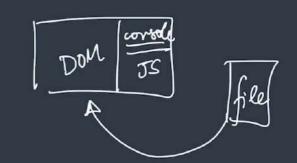
Node.js

JavaScript Runtime Environment

It is used for server side programming.



*Node.js is not a language, library or framework.

renagupta/sos@gmail.com

Node REPL

.help gives us commands

Evaluate Print Loop

```
Welcome to Node.js v16.13.0.
Type ".help" for more information.
> ls
Uncaught ReferenceError: ls is not defined
> pwd
Uncaught ReferenceError: pwd is not defined
> 1+2
3
> console.log("hello");
hello
undefined
> "hello"+" shradha"
'hello shradha'
> window
Uncaught ReferenceError: window is not defined
```

shradhakhapra@Shradhas-MacBook-Air ~ % node

```
undefined
> "hello"+" shradha"
'hello shradha'
> window
Uncaught ReferenceError: window is not defined
> global
<ref *1> Object [global] {
  global: [Circular *1],
  clearInterval: [Function: clearInterval],
  clearTimeout: [Function: clearTimeout],
  setInterval: [Function: setInterval],
  setTimeout: [Function: setTimeout] {
    [Symbol(nodejs.util.promisify.custom)]: [Getter]
  },
  queueMicrotask: [Function: queueMicrotask],
  performance: Performance {
    nodeTiming: PerformanceNodeTiming {
      name: 'node',
      entryType: 'node',
      startTime: 0,
      duration: 145236.36504209042,
      nodeStart: 1.3850420713424683,
      v8Start: 1.9596670866012573,
      bootstrapComplete: 22.711833000183105,
      environment: 13.9221670627594,
      loopStart: 37.88125002384186,
      loopExit: -1,
```

Press Ctrl+C to abort current expression, Ctrl+D to exit the REPL

Node Files

node fileName.js

```
shradhakhapra@Shradhas-MacBook-Air ~ % cd WebClassroom/Backend shradhakhapra@Shradhas-MacBook-Air Backend % 1s shradhakhapra@Shradhas-MacBook-Air Backend % touch script.js shradhakhapra@Shradhas-MacBook-Air Backend % node script.js hello, 0 hello, 1 hello, 2 hello, 3 hello, 4 shradhakhapra@Shradhas-MacBook-Air Backend % 

**Is script.js **

**Is script.
```

```
shradhakhapra@Shradhas-MacBook-Air ~ % cd WebClassroom/Backend shradhakhapra@Shradhas-MacBook-Air Backend % ls shradhakhapra@Shradhas-MacBook-Air Backend % touch script.js shradhakhapra@Shradhas-MacBook-Air Backend % node script.js hello, 0 hello, 1 hello, 2 hello, 3 hello, 4 shradhakhapra@Shradhas-MacBook-Air Backend % node script.js hello, 0 hello, 1 hello, 2 hello, 1 hello, 2 hello, 3 hello, 4 hello, 2 hello, 3 hello, 4 shradhakhapra@Shradhas-MacBook-Air Backend % node script.js hello, 2 hello, 3 hello, 4 hello, 8 hello, 8 hello, 8 hello, 8 hello, 8 hello, 8 hello, 9 hello, 8 hello, 8 hello, 8 hello, 8 hello, 9 hello, 8 hello, 8 hello, 8 hello, 9 hello, 8 hello, 9 he
```



process: This object provides information about, and control over, the current Node.js process.

process.argv: returns an array containing the command-line arguments passed when the Node.js process was launched.

```
Type ".help" for more information.
> process
process {
 version: 'v16.13.0
  versions: {
    node: '16.13.0',
    v8: '9.4.146.19-node.13',
    uv: '1.42.0',
    zlib: '1.2.11',
    brotli: '1.0.9',
    ares: '1.17.2',
    modules: '93',
    nghttp2: '1.45.1',
    napi: '8',
    llhttp: '6.0.4',
    openssl: '1.1.11+quic',
    cldr: '39.0',
    icu: '69.1',
    tz: '2021a',
    unicode: '13.0',
    ngtcp2: '0.1.0-DEV',
    nghttp3: '0.1.0-DEV'
  },
  arch: 'arm64',
  platform: 'darwin',
  release: {
```

```
lype ".help" for more information.
> process.release
{
   name: 'node',
   lts: 'Gallium',
   sourceUrl: 'https://nodejs.org/download/release/v16.13.0/node-v16.13
.0.tar.gz',
   headersUrl: 'https://nodejs.org/download/release/v16.13.0/node-v16.1
3.0-headers.tar.gz'
}
> pro
```

