Java Script

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Definition:

*JavaScript is a powerful programming language that can add interactivity to a website.

* JavaScript is a scripting language used to develop web pages.

* Various JavaScript frameworks are used for developing and building robust web applications.

*It was invented **by Brendan Eich.**

*JavaScript is versatile and beginner-friendly.

*With more experience, you'll be able to create games, animated 2D and 3D graphics, comprehensive database-driven apps, and much more.

*JavaScript is a scripting language used to develop web pages.

The Uses of JavaScript:

1.Enables you to create dynamically updating content

2.Control multimedia

3.Animate images and

4.Pretty much everything else.

Real Time Examples of JavaScript:

1.Web Development.

2.Web Applications.

3.Presentations.

4.Server Applications.

5.Web Servers.

6.Games.

7.Art.

8.Smartwatch Apps.

Why we use JavaScript in HTML:

image manipulation, form validation, and dynamic changes of content. To select an HTML element, JavaScript most often uses **the document.getElementById() method.**

Advantages of JavaScript:

1.Speed.
2.Reduces load on the server.
3.Ease of use.
4.Rich Interface.
5.Versatility.
6.Extended functionality.
7.Interoperability.
8.Popularity.

Disadvantages of JavaScript:

1.Client-side Security. Since the JavaScript code is viewable to the user, others may use it for malicious purposes.
2.Browser Support. The browser interprets JavaScript differently in different browsers.
3.Lack of Debugging Facility.
4.Single Inheritance.
5.Sluggish Bitwise Function.
6.Rendering Stopped.

Sample Program:

```
<!DOCTYPE html>
<html>
<body>

<h1>Using document.write()</h1>
<h2>JavaScript</h2>

<p>JavaScript is the programming language of the Web. JavaScript is easy to learn. This tutorial will teach you JavaScript from basic to advanced.</p>

<script>
document.write(5 + 6);
</script>

</body>
</html>
```

Variables:

Programs:

```
<!DOCTYPE html>

<html>

<body>

<h1>JavaScript Variables</h1>
```

```
<p>In this example, p, q, and r are undeclared.</p>
<p>They are automatically declared when first used.</p>
<p id="demo"></p>

<script>
//the values are declared
p = 20;
q = 10;
r = p + q;
document.getElementById("demo").innerHTML =
"The value of r is: " + r;
</script>
</body>
</html>


<!DOCTYPE html>
<html>
<body>
<h1>JavaScript Variables</h1>
```

```
<p>In this example, a, b, and c are variables.</p>
<p id="abc"></p>
<script>
//here we are using by "var"
var a = 5;
var b = 6;
var c = a + b;
document.getElementById("abc").innerHTML ="The value of c is: " + c;
</script>
</body>
</html>
```

```
<!DOCTYPE html>
<html>
<body>
<h1>JavaScript Variables by Using "let"</h1>
<p>In this example, d, e, and result are variables.</p>
```

```
<p id="xyz"></p>

<script>

let d = 12;

let e = 6;

let result = d * e;

document.getElementById("xyz").innerHTML =

"The result is: " + result;

</script>

</body>

</html>
```

```
<!DOCTYPE html>

<html>

<body>

<h1>JavaScript Variables by using "const"</h1>

<p>In this example, totalamount, withdraw, and balanceamount are variables.</p>

<p id="pqr"></p>
```

```
<script>
//here we are using the total
const totalamount= 30000;
const withdraw = 20000;
const balanceamount = totalamount - withdraw ;
document.getElementById("pqr").innerHTML =
"The Balance Amount is: " + balanceamount;
</script>
</body>
</html>

<!DOCTYPE html>
<html>
<body>
<h1>JavaScript Variables by using "let" and "const"</h1>
<p>In this example, mark1 , mark2 , mark3 , mark4 , mark5, and total are variables.</p>
<p id="marks"></p>
<script>
mark1 = 52;
mark2 = 76;
```

```
mark3 = 45;
mark4 = 87;
mark5 = 93;
total = mark1 + mark2 + mark3 + mark4 + mark5;
document.getElementById("marks").innerHTML =
"The total is: " + total;
</script>
</body>
</html>

<!DOCTYPE html>
<html>
<body>
<h1>JavaScript Variables for Data Types</h1>
<p>Strings are written with quotes.</p>
<p>Numbers are written without quotes.</p>
<p id="details"></p>
<script>
const pi = 3.14;
let person = "Hello";
let answer = 'Hii, Good Morning!!!';
```

```
document.getElementById("details").innerHTML =
pi + "<br>" + person + "<br>" + answer;
</script>
</body>
</html>

<!DOCTYPE html>
<html>
<body>
<h2>Activate Debugging</h2>
<p>F12 on your keyboard will activate debugging.</p>
<p>Then select "Console" in the debugger menu.</p>
<p>Then click Run again.</p>
<script>
//we are using
console.log(5 + 6);
console.log(8 * 5);
</script>
</body>
</html>
```

