Array.prototype.filter()

Summary: in this tutorial, you will learn how to use the JavaScript Array `filter()` method to filter elements in an array.

Introduction to JavaScript Array filter() method

The `filter()` method creates a new array with elements from the original array, which passes a test function.

Here's the syntax of the `filter()` method:

```
const newArray = array.filter(callbackFn, thisArg);
```

In this syntax:

- `callbackFn` is a function that the `filter()` method executes for each element of the `array` .

The `callbackFn` has the following form:

```
function callback(currentElement, index, array) {
   // ...
}
```

The `callback` function takes three arguments:

- The `currentElement` is the current element in the `array` that is being processed by the `callbackFn` function.
- The `index` is the index of the `currentElement` .
- The `array` object being processed.

The `index` and `array` arguments are optional.

- The `thisArg` argument is optional. It is referenced as `this` inside the `callbackFn` function.

If the `callbackFn` function returns true, the `filter()` function includes the elements in the result array.

One tip to remember this rule is to look at the **F**il**t**er method: Filter keeps true (letters **F** and **t**).

JavaScript Array filter() method examples

Let's take some examples of using the `filter()` method.

1) Basic JavaScript array filter() example

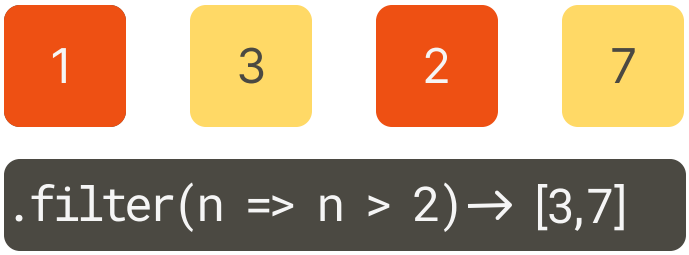
The following example uses the `filter()` method to return an array of numbers that are greater than 2:

```
const numbers = [1, 3, 2, 7];
const results = numbers.filter((n) => n > 2);

console.log({ results });
```

Output:

```
{ results: [ 3, 7 ] }
```



How it works.

First, define an array of numbers:

```
const numbers = [1, 3, 2, 7];
```

Second, use the `filter()` method to return an array of numbers that are greater than 2:

```
const results = numbers.filter((n) => n > 2);
```

The filter() method executes the following callback function for each number in the `numbers` array:

```
(n) => n > 2
```

- n = 1: the callback function returns false. The `filter()` method does not include the number `1` in the result array.
- n = 3: the callback function also returns true. The `filter()` method includes the number `3` in the result array.
- n = 2: the callback function also returns false. The `filter()` method does not include the number `2` in the result array.
- n = 7: the callback function also returns true. The `filter()` method includes the number `7` in the result array.

As a result, the `filter()` method returns an array that includes two numbers `3` and `7` .

```
{ results: [ 3, 7 ] }
```

2) Using the filter() method with an array objects

The following example uses the `filter()` method returns an array of cities that have a population greater than 3 million:

```
const cities = [
  { name: 'Los Angeles', population: 3_792_621 },
  { name: 'New York', population: 8_175_133 },
  { name: 'Chicago', population: 2_695_598 },
  { name: 'Houston', population: 2_099_451 },
  { name: 'Philadelphia', population: 1_526_006 },
```

```
];

const bigCities = cities.filter((city) => city.population > 3_000_000);

console.log(bigCities);
```

Output:

```
[
  { name: 'Los Angeles', population: 3792621 },
  { name: 'New York', population: 8175133 }
]
```

3) Chaining the filter() method with other array methods

Since the `filter()` method returns a new array, you can chain its result (which is an array) with other array methods such as `sort()`, `map()`, and `forEach()`.

For example, the following shows how to chain three array methods: `filter()`, `map()`, and `forEach()`:

```
const cities = [
  { name: 'Los Angeles', population: 3_792_621 },
  { name: 'New York', population: 8_175_133 },
  { name: 'Chicago', population: 2_695_598 },
  { name: 'Houston', population: 2_099_451 },
  { name: 'Philadelphia', population: 1_526_006 },
];

cities
  .filter((c) => c.population < 3_000_000)
  .map((c) => c.name)
  .forEach((c) => console.log(c));
```

Output:

```
Chicago
Houston
Philadelphia
```

How it works.

First, filter the cities whose populations are less than 3 million using the `filter()` method.

Second, returns a new array of city names using the `map()` method.

Third, display each city name in the console using the `forEach()` method.

4) Using the thisArg argument

The following example shows how to use the `filter()` method with the `thisArg` argument:

```
function isInRange(value) {
  if (typeof value !== 'number') {
    return false;
  }
  return value >= this.lower && value <= this.upper;
}

let range = {
  lower: 1,
  upper: 10,
};

let data = [10, 20, '30', 1, 5, 'JS', undefined];

let results = data.filter(isInRange, range);

console.log({ results });
```

Output:

```
{ results: [ 10, 1, 5 ] }
```

How it works.

First, define the `isInRange()` function that checks if its argument is a number and in the range specified by the `lower` and `upper` properties of an object (`this`):

```
function isInRange(value) {
  if (typeof value !== 'number') {
    return false;
  }
  return value >= this.lower && value <= this.upper;
}
```

Next, define the `range` object with two properties `lower` and `upper` :

```
let range = {
  lower: 1,
  upper: 10,
};
```

Then, define an array of mixed data that contains numbers, strings, and undefined:

```
let data = [10, 20, '30', 1, 5, 'JS', undefined];
```

After that, call the `filter()` methods of the `data` array and pass in the `isInRange()` function and the `range` object. Because we pass in the `range` object, inside the `isInRange()` function, the `this` keyword references to the `range` object:

```
let results = data.filter(isInRange, range);
```

Finally, show the result array in the console:

```
console.log({ results });
```

Summary

- Remember the rule: **F**il**t**er keeps true.
- Use the array `filter()` method to return an array of elements that pass a test function.