

JavaScript Journey

Chapter:1

https://github.com/Prakash9596/CSS_Supreme

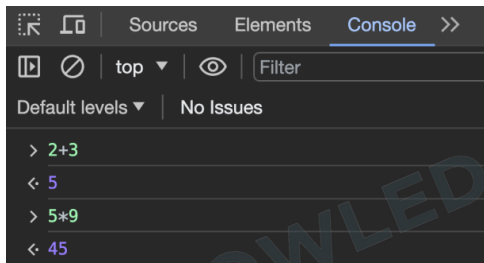
https://prakash9596.github.io/CSS_Supreme/

1.1 JS code can be executed in the console. (inspect--> console)

--> Show alert: `alert('Welcome to the world of JS')`

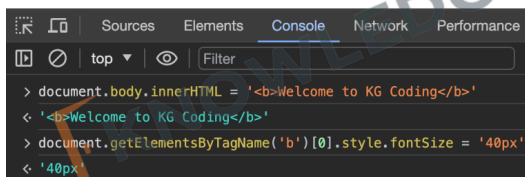


--> Use as a calculator: `>2+3 (result=5)`



--> DOM Manipulation : Document object model

(whole webpage is document, we can change it by DOM Manipulation)



--> Change HTML: `document.body.innerHTML = 'Welcome to the world of JS'`

--> Change CSS: `document.getElementsByTagName('b')[0].style.fontSize = '40px'`

--> Perform JS actions: `document.getElementsByClassName('class_name')[1].click()`

--> It can be used to create chrome extensions.

--> New forms of JS: Coffee Script & TypeScript (which will later be transpiled into JS only)

Chapter:2

2.2 Arithmetic Operators (+, -, *, /, %)

--> Order of operations (Bracket, OF, Divide/Multiply, Add/Subtract) [Left to Right]

--> Math.round(53.3) =53, Math.round(53.5) =54, Math.round(53.7) =54

--> Math.floor(53.3) =53, Math.floor(53.8) =53

--> Math.ceil(53.3) =54, Math.ceil(53.8) =54

--> Math.random() [it will give the value between 0-1]

B	O	D	M	A	S
Bracket	Order	Divide	Multiply	Add	Subtract
()	$\sqrt{x} x^2$	\div or \times		$+$ or $-$	
Parentheses	Exponents	Multiply	Divide	Add	Subtract
P	E	M	D	A	S

2.3 Strings: Anything from single character to paragraph.

--> Can be defined using: " ", ' ', ` ` (backticks)

[Recommended: ' ', ` `] [" " --> can be used when single quote is there in string]

--> `this is the end`

this is pakka the end` (backticks preserves the indentation)

`₹` + (5+3) = ₹8 (1st way),

`₹ \${5+3}` = ₹ 8 (2nd way using backticks)

--> String Concatenation: ['Hello ' + 'World' = 'Hello World'], ['Hello ' + 5 = 'Hello 5'],

['5' + '5' = 55], [5 + 5 = 10]

2.4 typeof operator:

[typeof 5 ='number'], [typeof 5.3 ='number'], [typeof 'hello' ='string']

Chapter:3

3.5 document.getElementById('id_name');

[It will return the element which is having same ID] [old method]

--> document.getElementsByClassName('class_name');

[It will return all the elements which is having same class] [old method]

--> document.querySelector('h1')

[It will return the element which is having h1 tag] [new method]

--> document.querySelector('#id_name')

[It will return the element which is having same id] [new method]

--> document.querySelector('.class_name')

[It will return the element which is having same class] [new method]

--> document.querySelectorAll('.class_name')

[It will return all the elements which is having same class] [new method]

3.6 Script Tag: It can be placed --> [at the end of the body tag of HTML] --> Why at the end of the body tag?

becoz page should load first then there is use of it's related action] or [in head tag --> not recommended]

--> way 1: <script>

--> alert('Hello Prakash Jha');

--> console.log('Hello console');

--> console.warn('I am warning');

--> console.error('I am error');

--> console.clear();

--> </script>

--> way 2: <script src=""></script>

--> We can use javascript from: [1. console me jake] [2. script tag ke andar se]

[3. html tags ke andar se bhi]

--> ex:3 <body> <button id="click-me" onclick="alert('I am clicked')"> Click Me </button>
</body>

--> document.querySelector('#click-me').click()

[Clicked the button from console without touching it.]