> process.cwd();
'/Users/shradhakhapra/WebClassroom/Backend'

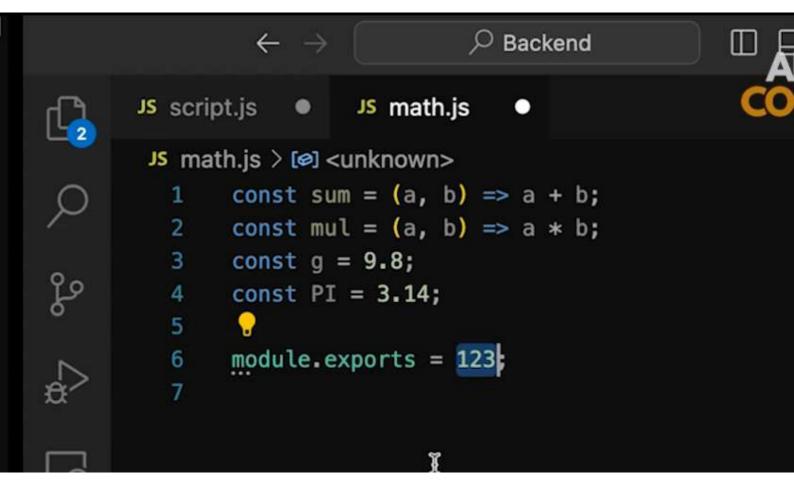
'/Users/shradhakhapra/WebC:
> process.argv
['/usr/local/bin/node']

```
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js shradha rajat rahul neha manisha
hello to shradha
hello to rajat
hello to rahul
hello to meha
kello to rajat
hello to meha
kello to rajat
hello to meha
kello to rajat
hello to rajat
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he
```



require() a built-in function to include external modules that exist in separate files.

module.exports a special object



```
JS script.js X    JS math.js

JS script.js > ...

1    const someValue = require("./math");
2
3    console.log(someValue);
4
```

shradhakhapra@Shradhas-MacBook-Air Backend % node script.js

123
shradhakhapra@Shradhas-MacBook-Air Backend % []

snehagupta7385@gmail.com

Node Installation

For Mac Users : https://nodejs.org/en

For Windows Users: https://nodejs.org/en/download

Windows user can also refer this video : https://www.youtube.com/watch?v=ElzdQxMXcrc

```
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
hello!
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
shradhakhapra@Shradhas-MacBook-Air Backend % 

| Js script.js | | Js script.js | | Js script.js | Js script.js | Js script.js | | Js
```

```
JS script.js
                            JS math.js
         Js math.js > ...
              const sum = (a, b) \Longrightarrow a + b;
           1
           2
                 const mul = (a, b) \Rightarrow a * b;
           3
                 const g = 9.8;
           4
                 const PI = 3.14;
           5
           6 let obj = {
           7
                      sum: sum,
           8
                      mul: mul,
9
                    g: g,
                     PI: PI
          10
          11
                 };
          12
                 module exports = <a href="mailto:pbj;">pbj;</a>
          13
          14
```

```
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js | hello! shradhakhapra@Shradhas-MacBook-Air Backend % node script.js | {} shradhakhapra@Shradhas-MacBook-Air Backend % node script.js | { sum: [Function: sum], mul: [Function: mul], g: 9.8, PI: 3.14 } shradhakhapra@Shradhas-MacBook-Air Backend %
```

```
Js script.js X Js math.js

Js script.js > ...
1    const math = require("./math");
2
3    console.log(math);
4
```

```
hello!
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
{}
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
{ sum: [Function: sum], mul: [Function: mul], g: 9.8, PI: 3.14 }
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
4
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
4
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js

4
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js

4
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
```

```
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js

∠ Backend

shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                                   JS script & X
                                                                                                    JS math.js
                                                                                                                 ×
hello!
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                                    JS math.js > [@] PI
{}
                                                                                          module.exports.sum = (a, b) => a + b;
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
{ sum: [Function: sum], mul: [Function: mul], g: 9.8, PI: 3.14 } shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                                          module.exports.mul = (a, b) => a * b;
                                                                                          nodule.exports.g = 9.8;
                                                                            धू
                                                                                          module.exports.PI = 3.14;
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                                          // module.exports = {
3.14
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                                              mul: mul,
shradhakhapra@Shradhas-MacBook-Air Backend % 🗌
```

```
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                               JS math.js > [@] PI
{}
                                                                                     exports.sum = (a, b) \Rightarrow a + b;
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
{ sum: [Function: sum], mul: [Function: mul], g: 9.8, PI: 3.14 }
                                                                                     exports.mul = (a, b) \Rightarrow a * b;
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                                     exports.g = 9.8;
                                                                                     exports.PI = 3.14;
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                                     // module.exports = {
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                                          mul: mul,
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
3.14
```

hello!

