PRO 3151 – L03
Sistemas de Informação
JavaScript – JS

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Ver. Abril 2023

Agenda

1. Onde estamos?
2. Estrutura do HTML – DOM
3. Sintaxe do JS
4. Lab. 03 – Calculadora
5. Próximos passos

1.ONDE ESTAMOS?

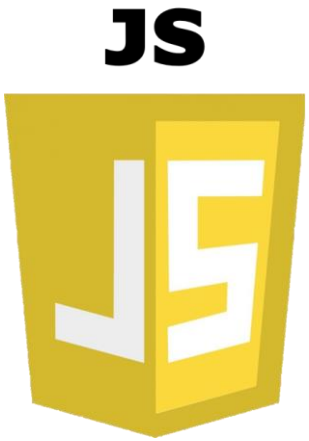
Onde estamos?

- Sabemos elaborar uma página HTML
- Sabemos aplicar estilos à página com CSS
- **Vamos aprender a incluir interatividade na página com o JavaScript – JS**

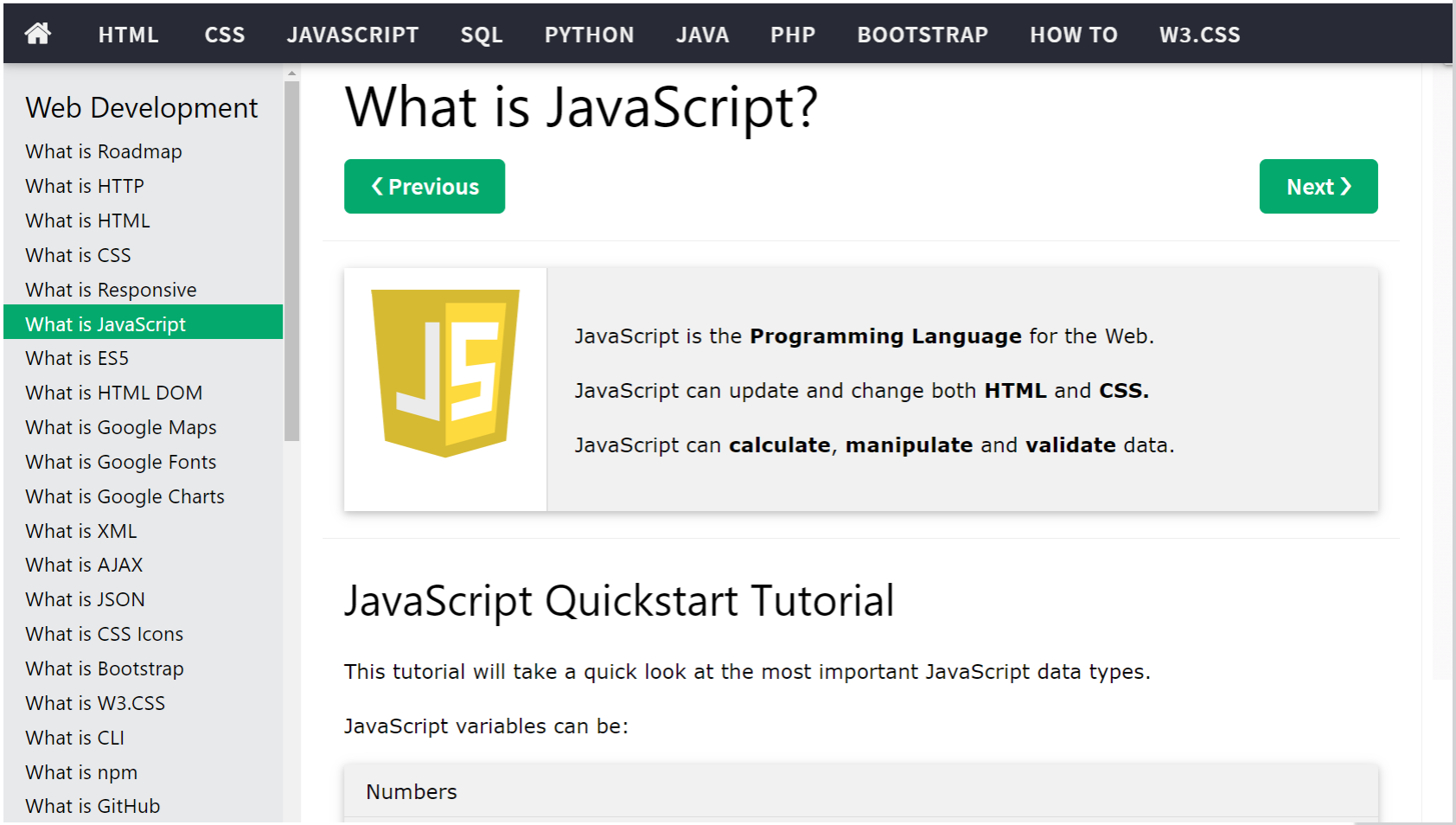
Onde estamos?

- Com o JS, fechamos uma trinca:
  - **HTML** – conteúdo
  - **CSS** – formato
  - **JS** – interação
- Essas três linguagens permitem criar páginas **dinâmicas** que rodam no navegador do **cliente** (*front-end)*!

JavaScript e Java não são a mesma coisa

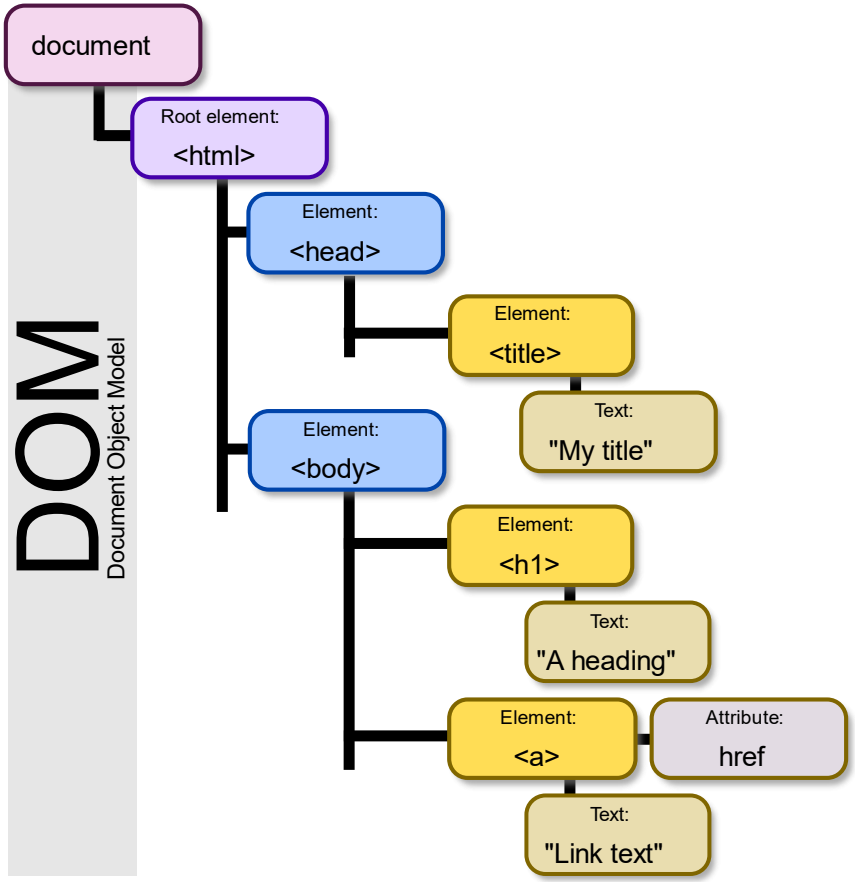


https://www.w3schools.com/whatis

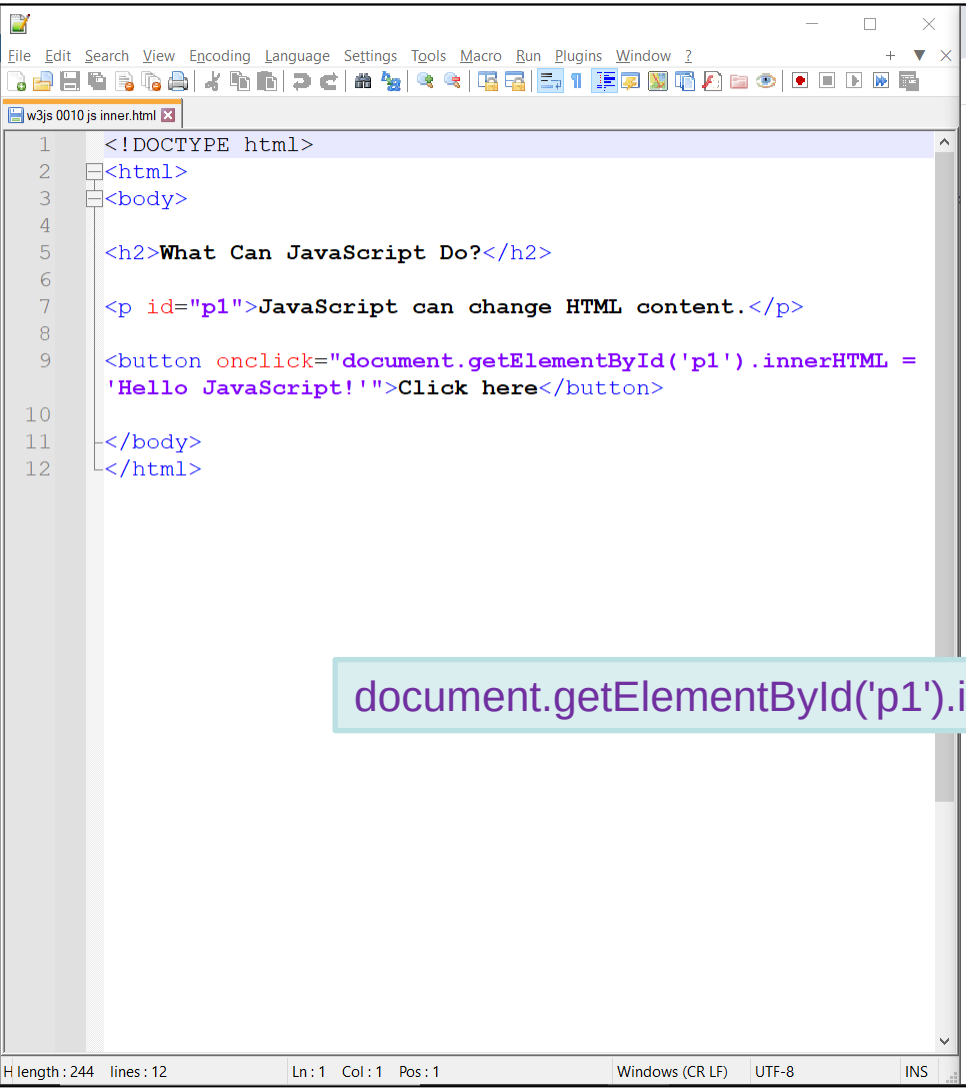


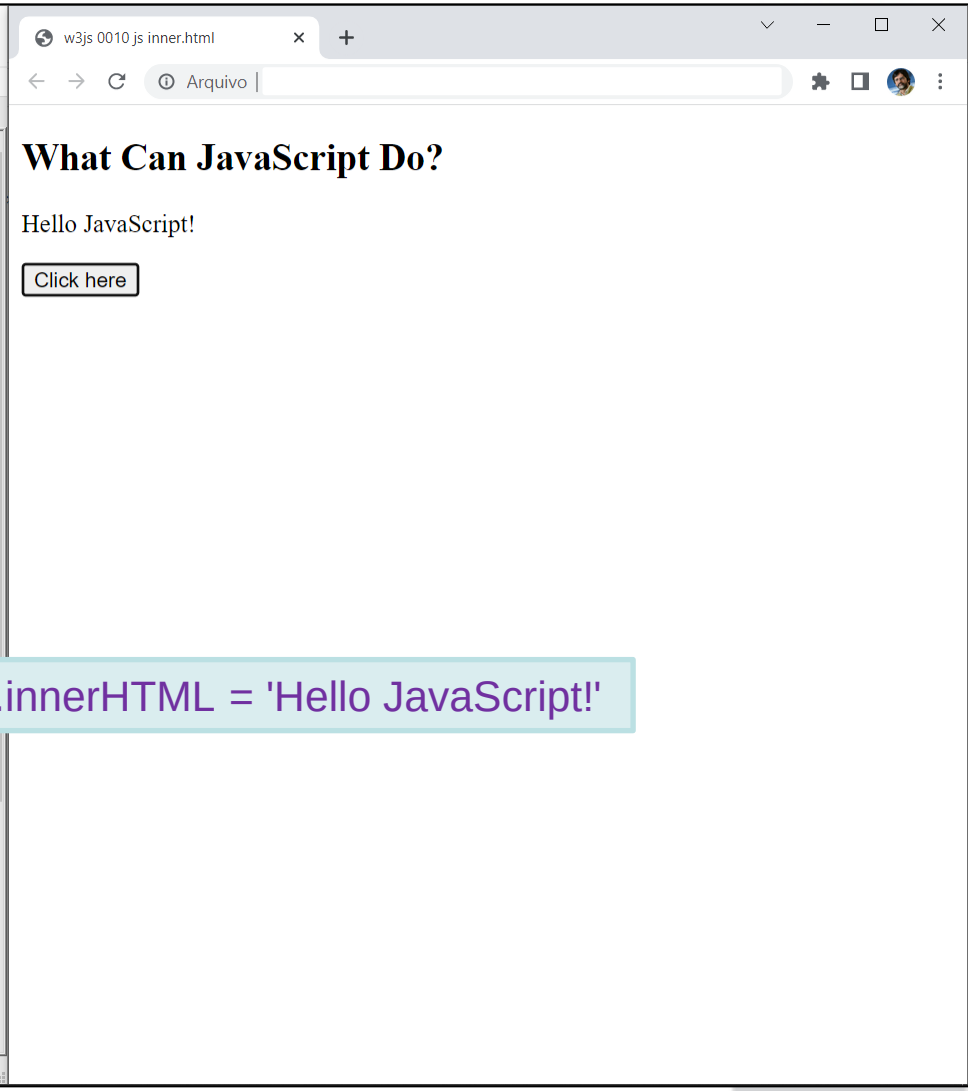
2. ESTRUTURA DO HTML

Document Object Model

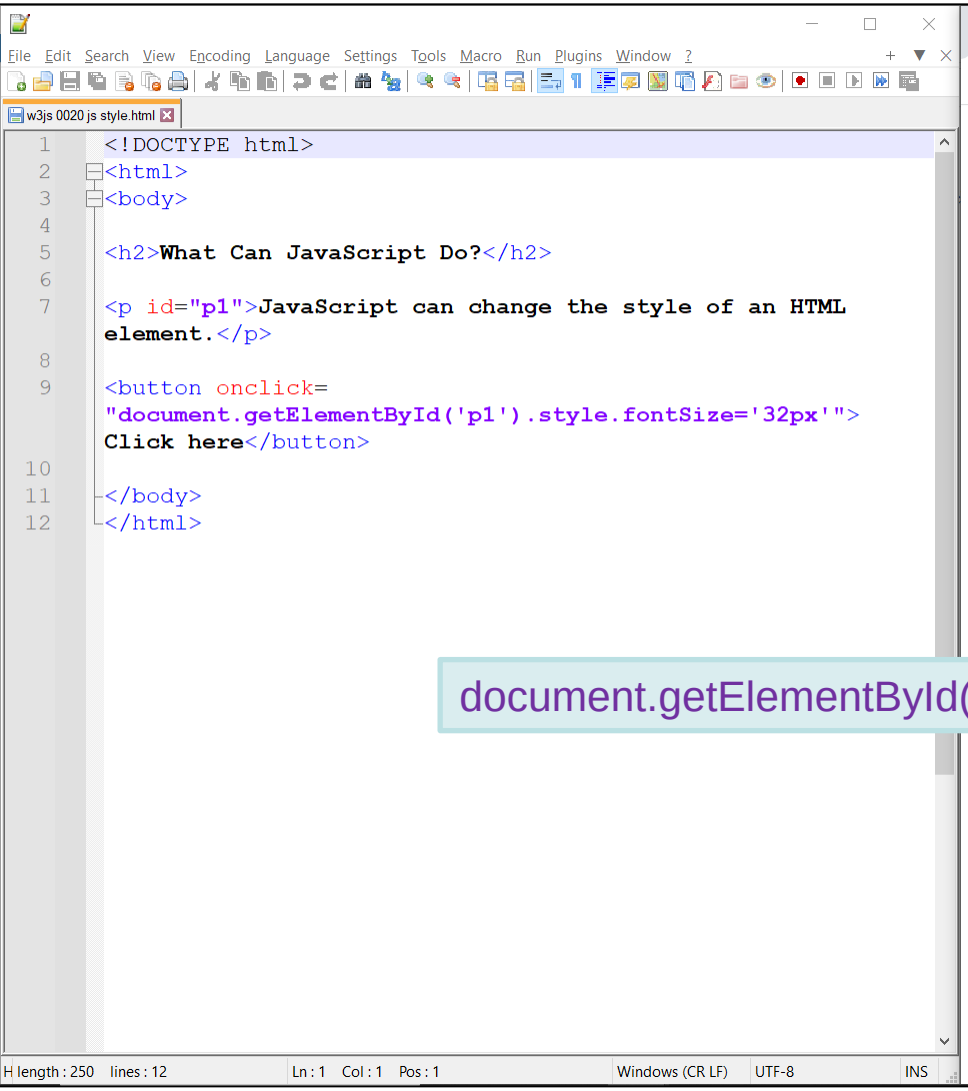


By Birger Eriksson - Own work, CC BY-SA 3.0,
https://commons.wikimedia.org/w/index.php?curid=18034500

