

Front End Development

Tom Owens



# Complex Data Types, Arrays and Loops

SESSION TYPE : LESSON

WBD4300

Arrays (indexed & associative)  
Loops (for each)

Definition of grids and their  
benefits.

Self Directed:  
Practice Array Iteration.

# Javascript: Arrays and Loops

## Indexed Arrays

Indexed arrays are used when you identify things by their position

## Associative Array

In computer science, an associative array, map, symbol table, or dictionary is an abstract data type composed of a collection of pairs, such that each possible key appears at most once in the collection.

## Loops

JavaScript loops are used to repeatedly run a block of code - until a certain condition is met. When developers talk about iteration or iterating over, say, an array, it is the same as looping.

## -Foreach

The `forEach()` method calls a provided function once for each element in an array, in order.



# Javascript: Arrays and Loops

An array is a special variable, which can hold more than one value at a time.

If you have a list of items (a list of car names, for example), storing the cars in single variables could look like this:

```
var car1 = "Saab";  
var car2 = "Volvo";  
var car3 = "BMW";
```

Spaces and line breaks are not important. A declaration can span multiple lines:

```
var cars = [  
    "Saab",  
    "Volvo",  
    "BMW"  
];
```



# Javascript: Arrays and Loops

Using the JavaScript Keyword **new**

```
var cars = new Array("Saab", "Volvo", "BMW");
```

There is no need to use `new Array()`.

For simplicity, readability and execution speed, use the first one (the array literal method

e.g: `var array_name = [item1, item2, ...];` ).

You refer to an array element by referring to the index number. This statement accesses the value of the first element in cars: `var name = cars[0];`

```
var cars = ["Saab", "Volvo", "BMW"];  
document.getElementById("demo").innerHTML = cars[0];
```

# Javascript: Arrays and Loops

Array Elements Can Be Objects

```
myArray[0] = Date.now;  
myArray[1] = myFunction;  
myArray[2] = myCars;
```

The length Property

The length property of an array returns the length of an array (the number of array elements).

```
var fruits = ["Banana", "Orange", "Apple", "Mango"];  
fruits.length;  
// the length of fruits is 4
```

# Javascript: Arrays and Loops

## Looping Array Elements

The best way to loop through an array, is using a "for" loop:

```
var fruits, text, fLen, i;
```

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

```
fLen = fruits.length;
```

```
text = "<ul>";
```

```
for (i = 0; i < fLen; i++) {  
    text += "<li>" + fruits[i] + "</li>";  
}
```

Let's dissect it.

# Javascript: Arrays and Loops

## Adding Array Elements

```
var fruits = ["Banana", "Orange", "Apple", "Mango"];  
fruits.push("Lemon");  
// adds a new element (Lemon) to fruits
```

## The Difference Between Arrays and Objects

In JavaScript, arrays use numbered indexes. In JavaScript, objects use named indexes.

Arrays are a special kind of objects, with numbered indexes.

You should use objects when you want the element names to be strings (text). You should use arrays when you want the element names to be numbers.



# Javascript: Arrays and Loops

## Avoid new Array()

There is no need to use the JavaScript's built-in array constructor `new Array()`.

Use `[]` instead.

## Converting Arrays to Strings

The JavaScript method `toString()` converts an array to a string of (comma separated) array values.

```
var fruits = ["Banana", "Orange", "Apple", "Mango"];  
document.getElementById("demo").innerHTML =  
fruits.toString();
```

Result → Banana,Orange,Apple,Mango

# Javascript: Arrays and Loops

The join() method also joins all array elements into a string.

```
var fruits = ["Banana", "Orange", "Apple", "Mango"];  
document.getElementById("demo").innerHTML =  
fruits.join(" * ");
```

Result

Banana \* Orange \* Apple \* Mango

Also

Pop()

Push()

