How to Manipulate Arrays in JavaScript

In this article, I would show you various methods of manipulating arrays in JavaScript

What are Arrays in JavaScript?

Before we proceed, you need to understand what arrays really mean.

In JavaScript, an array is a variable that is used to store different data types. It basically stores different elements in one box and can be later assesssed with the variable.
Declaring an array:

```
let myBox = [];     // Initial Array declaration in JS
```

Arrays can contain multiple data types

```
let myBox = ['hello', 1, 2, 3, true, 'hi'];
```

Arrays can be manipulated by using several actions known as **methods.** Some of these methods allow us to add, remove, modify and do lots more to arrays.
I would be showing you a few in this article, let's roll :)

*NB: I used **Arrow functions** in this post, If you don't know what this means, you should read here. Arrow function is an **ES6 feature**.*

toString()

The JavaScript method **toString()** converts an array to a string separated by a comma.

```
let colors = ['green', 'yellow', 'blue'];

console.log(colors.toString()); // green,yellow,blue
```

join()

The JavaScript **join()** method combines all array elements into a string.
It is similar to **toString()** method, but here you can specify the separator instead of the default comma.

```
let colors = ['green', 'yellow', 'blue'];

console.log(colors.join('-')); // green-yellow-blue
```

concat

This method combines two arrays together or add more items to an array and then return a new array.

```
let firstNumbers = [1, 2, 3];
let secondNumbers = [4, 5, 6];
let merged = firstNumbers.concat(secondNumbers);
console.log(merged); // [1, 2, 3, 4, 5, 6]
```

push()

This method adds items to the end of an array and **changes** the original array.

```
let browsers = ['chrome', 'firefox', 'edge'];
browsers.push('safari', 'opera mini');
console.log(browsers);
// ["chrome", "firefox", "edge", "safari", "opera mini"]
```

pop()

This method removes the last item of an array and **returns** it.

```
let browsers = ['chrome', 'firefox', 'edge'];
browsers.pop(); // "edge"
console.log(browsers); // ["chrome", "firefox"]
```

shift()

This method removes the first item of an array and **returns** it.

```
let browsers = ['chrome', 'firefox', 'edge'];
browsers.shift(); // "chrome"
console.log(browsers); // ["firefox", "edge"]
```

unshift()

This method adds an item(s) to the beginning of an array and **changes** the original array.

```
let browsers = ['chrome', 'firefox', 'edge'];
browsers.unshift('safari');
console.log(browsers); // ["safari", "chrome", "firefox", "edge"]
```

You can also add multiple items at once

splice()

This method **changes** an array, by adding, removing and inserting elements.
The syntax is:

```
array.splice(index[, deleteCount, element1, ..., elementN])
```

- **Index** here is the starting point for removing elements in the array
- **deleteCount** is the number of elements to be deleted from that index
- **element1, …, elementN** is the element(s) to be added

Removing items

*after running **splice()** , it returns the array with the item(s) removed and removes it from the original array.*

```
let colors = ['green', 'yellow', 'blue', 'purple'];
colors.splice(0, 3);
console.log(colors); // ["purple"]
// deletes ["green", "yellow", "blue"]
```

***NB**: The deleteCount does not include the last index in range.*

If the second parameter is not declared, every element starting from the given index will be removed from the array:

```
let colors = ['green', 'yellow', 'blue', 'purple'];
colors.splice(3);
console.log(colors); // ["green", "yellow", "blue"]
// deletes ['purple']
```

In the next example we will remove 3 elements from the array and replace them with more items:

```
let schedule = ['I', 'have', 'a', 'meeting', 'tommorrow'];
// removes 4 first elements and replace them with another
schedule.splice(0, 4, 'we', 'are', 'going', 'to', 'swim');
console.log(schedule);
// ["we", "are", "going", "to", "swim", "tommorrow"]
```

