



## Ejercicios del tercer trimestre (Se publicarán en Github)

### JavaScript Exercises

#### Exercise 1. Basics.

```
<!DOCTYPE html>
<html>
<head>
<script>
function myFunction() {
    document.getElementById("demo").innerHTML = "Paragraph changed.";
}
</script>
</head>
<body>
<h1>My Web Page</h1>
<p id="demo">A Paragraph</p>
<button type="button" onclick="myFunction()">Try it</button>
</body>
</html>
```

Modify the code for:

- Add a button (and a function) to clear the p demo.
- Place the script in an external file called MyJS.js.



## solución

### js01.html

```
<!DOCTYPE html>
<html>
<head>
<script src="js01.js"></script>
</head>
<body>
<h1>Mi página</h1>
<p id="demo">Un párrafo</p>
<button type="button" onclick="cambiaParrafo()">Cambiar párrafo</button>
<button type="button" onclick="borraParrafo()">Borra párrafo</button>
</body>
</html>
```

### js01.js

```
function cambiaParrafo() {
  document.getElementById("demo").innerHTML = "Párrafo cambiado.";
}
function borraParrafo() {
  document.getElementById("demo").style.display = 'none';
}
```



## Exercise 2. Showing messages.

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

<h1>My First Web Page</h1>
<p>My First Paragraph</p>

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

<script>
document.getElementById("demo").innerHTML = "Hello world!";
</script>

</body>
</html>
```

Modify the code for:

- Add a button (and a function) which writes into the p demo when click.
- Place the script in an external file called js02.js.

**(Solucionado en el ejercicio anterior)**



### Exercise 3.

In this file you will find [images about cars](#). In this other file you will find [images about Spiderman](#). You will write a web page where you could display different images of cars or Spiderman by clicking on buttons (1 for each image).

You can also build two different areas in the same page one for each group of images.

Finally, write two stylesheets and add two buttons for changing between styles.

### Solución parcial

#### js03.html

```
<!DOCTYPE html>
<html>
<head>
  <script>
    function cambiaCoche(nombre) {
      document.getElementById('miImagen').src = nombre;
    }
  </script>
</head>
<body>
  <h2>Imágenes de coches</h2>

  <p>Ejemplo de JavaScript en el que cambiamos las imágenes mostradas el pulsar
  un botón</p>

  <br>

  <button onclick="cambiaCoche('coche1.jpg')">Coche 1</button>
  <button onclick="cambiaCoche('coche2.jpg')">Coche 2</button>
  <button onclick="cambiaCoche('coche3.jpg')">Coche 3</button>
  <button onclick="cambiaCoche('coche4.jpg')">Coche 4</button>
  <button onclick="cambiaCoche('coche5.jpg')">Coche 5</button>
  <button onclick="cambiaCoche('coche6.jpg')">Coche 6</button>
</body>
</html>
```

Modify last exercise by using a “select” element instead of buttons:

[https://www.w3schools.com/html/html\\_form\\_elements.asp](https://www.w3schools.com/html/html_form_elements.asp)

We are going to use “onchange”, like the following example:

[https://www.w3schools.com/jsref/tryit.asp?filename=tryjsref\\_onchange](https://www.w3schools.com/jsref/tryit.asp?filename=tryjsref_onchange)



#### Exercise 4. Working with variables.

Create a HTML document which will declare a variable, will assign a value from an input and finally display it using the innerHTML property. Do it several times using numbers and text. You can be inspired by this:

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

<p>Create a variable, assign a value to it, and display it:</p>

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

<script>
var carName = "Volvo";
document.getElementById("demo").innerHTML = carName;
</script>

</body>
</html>
```

#### Exercise 5. Basics.

Create a HTML document from scratch with three groups of buttons. Each group will be focused on three different issues:

- Changing the style of a paragraph: choosing between three different font styles.
- Changing the attribute src from the img tag.
- Showing three different messages in a <div> tag.

