Node.JS

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KHOA CÔNG NGHỆ THÔNG TIN
TRƯỜNG ĐẠI HỌC KHOA HỌC TỰ NHIÊN

Agenda

1. NodeJS Introduction
2. NodeJS Inner Working
    - □ Global Object
    - □ Function Expression
    - □ Modules & require()
    - □ Module Patterns
    - □ Read & Write Files
    - □ Create & Delete Directories

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NodeJS Introduction

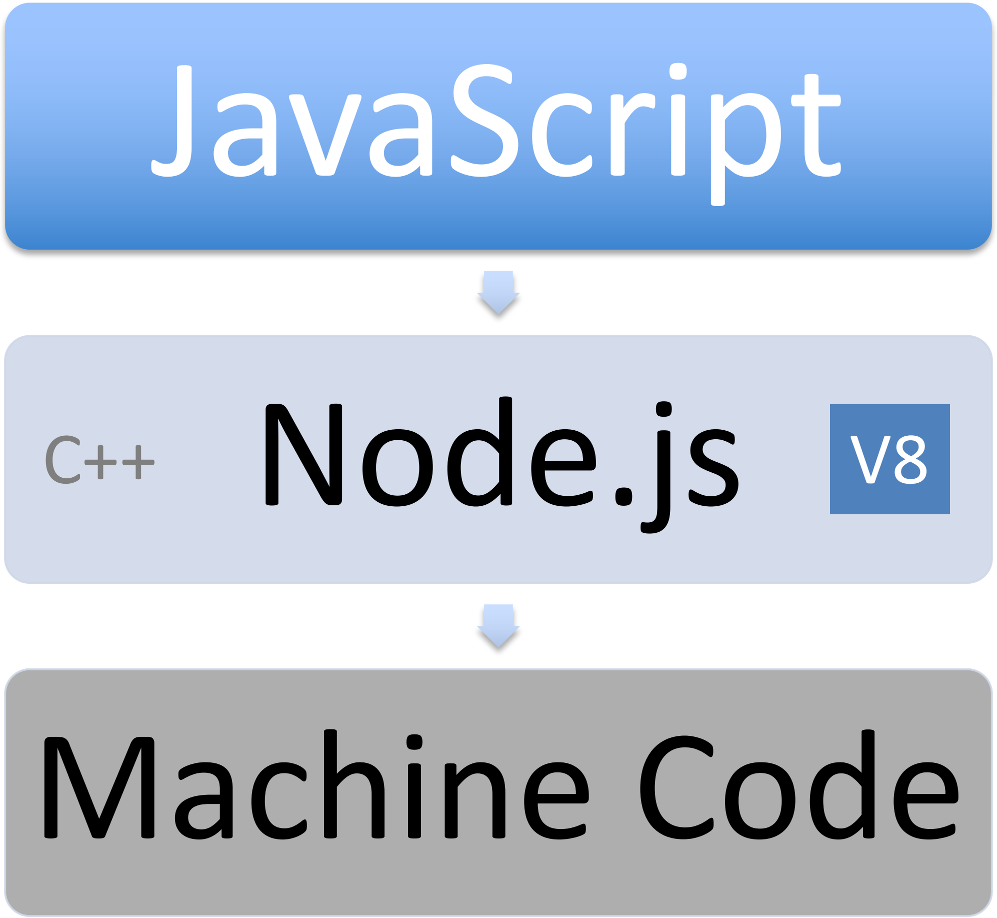
What is NodeJS?

V8 is an Open Source JavaScript Engine running on browsers developed by **Google**

- NodeJS is an Javascript runtime based on V8
- Published by **Ryan Dahl** in 2009
- NodeJS uses even-driven, non-blocking I/O model

Ref: https://nodejs.org/en/

Node.js



JavaScript

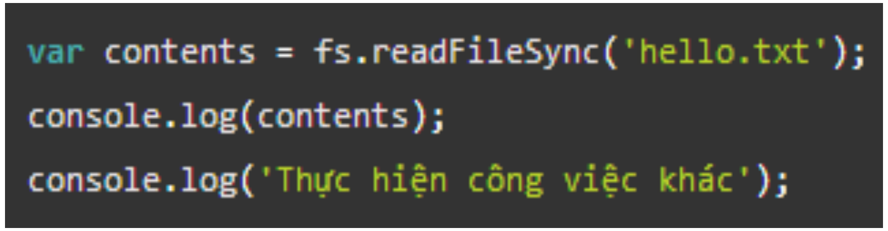
C++ Node.js V8

Machine Code

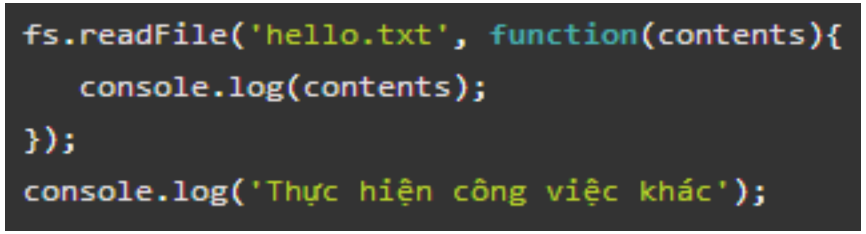
Why use NodeJS?