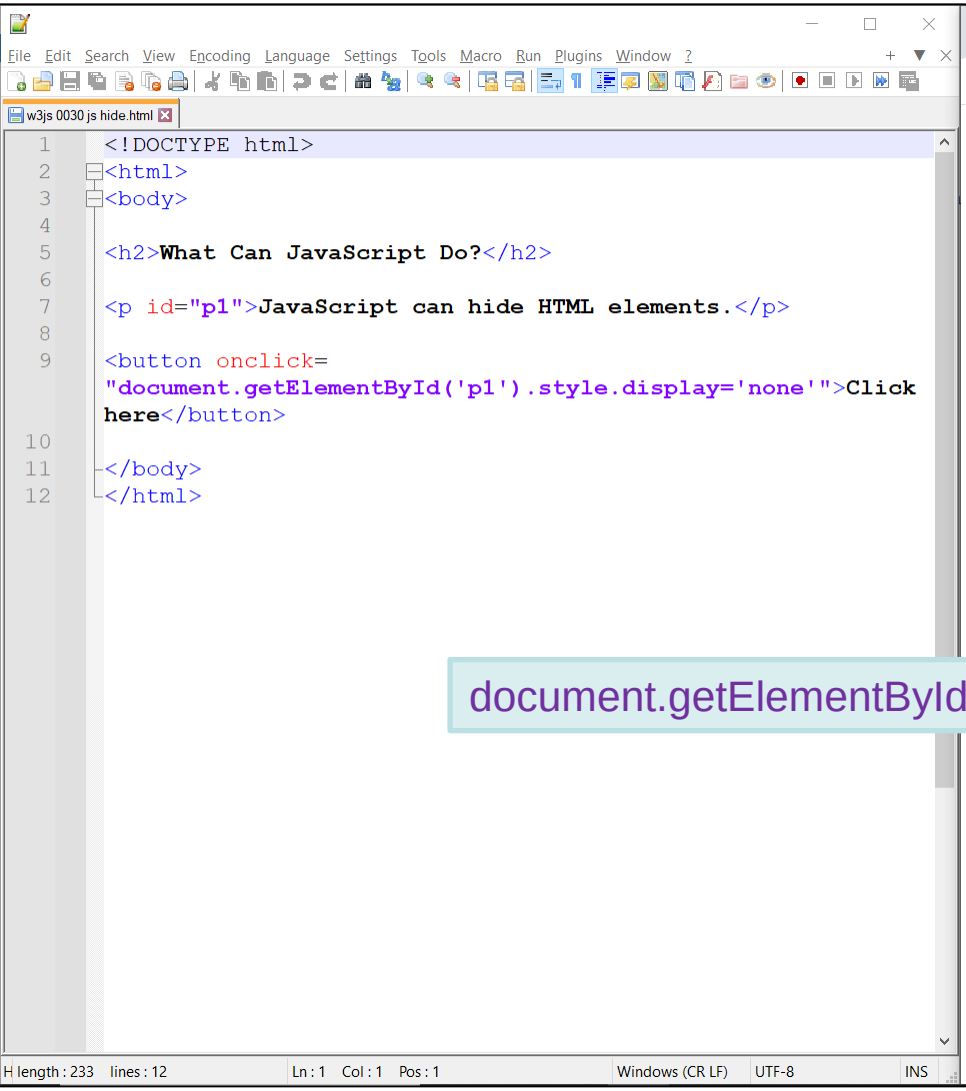


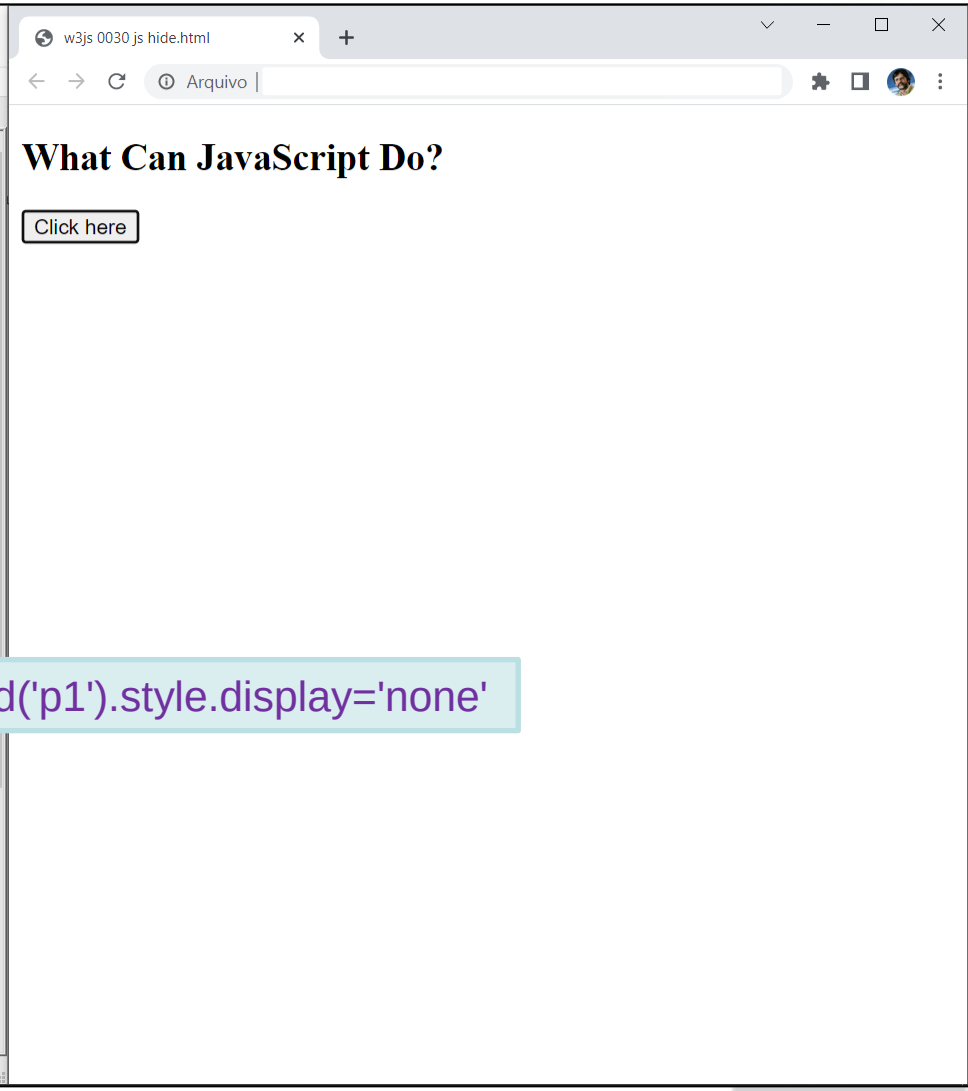



```
document.getElementById('p1').innerHTML = 'Hello JavaScript!'
```

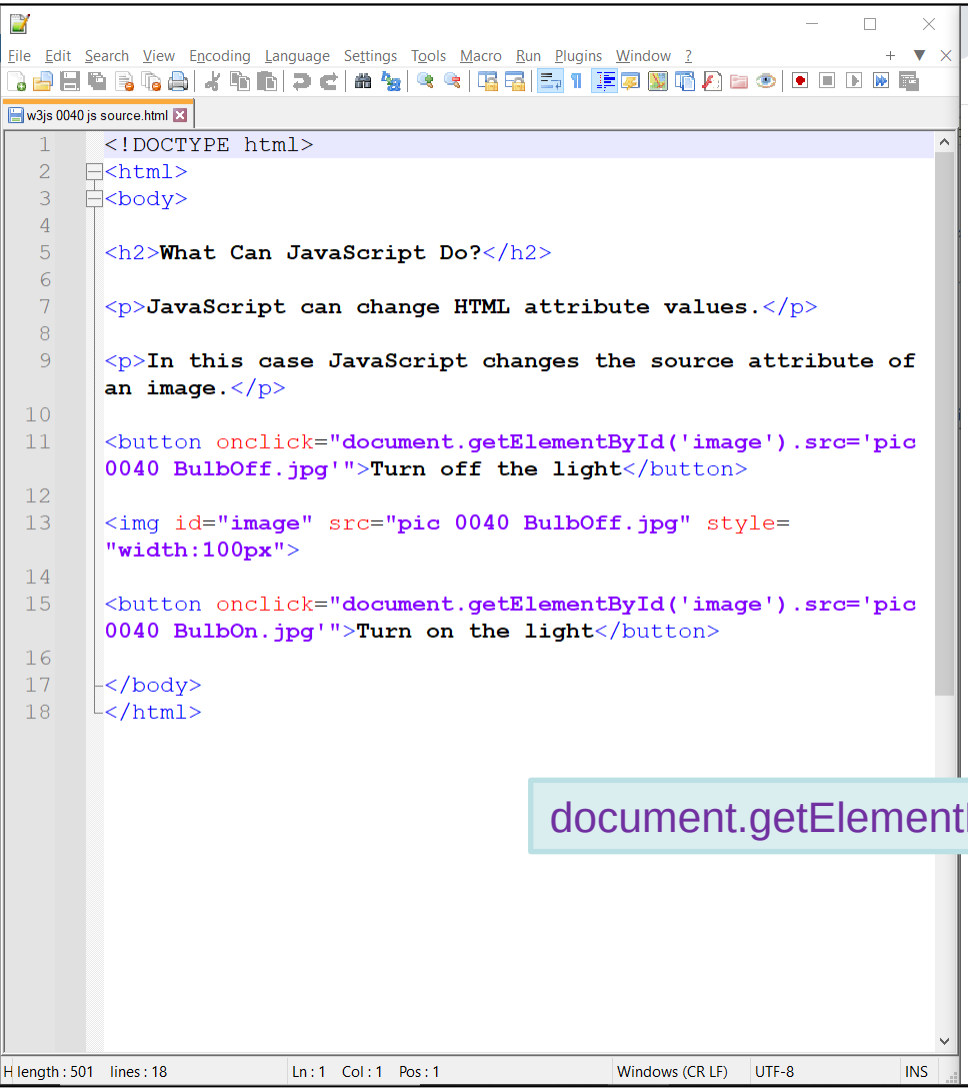


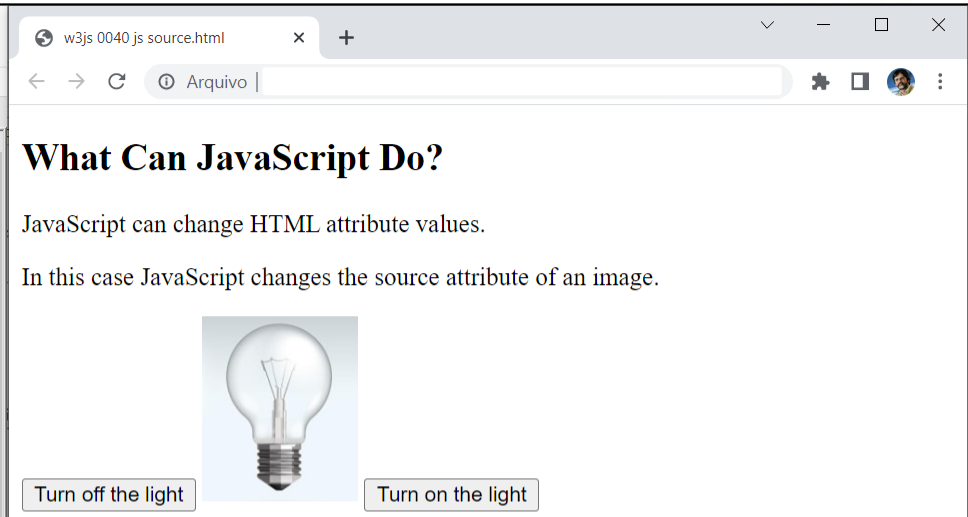
document.getElementById('p1').style.fontSize='32px'



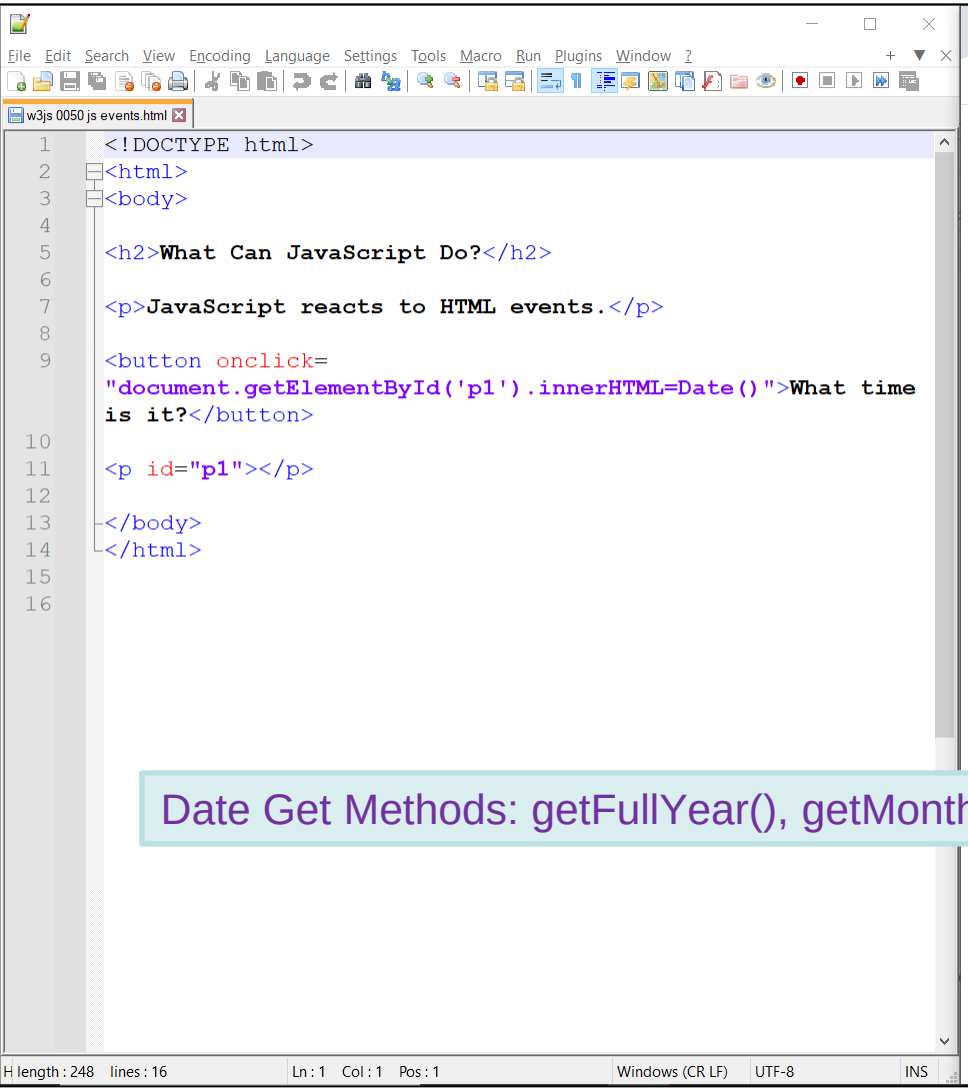


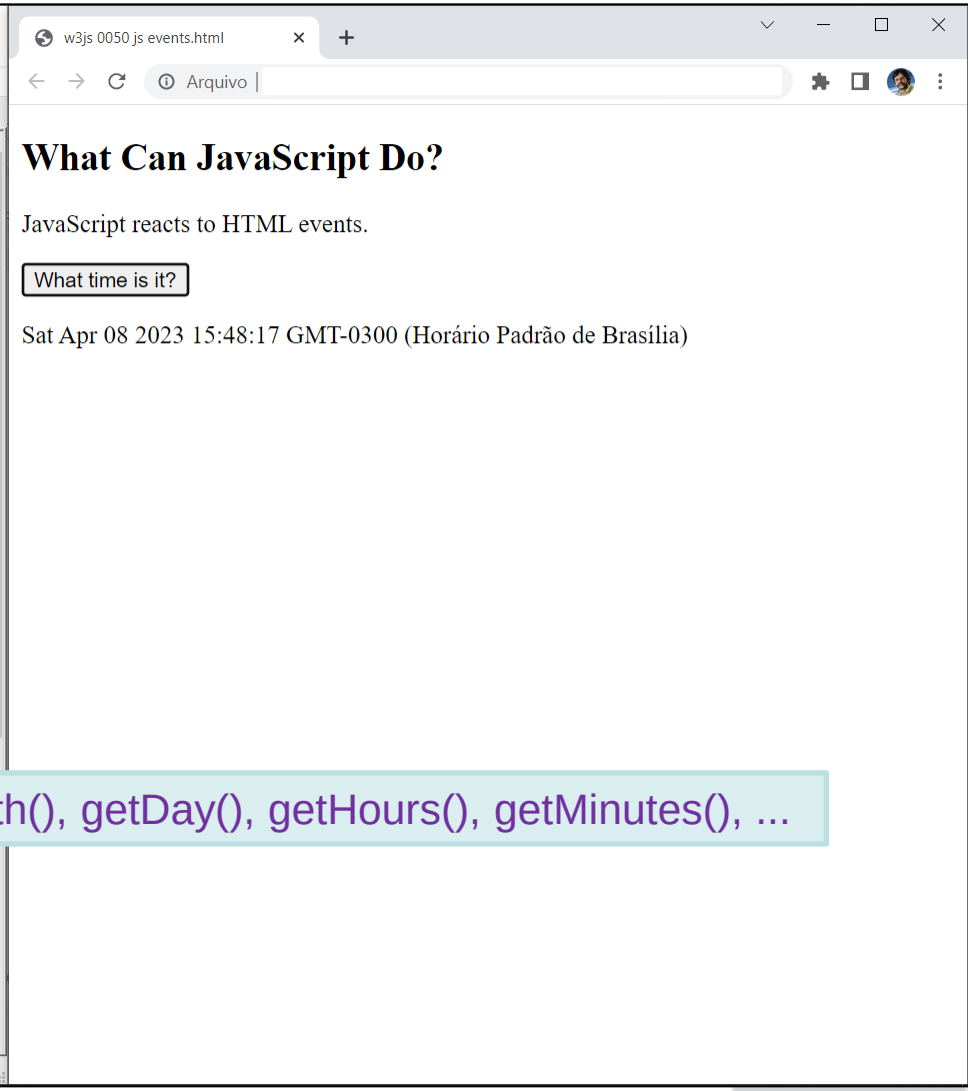
document.getElementById('p1').style.display='none'





document.getElementById('image').

