(/)

Curriculum
Short Specializations
Average: **56.01%**

0x05. NodeJS Basics

Back-end **JavaScript** **ES6** **NodeJS** **ExpressJS**

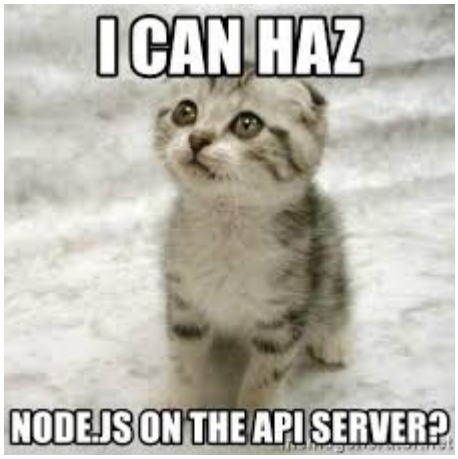
Weight: 1

Project over - took place from Aug 19, 2024 4:00 AM to Aug 21, 2024 4:00 AM

An auto review will be launched at the deadline

In a nutshell...

- **Auto QA review:** 0.0/32 mandatory
- **Altogether: 0.0%**
  - Mandatory: 0.0%
  - Optional: no optional tasks



Resources

Read or watch:

- Node JS getting started (/rltoken/hROgW3QO9jqFnFP-Nzwh8A)
- Process API doc (/rltoken/Wt69QV2xygB4GEqob26AjQ)
- Child process (/rltoken/IS4y9rRCblX71W_oeXpymw)
- Express getting started (/rltoken/XsfrhG9NRLuuaTpVZlZv_g)
- Mocha documentation (/rltoken/EBGDj1FwLrK_y4kgxp8hfg)
- Nodemon documentation (/rltoken/vnDSbLsicMDdxcf5YUSXIg)

Learning Objectives

At the end of this project, you are expected to be able to explain to anyone (/rltoken/vXmxtc5JH_CeIWReMTNhDA), **without the help of Google**:

- run javascript using NodeJS
- use NodeJS modules
- use specific Node JS module to read files
- use `process` to access command line arguments and the environment
- create a small HTTP server using Node JS
- create a small HTTP server using Express JS
- create advanced routes with Express JS
- use ES6 with Node JS with Babel-node
- use Nodemon to develop faster

Requirements

- Allowed editors: `vi`, `vim`, `emacs`, `Visual Studio Code`
- All your files will be interpreted/compiled on Ubuntu 18.04 LTS using `node` (version 12.x.x)
- All your files should end with a new line
- A `README.md` file, at the root of the folder of the project, is mandatory
- Your code should use the `js` extension
- Your code will be tested using `Jest` and the command `npm run test`
- Your code will be verified against lint using ESLint
- Your code needs to pass all the tests and lint. You can verify the entire project running `npm run full-test`
- All of your functions/classes must be exported by using this format: `module.exports = myFunction;`

Provided files

database.csv

```
firstname,lastname,age,field
Johann,Kerbrou,30,CS
Guillaume,Salou,30,SWE
Arielle,Salou,20,CS
Jonathan,Benou,30,CS
Emmanuel,Turlou,40,CS
Guillaume,Plessous,35,CS
Joseph,Crisou,34,SWE
Paul,Schneider,60,SWE
Tommy,Schoul,32,SWE
Katie,Shirou,21,CS
```

package.json

Click to show/hide file contents

babel.config.js

Click to show/hide file contents

.eslintrc.js

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Click to show/hide file contents

and...

Don't forget to run **$ npm install** when you have the **package.json**

Tasks

0. Executing basic javascript with Node JS

mandatory

Score: 0.0% (*Checks completed: 0.0%*)

In the file **0-console.js** , create a function named **displayMessage** that prints in **STDOUT** the string argument.

```
bob@dylan:~$ cat 0-main.js
const displayMessage = require('./0-console');

displayMessage("Hello NodeJS!");

bob@dylan:~$ node 0-main.js
Hello NodeJS!
bob@dylan:~$
```

Repo:

- GitHub repository: **alx-backend-javascript**
- Directory: **0x05-Node_JS_basic**
- File: **0-console.js**

Done? | Check your code | Ask for a new correction | Get a sandbox | QA Review

1. Using Process stdin

mandatory

Score: 0.0% (*Checks completed: 0.0%*)

Create a program named **1-stdin.js** that will be executed through command line:

- It should display the message **Welcome to Holberton School, what is your name?** (followed by a new line)
- The user should be able to input their name on a new line
- The program should display **Your name is: INPUT**

- When the user ends the program, it should display `This important software is now closing` (followed by a new line)

(/)