- Open Source & Free
  - Big community
  - over 15.000 Modules
- Multi-platform Linux/Windows/MacOS
- JavaScript
- Real-time application
- Non-blocking I/O

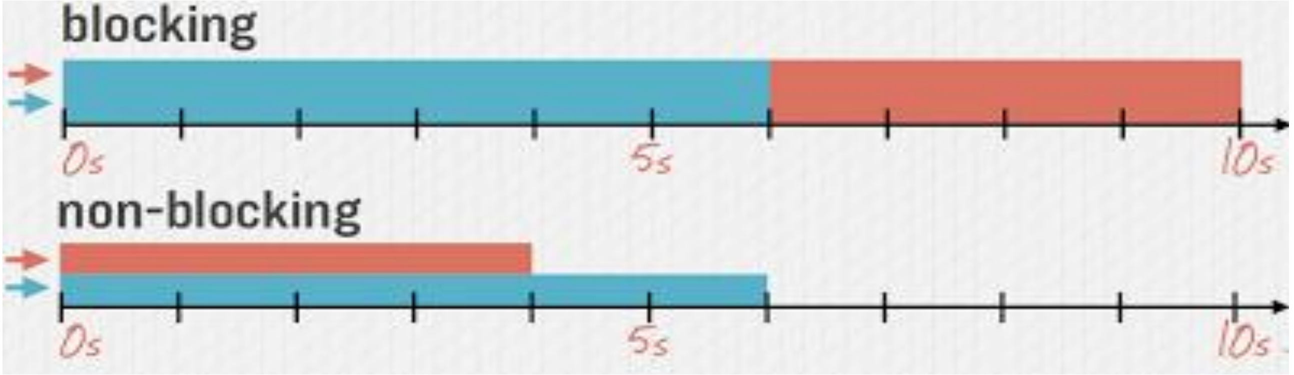
Blocking I/O vs Non-blocking I/O



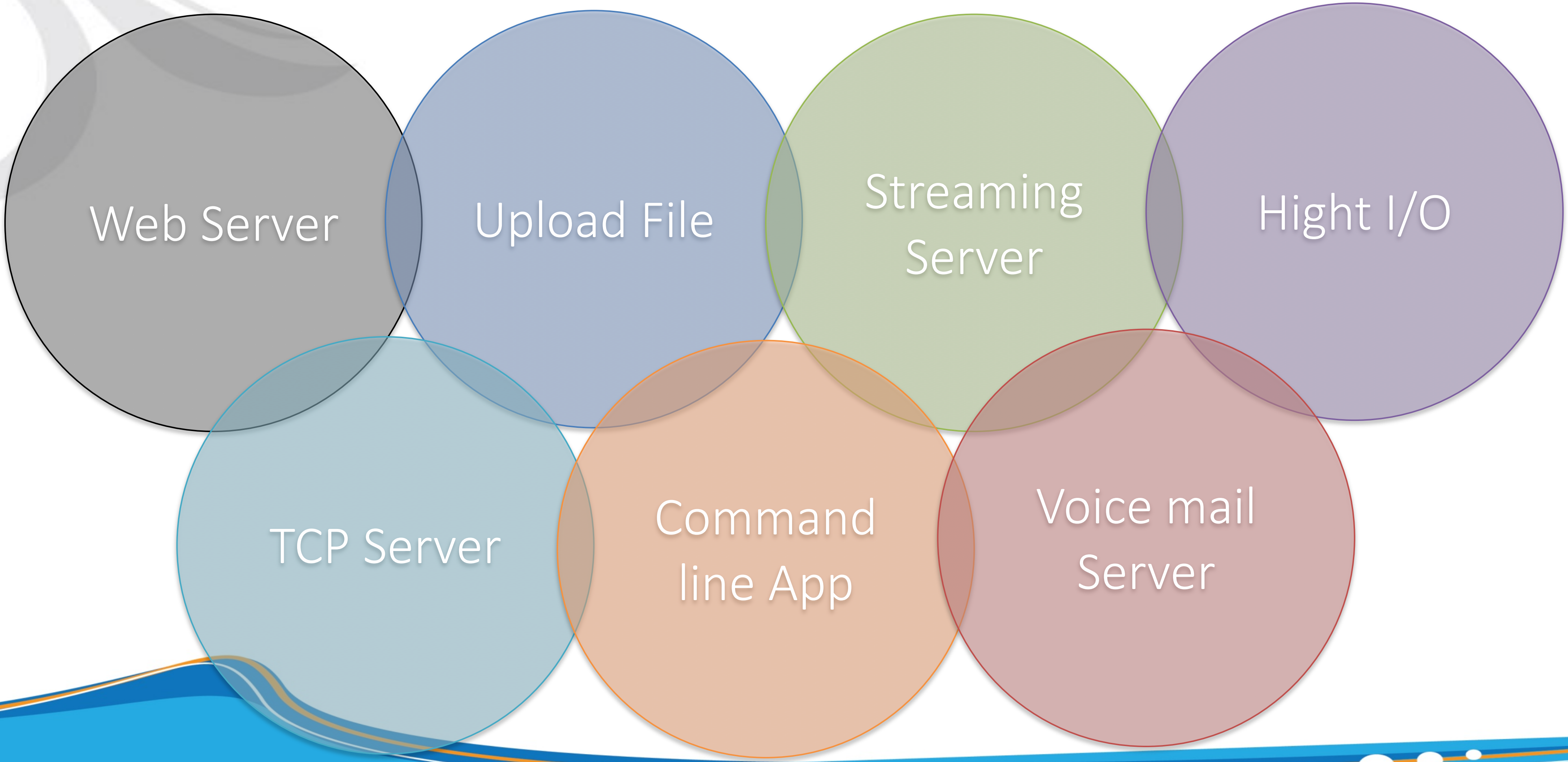
```
var contents = fs.readFileSync('hello.txt');
console.log(contents);
console.log('Thực hiện công việc khác');
```



```
fs.readFile('hello.txt', function(contents){
   console.log(contents);
});
console.log('Thực hiện công việc khác');
```