#### Exercise 6. Random Quotes.

Create a HTML document from scratch similar to the following:

<https://js-beginners.github.io/random-quotes-project/>

#### Exercise 7. Image Slider.

Create a HTML document from scratch similar to the following:

<https://js-beginners.github.io/background-image-slider-project/>

#### Exercise 8. Calculator.

Create a HTML document from scratch similar to the following:

<https://jsbeginners.com/calculator-javascript-project/>

#### Exercise 9. Functions.

Create a html document and use input tags to enter data for the following functions. Use a paragraph and innerHTML property to display the result.

- Define a function max() that takes two numbers as arguments and returns the largest of them. Use the if-then-else construct available in Javascript.
- Define a function maxOfThree() that takes three numbers as arguments and returns the largest of them.
- Write a function that takes a character (i.e. a string of length 1) and returns true if it is a vowel, false otherwise.
- Rövarspråket is a Swedish children-slang where by tongue-twisted what you say like this you can



basically talk to someone else who understands the "codec" with someone who doesn't understand. Write a function `translate()` that will translate a text into "rövarspråket". That is, double every consonant and place an occurrence of "o" in between. For example, `translate("this is fun")` should return the string "tothohisos isos fofunon". Note: You could visit [this link](#) for an example.

- E. Define a function `sum()` and a function `multiply()` that sums and multiplies (respectively) all the numbers in an array of numbers. For example, `sum([1,2,3,4])` should return 10, and `multiply([1,2,3,4])` should return 24.
- F. Define a function `reverse()` that computes the reversal of a string. For example, `reverse("jag testar")` should return the string "ratset gaj".
- G. Write a function to sort a list of words (an array) in alphabetical order
- H. Write a function `findLongestWord()` that takes an array of words and returns the length of the longest one.
- I. Write a function `filterLongWords()` that takes an array of words and an integer `i` and returns the array of words that are longer than `i`.
- J. Write a function `charFreq()` that takes a string and builds a frequency listing of the characters contained in it. Represent the frequency listing as a Javascript object. Try it with something like `charFreq("abbabcbdbabdbbabababcbcbab")`.



## XML DOM Exercises

Para estos ejercicios usaremos la consola del navegador y el fichero xml:

<https://www.w3schools.com/xml/books.xml>

Nota: si queremos mostrar un mensaje dentro de un bucle (for, while ...) haremos uso de "console.log()"

### Ejercicio 1. Escribe el código necesario para obtener los siguientes datos:

#### 1. Título del primer libro

```
document.getElementsByTagName("title")[0].childNodes[0].nodeValue;
```

#### 2. Año del primer libro

```
document.getElementsByTagName("year")[0].childNodes[0].nodeValue;
```

#### 3. Precio del segundo libro

```
document.getElementsByTagName("price")[1].childNodes[0].nodeValue;
```

#### 4. Autor del primer libro

```
document.getElementsByTagName("author")[0].childNodes[0].nodeValue;  
// otra posibilidad es...  
document.getElementsByTagName("book")[0].getElementsByTagName('author')[0].childNodes[0].nodeValue;
```

#### 5. Primer autor del tercer libro

```
document.getElementsByTagName("book")[2].getElementsByTagName('author')[0].childNodes[0].nodeValue;
```

#### 6. Segundo autor del tercer libro

```
document.getElementsByTagName("book")[2].getElementsByTagName('author')[1].childNodes[0].nodeValue;
```

#### 7. Valor del primer atributo del primer libro

```
document.getElementsByTagName("book")[0].attributes[0].nodeValue;
```

#### 8. Valor del primer atributo del primer libro

```
document.getElementsByTagName("book")[0].attributes[0].nodeValue;
```

#### 9. Número de autores del tercer libro

```
document.getElementsByTagName("book")[2].getElementsByTagName('author').length;
```

