

# JavaScript Unit Testing

*Mocha & Chai*

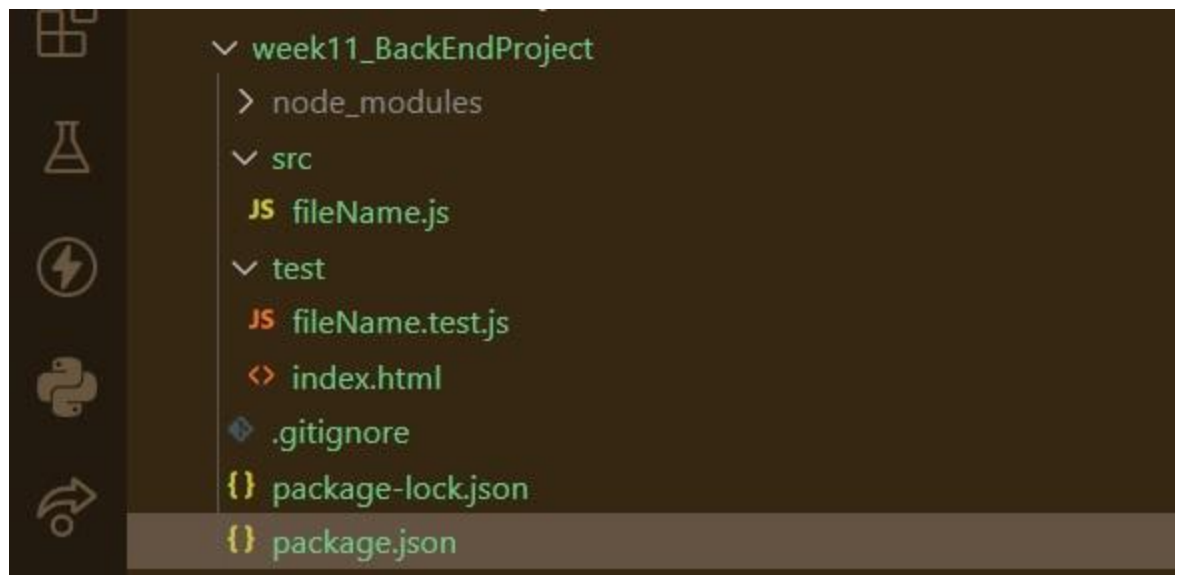
## What's what

- What is JavaScript Unit Testing?
  - JavaScript Unit Testing is a method where JavaScript test code is written for a web page or web application module. It is then combined with HTML as an inline event handler and executed in the browser to test if all functionalities are working as desired.
- What is BDD?
  - BDD stands for behavior-driven development, which provides an expressive language and readable style.
- What is TDD?
  - TDD stands for test-driven development, which provides a more classic feel.
- What is Mocha?
  - [Documentation](#)
  - Mocha is a JavaScript based test framework for Node.js
- What are hooks in Mocha?
  - Hooks are basically logic that have been configured to run before or after tests. They are useful for setting up preconditions for tests or cleaning up resources after tests. With the default BDD interface, Mocha provides four hooks:
    - `before()`: Runs once before the first test case in the block
    - `beforeEach()`: Runs before each test case
    - `afterEach()`: Runs after each test case
    - `after()`: Runs once after the last test case in the block
- What is Chai?
  - [Documentation](#)
  - Chai is an assertion library for Node.js and the browser. Chai must be connected to a JavaScript testing framework such as Mocha.
- What are Chai's three assertion styles?
  - Expect - this is a BDD style and is compatible across all browsers