NodeJS Applications



Web Server

Upload File

Streaming Server

Hight I/O

TCP Server

Command line App

Voice mail Server

Start with NodeJS

- □ Installation
  - ▫ http://nodejs.org

- □ Run node in Command Prompt / Terminal
  - ▫ `$ node`

- □ Run node application
  - ▫ `$ node /path/AppName.js`

Start with NodeJS

1. Create Hello world application

□ Create a file HelloWorld.js

```
Console.log('Hello World');
```

□ Open Terminal

```
$ node HelloWorld.js
```

□ Results

```
Hello World
```

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NodeJS Inner Working

1

Global Object

Global Object

- Tham khảo
  - https://nodejs.org/en/docs/

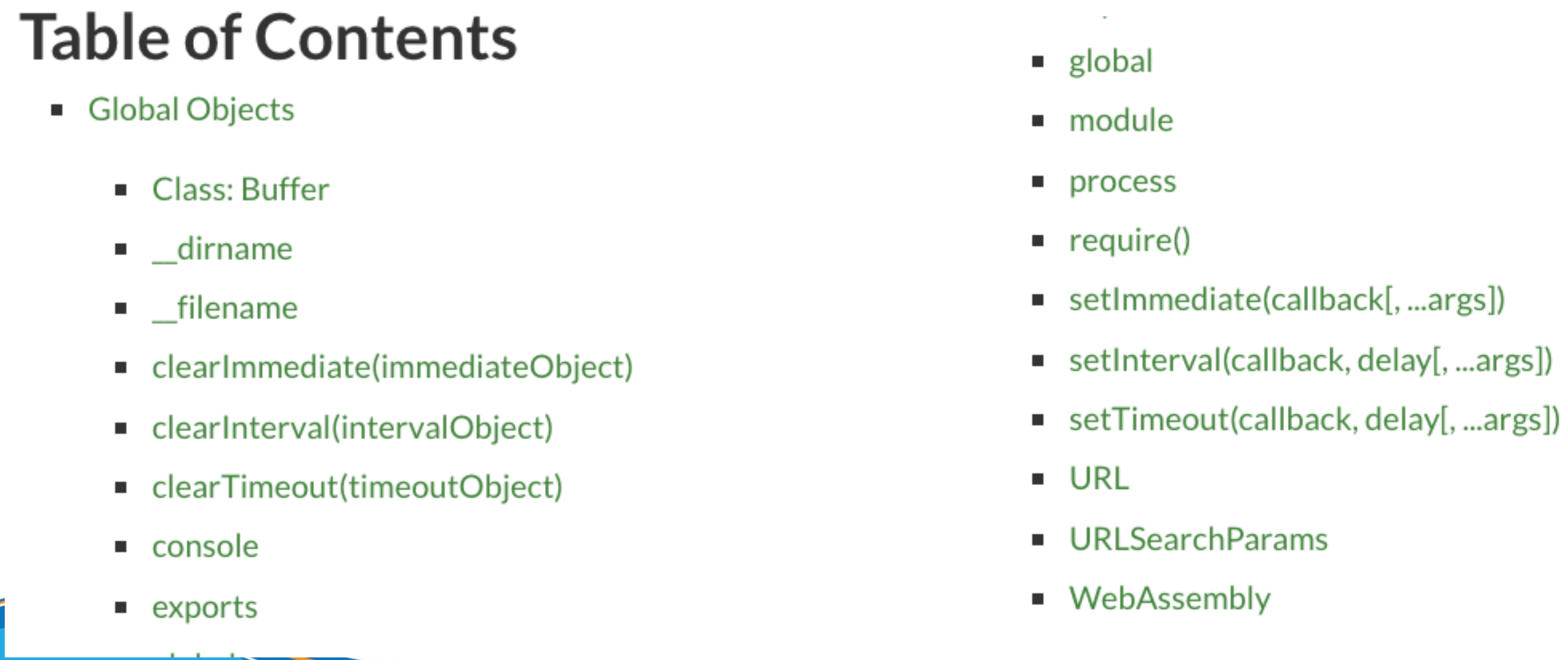

Table of Contents

- Global Objects
  - Class: Buffer
  - __dirname
  - __filename
  - clearImmediate(immediateObject)
  - clearInterval(intervalObject)
  - clearTimeout(timeoutObject)
  - console
  - exports
  - global
  - module
  - process
  - require()
  - setImmediate(callback[, ...args])
  - setInterval(callback, delay[, ...args])
  - setTimeout(callback, delay[, ...args])
  - URL
  - URLSearchParams
  - WebAssembly

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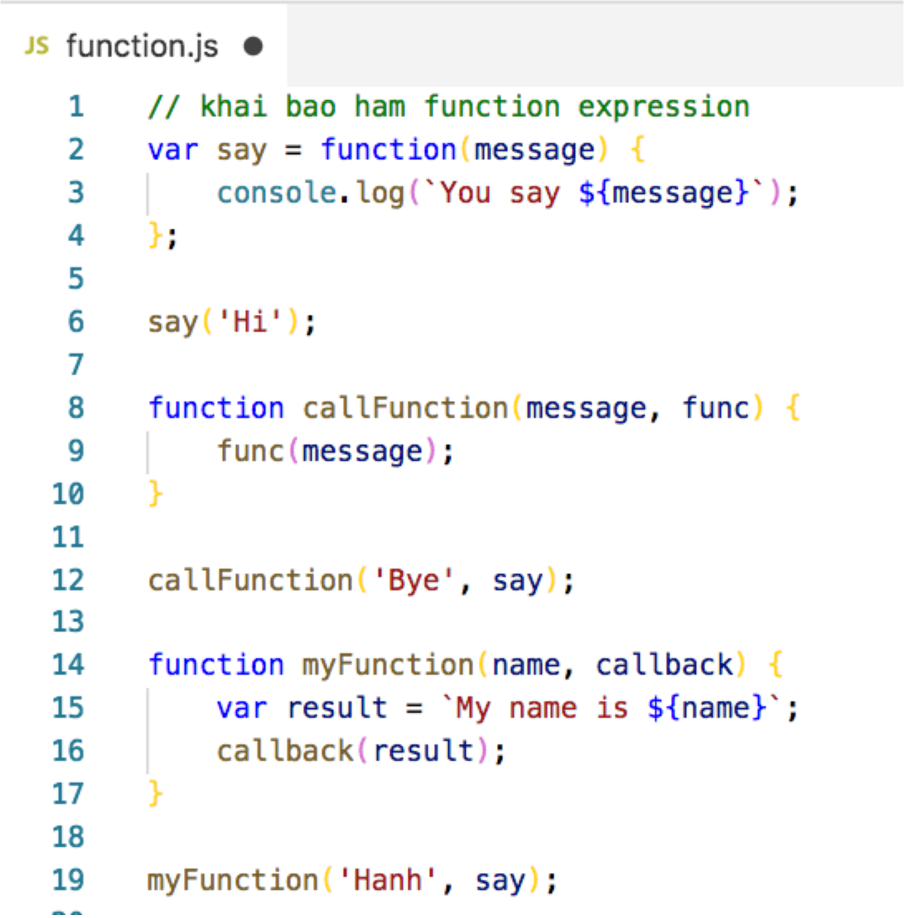
Function Expression

