Installing Node.js

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Helping developers get started with JavaScript

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Node.js

A JavaScript runtime built on Google's open source V8 engine that can execute programs outside a browser on Windows, Mac, and Linux.
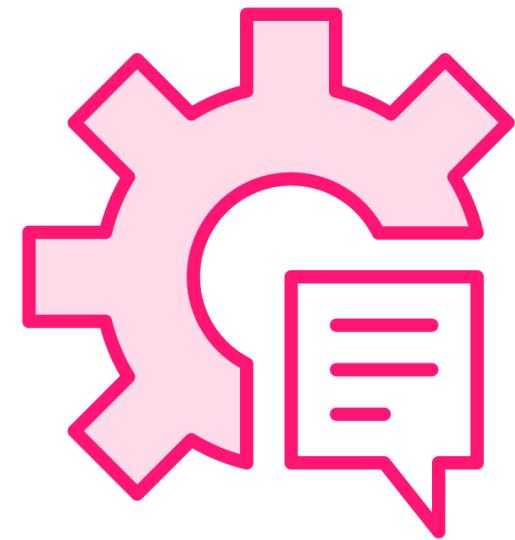
npm
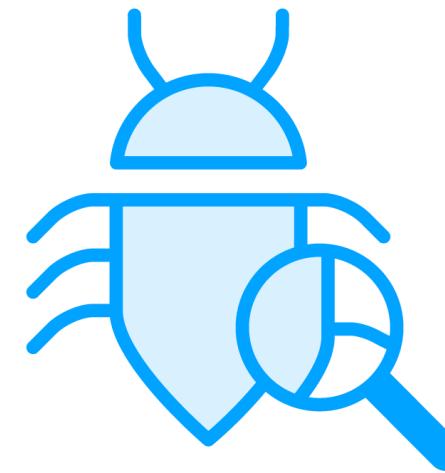
Node.js provides a package manager called the Node Package Manager or "npm" to manage third-party code dependencies.
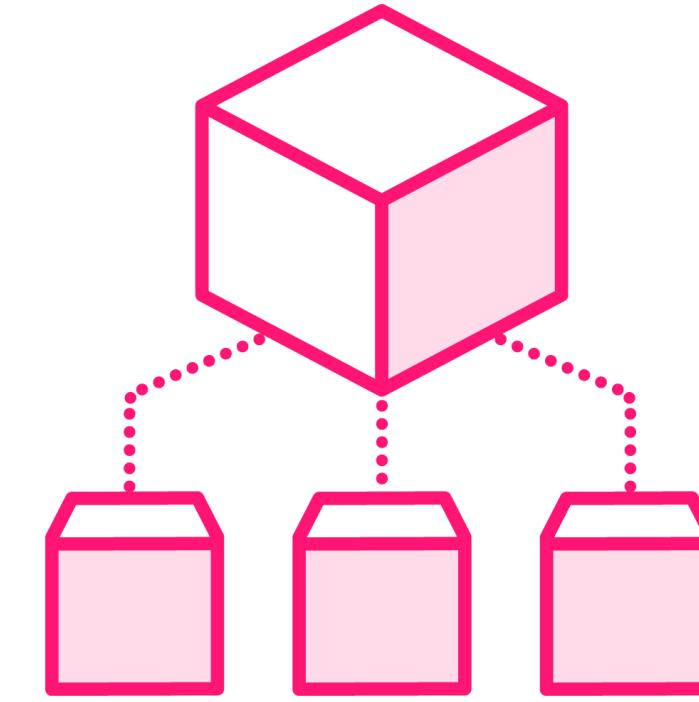
How IDEs Take Advantage of Node.js
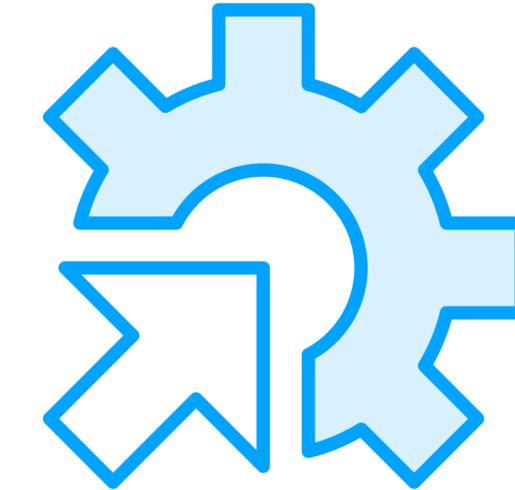
Language tools