The Sum of two Numbers:

Program:

```
<!DOCTYPE html>
<html>
<body>
<h2>Using inner HTML</h2>
<h3>The Sum of two Numbers</h3>
<p>JavaScript is the programming language of the Web.</p>
<p id="demo"></p>
<script>
document.getElementById("demo").innerHTML = 10 + 20;
</script>
</body>
</html>
```

ForLoop in JavaScript:

Program:

```
<!DOCTYPE html>
<html>
```

```
<body>
<h2>JavaScript For Loop</h2>
<h1> Flowers </h1>
<p id="for"></p>
<script>
const flowers = ["Lilly", "Rose", "Lotus", "Jasmine", "Sunflower",
"       Daisy"];
let text = "";
for (let i = 0; i < flowers.length; i++) {
    text += flowers[i] + "<br>";
}
document.getElementById("for").innerHTML = text;
</script>
</body>
</html>
```

Including External JavaScript File

Program:

```
<!DOCTYPE html>
<html>
<head>
```

```
<meta charset="UTF-8">
<title> Including External JavaScript File </title>
</head>
<body>
<button type="button" id="myBtn"> Click Me!!!</button>
<script src="hello.js"></script>
</body>
</html>
```

Digital Clock:

Program:

```
<!DOCTYPE html>
<html>
<head>
<title>Digital Clock</title>
</head>
<body>
<div id="clock"></div>
<script>
let clock = () => {
let date = new Date();
```

```
let hours = date.getHours();
let minutes = date.getMinutes();
let seconds = date.getSeconds();
let period = "AM";
if (hours == 0) {
hours = 12;
} else if (hours >= 12) {
hours = hours - 12;
period = "P.M";
}
hours = hours < 10 ? "0" + hours : hours;
minutes = minutes < 10 ? "0" + minutes : minutes;
seconds = seconds < 10 ? "0" + seconds : seconds;
let time = '{hours}:{minutes}:{seconds}:{period}';
document.write= time;
setTimeout(clock, 1000);
};
clock();
</script>
</body>
</html>
```

Concatination in JavaScript:

Program:

```
<!DOCTYPE html>
<html>
<body>
<body style="background-color: pink;"></body>
<h1 style="color:blue;">JavaScript Strings</h1>
<h2 style="color:red;">The concat() Method</h2>
<p style="color:green;">The concat() method joins two or more strings.</p>
<p style="color:black;">Join "Java" and "Script":</p>
<p id="demo"></p>
<script>
let text1 = "Java";
let text2 = "Script";
let result = text1.concat(text2);
document.getElementById("demo").innerHTML = result;
</script>
</body>
</html>
```

Comments in JavaScript:

Program:

```
<!DOCTYPE html>

<html>

<body>

<h1 id="myH"></h1>

<p id="myP"></p>

<script>

// Change heading:

document.getElementById("myH").innerHTML = "JavaScript Comments";

// Change paragraph:

document.getElementById("myP").innerHTML = "My first paragraph.";

</script>

</body>

</html>
```

Pop in JavaScript:

Program:

```
<!DOCTYPE html>
<html>
<body>
<h1>JavaScript Arrays</h1>
<h2>The pop() Method</h2>
<p>pop() removes the last element of an array.</p>
<p id="demo"></p>
<script>
const fruits = ["Banana", "Orange", "Apple", "Mango"];
fruits.pop();
document.getElementById("demo").innerHTML = fruits;
</script>
</body>
</html>
```

Push in JavaScript:

Program:

```
<!DOCTYPE html>
<html>
<body>
```

```
<body style="background-color: powderblue;"></body>

<h1    style="color:blue;">JavaScript Arrays</h1>

<h2 style="color:green;">The push() Method</h2>

<p    style="color:red;">push() adds new items to the end of an array</p>

<p id="arr"></p>

<script>

const cars = ["BMW", "Hyundai", "Audi", "Mercedes-Benz"];

cars.push("Honda", "TOYOTA");

document.getElementById("arr").innerHTML = cars;

</script>

</body>

</html>
```

```
<!DOCTYPE html>

<html>

<body>

<h1 style="color:blue;">JavaScript Arrays</h1>

<h2    style="color:green;">The shift() Method</h2>
```

```
<p style="color:red;">shift() returns the removed array element:</p>

<p id="pot"></p>

<script>

const flowers = ["Lilly", "Rose", "Lotus", "Jasmine", "Sunflower", "Daisy"];

document.getElementById("pot").innerHTML = flowers.shift();

</script>

</body>

</html>
```

```
<!DOCTYPE html>

<html>

<body>

<h1 style="color:blue;">JavaScript Arrays</h1>

<h2    style="color:green;">The unshift() Method</h2>

<p style="color:red;">unshift() adds new items to the beginning of an array</p>
```

```
<p id="der"></p>

<script>

const animals = ["Dog", "Cat", "Human", "Horse", "Lion",
"Tiger"];

animals.unshift("Rabbit", "Monkey");

document.getElementById("der").innerHTML = animals;

</script>

</body>

</html>



<!DOCTYPE html>

<html>

<body>

<h1 style="color:blue;">JavaScript Arrays</h1>

<h2    style="color:green;">The pop() Method</h2>

<p style="color:red;">pop() removes the last element of an
array.</p>

<p id="uhj"></p>

<script>
```

```
const fruits = ["Banana", "Orange", "Apple", "Mango"];
fruits.pop();
document.getElementById("uhj").innerHTML = fruits;
</script>
</body>
</html>
```

RegularExpression:

Program:

```
<!DOCTYPE html>
<html>
<body>
<body style="background-color: pink;"></body>
<h1>JavaScript Regular Expressions</h1>
<h2>RegExp Group [abc]</h2>
<p>A global search for the character "s" in a string:</p>
<p id="demo"></p>
<script>
let text = "Is this all there is?";
let pattern = /[s]/g;
```

```
let result = text.match(pattern);
document.getElementById("demo").innerHTML = result;
</script>
</body>
</html><br>



<!DOCTYPE html>
<html>
<body>
<h2> RegExp Group [^abc] </h2>
<p>Do a global search for that characters that are not "t":</p>
<p id="ytr"></p>
<script>
let texts = "Is this all there is?";
let patterns = /[^t]/g;
let results = texts.match(patterns);
document.getElementById("ytr").innerHTML = results;
</script>
</body>
</html><br>
```

```
<!DOCTYPE html>
<html>
<body>
<h2>RegExp Group [0-9]</h2>
<p>A global search for the numbers 1 to 5:</p>
<p id="ert"></p>
<script>
let textq = "123456789";
let patternq = /[1-5]/g;
let resultq = textq.match(patternq);
document.getElementById("ert").innerHTML = resultq;
</script>
</body>
</html><br>



<!DOCTYPE html>
<html>
<body>
<h1> RegExp Group [^0-9] </h1>
```

```
<p>A global search for numbers that are NOT from 2 to 6:</p>
<p id="wer"></p>
<script>
let textw = "123456789";
let patternw = /[^1-4]/g;
let resultw = textw.match(patternw);
document.getElementById("wer").innerHTML = resultw;
</script>
</body>
</html><br>



<!DOCTYPE html>
<html>
<body>
<h1>RegExp Group (x|y)</h1>
<p>A global search for the specified alternatives (red|green):</p>
<p id="demos"></p>
<script>
let texte = "re, green, red, green, gren, gr, blue, yellow";
let patterne = /(red|green)/g;
```

```
let resulte = texte.match(patterne);
document.getElementById("demos").innerHTML = resulte;
</script>
</body>
</html>



<!DOCTYPE html>
<html>
<body>
<h1>RegExp . Metacharacter</h1>
<p>A global search for "h.t":</p>
<p id="demow"></p>
<script>
let textr = "That's hot!";
let patternr = /h.t/g;
let resultr = textr.match(patternr);
document.getElementById("demow").innerHTML = resultr;
</script>
</body>
</html><br>
```

```
<!DOCTYPE html>
<html>
<body>
<h1>RegExp \w Metacharacter</h1>
<p>A global search for word characters:</p>
<p id="demot"></p>
<script>
let textt = "Good Morning!";
let patternt = /\w/g;
let resultt = textt.match(patternt);
document.getElementById("demot").innerHTML = resultt;
</script>
</body>
</html><br>


<!DOCTYPE html>
<html>
<body>
```

```
<h1></h1>
<p>A global search for non-word characters:</p>
<p id="demon"></p>
<script>
let textn = "Good Morning @*!";
let patternn = /\W/g;
let resultn = textn.match(patternn);
document.getElementById("demon").innerHTML = resultn;
</script>
</body>
</html><br>



<!DOCTYPE html>
<html>
<body>
<h1> RegExp \d Metacharacter</h1>
<p>A global search for digits:</p>
<p id="dem"></p>
<script>
let texty = "Good Morning to 256%! students ";
```

```
let patterny = /\d/g;
let resulty = texty.match(patterny);
document.getElementById("dem").innerHTML = resulty;
</script>
</body>
</html><br>



<!DOCTYPE html>
<html>
<body>
<h1>RegExp \D Metacharacter</h1>
<p>A global search for non-digit characters:</p>
<p id="dmo"></p>
<script>
let textu = "Good morning 256*@%!";
let patternu = /\D/g;
let resultu = textu.match(patternu);
document.getElementById("dmo").innerHTML=resultu;
</script>
```

```
</body>
</html><br>



<!DOCTYPE html>
<html>
<body>
<h1>RegExp \s Metacharacter</h1>
<p>A global search for whitespace characters:</p>
<p id="deo"></p>
<script>
let texti = "Is this all there is?";
let patterni = /\s/g;
let resulti = texti.match(patterni);
document.getElementById("deo").innerHTML = resulti;
</script>
</body>
</html><br>
```

```
<!DOCTYPE html>
<html>
<body>
<h1>RegExp \S Metacharacter</h1>
<p>A search for non-whitespace characters:</p>
<p id="hjhf"></p>
<script>
let texto = "Good Morning to all";
let patterno = /\S/g;
let resulto = texto.match(patterno);
document.getElementById("hjhf").innerHTML = resulto;
</script>
</body>
</html>
```

```
<!DOCTYPE html>
<html>
<body>
<h1>RegExp \b Metacharacter</h1>
```

```
<p>Search for the characters "LO" in the <b>beginning</b> of a word:</p>

<p>"HELLO, LOOK AT YOU!"</p>

<p id="duty"></p>

<script>

let textp = "HELLO, LOOK AT YOU!";

let patternp = /\bLO/;

let resultp = textp.search(patternp);

document.getElementById("duty").innerHTML = "Found in position: " + resultp;

</script>

</body>

</html>



<!DOCTYPE html>

<html>

<body>

<h1>RegExp \B Metacharacter</h1>

<p>Search for the characters "LO" the phrase: "HELLO, LOOK AT YOU!" and return the first position where it is present,

NOT in the <b>beginning</b> of a word:</p>
```

```
<p><span id="democ"></span></p>

<script>

let textc = "HELLO, LOOK AT YOU!";

let patternc = /\BLO/;

let resultc = textc.search(pattern);

document.getElementById("democ").innerHTML = "Found in
position: " + resultc;

</script>

</body>

</html>

<br>



<!DOCTYPE html>

<html>

<body>

<h1>RegExp \0 Metacharacter</h1>

<p>Find the position where a NUL character is found:</p>

<p id="demop"></p>

<script>
```

```
let texta = "Visit W3Schools.\0Learn JavaScript.";
let patterna = /\0/;
let resulta = texta.search(patterna);
document.getElementById("demop").innerHTML = resulta;
</script>
</body>
</html>
```