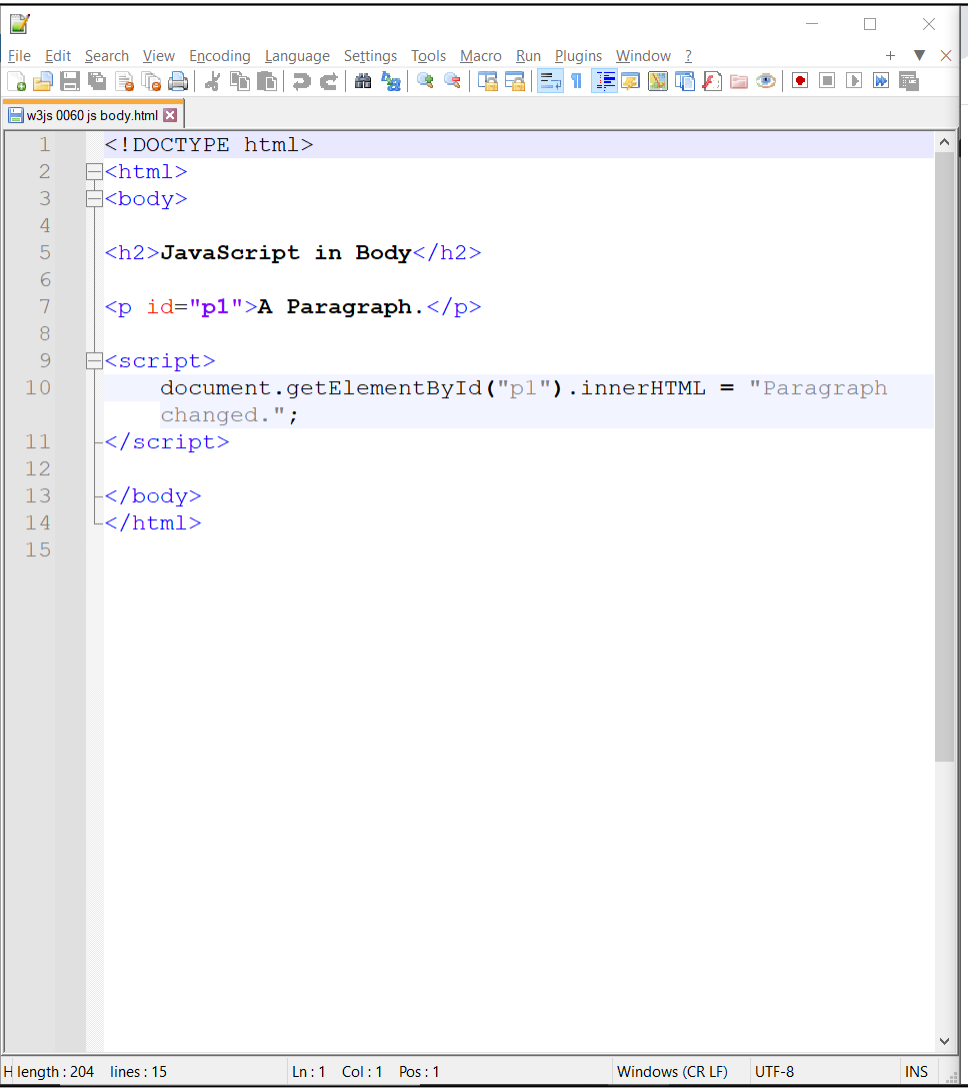


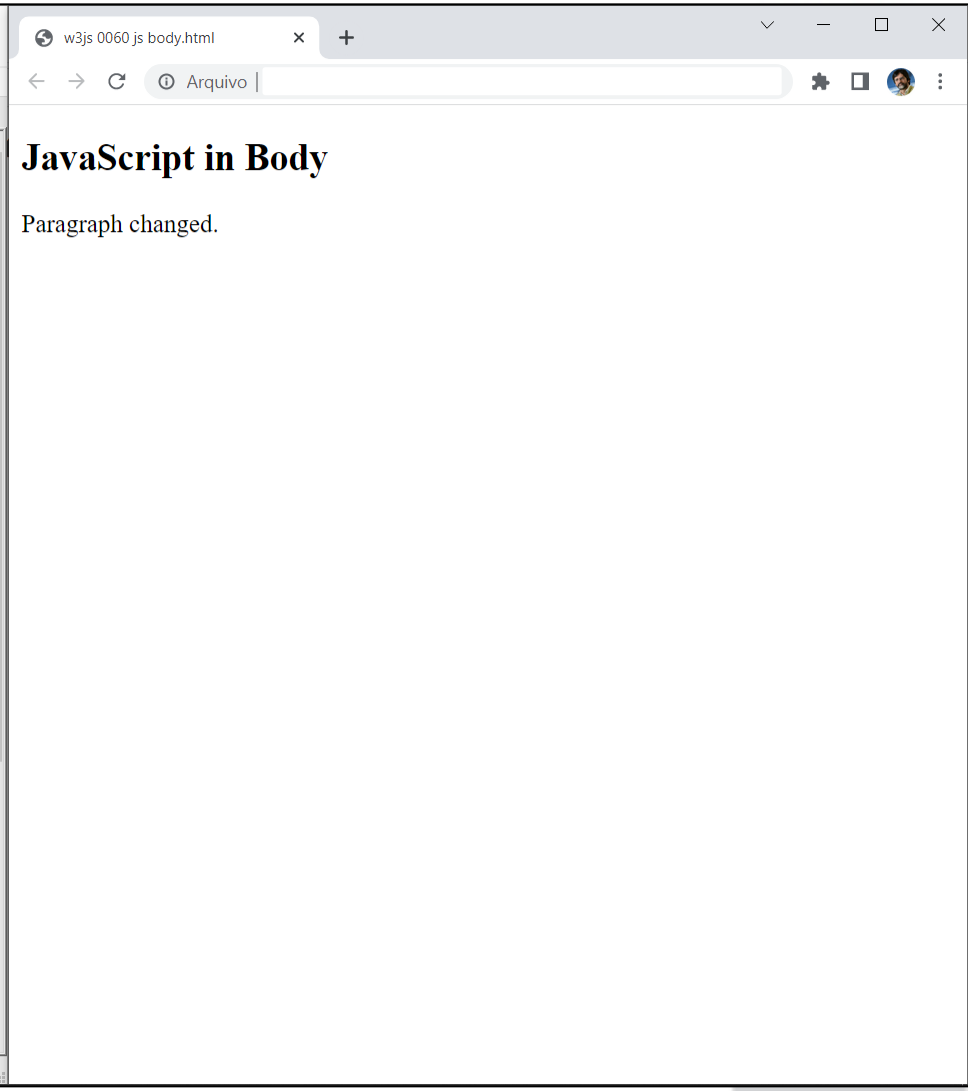


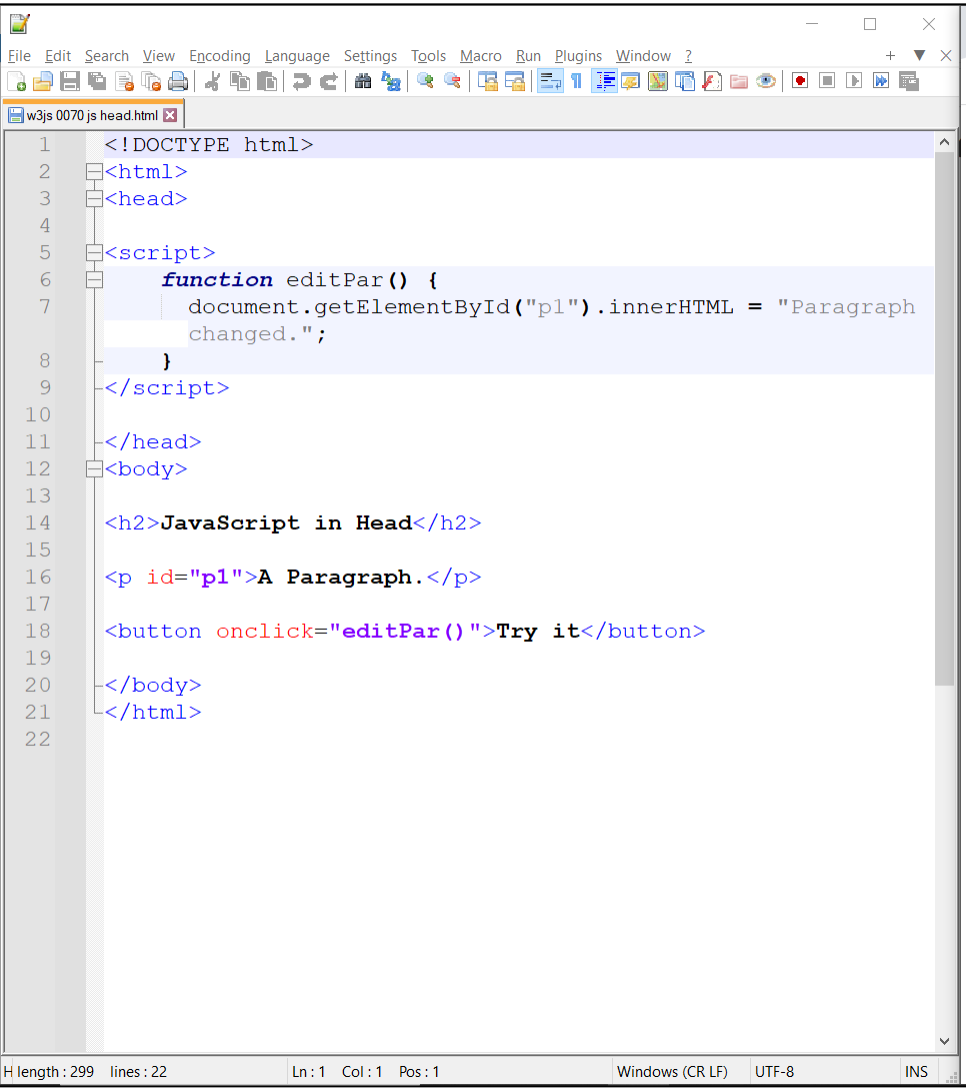
Date Get Methods: getFullYear(), getMonth(), getDay(), getHours(), getMinutes(), ...

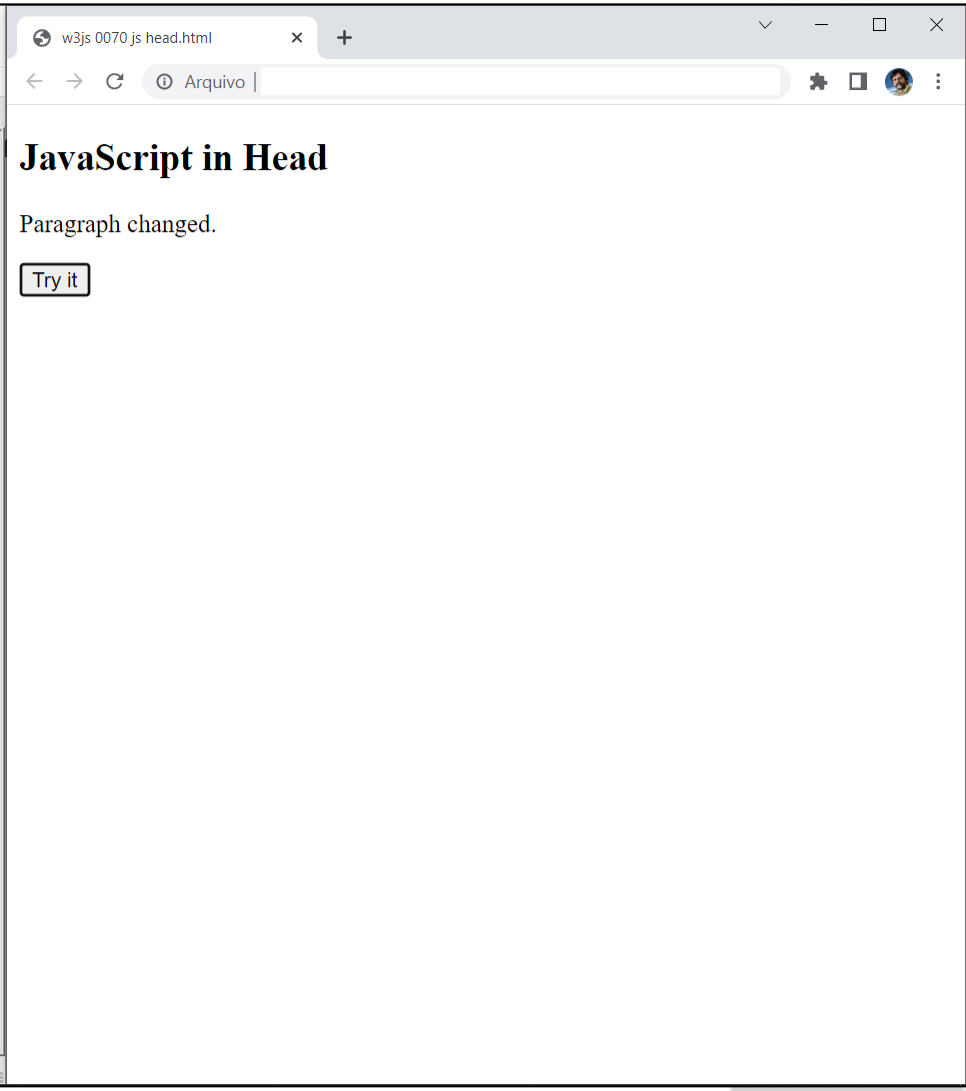
https://www.w3schools.com/js/default.asp

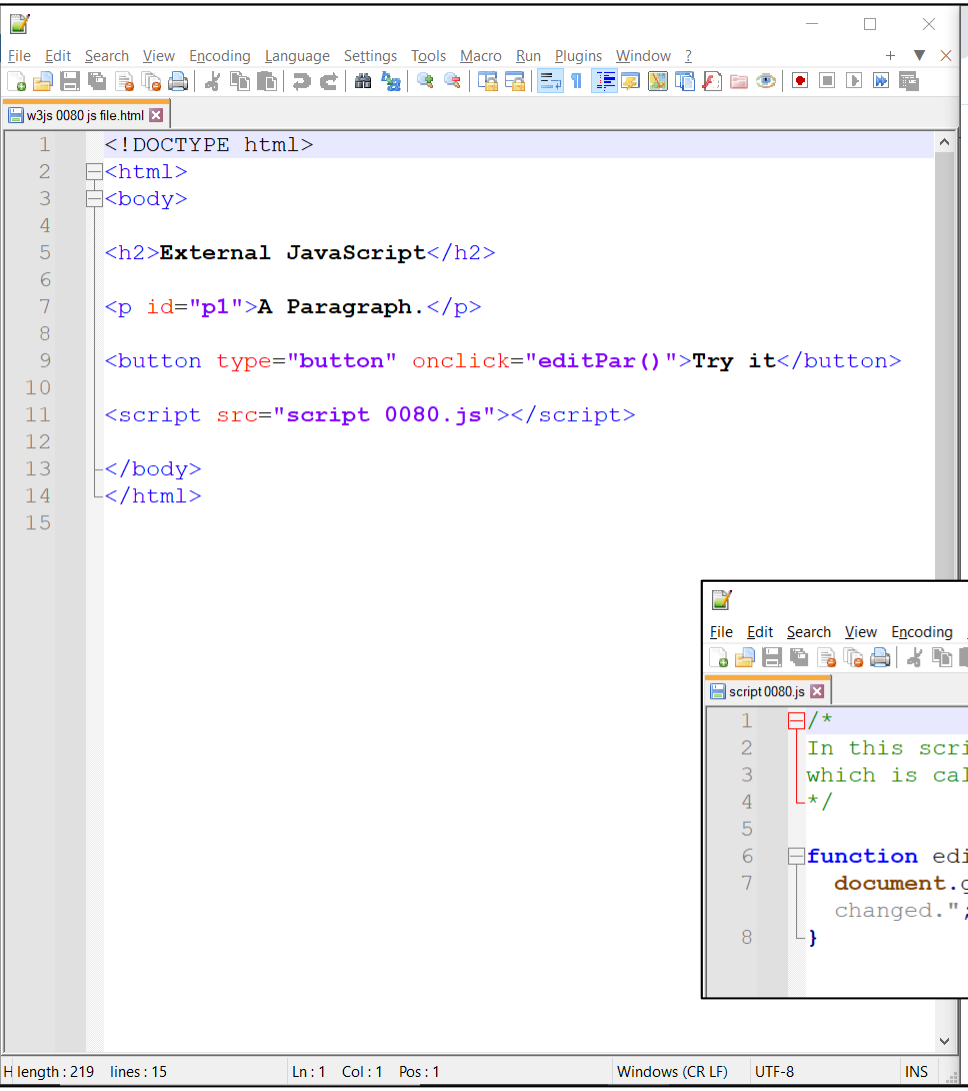
3. SINTAXE JS

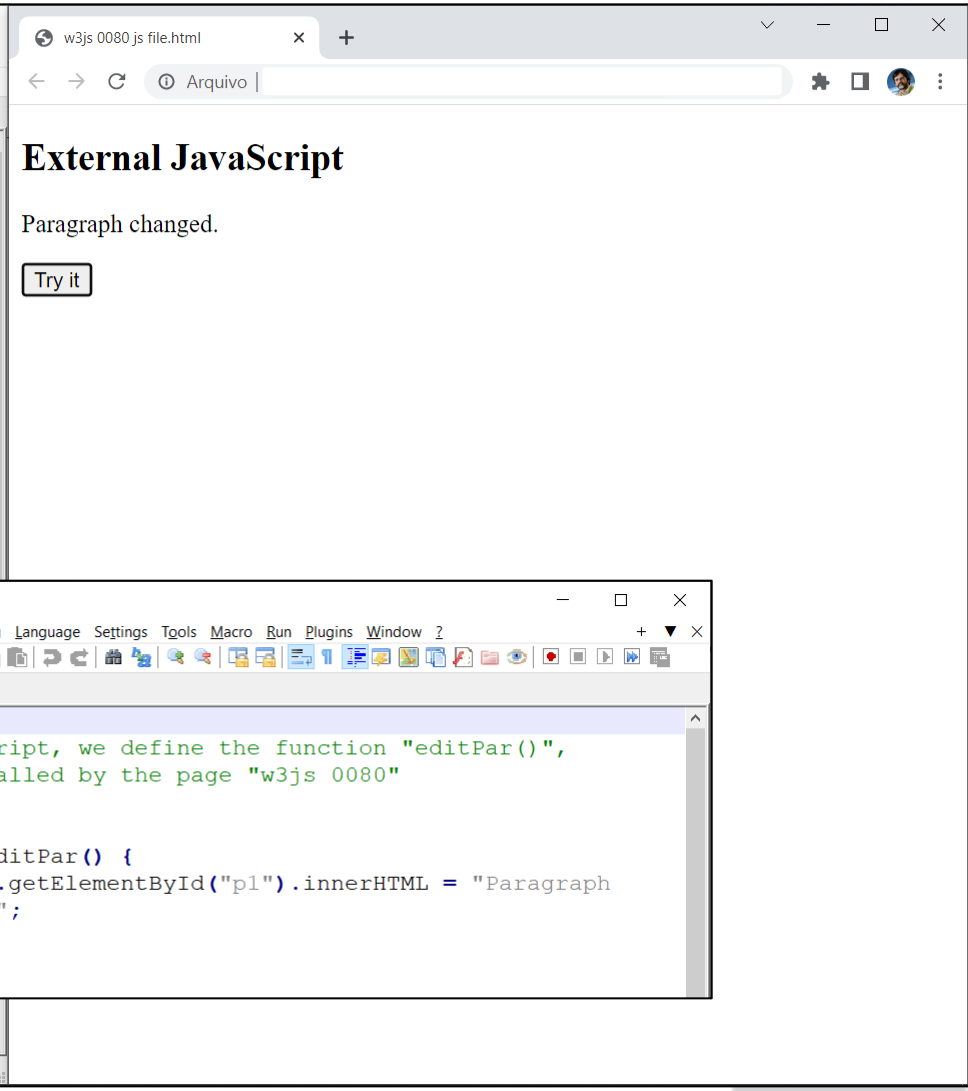

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0060 js body.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4
5 <h2>JavaScript in Body</h2>
6
7 A Paragraph.
8
9 <script>
10 document.getElementById("p1").innerHTML = "Paragraph changed.";
11 </script>
12
13 </body>
14 </html>
15
H length : 204 lines : 15 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 INS


w3js 0060 js body.html
Arquivo
JavaScript in Body
Paragraph changed.

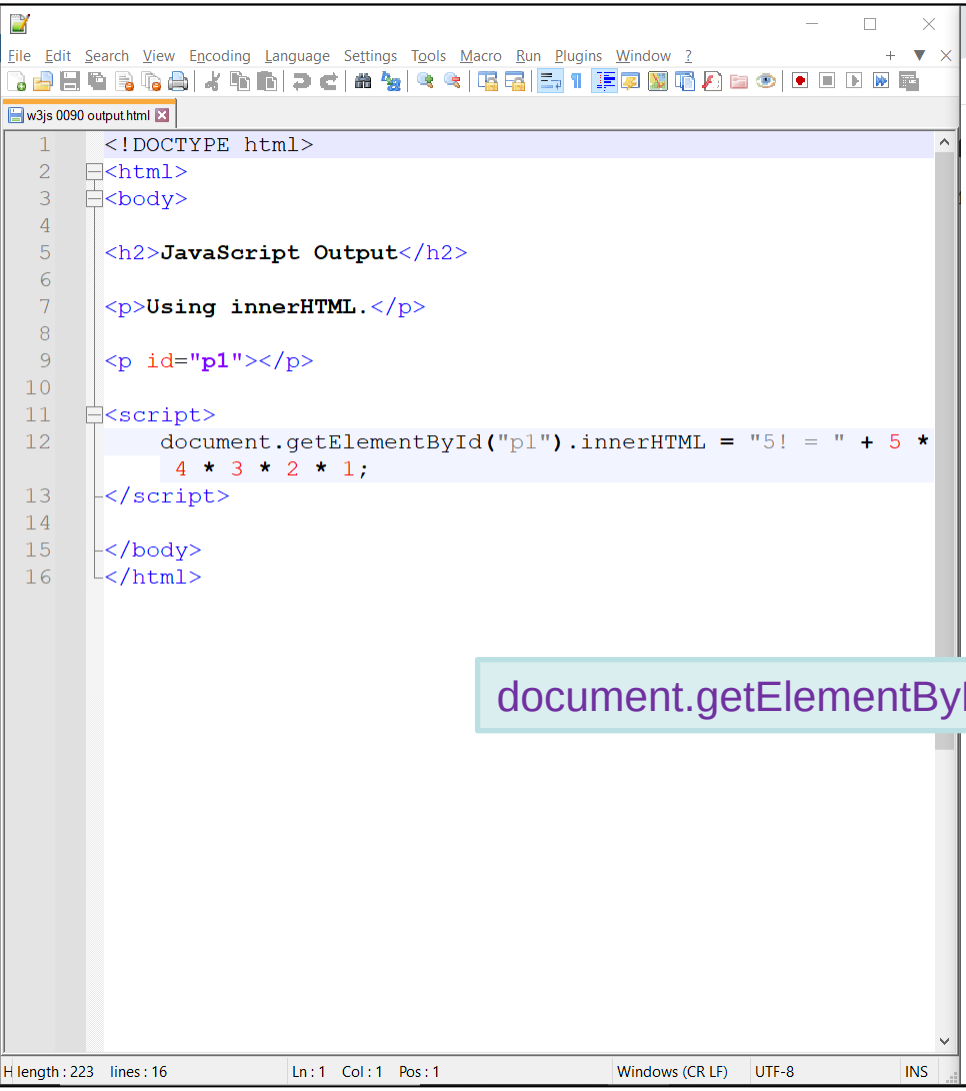

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0070 js head.html
1 <!DOCTYPE html>
2 <html>
3 <head>
4
5 <script>
6 function editPar() {
7 document.getElementById("p1").innerHTML = "Paragraph changed.";
8 }
9 </script>
10
11 </head>
12 <body>
13
14 <h2>JavaScript in Head</h2>
15
16 A Paragraph.
17
18 <button onclick="editPar()">Try it</button>
19
20 </body>
21 </html>
22
H length : 299 lines : 22 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 INS

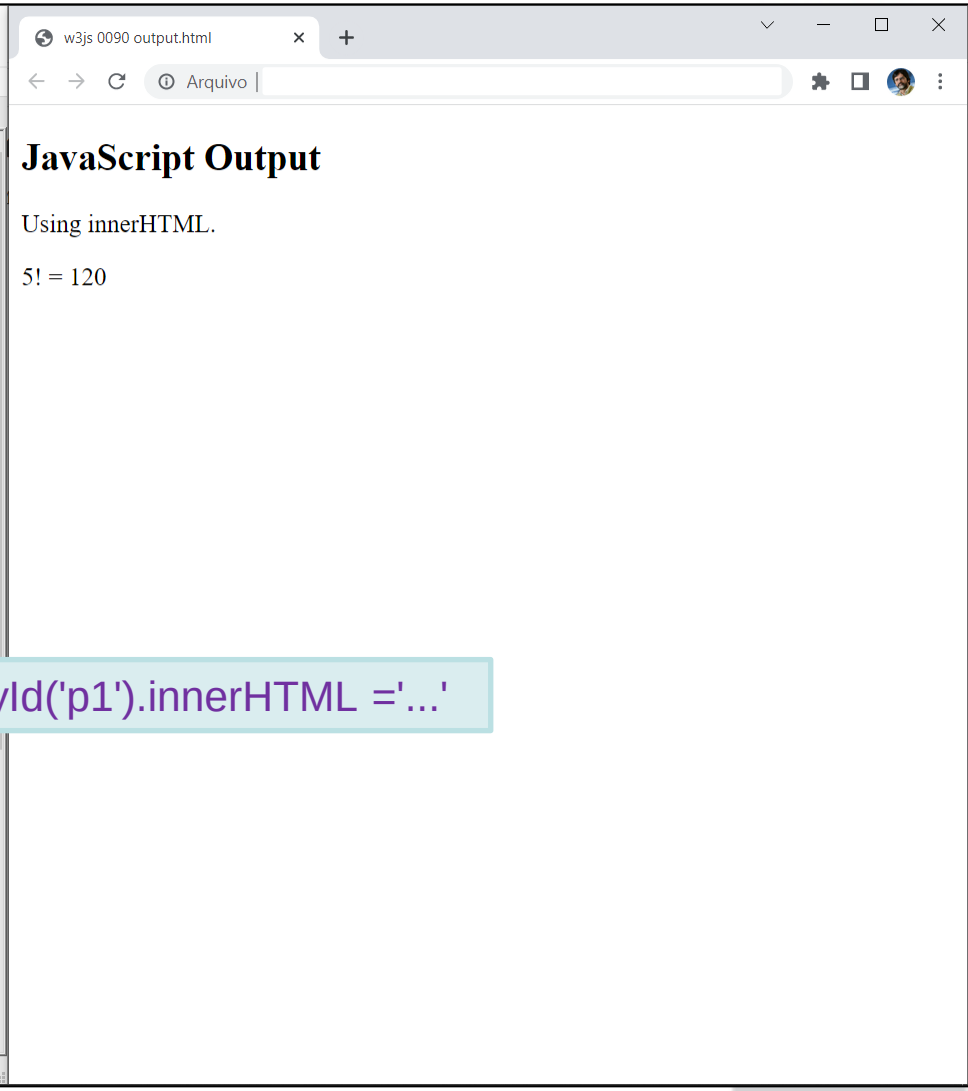

w3js 0070 js head.html
Arquivo
JavaScript in Head
Paragraph changed.
Try it


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0080 js file.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4
5 <h2>External JavaScript</h2>
6
7 A Paragraph.
8
9 <button type="button" onclick="editPar()">Try it</button>
10
11 <script src="script 0080.js"></script>
12
13 </body>
14 </html>
15
H length : 219 lines : 15
Ln : 1 Col : 1 Pos : 1
Windows (CR LF)
UTF-8
INS