#### 10. Mostrar todos los autores del tercer libro

```
l = document.getElementsByTagName("book")[2].getElementsByTagName('author').length;  
a = document.getElementsByTagName("book")[2].getElementsByTagName('author')  
for(i = 0; i < l; i++)  
    console.log(a[i].childNodes[0].nodeValue);
```



#### 11. Mostrar el número de atributos del cuarto libro

```
document.getElementsByTagName("book")[3].attributes.length;
```

#### 12. Mostrar el valor de los atributos del cuarto libro

```
l = document.getElementsByTagName("book")[3].attributes.length;  
a = document.getElementsByTagName("book")[3].attributes  
for(i = 0; i < l; i++)  
    console.log(a[i].nodeValue);
```

### Ejercicio 2. Escribe el código necesario para obtener los siguientes datos:

Puedes hacer uso del editor de w3schools siguiente, que muestra el nombre del artista del archivo [https://www.w3schools.com/js/cd\\_catalog.xml](https://www.w3schools.com/js/cd_catalog.xml)

[https://www.w3schools.com/js/tryit.asp?filename=tryjs\\_ajax\\_responsexml](https://www.w3schools.com/js/tryit.asp?filename=tryjs_ajax_responsexml)

Haz las modificaciones necesarias para mostrar lo que se pide:

1. Muestra el título de los CD
2. Muestra el precio
3. Muestra una tabla en la que se muestre artista y título
4. Muestra una tabla que muestre título, artista, compañía y año

Ahora usando el mismo editor y el fichero "<https://www.w3schools.com/xml/books.xml>"

1. Título del primer libro
2. Todos los títulos
3. Número de atributos del cuarto libro
4. Valor de los atributos del cuarto libro
5. Número de autores del tercer libro
6. Autores del tercer libro
7. Muestra una tabla que muestre el título, primer autor, precio y año
8. Muestra una tabla que muestre el título, autores, precio y año





## AJAX Exercises

### Exercise 1.

Using the cd\_catalog.xml file and the following code:

cd\_catalog.xml

[https://www.w3schools.com/js/cd\\_catalog.xml](https://www.w3schools.com/js/cd_catalog.xml)

AJAX example

[https://www.w3schools.com/js/tryit.asp?filename=tryjs\\_ajax\\_xml2](https://www.w3schools.com/js/tryit.asp?filename=tryjs_ajax_xml2)

1. The code must include information about country, company, price and year.
2. Using a div element, show the same information

### Exercise 2.

Escribe un programa que muestre información meteorológica de una localidad de Huelva (o cualquier otra provincia de tu elección): temperatura máxima y mínima, estado del cielo por tramo horario, dirección y velocidad del viento y humedad relativa).

Para acceder a datos meteorológicas vamos a usar la siguiente url:

- [http://www.aemet.es/xml/municipios/localidad\\_21041.xml](http://www.aemet.es/xml/municipios/localidad_21041.xml) (Huelva capital)
- [http://www.aemet.es/xml/municipios/localidad\\_21002.xml](http://www.aemet.es/xml/municipios/localidad_21002.xml) (Aljaraque)
- [http://www.aemet.es/xml/municipios/localidad\\_21021.xml](http://www.aemet.es/xml/municipios/localidad_21021.xml) (Cartaya) ...

Para mostrar datos de un municipio debe incluir en la url el código INE de localidad.

Nota: El código INE está accesible en la siguiente dirección:

- <https://www.ine.es/daco/daco42/codmun/codmunmapa.htm>

**Nota adicional:** La Aemet cuenta con un servicio de datos abiertos que puedes consultar en la siguiente dirección:

**opendata aemet**

[http://www.aemet.es/es/datos\\_abiertos/AEMET\\_OpenData](http://www.aemet.es/es/datos_abiertos/AEMET_OpenData)



### Exercise 3. JSON

En este ejercicio usaremos el archivo "json\_demo\_array" y el editor de w3schools. Responde a los siguientes apartados.