Adding items

To add items, we need to set the **deleteCount** to zero

```
let schedule = ['I', 'have', 'a', 'meeting', 'with'];
// adds 3 new elements to the array
schedule.splice(5, 0, 'some', 'clients', 'tommorrow');
console.log(schedule);
// ["I", "have", "a", "meeting", "with", "some", "clients", "tommorrow"]
```

slice()

This method is similar to ***splice()*** *but very different. It returns subarrays instead of substrings.*

This method **copies** a given part of an array and returns that copied part as a new array. **It does not change the original array.**

The syntax is:

array.slice(start, end)

Here’s a basic example:

```
let numbers = [1, 2, 3, 4]
numbers.slice(0, 3)
// returns [1, 2, 3]
console.log(numbers) // returns the original array
```

The best way to use **slice()** is to assign it to a new variable.

```
let message = 'congratulations'
```

```
const abbrv = message.slice(0, 7) + 's!';
console.log(abbrv) // returns "congrats!"
```

split()

This method is used for **strings**. It divides a string into substrings and returns them as an array.
Here’s the syntax:string.split(separator, limit);

- The **separator** here defines how to split a string either by a comma.
- The **limit** determines the number of splits to be carried out

```
let firstName = 'Bolaji';
// return the string as an array
firstName.split() // ["Bolaji"]
```

another example:

```
let firstName = 'hello, my name is bolaji, I am a dev.';
firstName.split(',', 2); // ["hello", " my name is bolaji"]
```

NB: *If we declare an empty array, like this firstName.split(''); then each item in the string will be divided as substrings:*

```
let firstName = 'Bolaji';
firstName.split('') // ["B", "o", "l", "a", "j", "i"]
```

indexOf()

This method looks for an item in an array and returns **the index** where it was found else it returns **-1**

```
let fruits = ['apple', 'orange', false, 3]
fruits.indexOf('orange'); // returns 1
fruits.indexOf(3); // returns 3
friuts.indexOf(null); // returns -1 (not found)
```

lastIndexOf()

This method works the same way **indexOf()** does except that it works from right to left. It returns the last index where the item was found

```
let fruits = ['apple', 'orange', false, 3, 'apple']
fruits.lastIndexOf('apple'); // returns 4
```

filter()

This method creates a new array if the items of an array pass a certain condition.

The syntax is:

```
let results = array.filter(function(item, index, array) {
  // returns true if the item passes the filter
});
```

Example:

Checks users from Nigeria

```
const countryCode = ['+234', '+144', '+233', '+234'];
const nigerian = countryCode.filter( code => code === '+234');
console.log(nigerian); // ["+234", "+234"]
```

map()

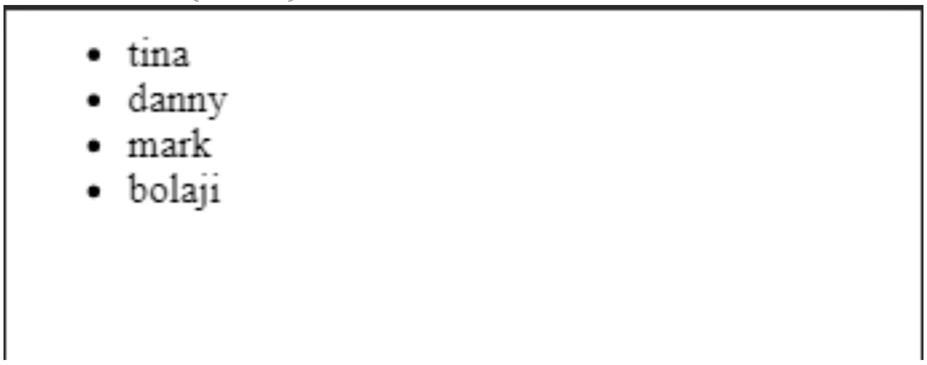
This method creates a new array by manipulating the values in an array.