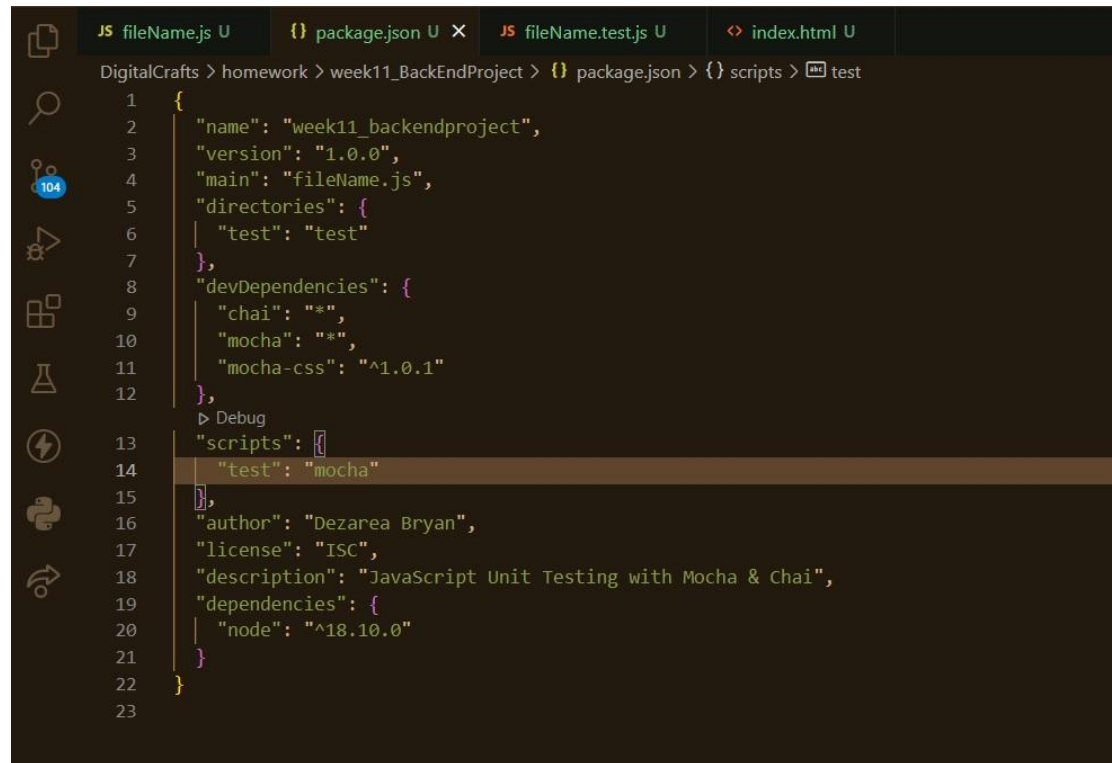
- Should - this is a BDD style and is compatible across all browsers except Internet Explorer
- Assert - this is a TDD style and is compatible across all browsers

## Installation

- As a pre-requisite, make sure that you have NPM and Node.js installed.
- Navigate to the root directory that you are working in. From there, run:
  - `npm i mocha chai`
  - `npm i --save-dev mocha-css`
  - `mkdir test`
  - `cd test`
  - `code fileName.test.js index.html`
- Once you have done the above steps, your folder should look something like this:



- You may notice that I have a .gitignore file. In this file, I have added node\_modules. This ensures that the node modules are not pushed to the github repository.

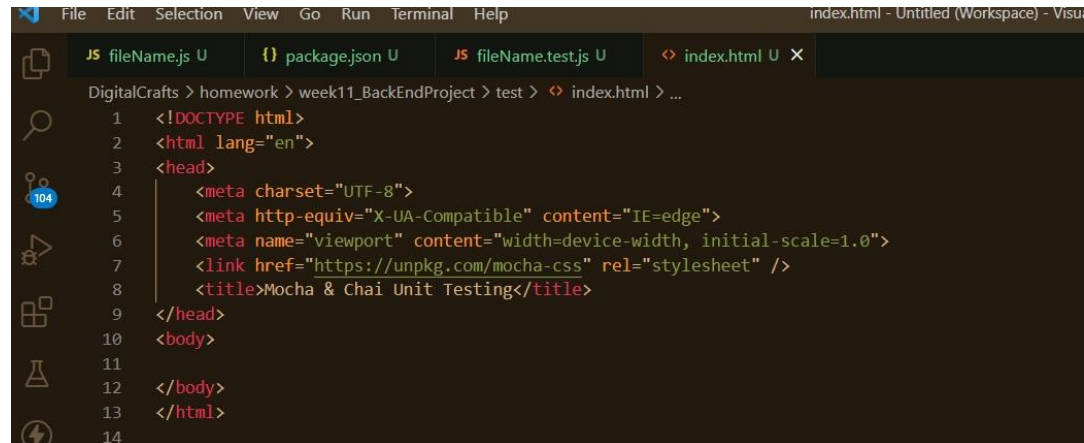


```
1 {
2   "name": "week11_backendproject",
3   "version": "1.0.0",
4   "main": "fileName.js",
5   "directories": {
6     "test": "test"
7   },
8   "devDependencies": {
9     "chai": "*",
10    "mocha": "*",
11    "mocha-css": "^1.0.1"
12  },
13  "scripts": {
14    "test": "mocha"
15  },
16  "author": "Dezarea Bryan",
17  "license": "ISC",
18  "description": "JavaScript Unit Testing with Mocha & Chai",
19  "dependencies": {
20    "node": "^18.10.0"
21  }
22 }
```

- 
- Above is an example of what your package.json should look like. You will notice that there is an \* next to Chai and Mocha. This is there so that the latest version will be installed whenever the npm install command is run. You will also notice that the test script has automatically been updated to Mocha. This will allow us to use the command `npm test` to run our unit tests for Mocha; however, we will not be using this command in this case because we are also using Chai.