[https://www.w3schools.com/js/json\\_demo\\_array.txt](https://www.w3schools.com/js/json_demo_array.txt)

[https://www.w3schools.com/js/tryit.asp?filename=tryjson\\_ajax](https://www.w3schools.com/js/tryit.asp?filename=tryjson_ajax)

1. Muestra la longitud del array
2. Muestra los elementos usando una tabla.

### Exercise 4. JSON

En este ejercicio usaremos el archivo "json\_demo" y el editor de w3schools. Responde a los siguientes apartados.

[https://www.w3schools.com/js/json\\_demo.txt](https://www.w3schools.com/js/json_demo.txt)

[https://www.w3schools.com/js/tryit.asp?filename=tryjson\\_ajax](https://www.w3schools.com/js/tryit.asp?filename=tryjson_ajax)

Nota: Para mostrar la longitud de un array usamos la propiedad length.

[https://www.w3schools.com/js/js\\_arrays.asp](https://www.w3schools.com/js/js_arrays.asp)

Nota: Para iterar los elementos de un array podemos usar

- 1- Bucle for(i=0; i < arr.length; i++)
- 2- Bucle for(x of arr)

[https://www.w3schools.com/js/js\\_loop\\_for.asp](https://www.w3schools.com/js/js_loop_for.asp)

#### **Apartados**

1. Muestra edad
2. Muestra del primer elemento pets, el tipo de animal
3. Muestra del primer elemento pets, el nombre
4. Muestra el número de mascotas (pets);
5. Muestra el nombre de todas las mascotas



6. Muestra todos los datos en un párrafo
7. Muestra los datos usando una tabla.

```
var myObj = JSON.parse(this.responseText);  
  
for( i = 0; i < myObj.pets.length; i++)  
  
    txt = txt + myObj.pets[i].name + "<br>";  
  
document.getElementById("demo").innerHTML = txt;
```

## Exercise 5. JSON

En este ejercicio usaremos un servicio de datos de la NASA a través de una API.

[https://api.nasa.gov/planetary/apod?api\\_key=DEMO\\_KEY&date=2020-05-01](https://api.nasa.gov/planetary/apod?api_key=DEMO_KEY&date=2020-05-01)

[https://www.w3schools.com/js/tryit.asp?filename=tryjson\\_ajax](https://www.w3schools.com/js/tryit.asp?filename=tryjson_ajax)

1. Muestra el valor de "explanation"
2. Muestra el valor de "date"
3. Muestra el valor de "url"
4. Añade una imagen vacía y muestra la imagen.

### Enlaces:

#### NASA

<https://api.nasa.gov/>

#### APOD - Astronomy Photo Of the Day

[https://api.nasa.gov/planetary/apod?api\\_key=DEMO\\_KEY&date=2020-05-01](https://api.nasa.gov/planetary/apod?api_key=DEMO_KEY&date=2020-05-01)

#### MRP - Mars Rover Photos

[https://api.nasa.gov/mars-photos/api/v1/rovers/curiosity/photos?sol=1000&camera=fhaz&api\\_key=DEMO\\_KEY](https://api.nasa.gov/mars-photos/api/v1/rovers/curiosity/photos?sol=1000&camera=fhaz&api_key=DEMO_KEY)

#### NASA Image and Video Library

<https://images-api.nasa.gov/search?q=moon>



**Nota final:** Truco para atender múltiples peticiones Ajax simultáneas:

<https://www.codeproject.com/Questions/764646/Send-multiple-AJAX-request-concurrently>

