Node JS Intro

#Node JS Notes

Introduction To Node Js

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.

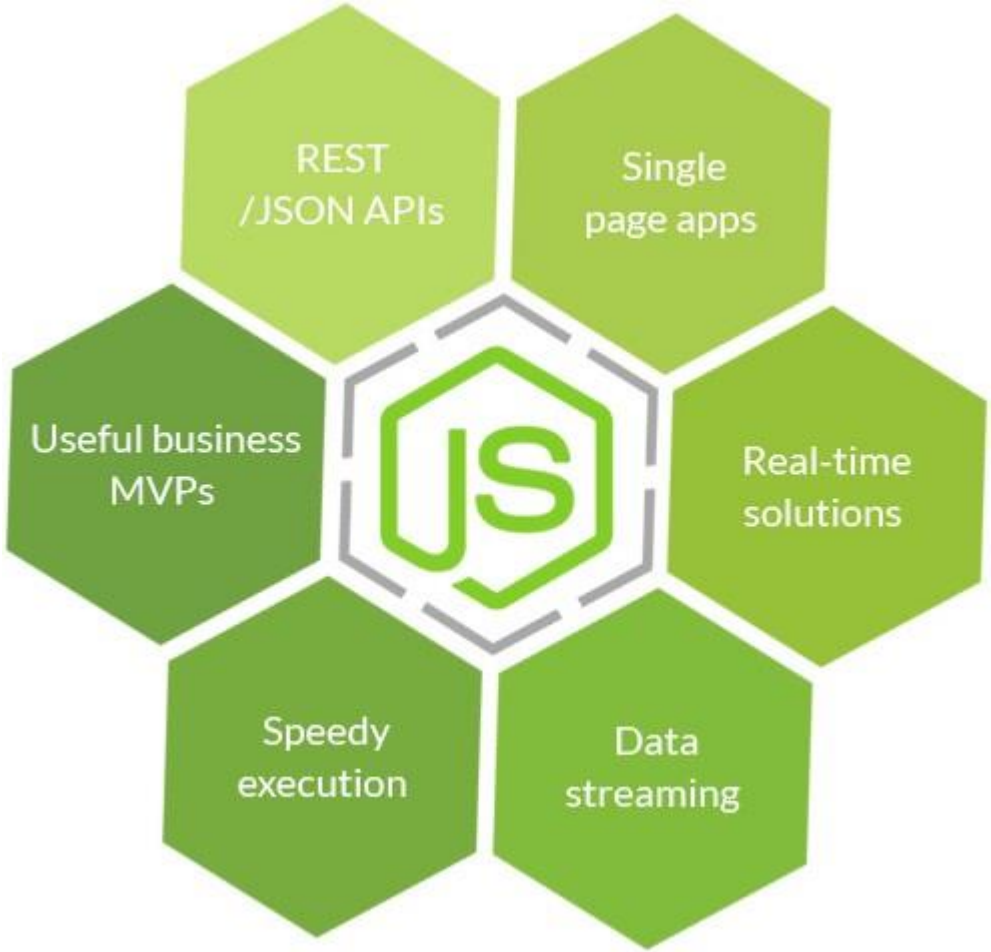
What we can make with Node js ?

- 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


REST
/JSON APIs
Single
page apps
Useful business
MVPs
JS
Real-time
solutions
Speedy
execution
Data
streaming

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

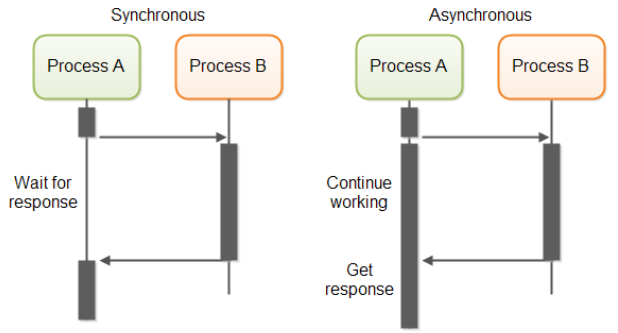
- **Application Programming Interface (API) is Not Stable**
- Lack of developers on the market since it is relatively new

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

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

total.js

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

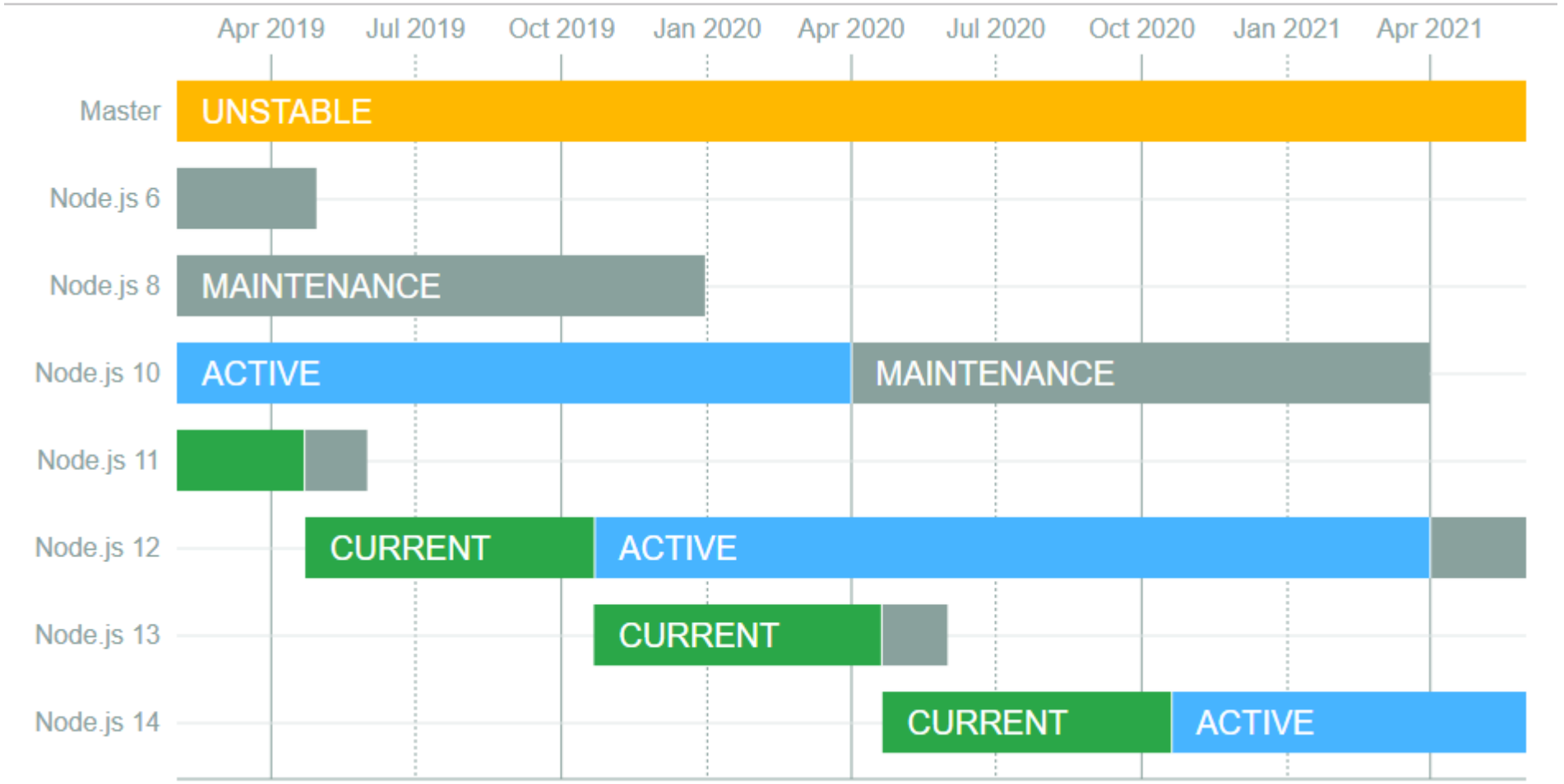
Differences between npm and npx:

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.