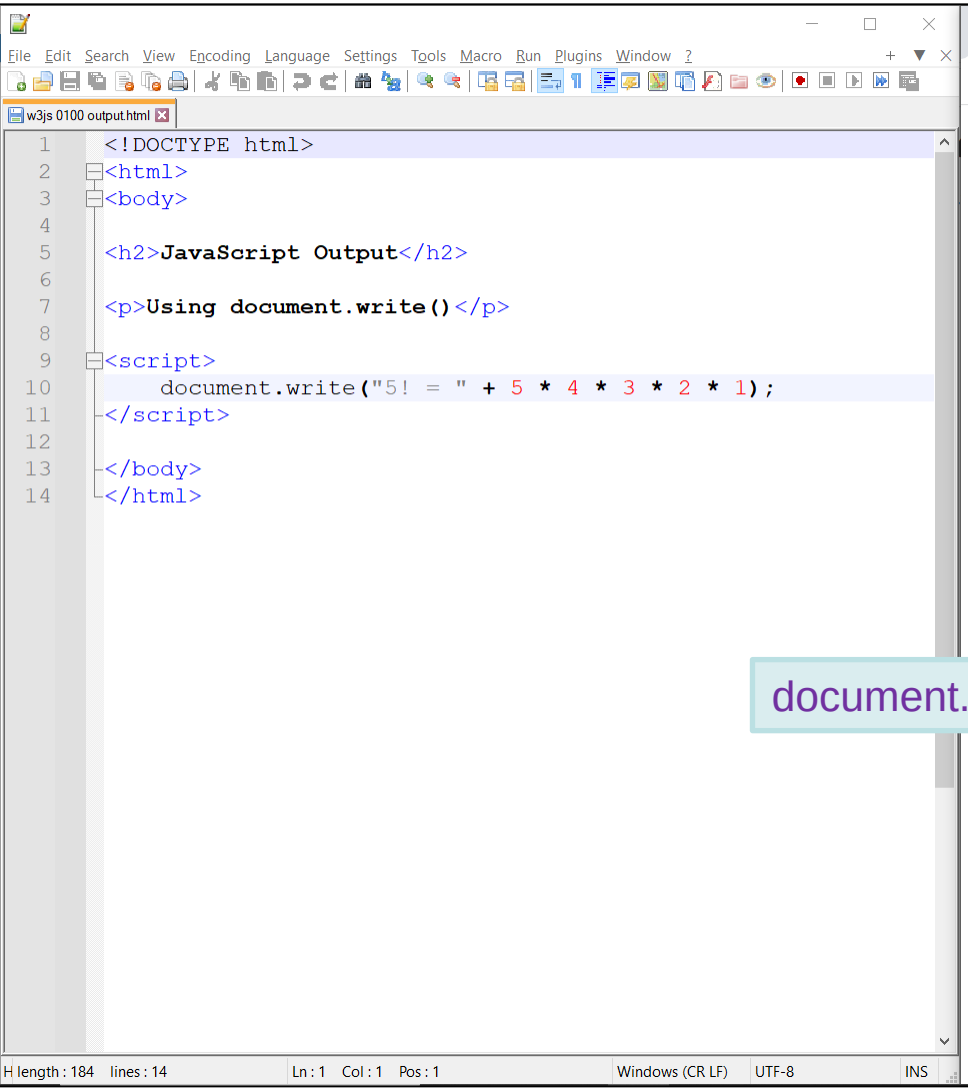

w3js 0080 js file.html
Arquivo
External JavaScript
Paragraph changed.
Try it

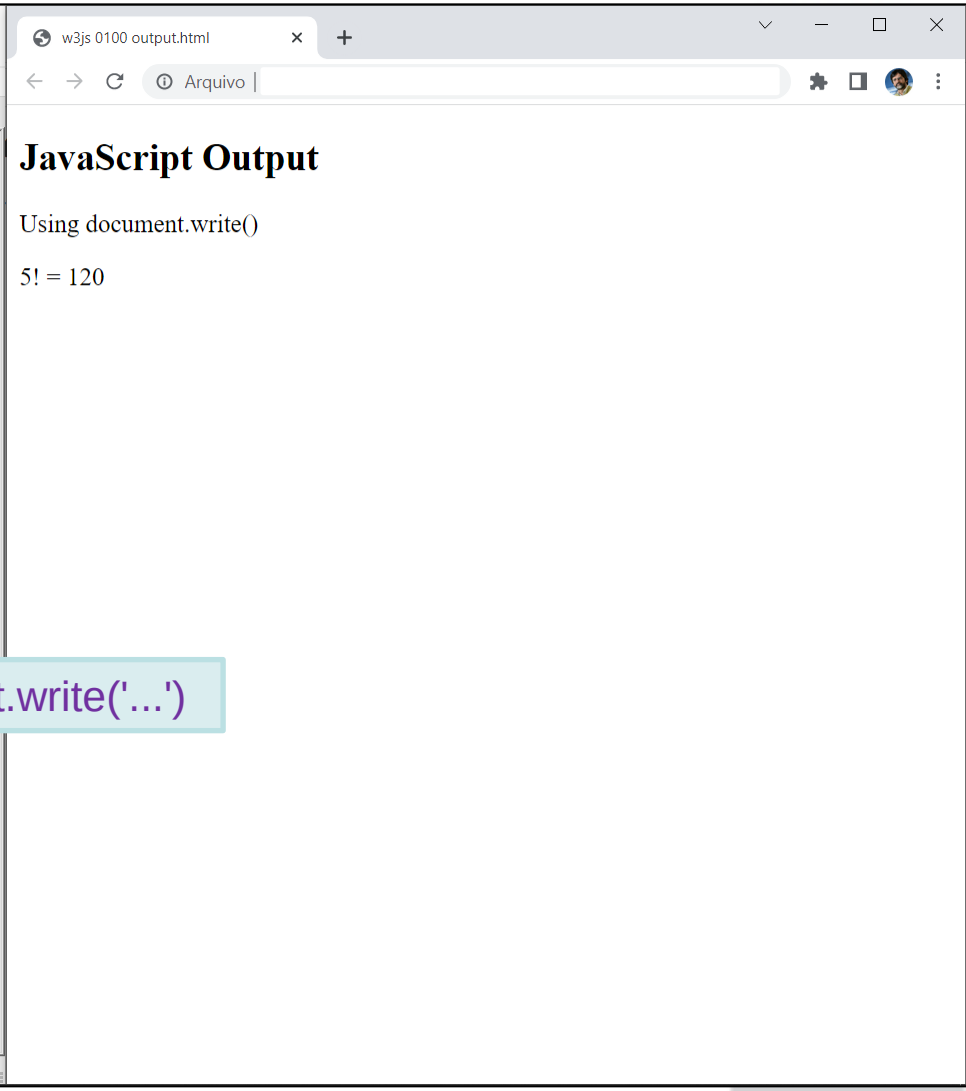
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
script 0080.js
1 /*
2 In this script, we define the function "editPar()",
3 which is called by the page "w3js 0080"
4 */
5
6 function editPar() {
7 document.getElementById("p1").innerHTML = "Paragraph changed.";
8 }



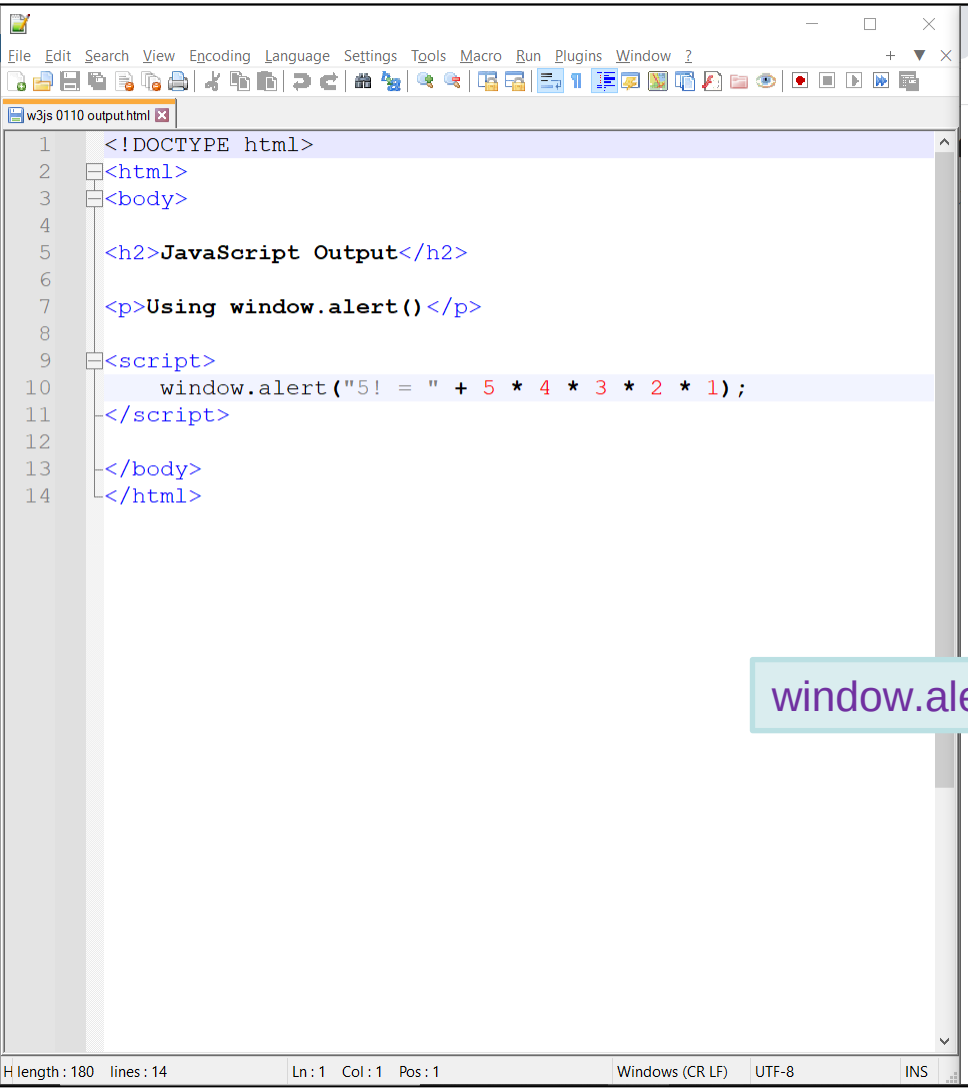


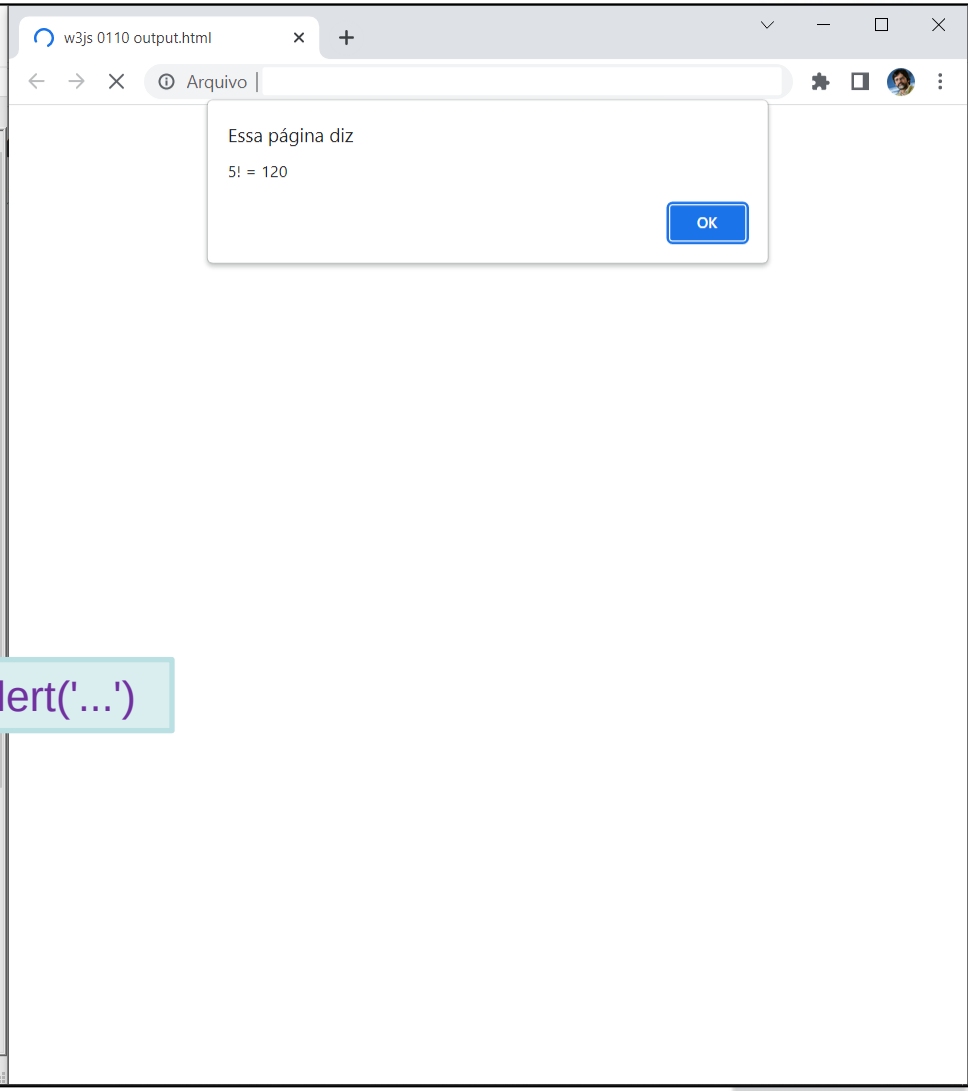
document.getElementById('p1').innerHTML ='...'



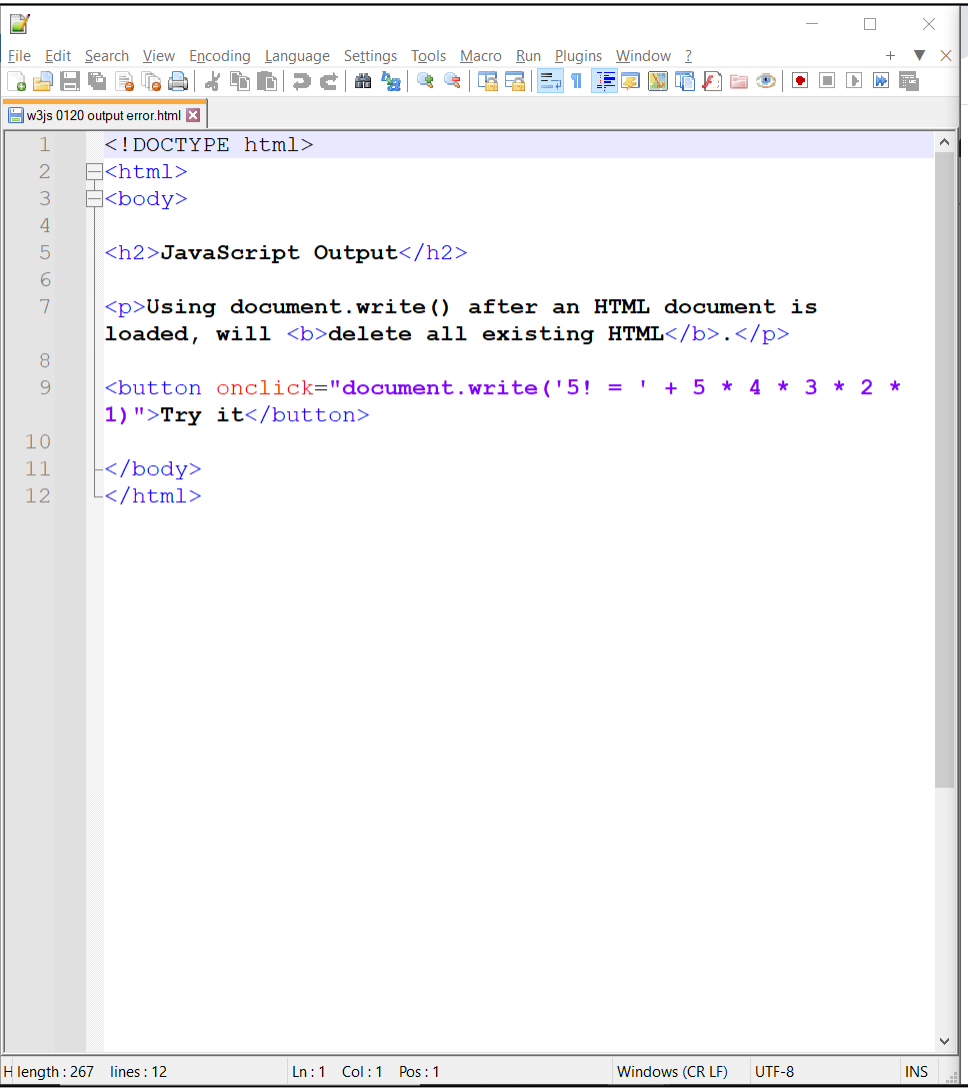


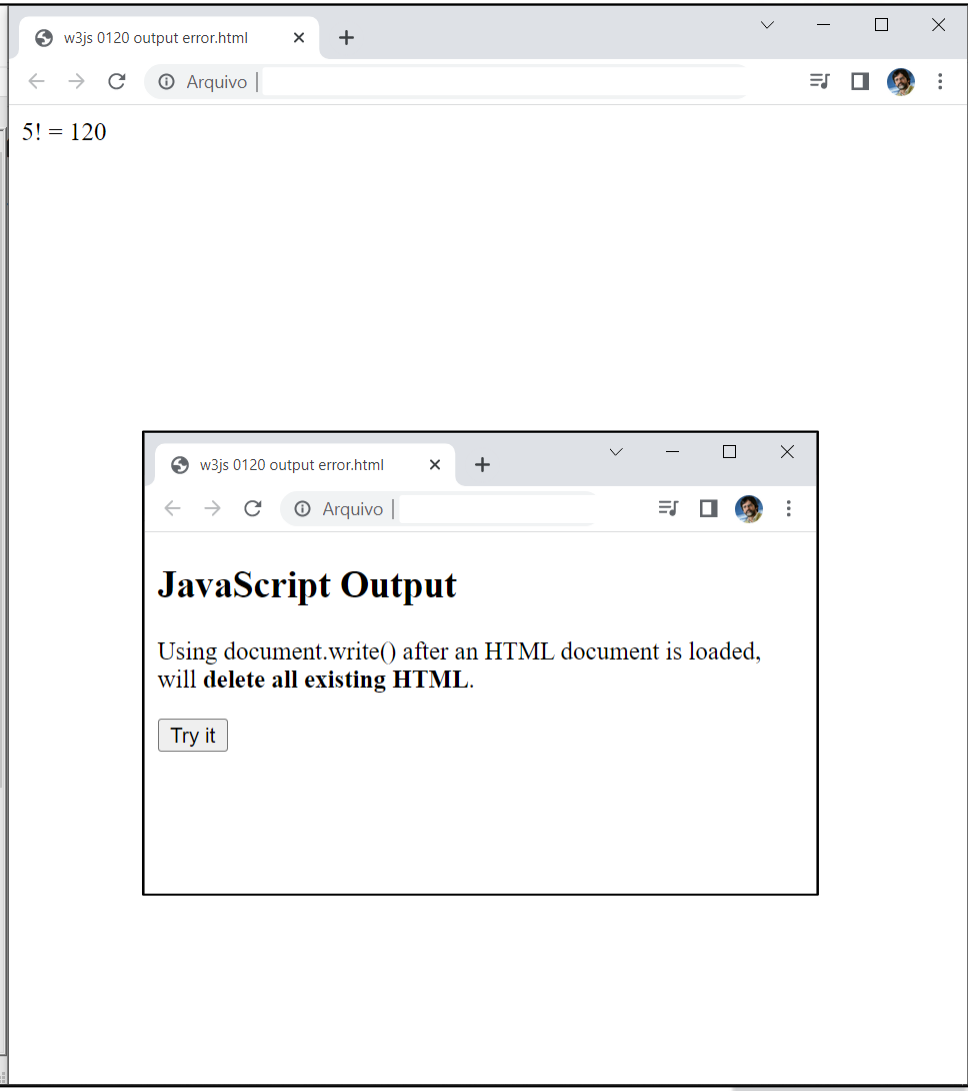
document.write('...')