3.7 Comments:

--> HTML <!-- --> , CSS // or /* */, JavaScript // or /**/

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4.8 Variables: Used to store data

--> [var a = 'Hello World'] [var b =100] [var c = true]

--> Syntax rules: [can't use keywords or reserved words as variable_name]

[can't start with a number] [no special character other than \$ and _]

--> let money = 1; [shorthand operators below]

money += 5; // money = money + 5;

money -= 2; // money = money - 2;

money *= 3; // money = money * 3;

money /= 4; // money = money / 4;

money++; // money = money + 1;

4.9 HTML:

<button class="bag-button" onclick=" cartQuantity++;

document.querySelector('#cart-summary').innerText = `Your cart has
\${cartQuantity}items`; ">Add to bag</button>

<h1 id ="cart-summary"></h1>

JS:

let cartQuantity =0;

document.querySelector('#cart-summary').innerText = `Your cart has \${cartQuantity}
items`;

4.10 Naming Convention:

[camelCase: helloPrakashJha, myNameIsKhan]

[snake_case: hello_prakash_jha, my_name_is_khan]

[kebab-case: hello-prakash-jha, my-name-is-khan]

[can't use this JavaScript: no special character other than \$ and _]



4.11 ways to create variable:

[var a=5;] --> global variable

[let a=5;] --> local variable

[const a=5;] --> [the value will be fixed and can't be changed in future, ex: pi=3.14]

4.(12) Scope of a variable:

--> Any variable created inside {} will remain inside {}

--> Variable can be redefined inside {}

--> Var does not follow scope

[Var will treat a redefined variable as a previously defined variable only.]

```
[let a=6; {
```

```
  let a=7;
```

```
}] --> let se bne hue variable dubara se define kiye ja sakte hain ..dono alag alag treat
```

honge.

```
[var a=6;
```

```
{
```

```
  var a=7;
```

```
}]--> var se bne hue variable bhi dubara se define kiye ja skte hain ..pr dono same hi treat
```

honge kahi se v access kre.

--> Global Scope: Accessible everywhere in the code.

--> Block Scope: Limited to a block, mainly with let and const.

4.13 Eval method:

console.log('45 + 45'); [output: 45 + 45]

console.log(eval('45 + 45')); [output: 90]

4.14 <input type="text" class="display" readonly>

--> let current_display ='';

--> document.querySelector('.display').value=current_display;

Chapter:5

5.15 if-else & Boolean

Equality (== Checks value equality), (=== Checks value and type equality)

Inequality (!= Checks value inequality), (!=== Checks value and type inequality)

Relational (> Greater than), (< Less than), (>= Greater than or equal to),

(<= Less than or equal to)

Note: Order of comparison operators is less than arithmetic operators.

```
[--> console.log(5 + 5 == 4 + 6); [true]]
```

```
--> console.log(5 == 5.0); [true], --> console.log(5 === '5.0'); [true]
```

```
--> console.log(5 == 5); [true], --> console.log(5 === '5'); [true]
```

```
--> console.log(5 == '5.0'); [true], --> console.log(5 === '5.0'); [false]
```

```
--> console.log(5 == '5'); [true], --> console.log(5 === '5'); [false]
```

```
Syntax: if(age >= 18){
    console.log("You can drive");}
    else if (age >=10){
    console.log("Use bicycle");}
    else {
    console.log("Sleep Baby Sleep");
    }
```

5.16 Truthy and Falsy Values:

--> Falsy Values: 0, null, undefined, false, NaN (Not a number), ""(empty string)

--> Truthy Values: All values not listed as falsy.

--> Used in conditional statements like if.

5.17 If alternates:

--> Ternary Operator: condition ? trueValue : falseValue

```
let age=12;
let result;
if(age > 18){
  result = 'Adult';
}else{
  result = 'Kid';
}
console.log(result);
```

```
[let age = 12;
let result = age > 18 ? 'Adult' : 'Kid';]
```

--> Guard Operator: value || defaultValue [Use when a fallback value is needed]

```
let age = 0;
let finalAge = age || 15; [kuchh bhi falsy value aa jaye to by-default 15]
console.log(age); --> 0
console.log(finalAge); --> 15
```

--> Default Operator: value ?? fallbackValue

[Use when you want to consider only null and undefined as falsy]

```
let age = 0;
let finalAge = age ?? 15; [agar null ya undefined value aa jaye to hi by-default 15]
console.log(age); --> 0
console.log(finalAge); --> 0
```

Chapter:6

6.18 Functions: Blocks of reusable code.

--> DRY Principle: "Don't Repeat Yourself" it Encourages code reusability.

--> Naming Rules: Same as variable names: camelCase

--> EX: alert(); Math.round(); console.log();

--> Functions Syntax:

```
function sum (x,y){  
    let s = x + y;  
    return s;  
}
```

result = sum(4,5); [Function invoking/ Function Calling]

--> Return statement : Can Return (Value, variable, calculation)

--> Parameters: Input values that a function takes.