Debugging tools
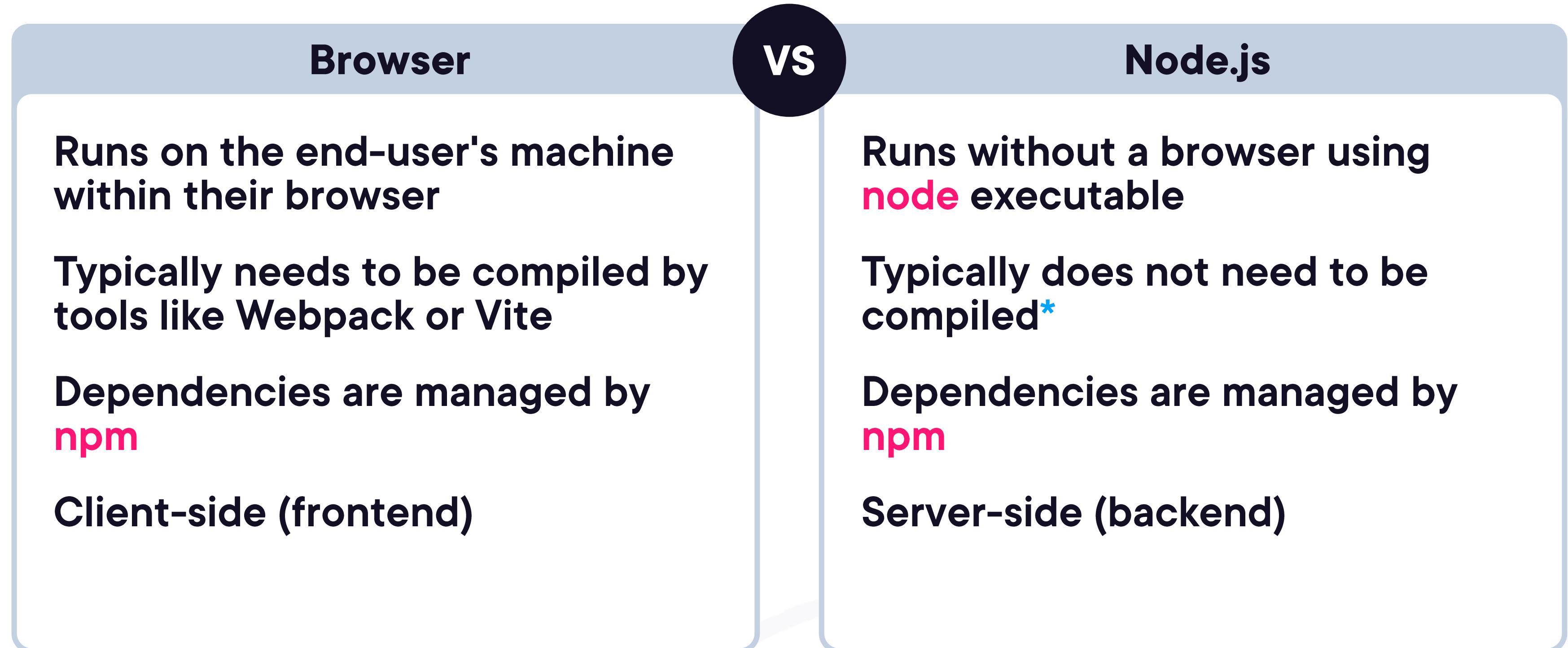
Package tools
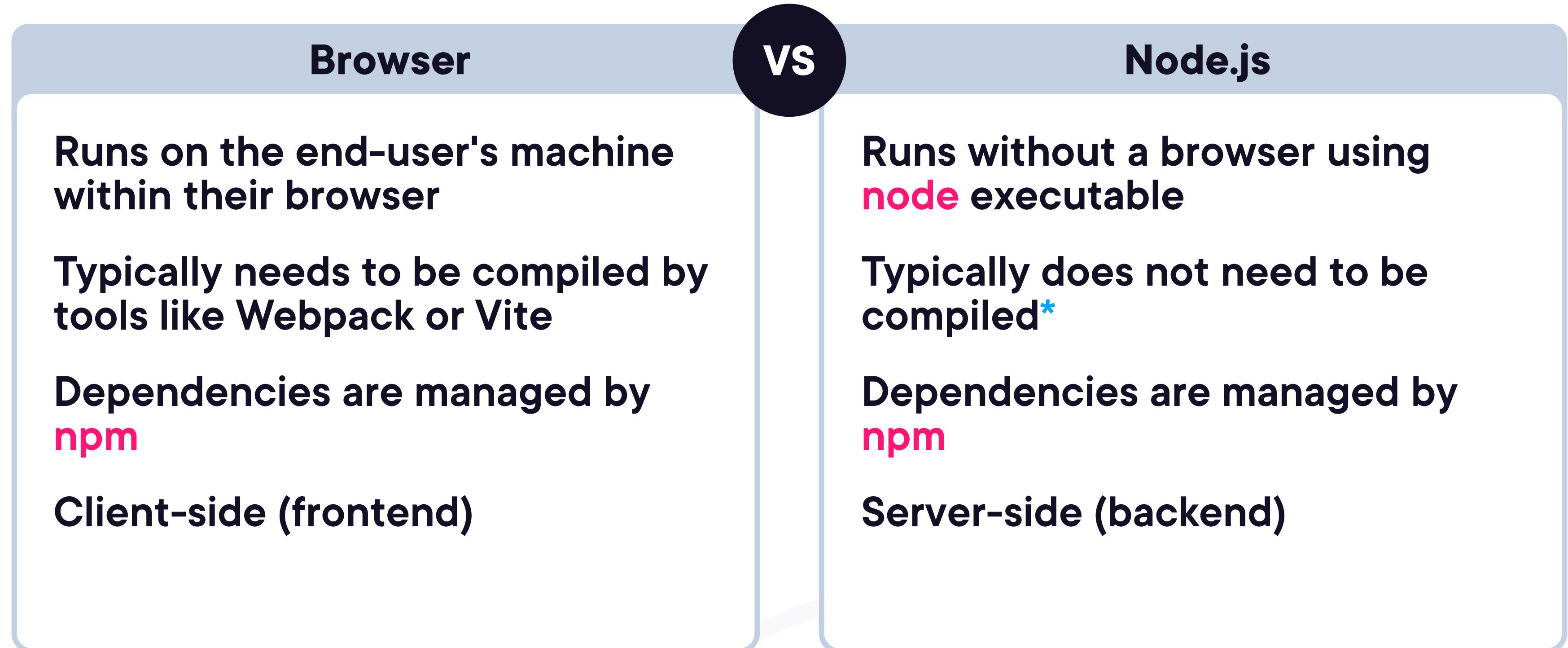
Task runners and scripts