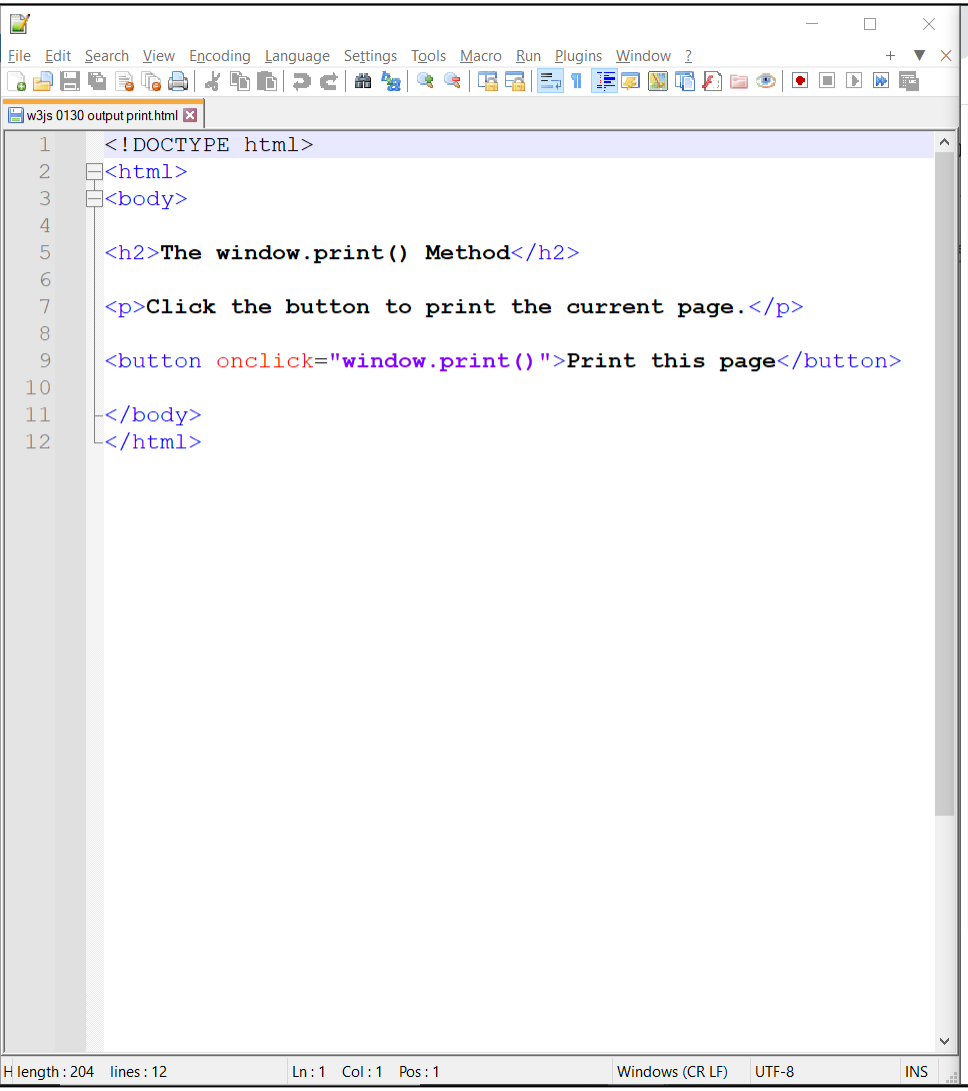


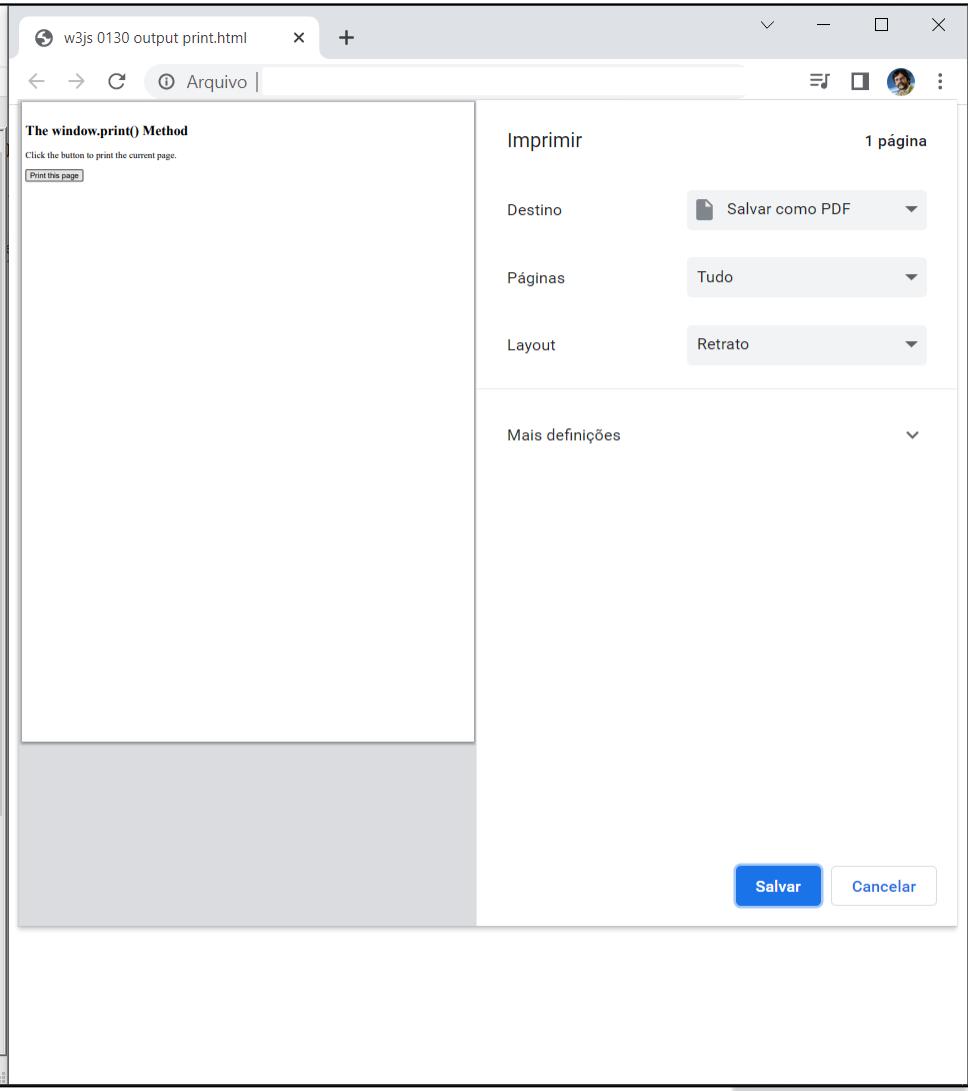
window.alert('...')


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0120 output error.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4
5 <h2>JavaScript Output</h2>
6
7 Using document.write() after an HTML document is loaded, will delete all existing HTML.
8
9 <button onclick="document.write('5! = ' + 5 * 4 * 3 * 2 * 1)">Try it</button>
10
11 </body>
12 </html>
H length : 267 lines : 12 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 INS


w3js 0120 output error.html
Arquivo
5! = 120

w3js 0120 output error.html
Arquivo
JavaScript Output
Using document.write() after an HTML document is loaded, will delete all existing HTML.
Try it


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0130 output print.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4
5 <h2>The window.print() Method</h2>
6
7 Click the button to print the current page.
8
9 <button onclick="window.print()">Print this page</button>
10
11 </body>
12 </html>
H length : 204 lines : 12 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 INS


w3js 0130 output print.html
Arquivo
The window.print() Method
Click the button to print the current page.
Print this page
Imprimir
1 página
Destino
Salvar como PDF
Páginas
Tudo
Layout
Retrato
Mais definições
Salvar
Cancelar

```
<!DOCTYPE html>
<html>
<head>
<style>
    table, td {
      border: 1px solid black;
    }
</style>
</head>
<body>

<h2>JavaScript Keywords</h2>

<p>Here is a list of some of the <b>keywords</b> of JavaScript
</p>

<table>
    <tr><td>Keyword</td><td>Description</td></tr>
    <tr><td>var</td><td>Declares a variable</td></tr>
    <tr><td>let</td><td>Declares a block variable</td></tr>
    <tr><td>const</td><td>Declares a block constant</td></tr>
    <tr><td>if</td><td>Marks a block of statements to be executed on a condition</td></tr>
    <tr><td>switch</td><td>Marks a block of statements to be executed in different cases</td></tr>
    <tr><td>for</td><td>Marks a block of statements to be executed in a loop</td></tr>
    <tr><td>function</td><td>Declares a function</td></tr>
    <tr><td>return</td><td>Exits a function</td></tr>
    <tr><td>try</td><td>Implements error handling to a block of statements</td></tr>
</table>

</body>
</html>
```

JavaScript Keywords

Here is a list of some of the **keywords** of JavaScript

Keyword	Description
var	Declares a variable
let	Declares a block variable
const	Declares a block constant
if	Marks a block of statements to be executed on a condition
switch	Marks a block of statements to be executed in different cases
for	Marks a block of statements to be executed in a loop
function	Declares a function
return	Exits a function
try	Implements error handling to a block of statements

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

<h2>JavaScript Data Types</h2>
<p>Examples: string, number, boolean, date, array, object etc.</p>

<p id="string"></p><p id="number1"></p><p id="number2"></p>
<p id="boolean"></p><p id="date"></p><p id="array"></p>
<p id="object"></p>

<script>
// Strings:
let name = "John";
document.getElementById("string").innerHTML = "Name: " + name;

// Numbers:
let age = 16, height = 1.75;
document.getElementById("number1").innerHTML = "Age: " + age;
document.getElementById("number2").innerHTML = "Height: " +
    height;

// Booleans
let x = true, y = false;
document.getElementById("boolean").innerHTML = x || y;

// Date object:
const date = new Date();
document.getElementById("date").innerHTML =
    date.toLocaleDateString();

// Array object:
const cars = ["Saab", "Volvo", "BMW"];
document.getElementById("array").innerHTML = cars[2];

