the Master Course

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INTERMEDIATE JAVASCRIPT

Introduction to Node.js and NPM

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Learning Objectives

To understand what Node.js is used for

To be able to run your JavaScript files in a Node Environment

To understand modularity in JavaScript

To be able to export and require modules

To understand what NPM is and how to use it

Node.js

A JavaScript runtime environment

An environment which understands JavaScript outside of the browser.

Node is a huge reason for JavaScript's surge in popularity because it lets us do things we could never do before.

JavaScript was designed to run in the browser, which limited its wider application

Node takes JavaScript server-side.

About Node

It it fast.

It is event driven.

It is non-blocking (can run JavaScript asynchronously)

It is powered by Googles V8 engine.

It is written C++

It takes the JavaScript and converts it into machine code.

We can run our JavaScript files in **node**.
We simply use the **node keyword** and the path to the JavaScript file we want to run.

Example:

node app.js

JavaScript can add interactivity to a web page in a browser but can't do much else

With Node we can connect databases and access the computer's file system. Basically, what traditional languages like C and Java can do.

Libraries and Frameworks

There are many JavaScript libraries and frameworks on the web. They are JavaScript files that other developers have written. We can use these files in our own projects as if we had written the code ourselves.

Node Module System

Node modules are blocks of encapsulated code that communicate with an external application.

There are many **core modules** built into node and there are many more that we can **install** too. We can also make our **own modules**.

There are three types of modules

Local modules (created by us)
Core modules (built into node)
Third party modules (made by other people)

Local Modules

Create modules to better organise and structure your projects.

Break down your programs into smaller, manageable JavaScript files.

Intermediate JS

```
let add = (num1, num2) => {
    let result = num1 + num2;
    return result;
};

let subtract = (num1, num2) => {
    let result = num1 - num2;
    return result;
};

module.exports = { add, subtract };
```

We can use the **module.exports** object to export functions, arrays, variables etc that we want to use in other files/folders

Intermediate JS

```
const myFunctions = require('./exp1');

console.log(myFunctions.add(2, 5));
console.log(myFunctions.subtract(5, 2));
```

To include a **module**, use the **require** method and store it in a variable.

Intermediate JS

```
const { add, subtract } = require('./exp1');

console.log(add(2, 5));
console.log(subtract(5, 2));
```

We can also **require** the exact functions directly using curly braces, this is called **object destructuring**

Core Modules

The built in modules are developed by the node team and are part of the language itself.

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Intermediate JS

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

let userDetails = os.userInfo().username;

fs.appendFile('oh-hi.txt', `Hello ${userDetails}`, (err) => {
    if (err) {
        console.log('oops');
    }
});
```

Let's use the **os** and **fs** core modules.
What does this do?

Read the documentation

os and **fs** have different methods, see what else you can do.

https://nodejs.org/api/os.html
https://nodejs.org/api/fs.html

Third Party Modules

Third-Part Modules are modules that are available online using the **Node Package Manager**

Node Package Manager

We can use the **Node Package Manager** (NPM) to install third party packages. **NPM** is also included in node, so we do not have to install it!

Using NPM

First we need to initialise our project. In the terminal, make sure you are in the correct folder and run the **command:**

npm init -y

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Intermediate JS

```
{
  "name": "advanced-javascript-wk4",
  "version": "1.0.0",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "description": ""
}
```

We now have a **package.json** file which will store our module information.

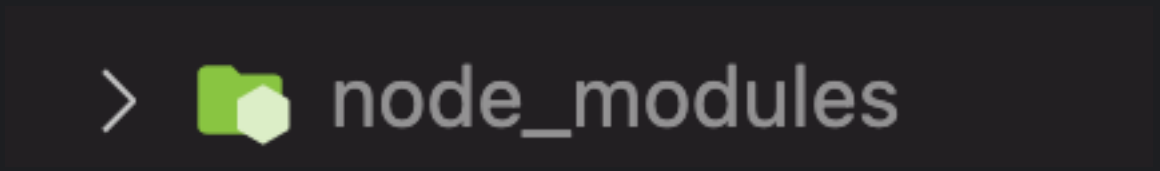
Installing a package

In the terminal run the command:

npm install inquirer

Node Modules

Third party modules we use are referred to as dependencies. When we install them they are included in a folder called node_modules.

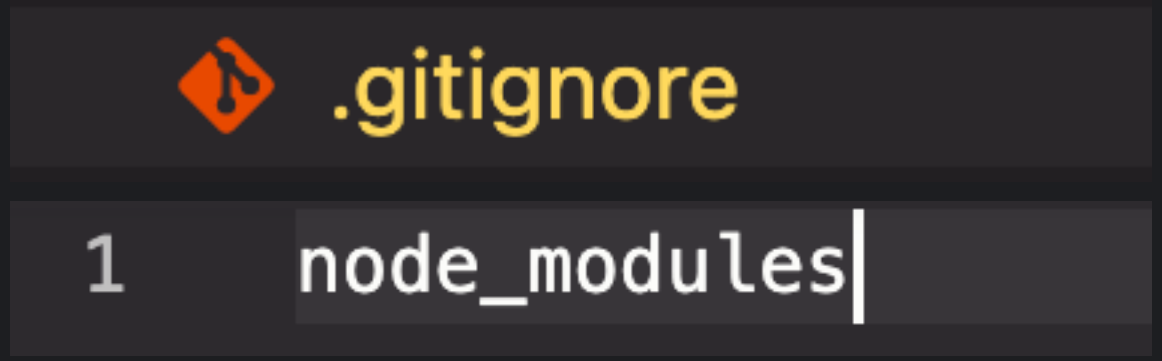


```
{
  "name": "advanced-javascript-wk4",
  "version": "1.0.0",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "description": "",
  "dependencies": {
    "inquirer": "^8.2.4"
  }
}
```

Our **package.json** file now includes this package as a dependency

Git ignore

node_modules should not be pushed to git. Create a folder named **.gitignore** and add the **node_modules** inside the file.



Package.json

Our **package.json** lists any dependencies that the project relies on to run. If you clone a **repository** from Github, remember to run **npm install** in the terminal to get the node_modules to run the project.

Activity

Use a third party package in your Coffee Shop Challenge.

Example packages:

Inquirer lets you have an interactive command line app to prompt questions to the user https://www.npmjs.com/package/inquirer

Chalk lets you style the console logs in the terminal https://www.npmjs.com/package/chalk

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