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BEIJING NORMAL UNIVERSITY · HONG KONG BAPTIST UNIVERSITY
UNITED INTERNATIONAL COLLEGE

Java Script
6A Arrays

Systems and Web Development Workshop
2025 Spring

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Test 1

- Test 1 will be held this week during lab.
- People who cannot take Test 1 as scheduled for your section must have valid reasons.
  - Need to get permission form from CST office (T3-602)
- The test
  - Covers everything up to and including material covered this week
  - Is a written test 1:50 long; bring a pen or two; we will provide scratch papers
  - Is closed book; no books, notes or electronic devices allowed
  - Questions will be multiple choice, short answers and writing code fragments
  - Venue will be announce in iSpace and WeCom

JavaScript Arrays

Just like C

- https://www.w3schools.com/js/js_arrays.asp (in English)
- https://www.w3ccoo.com/js/js_arrays.asp
- https://www.w3schools.cn/js/js_arrays.asp (in Chinese)

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

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

- Using an array is more efficient.
- An array is a special variable, which can hold more than one value at a time.
- Array in JavaScript is very similar to array in C.

Creating an Array

- Using an **array literal** is the easiest way to create a JavaScript Array.

Syntax

```
var array_name = [item1, item2, ...];
```

Example

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

- A declaration can span multiple lines.
- The two declarations at the right are the same.

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

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

- Should **not** use “new” as in the declaration at left.
- The two declarations above are considered better.

Creating an Array

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

<h2>JavaScript Arrays</h2>

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

<script>
var cars = ["Saab", "Volvo", "BMW"];
document.getElementById("demo").innerHTML = cars;
</script>

</body>
</html>
```

JavaScript Arrays

Saab,Volvo,BMW

Try It Yourself sample code array1.html or www.w3schools.cn/js/js_arrays.asp

Accessing an Array

Just like C

- We can access an array element by referring to the **index number**.
- Accessing element zero in cars: `var name = cars[0];`
- This statement modifies the element 1 in cars: `cars[1] = “Opel”;`

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

- This writes out _____

Try it Yourself sample code array1.html or

www.w3schools.com/js/js_arrays.asp

The length Property

- The length property of an array returns the number of elements in the array.

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

- The index for fruits[] is 0, 1, 2, 3.
  - fruits.length is one higher than the highest index.
- arrayName.length is useful in for-loop

```
For (i = 0; i < arrayName.length; i++) {...}
```

Sample code arrayLength.html

Looping Array Elements

- Looping through an array with 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>";
}
text +="</ul>";
```

- Banana
- Orange
- Apple
- Mango

Try it Yourself sample code arrayLoop.html or

https://www.w3schools.com/js/tryit.asp?filename=tryjs_array_loop

Adding Array Elements (Pushing)

- The easiest way to add a new element to an array is using the **push** method:

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

- Can also add a new element by using the length property:

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

Try It Yourself sample code arrayPush.html or

www.w3schools.com/js/js_array_methods.asp

Removing Array Elements (Popping)

- The **pop()** method removes the array's last element.

```
var fruits =
["Banana", "Orange", "Apple", "Mango"];
// write original fruits

fruits.pop(); // Removes the last
element ("Mango") from fruits
// write fruits after pop
```

Original fruits:

Banana,Orange,Apple,Mango

After pop:

Banana,Orange,Apple

pop.html
www.w3schools.com/js/js_array_methods.asp

Removing Array Elements (Popping)

- The **pop()** method removes the array's last element.
- The **pop()** method also returns the value that was "popped out":