Slicing :

Program:

```
<!DOCTYPE html>
<html>
<body>
<body style="background-color: powderblue;"></body>
<h1    style="color:blue;">JavaScript Array Methods</h2>
<h2    style="color:red;">slice()</h2>
<p>Array.slice() returns selected array elements as a new
array</p>
<p id="div"></p>
<script>
const fruits = ["Banana", "Orange", "Lemon", "Apple", "Mango"];
```

```
const citrus = fruits.slice(1, 3);
document.getElementById("div").innerHTML = citrus;
</script>
</body>
</html>

<!DOCTYPE html>
<html>
<body>
<body style="background-color: powderblue;"></body>
<h1    style="color:blue;">JavaScript Array Methods</h1>
<h2    style="color:red;">slice()</h2>
<p    style="color:green;">Array.slice() returns selected array elements as a new array:</p>
<p id="ghj"></p>
<script>
const cars = ["BMW", "Toyota", "Hyundai", "Honda", "Swift"];
const myBest = cars.slice(1, -1);
document.getElementById("ghj").innerHTML = myBest;
</script>
</body>
```

</html>

Splice:

Program:

```
<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>
<body style="background-color: pink;"></body>
<h1 style="color:blue;">This is a Heading</h1>
<br>
<p "id="sdf"></p>
<script>
var colors=["Red", "Green", "Blue"];
var removed=colors.splice(0, 1);
document.write(colors);
document.write(removed);
document.write(removed.length);
</script>
```

```
</body>
</html>



<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>
<h1>This is a Heading</h1>
<br>
<p id="dfg"></p><br>
<script>
removed=colors.splice(1, 0,"Pink", "Yellow");
document.write(colors);
document.write(removed);
document.write(removed.length);
</script>
</script>
</body>
```

```
</html>


<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>
<h1>This is a Heading</h1>
<br>
<p id="wer"></p>
<script>
removed=colors.splice(1, 1, "Purple", "Voilet");
document.write(colors);
document.write(removed);
document.write(removed.length);
</script>
</body>
</html>
```

Arrays in JavaScript:

Array is a collection of similar data types.

Programs:

```
<!DOCTYPE html>

<html>

<head>

<title> JavaScript Arrays </title>

</head>

<body>

<h1>Arrays in JavaScript</h1>

<p>Arrays are used to store multiple values in a single variable. This is compared to a variable that can store only one value. Each item in an array has a number attached to it, called a numeric index, that allows you to access it. In JavaScript, arrays start at index zero and can be manipulated with various methods.</p>

<p id="asd"></p>

<script>

const animals = ["Dogs", "Cats", "Horse", "Cows", "Elephant"];

document.getElementById("asd").innerHTML = animals;

</script>

</body>
```

```
</html>
```

Array Methods:

Program:

```
<!DOCTYPE html>
<html>
<body>
<body style="background-color: pink;"></body>
<h1    style="color:blue;">JavaScript Array Methods</h2>
<h2    style="color:red;">slice()</h2>
<p>Array.slice() returns selected array elements as a new
array</p>
<p id="div"></p>
<script>
const fruits = ["Banana", "Orange", "Lemon", "Apple", "Mango"];
const citrus = fruits.slice(1, 3);
document.getElementById("div").innerHTML = citrus;
</script>
</body>
</html>
```

```
<!DOCTYPE html>
<html>
<body>
<h1    style="color:blue;">JavaScript Array Methods</h1>
<h2    style="color:red;">slice()</h2>
<p    style="color:green;">Array.slice() returns selected array elements as a new array:</p>
<p id="ghj"></p>
<script>
const cars = ["BMW", "Toyota", "Hyundai", "Honda", "Swift"];
const myBest = cars.slice(1, -1);
document.getElementById("ghj").innerHTML = myBest;
</script>
</body>
</html>
```

```
<!DOCTYPE html>
<html>
```

```
<head>
<title>Page Title</title>
</head>
<body>
<h1 style="color:blue;">This is a Heading</h1>
<br>
<p "id="sdf"></p>
<script>
var colors=["Red", "Green", "Blue"];
var removed=colors.splice(0, 1);
document.write(colors);
document.write(removed);
document.write(removed.length);
</script>
</body>
</html>
```

```
<!DOCTYPE html>
<html>
<head>
```

```
<title>Page Title</title>
</head>
<body>
<h1 style="color:blue;">Removing</h1>
<p id="dfg"></p><br>
<script>
removed=colors.splice(1, 0,"Pink", "Yellow");
document.write(colors);
document.write(removed);
document.write(removed.length);
</script>
</script>
</body>
</html>

<!DOCTYPE html>
<html>
<head>
<title>Page Title</title>
</head>
<body>
```

```
<h1 style="color:blue;">Removing</h1>
<p id="wer"></p>
<script>
removed=colors.splice(1, 1, "Purple", "Voilet");
document.write(colors);
document.write(removed);
document.write(removed.length);
</script>
</body>
</html>



<!DOCTYPE html>
<html>
<body>
<h1    style="color:blue;">JavaScript Arrays</h1>
<h2    style="color:red;">The join() Method</h2>
<p    style="color:green;">join() returns an array as a string:</p>
<p id="sad"></p>
<script><hr>
var cars=["BWM", "TOYATA", "Innova"];
```

```
document.write(cars.join());

document.write(cars.join(""));

document.write(cars.join("-"));

document.write(cars.join(", "));

</script>

</body>

</html>
```

```
<!DOCTYPE html>

<html>

<body>

<h1 style="color:blue;">JavaScript Strings</h1>

<h2 style="color:red;">The concat() Method</h2>

<p style="color:green;">The concat() method joins two or more strings.</p>

<p style="color:black;">Join "Java" and "Script":</p>

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

<script>

let text1 = "Java";
```

```
let text2 = "Script";
let result = text1.concat(text2);
document.getElementById("demo").innerHTML = result;
</script>
</body>
</html>
```

```
<!DOCTYPE html>
<html>
<body>
<h1 style="color:blue;">JavaScript Arrays</h1>
<h2 style="color:red;">The delete Method</h2>
<p h1 style="color:green;">Deleting elements leaves undefined holes in an array:</p>
<p id="demo1"></p>
<p id="demo2"></p>
<script>
const fruits = ["Banana", "Orange", "Apple", "Mango"];
```

```
document.getElementById("demo1").innerHTML =
"The first fruit is: " + fruits[0];
delete fruits[0];
document.getElementById("demo2").innerHTML =
"The first fruit is: " + fruits[0];
</script>
</body>
</html>
```

```
<!DOCTYPE html>
<html>
<body>
<h1 style="color:blue;">JavaScript Arrays</h1>
<h2 style="color:red;">The indexOf() Method</h2>
<p>indexOf() returns the position of a specified value in an array.</p>
<p>Search for "Apple", starting at position 3:</p>
<p id="demo"></p>
<script>
```

```
const fruits = ["Banana", "Orange", "Apple", "Mango", "Apple"];
let index = fruits.indexOf("Apple", -3);
document.getElementById("demo").innerHTML = index;
</script>
</body>
</html>
```