**Difference between == and ===?**

== in JavaScript is used for comparing two variables, but it ignores the datatype of variable.

=== is used for comparing two variables, but **this operator also checks datatype and compares two values.**

**For e.g.**

<body>

<p id="demo"></p>

<p id="demo1"></p>

<script>

var a = 10;

var b = **"**10**"**;

document.getElementById("demo").innerHTML = (a==b) // true

document.getElementById("demo1").innerHTML = (a===b) // false

</script>

</body>

**Hoisting of var**

Hoisting is a JavaScript mechanism where variables and function declarations are moved to the top of their scope before code execution. This means that if we do this:

console.log (greeter);

var greeter = "say hello"

It is interpreted as this:

var greeter;

console.log(greeter); // greeter is undefined

greeter = "say hello"

In other words, a variable can be used before it has been declared.

e.g.1 and e.g.2 will produce the same result

**e.g.1**

<body>

<p id="demo"></p>

<script>

var x; // Declare x

x = 5; // Assign 5 to x

elem = document.getElementById("demo"); // Find an element

elem.innerHTML = x; // Display x in the element

</script>

</body>

**e.g.2**

<body>

<p id="demo"></p>

<script>

x = 19; // Assign 19 to x

elem = document.getElementById("demo"); // Find an element

elem.innerHTML = x; // Display x in the element

var x; // Declare x

</script>

</body>

<script>

var greeting = "say Hi";

var times = 4;

if (times > 3) {

var hello = "say Hello instead";

console.log(hello);// say Hello instead

console.log(greeting); // say Hi

var greeting = "Test Hi";

console.log(greeting); //Test Hi

}

console.log(greeting); // Test Hi

</script>

**Hoisting of let**

Just like var, let declarations are hoisted to the top. Unlike var which is initialized as undefined, the let keyword is not initialized. So if you try to use a let variable before declaration, you'll get a Reference Error.

1. let is block scoped
2. let can be updated but not re-declared in same block.

**e.g. -1**

<script>

let greeting = "say Hi";

let times = 4;

if (times > 3) {

let hello = "say Hello instead";

console.log(hello); // say Hello instead

console.log(greeting); // Gives error "Cannot access 'greeting' before initialization" and stop further execution

let greeting = "Test Hi";

console.log(greeting); //Test Hi

}

console.log(greeting); //say Hi

</script>

**e.g. -2**

<script>

let greeting = "say Hi";

let times = 4;

if (times > 3) {

let hello = "say Hello instead";

console.log(hello); // "say Hello instead"

let greeting = "Test Hi";

console.log(greeting); //Test Hi

}

console.log(greeting); //say Hi

</script>

**Const**

Variables declared with the const maintain constant values. const declarations share some similarities with let declarations.

1. const declarations are block scoped
2. const cannot be updated or re-declared
3. Every const declaration, must be initialized at the time of declaration.

This behavior is somehow different when it comes to objects declared with const. While a const object cannot be updated, but the properties of this objects can be updated. Therefore, if we declare a const object as this:

const greeting = {

message: "say Hi",

times: 4

}

While we cannot do this:

const greeting = {

words: "Hello",

number: "five"

} // error: Assignment to constant variable.

But we can do this:

greeting.message = "say Hello instead";

This will update the value of greeting.message without returning errors.

**Difference between var, let and const**

1. **var** declarations are globally scoped or function scoped while **let** and **const** are block scoped.
2. **var** variables can be updated and re-declared within its scope; **let** variables can be updated but not re-declared; **const** variables can neither be updated nor re-declared.
3. They are all hoisted to the top of their scope. But while **var** variables are initialized with undefined, **let** and **const** variables are not initialized.
4. While **var** and **let** can be declared without being initialized, **const** must be initialized during declaration.

**Definition and Usage of map() method**

* The map() method creates a new array with the results of calling a function for every array element.
* The map() method calls the provided function once for each element in an array, in order.

Note: map() does not execute the function for array elements without values.

Note: this method does not change the original array.