--> Naming Convention: Same as variable names

--> Function Parameter(jo function ko define krte waqt use krte ho) [x,y]

--> Function Argument (Jo function ko call krte waqt use krte ho) [4,5]

--> Default Value: Can set a default value for a parameter.

```
function greeting(name = 'Pyare'){  
    console.log(`Namaste ${name} Uncle`);  
}
```

greeting('titu'); [Namaste titu Uncle]

greeting(); [Namaste Pyare Uncle]

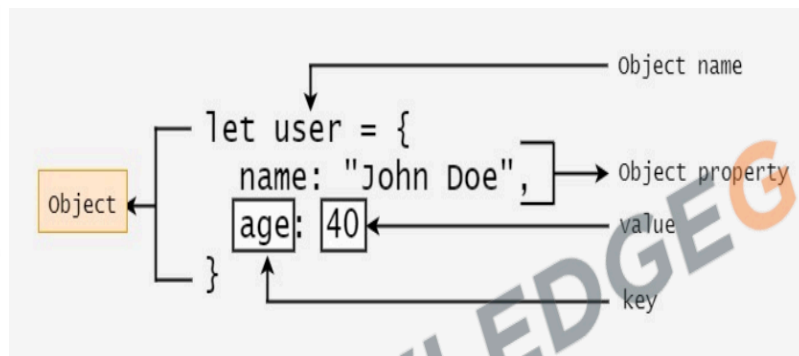
Chapter:7

7.19 Objects: Groups multiple values together in key-value pairs. Organizes related data under a single name.

--> Use . operator to access values.

```
let user = {  
  name: 'Milky Singh',  
  age: 32,  
  'skin-color': 'White'  
};  
let propertyName = age;
```

--> Syntax: [Object name: user] [Object Properties: name, age]
[key: name, age] [value: Milky Singh, 32] [Object: Pura ka pura]



DOT Notation

--> console.log(user); [Reading the whole object]
--> console.log(user.name); [Reading the property of object]
--> console.log(user.age); [Reading the property of object]
--> console.log(user.skin-color); [Not allowed as hyphen can't be used]
--> console.log(user.propertyName); [Not allowed as this is not defined within object]
--> user.name = 'Ring EduCrafter'; [Writing/Changing the property of object]
--> console.log(user); [Reading the whole object]
--> delete user.age; [Deletion of property from the object]
--> console.log(user); [won't return age property now]

Bracket Notation

```
--> console.log(user); [Reading the whole object]
--> console.log(user['name']); [Reading the property of object]
--> console.log(user['age']); [Reading the property of object]
--> console.log(user['skin-color']); [allowed, output: White]
--> console.log(user['propertyName']); [allowed, output: 32]
--> user['name'] = 'Ring Educrafter'; [[Writing/Changing the property of object]]
--> console.log(user); [Reading the whole object]
--> delete user['age']; [Deletion of property from the object]
--> console.log(user); [won't return age property now]
```

--> Objects can contain Primitives like numbers and strings.
--> Objects can contain other objects and are called Nested Objects.
--> Functions inside an object are called methods.

```
--> let product = {
  company: 'Mango',           --> string
  itemName: 'Cotton striped t-shirt', --> string
  price: 861,                 --> numbers
  rating:{                   --> object (nested object)
    stars: 4.5,
    noOfReviews: 87
  },
  displayPrice: function(){   --> function
    return `Price of the product is ${this.price}`;
  }
}; [this mtlb is object ke andar jo v price defined the wo]
```

--> Function call : product.displayPrice();

7.20 Autoboxing:

--> Automatic conversion of primitives to objects. Allows properties and methods to be used on primitives.

--> Example: Strings have properties and methods like length, toUpperCase, replace etc.

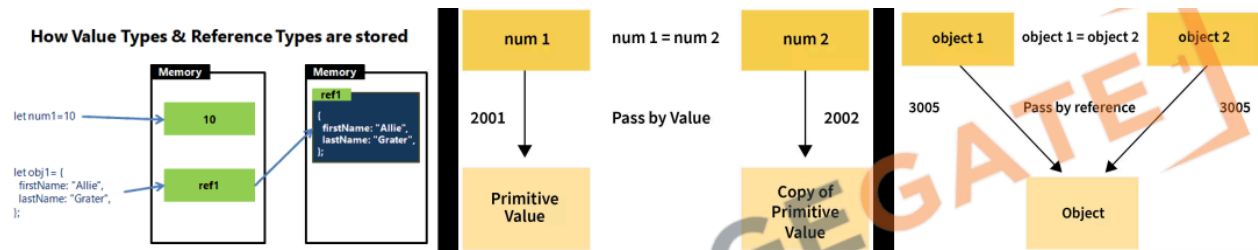
```
console.log('Hello, My Name is Prakash Jha'.length());
console.log('Hello, My Name is Prakash Jha'.toUpperCase());
```

7.21 Object References:

--> Objects work based on references, not actual data.

--> Copying an object copies the reference, not the actual object.

--> Changes to one reference affects all copies.