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

var x = fruits.pop();
// the value of x is "Mango"
```

Original fruits:

Banana,Orange,Apple,Mango

fruits.pop() returns the popped element

Mango

Current fruits:

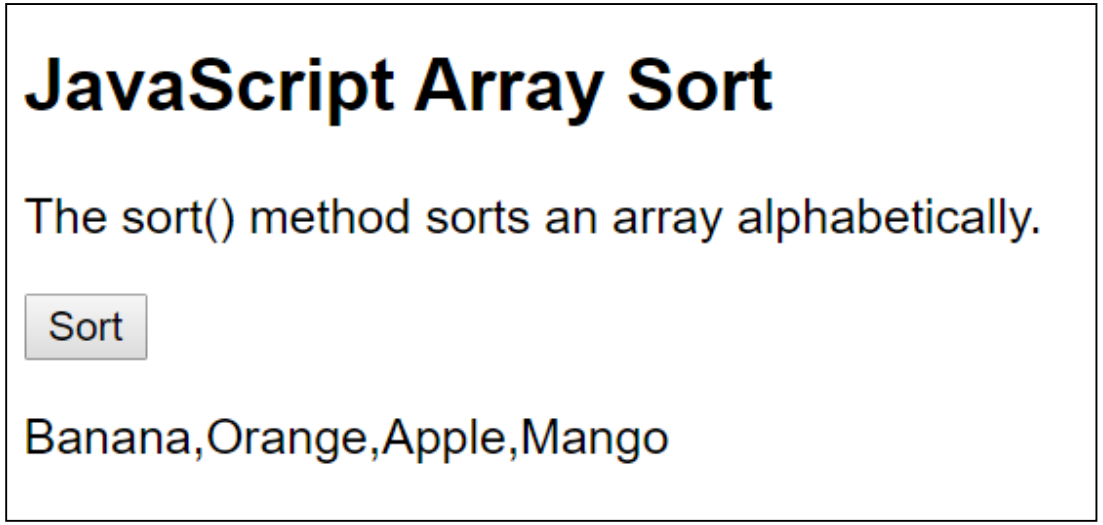
Banana,Orange,Apple

Try It Yourself sample popOut.html or
www.w3schools.com/js/js_array_methods.asp

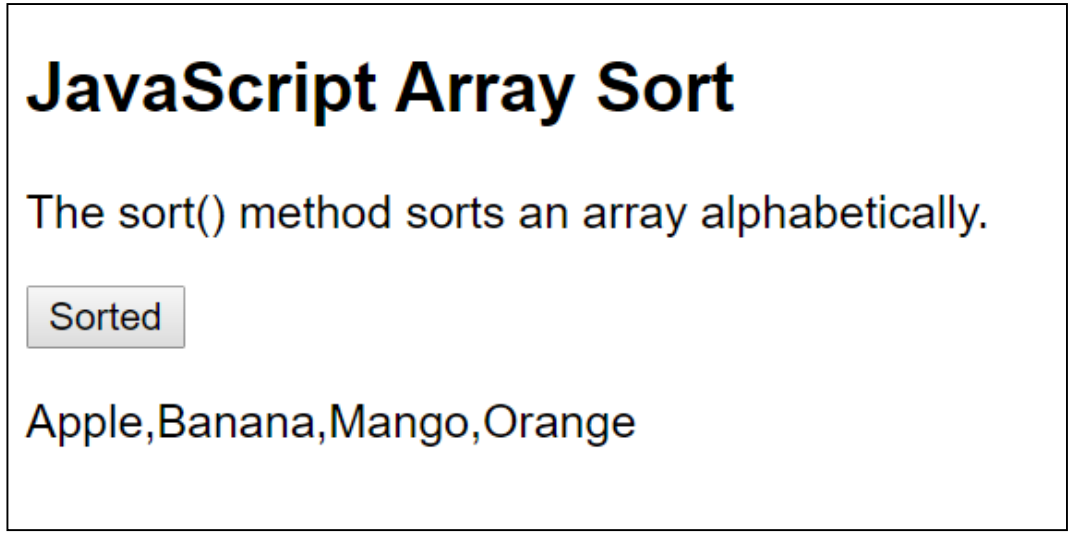
Sorting an Array

- The **sort**() method sorts an array alphabetically:

```
var fruits = ["Banana", "Orange", "Apple", "Mango"];
fruits.sort();          // Sorts the elements of fruits
```



Before sorting



After sorting

arraySort.html and www.w3schools.com/js/js_array_sort.asp

Sorting an Array

- Sort an array in descending order – use reverse() method.
  - Change fruits.sort() to fruits.reverse()