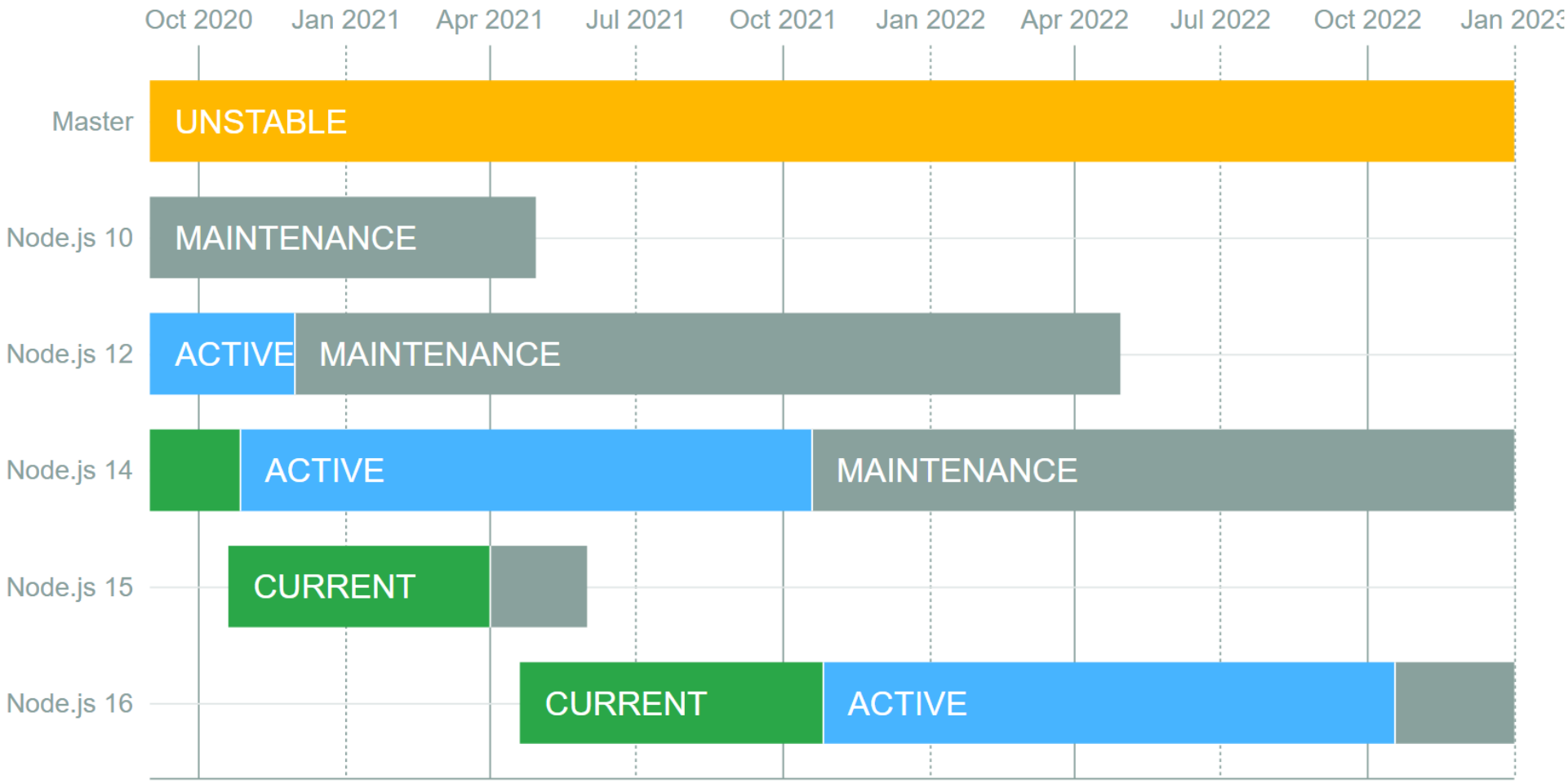
Node JS Version

- Latest LTS Version : 14.X.**X** (includes npm 6.X.X)
  - **Long Term Support**
- Latest Current Version : 16.X.X (includes npm 7.X.X)

Node JS Version History



Node js 15 - 16

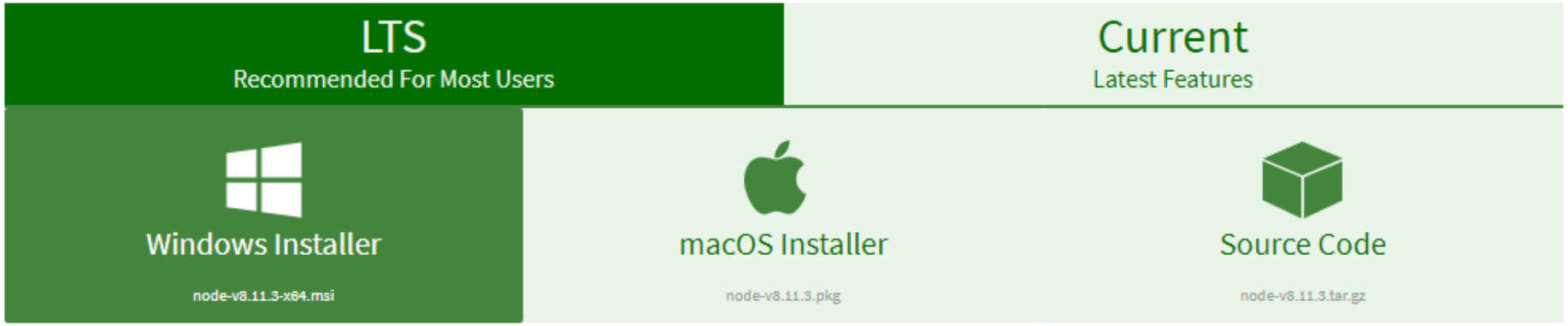

Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Master
UNSTABLE
Node.js 10
MAINTENANCE
Node.js 12
ACTIVE
MAINTENANCE
Node.js 14
ACTIVE
MAINTENANCE
Node.js 15
CURRENT
Node.js 16
CURRENT
ACTIVE

Release	Status	Codename	Initial Release	Active LTS Start	Maintenance LTS Start	End-of-life
v10	Maintenance LTS	Dubnium	2018-04-24	2018-10-30	2020-05-19	2021-04-30
v12	Maintenance LTS	Erbium	2019-04-23	2019-10-21	2020-11-30	2022-04-30
v14	Active LTS	Fermium	2020-04-21	2020-10-27	2021-10-19	2023-04-30
v15	Current		2020-10-20		2021-04-01	2021-06-01
v16	Pending		2021-04-20	2021-10-26	2022-10-18	2024-04-30