## Connecting

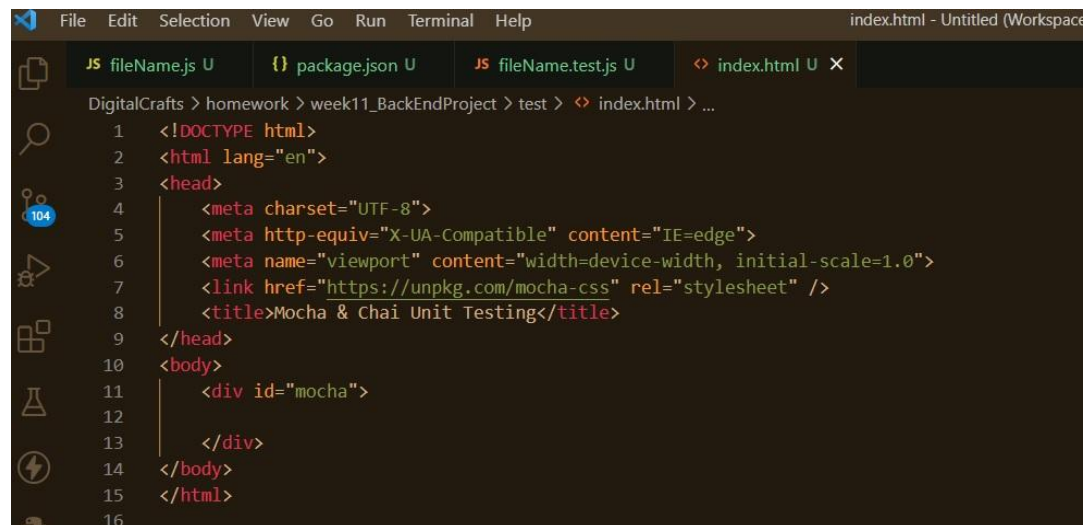
- While this is optional, I highly recommend that you begin by linking mocha's built in css. (Line 7)
  - [Documentation](#)



The screenshot shows a code editor with the following HTML code in index.html:

```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta http-equiv="X-UA-Compatible" content="IE=edge">
6   <meta name="viewport" content="width=device-width, initial-scale=1.0">
7   <link href="https://unpkg.com/mocha-css" rel="stylesheet" />
8   <title>Mocha & Chai Unit Testing</title>
9 </head>
10 <body>
11
12 </body>
13 </html>
```

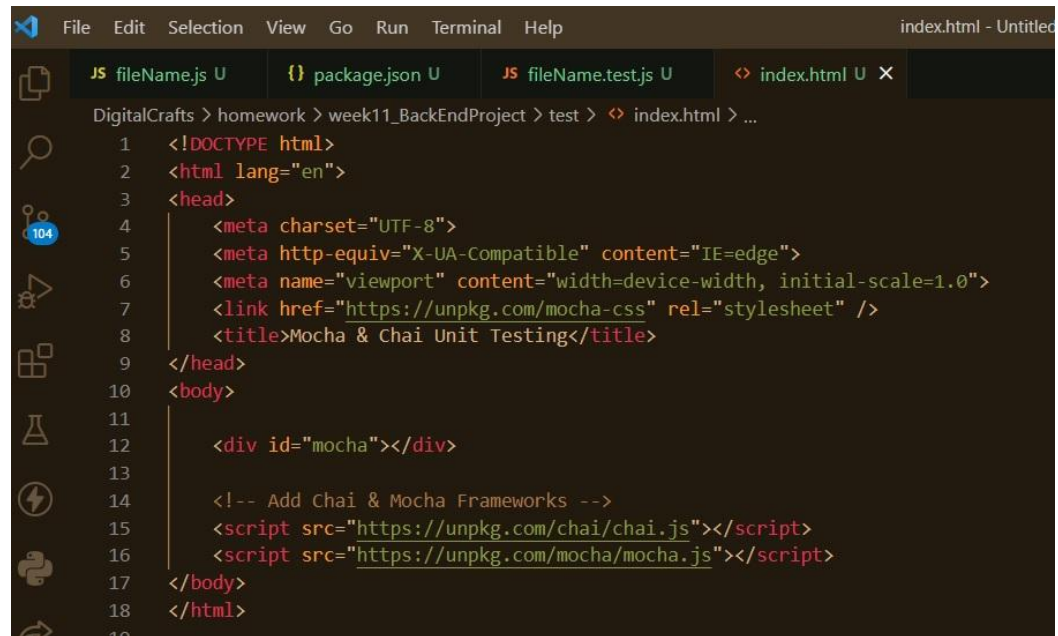
- Add the ID “mocha” to an element. In this case, we will add it to a div so that Mocha knows where to render the data. (Lines 11-13)



