

Understanding execution of Async-Sync function in multiple client's scenario:

We're testing a JavaScript file using multiple clients (terminals) to understand its asynchronous behavior.

The file, **main.js**, works like this:

1. It asks for a username from the command line.
2. Then, it calls the **deleteDocument** function.
3. Inside **deleteDocument**, it first retrieves the user's password and saves it as **password_1**.
4. Now we introduce a delay of 5seconds, and we will retrieve the password again after 5 seconds and save it in a variable declared as **password_2**
5. But due to async behavior of the code the next part of the code executes where we check the password length (**password_1** – the password retrieved for the first time) of the user and if it is less than (<8) we delete the record of that username from our database.
6. After 5seconds we try to retrieve the password for the second time(**password_2**). Now if the username has password length less than 8, we will get the password as null or else we will successfully print the password of the username.

This illustrates how the code keeps going even with a delay, showing its asynchronous nature.

Console outputs for multiple scenarios:

- 1) If the user exists in the database and password length is ≥ 8

```
C:\Users\Dell.000\Documents\meenakshi_mam_25_04_24\multiple_clients>node x.js jahnavi
Calling deleteDocument function
Entered deleteDocument function
(node:18932) [DEP0040] DeprecationWarning: The `punycode` module is deprecated. Please use
punycode.
(Use `node --trace-deprecation ...` to show where the warning was created)
password retrieved for the first time : 123456789
Introducing delay of 5seconds
Password length is greater than 8.No Record deleted.
5seconds delay is done
Password retrieved after 5 seconds: 123456789
```

Here the password length is already greater than 8 so we will not delete the record so even after 5seconds after retrieving the document the password is still the same

2) If the user exists and password is <8

```
C:\Users\Dell.000\Documents\meenakshi_mam_25_04_24\multiple_clients>node x.js sahithi
Calling deleteDocument function
Entered deleteDocument function
(node:13580) [DEP0040] DeprecationWarning: The `punycode` module is deprecated. Please
d.
(Use `node --trace-deprecation ...` to show where the warning was created)
password retrieved for the first time : 12
Introducing delay of 5seconds
Password length is not greater than 8. Deleting the document...
1 documents deleted
5seconds delay is done
Password retrieved after 5 seconds: null
```

Here, the password length is already less than 8, so after 5 seconds, when we try to retrieve it, we get it as null.

3) If the user doesn't exist in the database

```
C:\Users\Dell.000\Documents\meenakshi_mam_25_04_24\multiple_clients>node x.js test
Calling deleteDocument function
Entered deleteDocument function
(node:3644) [DEP0040] DeprecationWarning: The `punycode` module is deprecated. Please
.
(Use `node --trace-deprecation ...` to show where the warning was created)
User with Username test doesn't exist
Introducing delay of 5seconds
user does not exist. No document deleted.
5seconds delay is done
Password retrieved after 5 seconds: null
```

Code execution:

To execute the main.js file Run the following command:

Node main.js username

Test.js:

The test script verifies the behavior of the **deleteDocument** function, which is responsible for deleting user documents from a MongoDB database based on the provided username.

7. User Exists and Password Length is Less Than or Equal to 8:

- The test ensures that the function correctly handles scenarios where the user exists and the password length is less than or equal to 8 characters.
- If the password length is not as expected, the test case fails.

8. User Doesn't Exist:

- The test checks how the function behaves when the provided username doesn't correspond to an existing user.
- It expects the function to indicate the absence of the user and fails the test if it doesn't do so.

9. User Exists and Password Length is Greater Than 8:

- This scenario evaluates the function's behavior when the user exists, and the password length exceeds 8 characters.
- If the password meets the expected length criteria, the test case passes.

Execution:

- To run the test, execute the test script with the desired username as a command-line argument.

Timeout:

- The test case has a timeout set to 10 seconds to allow for any potential delays in the execution of database operations.

Console output:

To test the code with mocha, Run the following command: `mocha username test.js`

Case1: user exists, and length of the password is greater than 8

```
sahithi@sahithi:~/Documents/7th sem/new/src$ mocha jahnavi test.js
Warning: Cannot find any files matching pattern "jahnavi"
(node:129326) [DEP0040] DeprecationWarning: The `punycode` module is deprecated. Please use a userland alternative instead.
(Use `node --trace-deprecation ...` to show where the warning was created)

Testing
  retrievePassword
Entered deleteDocument function
Password retrieved for the first time: 123456789
Introducing delay of 5 seconds
5 seconds delay is done
Password retrieved after 5 seconds: 123456789
Password length is greater than 8. No record deleted.
123456789
    ✓ should retrieve password and check length (5036ms)

1 passing (5s)
```

Case2: user does not exist

```
sahithi@sahithi:~/Documents/7th sem/new/src$ mocha sahlthi test.js
Warning: Cannot find any files matching pattern "sahlthi"
(node:129918) [DEP0040] DeprecationWarning: The `punycode` module is deprecated. Please use a userland alternative instead.
(Use `node --trace-deprecation ...` to show where the warning was created)

Testing
  retrievePassword
Entered deleteDocument function
User with Username sahlthi doesn't exist
Introducing delay of 5 seconds
5 seconds delay is done
Password retrieved after 5 seconds: null
User does not exist. No document deleted.
null
    1) should retrieve password and check length

0 passing (5s)
1 failing

1) Testing
   retrievePassword
     should retrieve password and check length:
Error: User with Username sahlthi doesn't exist
    at Context.<anonymous> (test.js:75:15)
    at process.processTicksAndRejections (node:internal/process/task_queues:95:5)
```

Case3: user exists, and password length is less than or equal to 8

```
sahithi@sahithi:~/Documents/7th sem/new/src$ mocha jahnavi test.js
Warning: Cannot find any files matching pattern "jahnavi"
(node:130072) [DEP0040] DeprecationWarning: The 'punycode' module is deprecated. Please use a userland alternative instead.
(Use 'node --trace-deprecation ...' to show where the warning was created)

Testing
  retrievePassword
    Entered deleteDocument function
    Password retrieved for the first time: 1234
    Introducing delay of 5 seconds
    5 seconds delay is done
    Password retrieved after 5 seconds: 1234
    Password length is not greater than 8. Deleting the document...
    1234
    1) should retrieve password and check length

0 passing (5s)
1 failing

1) Testing
   retrievePassword
     should retrieve password and check length:

    AssertionError [ERR_ASSERTION]: Password length is greater than 8 characters
    + expected - actual

    -false
    +true

    at Context.<anonymous> (test.js:72:16)
    at process.processTicksAndRejections (node:internal/process/task_queues:95:5)
```