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JS OOPS

Objects

structuredClone

getters

Like in vue js we had **computation** property in this we have getters in case while getting a value or a property of an object we need to compute something we use the **getters** for it;

```
<!-- totalMoney: 1000000, -->
const abhishek = {

  get balance(){
    return "Mind Your Own Business"
  }

}

const rect = {
  length : 100 ,
  breadth : 100 ,
  get area(){
    return this.length * this.breadth
  }
}

console.log(rect.area) // 10000 (will run the function but you can use it as a property)
```

setters

The setters property are **not enumerable** so you won't get them via Object keys.

The Getter And Setter can be removed via delete keyword

```
const user = {
  firstName: '',
  lastName: '',
  set fullName(name){
    [this.firstName, this.lastName] = name.split(' ')
  }
}

user.fullName = 'Saksham Bakshi';
//user.firstName = Saksham
//user.lastName = Bakshi it will be set via that function
```

(getters and setters) vs Proxy

enumerable

The enumerables in js means those properties on js Object that can be viewed and that be looped like via **for of** loop or what you are returned via **Object.keys**

Prototype Changing

Shadow properties

The ways to set Prototype

There are 2 kinds of way to do this:

- Object.create
- Object.assign

Object Create

The Object.create can be used to create a prototype property on an Object

```
const parentObj = {
  methods() {
    console.log(this.name)
  }
}

const childObj = Object.create(parentObj)
childObj.name = "This Will Console when you invoke methods on ChildObj"
```

```
function Shape() {
  this.x = 0
  this.y = 0

  function move(x, y) {
    [this.x, this.y] = [x, y]
  }
}

function Rect() {
  Shape.call(this)
}

Rect.prototype = Object.create(Shape.prototype, {
  constructor: {
    value: Rect,
    writable: true
  }
})
```

Important Methods

hasOwn()

It returns the **boolean value** whether the given object and **propertyName** string (key) and telling whether its inherited or its own property

assign

-It only works on the enumerable property or those property that can be assigned or Reset. Basically all the property that are not inherited and existed to an object .

getPrototypeOf()

The getPrototypeOf is a method in which will the parent or immediate prototype of the given object. You can find all the parent

```
obj = Date
do {
  console.log("Start" , obj)
  obj = Object.getPrototypeOf(obj);

  console.log("Finish" , obj)
}while(obj)

//Object prototype is null so it will end
```

setPrototypeOf()

```

> const parentObj = {
  methods(){
    console.log(this.name)
  }
}
const childObj = {
  name:"Child"
}

```

```

const InheritObj = Object.create(childObj , parentObj)

```

```

< undefined

```

```

> InheritObj

```

```

< ▶ {methods: undefined}

```

```

> inc = Object.setPrototypeOf(childObj , parentObj)

```

```

< ▶ {name: 'Child'}

```

```

> inc.__proto__

```

```

< ▼ {methods: f} ⓘ
  ▶ methods: f methods()
  ▶ [[Prototype]]: Object

```

```

> inc.methods = null

```

```

< null

```

```

> parentObj

```

```

< ▶ {methods: f}

```

```

> inc.__proto__.methods

```

```

< f methods(){
  console.log(this.name)
}

```

```

> inc.__proto__.methods = null

```

```

< null

```

```

> inc.__proto__.methods

```

```

< null

```

The `setPrototypeOf` takes **childObject** **parentObj** or prototype take it as parameter and then mutate the childObj directly by setting up its prototype to a parentObj and **mutate directly** and the prototype is marked as reference so if the prototype method or property is set the original parent obj also change

```

const parentObj = {
  methods() {
    console.log(this.name)
  }
}
const childObj = {
  name: "Child"
}

const InheritObj = Object.create(childObj , parentObj)
undefined
InheritObj
{methods: undefined}
inc = Object.setPrototypeOf(childObj , parentObj)
{name: 'Child'}
inc.__proto__
{methods: f}methods: f methods() [[Prototype]]: Object
inc.methods = null
null
parentObj
{methods: f}methods: f methods()length: 0name: "methods"arguments: (...)caller: (...)[[FunctionLocation]]: VM90:2[[Prototype]]: f ()
[[Scopes]]: Scopes[2] [[Prototype]]: Object
inc.__proto__.methods
f methods() {
  console.log(this.name)
}
inc.__proto__.methods = null
null
inc.__proto__.methods