```
fruits.reverse();      // Reverses the order of the elements
```

- Output becomes

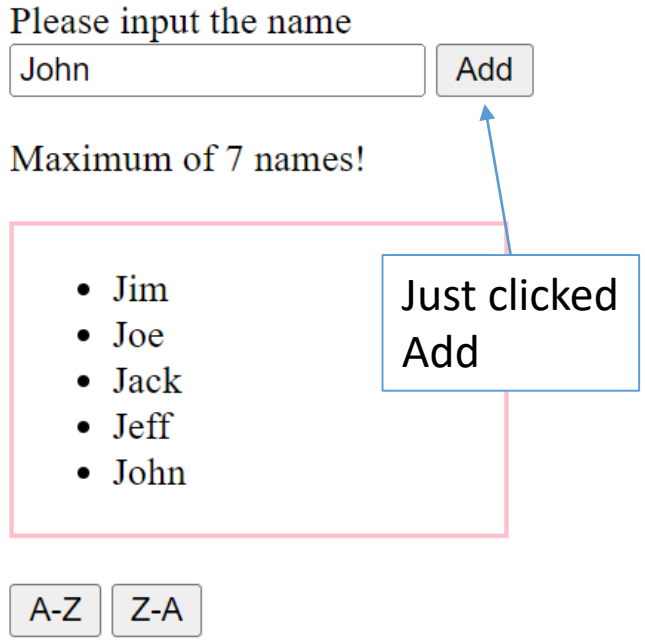
Orange, Mango, Banana, Apple

arraySort.html and www.w3schools.com/js/js_array_sort.asp

Class Exercise: Array1.html

Create array1.html to

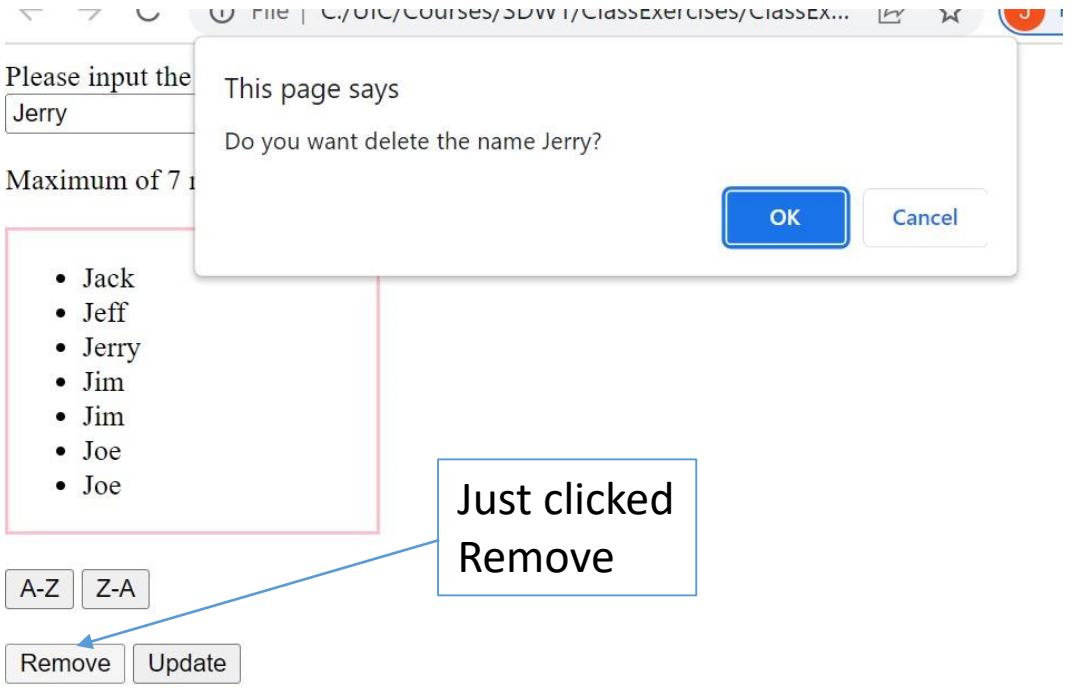
- Create a list of names in an array
  - When the Add button is clicked, the name in the input box is added to the array.
  - Display the names in a bordered box.
- Add two buttons A-Z and Z-A
  - When A-Z is clicked, the list is shown in alphabetical order from A to Z.
  - When Z-A is clicked, the list is shown in reverse alphabetical order from Z to A.
- See 6a_Array1_Start.html to help you get started.



Class Exercise: Array2.html (optional)

Create array2.html by adding to array1.html

- Remove button
  - When Remove is clicked, a confirm box would ask if the name in the input box should be removed.
  - If OK is clicked, the name is removed from the array.



- Update button
  - When pressed, search for the name in the input box and allow the user to update the name in the list.
- Hint: Look up the JS Array method splice()

Heads-up

- Assignment 2 will be released in Week 7.
  - Due before the end of Reading Week.
- Pay attention for announcements in WeChat and iSpace, and of course, in class.