**e.g. -1**

<script>

var numbers = [4, 9, 16, 25];

function myFunction() {

x = document.getElementById("demo")

x.innerHTML = numbers.map(Math.sqrt); **// 2,3,4,5**

}

</script>

**e.g. -2**

<script>

var numbers = [65, 44, 12, 4];

var newarray = numbers.map(myFunction)

function myFunction(num) {

return num \* 10;

}

document.getElementById("demo").innerHTML = newarray; **// 650,440,120,40**

</script>

**e.g. -3**

<script>

var persons = [

{ firstname: "Malcom", lastname: "Reynolds" },

{ firstname: "Kaylee", lastname: "Frye" },

{ firstname: "Jayne", lastname: "Cobb" }

];

function getFullName(item) {

var fullname = [item.firstname, item.lastname].join(" ");

return fullname;

}

function myFunction() {

document.getElementById("demo").innerHTML = persons.map(getFullName);

**// Malcom Reynolds,Kaylee Frye,Jayne Cobb**

}

</script>

The **reduceRight()** method executes a provided function for each value of the array **(from right-to-left).**

**Definition and Usage reduce() method**

* The reduce() method reduces the array to a single value.
* The reduce() method executes a provided function for each value of the array **(from left-to-right).**
* The return value of the function is stored in an accumulator (result/total).

Note: reduce() does not execute the function for array elements without values.

Note: This method does not change the original array.

**e.g. -1**

<script>

var numbers = [175, 50, 25];

document.getElementById("demo").innerHTML = numbers.reduce(myFunc); //100

document.getElementById("demo").innerHTML = numbers.reduceRight(myFunc); //-200

function myFunc(total, num) {

return total - num;

}

</script>

**e.g. -2**

<body>

<button onclick="myFunction()">Try it</button>

<p>Sum of numbers in array: <span id="demo"></span></p>

<script>

var numbers = [15.5, 2.3, 1.1, 4.7];

function getSum(total, num) { //0 ,15.5 in first iteration

return total + Math.round(num);

}

function myFunction(item) {

document.getElementById("demo").innerHTML = numbers.reduce(getSum, 0); //24

}

</script>

</body>

**Datatypes:**

var length = 16;   // Number  
var lastName = "Johnson";    // String  
var x = {firstName:"John", lastName:"Doe"};  // Object

JavaScript Types are Dynamic

JavaScript has dynamic types. This means that the same variable can be used to hold different data types:

var x;           // Now x is undefined  
x = 5;           // Now x is a Number  
x = "John";   // Now x is a String

**What is the difference between Undefined and Null?**

undefined and null are **equal in value but different in type**

**For e.g.**

<body>

<p id="demo"></p>

<p id="demo1"></p>

<p id="demo2"></p>

<script>

document.getElementById("demo").innerHTML = (null == undefined); // true

document.getElementById("demo1").innerHTML = (null === undefined); //false

**document.getElementById("demo2").innerHTML = 4 + '5'// 45**

</script>

</body>

**Complex Data:**

The **typeof** operator can return one of the two complex types:

* function
* object

The typeof operator returns "object" for objects, arrays, and null.

The typeof operator does not return "object" for functions.

**For e.g.**

typeof {name:'John', age:34} // Returns "object"  
typeof [1,2,3,4]             // Returns "object" (not "array", see note below)  
typeof null                  // Returns "object"  
typeof function myFunc(){}   // Returns "function"

**Variable Lifetime**

**Global variables** live until the page is discarded, like when you navigate to another page or close the window.

**Local variables** have short lives. They are created when the function is invoked, and deleted when the function is finished.

**What is a Closure?**

A closure is the combination of a function bundled together (enclosed) with references to its surrounding state (the lexical environment). In other words, a closure gives you access to an outer function’s scope from an inner function.

To use a closure, define a function inside another function and expose it. To expose a function, return it or pass it to another function.