The screenshot shows the same code editor with the following HTML code in index.html:

```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta http-equiv="X-UA-Compatible" content="IE=edge">
6   <meta name="viewport" content="width=device-width, initial-scale=1.0">
7   <link href="https://unpkg.com/mocha-css" rel="stylesheet" />
8   <title>Mocha & Chai Unit Testing</title>
9 </head>
10 <body>
11   <div id="mocha">
12
13   </div>
14 </body>
15 </html>
```

- Add Mocha and Chai frameworks. (Lines 15-16)

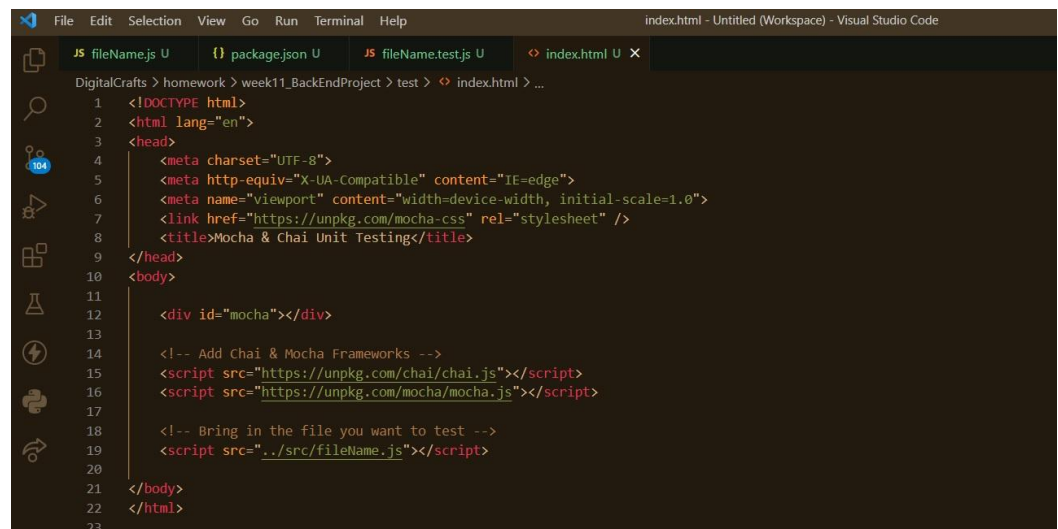


```

1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <meta http-equiv="X-UA-Compatible" content="IE=edge">
6      <meta name="viewport" content="width=device-width, initial-scale=1.0">
7      <link href="https://unpkg.com/mocha-css" rel="stylesheet" />
8      <title>Mocha & Chai Unit Testing</title>
9  </head>
10 <body>
11
12     <div id="mocha"></div>
13
14     <!-- Add Chai & Mocha Frameworks -->
15     <script src="https://unpkg.com/chai/chai.js"></script>
16     <script src="https://unpkg.com/mocha/mocha.js"></script>
17 </body>
18 </html>

```

- Add the file we would like to test. (Line 19)



```

1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <meta http-equiv="X-UA-Compatible" content="IE=edge">
6      <meta name="viewport" content="width=device-width, initial-scale=1.0">
7      <link href="https://unpkg.com/mocha-css" rel="stylesheet" />
8      <title>Mocha & Chai Unit Testing</title>
9  </head>
10 <body>
11
12     <div id="mocha"></div>
13
14     <!-- Add Chai & Mocha Frameworks -->
15     <script src="https://unpkg.com/chai/chai.js"></script>
16     <script src="https://unpkg.com/mocha/mocha.js"></script>
17
18     <!-- Bring in the file you want to test -->
19     <script src="../src/fileName.js"></script>
20
21 </body>
22 </html>