[https://www.w3schools.com/js/tryit.asp?filename=tryjs\\_ajax\\_display\\_table](https://www.w3schools.com/js/tryit.asp?filename=tryjs_ajax_display_table)

```
function myAjaxRequest(url, callback) {
    var ajax = new XMLHttpRequest();
    ajax.onreadystatechange = function() {
        if (this.readyState==4 && this.status==200)
            callback(this);
    }
    ajax.onerror = function() {
        console.log("AJAX request failed to: " + url);
    }
    ajax.open("GET", url, true);
    ajax.send();
}

function loadXMLDoc2() {
    myAjaxRequest('cd_catalog.xml', onCdXmlLoaded);
    myAjaxRequest('cd_catalog.xml', onCdXmlLoaded2);
}

function onCdXmlLoaded(ajax) {
    var xmlDoc = ajax.responseXML;
    var txt = '';
    x=xmlDoc.getElementsByTagName("ARTIST");
    for (i=0;i<x.length;i++) {
        txt=txt + x[i].childNodes[0].nodeValue + "<br>";
    }
    document.getElementById("myDiv").innerHTML=txt;
}

function onCdXmlLoaded2(ajax) {
    var xmlDoc = ajax.responseXML;
    var txt = '';

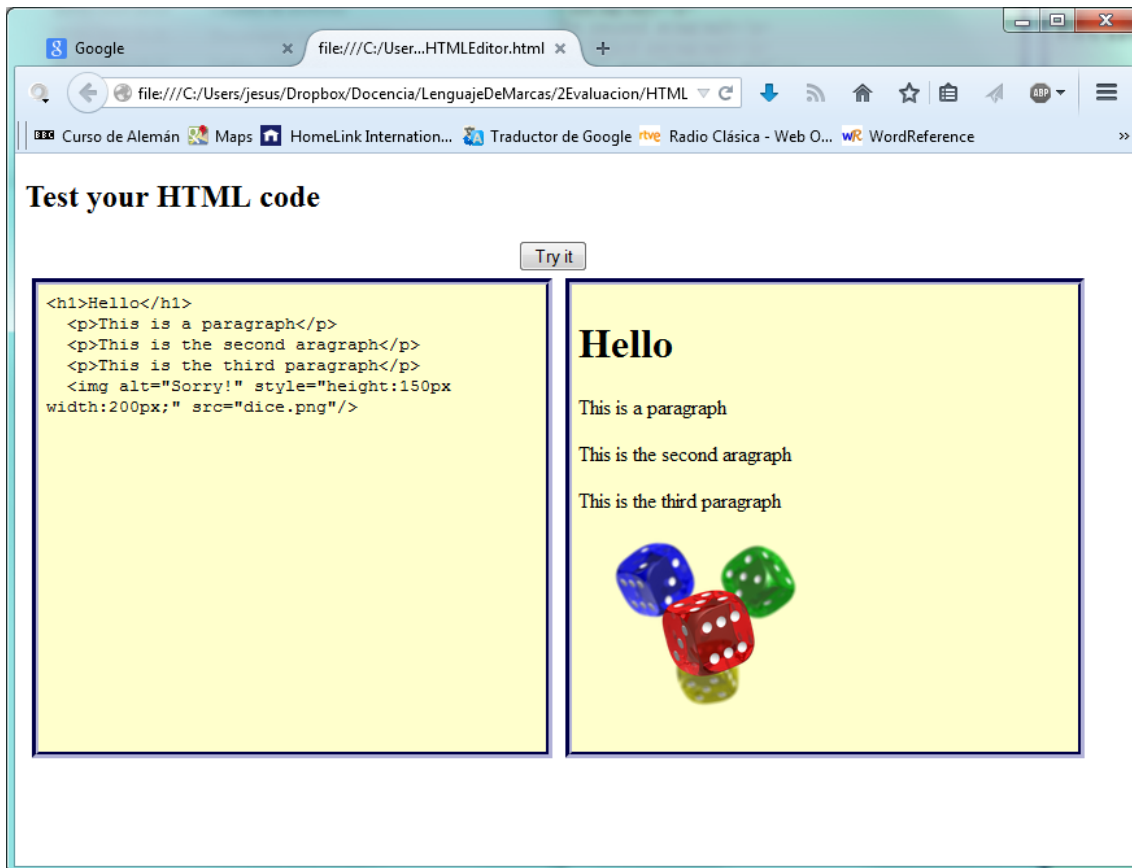
    x=xmlDoc.getElementsByTagName("TITLE");
    for (i=0;i<x.length;i++) {
        txt=txt + x[i].childNodes[0].nodeValue + "<br>";
    }
    document.getElementById("myDiv2").innerHTML=txt;
}
```



## Advanced apps with JavaScript

### Exercise 1. HTML&CSS editor.

Create a HTML page where users write code and display the result in a little area next to the code. Use a textarea for writing the code and a DIV for the result.



