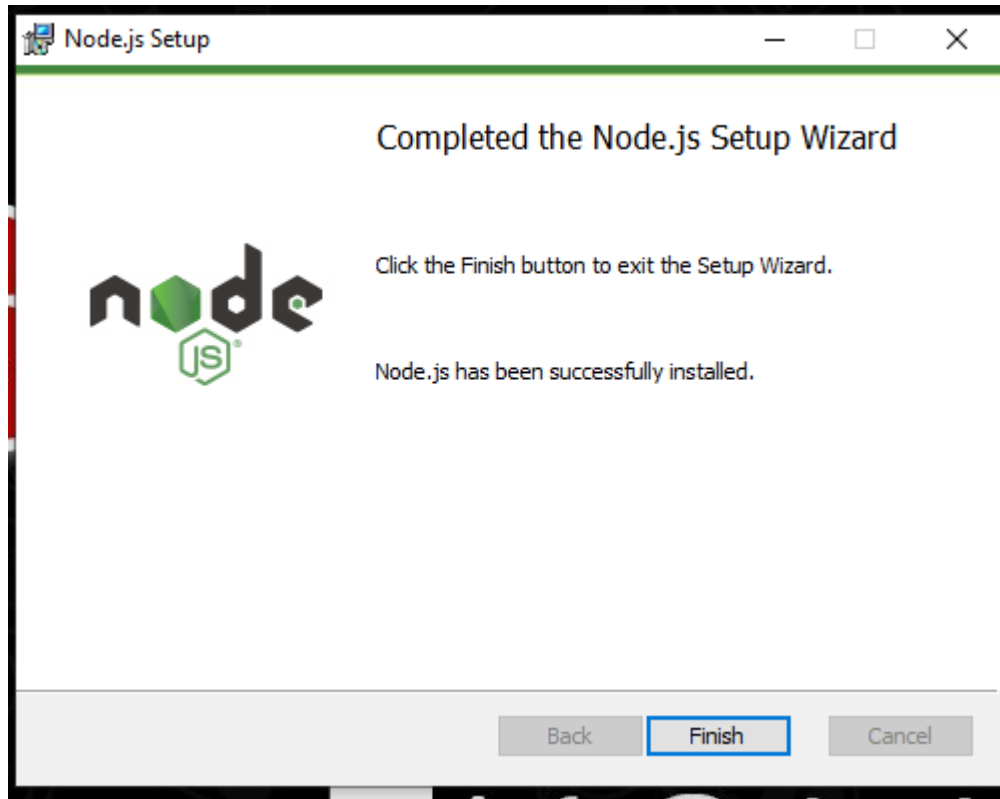












Check Node Version

C:\Windows\system32\cmd.exe

```
C:\Users\akash>node -v  
v16.13.0
```

```
C:\Users\akash>
```



Npm version

```
C:\Users\akash>node -v  
v16.13.0
```

```
C:\Users\akash>npm -v  
8.1.0
```

```
C:\Users\akash>
```



Npx version

C:\Windows\system32\cmd.exe

```
C:\Users\akash>node -v  
v16.13.0
```

```
C:\Users\akash>npm -v  
8.1.0
```

```
C:\Users\akash>npx -v  
8.1.0
```

```
C:\Users\akash>
```





Get Ready for..



Hello World in Node JS



Hello World

- `/* Hello, World! program in node.js */`
- `console.log("Hello, World!")`



How to Run Program

- Open your Favourite editor and Start typing JavaScript.
- Once you are done with your code Save file as.
- "FileName.js"
- To Run file Open Node terminal and type
- `node filename.js`



REPL

- REPL stands for Read Eval Print Loop and it represents a computer environment like a Windows console or Unix/Linux shell where a command is entered and the system responds with an output in an interactive mode.
- Node.js or **Node** comes bundled with a REPL environment. It performs the following tasks –
 - **Read** – Reads user's input, parses the input into JavaScript data-structure, and stores in memory.
 - **Eval** – Takes and evaluates the data structure.
 - **Print** – Prints the result.
 - **Loop** – Loops the above command until the user presses **ctrl-c** twice.



C:\Windows\system32\cmd.exe - node

```
C:\Users\Akash>node
Welcome to Node.js v16.6.1.
Type ".help" for more information.
> 10+10
20
>
```



C:\Windows\system32\cmd.exe - node

```
C:\Users\Akash>node
Welcome to Node.js v16.6.1.
Type ".help" for more information.
> 10+10
20
> "Hello" + "Node JS"
'HelloNode JS'
> var a = 10 , b = 20;
undefined
> a+b
30
> console.log("Welcome");
Welcome
undefined
> for(i=0;i<5;i++){
... console.log(i)
... }
0
1
2
3
4
undefined
```

```
Welcome
undefined
> for(i=0;i<5;i++){
... console.log(i)
... }
0
1
2
3
4
undefined
>
(To exit, press Ctrl+C again or Ctrl+D or type .exit)
>

C:\Users\Akash>
```

node also prints undefined because **IN GENERAL**, it displays the return value of each command and console.log doesn't return anything.



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