Function Expression



```javascript
// khai bao ham function expression
var say = function(message) {
    console.log(`You say ${message}`);
};

say('Hi');

function callFunction(message, func) {
    func(message);
}

callFunction('Bye', say);

function myFunction(name, callback) {
    var result = `My name is ${name}`;
    callback(result);
}

myFunction('Hanh', say);
```

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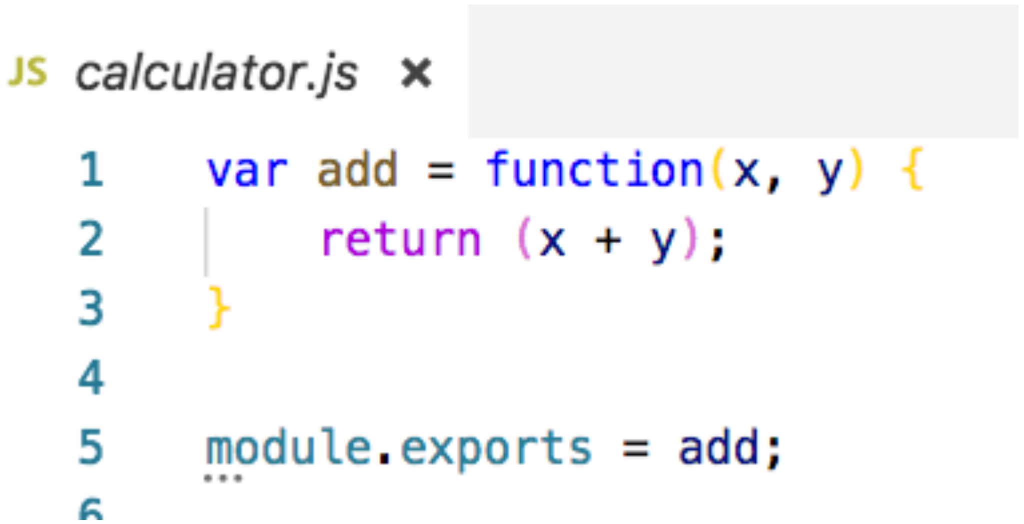
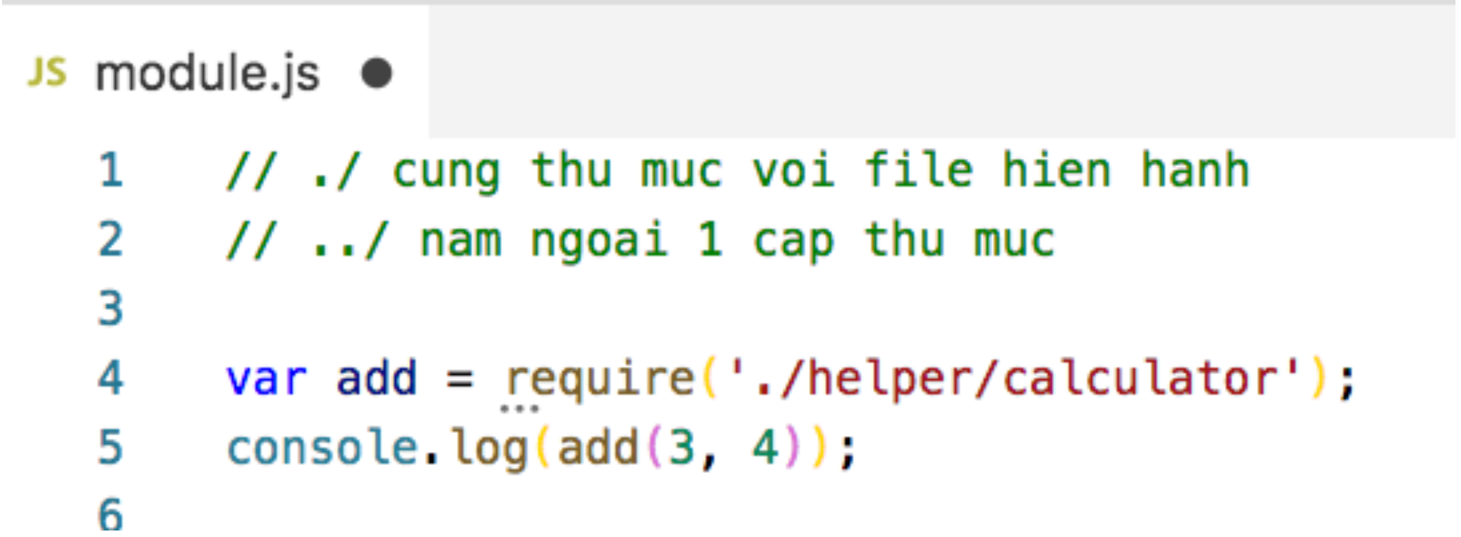
Modules & require()

Module Patterns



```javascript
var add = function(x, y) {
    return (x + y);
}

module.exports = add;
```



```javascript
// ./ cung thu muc voi file hien hanh
// ../ nam ngoai 1 cap thu muc

var add = require('./helper/calculator');
console.log(add(3, 4));
```