Requirements:

- Your code will be tested through a child process, make sure you have everything you need for that

```
bob@dylan:~$ node 1-stdin.js
Welcome to Holberton School, what is your name?
Bob
Your name is: Bob
bob@dylan:~$
bob@dylan:~$ echo "John" | node 1-stdin.js
Welcome to Holberton School, what is your name?
Your name is: John
This important software is now closing
bob@dylan:~$
```

Repo:

- GitHub repository: `alx-backend-javascript`
- Directory: `0x05-Node_JS_basic`
- File: `1-stdin.js`

Done? | Check your code | Ask for a new correction | Get a sandbox | QA Review

2. Reading a file synchronously with Node JS

mandatory

Score: 0.0% (*Checks completed: 0.0%*)

Using the database `database.csv` (provided in project description), create a function `countStudents` in the file `2-read_file.js`

- Create a function named `countStudents`. It should accept a path in argument
- The script should attempt to read the database file synchronously
- If the database is not available, it should throw an error with the text `Cannot load the database`
- If the database is available, it should log the following message to the console `Number of students: NUMBER_OF_STUDENTS`
- It should log the number of students in each field, and the list with the following format: `Number of students in FIELD: 6. List: LIST_OF_FIRSTNAMES`
- CSV file can contain empty lines (at the end) - and they are not a valid student!

```
bob@dylan:~$ cat 2-main_0.js
const countStudents = require('./2-read_file');

countStudents("nope.csv");

bob@dylan:~$ node 2-main_0.js
2-read_file.js:9
  throw new Error('Cannot load the database');
  ^

Error: Cannot load the database
...
bob@dylan:~$
bob@dylan:~$ cat 2-main_1.js
const countStudents = require('./2-read_file');

countStudents("database.csv");

bob@dylan:~$ node 2-main_1.js
Number of students: 10
Number of students in CS: 6. List: Johann, Arielle, Jonathan, Emmanuel, Guillaume, Katie
Number of students in SWE: 4. List: Guillaume, Joseph, Paul, Tommy
bob@dylan:~$
```

Repo:

- GitHub repository: **alx-backend-javascript**
- Directory: **0x05-Node_JS_basic**
- File: **2-read_file.js**

Done? | Check your code | Ask for a new correction | Get a sandbox | QA Review

3. Reading a file asynchronously with Node JS

mandatory

Score: 0.0% (*Checks completed: 0.0%*)

Using the database **database.csv** (provided in project description), create a function **countStudents** in the file **3-read_file_async.js**

- Create a function named **countStudents** . It should accept a path in argument (same as in **2-read_file.js**)
- The script should attempt to read the database file asynchronously
- The function should return a Promise
- If the database is not available, it should throw an error with the text **Cannot load the database**
- If the database is available, it should log the following message to the console **Number of students: NUMBER_OF_STUDENTS**
- It should log the number of students in each field, and the list with the following format: **Number of students in FIELD: 6. List: LIST_OF_FIRSTNAMES**
- CSV file can contain empty lines (at the end) - and they are not a valid student!

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```
bob@dylan:~$ cat 3-main_0.js
const countStudents = require('./3-read_file_async');

countStudents("nope.csv")
  .then(() => {
    console.log("Done!");
  })
    .catch((error) => {
    console.log(error);
  });

bob@dylan:~$ node 3-main_0.js
Error: Cannot load the database
...
bob@dylan:~$
bob@dylan:~$ cat 3-main_1.js
const countStudents = require('./3-read_file_async');

countStudents("database.csv")
  .then(() => {
    console.log("Done!");
  })
    .catch((error) => {
    console.log(error);
  });
console.log("After!");

bob@dylan:~$ node 3-main_1.js
After!
Number of students: 10
Number of students in CS: 6. List: Johann, Arielle, Jonathan, Emmanuel, Guillaume, Katie
Number of students in SWE: 4. List: Guillaume, Joseph, Paul, Tommy
Done!
bob@dylan:~$
```

Tips:

- Using asynchronous callbacks is the preferred way to write code in Node to avoid blocking threads

Repo:

- GitHub repository: alx-backend-javascript
- Directory: 0x05-Node_JS_basic
- File: 3-read_file_async.js

Done? | Check your code | Ask for a new correction | Get a sandbox | QA Review

4. Create a small HTTP server using Node's HTTP module

mandatory

Score: 0.0% (*Checks completed: 0.0%*)

In a file named `4-http.js`, create a small HTTP server using the `http` module:

(/)

- It should be assigned to the variable `app` and this one must be exported
- HTTP server should listen on port 1245
- Displays `Hello Holberton School!` in the page body for any endpoint as plain text

In terminal 1:

```
bob@dylan:~$ node 4-http.js
...
```

In terminal 2:

```
bob@dylan:~$ curl localhost:1245 && echo ""
Hello Holberton School!
bob@dylan:~$
bob@dylan:~$ curl localhost:1245/any_endpoint && echo ""
Hello Holberton School!
bob@dylan:~$
```

Repo:

- GitHub repository: `alx-backend-javascript`
- Directory: `0x05-Node_JS_basic`
- File: `4-http.js`

Done? | Check your code | Ask for a new correction | Get a sandbox | QA Review

5. Create a more complex HTTP server using Node's HTTP module

mandatory

Score: 0.0% (*Checks completed: 0.0%*)

In a file named `5-http.js`, create a small HTTP server using the `http` module:

- It should be assigned to the variable app and this one must be exported
- HTTP server should listen on port 1245
- It should return plain text
- When the URL path is `/`, it should display `Hello Holberton School!` in the page body
- When the URL path is `/students`, it should display `This is the list of our students` followed by the same content as the file `3-read_file_async.js` (with and without the database) - the name of the database must be passed as argument of the file
- CSV file can contain empty lines (at the end) - and they are not a valid student!

Terminal 1:

```
bob@dylan:~$ node 5-http.js database.csv
...
```

In terminal 2:

```
bob@dylan:~$ curl localhost:1245 && echo ""
Hello Holberton School!
bob@dylan:~$
bob@dylan:~$ curl localhost:1245/students && echo ""
This is the list of our students
Number of students: 10
Number of students in CS: 6. List: Johann, Arielle, Jonathan, Emmanuel, Guillaume, Katie
Number of students in SWE: 4. List: Guillaume, Joseph, Paul, Tommy
bob@dylan:~$
```

Repo:

- GitHub repository: `alx-backend-javascript`
- Directory: `0x05-Node_JS_basic`
- File: `5-http.js`

Done? | Check your code | Ask for a new correction | Get a sandbox | QA Review

6. Create a small HTTP server using Express

mandatory

Score: 0.0% (*Checks completed: 0.0%*)

Install Express and in a file named `6-http_express.js`, create a small HTTP server using Express module:

- It should be assigned to the variable `app` and this one must be exported
- HTTP server should listen on port 1245
- Displays `Hello Holberton School!` in the page body for the endpoint `/`

In terminal 1:

```
bob@dylan:~$ node 6-http_express.js
...
```

In terminal 2:

```
bob@dylan:~$ curl localhost:1245 && echo ""
Hello Holberton School!
bob@dylan:~$
bob@dylan:~$ curl localhost:1245/any_endpoint && echo ""
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="utf-8">
<title>Error</title>
</head>
<body>
<pre>Cannot GET /lskdlskd</pre>
</body>
</html>
bob@dylan:~$
```

Repo:

- GitHub repository: alx-backend-javascript
- Directory: 0x05-Node_JS_basic
- File: 6-http_express.js

Done? | Check your code | Ask for a new correction | Get a sandbox | QA Review

7. Create a more complex HTTP server using Express

mandatory

Score: 0.0% (*Checks completed: 0.0%*)

In a file named **7-http_express.js**, recreate the small HTTP server using **Express**:

- It should be assigned to the variable app and this one must be exported
- HTTP server should listen on port 1245
- It should return plain text
- When the URL path is **/**, it should display **Hello Holberton School!** in the page body
- When the URL path is **/students**, it should display **This is the list of our students** followed by the same content as the file **3-read_file_async.js** (with and without the database) - the name of the database must be passed as argument of the file
- CSV file can contain empty lines (at the end) - and they are not a valid student!

Terminal 1:

```
bob@dylan:~$ node 7-http_express.js database.csv
...
```

In terminal 2:

```
bob@dylan:~$ curl localhost:1245 && echo ""
Hello Holberton School!
bob@dylan:~$
bob@dylan:~$ curl localhost:1245/students && echo ""
This is the list of our students
Number of students: 10
Number of students in CS: 6. List: Johann, Arielle, Jonathan, Emmanuel, Guillaume, Katie
Number of students in SWE: 4. List: Guillaume, Joseph, Paul, Tommy
bob@dylan:~$
```

Repo:

- GitHub repository: alx-backend-javascript
- Directory: 0x05-Node_JS_basic
- File: 7-http_express.js

Done? | Check your code | Ask for a new correction | Get a sandbox | QA Review

8. Organize a complex HTTP server using Express

mandatory

Score: 0.0% (*Checks completed: 0.0%*)

Obviously writing every part of a server within a single file is not sustainable. Let's create a full server in a directory named **full_server**.

Since you have used ES6 and Babel in the past projects, let's use **babel-node** to allow to use ES6 functions like **import** or **export**.

8.1 Organize the structure of the server

- Create 2 directories within:
  - **controllers**
  - **routes**
- Create a file **full_server/utils.js**, in the file create a function named **readDatabase** that accepts a file path as argument:
  - It should read the database asynchronously
  - It should return a promise
  - When the file is not accessible, it should reject the promise with the error
  - When the file can be read, it should return an object of arrays of the firstname of students per fields

8.2 Write the App controller

Inside the file **full_server/controllers/AppController.js**:

- Create a class named **AppController**. Add a static method named **getHomepage**
- The method accepts **request** and **response** as argument. It returns a 200 status and the message **Hello Holberton School!**

8.3 Write the Students controller

Inside the file **full_server/controllers/StudentsController.js**, create a class named **StudentsController**. Add two static methods:

The first one is **getAllStudents**:

- The method accepts **request** and **response** as argument
- It should return a status 200
- It calls the function **readDatabase** from the **utils** file, and display in the page:
  - First line: **This is the list of our students**
  - And for each field (order by alphabetic order case insensitive), a line that displays the number of students in the field, and the list of first names (ordered by appearance in the database file) with the following format: **Number of students in FIELD: 6. List: LIST_OF_FIRSTNAMES**
- If the database is not available, it should return a status 500 and the error message **Cannot load the database**

The second one is **getAllStudentsByMajor**:

- The method accepts **request** and **response** as argument
- It should return a status 200
- It uses a parameter that the user can pass to the browser **major**. The **major** can only be **CS** or **SWE**. If the user is passing another parameter, the server should return a 500 and the error **Major parameter must be CS or SWE**

(/)

- It calls the function **readDatabase** from the **utils** file, and display in the page the list of first names for the students (ordered by appearance in the database file) in the specified field **List: LIST_OF_FIRSTNAMES_IN_THE_FIELD**
- If the database is not available, it should return a status 500 and the error message **Cannot load the database**

8.4 Write the routes

Inside the file **full_server/routes/index.js** :

- Link the route **/** to the **AppController**
- Link the route **/students** and **/students/:major** to the **StudentsController**

8.5 Write the server reusing everything you created

Inside the file named **full_server/server.js** , create a small Express server:

- It should use the routes defined in **full_server/routes/index.js**
- It should use the port **1245**

8.6 Update package.json (if you are running it from outside the folder full_server)

If you are starting node from outside of the folder **full_server** , you will have to update the command **dev** by: **nodemon --exec babel-node --presets babel-preset-env ./full_server/server.js ./database.csv**

Warning:

- Don't forget to export your express app at the end of **server.js** (**export default app;**)
- The database filename is passed as argument of the **server.js** BUT, for testing purpose, you should retrieve this filename at the execution (when **getAllStudents** or **getAllStudentsByMajor** are called for example)

In terminal 1:

```
bob@dylan:~$ npm run dev
...
```

In terminal 2:

(7)

```
bob@dylan:~$ curl localhost:1245 && echo ""
Hello Holberton School!
bob@dylan:~$
bob@dylan:~$ curl localhost:1245/students && echo ""
This is the list of our students
Number of students in CS: 6. List: Johann, Arielle, Jonathan, Emmanuel, Guillaume, Katie
Number of students in SWE: 4. List: Guillaume, Joseph, Paul, Tommy
bob@dylan:~$
bob@dylan:~$ curl localhost:1245/students/SWE && echo ""
List: Guillaume, Joseph, Paul, Tommy
bob@dylan:~$
bob@dylan:~$ curl localhost:1245/students/French -vvv && echo ""
*   Trying 127.0.0.1...
* TCP_NODELAY set
* Connected to localhost (127.0.0.1) port 1245 (#0)
> GET /students/SWES HTTP/1.1
> Host: localhost:1245
> User-Agent: curl/7.58.0
> Accept: */*
>
< HTTP/1.1 500 Internal Server Error
< X-Powered-By: Express
< Date: Mon, 06 Jul 2020 03:29:00 GMT
< Connection: keep-alive
< Content-Length: 33
<
* Connection #0 to host localhost left intact
Major parameter must be CS or SWE
bob@dylan:~$
```

If you want to add test to validate your integration, you will need to add this file: **.babelrc**

Click to show/hide file contents

Repo:

- GitHub repository: **alx-backend-javascript**
- Directory: **0x05-Node_JS_basic**
- File: **full_server/utils.js, full_server/controllers/AppController.js, full_server/controllers/StudentsController.js, full_server/routes/index.js, full_server/server.js**

☐ Done? | Check your code | Ask for a new correction | >_ Get a sandbox | QA Review