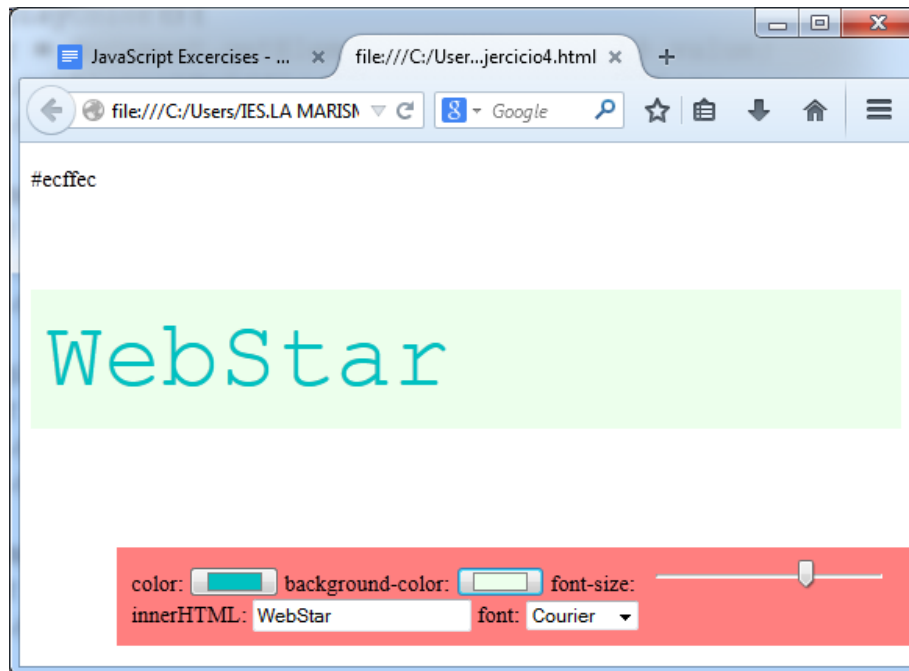
Tip: Style the textarea with the rule "resize:none".

### Exercise 2. Changing styles.

Write a web page where you can change the font size, the background color, the text color, etc in a



specific area which will be fixed in a determined place.  
You should display the page as the following:



Tip: Use new HTML5 input types color and range and try with the onchange event.



### Exercise 3. Changing the style sheet.

Build a web page and add a type select input where you could choose between at least three different kind of style sheets. You should choose one of them and apply immediately modifying the attribute *href* in the *link* tag.

The page's code without styling could be something like this:

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

  <div id="container" style="width:500px">

    <div id="header">
      <h1>Main Title of Web Page</h1></div>

    <div id="menu">
      <b>Menu</b><br>
      HTML<br>
      CSS<br>
      JavaScript</div>