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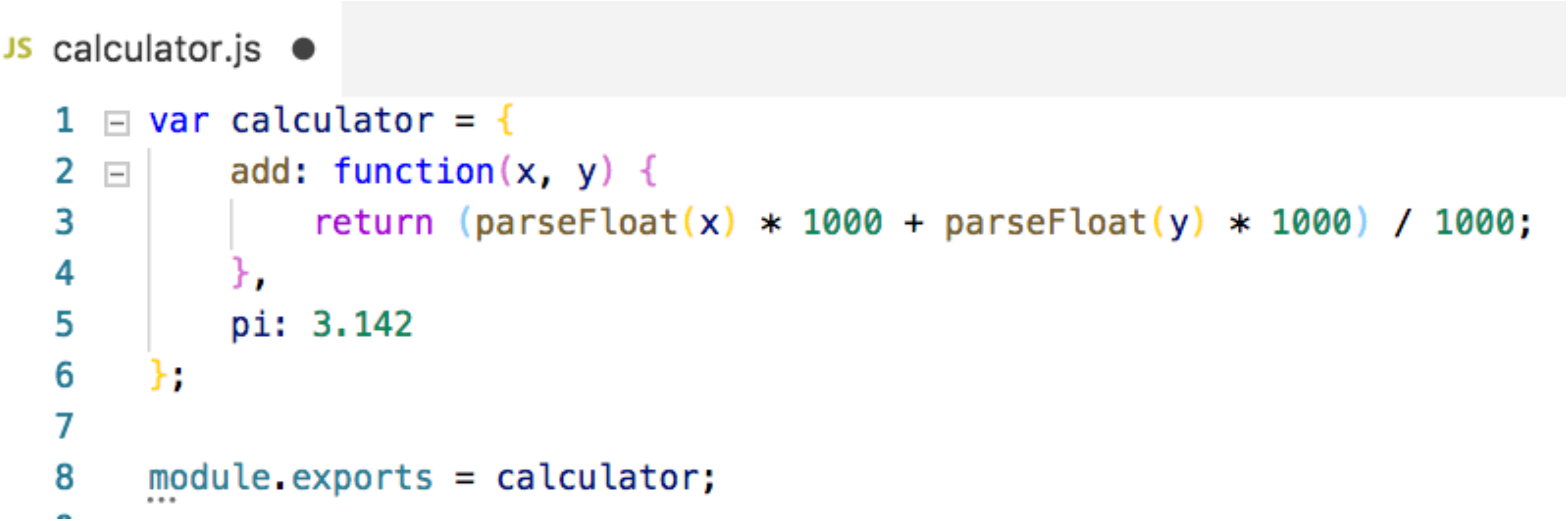
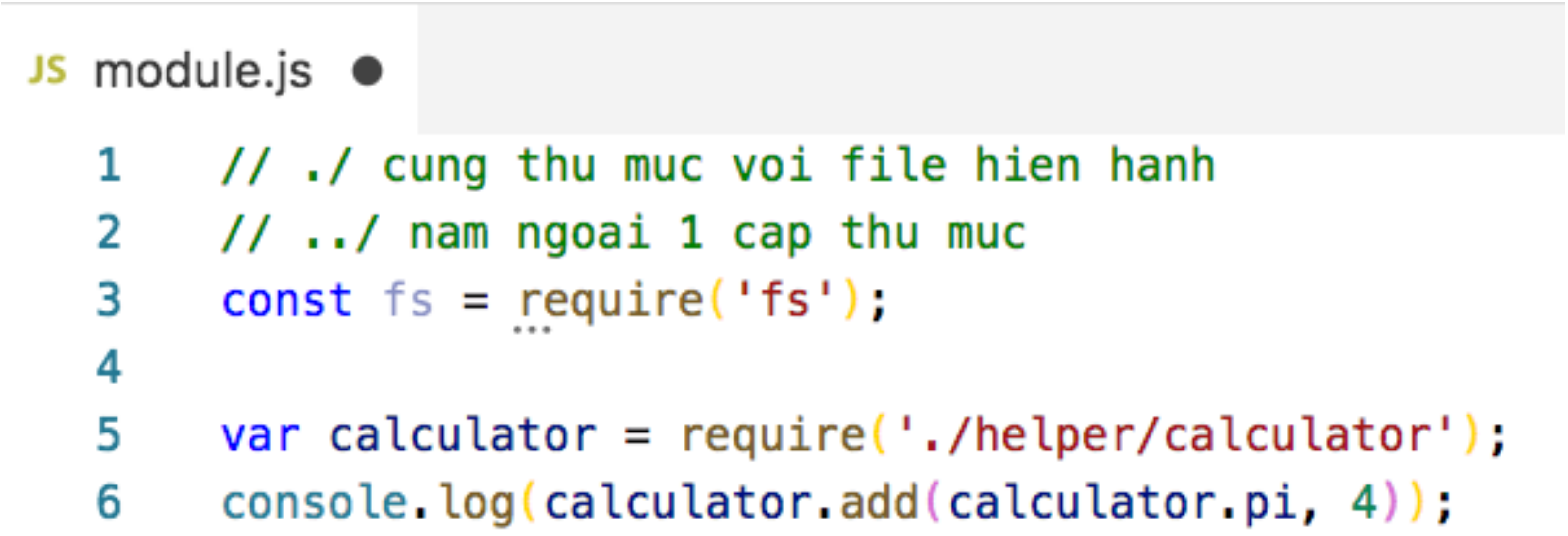
Module Patterns



JS calculator.js ●

```js
var calculator = {
    add: function(x, y) {
        return (parseFloat(x) * 1000 + parseFloat(y) * 1000) / 1000;
    },
    pi: 3.142
};

module.exports = calculator;
```



JS module.js ●

```js
// ./ cung thu muc voi file hien hanh
// ../ nam ngoai 1 cap thu muc
const fs = require('fs');

var calculator = require('./helper/calculator');
console.log(calculator.add(calculator.pi, 4));
```