Download Node JS

https://nodejs.org/en/download

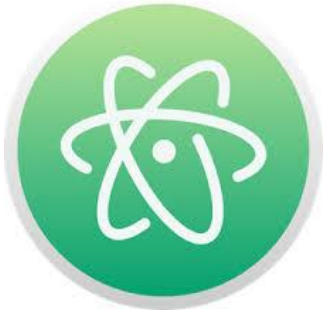
https://nodejs.org/dist/



Windows Installer (.msi)	32-bit	64-bit	
Windows Binary (.zip)	32-bit	64-bit	
macOS Installer (.pkg)	64-bit		
macOS Binary (.tar.gz)	64-bit		
Linux Binaries (x86/x64)	32-bit	64-bit	
Linux Binaries (ARM)	ARMv6	ARMv7	ARMv8
Source Code	node-v8.11.3.tar.gz		

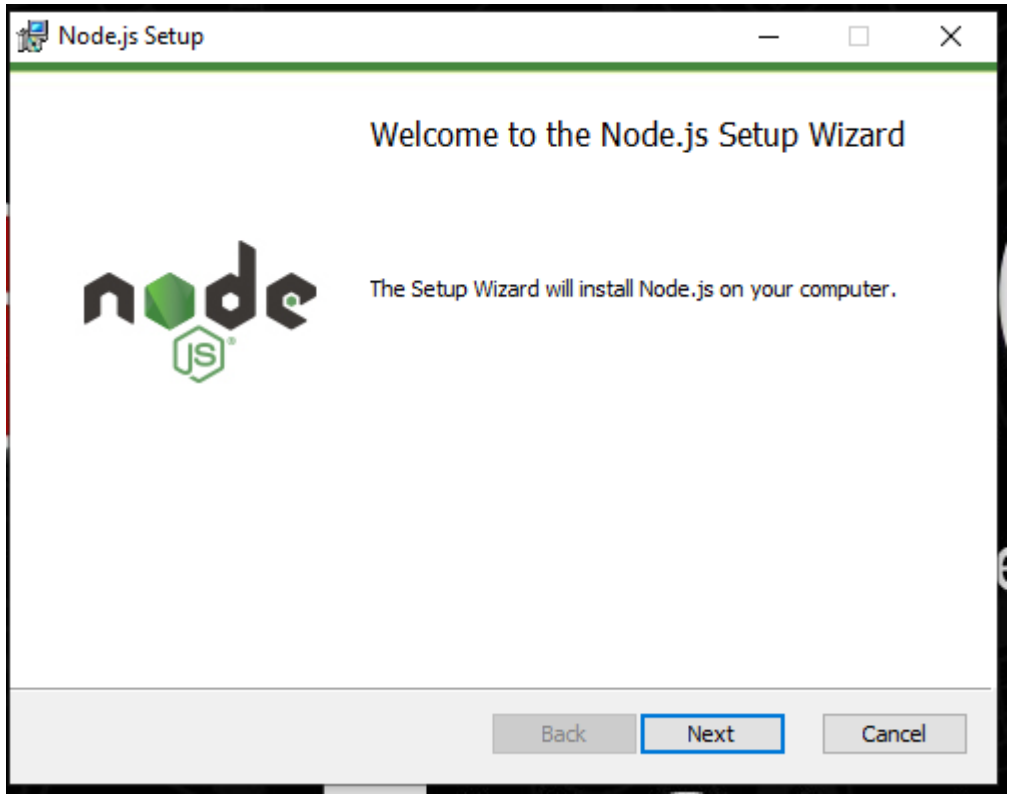
Editor

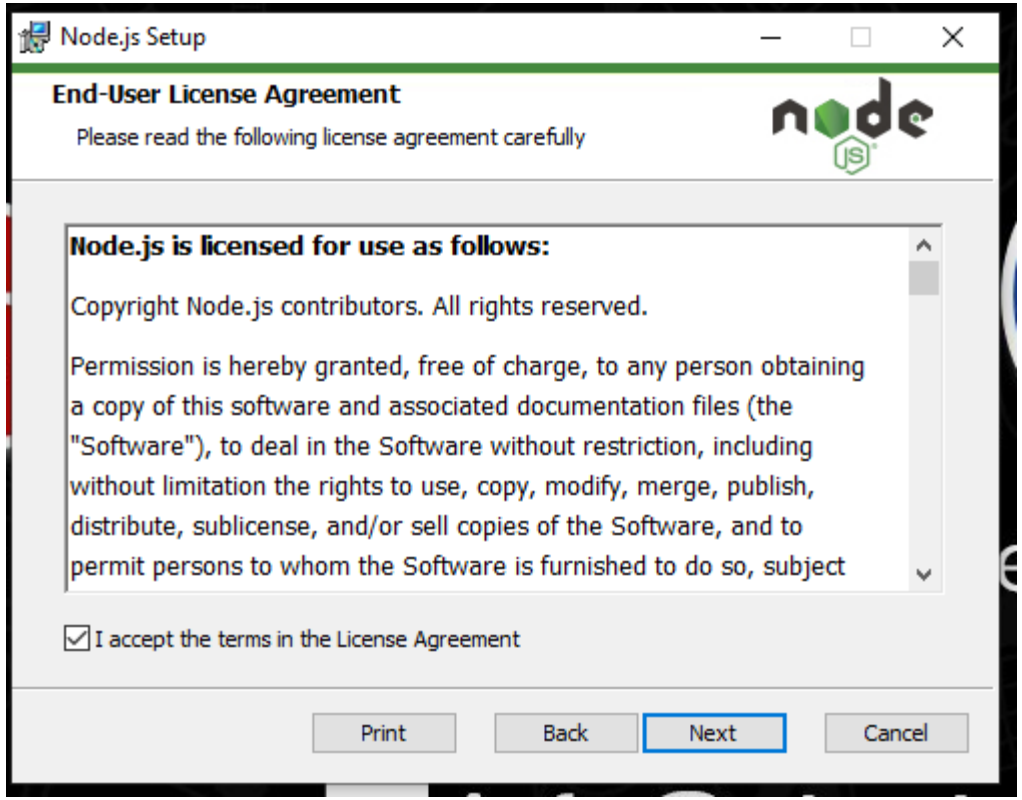
- Visual Studio Code Editor
- Sublime Editor
- Atom Editor
- WebStorm IDE