// Object:
const person = {firstName:"John", lastName:"Doe"};
document.getElementById("object").innerHTML = person.firstName
    + " " + person.lastName;
```

w3js 0150 data types.html

Arquivo

JavaScript Data Types

Examples: string, number, boolean, date, array, object etc.

Name: John

Age: 16

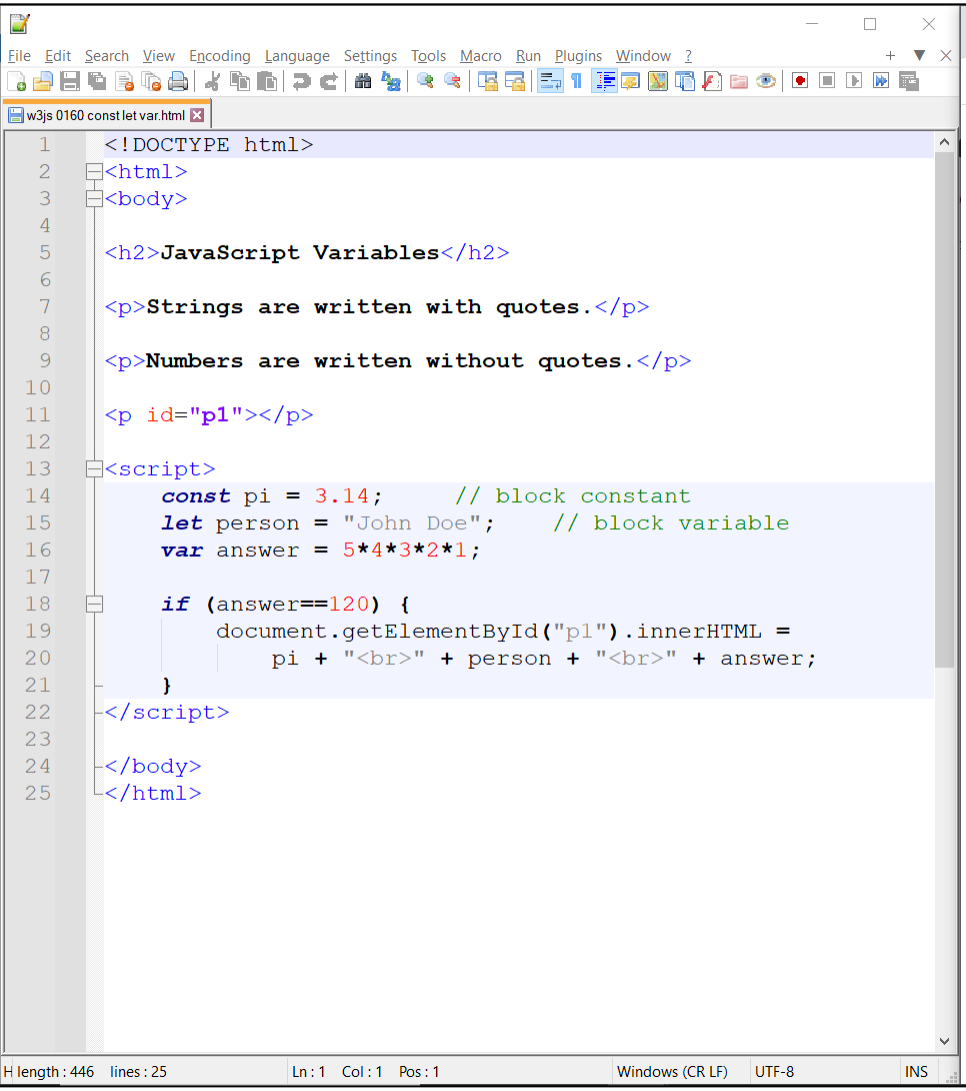
Height: 1.75

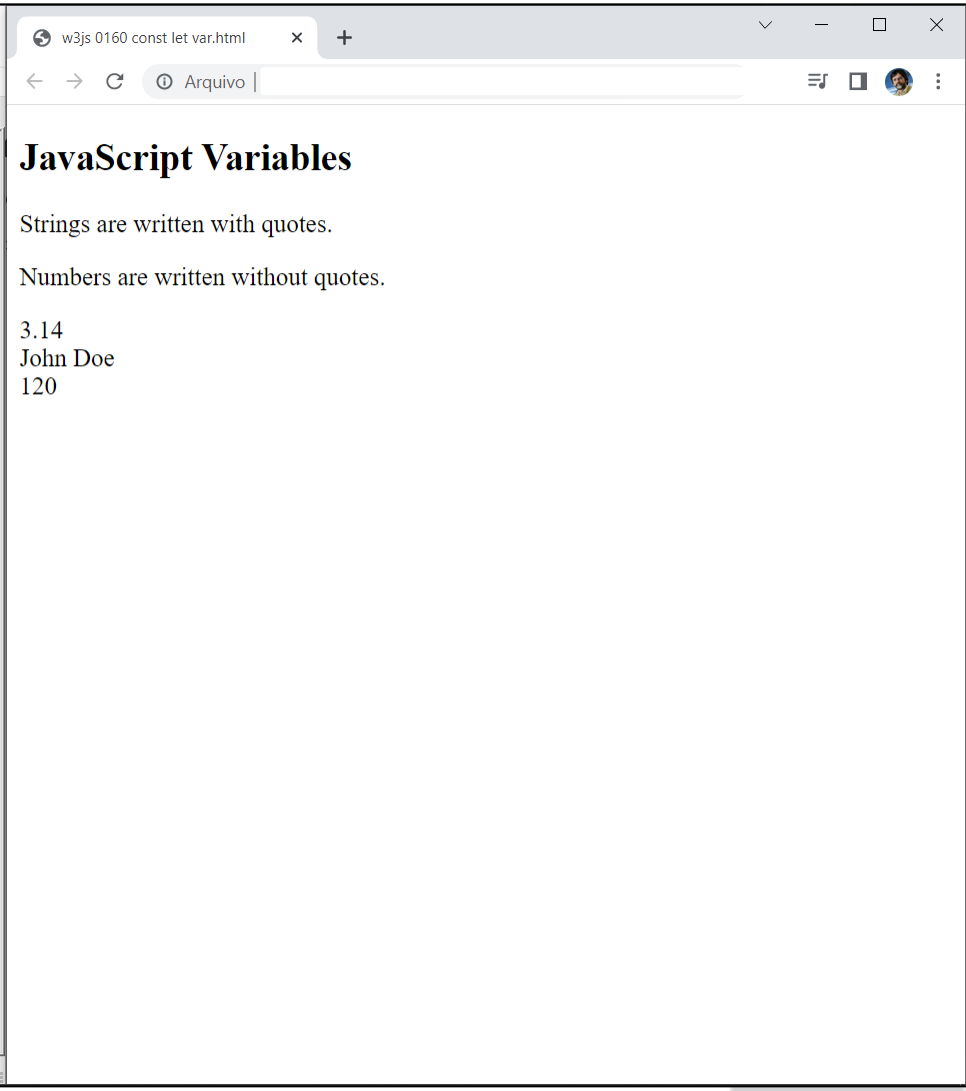
true

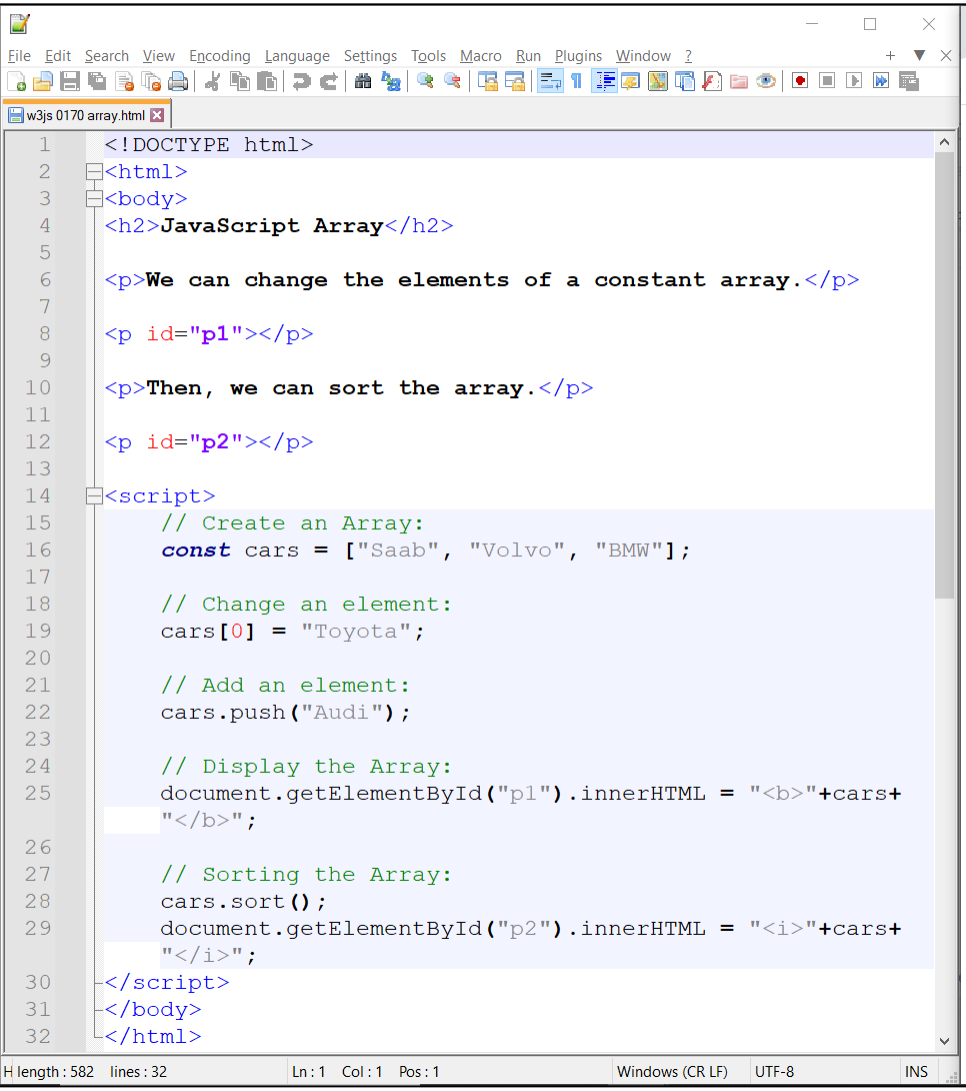
08/04/2023

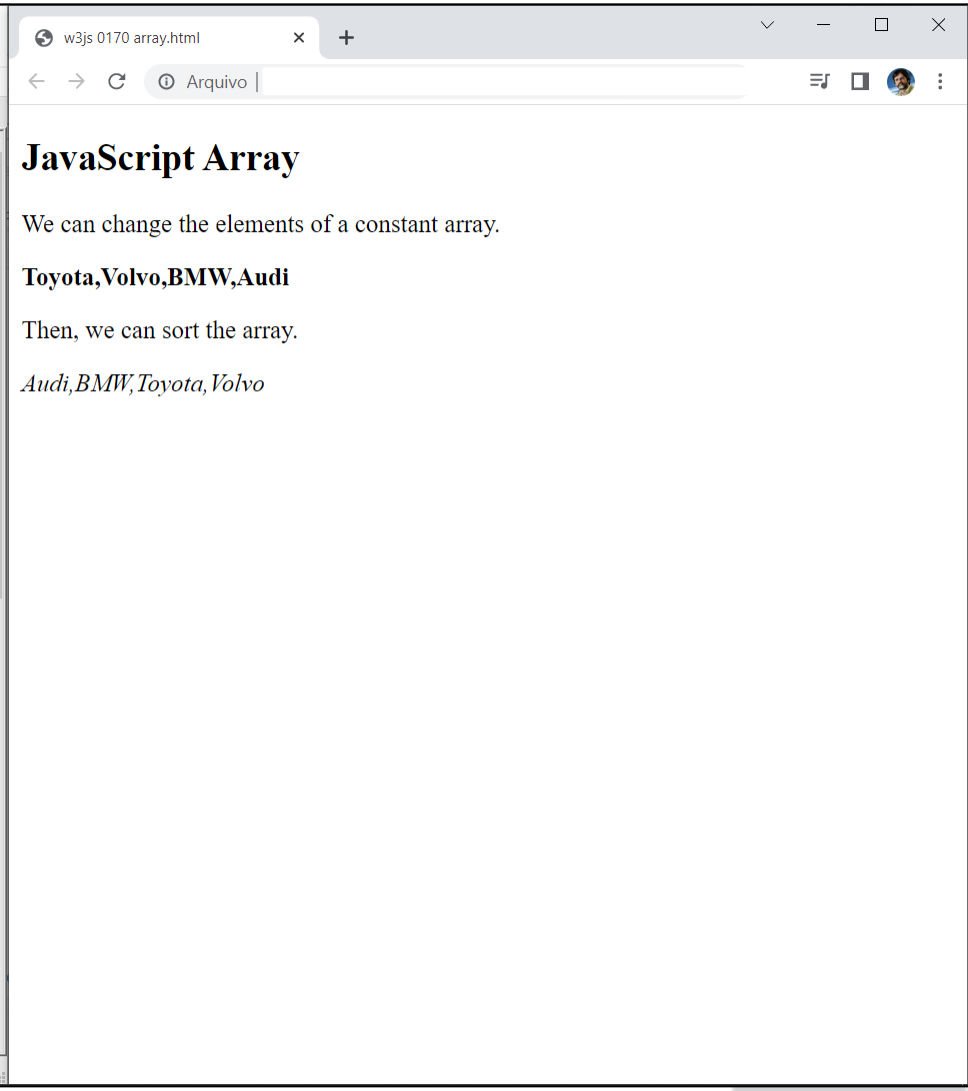
BMW

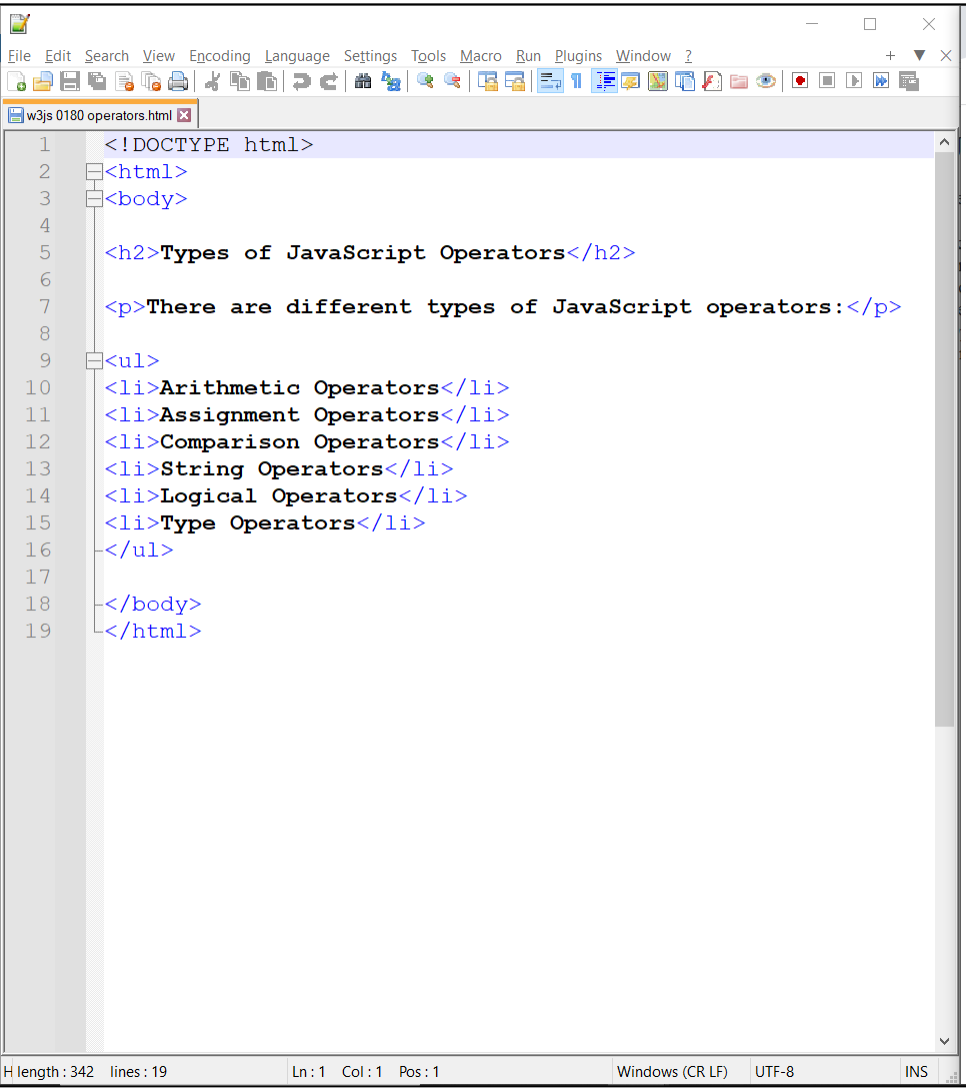
John Doe

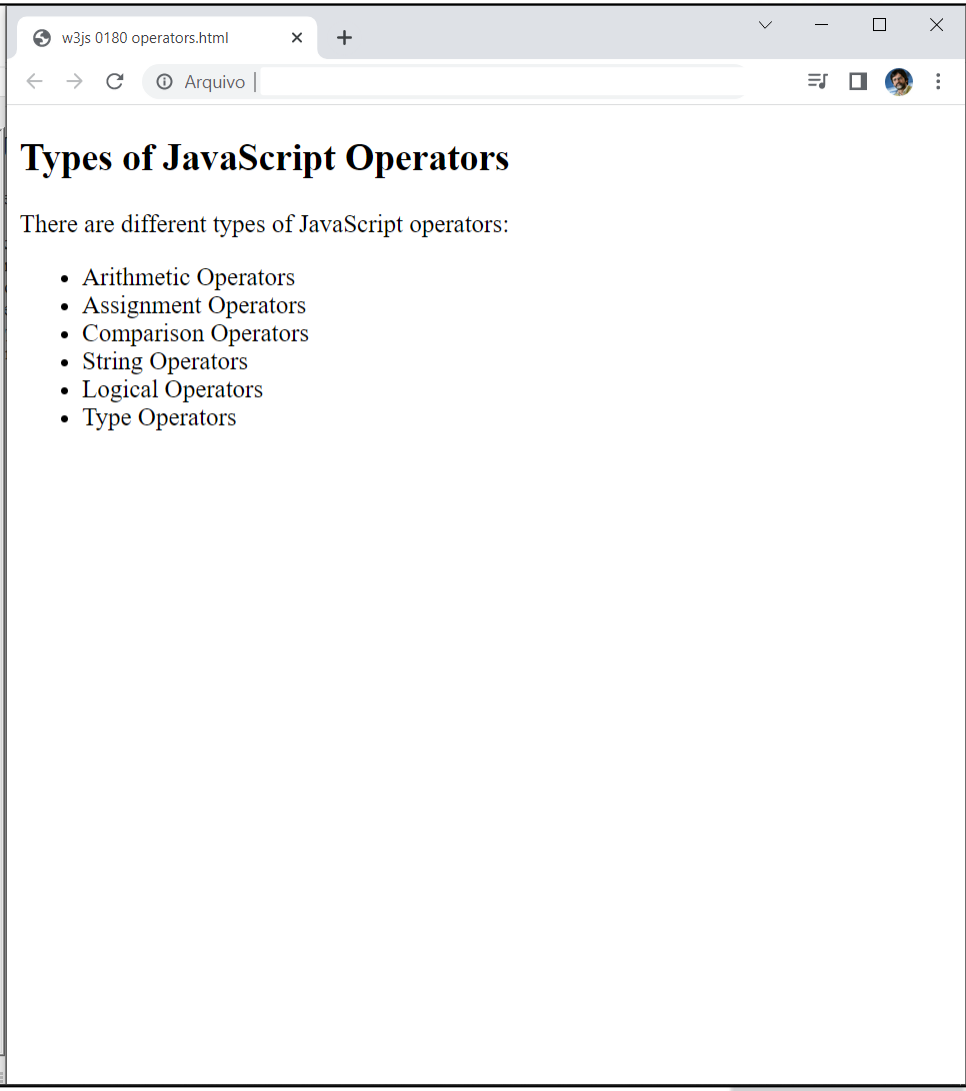

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0160 const let var.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4
5 <h2>JavaScript Variables</h2>
6
7 Strings are written with quotes.
8
9 Numbers are written without quotes.
10
11
12
13 <script>
14 const pi = 3.14; // block constant
15 let person = "John Doe"; // block variable
16 var answer = 5*4*3*2*1;
17
18 if (answer==120) {
19 document.getElementById("p1").innerHTML =
20 pi + "
" + person + "
" + answer;
21 }
22 </script>
23
24 </body>
25 </html>
H length : 446 lines : 25
Ln : 1 Col : 1 Pos : 1
Windows (CR LF)
UTF-8
INS

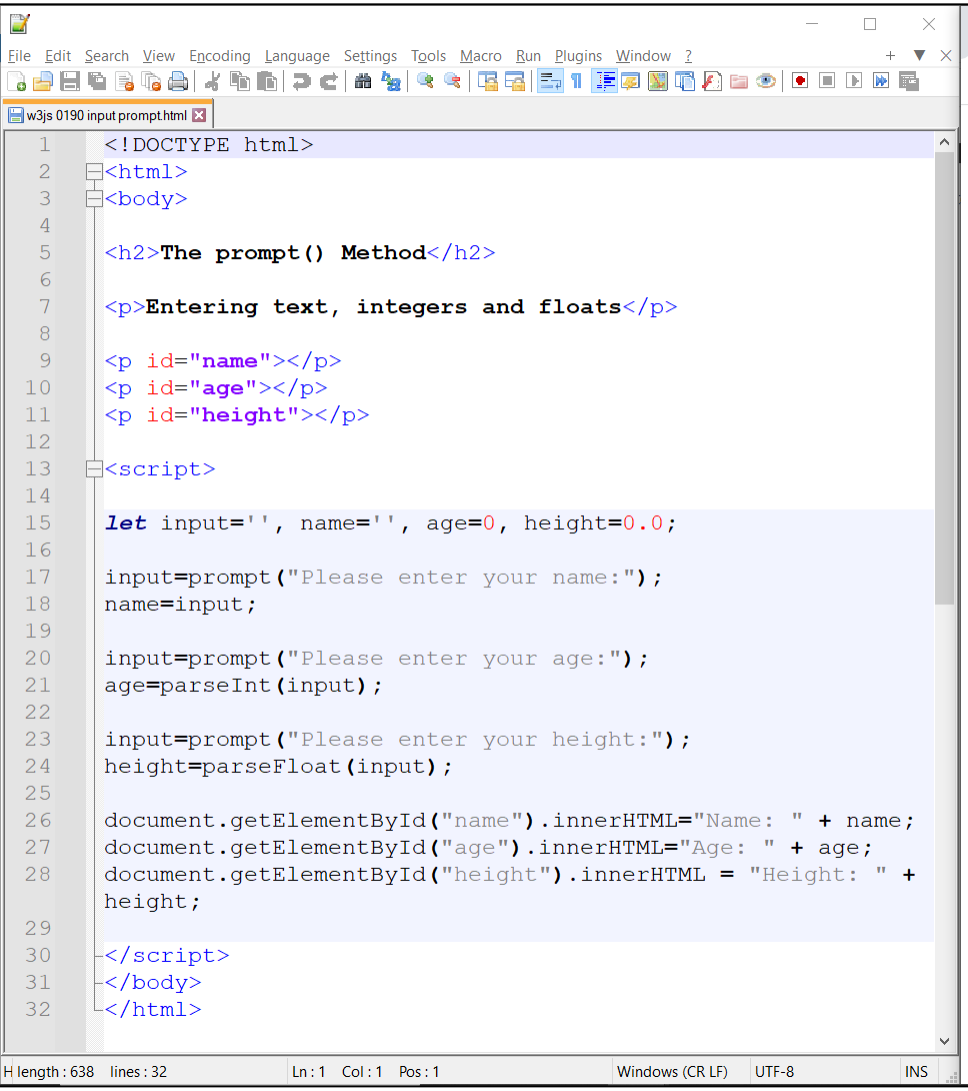

w3js 0160 const let var.html
Arquivo
JavaScript Variables
Strings are written with quotes.
Numbers are written without quotes.
3.14
John Doe
120

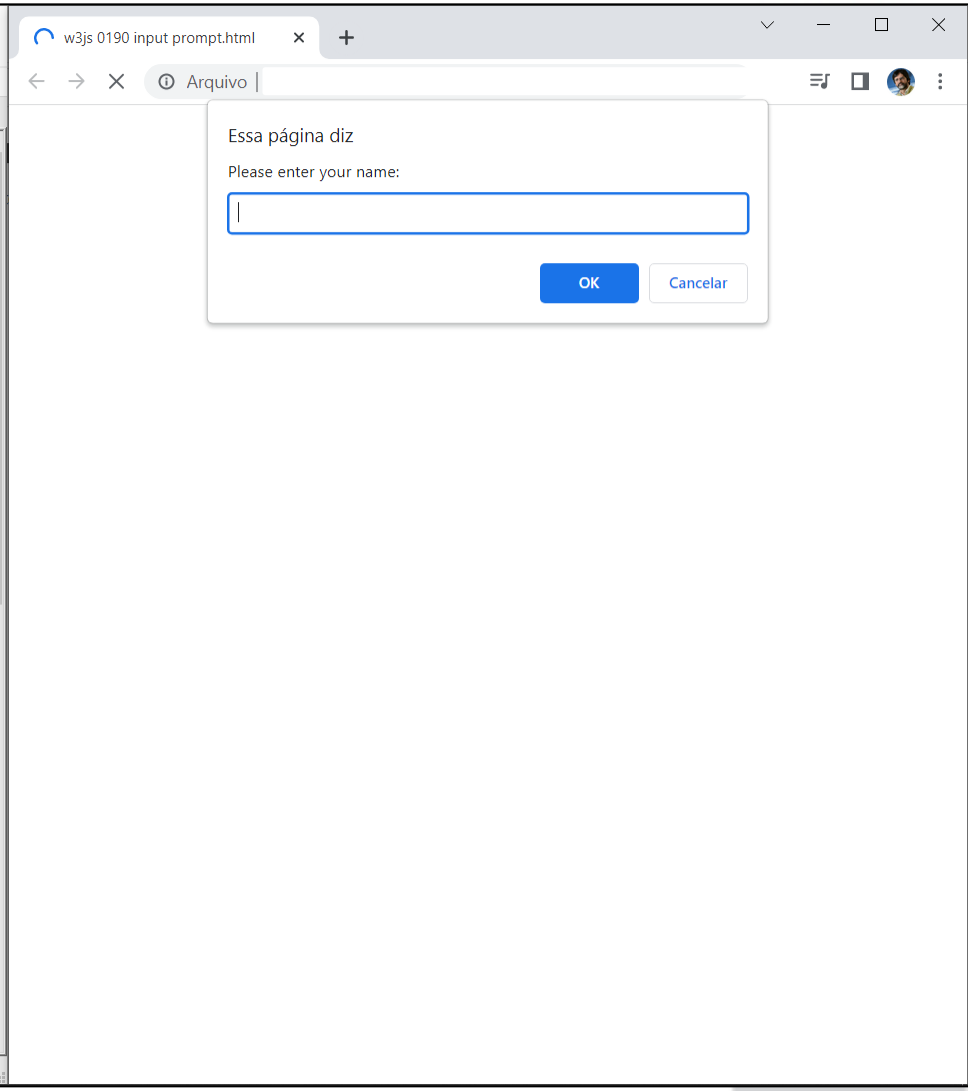

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0170 array.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4 <h2>JavaScript Array</h2>
5
6 We can change the elements of a constant array.
7
8
9
10 Then, we can sort the array.
11
12
13
14 <script>
15 // Create an Array:
16 const cars = ["Saab", "Volvo", "BMW"];
17
18 // Change an element:
19 cars[0] = "Toyota";
20
21 // Add an element:
22 cars.push("Audi");
23
24 // Display the Array:
25 document.getElementById("p1").innerHTML = ""+cars+
"";
26
27 // Sorting the Array:
28 cars.sort();
29 document.getElementById("p2").innerHTML = ""+cars+
"";
30 </script>
31 </body>
32 </html>
H length : 582 lines : 32
Ln : 1 Col : 1 Pos : 1
Windows (CR LF)
UTF-8
INS

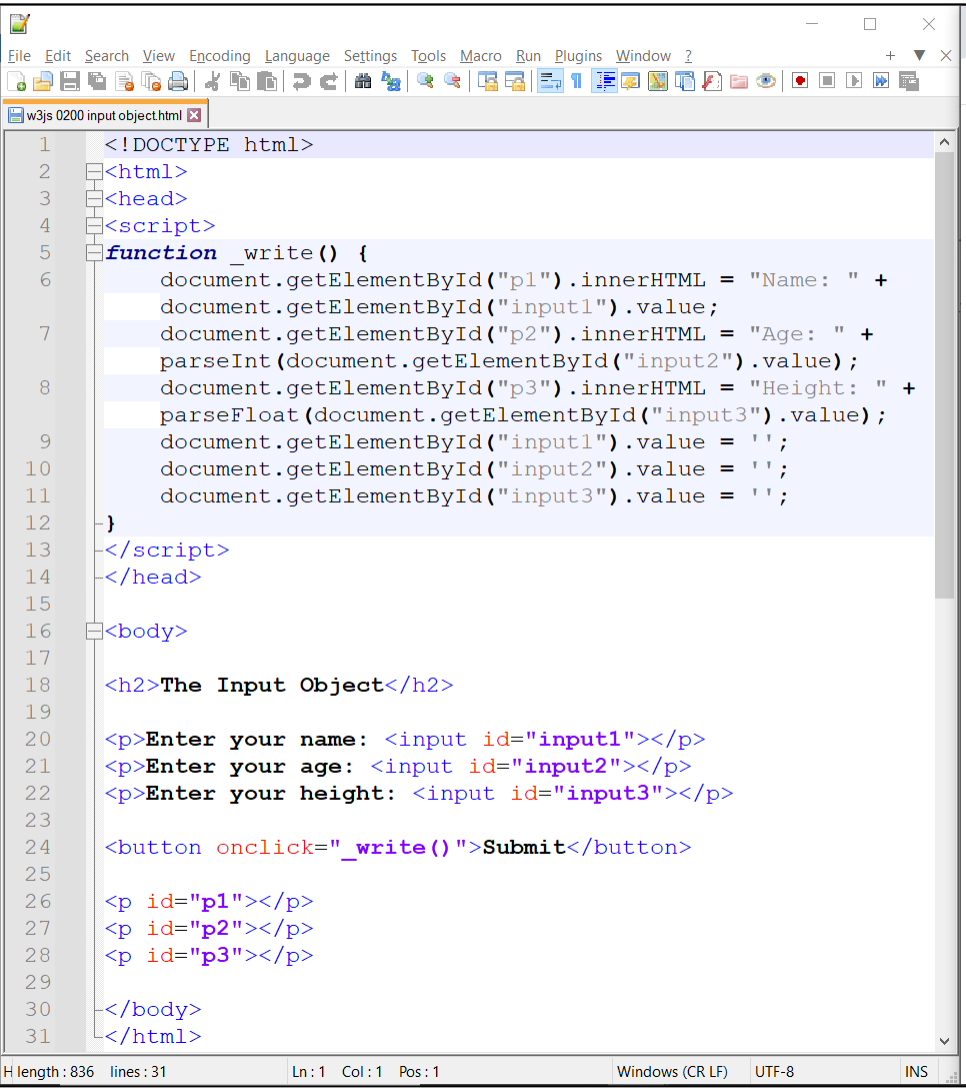

w3js 0170 array.html
Arquivo
JavaScript Array
We can change the elements of a constant array.
Toyota,Volvo,BMW,Audi
Then, we can sort the array.
Audi,BMW,Toyota,Volvo

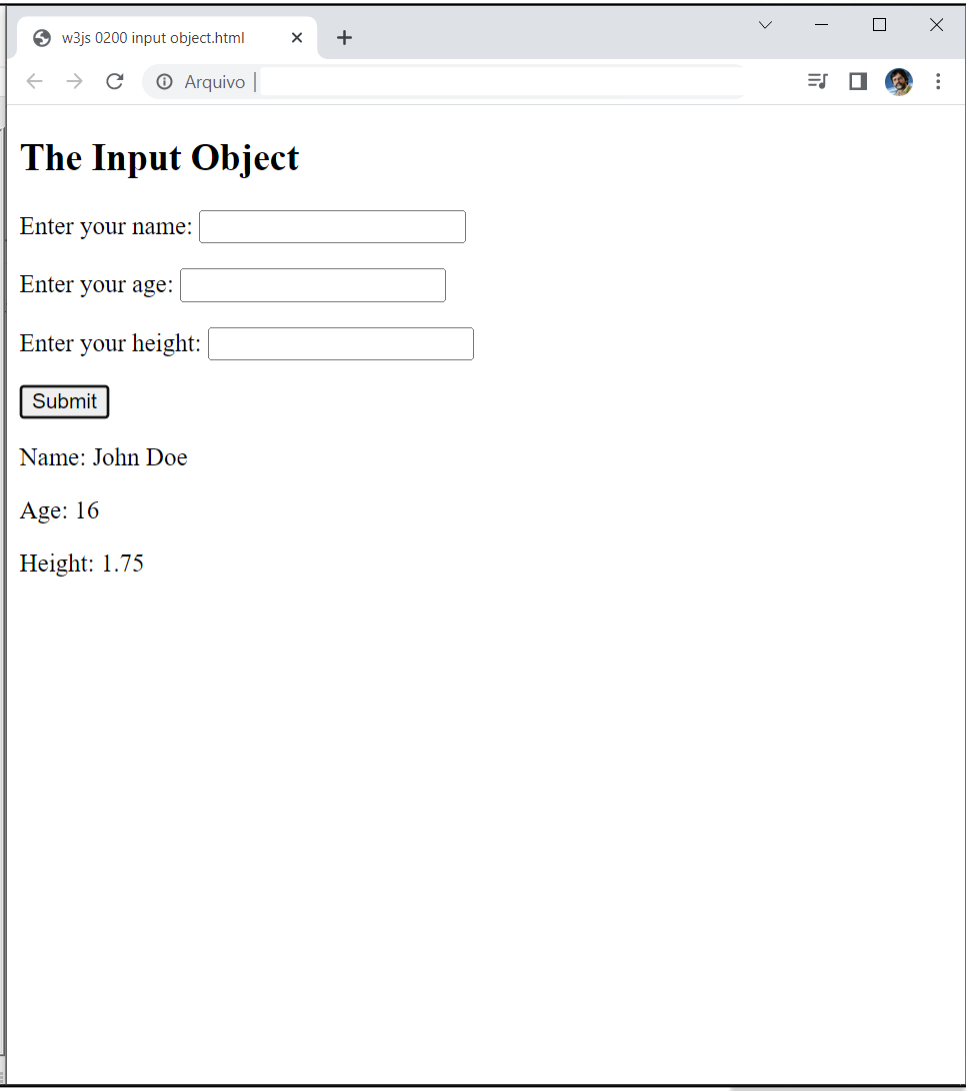

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0180 operators.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4
5 <h2>Types of JavaScript Operators</h2>
6
7 There are different types of JavaScript operators:
8
9
10 Arithmetic Operators
11 Assignment Operators
12 Comparison Operators
13 String Operators
14 Logical Operators
15 Type Operators
16
17
18 </body>
19 </html>
H length : 342 lines : 19
Ln : 1 Col : 1 Pos : 1
Windows (CR LF)
UTF-8
INS

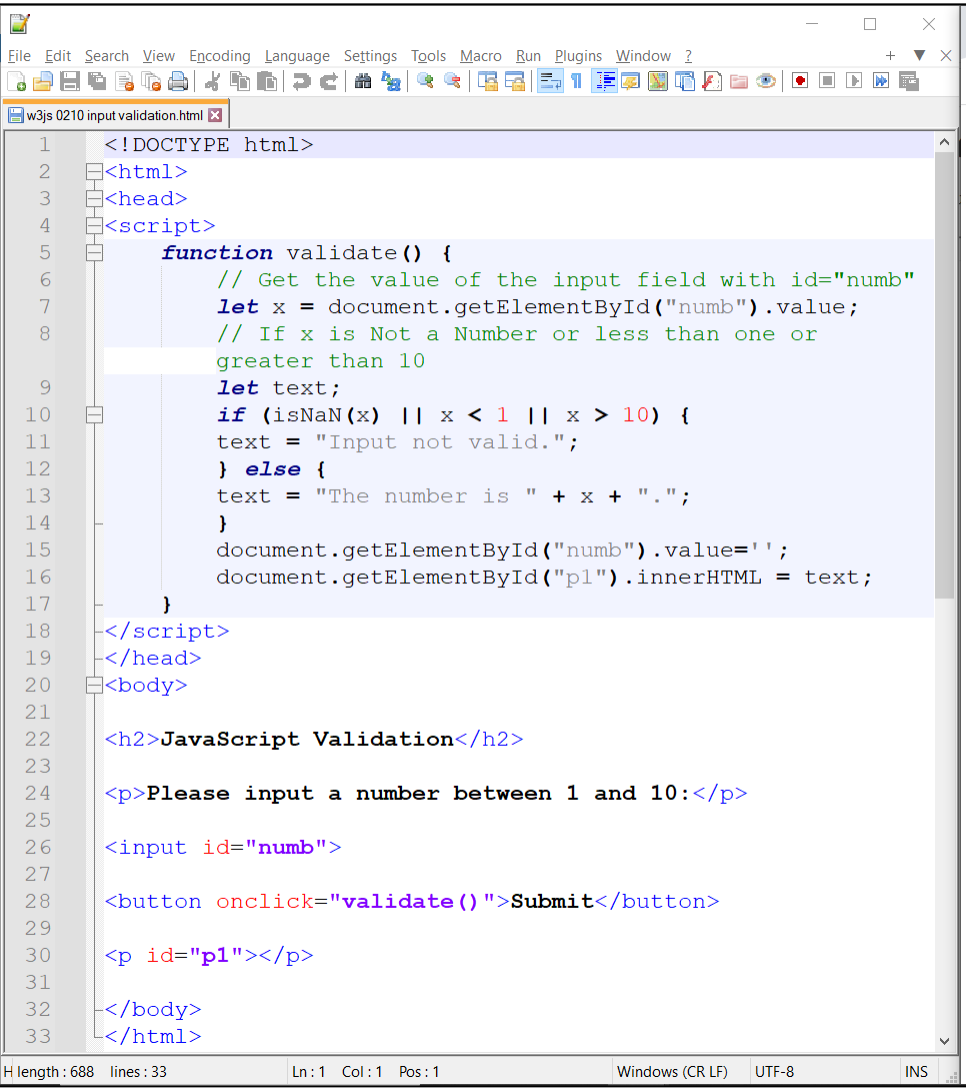

w3js 0180 operators.html
Arquivo
Types of JavaScript Operators
There are different types of JavaScript operators:
Arithmetic Operators
Assignment Operators
Comparison Operators
String Operators
Logical Operators
Type Operators


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0190 input prompt.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4
5 <h2>The prompt() Method</h2>
6
7 Entering text, integers and floats
8
9
10
11
12
13 <script>
14
15 let input='', name='', age=0, height=0.0;
16
17 input=prompt("Please enter your name:");
18 name=input;
19
20 input=prompt("Please enter your age:");
21 age=parseInt(input);
22
23 input=prompt("Please enter your height:");
24 height=parseFloat(input);
25
26 document.getElementById("name").innerHTML="Name: " + name;
27 document.getElementById("age").innerHTML="Age: " + age;
28 document.getElementById("height").innerHTML = "Height: " +
height;
29
30 </script>
31 </body>
32 </html>
H length : 638 lines : 32
Ln : 1 Col : 1 Pos : 1
Windows (CR LF)
UTF-8
INS

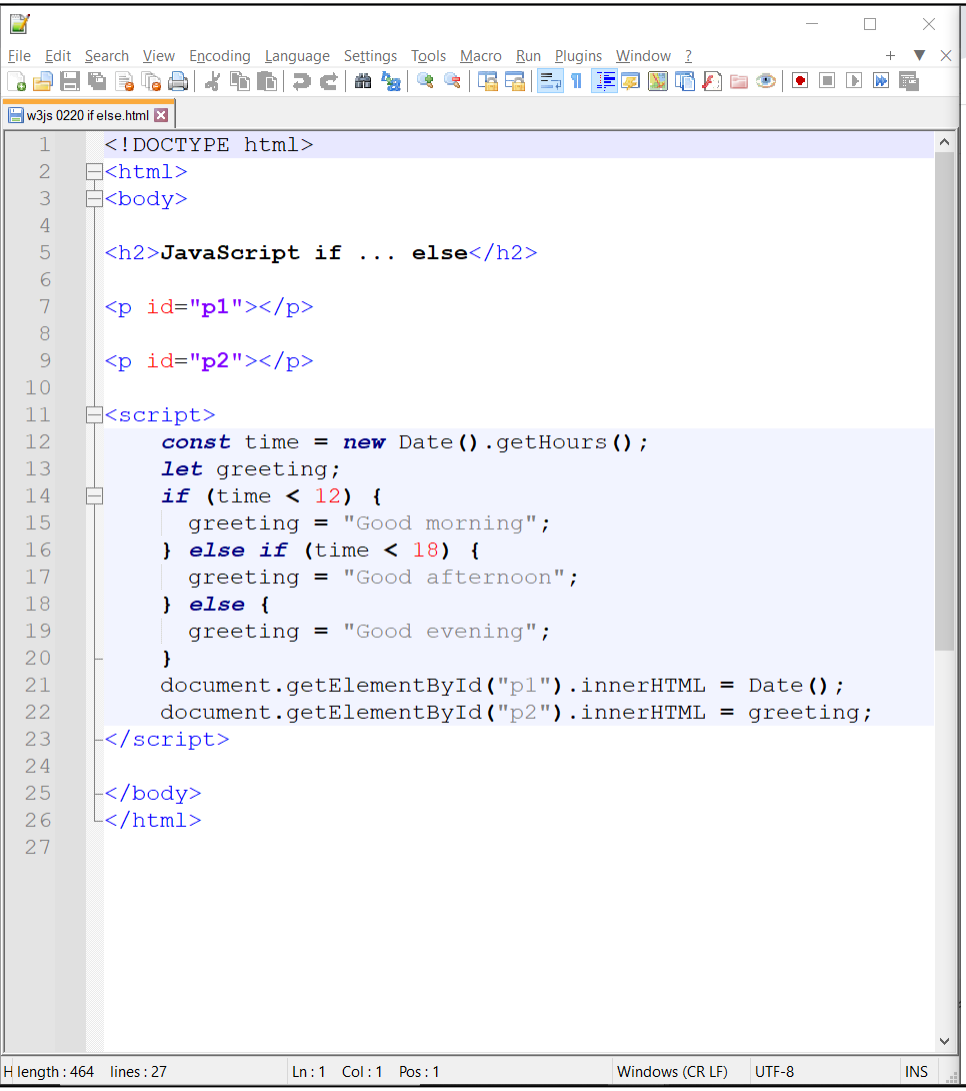

w3js 0190 input prompt.html
Arquivo
Essa página diz
Please enter your name:
OK
Cancelar


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0200 input object.html
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <script>
5 function _write() {
6 document.getElementById("p1").innerHTML = "Name: " +
document.getElementById("input1").value;
7 document.getElementById("p2").innerHTML = "Age: " +
parseInt(document.getElementById("input2").value);
8 document.getElementById("p3").innerHTML = "Height: " +
parseFloat(document.getElementById("input3").value);
9 document.getElementById("input1").value = '';
10 document.getElementById("input2").value = '';
11 document.getElementById("input3").value = '';
12 }
13 </script>
14 </head>
15
16 <body>
17
18 <h2>The Input Object</h2>
19
20 Enter your name: <input id="input1">
21 Enter your age: <input id="input2">
22 Enter your height: <input id="input3">
23
24 <button onclick="_write()">Submit</button>
25
26
27
28
29
30 </body>
31 </html>
H length : 836 lines : 31
Ln : 1 Col : 1 Pos : 1
Windows (CR LF)
UTF-8
INS

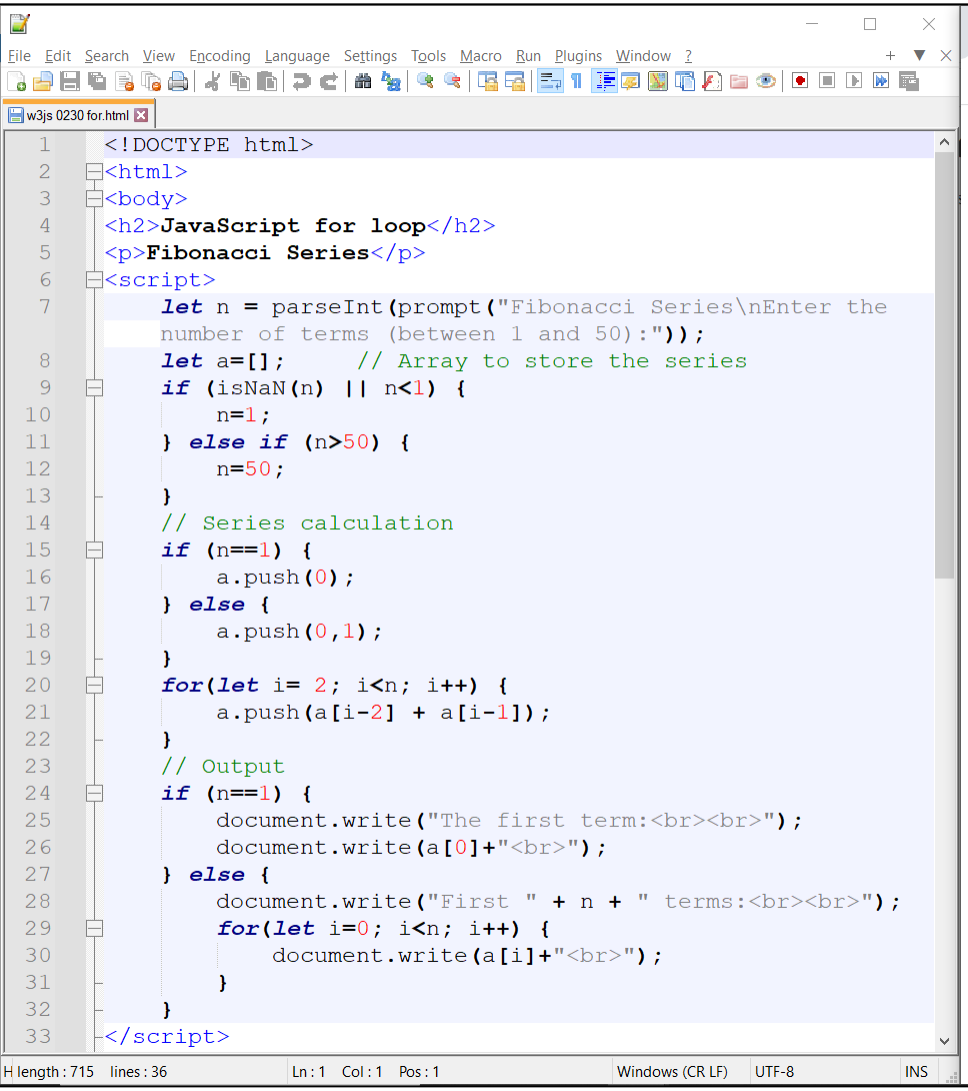

w3js 0200 input object.html
Arquivo
The Input Object
Enter your name:
Enter your age:
Enter your height:
Submit
Name: John Doe
Age: 16
Height: 1.75


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0210 input validation.html