Shift() // removes the first array element

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# The Definition of Grids

## The Definition of Grids

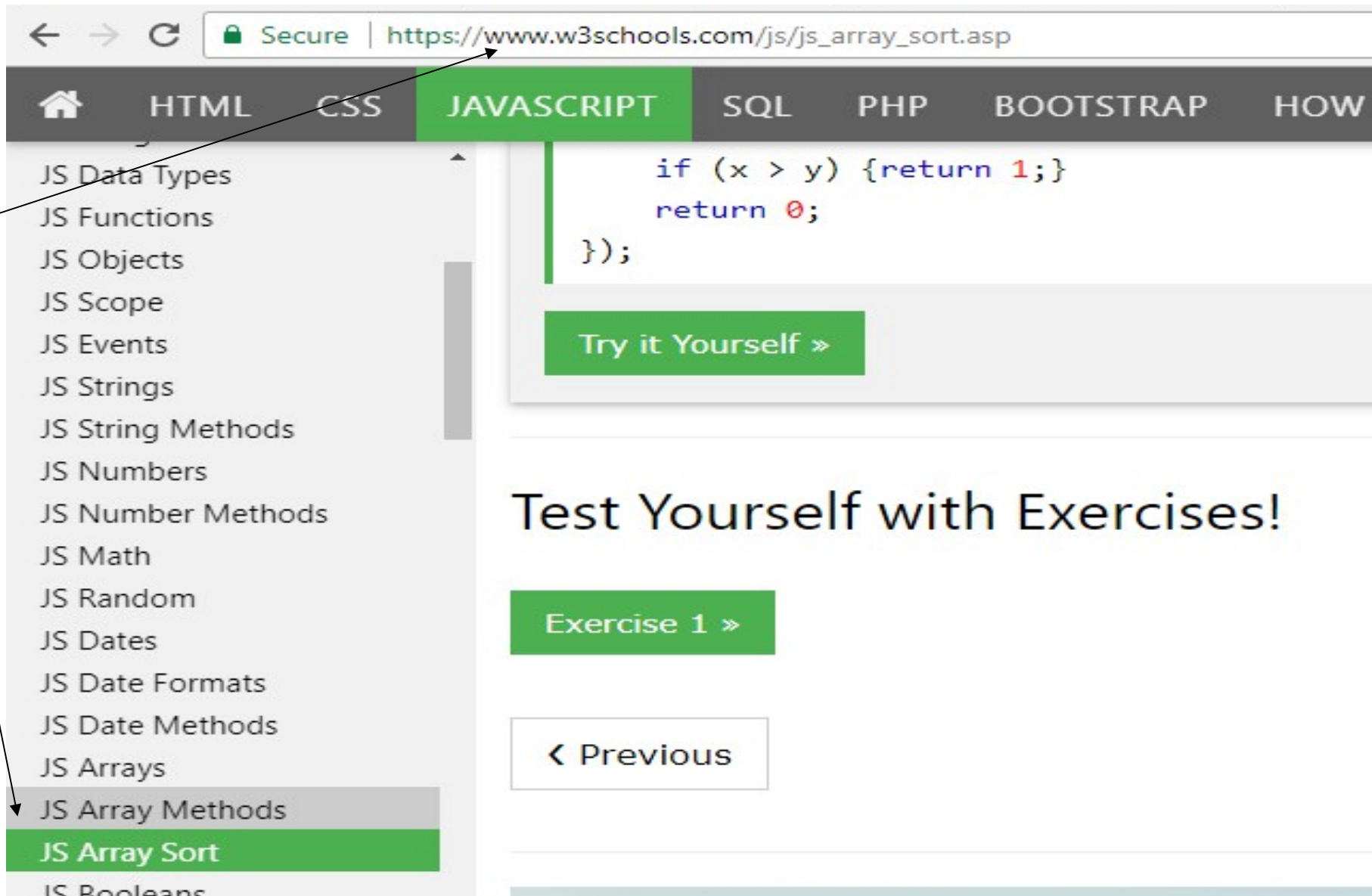
Many web pages are based on a grid-view, which means that the page is divided into columns:

## The Benefits of Grids

Using a grid-view is very helpful when designing web pages. It makes it easier to place elements on the page.