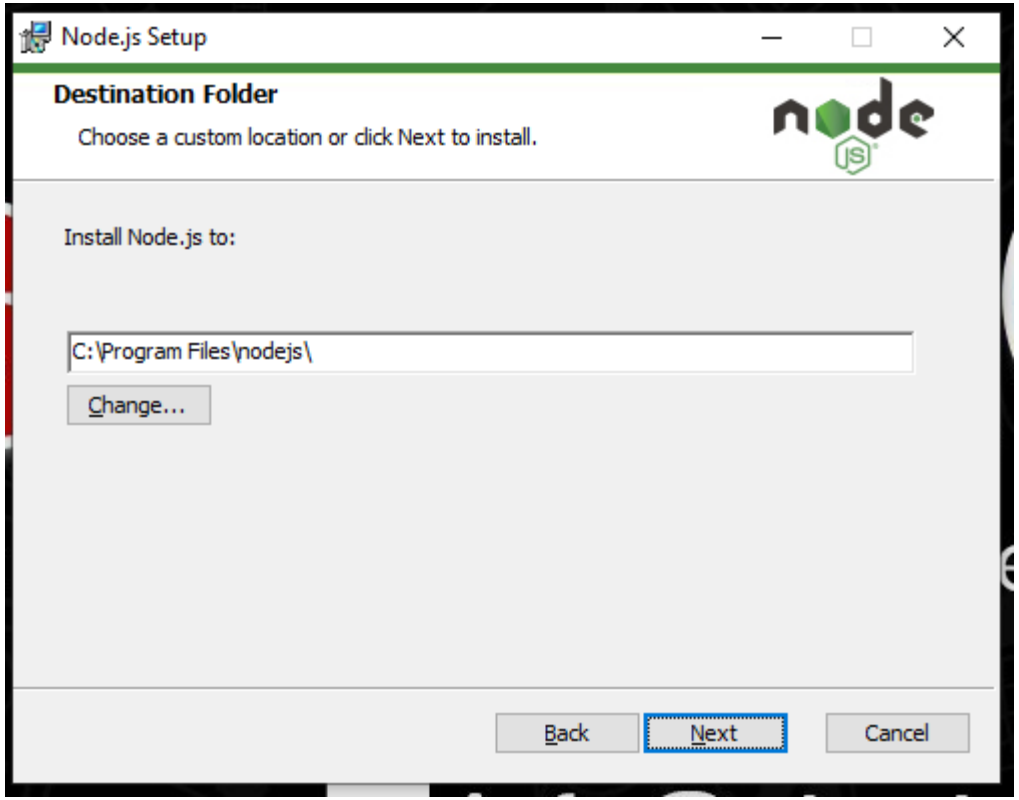


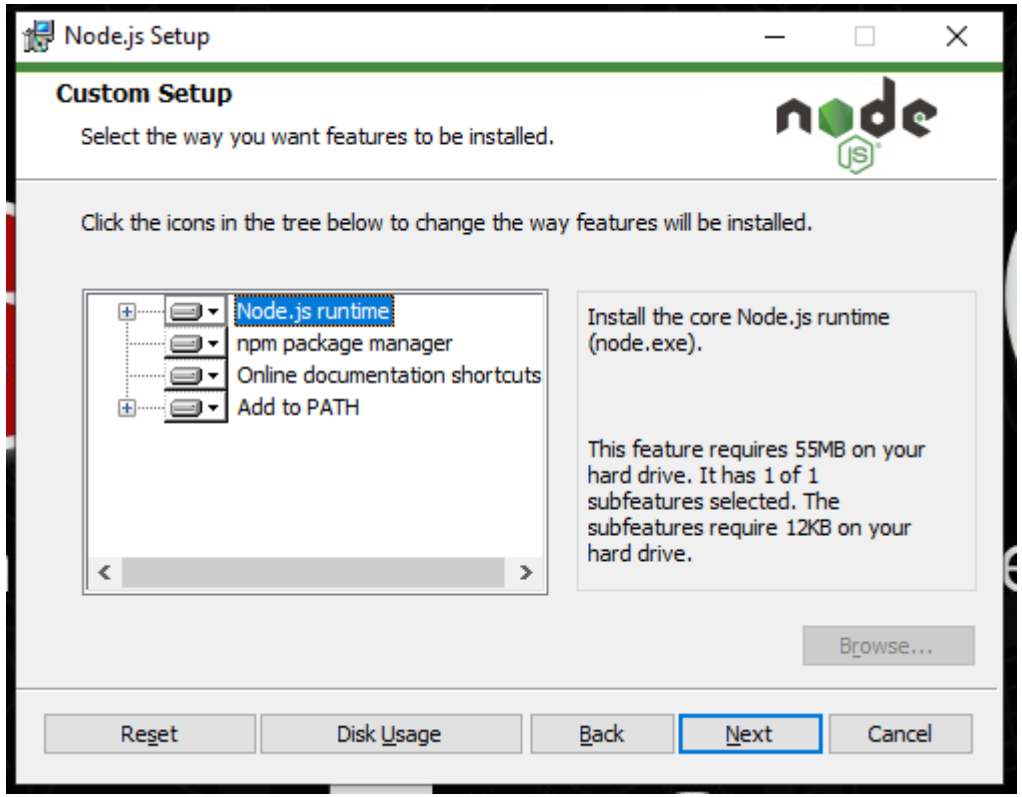
Installation steps :

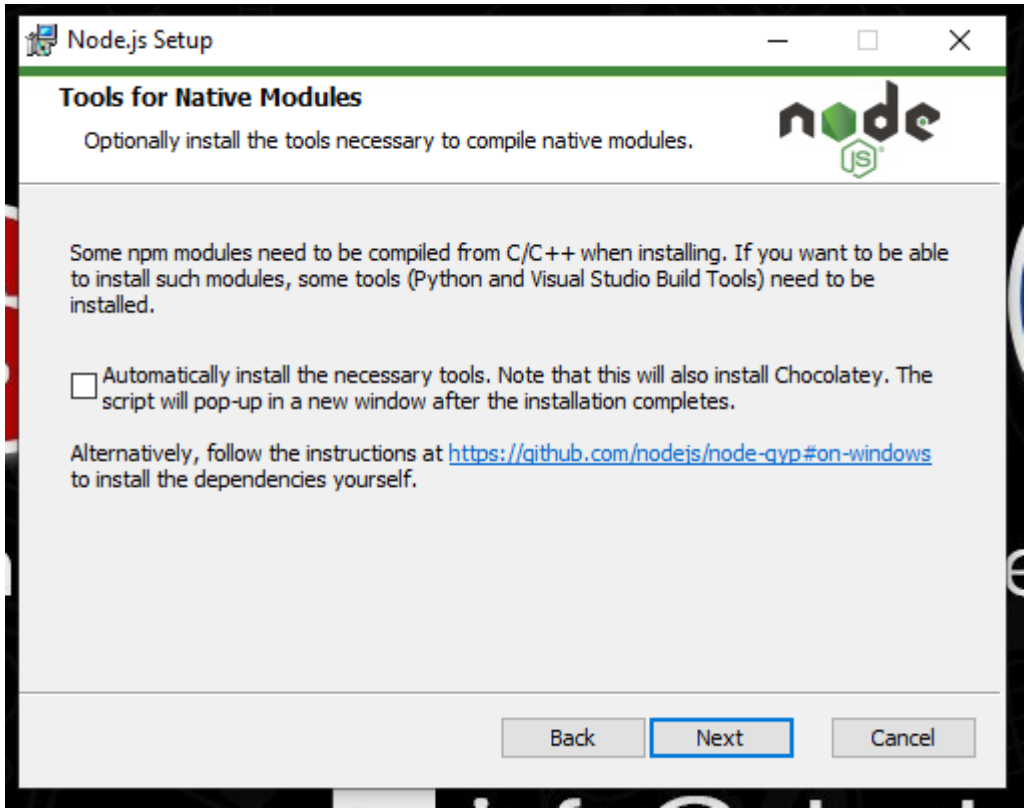
1. Download the installer from the official Node.js site link : https://nodejs.org/en/download/ based on your machine **OS.**
2. Run the installer. Follow the installer steps, agree the license agreement and follow the instructions by clicking next button.
3. Restart your system/machine to finish the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