```

assign vs Create

The assign is to assign the property to new object and were as in the create a prototype on object

is

It is used to compare two value wether two value is same mind it cgan help you to detect wether the object is of same reference not having same value
 ![Link]("Link" https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Object/is)

isExtensible

isFrozen

isPrototypeOf

Its not a static method but a **prototype** it helps us to check the prototype of the object like for Example

```
function Foo() {}
function Boo() {}

Boo.prototype = Object.create(Foo.prototype)

const bar = new Boo();

console.log(Foo.prototype.isPrototypeOf(bar))
console.log(Boo.prototype.isPrototypeOf(bar))
```

isSealed

isSealed vs isFrozen

keys

The Object.keys() helps us to get array of keys String of an object passed in arguments

entries

The entries static method returns the enumerable properties **keys** and **value** subArray

```
Object.entries({key: 'value'})
[
  [key, value]
]
```

value

The Object.value() returns the values array of the object

keys vs entries

The **keys** vs **entries** method takes same type and value of argument and key return just array of key (string) and in the case of entries you can get sub-array of key and value

preventExtension

The preventExtension method takes object as an argument and makes unextensionable i.e you will not be able to add new property

freeze

The freeze neither let you add new property or update, delete property or change the property descriptor and it works different with strict mode

```
Object.freeze(obj)
Object.defineProperty(obj, "ohai", { value: 17 });
Object.defineProperty(obj, "foo", { value: "eit" });

// It's also impossible to change the prototype
// both statements below will throw a TypeError.
Object.setPrototypeOf(obj, { x: 20 });
obj.__proto__ = { x: 20 };
```

seal

It just lets you modify existing value

seal vs freeze vs preventExtension

| Actions | Object.preventExtensions | Object.seal | Object.freeze |
|---|--------------------------|-------------|---------------|
| Can add a new property. | ✗ | ✗ | ✗ |
| Can modify values of existing properties. | ✓ | ✓ | ✗ |
| Can delete existing properties. | ✓ | ✗ | ✗ |
| Can reconfigure existing properties. | ✓ | ✗ | ✗ |

defineProperty

Helps to define property with descriptors

enumerable; configurable; writable; value

What are property Descriptors??

The proper descriptors are the property type of object like is it a **getter** , **setter** ; **enumerable** ; **configurable** ; **writable** ; **value**

JS DS ALGO ISSUES

- sliding window
- two pointer technique
- SORTING
- LINKED list

Function

Currying

Closures

Using closures for private property

Aync Activities

Promises

States

- Fulfilled
- Settled
- Pending
- Rejected

Even if a promise is fulfilled and then also you called the **then method** it will still be executed and they will be called after the **call stack** is cleared and then they will be executed

Settled

The Settled state refers to the state when the Promise is either fulfilled or rejected , that means **the promise is said to be settled if either its accepted or rejected**

Promise constructor Methods

then()

It takes 2 args the first one is the cb when the the promise is successfully resolve and the other one is to used one their are some issue and for the **reject or catch phase**, A promise participate more than one nesting or for multiple then .4

Even if the Promise is resolved and it has executed its success method even after that if you invoked the then() method it will still execute its callback in the next call stack cycle

```
const somePromise = new Promise(someFunc)
somePromise.then(onResolve , onReject)
somePromise.then(onResolve , onReject)
// both could be invoked
```

catch()

Its for the error handling

finally

Promises Static Methods

| | Either... | |
|-----------------------------------|-----------|----------|
| | resolved | rejected |
| <code>Promise.all()</code> | all | any |
| <code>Promise.race()</code> | any | any |
| <code>Promise.allSettled()</code> | all | |
| <code>Promise.any()</code> | any | all |

Interview Question of Bacancy

What if something happens in allStelled or any or anyother method when the single one is rejected and you wnat to start again ????