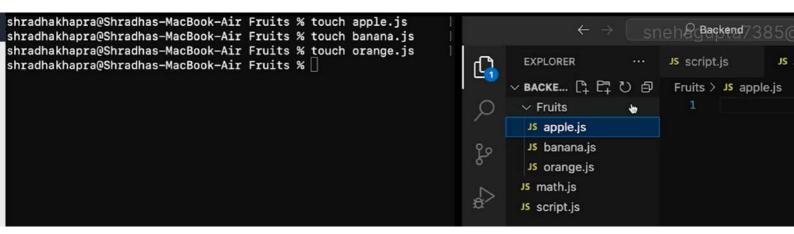
Js matn.js

module.exports

requiring directories

require() a built-in function to include external modules that exist in separate files.

module.exports a special object



```
Js apple.js X Js math.js •

Fruits > Js apple.js > [@] <unknown>

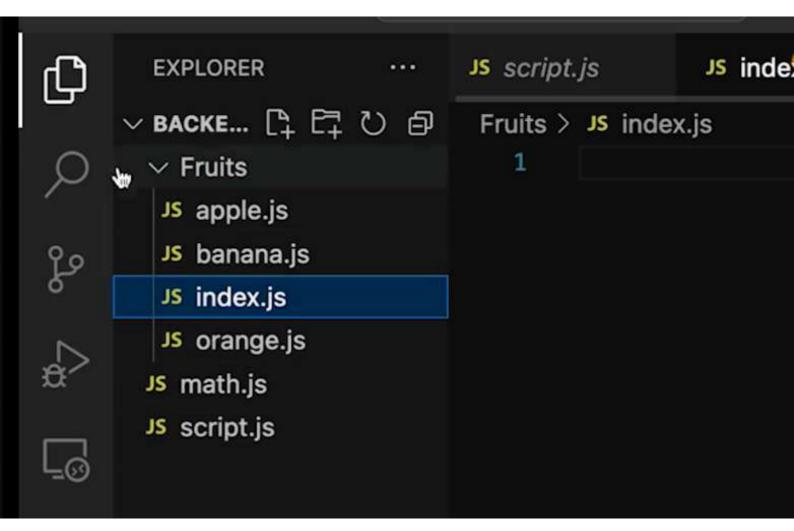
1 module.exports = {
2 name: "apple",
3 color: "red",
4 };
5
```

```
Js apple.js Js banana.js Js orange.js

Fruits > Js orange.js > [@] <unknown> > % color

module.exports = {
    name: "orange",
    color: "orange",
    4
    };

T
```



```
JS script.js
                  Js index.is
                               X
Fruits > Js index.js > ...
       const apple = require("./apple");
  1
       const banana = require("./banana");
  2
       const orange = require("./orange");
  3
  4
  5
       let fruits = [apple, banana, orange];
  6
       module.exports = fruits;
  7
  8
```



npm is the standard package manager for Node.js.

NPM (Node Package Manager)

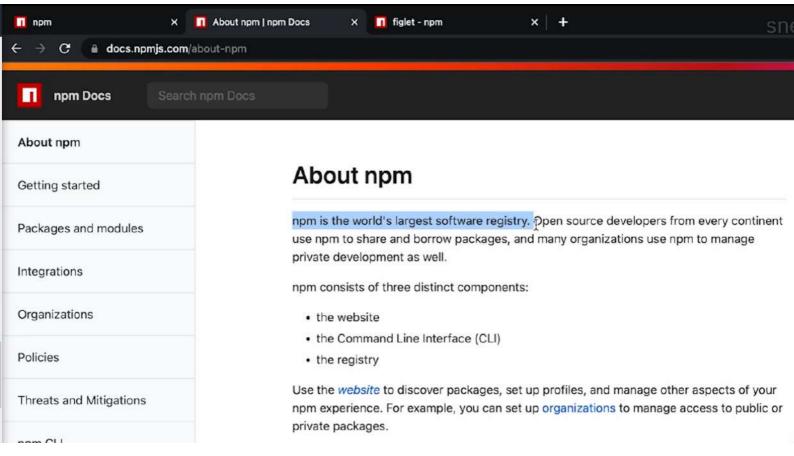
code

npm is the standard package manager for Node.js.