# Self Directed:

Practice Array Iteration



The screenshot shows a web browser window with the URL [https://www.w3schools.com/js/js\\_array\\_sort.asp](https://www.w3schools.com/js/js_array_sort.asp). The navigation menu includes Home, HTML, CSS, JAVASCRIPT (highlighted), SQL, PHP, BOOTSTRAP, and HOW. A dropdown menu under JAVASCRIPT lists various topics, with 'JS Array Sort' highlighted. The main content area displays a code snippet for a sorting function:

```
if (x > y) {return 1;}  
return 0;  
});
```

Below the code is a green button labeled 'Try it Yourself >'. Further down, the text 'Test Yourself with Exercises!' is displayed, followed by a green button 'Exercise 1 >' and a white button with a black border labeled '< Previous'. A logo for 'SAC INSTITUTE' is visible in the bottom left corner.

# Self Directed

I would like to give you small project brief based on what you have learnt. I will assist you throughout.

The Brief:

A 4 page website, including some of the sample exercises I have sent to you to combine into one project. Including;


A drop down menu using JS.

And Validated Form.....

# Self Directed

Here are some of the sample scripts I have sent to you. I would like for you to combine them in the project and see how you get on.

- Change Back ground
- Change\_img\_mouseover
- Form Validation Simple
- Javascript Form Validation.

 Change\_background

 Chang\_img\_mouseover


## Week 2

 javascript\_Events


 Mouseover\_Effect

 Custom\_Timer


 Progress\_Bar

 System\_Time

 Progress\_Bar\_2

 Progress\_Bar\_Moon\_landing\_Task

 Progress\_Bar\_Moon\_landing

 Drop\_down\_menu\_shopping\_cart

 Form\_validation\_simple

 Form\_validation\_advanced


 3\_Form\_validation\_js\_advanced\_2

 Image\_Zoom\_In\_Out

 Image\_opacity\_fadein\_fadeout

## Week 3

 javascript\_Form\_Validation

 System\_Time

 Custom\_Timer

 System\_Time\_Simple

## Week 4

 javascript\_Making\_Decisions

 javascript\_Arrays and Loops

 Making\_Decisions

 RollTheDice-v1

# Self Directed: The Brief

Using what you have learnt from the previous lesson on Functions and Validation;

Create a contact form with following the minimum requirements:

The form fields must consist of ;

- Name
- Email
- Confirmation Email Address,
- Phone Number

All fields must use JavaScript to check that they have been completed correctly.



# Self Directed : The Brief

If your feeling brave, you could include a **browser redirect**.

```
<script type="text/javascript">  
  if (screen.width <= 720) {  
    window.location = "mobile/index.html";  
  }  
</script>
```

Sometimes used when there is a separate mobile version of the website. It can also be used to reveal hidden content such a new menu triggered by the screen dimensions. The browser version can also be used. Be mindful of high resolution screen and retina displays that have a similar pixel count to PC monitors but on mobile devices such as iPhone.