How Different Runtimes Compare

Browser	VS	Node.js
Runs on the end-user's machine within their browser		Runs without a browser using **node** executable
Typically needs to be compiled by tools like Webpack or Vite		Typically does not need to be compiled*
Dependencies are managed by **npm**		Dependencies are managed by **npm**
Client-side (frontend)		Server-side (backend)

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Client-side (frontend)		Server-side (backend)

* TypeScript and C++ bindings need to be compiled to JavaScript to run in Node.js

See learning path:

Working with Node.js

pluralsight.com/paths/working-with-nodejs

Windows Installation Step-by-step

Walkthrough

Install Node.js and npm on Windows

Download Installer
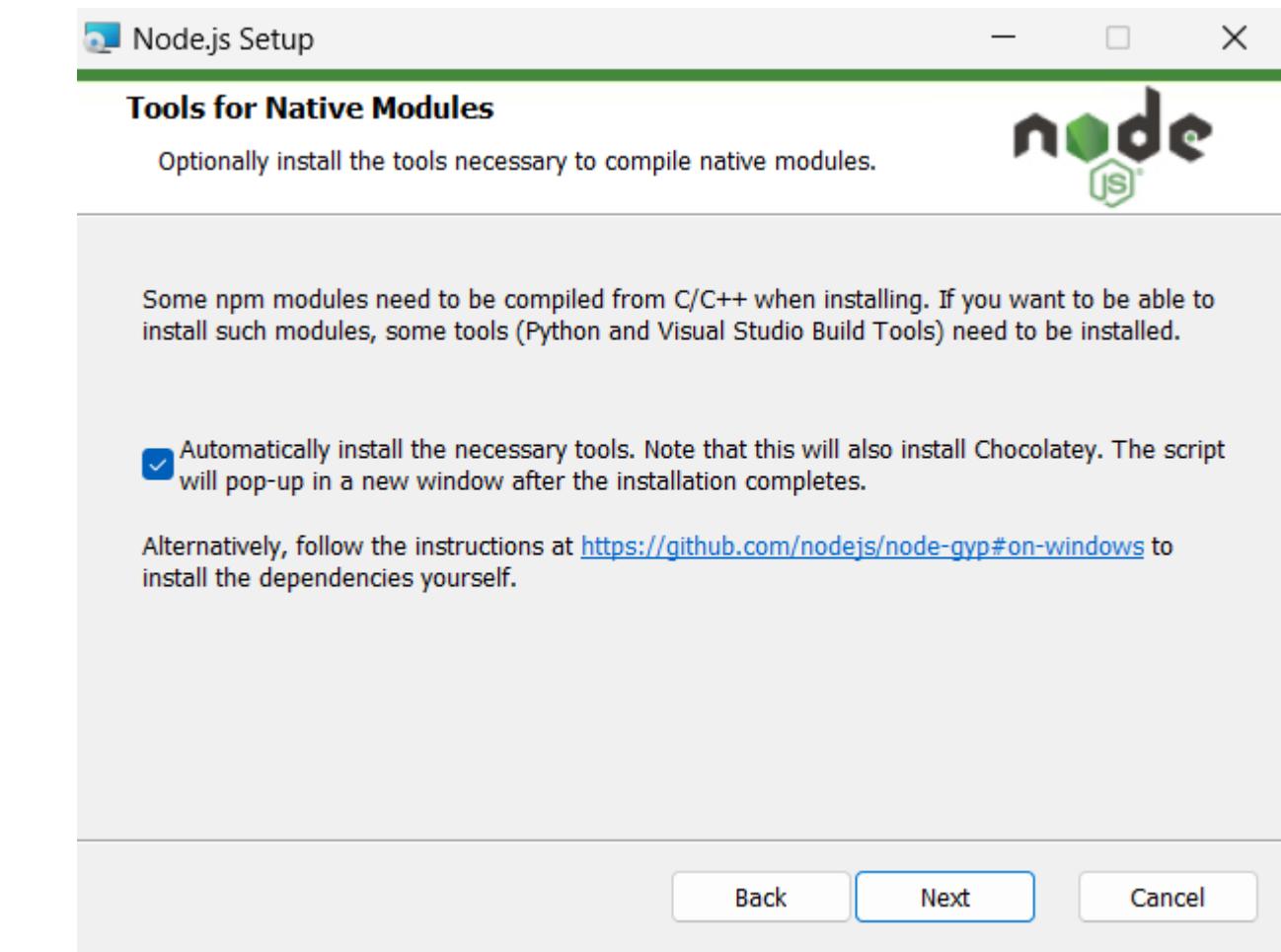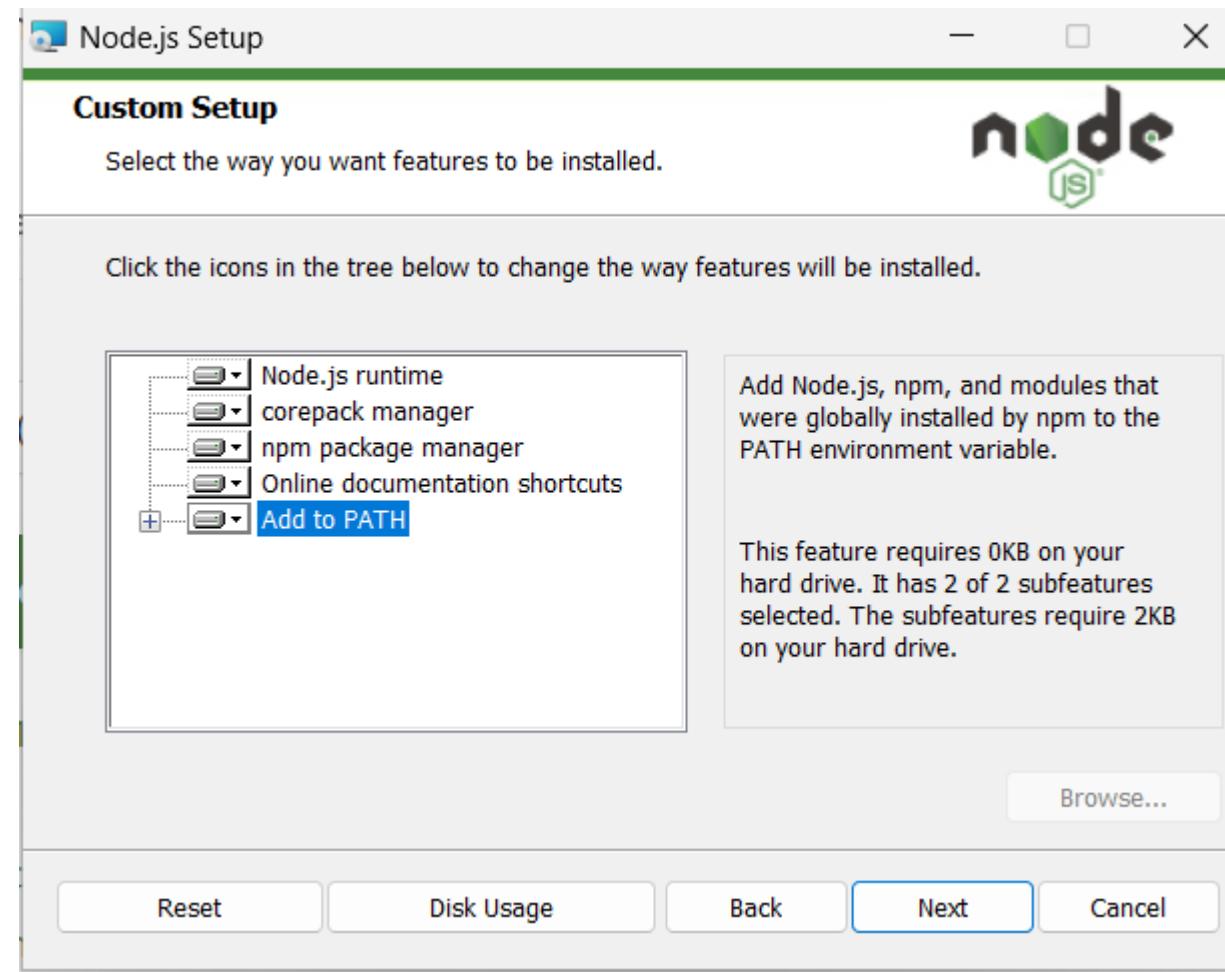
Go Through Installation Process