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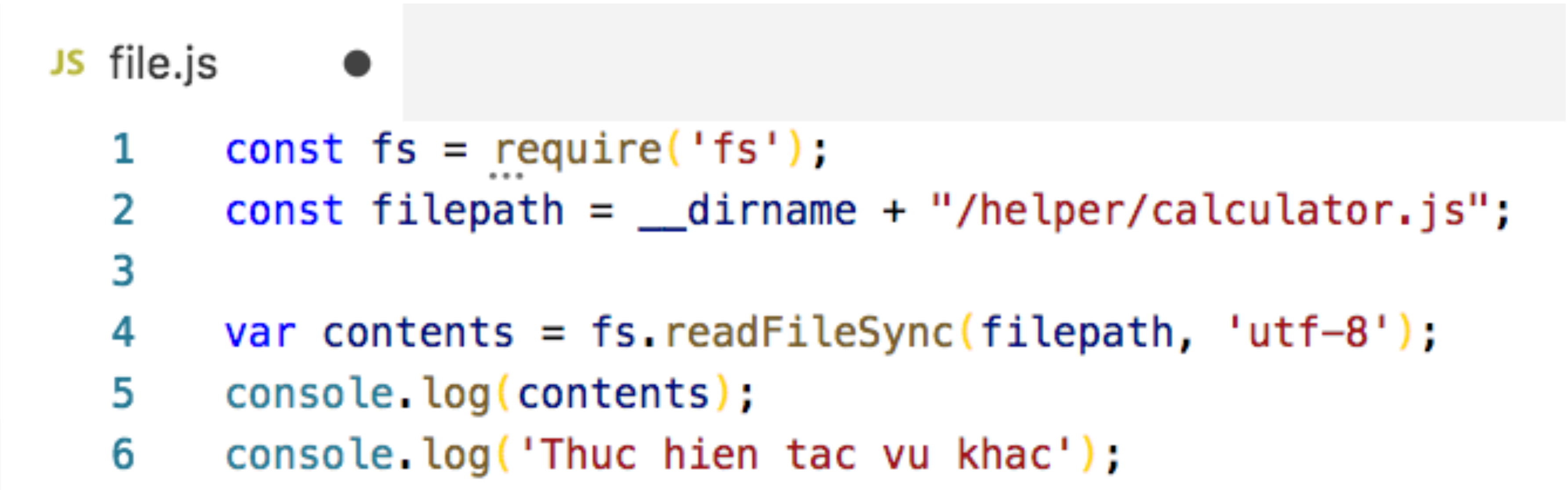
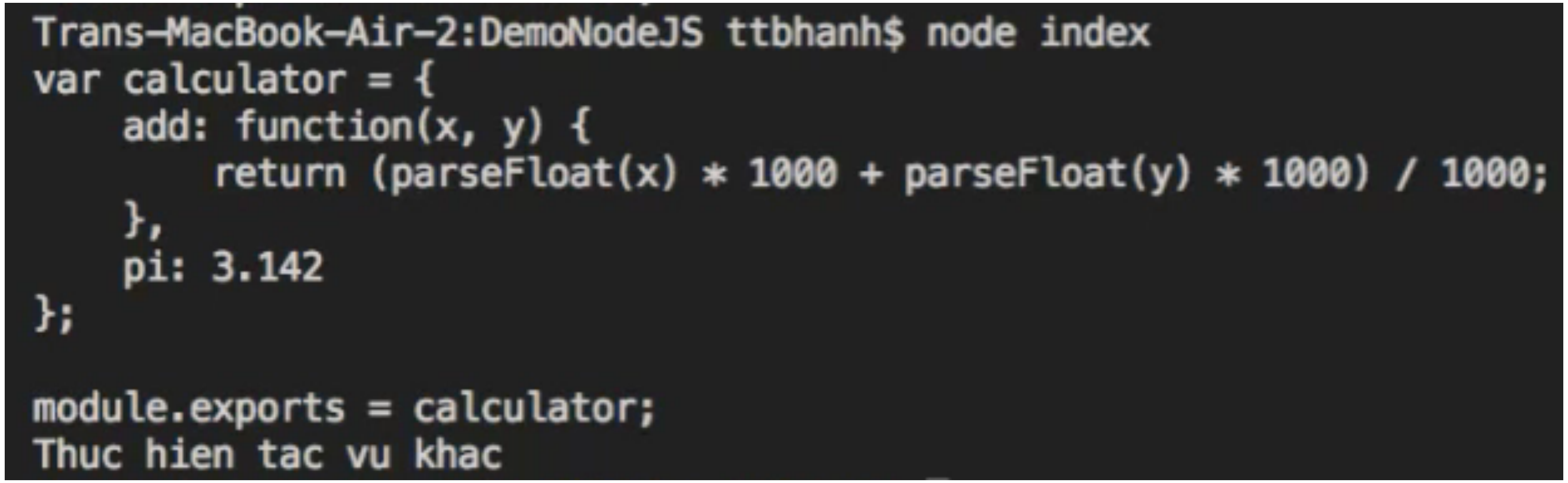
Read & Write Files