```

- Next, we want to initialize mocha. (Lines 22-24)

```

1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <meta http-equiv="X-UA-Compatible" content="IE=edge">
6      <meta name="viewport" content="width=device-width, initial-scale=1.0">
7      <link href="https://unpkg.com/mocha-css" rel="stylesheet" />
8      <title>Mocha & Chai Unit Testing</title>
9  </head>
10 <body>
11
12     <div id="mocha"></div>
13
14     <!-- Add Chai & Mocha Frameworks -->
15     <script src="https://unpkg.com/chai/chai.js"></script>
16     <script src="https://unpkg.com/mocha/mocha.js"></script>
17
18     <!-- Bring in the file you want to test -->
19     <script src="./src/fileName.js"></script>
20
21     <!-- Initialize mocha -->
22     <script>
23         | mocha.setup('bdd')
24     </script>
25
26 </body>
27 </html>
28

```

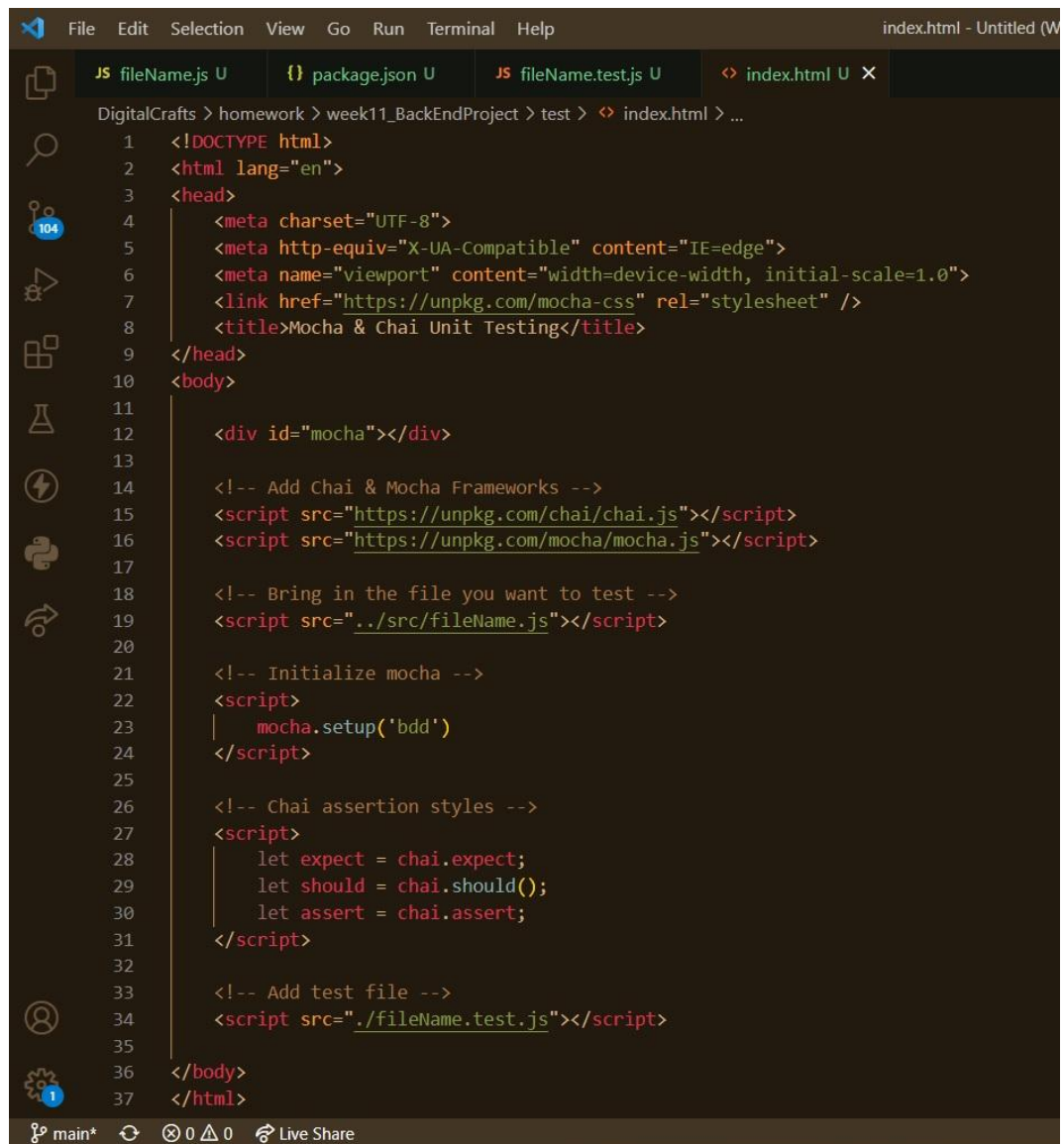
- Next we will be bringing in the Chai assertion style of our choosing. In this example, I will show you how to bring in all three styles. (Lines 27-31)

```

1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <meta http-equiv="X-UA-Compatible" content="IE=edge">
6      <meta name="viewport" content="width=device-width, initial-scale=1.0">
7      <link href="https://unpkg.com/mocha-css" rel="stylesheet" />
8      <title>Mocha & Chai Unit Testing</title>
9  </head>
10 <body>
11
12     <div id="mocha"></div>
13
14     <!-- Add Chai & Mocha Frameworks -->
15     <script src="https://unpkg.com/chai/chai.js"></script>
16     <script src="https://unpkg.com/mocha/mocha.js"></script>
17
18     <!-- Bring in the file you want to test -->
19     <script src="./src/fileName.js"></script>
20
21     <!-- Initialize mocha -->
22     <script>
23         | mocha.setup('bdd')
24     </script>
25
26     <!-- Chai assertion styles -->
27     <script>
28         | let expect = chai.expect;
29         | let should = chai.should();
30         | let assert = chai.assert;
31     </script>
32
33 </body>
34 </html>
35