<body>

<button type="button" onclick="myFunction()">Count!</button>

<p id="demo">0</p>

<script>

var add = (function () {

var counter = 0;

return function () { counter += 1; return counter; }

})();

function myFunction() {

document.getElementById("demo").innerHTML = add();

}

</script>

</body>

**Example Explained**

* The variable add is assigned to the return value of a self-invoking function.
* The self-invoking function only runs once. It sets the counter to zero (0), and returns a function expression.
* This way add becomes a function. The "wonderful" part is that it can access the counter in the parent scope.
* This is called a JavaScript closure. It makes it possible for a function to have "private" variables.
* The counter is protected by the scope of the anonymous function, and can only be changed using the add function.

**join() :** By default join with ‘,’

<script>

function myFunction() {

var fruits = ["Banana", "Orange", "Apple", "Mango"];

var x = document.getElementById("demo");

x.innerHTML = fruits.join(); //fruits.join(',') **output:** Banana,Orange,Apple,Mango

}

</script>

**Inheritance in Javascript**

<body>

<p id="demo"></p>

<script>

class BaseCar {

display() {

return 'Base Car Class';

}

}

class Car extends BaseCar {

constructor(brand) {

super();

this.carname = brand;

}

present() {

return 'I have a ' + this.carname;

}

}

class Model extends Car {

constructor(brand, mod) {

super(brand);

this.model = mod;

}

show() {

return this.display() + ' ' + this.present() + ', it is a ' + this.model;

}

}

let myCar = new Model("Ford", "Mustang");

document.getElementById("demo").innerHTML = myCar.show();

</script>

</body>

**The JavaScript call() Method**

* The call() method is a predefined JavaScript method.
* It can be used to invoke (call) a method with an owner object as an argument (parameter).
* With call(), an object can use a method belonging to another object.

<body>

<p id="demo"></p>

<script>

var person = {

fullName: function () {

return this.firstName + " " + this.lastName;

}

}

var person1 = {

firstName: "John",

lastName: "Doe"

}

var person2 = {

firstName: "Mary",

lastName: "Doe"

}

var x = person.fullName.call(person1);

document.getElementById("demo").innerHTML = x;

</script>

</body>

**The JavaScript apply() Method**

With the apply() method, you can write a method that can be used on different objects.

<body>

<p id="demo"></p>

<script>

var person = {

fullName: function () {

return this.firstName + " " + this.lastName;

}

}

var person1 = {

firstName: "John",

lastName: "Doe"

}

var x = person.fullName.apply(person1);

document.getElementById("demo").innerHTML = x;

</script>

</body>

The call() method takes arguments separately.

The apply() method takes arguments as an array.

var person = {

fullName: function (city, country) {

return this.firstName + " " + this.lastName + "," + city + "," + country;

}

}

var person1 = {

firstName: "John",

lastName: "Doe"

}

var x = person.fullName.**call**(person1, "Oslo", "Norway"); //John Doe,Oslo,Norway

var y = person.fullName.**apply**(person1, ["Oslo", "Norway"]); //John Doe,Oslo,Norway

**Difference between $(document).ready() and $(window).load()**

1) Unlike jQuery ready event, which is only available in jQuery library, window.onload is standard event in JavaScript and available in every browser and library.

2) In most cases jQuery document ready event fire before window.onload event, in worst case, where there is no bulky content to load and there is no delay from browser side, window onload event get trigger at same time as document.ready event.

3) Another difference between document ready vs window load is that, by using window's onload technique, we can only specify one event handler, but we can use jQuery ready code multiple times in a page and browser will invoke them in the order they are declared in page.

4) jQuery ready event fires as soon as DOM is loaded i.e. all it's elements are available, it doesn't wait for DOM contents e.g. images, while JavaScript window.onload event first when DOM is fully loaded including contents e.g. images.

<script type="text/javascript">

$(document).ready(function () {

// executes when HTML-Document is loaded and DOM is ready

alert("page is loading now");

});

window.onload = function () {

// executes when complete page is fully loaded, including all frames, objects and images

alert("(window).load was called - window is loaded!");

};

</script>