--> let a=5;

let b=a;

console.log(`a=\${a}, b=\${b}`); [a=5, b=5]

a = 8;

console.log(`a=\${a}, b=\${b}`); [a=8, b=5]

--> let x = {num: 5};

let y = x;

console.log(`x=\${x.num}, y=\${y.num}`); [a=5, b=5]

x.num =8;

console.log(`x=\${x.num}, y=\${y.num}`); [a=8, b=8]

--> When comparing with ==/===, you're comparing references, not content.

let p = {pop: 'hello'};

let q = {pop: 'hello'};

console.log(p == q);

[false, becoz dono object alag alag memory me rakhe hain/point kar rahe hain]

7.22 Object Shortcuts:

1. Destructuring:

```
let product = {  
  company: 'Mango',  
  itemName: 'Cotton striped t-shirt',  
  price: 861,  
};
```

--> **Destructuring:**

way 1: let company = product.company

way 2: let {company} = product;

```
let {company} = product;
```

```
console.log(company);           [Output: Mango]
```

```
let {company, price} = product;
```

```
console.log(company);           [Output: Mango]
```

```
console.log(price);             [Output: 861]
```

2. Property shorthand:

```
let price = 861;
```

Way 1: let product = {
 company: 'Mango',
 itemName: 'Cotton striped t-shirt',
 price: price, --> assuming ki ye price kahin aur se aa raha hai
};

Way 2: let product = {
 company: 'Mango',
 itemName: 'Cotton striped t-shirt',
 price --> assuming ki ye price kahi aur se aa raha hai
};

3. Method shorthand:

way 1: let product = {
 company: 'Mango',
 itemName: 'Cotton striped t-shirt',
 price: 861,
 displayPrice: function(){
 return `Price of the product is \${this.price}`;
 }
};

way 2: let product = {
 company: 'Mango',
 itemName: 'Cotton striped t-shirt',
 price: 861,
 displayPrice(){
 return `Price of the product is \${this.price}`;
 }
};

7.23 Create function isIdenticalProduct to compare two product objects.

```
function isIdenticalProduct(product1, product2){
  if(typeof product1 !== 'object' || typeof product2 !== 'object'){
    console.warn('Parameter passed was not an object');
    return false;          --> checking inputs
  } else if(product1 === product2){
    return true; } --> checking ki same object to nahi hai
  else if ( product1.name === product2.name && product1.size === product2.size
    && product1.fit === product2.fit
    && product1['delivery-time'] === product2['delivery-time']){
    return true; } else{
    return false;
  }
}
```

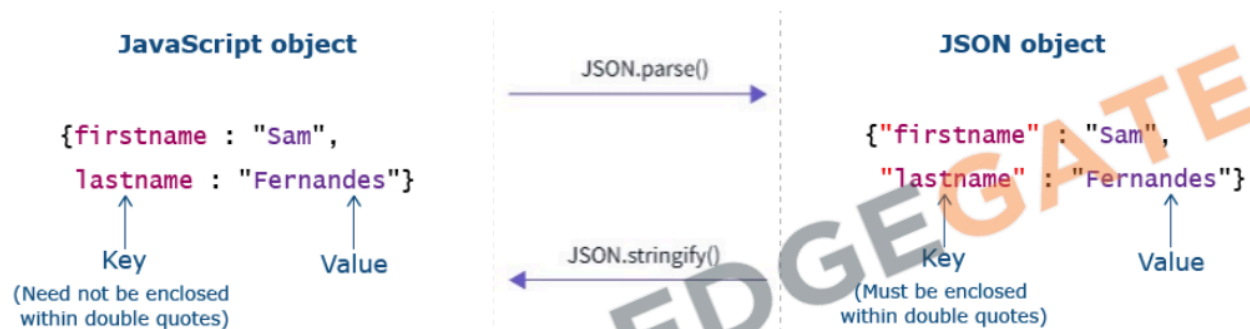
```
let productP ={
  name: 'Jeans',
  size: 'S',
  fit: 'slim-fit',
  'delivery-time': 'same day delivery',
} let productS ={
  name: 'Jeans',
  size: 'S',
  fit: 'slim-fit',
  'delivery-time': 'same day delivery',
}
```

--> console.log(isIdenticalProduct(productP, productS)); [Output: true]

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8.24 JSON:

1. JSON (JavaScript Object Notation): Not the same as JS object, but similar.
2. Common in network calls and data storage.
3. JSON.stringify() [used to convert object into string]
and JSON.parse() [string ko object banane ke liye]
4. Strings are easy to transport over the network.
5. JSON requires double quotes "" in Keys as well.
(Object me usually bs value hi ""/" me hota hai)
6. JSON is data format, JS object is a data structure.



```
let product = {  
  name: 'TShirt',  
  price: 789,  
  rating: {  
    stars: 4.5,  
    noOfReviews: 453,  
  },  
};  
console.log(typeof product);  
console.log(product);  
let str = JSON.stringify(product);  
console.log(typeof str);  
console.log(str);
```

[object]
[whole object print hoga]
[object ko string bna diye]
[string]
[pura string ke form me print hoga]

```
let newProduct = JSON.parse(str);  
console.log(typeof newProduct);  
console.log(newProduct);
```

