Async Javascript

→ Sync means ek ke baad dusra hoga, jb tak ek command complete na ho, dusra shuru nahi hoga

→ Async means, sare kam ek sath shuru honge, jiska answer pehle aayega wo ka Jawaab dedega

e.g. task 1 → 5 sec
task 2 → 10 sec
task 3 → 15 sec.
task 4 → 1 sec.

∴ sync = 31 sec

Async = 15 sec.

How to identify ?
→ if you are using
setTimeout,
setInterval,
promises,
fetch,
axios
XMLHttpRequest
then, it is async js

what is async js ?
→ Sometime's your final code is dependant on another's server & we never know when the data will come from that server, ∴ in this case what we cannot do is writing sync code.

∴ to deal with this we write async code & jo bhi code uske respect me hai vo chl jayega.

e.g. — sync
setTimeOut (function() { }, 2000); async
— sync

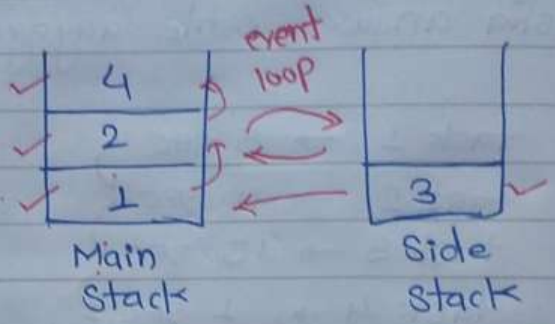
you can write the line inside function, which will run after 2 sec.

o/p:- Sync
Sync
async after 2 sec.

-- js is not asynchronous ?

1 — sync
2 — sync
3 — async
4 — syn

There are two stacks

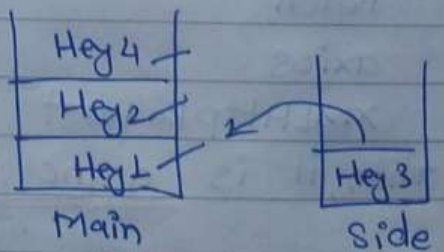


MS → holds sync code
SS → async code

the comm. betn main & side stack is maintained by the event loop.

whenever, the main stack gets empty then code from side stack is moved to main stack.
(if code in ss is completed)

e.g.
```
console.log("Hey1")
console.log("Hey2");
setTimeout(function(){
    console.log("Hey3");
}, 0);
console.log("Hey4");
```



∴ o/p: Hey1
Hey2
Hey4
Hey3

even if 0 sec. wait is there, it run's one after another..

--imp

* Single threaded → one computation at a time ← JS ?
multi threaded → multiple " at a time

-- How to write ?

you can request the data by writing / using ..

- fetch
- axios
- promises
- setTimeout
- setInterval

} sending request

→ where this data is handled ?

after getting the data {
- then catch
- callbacks
- async await

-- callbacks

functions that runs after sometime..

-- promises

↳ just like you make promises in regular life..

promise will either → in pending state
→ resolved → store in variable
→ rejected → use .then(callback)
→ .catch(callback)..

- if the promise is resolved .then is executed
- if rejected catch is executed..
- promise is a constructor function

both then catch accepts a callback,

```
var a = new Promise( function( res, rej) {
                return res();
            });

a.then( function() {
    console.log("resolved");})
 .catch( function() {
    console.log("rejected")})
```

practice: if the numbe is below 5 then resolve
if it is above 5 then reject..

-- Promise chaining

do the following tasks one after another..
1. come home then
2. talk with meow then
3. do some coding then..
4. then goto sleep.

@piranshinde

```
var t1 = new Promise (function (res, rej) {
        return res("come home");
        });

var t2 = t1.then (function (val) {
        console.log(val);

        return new Promise(function(res, rej){
            return res("talk with meow");
        });
    });

var t3 = t2.then (function(val) {
        console.log(val);

        return new promise( . .

        }
```

-- throttling kisi code ko control karna, no. of executions

area ↕ mouse is scrolling 600 times → throttle → 50 times

-- async await

when you are fetching some info. by sending a request on url..

```
fetch('https://randomuser.me/')
.then(function(val){
    return val.json();
})
.then(function(val){
    console.log(val);
});
```

→ returns promise.. ∴ apply then

→ again you need to convert raw data to json ∴ use then

→ finally get the data

you can eliminate this process by using async await

1. make the nearest parent function async
2. await the fetch
3. await the json data..

↓ await removes ↓ .then..

e.g.

```
async function getUser(){

    var raw = await fetch('url');
    var data = await raw.json();

    console.log(data);
}

getUser();
```

-- Concurrency is me sync code and async code ek sath process ho rha tha, this is concurrency

-- parallelism Focuses on different processor's & their core's

Ecmascript → Js standard..

Some other ES6 concepts..

→ In older js there were 3 types of functions..

① Function statement

```
function sum(a,b){
    return a+b;
}
```

② Function expression

```
const add = function (a,b){
    return a+b;
}
```

③ Anonymous function

```
const square = function (x) {
    return x*x;
}
```

or

```
const double = (num) =>
    num*2;
```

→ In new js, there is only one function arrow function

① Basic fat arrow function

```
() => { }
```

```
var a = () => { }
```

② with one parameter

```
var a = (param) => { }
a(12);
```

OR

```
var a = param => { }
a(12);
```

* when you pass multiple arguments then use 1st way..

③ with implicit return

```
var g = () => 133;
console.log(g());
```

↳ 133

-- template literals (Backticks)

`...`

in normal way..

```
console.log("2+2 is", 2+2, " and 2*3 is ", 2*3)
```

↓ but using template literals

```
`2+2 is ${2+2} and 2*3 is ${2*3}`
```

-- default values

```
function abcd(param)
{
    console.log(param);
}

abcd(1);
abcd();
```

o/p: 1
undefined

without default

```
function abcd(param=0)
{
    console.log(param);
}

abcd(10);
abcd();
```

o/p: 10
0

with default..

-- spread & rest

```
var a = [1,2,3,4];
var b = [...a];
```

↑ spread

Copying values..

```
function sum(a,b,...c)
{
    ——
}
```

1 2 [3,4,5]

↑ Rest

```
sum(1,2,3,4,5);
```

a b

when you want to copy remaining values..

-- destructuring

getting values out from array, objects..

```
var arr = [1, 2, 3]
var [a, b, c] = arr;
      ↓  ↓  ↓
      1  2  3

var [x, , z] = arr;
      ↓     ↓
      1     3
```

```
var obj = {name: "Kiran", age:22}
var {name} = obj;
      ↓
"Kiran"
```

-- try catch

```
console.log("Hey");
console.log(Hey);
console.log("Hey");
```

→ interpreted ∴ o/p → Hey

→ now, this throws an error ∴ no line's after it are xecuted..

∴

```
console.log("Hey");
try {
  console.log(Hey);
}
catch(err){
  console.log(err);
}

console.log("Hey");
```

o/p: Hey
Hey is not defined
Hey..