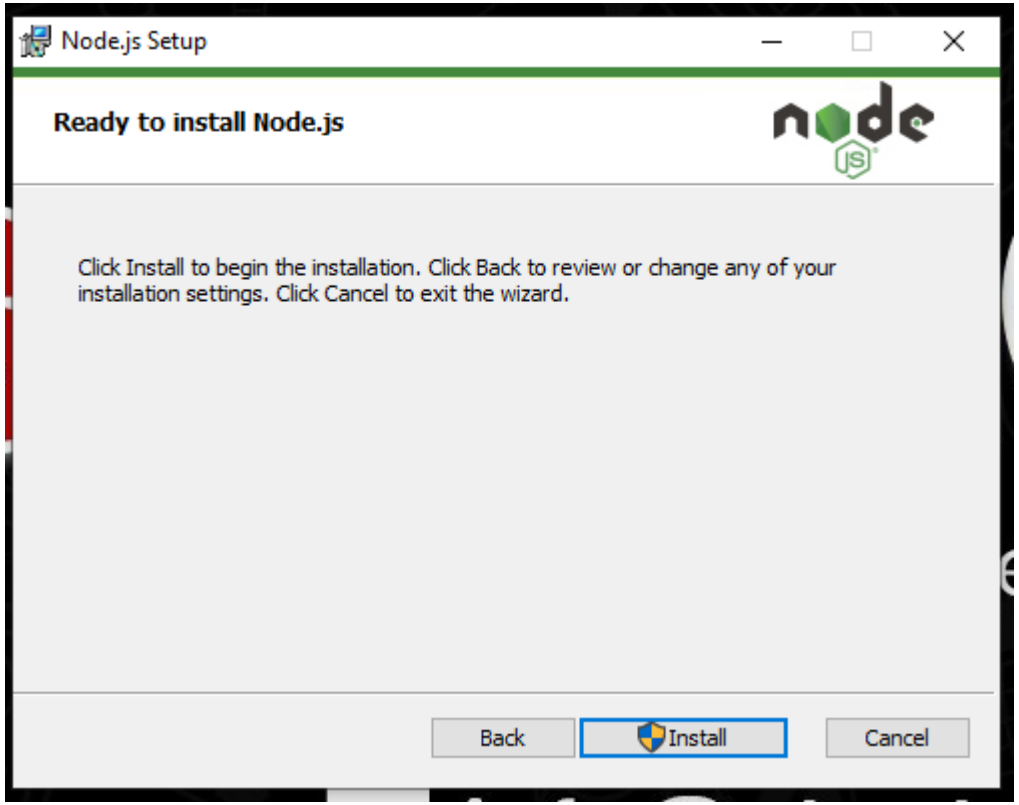

Node.js Setup
Welcome to the Node.js Setup Wizard
The Setup Wizard will install Node.js on your computer.
Back
Next
Cancel

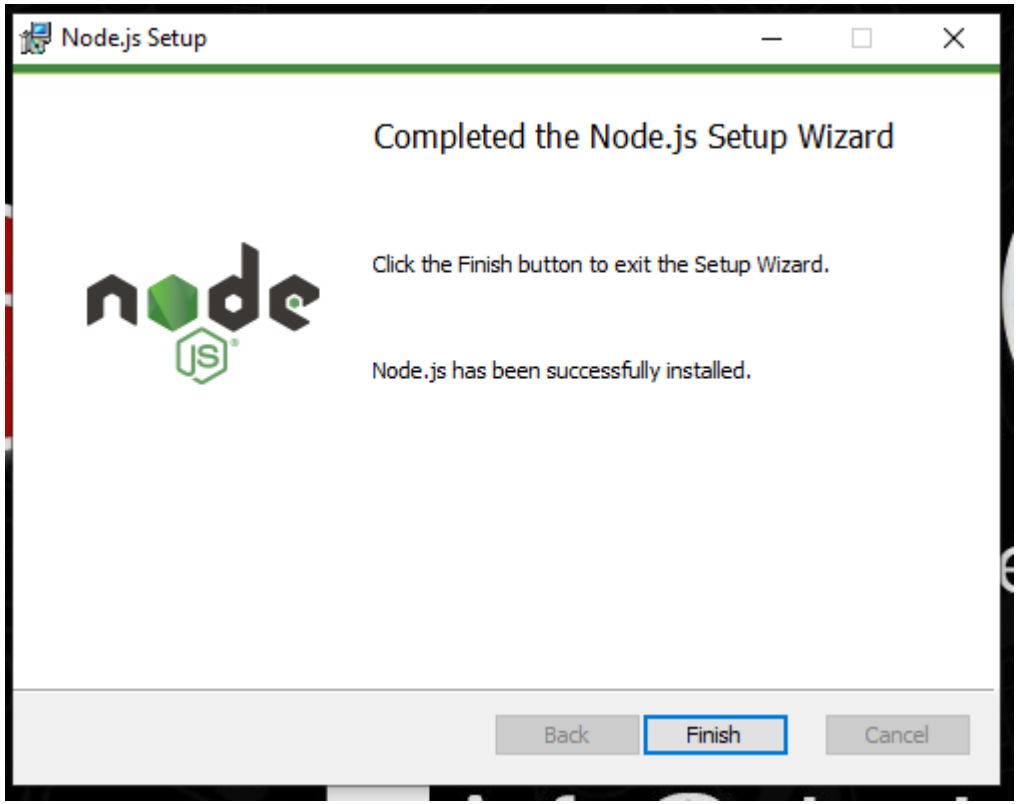

Node.js Setup
End-User License Agreement
Please read the following license agreement carefully
Node.js is licensed for use as follows:
Copyright Node.js contributors. All rights reserved.
Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject
I accept the terms in the License Agreement
Print
Back
Next
Cancel


Node.js Setup
Destination Folder
Choose a custom location or click Next to install.
Install Node.js to:
C:\Program Files\nodejs\
Change...
Back
Next
Cancel

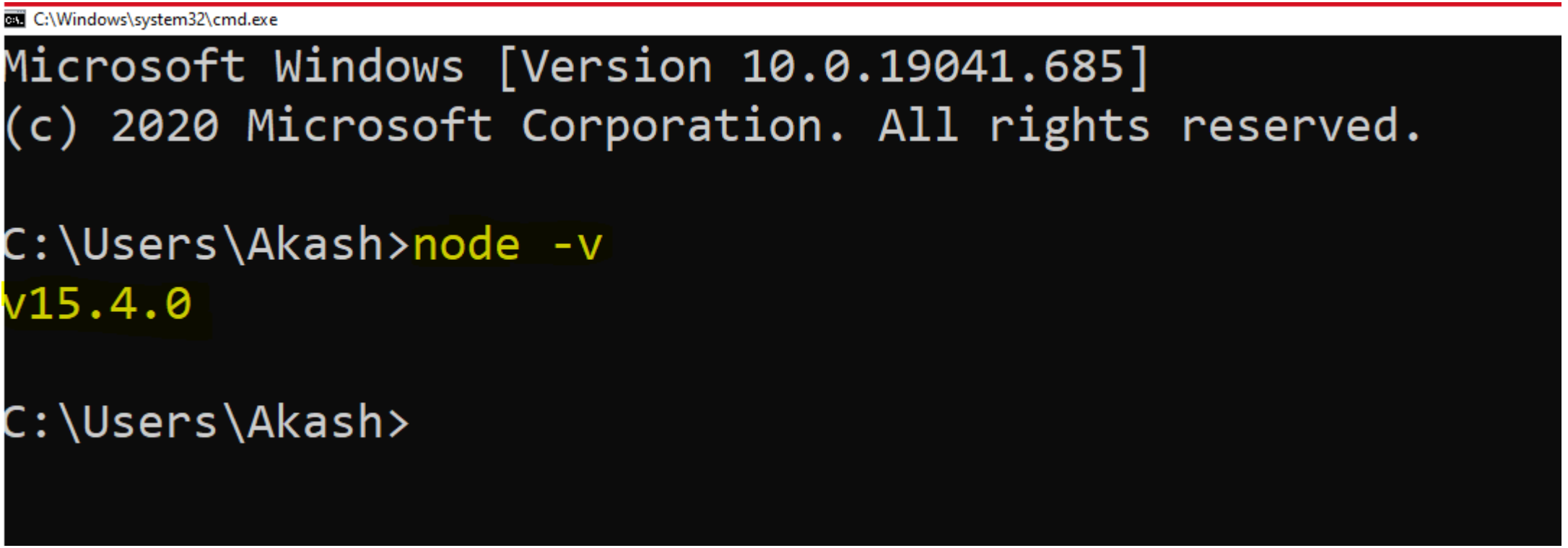

Node.js Setup
Custom Setup
Select the way you want features to be installed.
Click the icons in the tree below to change the way features will be installed.
Node.js runtime
npm package manager
Online documentation shortcuts
Add to PATH
Install the core Node.js runtime (node.exe).
This feature requires 55MB on your hard drive. It has 1 of 1 subfeatures selected. The subfeatures require 12KB on your hard drive.
Browse...
Reset
Disk Usage
Back
Next
Cancel