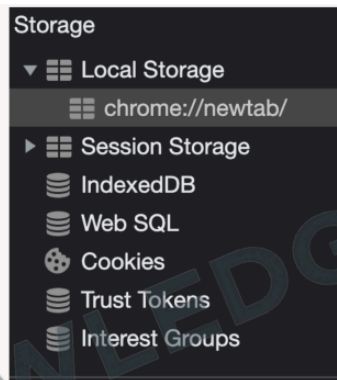
[string ko object bna rhe hain]
[object]
[whole object print hoga]

8.25 Local Storage:

1. Persistent data storage in the browser.
2. `setItem`: Stores data as key-value pairs.
3. Only strings can be stored.
4. `getItem`: Retrieves data based on key.
5. Other Methods: `localStorage.clear()`, `removeItem()`.
6. Do not store sensitive information. Viewable in the storage console.

```
// store an object in Local Storage
localStorage.setItem(
  "user",
  JSON.stringify({
    name: "Gopi Gorantala"
    age: 32
  })
);

// retrieve an object in Local Storage
const user = JSON.parse(
  localStorage.getItem("user")
);
```



[ye same key value browser storage me store ho jayega:

application >> local storage >> url >> key-value pair]

--> `localStorage.setItem('Name', 'Prakash Jha');`

--> `console.log(localStorage.getItem('Name'));` [to get the value using key]

```
let product = {
  name: 'TShirt',
  price: 789,
  rating: {
    stars: 4.5,
    noOfReviews: 453,
  },
};
```

```
localStorage.setItem('product', JSON.stringify(product));
```

[object ko string me convert kar ke save kr rhe]

```
let product2 = JSON.parse(localStorage.getItem('product'));
```

[string ko object me convert kr rhe]

```
console.log(product2);
```

--> `localStorage.removeItem('Name');` [will delete the key-value pair where key = 'Name']

--> `localStorage.clear();` [will delete all the key-value pair from browser storage]

8.26 Date:

1. new Date() Creates a new Date object with the current date and time.
2. Key Methods:

```
let myDate = new Date();  
console.log(myDate.getTime());           [Milliseconds since Epoch (1 jan 1970/1971)]  
console.log(myDate.getFullYear());       [4-digit year]  
console.log(myDate.getDay());             [Day of the week]  
console.log(myDate.getHours());           [Current hour]  
console.log(myDate.getMinutes());         [Current minute]  
console.log(myDate.getMilliseconds());    [Current ms]
```

3. Crucial for timestamps, scheduling, etc.

8.27 DOM Properties & Methods:

DOM and Element Properties

1. location 2. title 3. href 4. domain 5. innerHTML 6. innerText 7. classList

```
--> document.location;  
--> document.title; document.title = 'newTitle'; [title change kr diye webpage ka]  
--> document.domain;  
--> document.body.innerHTML = '<b>Welcome to the world of JS</b>';  
--> document.querySelector('#cart-summary').innerText = `Your cart has ${cartQuantity}  
items`;  
--> document.querySelector('.class_name_of_any_element').classList;  
[will return kon-konsa class define hua h ush element ke liye]  
--> document.querySelector('.class_name_of_any_element').classList.add('newly-added-cla  
ss'); [to add any class]  
--> document.querySelector('.class_name_of_any_element').classList.remove('class-name');  
[to remove any class]  
  
--> document.querySelector('.class_name')  
[It will return the element which is having same class] [new method]  
--> document.querySelectorAll('.class_name')  
[It will return all the elements which is having same class] [new method]
```



```
--> document.querySelector('#click-me').click()
--> document.querySelector('.display').value=current_display;    [input type="text" ho]
--> document.querySelector('h1')
[It will return the element which is having h1 tag] [new method]
--> document.querySelector('#id_name')
[It will return the element which is having same id] [new method]
```

DOM and Element Methods

1. getElementById() 2. querySelector() 3. classList: add(), remove()
4. createElement() 5. appendChild() 6. removeChild() 7. replaceChild()

```
--> let button = document.createElement('Button');
[jaisa v element create krna chahte hain, yahan button kr rhe]
--> console input: [button], console output: [<button></button>]
```

```
--> <div class="my-div">This is the div</div>    [html code]
--> document.querySelector('.my-div').appendChild(button);    [JS Code]
    button.innerText = 'Click Me';
[appendChild matlab uske andar koi element create krna]
--> document.querySelector('.my-div').removeChild(button);
[removeChild matlab child element delete karna]
```

```
--> document.getElementById('id_name');
[It will return the element which is having same ID] [old method]
--> document.getElementsByClassName('class_name');
[It will return all the elements which is having same class] [old method]
```