1) library of pachages
(3) command line tool

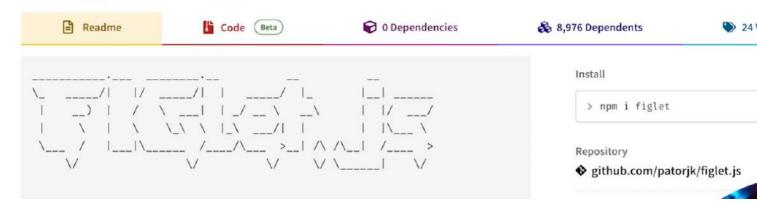
Installing Packages

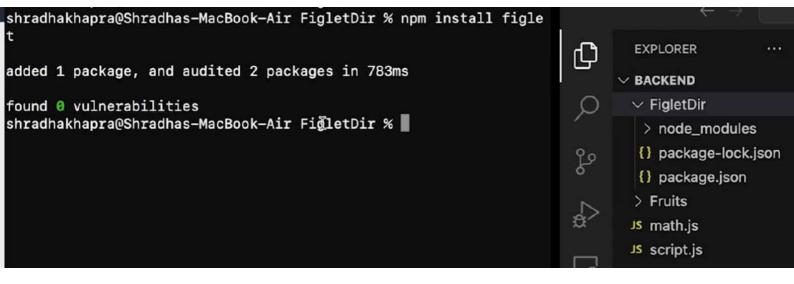
npm install <- package name ->



figlet DT

1.6.0 • Public • Published 4 months ago







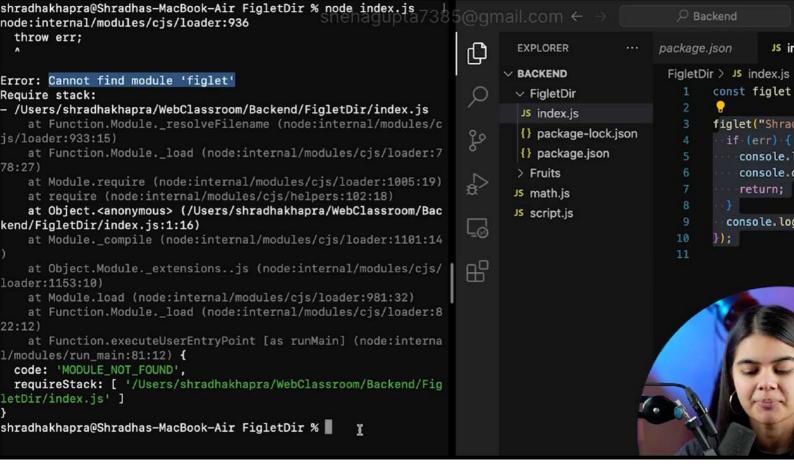
node_modules The node_modules folder contains every installed dependency for your project.

package-lock.json It records the exact version of every installed dependency, including its sub-dependencies and their versions.

```
shradhakhapra@Shradhas-MacBook-Air FigletDir % ls
shradhakhapra@Shradhas-MacBook-Air FigletDir % npm install figle
                                                                         D
                                                                                {} package-lock.json
                                                                                                    Js index.js
                                                                                FigletDir > JS index.js > ...
added 1 package, and audited 2 packages in 783ms
                                                                                      const figlet = require("figlet");
                                                                          Q
found 0 vulnerabilities
                                                                                      figlet("Hello World!!", function (err, data) {
shradhakhapra@Shradhas-MacBook-Air FigletDir % ls
node modules
                          package.json
                                                                                         console.log("Something went wrong...");
package-lock.json
                                                                                         console.dir(err);
shradhakhapra@Shradhas-MacBook-Air FigletDir % node index.js
                                                                                         return;
                                                                                       console.log(data);
                                                                         shradhakhapra@Shradhas-MacBook-Air FigletDir % 📗
```



npm init



```
This utility will walk you through creating a package.json file.

∠ Backend

It only covers the most common items, and tries to guess sensibl
e defaults.
                                                                         凸
                                                                                1) package.json X
                                                                                                    JS index.js
See `npm help init` for definitive documentation on these fields
                                                                                MyProject > {} package.json > ...
and exactly what they do.
                                                                                          "name": "myproject",
Use `npm install <pkg>` afterwards to install a package and
save it as a dependency in the package.json file.
                                                                                          "description": "This is first project",
Press ^C at any time to quit.
                                                                                          "main": "index.js",
package name: (myproject)
                                                                                          Debug
version: (1.0.0)
description: This is first project
entry point: (index.js)
                                                                                          "scripts": {
                                                                                            "test": "echo \"Error: no test specified\
test command:
                                                                         "author": "Shradha Khapra",
git repository:
                                                                                          "license": "ISC"
keywords:
                                                                         出
author: Shradha Khapra
license: (ISC)
About to write to /Users/shradhakhapra/WebClassroom/Backend/MyPr
oject/package.json:
  "name": "myproject", "version": "1.0.0",
  "description": "This is first project",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
```