Node.js Setup
Tools for Native Modules
Optionally install the tools necessary to compile native modules.
Some npm modules need to be compiled from C/C++ when installing. If you want to be able to install such modules, some tools (Python and Visual Studio Build Tools) need to be installed.
Automatically install the necessary tools. Note that this will also install Chocolatey. The script will pop-up in a new window after the installation completes.
Alternatively, follow the instructions at https://github.com/nodejs/node-gyp#on-windows to install the dependencies yourself.
Back
Next
Cancel

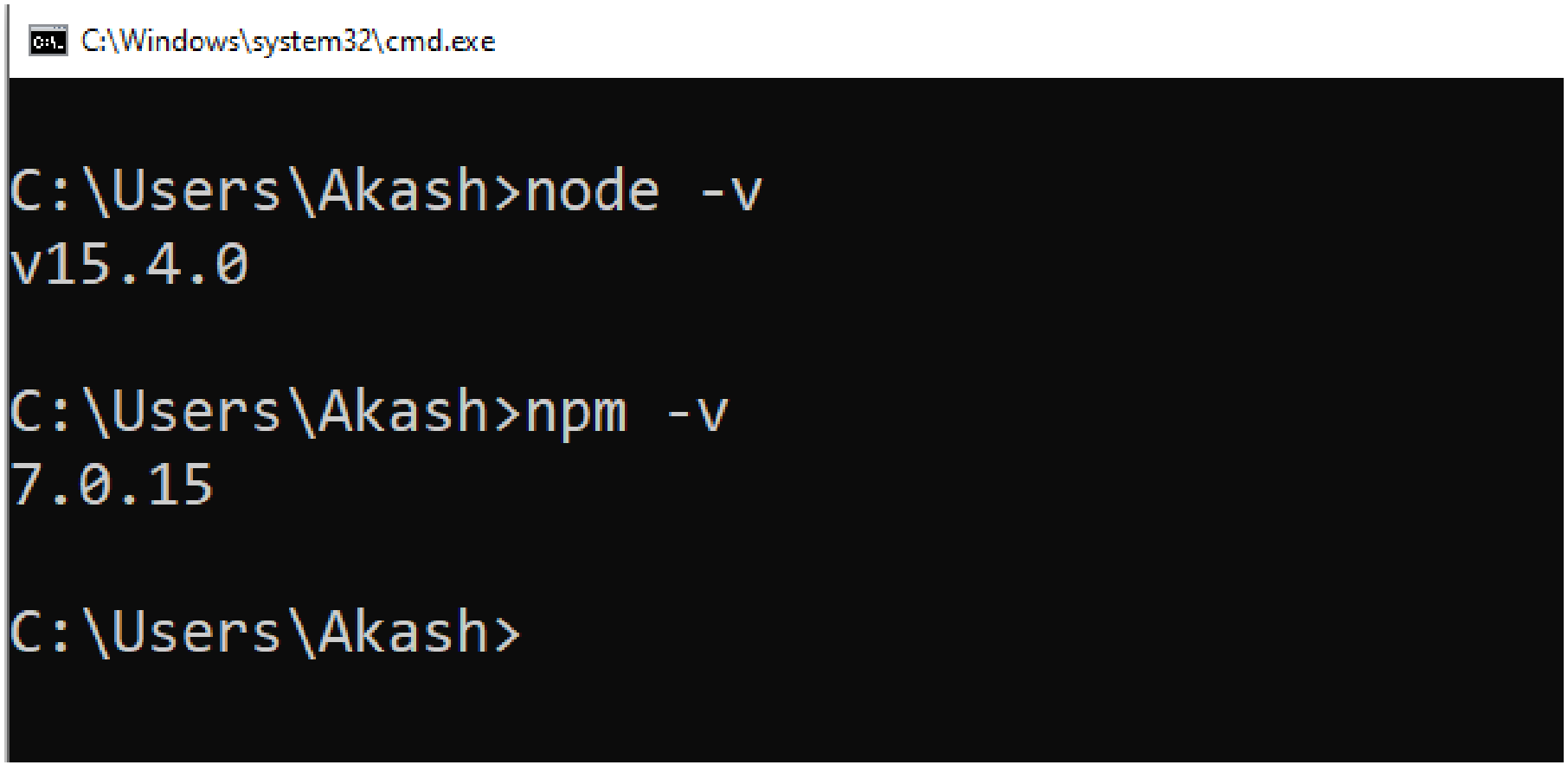

Node.js Setup
Ready to install Node.js
Click Install to begin the installation. Click Back to review or change any of your installation settings. Click Cancel to exit the wizard.
Back
Install
Cancel


Node.js Setup
Completed the Node.js Setup Wizard
Click the Finish button to exit the Setup Wizard.
Node.js has been successfully installed.
Back
Finish
Cancel