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <script>
5 function validate() {
6 // Get the value of the input field with id="numb"
7 let x = document.getElementById("numb").value;
8 // If x is Not a Number or less than one or
greater than 10
9 let text;
10 if (isNaN(x) || x < 1 || x > 10) {
11 text = "Input not valid.";
12 } else {
13 text = "The number is " + x + ".";
14 }
15 document.getElementById("numb").value='';
16 document.getElementById("p1").innerHTML = text;
17 }
18 </script>
19 </head>
20 <body>
21
22 <h2>JavaScript Validation</h2>
23
24 Please input a number between 1 and 10:
25
26 <input id="numb">
27
28 <button onclick="validate()">Submit</button>
29
30
31
32 </body>
33 </html>
H length : 688 lines : 33
Ln : 1 Col : 1 Pos : 1
Windows (CR LF)
UTF-8
INS


w3js 0210 input validation.html
Arquivo
JavaScript Validation
Please input a number between 1 and 10:
Submit
The number is 5.


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0220 if else.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4
5 <h2>JavaScript if ... else</h2>
6
7
8
9
10
11 <script>
12 const time = new Date().getHours();
13 let greeting;
14 if (time < 12) {
15 greeting = "Good morning";
16 } else if (time < 18) {
17 greeting = "Good afternoon";
18 } else {
19 greeting = "Good evening";
20 }
21 document.getElementById("p1").innerHTML = Date();
22 document.getElementById("p2").innerHTML = greeting;
23 </script>
24
25 </body>
26 </html>
27
H length : 464 lines : 27
Ln : 1 Col : 1 Pos : 1
Windows (CR LF)
UTF-8
INS

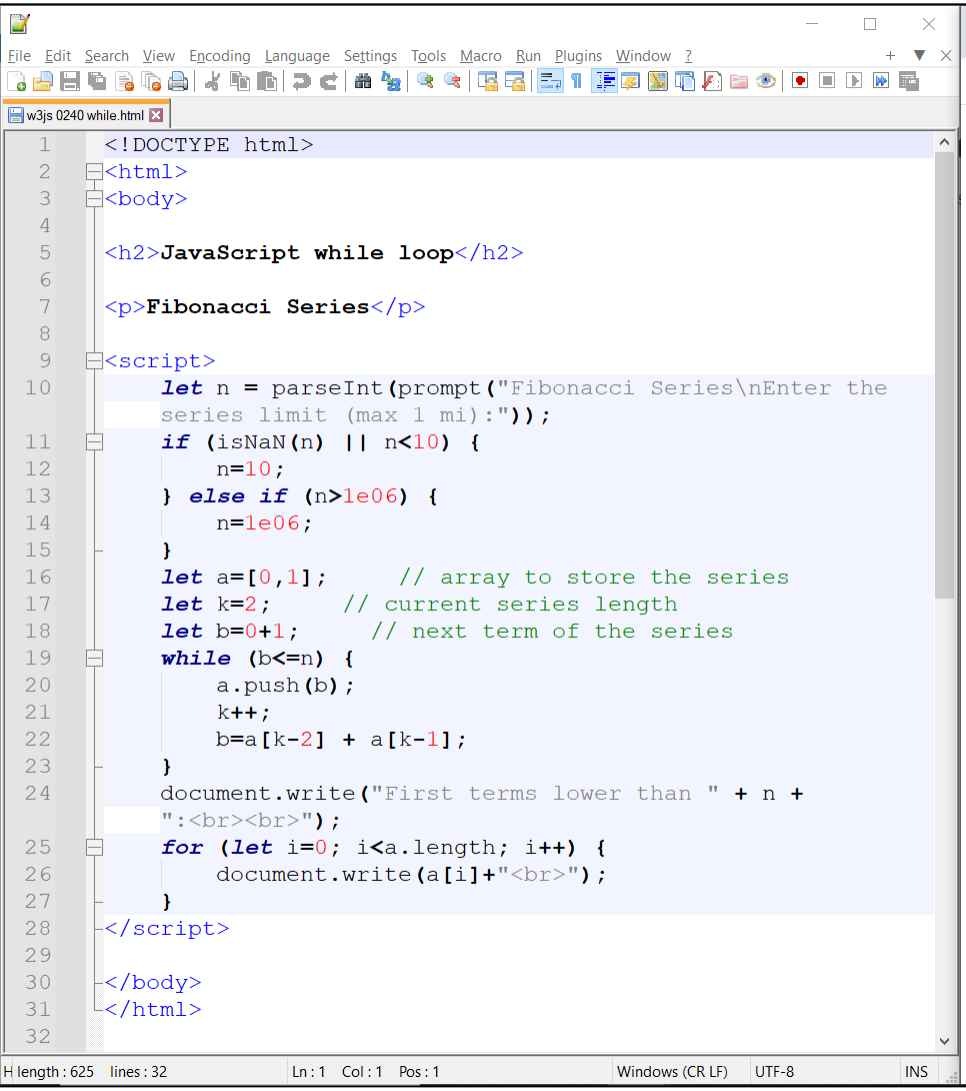

w3js 0220 if else.html
Arquivo
JavaScript if ... else
Sat Apr 08 2023 16:55:00 GMT-0300 (Horário Padrão de Brasília)
Good afternoon


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0230 for.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4 <h2>JavaScript for loop</h2>
5 Fibonacci Series
6 <script>
7 let n = parseInt(prompt("Fibonacci Series\nEnter the number of terms (between 1 and 50):"));
8 let a=[]; // Array to store the series
9 if (isNaN(n) || n<1) {
10 n=1;
11 } else if (n>50) {
12 n=50;
13 }
14 // Series calculation
15 if (n==1) {
16 a.push(0);
17 } else {
18 a.push(0,1);
19 }
20 for(let i= 2; i<n; i++) {
21 a.push(a[i-2] + a[i-1]);
22 }
23 // Output
24 if (n==1) {
25 document.write("The first term:

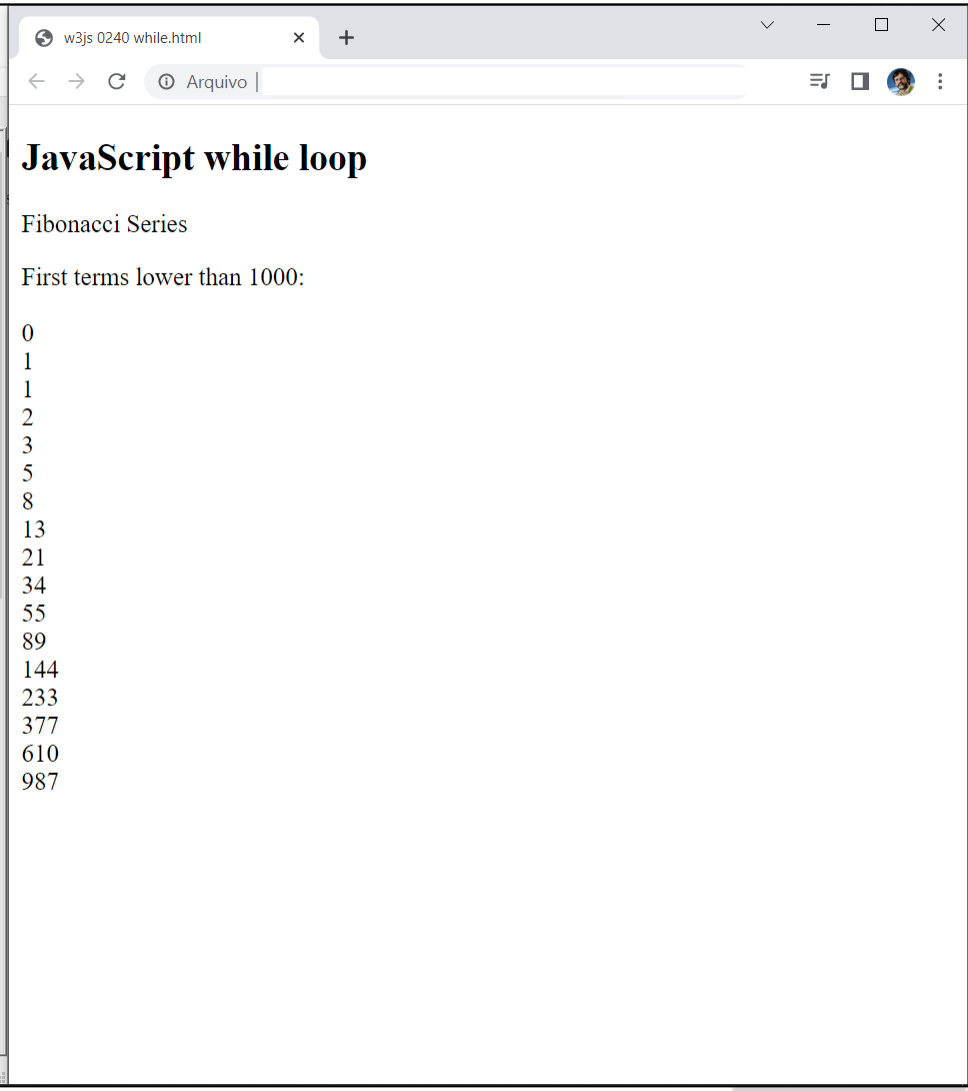
");
26 document.write(a[0]+"
");
27 } else {
28 document.write("First " + n + " terms:

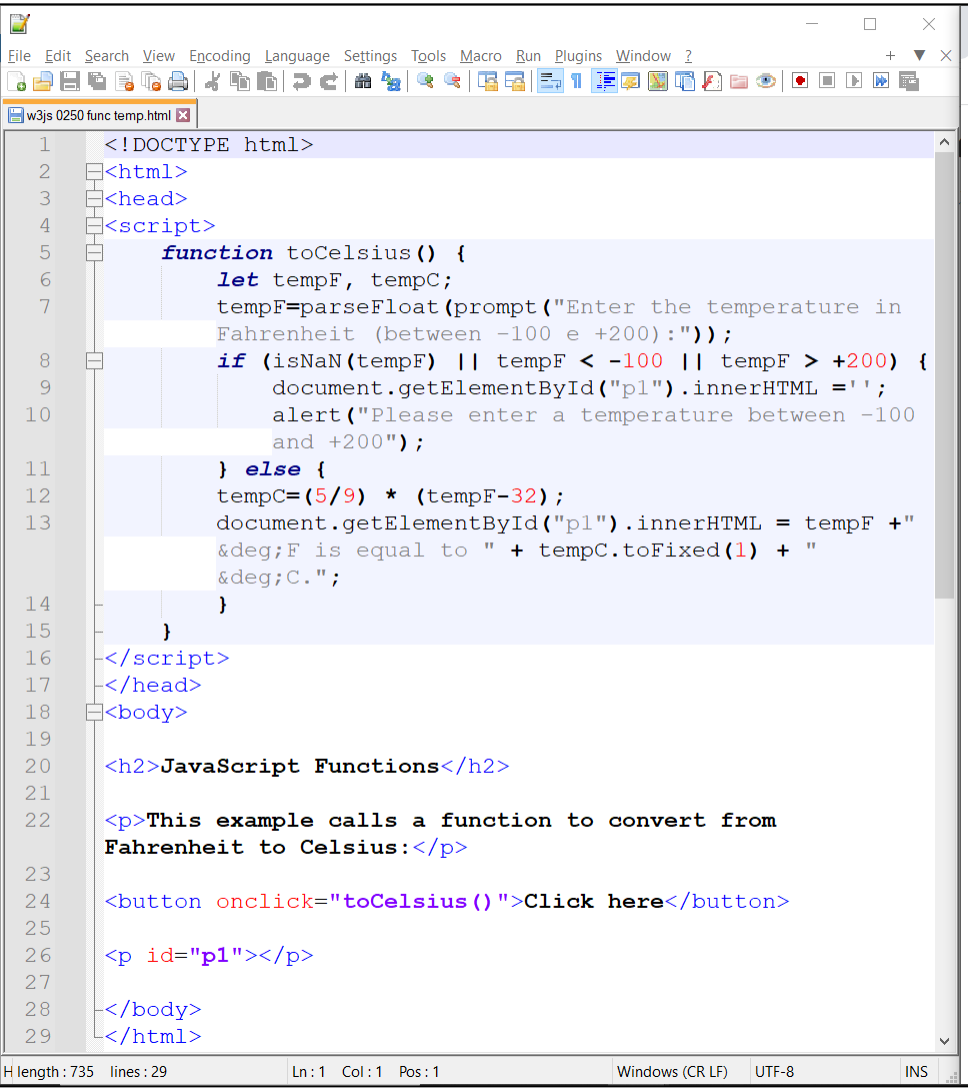
");
29 for(let i=0; i<n; i++) {
30 document.write(a[i]+"
");
31 }
32 }
33 </script>
H length : 715 lines : 36 Ln : 1 Col : 1 Pos : 1 Windows (CR LF) UTF-8 INS

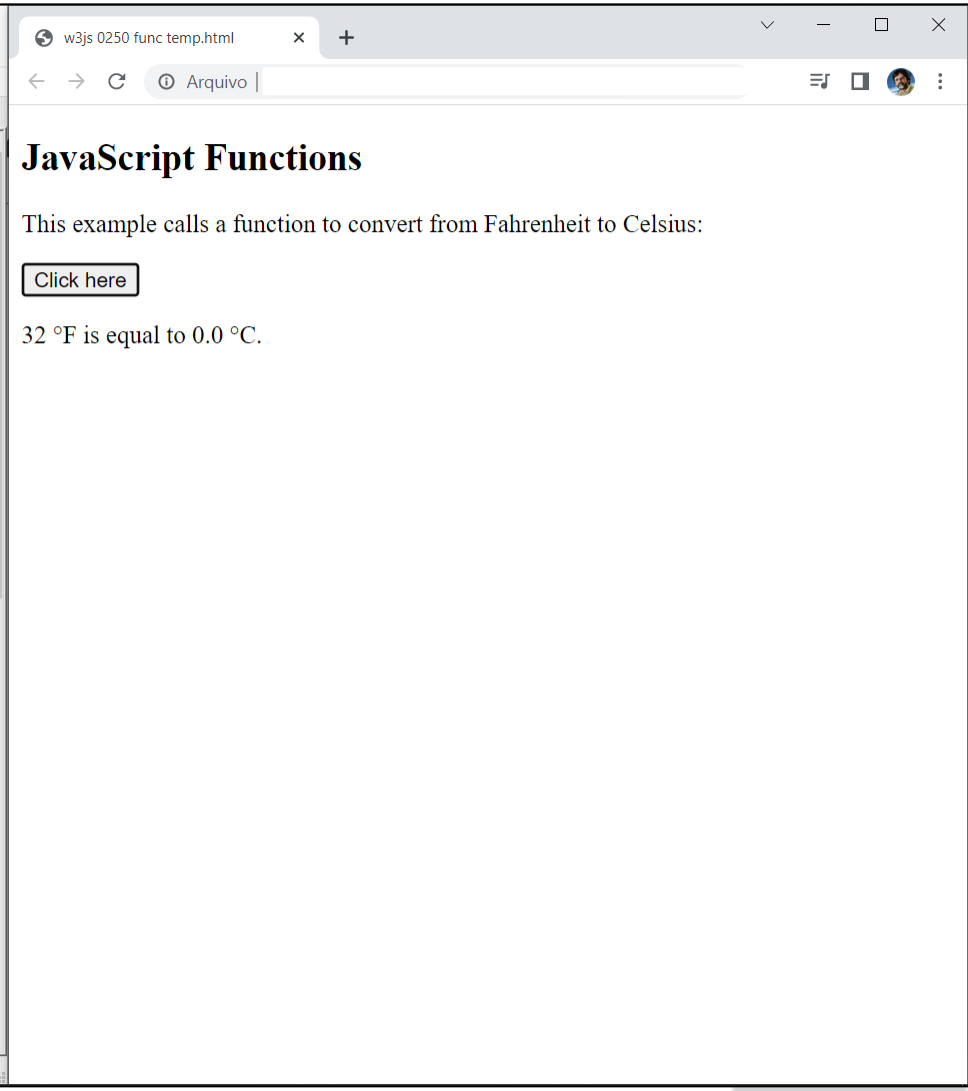

w3js 0230 for.html
Arquivo
JavaScript for loop
Fibonacci Series
First 10 terms:
0
1
1
2
3
5
8
13
21
34


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0240 while.html
1 <!DOCTYPE html>
2 <html>
3 <body>
4
5 <h2>JavaScript while loop</h2>
6
7 Fibonacci Series
8
9 <script>
10 let n = parseInt(prompt("Fibonacci Series\nEnter the series limit (max 1 mi):"));
11 if (isNaN(n) || n<10) {
12 n=10;
13 } else if (n>1e06) {
14 n=1e06;
15 }
16 let a=[0,1]; // array to store the series
17 let k=2; // current series length
18 let b=0+1; // next term of the series
19 while (b<=n) {
20 a.push(b);
21 k++;
22 b=a[k-2] + a[k-1];
23 }
24 document.write("First terms lower than " + n + ":

");
25 for (let i=0; i<a.length; i++) {
26 document.write(a[i]+"
");
27 }
28 </script>
29
30 </body>
31 </html>
32
H length : 625 lines : 32
Ln : 1 Col : 1 Pos : 1
Windows (CR LF)
UTF-8
INS


w3js 0240 while.html
Arquivo
JavaScript while loop
Fibonacci Series
First terms lower than 1000:
0
1
1
2
3
5
8
13
21
34
55
89
144
233
377
610
987


File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
w3js 0250 func temp.html
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <script>
5 function toCelsius() {
6 let tempF, tempC;
7 tempF=parseFloat(prompt("Enter the temperature in Fahrenheit (between -100 e +200):"));
8 if (isNaN(tempF) || tempF < -100 || tempF > +200) {
9 document.getElementById("p1").innerHTML ='';
10 alert("Please enter a temperature between -100 and +200");
11 } else {
12 tempC=(5/9) * (tempF-32);
13 document.getElementById("p1").innerHTML = tempF +" °F is equal to " + tempC.toFixed(1) + " °C.";
14 }
15 }
16 </script>
17 </head>
18 <body>
19
20 <h2>JavaScript Functions</h2>
21
22 This example calls a function to convert from Fahrenheit to Celsius:
23
24 <button onclick="toCelsius()">Click here</button>
25
26
27
28 </body>
29 </html>
H length : 735 lines : 29
Ln : 1 Col : 1 Pos : 1
Windows (CR LF)
UTF-8
INS


w3js 0250 func temp.html
Arquivo
JavaScript Functions
This example calls a function to convert from Fahrenheit to Celsius:
Click here
32 °F is equal to 0.0 °C.

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

<h2>JavaScript Objects</h2>

<p>Object methods are functions defined in the object properties.</p>

<p id="p1"></p>

<script>
    // Create an object
    const car = {
      type:"Fiat",
      model:"500",
      color:"white",
      fullDescription:
        function() {
            return this.type + " " + this.model + " " +
            this.color + ".";
        }
    };

    // Display data from the object:
    document.getElementById("p1").innerHTML =
    car.fullDescription();
</script>

</body>
</html>
```