`allSettled`

If all resolved and all rejected

`any`

If any resolved and any rejected

`all`

If all done any rejected

`race`

If any done all rejected

`reject`

`resolve`

`async/await`

Promises vs `async/await`

Timers

`setTimeout`

`clearInterval`

`setInterval`

`setImmediate`

`clearInterval`

Advance Topics

Memorization

Debouncing and throttling

For [Overview \(https://tools.dev/debounce-and-throttle-functions-in-javascript\)](https://tools.dev/debounce-and-throttle-functions-in-javascript) read this

DOWNLOAD

DOWNLOAD

DOWNLOAD

fn()

throttle(fn)

debounce(fn)

Debouncing

Debounced:

Regular:

What debouncing does is that whenever a function is called which is debounced it will run it after given/specified interval of time if during that the wait duration another invoking is done it will reset the time and start againb the time unless the last even is fired and after that given duration it will execute

```
function basicDebounceImplementation(fn , duration){
  let debounceTimer = null ;
  return function () {
    const [context , args] = [this , arguments]
    if(debounceTimer) clearInterval(debounceTimer); // the more you call the later the function will be called
    debounceTimer = setTimeout(() => fn.apply(context ,args) , duration))
  }
}
```

Rate Limiting

Throttling

What throttle does is that it execute the function and waits for the given time and even through the same function is being called or same event is running it will pause for a given duration after that if the event continuous it will run it and then pause the repeated execuction for that time

Rate Limiting

```
function basicThrottlingImplementation(fn , duration ){
  const isThrottling = false
  return function () {
    if(isThrottling) return null
    const [context , args] = [this , arguments];
    isThrottling = true;
    setTimeout(() =>{isThrottling = false} , duration)
    fn.apply(context ,args )
  }
}
```


Script Loading

Defer

Async

AbortController

[Docs \(https://developer.mozilla.org/en-US/docs/Web/API/AbortController/signal\)](https://developer.mozilla.org/en-US/docs/Web/API/AbortController/signal)

The AbortController is a really helpful if you want to cancel WEB API network call and anything async (like **event handler** and **websocket**) and its really helpful to manage unnecessary calling going out and manage wrong cb running and unnecessary load on the server .

AbortController Comes it with its event as well

We can event listen on signal that whether the partially **Controller** is aborted or not so for example when some controller is aborted you want to some request to a server or log or perform any other action this is the place and we can also use this to abort anything that does take signal example websocket

Network Call AbortController

I have used this in real time sports betting application as user can select any sport page and if the user changes very fast before previous one is even loaded this can create a unnecessary work to be done both backend and frontend and it will show the previous sport and the next support according how their network are being completed and how their callbacks are being executed but if user have changed or selected a new sport and a previous one is not loaded just cancelled it .

Understand this with the **Netflix** example if you select stranger game and you say fuck off lets watch something old school like **friends** and meantime it the stranger game is still being fetched and a spinner on the page and the user clicks on the back button and click your new old school show it will now be loading both the stranger game and friends . But with the help of our hero abortcontroller you can cancel stranger games and only load the friend saving both server resources and the client resources.

```
// a video play example
let controller

let playbutton = document.getElementById("play")

let abortButton = document.getElementById("abort")

abortButton.addEventListener('click', () =>{
  if(controller){
    controller.abort();
  }
})

function fetchVideo(){
  controller = new AbortController();
  const signal = controller.signal

  fetch("ENTER_YOUR_URL" , {signal}),then(resp =>{
    controller = null
  }).catch((err)=> {
    console.error(err);
  })
}
```

