Episode-07 → sync, async, setTimeoutZero code

- // Synchronous Function

→ fs.readFileSync("./file.txt", "utf8")

- Now V8 engine off loads this operation to libuv but the main thread will get blocked until this operation completion, this is synchronous code so the thread stuck here.

- // Asynchronous Function

→ fs.readFile("./file.txt", "utf8",
(error, data) ⇒ {
console.log("File Data", data);
}
)

- V8 Engine also off loads this task to libuv but main thread will remain free here.
This will not stop other codes to get execute

→ crypto.pbkdf2("password", "salt", 500000, 50, "sha512", (err, key)
⇒ { console.log("key is generated")
})

password which One want to set

no. of iteration so making password more secure

length

- pbkdf2 → Password - Based Key Derivation Function 2.

- The purpose of this function is to crypt (hash) the password to make it strong & secure.

→ crypto.pbkdf2Sync("password", "salt", 500000, 50, "sha512")
This function also do the same work but this is synchronous task and it will block the main thread.

- If we increase the no. of iterations in this, from 500000 to 5000000, this will take a lot more time, it's a very CPU intensive task.

→ The next code will not execute until this is not done, it doesn't matter how much time this task will take after increasing it's iterations, the thread will get block here.

→ Therefore, it is advised that we should not use Sync functions.

ex → readFileSync, pbkdf2Sync etc.

- SetTimeoutZero →

- We know that how much time we set in setTimeout the callback present in that will get executed after completion of that much time.

- But the question arises what if we passes `0 ms` in setTimeout, will the execution of that callback takeplace immediately?

```
setTimeout (() => {
  console.log ("Executed Immediately")
}, 0)
```

- But this will not execute immediately because this is an async operation and this will go to libuv.
And the libuv can only deliver this callback to V8 engine only if the "callstack" is empty. Once the "call stack" finishes it execution, then after that libuv give the callback present in setTimeout to V8.

→ That's why there is trust issue with setTimeout.

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