

Node.js - Guide

section 5 - Testing - Mocha

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A brief outline of testing Node.js apps with Mocha.

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intro

We can use testing within our Node.js apps to check and verify that logic and functionality is actually working as expected.

For example, abstract and test a function to correctly fetch a user id, name &c. from a database.

testing - Mocha testing

We can start by creating a simple app, which can then be used to demonstrate testing options for Node.js.

A basic app directory, **node-testing**, and a sub-directory for some test custom modules, e.g. **utilities**.

In a file, **utilities.js**, we can add a sample function, which we'll then use for basic testing.

```
// basic function for testing  
module.exports.adder = (a, b) => a + b;
```

Mocha is framework we can use to configure our test suite for such Node.js apps. Further information,

- <https://mochajs.org>

Install Mocha,

```
npm install mocha --save-dev
```

The flag **--save-dev** will not be installed for production apps, Heroku &c.

Then we can create a test file for Mocha, e.g. **/utilities/utilities.test.js**. Mocha will look in a directory for files with this type of filename pattern, i.e. with **..test.js**.

testing - test case for Mocha

Then we can add a test case for Mocha. e.g.

```
const utils = require('./utilities');

// behaviour driven development (bdd) - describe what you want the test to do...
it('should add some numbers', () => {
  var total = utils.adder(22, 11);
});
```

`it()` is a function provided by Mocha. The first parameter is a description, which should use `it` as part of the test description - known as **behaviour driven development**.

Then, the second parameter is a function for the testing itself. We can create a simple variable to help run and test the function `adder()` in the `utilities.js` file.

In the `package.json` file, we need to modify the `test` script to run Mocha and any available test files, e.g.

```
...
"scripts": {
  "test": "mocha **/*.test.js"
}
...
```

We're now calling Mocha, which checks every directory for any file that has a matching ending of `.test.js`. i.e. our test files for a node.js app.

We can run our initial test with Mocha, which is executed from the command specified in `package.json`, e.g.

```
npm test
```

Mocha will run the test we created in the `/utilities/utilities.test.js` file for the required `/utilities/utilities.js`, and output some comments for the test to the command line, including whether the test has passed, how long the test took to run, and the `it()` test description.

testing - add error checking to initial test cases

In addition to simply checking whether a function runs correctly, we can also add some useful error checking and reporting to a test, e.g.

```
it('should add some numbers', () => {
  var total = utils.adder(22, 11);
  // error check and report
```

```
if (total !== 33) {  
  throw new Error(`result should have been 33, and not ${total}`);  
}  
});
```

We can check this error handling and reporting by slightly modifying the original `adder()` function to deliberately create an error with the add calculation, perhaps adding more than the expected two numbers.

If we then run Mocha for this test, we'll get a series of debug messages, and the returned error message. Very useful for debugging problems part of a Node.js app.

testing - auto re-run tests for changes

We can use `nodemon` to help monitor and re-run `npm test`, e.g.

```
nodemon --exec "npm test"
```

We can also update our app's `package.json` file to include a custom script, which will make it less verbose to run this monitored test script, e.g.

```
...  
"scripts": {  
  "test": "mocha **/*.test.js",  
  "test-mon": "nodemon --exec \"npm test\""  
}  
...
```

This means we can now run monitored tests using the `npm run test-mon` command. This allows us to run a custom script.

n.b. we use double quotes for the `"npm test"` command to make sure this will work on most OSs, including Windows.