Example:

Displays usernames on a page. (Basic friend list display)

```
const userNames = ['tina', 'danny', 'mark', 'bolaji'];
const display = userNames.map(item => {
```

```
return '<li>' + item + '</li>';
})
const render = '<ul>' + display.join('') + '</ul>';
document.write(render);
```



- tina
- danny
- mark
- bolaji

another example:

```
// adds dollar sign to numbers
const numbers = [10, 3, 4, 6];
const dollars = numbers.map( number => '$' + number);
console.log(dollars);
// ['$10', '$3', '$4', '$6'];
```

reduce()

This method is good for calculating totals.

reduce() is used to calculate a single value based on an array.

```
let value = array.reduce(function(previousValue, item, index, array) {
  // ...
}, initial);
```

example:

To loop through an array and sum all numbers in the array up, we can use the for of loop.

```
const numbers = [100, 300, 500, 70];
let sum = 0;
for (let n of numbers) {
sum += n;
}
console.log(sum);
```

Here's how to do same with **reduce()**

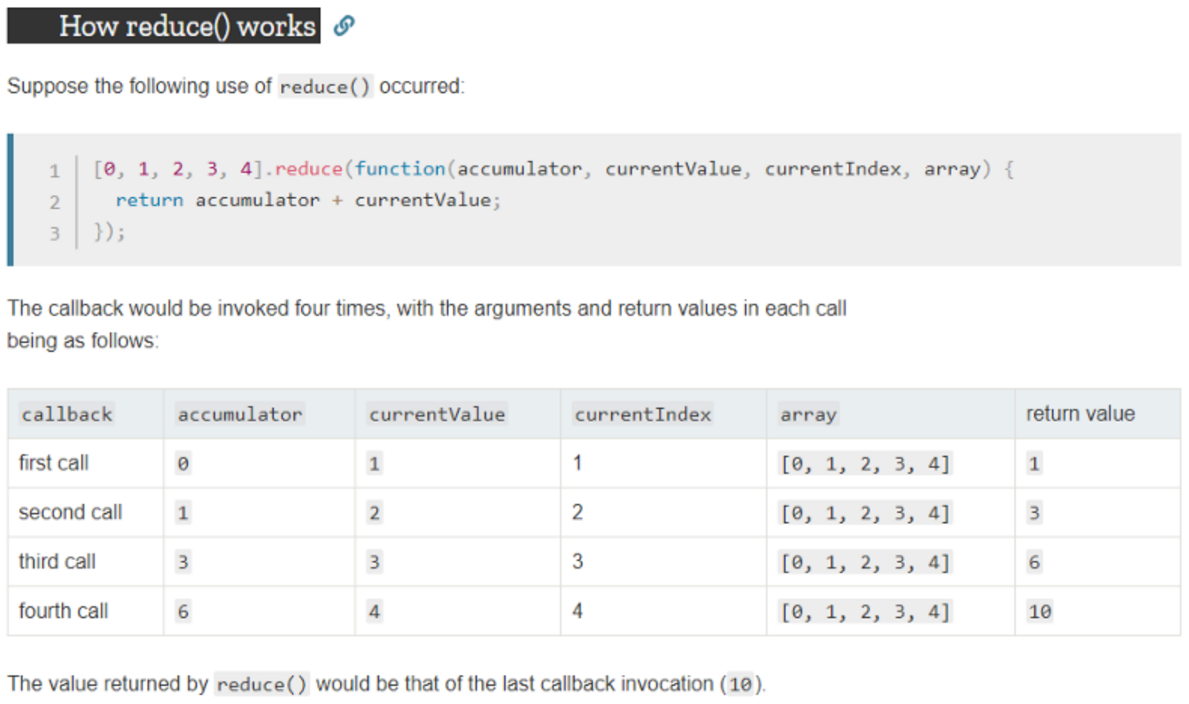
```
const numbers = [100, 300, 500, 70];
const sum = numbers.reduce((accummulator, value) =>
accummulator + value
, 0);
console.log(sum); // 970
```