Go Through Installation Process

For additional help, see:

Troubleshooting Installation Issues

Installation Resources

Download Node.js
https://nodejs.org/en/download

nvm: Node Version Manager for Windows
https://github.com/coreybutler/nvm-windows

Install with Package Manager
https://nodejs.org/en/download/package-manager

Mac Installation Step-by-step

Walkthrough

Install Node.js and npm on Mac

Download Installer

Go Through Installation Process

For additional help, see:

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Installation Resources

Download Node.js
https://nodejs.org/en/download

nvm: Node Version Manager for Mac and Linux
https://github.com/nvm-sh/nvm

Install with Package Manager
https://nodejs.org/en/download/package-manager

Verifying Node.js Installation

```
node -v

npm -v
```

Demo: Node Version

For additional help, see:

Troubleshooting Installation Issues

```
node -v

npm -v
```

Demo: Node Version

```
node
> console.log("Hello Pluralsight!")
Hello Pluralsight!
undefined
```

Demo: Node REPL

```
ls

cat index.js

node index.js
```

Demo: Execute JS files

Troubleshooting Installation Issues

Troubleshooting

Install native build tools manually

Fix node or npm command not being found

Fix too many open files error

Fix JavaScript heap out of memory error

Tips for using Node.js on WSL

Make Sure Your System Is Ready

Sufficient disk space

Antivirus software

Network connectivity

Firewall rules

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Installing Native Build Tools Manually

On Windows

Install tools with Chocolatey:

```
choco install python visualstudio2022-workload-vctools -y
```

Or install and configure Python and Visual Studio tools manually:

- Install the current version of Python from the Microsoft Store.

- Install Visual C++ Build Environment: For Visual Studio 2019 or later, use the `Desktop development with C++` workload from Visual Studio Community. For a version older than Visual Studio 2019, install Visual Studio Build Tools with the `Visual C++ build tools` option.

If the above steps didn't work for you, please visit Microsoft's Node.js Guidelines for Windows for additional tips.

To target native ARM64 Node.js on Windows on ARM, add the components "Visual C++ compilers and libraries for ARM64" and "Visual C++ ATL for ARM64".

To use the native ARM64 C++ compiler on Windows on ARM, ensure that you have Visual Studio 2022 17.4 or later installed.