```

- Add fileName.test.js to our index.html. (Line 34)

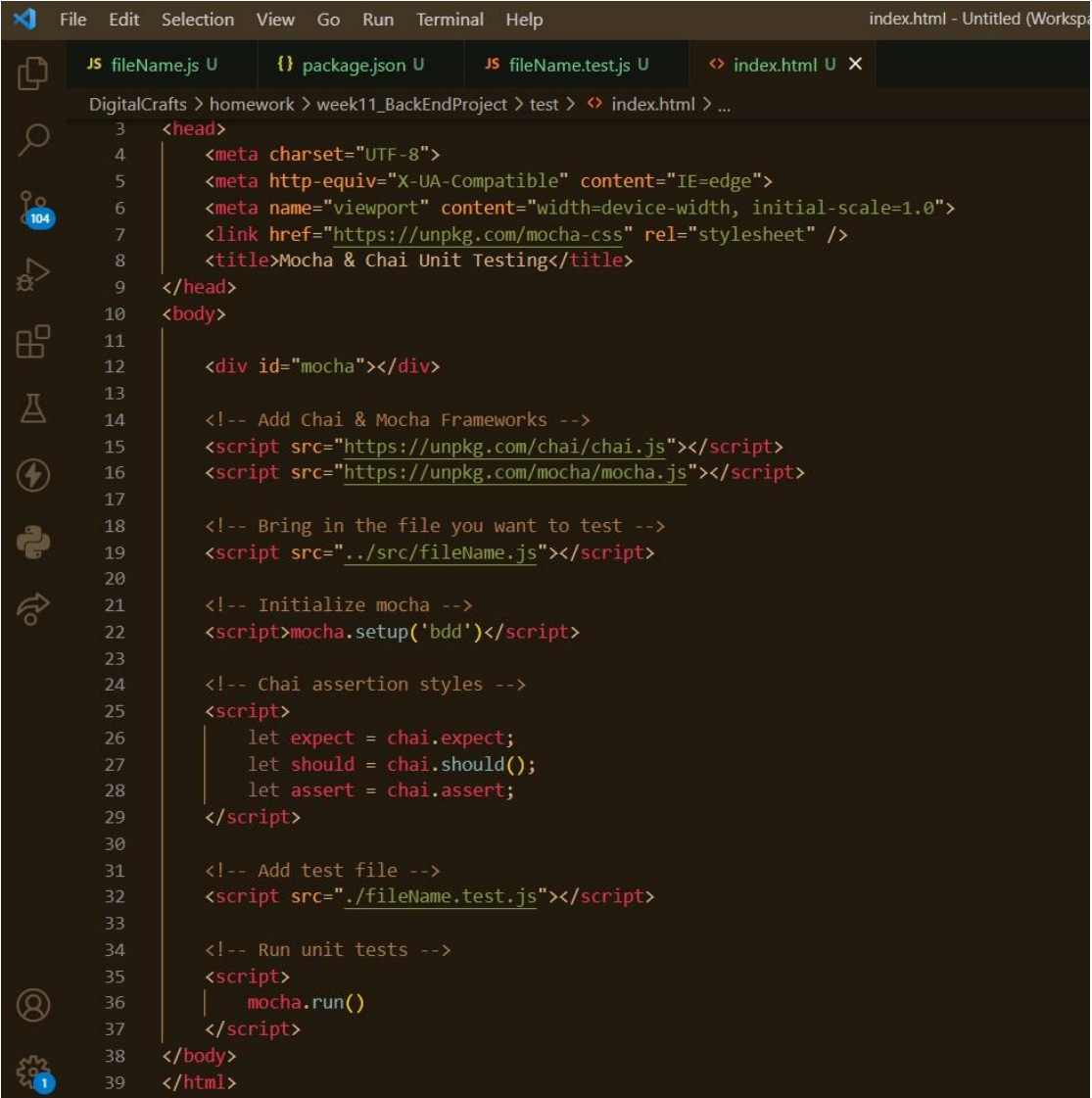


The screenshot shows a VS Code editor window with the file 'index.html' open. The editor has a dark theme and a sidebar on the left with various icons. The top of the editor shows the file explorer with 'JS fileName.js U', '{} package.json U', 'JS fileName.test.js U', and '<> index.html U x'. The main editor area shows the content of 'index.html' with line numbers 1 through 37. The code is an HTML document that includes Mocha and Chai frameworks. It uses script tags to load the frameworks from unpkg.com and includes a script tag to load 'fileName.test.js' at line 34. The document also includes a meta charset of 'UTF-8', a viewport meta tag, and a title 'Mocha & Chai Unit Testing'.

```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <meta http-equiv="X-UA-Compatible" content="IE=edge">
6   <meta name="viewport" content="width=device-width, initial-scale=1.0">
7   <link href="https://unpkg.com/mocha-css" rel="stylesheet" />
8   <title>Mocha & Chai Unit Testing</title>
9 </head>
10 <body>
11
12   <div id="mocha"></div>
13
14   <!-- Add Chai & Mocha Frameworks -->
15   <script src="https://unpkg.com/chai/chai.js"></script>
16   <script src="https://unpkg.com/mocha/mocha.js"></script>
17
18   <!-- Bring in the file you want to test -->
19   <script src="../src/fileName.js"></script>
20
21   <!-- Initialize mocha -->
22   <script>