Event Handler Abort Controller

Turns you can use abortcontroller to stop / abort event as well. It can be used to remove events , example you have many hundreds all event register and you want to remove it together you can passing the signal property and cancel/remove all the event handler

```

const controller = new AbortController();
const signal = controller.signal ;

const button1 = document.getElementById('btn1')
const button2 = document.getElementById('btn2')
const button3 = document.getElementById('btn3')

button1.addEventListener('click' , function () {
  console.log("Just console on click")
} , {signal})
button2.addEventListener('click' , function () {
  console.log("Just console on click")
} , {signal})
button3.addEventListener('click' , function () {
  console.log("Just console on click")
} , {signal})

const removeBtn = document.getElementById('removeBtn')
removeBtn.addEventListener('click' , ()=>{
  controller.abort() // aall event will be removed
})

```

Custome Use Case

Lets just consider you want to abort a websocket which does not take signal as a parameter.

```

const controller = new AbortController();
const {signal} = controller

function initWebSocket(){
  const socket = new WebSocket();

  if(signal.aborted){
    socket.close(); // incase if controller befor the connection is made
  }

  signal.addEventListener('abort' , () => socket.close() , {once: true } /*once is passed to tell it should only be run one time only*/) // you can use to abort event to make your custom abort for async process like file action , stream , etc
}

```

It can be use for exiting heavy process

generator in js

- The yield is used to pause the function and is used to give out the value
- the yield also take the value and start it again from where it had left (We can pass in the value to another yield expression .)
- *yield its used to pause and delegate it to anyother gemator function outside its generator function .

After the invocation of that function you get the **iterable object** with a **done** property and a **value** .

The value will be false and to resume **next method** we can continue to this until **done is false**

MutationObserver

Service Worker

[Resources \(https://www.youtube.com/@SteveGriffith-Prof3ssorSt3v3\)](https://www.youtube.com/@SteveGriffith-Prof3ssorSt3v3)

IndexDB

EVENTS Concept of JS

Bubbling vs Capturing

Capturing

Its by default false

Bubbling

stopPropagation()

Event Delgation

Use in the case of the bubbling as image you ve the hundred of li or lots of sibling element instead puting evengt on each one of them you can add and omponent parent and listen the event over there via the property of the Bubbling

currentTarget v s target

- The currentTarget provided you with the element on which the event listner is added but in the case of the target it tells you where the event is triggered or actual event happens.

Load vs DOMContentLoaded

DOMContentLoaded is loaded when the dom is parsed and load when all the script , styles are loaded

Basic OOPS

CLASS VS INTERFERENCE

Design Patterns

SOLID principle

Memorization

```
[
  "Debouncing & Throttling | Interview Prep | Browser Module | Web Dev In Hindi",
  "DOMContentLoaded Vs Load Events | Interview Prep | Browser Module | Web Dev In Hindi",
  "Defer Vs Async Vs Normal Scripts | Interview Prep | Browser Module | Web Dev In Hindi",
  "CSS Background Properties | Interview Prep | Browser Module | Web Dev In Hindi",
  "Cookies and CSRF Attack!! | Interview Prep | Browser Module | Web Dev In Hindi",
  "CORS Error!! (Cross Origin Resource Sharing) | Interview Prep | Browser Module | Web Dev",
  "CSS Selectors Specifity | Interview Prep | Browser Module | Web Dev In Hindi",
  "HTTP Verbs (Methods, Status codes, Status type) | Interview Prep | Browser Module | Web Dev",
  "CSS Pseudo Classes | Interview Prep | Browser Module | Web Dev In Hindi",
  "CSS z-index Property | Interview Prep | Browser Module | Web Dev In Hindi",
  "XMLHttpRequest Vs Fetch Vs Axios [Network Requests] | Interview Prep | Browser Module | Web Dev",
  "IndexedDB Storage | Web Storage API | Interview Prep | Browser Module | Web Dev In Hindi",
  "Local Storage Vs Session Storage | Web Storage API | Interview Prep | Browser Module | Web Dev",
  "Browser Events [In-depth] | Bubbling, Capturing, Target, Current Target | Interview Prep | Web Dev"
]
```