

Module 3 - Lecture 7

JavaScript Functions



Named Functions



Named Function

- camelCase naming convention
- No return type
- No data types on parameters
- Returning a value is optional

```
function multiplyBy(multiplicand, multiplier) {  
    let result = multiplicand * multiplier;  
  
    return result;  
}
```

The diagram highlights the function syntax with annotations:

- Name:** A blue box around `multiplyBy` with a blue arrow pointing to it from the label "Name".
- Parameters:** A green box around `(multiplicand, multiplier)` with a green arrow pointing to it from the label "Parameters".



Parameters

- When calling a function, supplying parameter values is optional.
 - They will default to undefined if not supplied.

```
function multiplyBy(multiplicand, multiplier) {  
  let result = multiplicand * multiplier;  
  
  return result;  
}
```

```
multiplyBy()
```



Default Parameters

- I can supply default values for parameters.
 - The default value will be used if a value is not supplied by the caller.

```
function multiplyBy(multiplicand = 0, multiplier = 0) {  
  let result = multiplicand * multiplier;  
  
  return result;  
}
```



An unknown number of parameters

- When I call a function, parameters values that I pass are stored in **an array-like object named arguments**.

```
function concatAll() { // No parameters defined, but we still might get some
  let result = '';
  for(let i = 0; i < arguments.length; i++) {
    result += arguments[i];
  }
  return result;
}
```



An unknown number of parameters

- I can also write a function that accepts a variable number of parameters. JavaScript will store these in an array. This is called rest parameter syntax.

```
1  function myFun(a, b, ...manyMoreArgs) {
2      console.log("a", a)
3      console.log("b", b)
4      console.log("manyMoreArgs", manyMoreArgs)
5  }
6
7  myFun("one", "two", "three", "four", "five", "six")
8
9  // Console Output:
10 // a, one
11 // b, two
12 // manyMoreArgs, ["three", "four", "five", "six"]
```

Question:

If a parameter's value is modified within a function, does that modification persist when I return from that function?

Answer:

It depends on the data type of the parameter.



Changes to object parameters will persist.

This includes:

- Object
- Arrays
- Date
- and more

```
function willObjectChange(arr, obj) {  
  arr.push(5);           // add 5  
  obj.firstName = 'Bob'; // Change firstName  
}
```

```
let a = [2, 3]; // array with two elements
```

```
let b = {           // object with one property  
  firstName: 'Walt'  
};
```

```
willObjectChange(a, b);
```

```
console.log(a);  
console.log(b);
```

```
► (3) [2, 3, 5]
```

```
► {firstName: "Bob"}
```

Changes to more primitive types will not.

This includes:

- Number
- String
- Boolean

```
function willPrimitiveChange(num, str, bool) {  
  num = num + 5;           // add 5  
  str = str + ' Changed!'; // concatenate ' Changed!'  
  bool = !bool;            // flip it to the opposite  
}
```

```
let a = 1;  
let b = 'Test';  
let c = true;
```

```
willPrimitiveChange(a, b, c);
```

```
console.log(a);  
console.log(b);  
console.log(c);
```

```
1
```

```
Test
```

```
true
```

Anonymous Functions & Arrow Functions



```
function (a, b) {  
  return a * b;  
}
```

```
(a, b) => {  
  return a * b;  
}
```



Traditional Functions vs Arrow Functions

```
1 // Traditional Function
2 function (a){
3     return a + 100;
4 }
5
6 // Arrow Function Break Down
7
8 // 1. Remove the word "function" and place arrow between the argument and opening body
9 (a) => {
10     return a + 100;
11 }
12
13 // 2. Remove the body brackets and word "return" -- the return is implied.
14 (a) => a + 100;
15
16 // 3. Remove the argument parentheses
17 a => a + 100;
```

Things to note:

- if your arrow function has 0 or more than 1 parameter, parentheses are required.
- if your arrow function has more than 1 statement, surrounding curly braces are required.

Array Methods

- Several of the methods of an Array in JavaScript require a **callback function**.
- A callback function is a function passed into another function that the called function invokes.
- This is done to simplify common tasks with Arrays.



Using array method with a callback

```
const myArray = [1, 2, 5, -1, 4];  
myArray.every((item) => item > 0);
```

How this works...

```
function every(callback) {  
  for(let i = 0; i < myArray.length; i++) {  
    if(!callback(myArray[i])) {  
      return false;  
    }  
  }  
  
  return true;  
}
```

Without a callback

```
const myArray = [1, 2, 5, -1, 4];  
  
function isEverythingPositive(arr) {  
  for(let i = 0; i < arr.length; i++) {  
    if(arr[i] <= 0) {  
      return false;  
    }  
  }  
  
  return true;  
}  
  
isEverythingPositive(myArray);
```



Other Array Methods

- **forEach**
 - Loop over each element of an array
- **find**
 - Loop over each element of an array, return the first match; null if none.
- **map**
 - Map each element of an array to a new value.
- **filter**
 - Keep elements that meet the filter criteria. Remove others.
- **reduce**
 - Reduce the array to a single value. Summing an array is one example use case.
- **some / every**
 - Return true if some / every element meets a condition.



QUESTIONS?