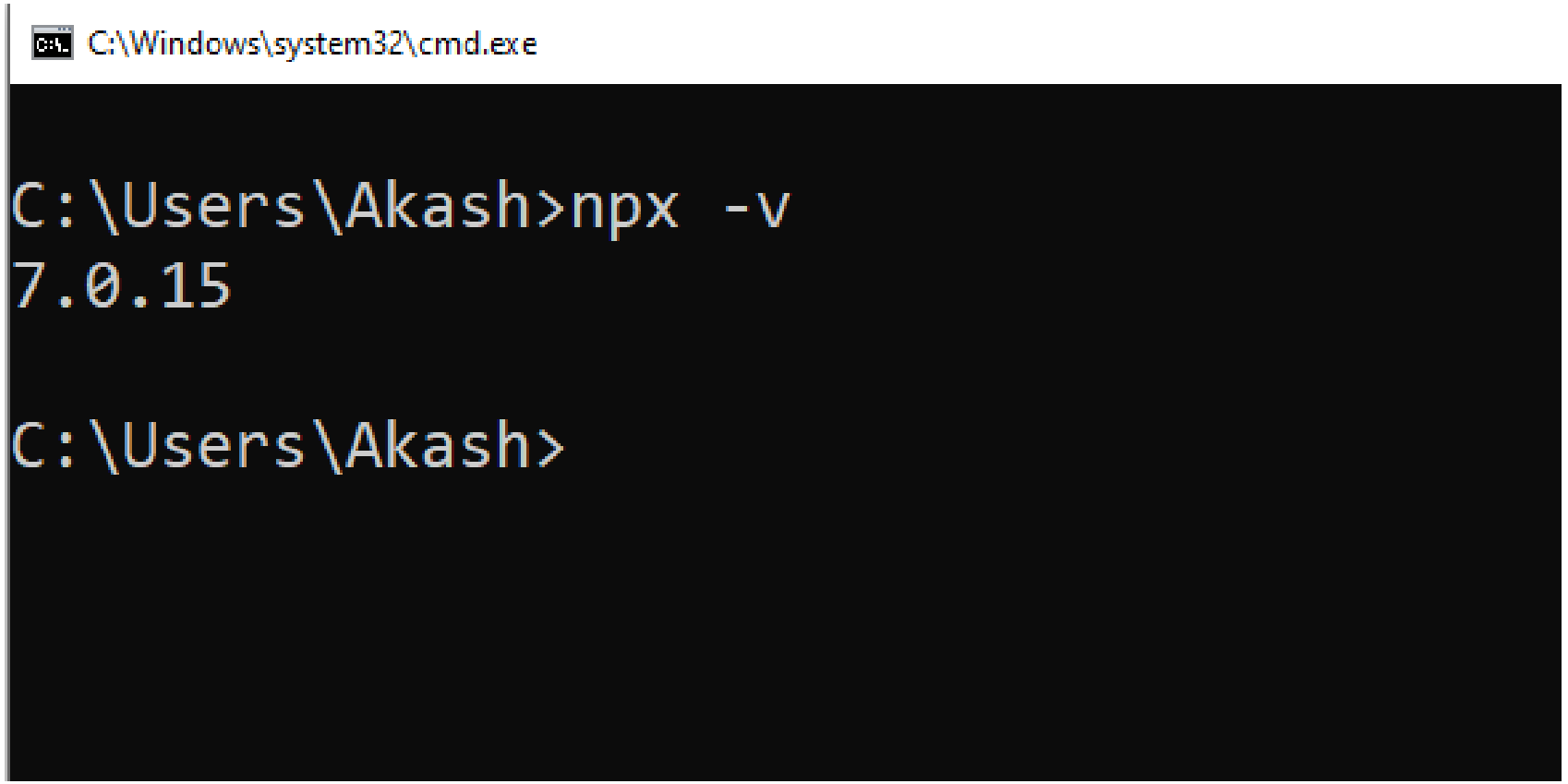
Check Node Version



Npm version


C:\Windows\system32\cmd.exe
C:\Users\Akash>node -v
v15.4.0
C:\Users\Akash>npm -v
7.0.15
C:\Users\Akash>

Npx version


C:\Windows\system32\cmd.exe
C:\Users\Akash>npx -v
7.0.15
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"

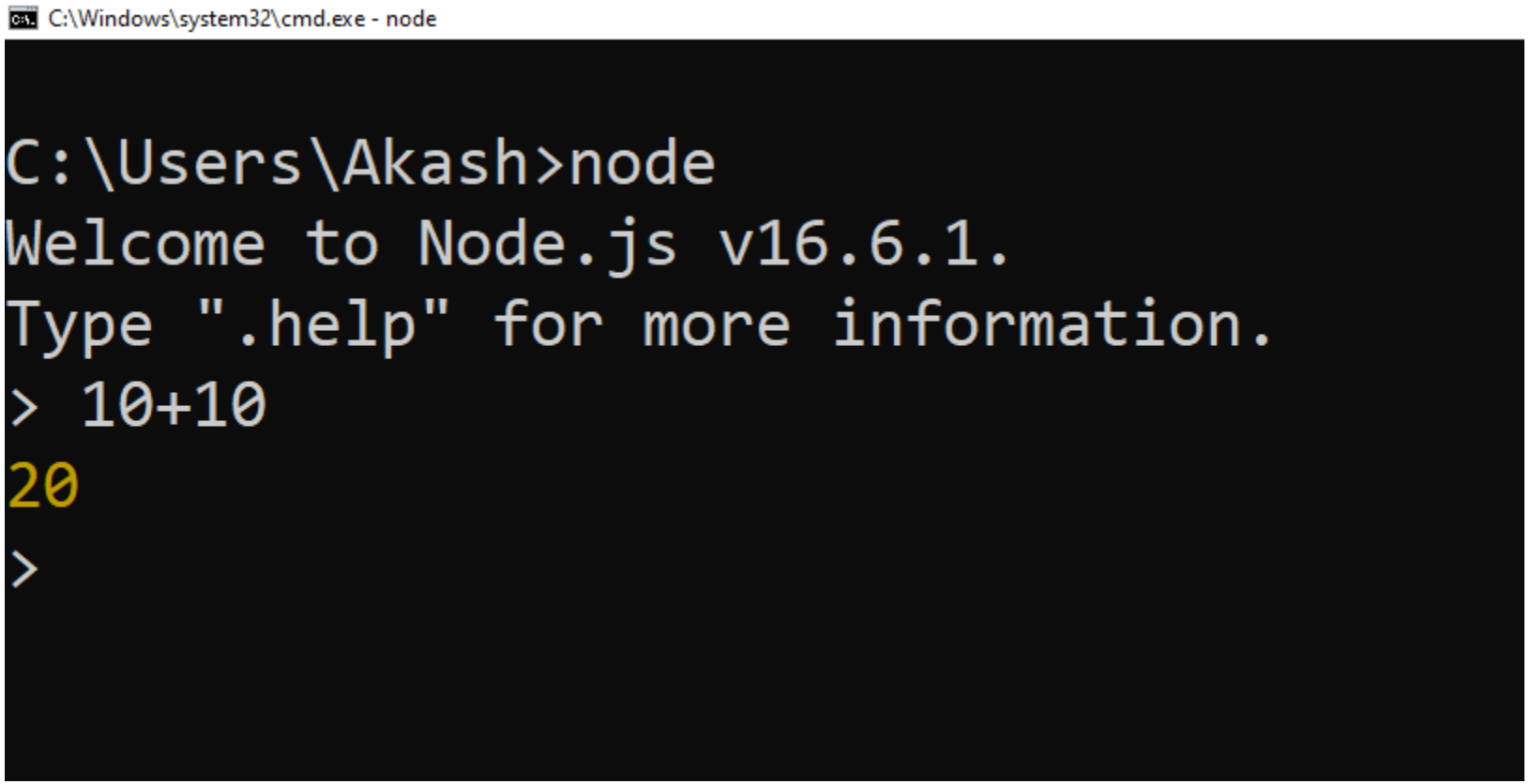
- To Run file Open Node terminal and type