It's advised to install following Powershell module: VSSetup using `Install-Module VSSetup -Scope CurrentUser`. This will make Visual Studio detection logic to use more flexible and accessible method, avoiding Powershell's `ConstrainedLanguage` mode.
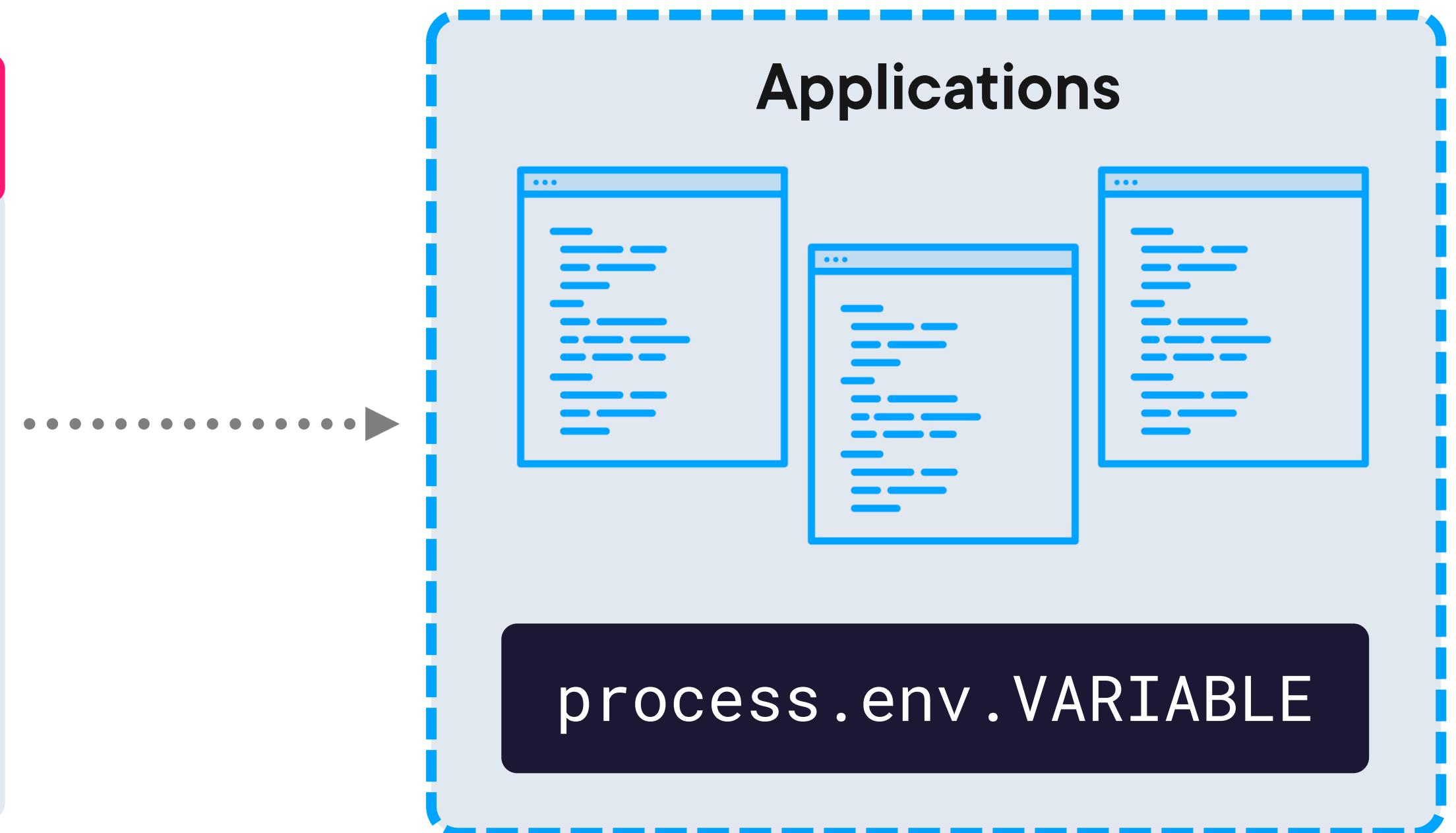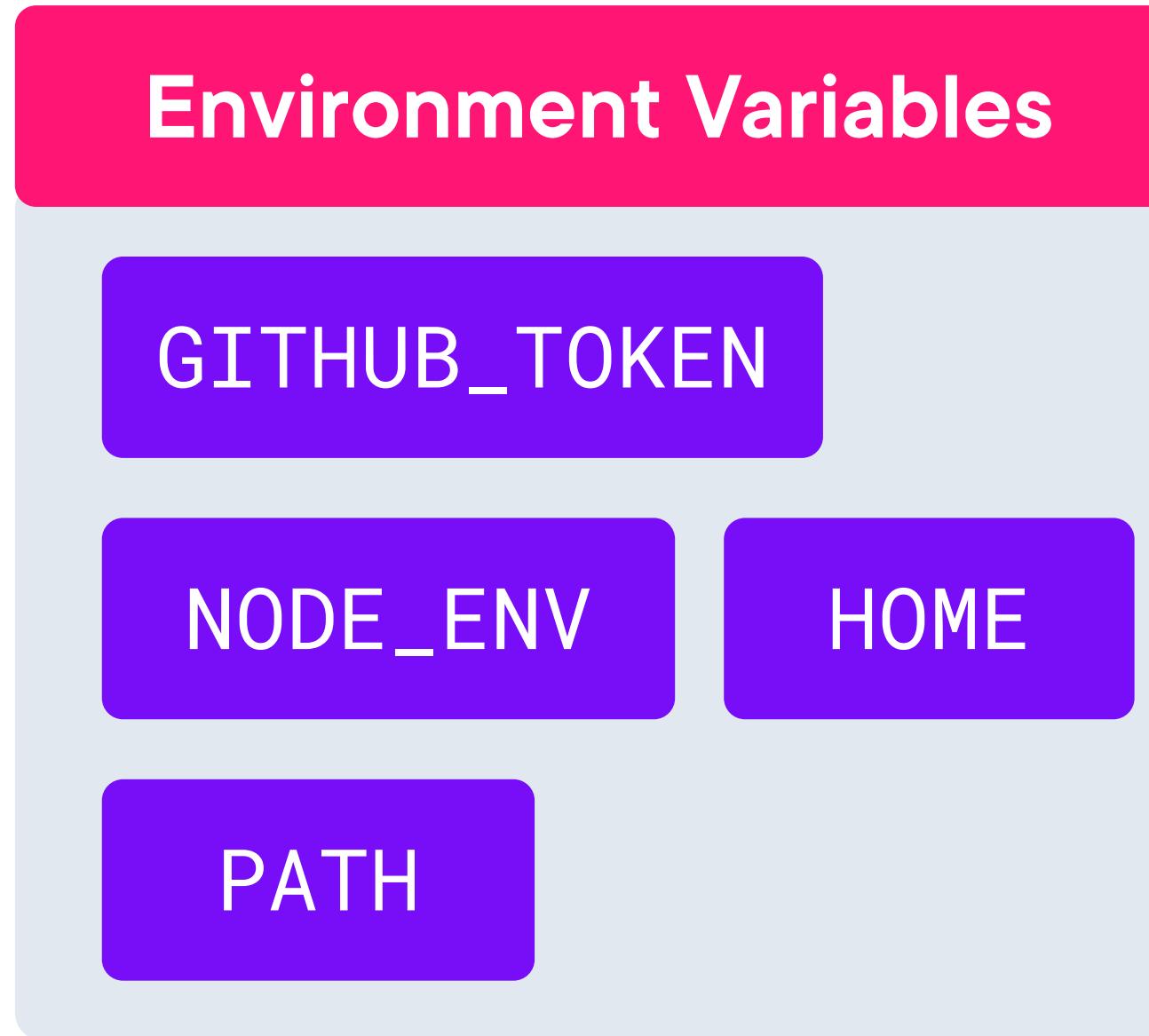
```
'node' is not recognized as an internal or external command
```