23     | mocha.setup('bdd')
24   </script>
25
26   <!-- Chai assertion styles -->
27   <script>
28     | let expect = chai.expect;
29     | let should = chai.should();
30     | let assert = chai.assert;
31   </script>
32
33   <!-- Add test file -->
34   <script src="./fileName.test.js"></script>
35
36 </body>
37 </html>
```



- Finally, we need to have mocha run our unit tests that will be set up in our test file. (Lines 35-37)



```
3 <head>
4   <meta charset="UTF-8">
5   <meta http-equiv="X-UA-Compatible" content="IE=edge">
6   <meta name="viewport" content="width=device-width, initial-scale=1.0">
7   <link href="https://unpkg.com/mocha-css" rel="stylesheet" />
8   <title>Mocha & Chai Unit Testing</title>
9 </head>
10 <body>
11   <div id="mocha"></div>
12
13   <!-- Add Chai & Mocha Frameworks -->
14   <script src="https://unpkg.com/chai/chai.js"></script>
15   <script src="https://unpkg.com/mocha/mocha.js"></script>
16
17   <!-- Bring in the file you want to test -->
18   <script src="../src/fileName.js"></script>
19
20   <!-- Initialize mocha -->
21   <script>mocha.setup('bdd')</script>
22
23   <!-- Chai assertion styles -->
24   <script>
25     let expect = chai.expect;
26     let should = chai.should();
27     let assert = chai.assert;
28   </script>
29
30   <!-- Add test file -->
31   <script src="./fileName.test.js"></script>
32
33   <!-- Run unit tests -->
34   <script>
35     mocha.run()
36   </script>
37 </body>
38 </html>
```