Conceptual:

```
.js-odd { background-color: chocolate; }
.js-even { background-color: lawngreen; }
if (noOfTimesClicked % 2 === 0) {
    button.classList.remove('js-odd');
    button.classList.add('js-even');
} else {
    button.classList.remove('js-even');
    button.classList.add('js-odd');}
```

```
let noOfTimesClicked = localStorage.getItem('noOfTimesClicked') || 0;

function buttonPressed() {
  noOfTimesClicked++;
  localStorage.setItem('noOfTimesClicked', noOfTimesClicked);
  updateButton();
}
```

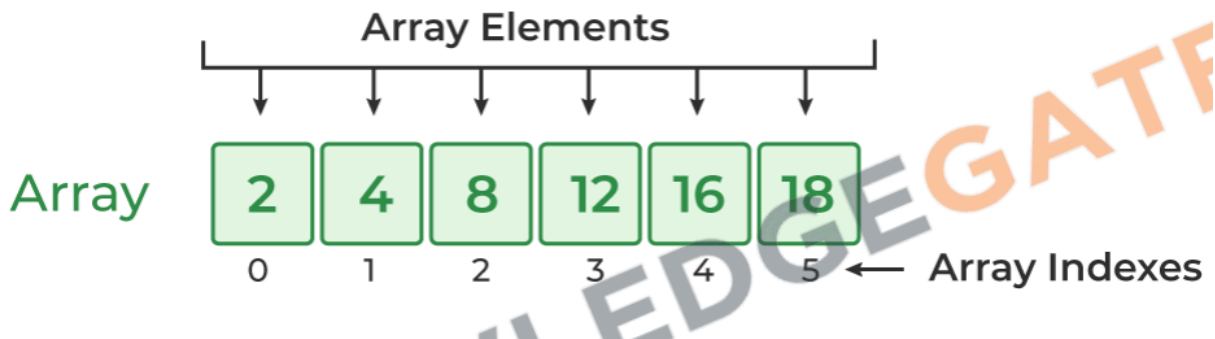
Conceptual:

```
let todoList = [
  {
    item: 'Buy Milk',
    dueDate: '2024-10-15'
  },
  {
    item: 'Go to College',
    dueDate: '2024-10-15'
  }
];
```

```
let inputElement = document.querySelector('#todo-input');
//target kiye user input wale element ko
let dateElement = document.querySelector('#todo-date');
//target kiye user selected date wale element ko
let todoItem = inputElement.value; //text value store kr diye
let todoDate = dateElement.value; //date value store kr diye
todoList.push({item: todoItem, dueDate: todoDate});
//array me text aur date object ke form me bhej diye
inputElement.value = "";
//null kr diye taki phir se enter krne ke liye aaye
dateElement.value = "";
```

Chapter:9

9.28 Arrays & Loops:



1. An Array is just a list of values.
2. Index: Starts with 0.
3. Arrays are used for storing multiple values in a single variable.
4. Arrays can hold any value, including arrays.
5. typeof operator on Array Returns Object.
6. Arrays also use references like objects.

```
let arr= [9,8,5,7,6];
```

```
let arr2= arr;
```

```
arr2[0]=99;
```

```
console.log(arr); [99,8,5,7,6]
```

[mtlb dono same hi array ko point kr rha h kisi me change kr do]

7. De-structuring also works for Arrays.

```
let [a,b,c,d,e] = arr;
```

```
console.log(`a= ${a}, b= ${b}, c= ${c}, d= ${d}, e= ${e}`);
```

--> Syntax:

```
let myArray = [1, 'Prakash Jha', null, true, {likes: '! Million'}];
```

```
console.log(myArray);
```

```
console.log(myArray[0]);
```

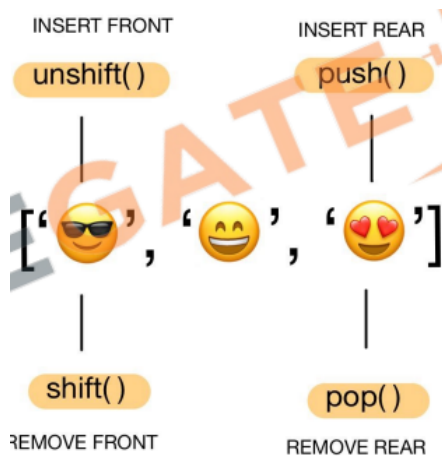
```
console.log(typeof myArray);
```

[object, becoz array is also special type of object which contains list of values inside square bracket]

--> `console.log(Array.isArray(myArray));` [true, checks if a variable is an array]

`console.log(myArray.length);` [5, returns the size of the array]

--> **Common Methods:**



```
console.log(myArray);  
myArray.push('hello'); [adds element at the end]  
myArray.pop();         [removes last element ]  
let x = myArray.pop();  
[last value array se remove bhi kr dega aur whi same return bhi kr dega]
```

```
myArray.shift();        [removes first element]  
myArray.unshift('kya ho rha h'); [adds element at the start]
```

```
myArray.splice(1,2);    [1st index se delete karna start karo aur 2 element delete kr do]  
let k= myArray.slice(2,5);  
[ye 2nd_index(inclusive) se 5th_index(exclusive) tk ka element return krega]  
console.log(k);  
console.log( myArray.toString() );    [to convert array into string]
```

```
console.log(myArray);  
myArray.sort();  
[sorting kr dega, string ko alphabetically aur numbers ko ascending to descending order]  
console.log(myArray);
```

```
console.log( myArray.valueOf() );    [ye same hi array return kr dega: useless]
```

```
let arr = ['Happiness', 'is', 'good', 'for', 'health']  
console.log(arr.join(' '));  
[Happiness is good for health, jis bhi tarah se join karna chaho]
```

9.29 Loops:

[Functions: Reusable blocks of code.] [Loops: Repeated execution of code.]