If you omit the initial value, the total will by default start from the first item in the array.

```
const numbers = [100, 300, 500, 70];
const sum = numbers.reduce((accummulator, value) => accummulator + value);
console.log(sum); // still returns 970
```

The snippet below shows how the **reduce()** method works with all four arguments.

source: MDN Docs



How reduce() works

Suppose the following use of `reduce()` occurred:

```
[0, 1, 2, 3, 4].reduce(function(accumulator, currentValue, currentIndex, array) {
  return accumulator + currentValue;
});
```

The callback would be invoked four times, with the arguments and return values in each call being as follows:

`callback`	`accumulator`	`currentValue`	`currentIndex`	`array`	return value
first call	`0`	`1`	1	`[0, 1, 2, 3, 4]`	`1`
second call	`1`	`2`	2	`[0, 1, 2, 3, 4]`	`3`
third call	`3`	`3`	3	`[0, 1, 2, 3, 4]`	`6`
fourth call	`6`	`4`	4	`[0, 1, 2, 3, 4]`	`10`

The value returned by `reduce()` would be that of the last callback invocation (`10`).

More insights into the **reduce()** method and various ways of using it can be found here and here.

forEach()

This method is good for iterating through an array.

It applies a function on all items in an array

```
const colors = ['green', 'yellow', 'blue'];
colors.forEach((item, index) => console.log(index, item));
// returns the index and the every item in the array
// 0 "green"
// 1 "yellow"
// 2 "blue"
```

iteration can be done without passing the index argument

```
const colors = ['green', 'yellow', 'blue'];
colors.forEach((item) => console.log(item));
// returns every item in the array
// "green"
// "yellow"
// "blue"
```

every()

This method checks if all items in an array pass the specified condition and return**true** if passed, else **false.**

check if all numbers are positive

```
const numbers = [1, -1, 2, 3];
let allPositive = numbers.every((value) => {
return value >= 0;
})
console.log(allPositive); // would return false
```

some()

This method checks if an item (one or more) in an array pass the specified condition and return true if passed, else false.

checks if at least one number is positive

```
const numbers = [1, -1, 2, 3];

let atLeastOnePositive = numbers.some((value) => {

return value >= 0;

})

console.log(atLeastOnePositive); // would return true
```

includes()

This method checks if an array contains a certain item. It is similar to **.some()**, but instead of looking for a specific condition to pass, it checks if the array contains a specific item.

```
let users = ['paddy', 'zaddy', 'faddy', 'baddy'];

users.includes('baddy'); // returns true
```

If the item is not found, it returns **false**

There are more array methods, this is just a few of them. Also, there are tons of other actions that can be performed on arrays, try checking MDN docs herefor deeper insights.

Summary

- **toString()** converts an array to a string separated by a comma.
- **join()** combines all array elements into a string.
- **concat** combines two arrays together or add more items to an array and then return a new array.
- **push()** adds item(s) to the end of an array and **changes** the original array.
- **pop()** removes the last item of an array and **returns** it
- **shift()** removes the first item of an array and **returns** it
- **unshift()** adds an item(s) to the beginning of an array and **changes** the original array.
- **splice()** c**hanges** an array, by adding, removing and inserting elements.
- **slice()** copies a given part of an array and returns that copied part as a new array. **It does not change the original array.**
- **split()** divides a string into substrings and returns them as an array.
- **indexOf()** looks for an item in an array and returns **the index** where it was found else it returns -1
- **lastIndexOf()** looks for an item from right to left and returns the last index where the item was found.
- **filter()** creates a new array if the items of an array pass a certain condition.
- **map()** creates a new array by manipulating the values in an array.
- **reduce()** calculates a single value based on an array.
- **forEach()** iterates through an array, it applies a function on all items in an array
- **every()** checks if all items in an array pass the specified condition and return true if passed, else false.
- **some()** checks if an item (one or more) in an array pass the specified condition and return true if passed, else false.
- **includes()** checks if an array contains a certain item.