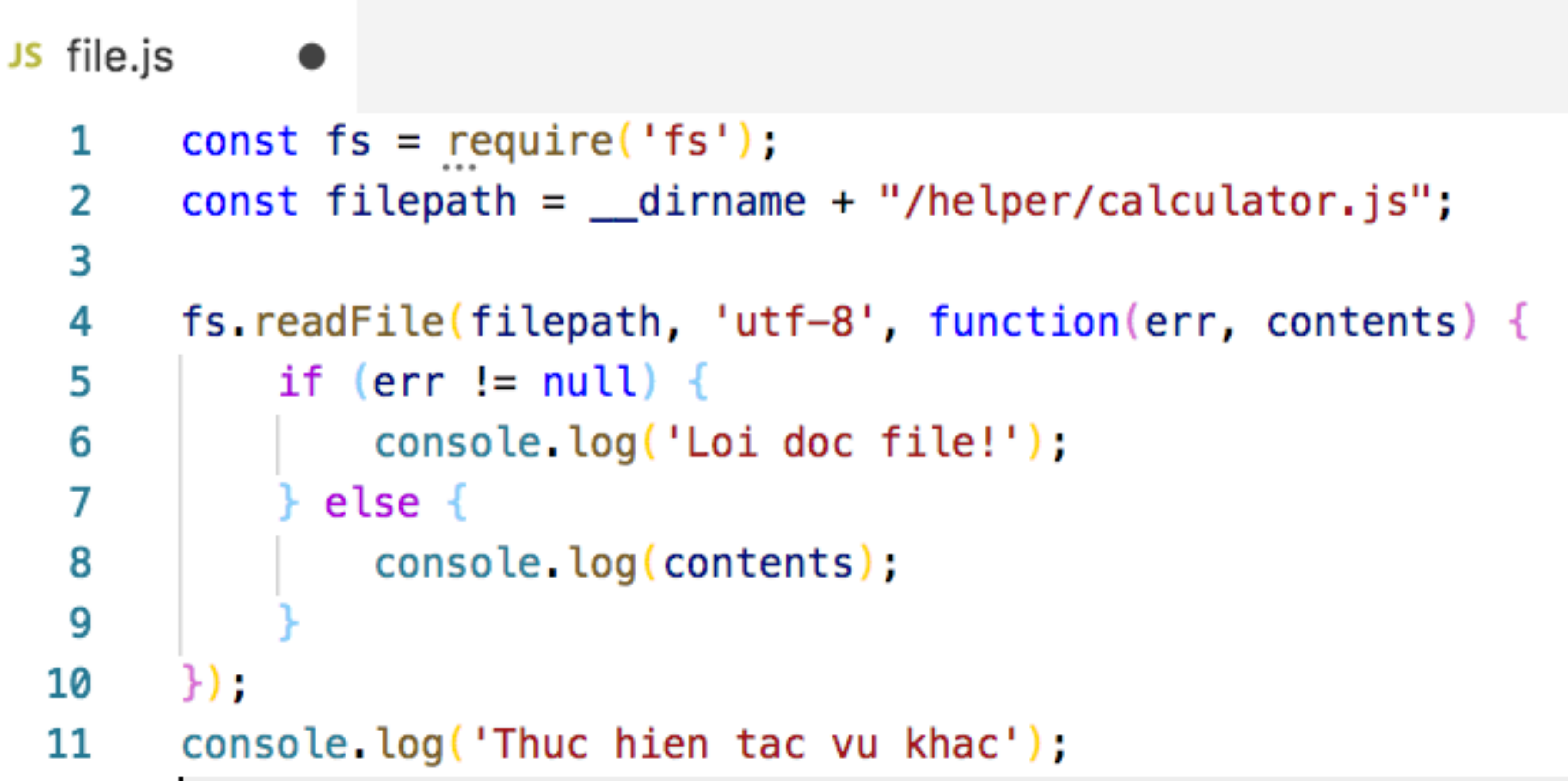
```
const fs = require('fs');
const filepath = __dirname + "/helper/calculator.js";

var contents = fs.readFileSync(filepath, 'utf-8');
console.log(contents);
console.log('Thuc hien tac vu khac');
```



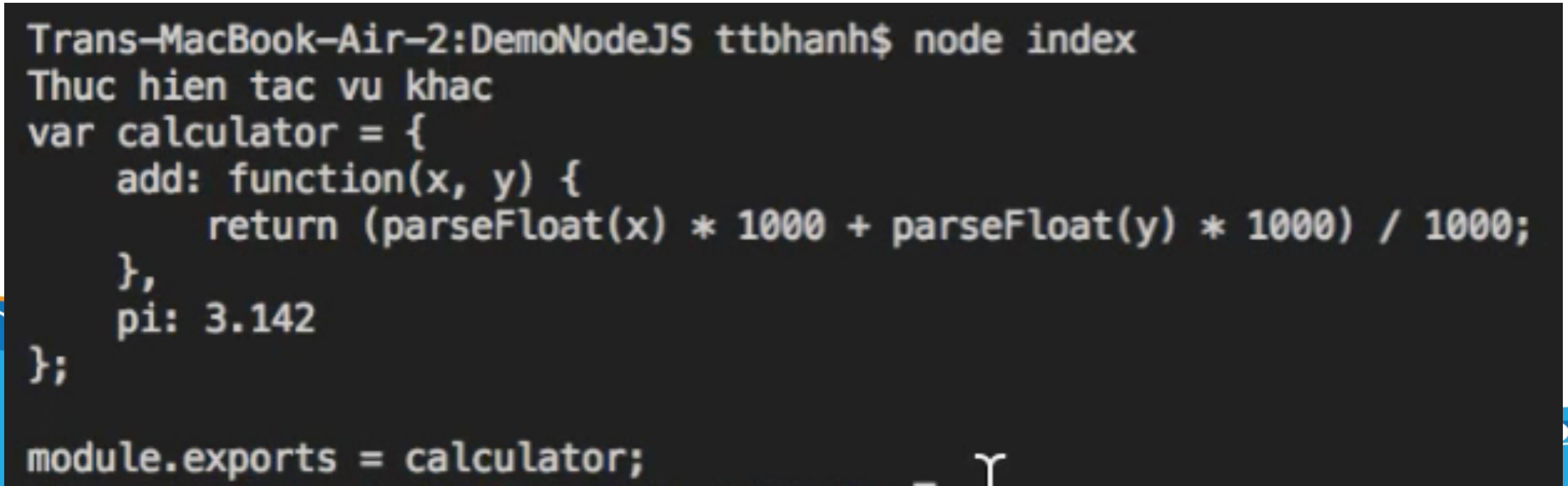
```
Trans-MacBook-Air-2:DemoNodeJS ttbhanh$ node index
var calculator = {
    add: function(x, y) {
        return (parseFloat(x) * 1000 + parseFloat(y) * 1000) / 1000;
    },
    pi: 3.142
};

module.exports = calculator;
Thuc hien tac vu khac
```



```javascript
const fs = require('fs');
const filepath = __dirname + "/helper/calculator.js";

fs.readFile(filepath, 'utf-8', function(err, contents) {
    if (err != null) {
        console.log('Loi doc file!');
    } else {
        console.log(contents);
    }
});
console.log('Thuc hien tac vu khac');
```



```
Trans-MacBook-Air-2:DemoNodeJS ttbhanh$ node index
Thuc hien tac vu khac
var calculator = {
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    },
    pi: 3.142
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module.exports = calculator;
```