Local vis Global

npm install -g <- package name ->

npm link <- package name ->

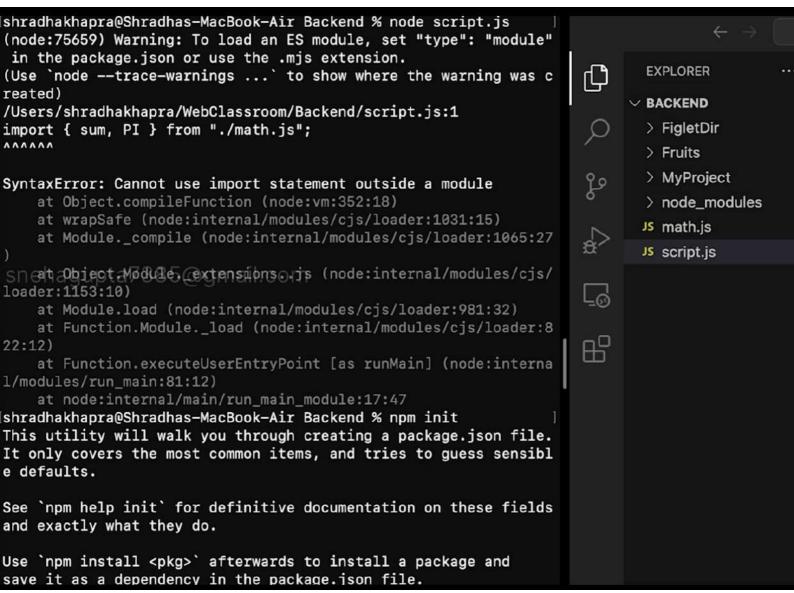
CO

require vis import

import { sum } from "./math.js"

We can't selectively load only the pieces we need with require but with import, we can selectively load only the pieces we need, which can save memory.

Loading is synchronous for 'require' but can be asynchronous for 'import'.



```
Use `npm install <pkg>` afterwards to install a package and
save it as a dependency in the package.json file.
                                                                               {} package.json > inc type
Press ^C at any time to quit.
package name: (backend)
                                                                                       "name": "backend",
                                                                                       "version": "1.0.0",
version: (1.0.0)
description:
                                                                                       "description": "",
entry point: (math.js)
                                                                                       "main": "math.js",
test command:
                                                                                       "dependencies": {
git repository:
                                                                                         "figlet": "^1.6.0"
keywords:
author: ShradhaKhapra
                                                                                       "devDependencies": {}
license: (ISC)
                                                                                        Debug
About to write to /Users/shradhakhapra/WebClassroom/Backend/pack
                                                                                       "scripts": {
age gron upta/385@gmail.com
                                                                       出
                                                                                         "test": "echo \"Err
                                                                                11
{
  "name": "backend",
"version": "1.0.0",
                                                                                13
                                                                                       "author": "ShradhaKha
                                                                                       "license": "ISC",
   "description": "",
                                                                                       "type": "module"
  "main": "math.js",
   "dependencies": {
     "figlet": "^1.6.0"
  },
  "devDependencies": {},
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  "author": "ShradhaKhapra",
  "license": "ISC"
```

JS script.js

(Q)

{} package.json

```
∠ Backend

                                                                                                                       words
                                                                                                              Js math.js
                                                                    0
                                                                           JS script.js
                                                                                           {} package.json
added 2 packages, and audited 5 packages in 2s
                                                                            JS script.js
found 0 vulnerabilities
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                                  import { generate } from "random-words";
buy
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
air
                                                                                  console.log(generate());
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
basket
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
vertical
shradhakhapra@Shradhas-MacBook-Air Backend % node script.js
                                                                    shradhakhapra@Shradhas-MacBook-Air Backend % 🗌
                                                                                               I
```

shradhakhapra@Shradhas-MacBook-Air Backend % npm install random-