    <div id="content">
      Content goes here</div>

    <div id="footer">
      Copyright © W3Schools.com</div>

  </div>

</body>
</html>
```

After choosing this would be one of the result:



Note: You can find the CSS specification at [http://www.w3schools.com/html/tryit.asp?filename=tryhtml\\_layout\\_divs](http://www.w3schools.com/html/tryit.asp?filename=tryhtml_layout_divs)

### Exercise 4. HTML DOM.



Write a HTML document which has to generate the times table of a number write into a input type text. You have to display the table properly styled.

### *Exercise 5. Memory game.*

Design a web page where users could test their memory. Choose the four [chinese words](#) you prefer from the image and transform it on a 200x200 pixels image. Users will click on two pictures and it will turn over, showing a chinese word in each image. If the word is the same then both of it will keep on displaying. In other case, after three seconds it will hide again. You could try to count the spent time until the user got the goal and offer different combinations each time users reloaded the page.

### *Exercise 6. Generating Captchas*

Write a HTML document to generate and evaluate captchas.

#### **Introduce el código de la imagen**



You can get the images [here](#).

### *Exercise 7. Caesar Cypher +4*

PIEOI KVEUY IEOKY QSWHI ZWSX VSWLE OEMW MQZIV XMHSX MIPTS IQHIW GMJVE VIWXI PIQWE NIOEG  
YVMSW MHEHI WYQEH IOEWP ECSVI WZMVX YHIWH IOWIV LYPEQ SCSOI





## Some ideas

### Exercise #3.

```
<!DOCTYPE html>
<html>
<head>
  <style>
    * {font-family:Arial;}
    h1{
      text-shadow: 2px 2px 5px #888888;
    }

    #botones{
      height:50px;
      width:1px;
      padding:20px;
      border-radius:25px;
      position:fixed;
      top:350px;
      border:1px solid black;
      background-color:rgba(181,181,219,0.7);
      box-shadow: 5px 5px 2px #000000;
      /* transition:width 2s;*/
      -webkit-transition: width 1s;
      overflow:hidden;
    }

    #botones:hover
    {
      width:500px;
    }

    #demo{
      padding:20px;
      width:80%;
      margin:auto;
    }
    #mensaje{
      font-weight:bold;
    }
  </style>
  <script>
    tam=12;

    function Aumenta()
    {
      tam=tam+5;
      x=document.getElementById("demo");
      x.style.font=tam+"px Arial";
    }

    function Disminuye()
    {
      tam=tam-5;
      x=document.getElementById("demo");
      x.style.font=tam+"px Arial";
    }
  </script>
</html>
```



```
function ColorFondo()
{
nuevoColor=document.getElementById("Fondo").value;
x=document.getElementById("demo");
x.style.background=nuevoColor;
document.getElementById("mensaje").innerHTML="El color del fondo es "+nuevoColor;
}

function ColorTexto()
{
nuevoColor=document.getElementById("Texto").value;
x=document.getElementById("demo");
x.style.color=nuevoColor;
document.getElementById("mensaje").innerHTML="El color del texto es "+nuevoColor;
}
</script>

</head>
<body>

<h1>Changing font colors and size</h1>

<div id="demo">JavaScript can change the content of an HTML element.</div>

<div id="botones" >
<div id="mensaje">Choose your favorite color!</div>
<button type="button" onclick="Aumenta()">Aumenta</button>
<button type="button" onclick="Disminuye()">Disminuye</button>

Color del texto: <input type="color" onchange="ColorTexto()" id="Texto"/>
Color del fondo: <input type="color" onchange="ColorFondo()" id="Fondo"/>
</div>
</body>
</html>
```

## Exercise #6

```
<!DOCTYPE html>
<head>
<style>
.col
{background-color:silver;}
</style>
</head>
<html>
<body>

<p>Hello World!</p>
<p>The DOM is very useful!</p>
<p>This example demonstrates the <b>length</b> property.</p><div id="ss"></div>

<script>
x=document.getElementsByTagName("p");
resul=("<table border=1>");
for (i=0;i<x.length;i++)
{
resul=resul+("<tr><td class=col>");
resul=resul+("Párrafo "+i+"</td><td>");
```



```
    resul=resul+(x[i].innerHTML.length+"</td><td>");
    resul=resul+(x[i].innerHTML);
    resul=resul+("</td></tr>");

}
resul=resul+("</table>");
document.getElementById("ss").innerHTML=resul;

</script>
</body>
</html>
```