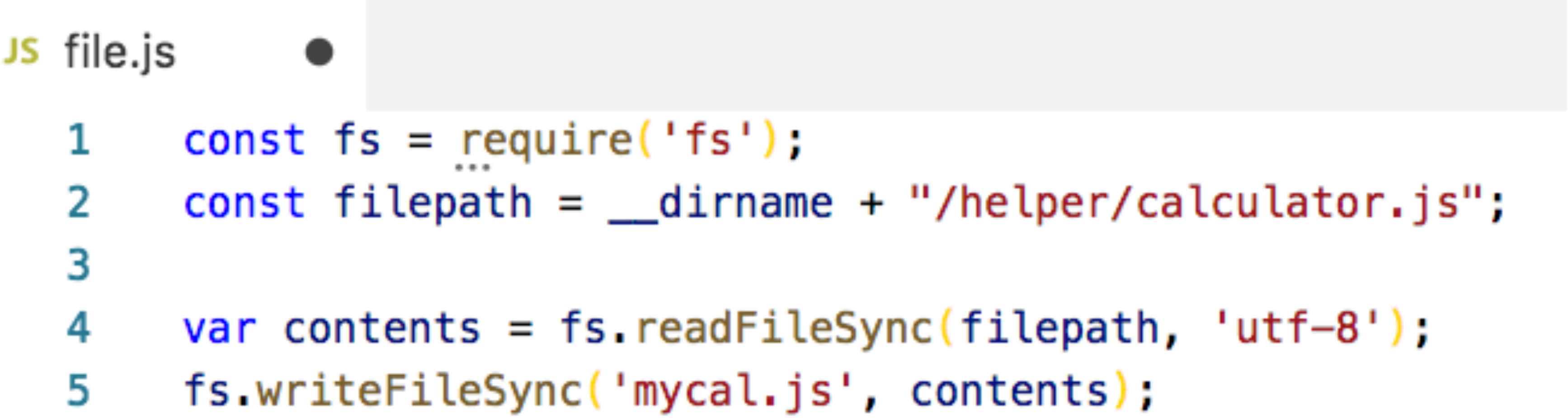

```javascript
const fs = require('fs');
const filepath = __dirname + "/helper/calculator.js";

var contents = fs.readFileSync(filepath, 'utf-8');
fs.writeFileSync('mycal.js', contents);
```

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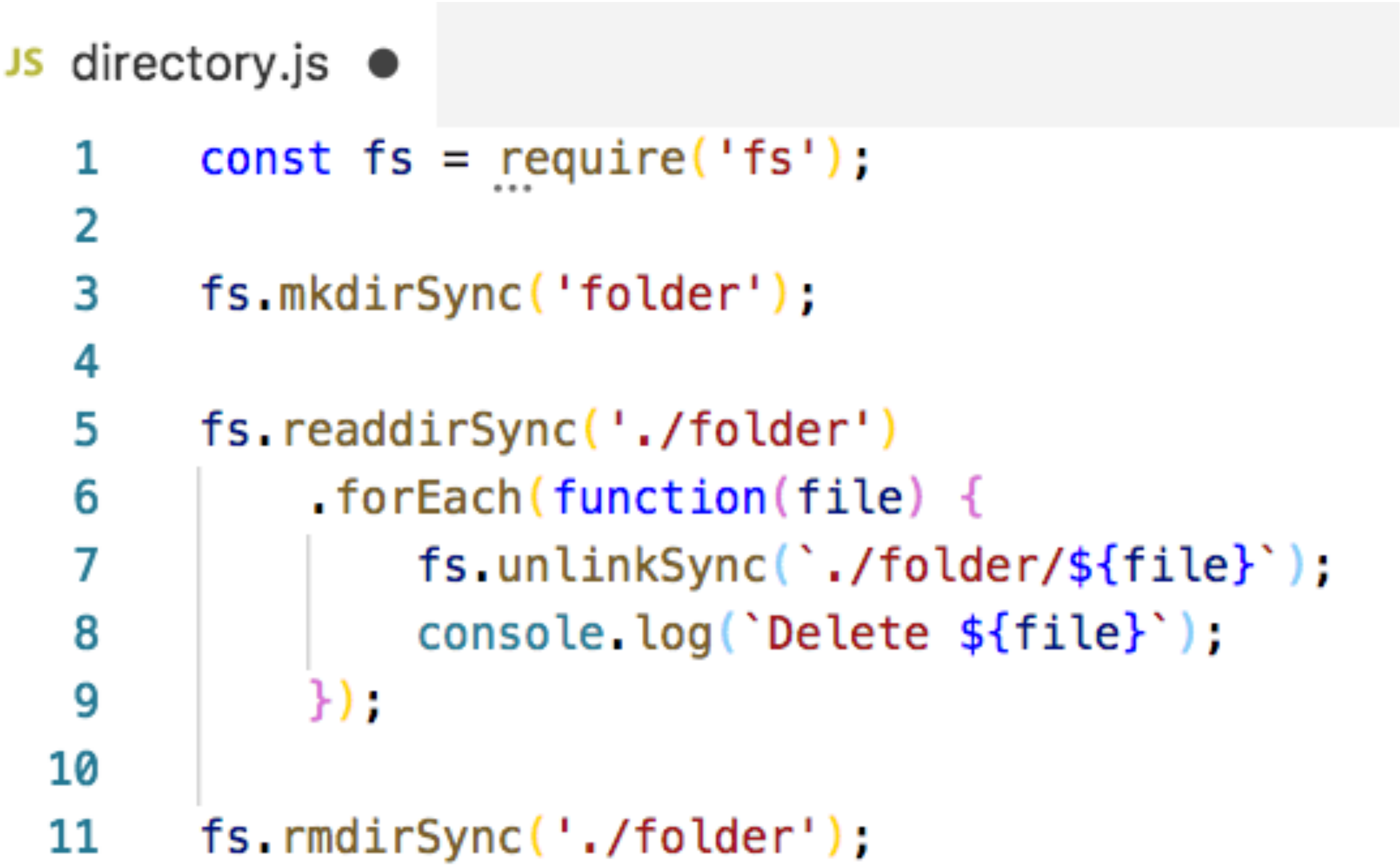
Create & Delete Directories

Tạo & Xoá Thư mục



```javascript
const fs = require('fs');

fs.mkdirSync('folder');

fs.readdirSync('./folder')
    .forEach(function(file) {
        fs.unlinkSync(`./folder/${file}`);
        console.log(`Delete ${file}`);
    });

fs.rmdirSync('./folder');
```