1. Code that runs multiple times based on a condition.
2. Loops also alter the flow of execution, similar to functions.
3. Loops automate repetitive tasks.
4. Types of Loops: for, while, do-while.
5. Iterations: Number of times the loop runs.

1. While loop: (Used for non-standard conditions. Jb nhi pta ho loop kitne baar chalana hai)

Remember: Always include an updation to avoid infinite loops.

```
EX:1 let num =1;           //initialization
    while (num <=10){       //condition
        console.log(num);
        num++;             //updation
    }
```

```
EX:2 let x = 0;           //initialization
    while (x < 1){          //condition
        console.log(x);
        x = Math.random()*2; //updation
    }
    console.log('final value of x:' + x);
```

2. Do While Loop: (Guaranteed to run at least one iteration)

```
EX:1 let num=0;           //initialization
    do {
        console.log(num);
        num++;             //updation
    }while (num >5); //condition (first iteration is unconditional)
```

3. For Loop: (Standard loop for running code multiple times)

```
EX:1 let nums = [4,56,8,3,-87,9,78,9,3,5,7];
    for (let i = 0; i < nums.length; i++) { //initialization //condition //updation
        console.log(nums[i]);
    }
```

9.30 Break & Continue:

1. Break lets you stop a loop early, or break out of a loop
2. Continue is used to skip one iteration or the current iteration
3. In while loop remember to do the increment manually before using continue

Break:

```
let arr = [1,3,5,6,7,8,3,4];
for (let i = 0; i < arr.length; i++) {
  if (arr[i] === 8) {
    console.log(`Number found at index ${i}`);
    break;
  }
}
```

Continue:

```
for (let i = 1; i <= 25; i++) { //To print odd no. from 1 to 25
  if (i % 2 == 0) {
    continue;
  }
  console.log(i);
}
```

Chapter:10

Advance Functions:

10.31 Anonymous Functions As Values: //it's like a datatype only (int,string,object, array, function)

1. Functions in JavaScript are first-class citizens; they can be assigned to variables.
2. Functions defined without a name, often assigned to a variable.
3. Anonymous functions can be properties in objects.
4. This Can be passed as arguments to other functions.
5. Invoked using () after the function name or variable.
6. console.log(myFunction); and typeof myFunction will both indicate it's a function.

EX:1 //Anonymous function jisko sum variable me assign kiya ja rha h

```
let sum = function(num1, num2){  
    return num1 + num2;  
};
```

```
let newSum = sum;           //function ko as a variable use kr le rhe  
console.log(newSum(4,5));
```

EX:2 //This Can be passed as arguments to other functions.

// 3 no. pass kr rhe aur ek aisa function jo 2 no. ka sum kr paye

```
let sumThreeNumbers = function (num1, num2, num3, sum){  
    let sum1 = sum(num1, num2);           // 1st call (2 no. ko sum krne wala function)  
    return sum(sum1, num3);              // 2nd call (2 no. ko sum krne wala function)  
}  
console.log(sumThreeNumbers(4,5,6,sum));
```

```
<!-- let sumThreeNumbers = function (num1, num2, num3, sumTwoNumbers){  
    let sum1 = sumTwoNumbers(num1, num2);  
    return sumTwoNumbers(sum1, num3);  
} console.log(sumThreeNumbers(4,5,6,sum));  
//ye bhi theek hai kyunki sum/sumTwoNumbers to bas ek variable ke jaisa h
```

```
--> console.log(sum);           [will return whole body of the function]  
--> console.log(typeof sum);   [function]
```

10.32 Arrow Functions:

1. A concise way to write anonymous functions.

Form 0 : Object create krte waqt wala form

```
let product = {  
  company: 'Mango',  
  greeting: function(){  
    return `Hello Sir`;  
  }  
};  
product.greeting();
```

Form 0': Object create krte waqt wala another form

```
let product = {  
  company: 'Mango',  
  greeting(){  
    return `Price of the product is ${this.price}`;  
  }  
};  
product.greeting();
```

Form 1 : Normal Function

```
function sum (num1, num2){  
  let s = num1 + num2;  
  return s;  
}  
console.log(sum(2,3));
```