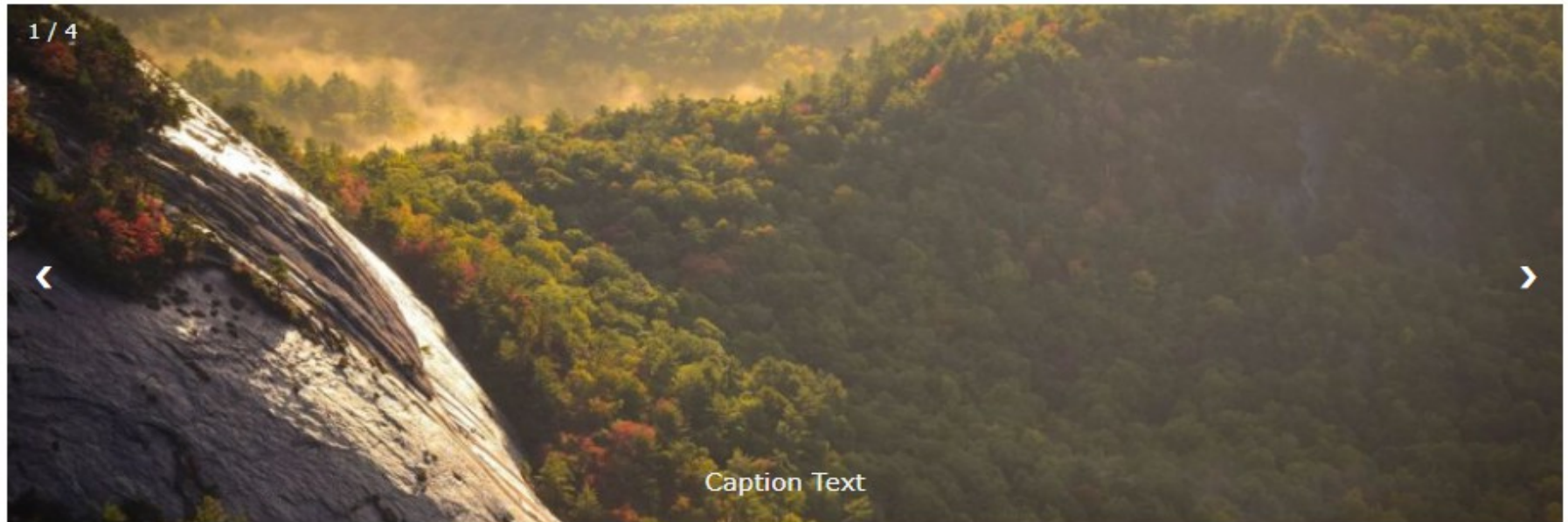
# Self Directed : The Brief

Like wise you might also attempt a Slide Show.

Used to carousel images in a show reel style. This is achievable with Javascript, CSS and HTML together.

## Slideshow / Carousel

A slideshow is used to cycle through elements:



# Self Directed : The Brief, Slide Show

```
<div class="mySlides fade"> <div class="numbertext">1 / 3</div>  
   <div class="text">Caption Text</div>  
</div>
```

```
<div class="mySlides fade"> <div class="numbertext">2 / 3</div>  <div class="text">Caption Two</div>  
</div>
```

```
<div class="mySlides fade"> <div class="numbertext">3 / 3</div>  <div class="text">Caption Three</div>  
</div>
```

```
<a class="prev" onclick="plusSlides(-1)">&#10094;</a><a class="next"  
onclick="plusSlides(1)">&#10095;</a> </div> <br>
```

```
<div style="text-align:center"> <span class="dot"  
onclick="currentSlide(1)"></span>  
<span class="dot" onclick="currentSlide(2)"></span> <span class="dot"  
onclick="currentSlide(3)"></span> </div>
```

[https://www.w3schools.com/howto/howto\\_js\\_slideshow.asp](https://www.w3schools.com/howto/howto_js_slideshow.asp)

# Self Directed : The Brief, Slide Show

```
/* Fading animation */  
.fade {  
  -webkit-animation-name: fade;  
  -webkit-animation-duration: 1.5s;  
  animation-name: fade;  
  animation-duration: 1.5s;  
}
```

```
@-webkit-keyframes fade {  
  from {opacity: .4}  
  to {opacity: 1}  
}
```

```
@keyframes fade {  
  from {opacity: .4}  
  to {opacity: 1}  
}
```

In addition to adding styles to the container and each div and element, the most important thing to note in the CSS is the webkit animation.

# Self Directed : The Brief, Slide Show

```
var slideIndex = 1;
showSlides(slideIndex);

// Next/previous controls
function plusSlides(n) {
  showSlides(slideIndex += n);
}

// Thumbnail image controls
function currentSlide(n) {
  showSlides(slideIndex = n);
}
```

The Javascript comprises functions  
And if control structures.

This can be largely copied and pasted from  
W3schools, provided you understand it in principal

```
function showSlides(n) {
  var i;
  var slides =
document.getElementsByClassName("mySlid
es");
  var dots =
document.getElementsByClassName("dot");
  if (n > slides.length) {slideIndex = 1}
  if (n < 1) {slideIndex = slides.length}
  for (i = 0; i < slides.length; i++) {
    slides[i].style.display = "none";
  }
  for (i = 0; i < dots.length; i++) {
    dots[i].className =
dots[i].className.replace(" active", "");
  }
  slides[slideIndex-1].style.display = "block";
  dots[slideIndex-1].className += " active";
}
```

# Going Forward

Penny from OSO will be sending a brief through to see how you get on. The poster competition.

Other guest speakers around Digital Marketing.

Adam Galloway (Launch Code, 25 under 25) and Stephen Reilly (Head of Digital Marketing, The Lead Agency).