w3js 0260 object.html

Arquivo

JavaScript Objects

Object methods are functions defined in the object properties.

Fiat 500 white.

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

<h2>JavaScript Class Methods</h2>

<p>How to define and use a Class method.</p>

<p id="p1"></p>

<script>
    class Car {
      constructor(name, year) {
        this.name = name;
        this.year = year;
      }
      age() {
        const date = new Date();
        return date.getFullYear() - this.year;
      }
    }

    const myCar = new Car("Ford", 2014);
    document.getElementById("p1").innerHTML =
        "My car is " + myCar.age() + " years old.";
</script>

</body>
</html>
```

w3js 0270 class.html

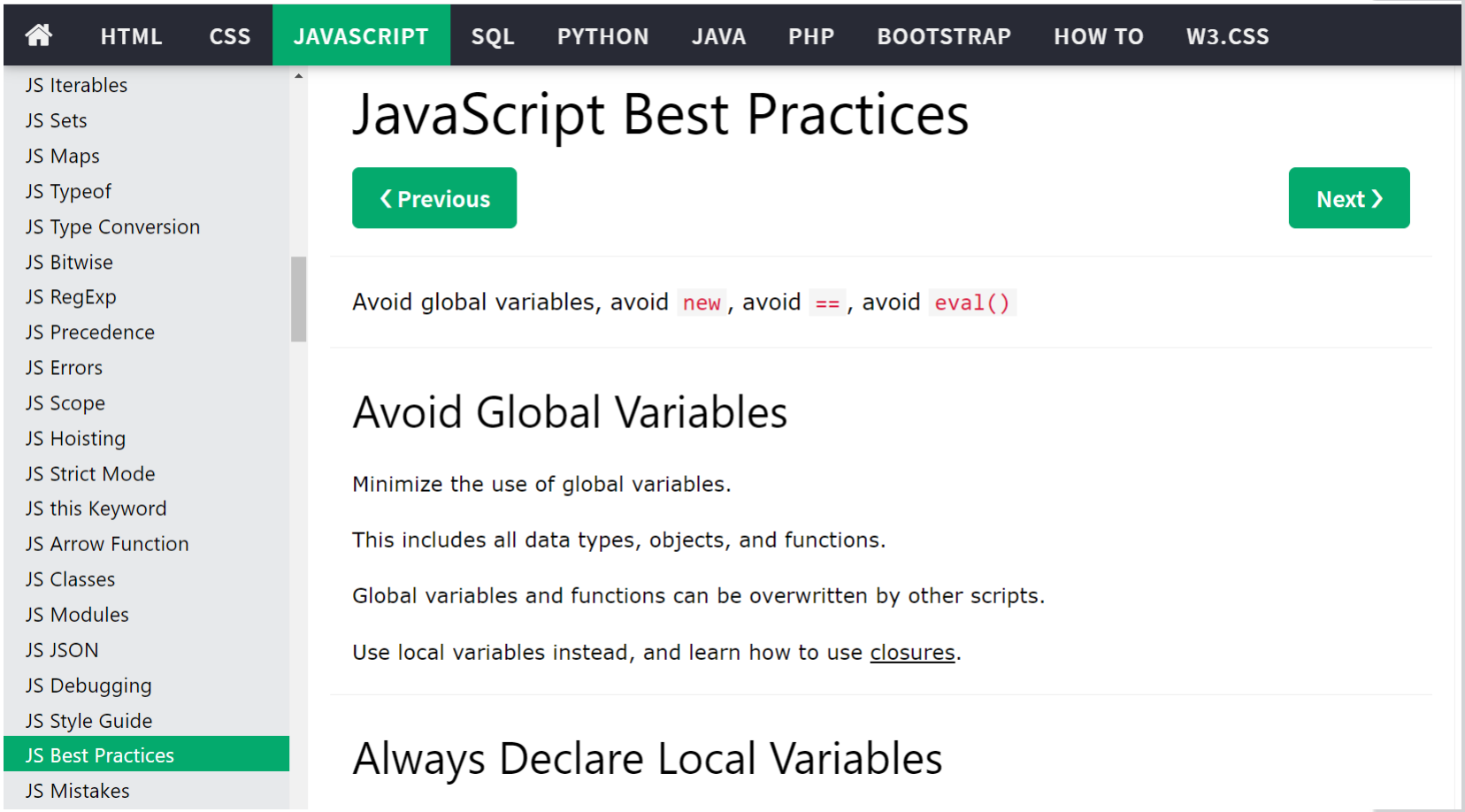
Arquivo

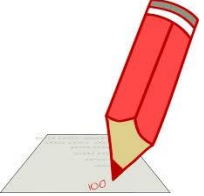
JavaScript Class Methods

How to define and use a Class method.

My car is 9 years old.

https://www.w3schools.com/js





Entrega ao final da aula

4. LAB 03 – EXERCÍCIO

Lab. 03

- Desenvolver uma calculadora com
  - HTML, CSS e JS
- A calculadora deve receber **dois números** e executar as **quatro operações** básicas e **raiz quadrada**
- Entrega ao final da aula (uma entrega por grupo)

5.Próximos passos

Próximos passos

- Com o aprendizado do JS, fechamos a trinca: **HTML** (conteúdo), **CSS** (formato) e **JS** (interação).
- Essa trinca permite desenvolver páginas que rodam no navegador do cliente (***front-end***)
- Próximos passos:
  - Aplicações rodando no servidor (***back-end***)
    - Ambientes de Desenvolvimento – XAMPP
    - Servidores – Apache
    - Bancos de Dados – MySQL
    - Linguagens de Programação – PHP

PRO 3151 – L03
Sistemas de Informação
JavaScript – JS