



Fullstack Web Development Tutorial Lesson 7

Today's lesson will cover

- **Methods of primitives**
- **Strings**
- **Arrays**



JavaScript fundamentals

Methods of primitives

- JavaScript allows us to work with primitives (strings, numbers, etc.) as if they were objects
- The “object wrappers” are different for each primitive type and are called: `String`, `Number`, `Boolean` and `Symbol`. Thus, they provide different sets of methods.
 - Refer to MDN for each of their methods whenever needed for anything you are working on

Strings

- Single and double quotes are essentially the same. Backticks, however, allow us to embed any expression into the string, by wrapping it in `$ { ... }`
- `str.length` provides length as a numeric property
- `toLowerCase()` or `toUpperCase()` is used to change case
- Searching for substring is possible in different ways:
 - Modern methods:
 - `str.includes()`
 - `str.startsWith()`
 - `str.endsWith()`

<u>Special Characters</u>	
Character	Description
<code>\n</code>	New line
<code>\r</code>	Carriage return: not used alone. Windows text files use a combination of two characters <code>\r\n</code> to represent a line break.
<code>\', \"</code>	Quotes
<code>\\</code>	Backslash
<code>\t</code>	Tab
<code>\b, \f, \v</code>	Backspace, Form Feed, Vertical Tab – kept for compatibility, not used nowadays.

Exercise

- Prompt for an email Subject
- Write a function checkSpam()
 - It can convert messages to all lowercase no matter if the letters are uppercase, lowercase or mixed cases
 - Checks if message subject includes spam words such "million" or "virus"
 - Outputs "It is a spam" if mail subject contains spam words, otherwise it returns "Here is your mail"
- Show the output message on alert window

Arrays

- Objects are not handy to work in case of ordered collection
 - No way to insert properties in between existing ones
- Array is the special data structure to store ordered collections
- Syntax
 - `let arr = new Array();` // Good to know but rarely used
 - `let arr = [];`
- Array elements are numbered, starting with zero
- You can replace, add, count or do any modifications to arrays
- Arrays can store any elements, including objects or functions
- **Length property** automatically updates when array is modified. To be precise, it is actually not the count of values in the array, but the greatest numeric index plus one.

Array Methods: pop/push, shift/unshift

- Array supports both operations of **queue**, which in computer science means an ordered collections of elements which supports:
 - `push` appends an element to the end.
 - `shift` get an element from the beginning, advancing the queue, so that the 2nd element becomes the 1st.
- Another use case of arrays is with the data structure named stack. It supports two operations:
 - `push` adds an element to the end.
 - `pop` takes an element from the end
 - So new elements are added or taken always from the “end”
- Arrays in JavaScript can work both as a queue and as a stack. They allow you to add/remove elements both to/from the beginning or the end.
 - In computer science the data structure that allows this, is called **deque**.
- Methods that work with the end of array: `pop` and `push`
- Methods that work with the beginning of the array: `shift` and `unshift`
- Array is a special kind of object. The square brackets used to access a property `arr[0]` actually come from the object syntax. That's essentially the same as `obj[key]`, where `arr` is the object, while numbers are used as keys.

Exercise

- Create an array `genre` with items “Jazz” and “Blues”.
- Append “Rock-n-Roll” to the end.
- Replace the value in the middle (Calculate the middle number by math operations instead of hard coding) by “Classics”. Hint: You can use `Math.floor` alongside your calculation to find the target index value
- Strip off the first value of the array and so that “Classics” becomes the first value in the new array.
- Prepend `Rap` and `Reggae` to the array.
- Output the array changes in every steps on the console and it should look like this:

```
o   Jazz, Blues
```

```
Jazz, Blues, Rock-n-Roll
```

```
Jazz, Classics, Rock-n-Roll
```

```
Classics, Rock-n-Roll
```

```
Rap, Reggae, Classics, Rock-n-Roll
```

Loops in Arrays

- for loop works to loop over indexes
- for..of is meant for looping through arrays
- Possible to use for..in but with potential problems
 - for..in is optimized for generic objects, not arrays
 - Generally, shouldn't use for..in for arrays

Multidimensional Array

- Multidimensional arrays aren't supported in Javascript natively
- Arrays can have items that are also arrays. We can use it for multidimensional arrays, for example to store matrices

Exercise

- Write a function `findSum()` that:
 - Keeps asking the user for values using `prompt` and stores the values in the `numbers` array.
 - P.S. A zero `0` is a valid number. Don't stop the input on zero
 - Finishes asking when the user enters a non-numeric value, an empty string, or presses "Cancel".
 - Calculates and returns the sum of array items.
- Show the sum of array values on alert window

Summary

- Array is a special kind of object, suited to storing and managing ordered data items.
- The `length` property is the array length or, to be precise, its last numeric index plus one. It is auto-adjusted by array methods.
 - If we shorten `length` manually, the array is truncated.
- We can use an array as a deque with the following operations:
 - `push(...items)` adds `items` to the end.
 - `pop()` removes the element from the end and returns it.
 - `shift()` removes the element from the beginning and returns it.
 - `unshift(...items)` adds `items` to the beginning.
- To loop over the elements of the array:
 - `for (let i=0; i<arr.length; i++)` – works fastest, old-browser-compatible.
 - `for (let item of arr)` – the modern syntax for items only,
 - `for (let i in arr)` – never use.



Self Study Assignments

To Dos

- Continue freecodecamp Javascript. Ideally finish before we resume after summer.
- Continue with FCC HTML, CSS lessons. Ideally finish all the lessons by end of this month.
- If you need help pushing your HTML CSS project on Github and using [Github pages](#) let me know right away.