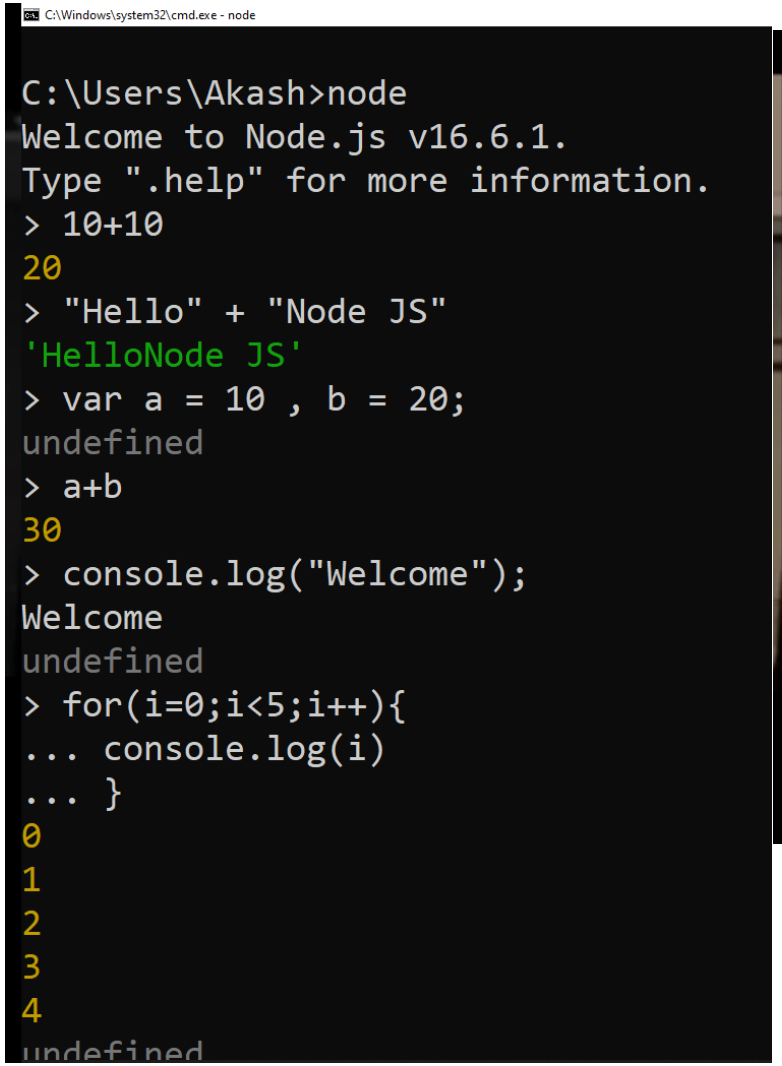
- node filename.js

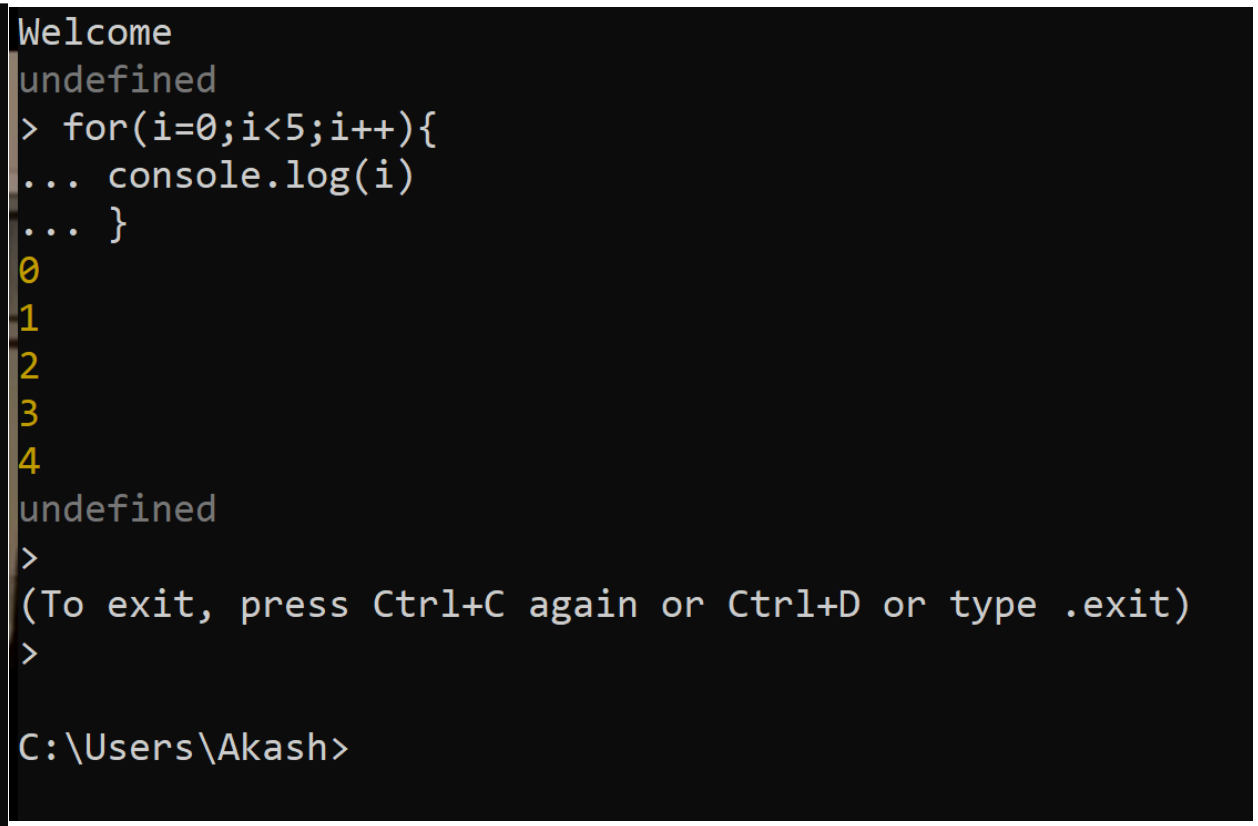
REPL

- 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
>





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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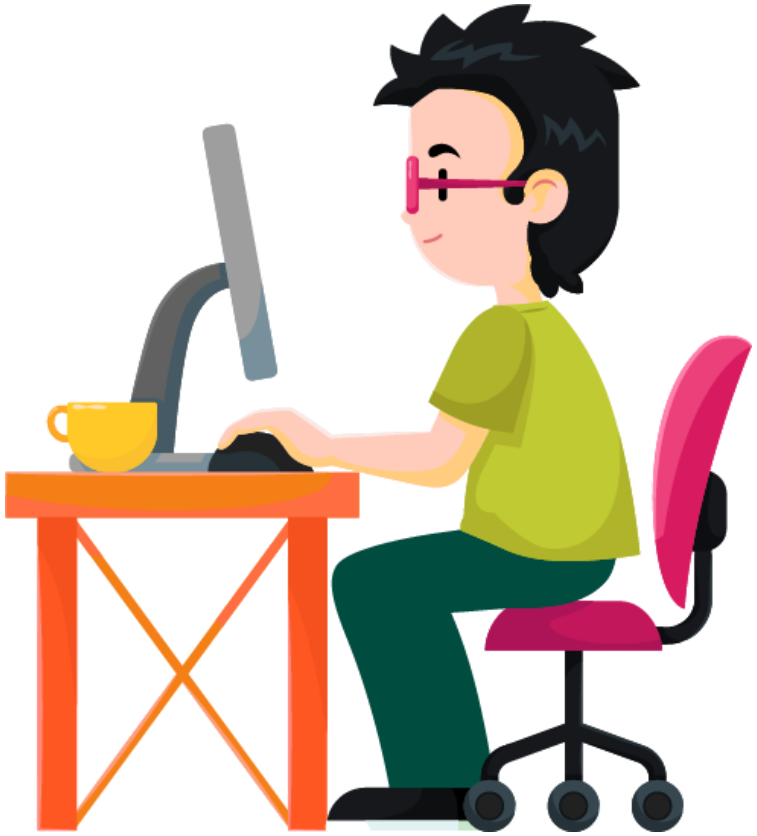

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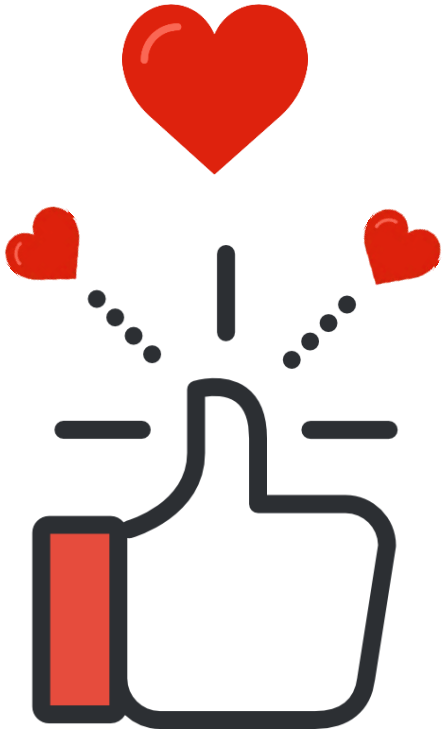
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