Node Cannot Be Executed in Terminal

This is due not adding the Node.js installation folder in the PATH system environment variable. Add the installation path and restart the system to fix it.

What Are Environment Variables?

Environment Variables

GITHUB_TOKEN

NODE_ENV

HOME

PATH

Applications

`process.env.VARIABLE`

Adding node to the PATH

How to add /usr/local/bin in $PATH on Mac
https://stackoverflow.com/q/11025980

Adding a directory to the PATH environment variable in Windows
https://stackoverflow.com/q/9546324

'node' is not recognized as an internal or external command
https://stackoverflow.com/a/8768567

Error: EMFILE, too many open files

```
# Check your current max file count
$ sysctl -A | grep kern.maxfiles
```

Increasing Open File Limits

If you run into this error on macOS, you may need to increase the system's open file limit

https://stackoverflow.com/a/27982223

FATAL ERROR: (...) Allocation failed - JavaScript heap out of memory

```
# Recommended: Set below maximum RAM capacity
export NODE_OPTIONS="--max-old-space-size=1536"  # 2gb machine
export NODE_OPTIONS="--max-old-space-size=2048"  # 4gb machine
export NODE_OPTIONS="--max-old-space-size=4096"  # 8gb machine
export NODE_OPTIONS="--max-old-space-size=8192"  # 16gb machine
export NODE_OPTIONS="--max-old-space-size=16384" # 32gb machine
```

Increasing Memory Usage Limits

If you run into out of memory crashes, you may need to increase Node's memory limit

https://stackoverflow.com/a/64409997

```
> NODE_ENV=production npm start


NODE_ENV=production : The term 'NODE_ENV=production' is not recognized as the name of a
cmdlet, function, script file, or operable program.
```

Tips for Using Node.js on Windows Subsystem for Linux (WSL)

Not every JavaScript project will run natively on Windows. In that case, you may need to configure the Windows Subsystem for Linux (WSL) and install Node.js.

https://learn.microsoft.com/en-us/windows/dev-environment/javascript/nodejs-on-wsl

Need More Help?

Microsoft's Node.js Guidelines
https://github.com/microsoft/nodejs-guidelines

StackOverflow
https://stackoverflow.com/questions/tagged/nodejs

Summary

npm is packaged with all Node.js installations

You can upgrade npm separately

Use a version manager like nvm when dealing with multiple projects

Make sure node and npm commands work on the command-line