Form 2: Anonymous Function

```
let sum = function(num1, num2){  
  let s = num1 + num2;  
  return s;  
};  
console.log(sum(2,3));
```


Form 3:

```
1. let sum = (num1, num2) =>{  
    let s = num1 + num2;  
    return s;  
};  
console.log(sum(2,3));
```

2. For Single Argument: Round brackets optional.**Form 4:**

```
let square = num =>{  
    let s = num *num;  
    return s;  
};  
console.log(square(5));
```

3. For Single Line: Curly brackets and return optional.**Form 5:**

```
let square = num => num*num;  
console.log(square(5));
```

4. Often used when passing functions as arguments.

10.33 setTimeout & setInterval

1. Functions for executing code asynchronously after a delay.

2. setTimeout runs once; setInterval runs repeatedly

3. setTimeout:

- Syntax: setTimeout(function, time)
- Cancel: clearTimeout(timerID)

```
let alarm = function(){                                //Anonymous Functions
  console.log('Subah ho gayi, uth jao');
};
```

```
let timerId = setTimeout(alarm, 5000);                 //5 sec baad execute hoga
console.log(timerId);
//setTimeout(alarm(), 5000);                           //aisa nhi krna h bs argument dena h
function ko call setTimeout khud krega
clearTimeout(timerId);                                // to cancel the alarm before execution
```

4. setInterval:

- Syntax: setInterval(function, time)
- Cancel: clearInterval(intervalID)

```
let alarm = function(){                                //Anonymous Functions
  console.log('Subah ho gyi, uth jao');
};
let intervalId = setInterval(alarm, 2000);             // to repeat after every 2 sec
//clearInterval(intervalId);                           // to cancel it
```

What if you want to repeat this after every 2 sec till 10 sec [total 5 repetition]

```
let hello = function(){
  clearInterval(intervalId);
}
setTimeout(hello, 10000);
// ye 10 sec baad hello function ko execute krke rok dega alarm ko
```

10.34 Event Listener

1. What Is an Event: Occurrences like clicks, mouse movement, keyboard input (e.g., birthday, functions).
2. Using `querySelector` to attach listeners.
3. Multiple Listeners: You can add more than one.
4. `removeEventListener('event', functionVariable);`

Previously used method: **In HTML**

```
<button id="my-button" onclick="console.log(`I'm clicked`)">Click Me</button>
```

Now: From JS

```
<button id="my-button" >Click Me</button> (HTML)
```

```
let btnTarget=document.querySelector('#my-button');
let status = function() {                                     //Anonymous Functions
    console.log(`I'm clicked`);
};
let showDate = function(){
    console.log(new Date());
}
btnTarget.addEventListener('click', status);
//yahan status() mt use kr lena, nhi to bs ek baar call hoga
btnTarget.addEventListener('click', showDate);               // adding multiple events
btnTarget.removeEventListener('click', status);
// on-click se status event remove kr rhe
```

10.35 For Each Loop

1. A method for array iteration, often preferred for readability.
2. Parameters: One for item, optional second for index.
3. Using `return` is similar to `continue` in traditional loops.
4. Not straightforward to break out of a `forEach` loop.
5. **USE THIS:** When you need to perform an action on each array element and don't need to break early.

Previous method: 1

```
let arr =[2,5,'hello', 'prakash', 67];
for(let i=0; i<arr.length; i++){
  console.log(arr[i]);
}
```

New method: 2

```
arr.forEach(function(element){
  console.log(element);
});
```

Arrow function: 3

```
arr.forEach(element => console.log(element));
```

//search function bnao using old method

```
let arr =[1,2,3,4,5,6,7,8,9];
function search(arr, num){
  for (let i=0; i< arr.length; i++){
    if(arr[i] == num){
      return i;
    }
  }
  console.log("Element not found");
}
console.log(search(arr, 5));
```

//Do the same with For each loop //won't work

//Using return is similar to continue in traditional loops.

```
let arr =[1,2,3,4,5,6,7,8,9];
arr.forEach(num => {
  if(num ===5){
    return;
  }
  console.log(`visited:${num}`);
});
```

→ [output: 1,2,3,4,6,7,8,9]

10.36 Array Methods

1. Filter Method:

- Syntax: `array.filter((value, index) => return true/false)`
- Use: Filters elements based on condition.

```
let arr = [1,2,3,4,5,6,7,8,9];
let odds = arr.filter((num, index) => {
  if (num % 2 === 1) {
    return true;
  } else {
    return false;
  }
});
console.log(odds); [1,3,5,7,9]
```

```
let newOdds = arr.filter( (num, index) => num % 2 === 1 );
console.log(newOdds); [1,3,5,7,9]
```

2. Map Method:

- Syntax: `array.map((value) => return newValue)`
- Use: Transforms each element.

```
let arr = [1,2,3,4,5,6,7,8,9];
let squares = arr.map(num => num*num);
console.log(squares);
```

Completed !!!