The While Loop

Learn how to repeat your code as many times as you want, by just writing down your code once. This lesson will introduce you to the while loop.

Introduction

Let's see iteration. In order to execute the same expressions multiple times, we create *loops*. A loop is like a cheap song. You know, Berlin is famous for the city of DJs. Sometimes I believe every third man claims he is a DJ. I happened to be a neighbor of one, fortunately, property management terminated his contract. This lunatic guy "worked" on one melody for half a year. And he repeated it over and over and over and over and over and over again.

Think of a loop like the song "Around the world, around the wo-orld. Around the world, around the wo-orld…". You get the idea. Take a melody, repeat it a hundred times, and you get the song. In programming terms, take some code, repeat it `x` amount of times, and you get code executed a hundred times.

Let's create a function that sums the values of an array:

```
let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
```

The first four numbers are not by accident. They were the level selector cheat code of Sonic 2. If you have slight aspergers syndrome, you tend to remember some weird numbers.

```
let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
function sumArray( values ) {
  let sum = 0;
  let i = 0;
  while ( i < values.length ) {
    sum += values[i];
    i += 1;
  }
  console.log( 'The loop was executed ' + i + ' times' );
  return sum;
}
```

```
sumArray( numbers );
```

The While Loop

The variable `i` keeps track of how many times the loop is executed.

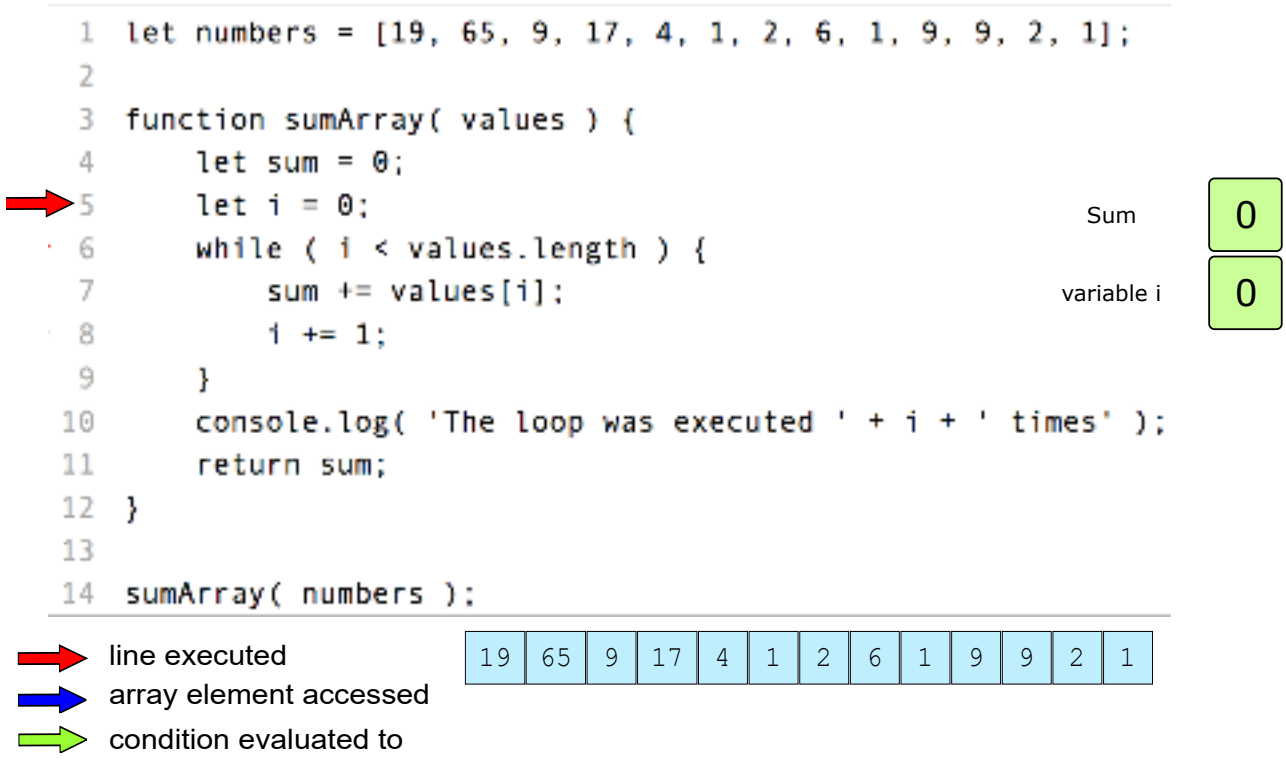
First the JavaScript interpreter examines the condition in the `while` loop. As `i` is `0` and `numbers.length` is `13`, we conclude the condition is true.

If the condition is true, we execute the body of the while loop. So we add the ith element of the array to the sum, and increase the loop variable by `1`.

Then we compare `1` against the length of the array, `13`. As `1` is smaller than `13`, we execute the loop body again. The `sum` variable now stores `19 + 65 = 84`. The value of `i` becomes `2`.

We continue this until `i` becomes `13`. Then we realize the condition `i < numbers.length` becomes `false`. Once the condition of the `while` loop becomes `false`, we continue with the code after the `while` loop.

The following slides demonstrate four iterations of the while loop:



1 of 13

```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

TRUE

Sum 0

variable i 0

19	65	9	17	4	1	2	6	1	9	9	2	1

line executed

array element accessed

condition evaluated to


```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

Sum 19

variable i 0

19	65	9	17	4	1	2	6	1	9	9	2	1

line executed

array element accessed

condition evaluated to

```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

Sum 19

variable i 1

19	65	9	17	4	1	2	6	1	9	9	2	1

line executed

array element accessed

condition evaluated to


```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

TRUE

Sum 19

variable i 1

19	65	9	17	4	1	2	6	1	9	9	2	1

line executed

array element accessed

condition evaluated to

```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

Sum 84

variable i 1

19	65	9	17	4	1	2	6	1	9	9	2	1

line executed

array element accessed

condition evaluated to


```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

Sum 84

variable i 2

19	65	9	17	4	1	2	6	1	9	9	2	1

line executed

array element accessed

condition evaluated to

```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

TRUE

Sum 84

variable i 2

19	65	9	17	4	1	2	6	1	9	9	2	1

line executed

array element accessed

condition evaluated to


```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

Sum 93

variable i 2

19	65	9	17	4	1	2	6	1	9	9	2	1

line executed

array element accessed

condition evaluated to

```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

Sum 93

variable i 3

19	65	9	17	4	1	2	6	1	9	9	2	1

line executed

array element accessed

condition evaluated to


```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

TRUE

Sum 93

variable i 3

19	65	9	17	4	1	2	6	1	9	9	2	1

line executed

array element accessed

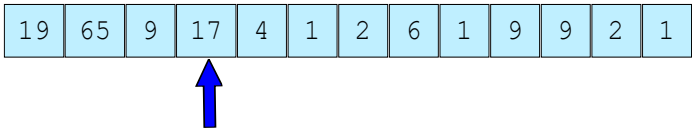
condition evaluated to

```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

Sum 110

variable i 3

line executed
array element accessed
condition evaluated to




```
1  let numbers = [19, 65, 9, 17, 4, 1, 2, 6, 1, 9, 9, 2, 1];
2
3  function sumArray( values ) {
4      let sum = 0;
5      let i = 0;
6      while ( i < values.length ) {
7          sum += values[i];
8          i += 1;
9      }
10     console.log( 'The loop was executed ' + i + ' times' );
11     return sum;
12 }
13
14 sumArray( numbers );
```

Sum 110

variable i 4

line executed
array element accessed
condition evaluated to