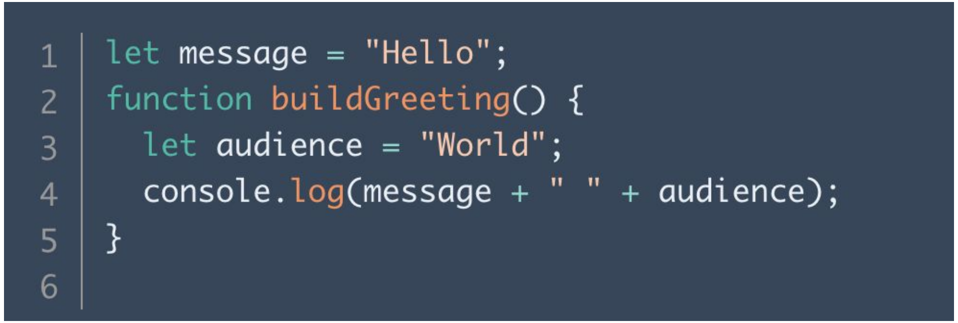
Javascript Closures & First Class Functions

Synarah Sitaf

What is a Javascript Closure?

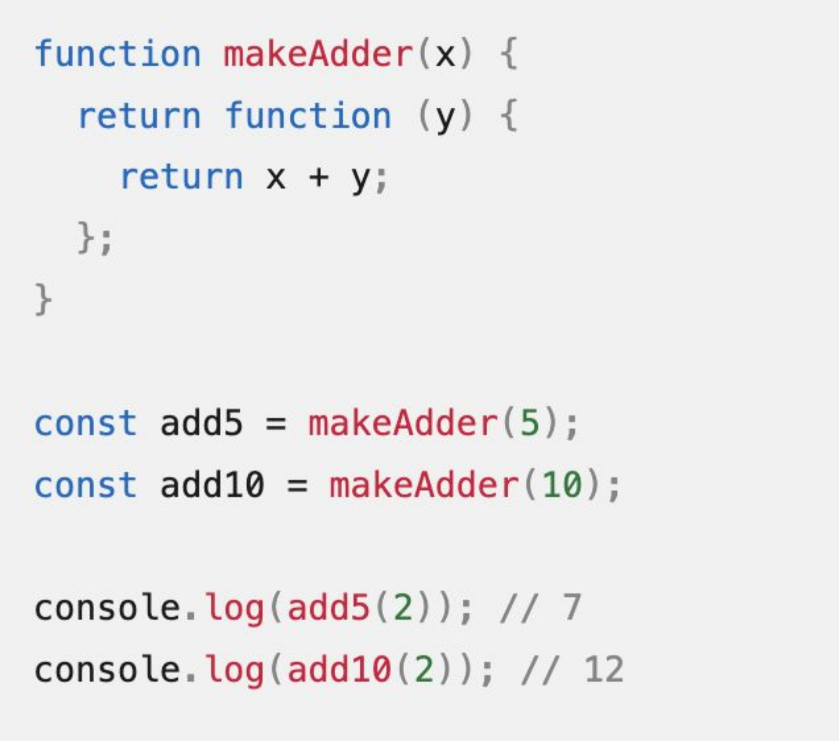
- A closure gives an inner function access to an outer functions scope
- A closure is created every time a function is created
- Lets you associate data with a function that acts on that data
    - Similar to OOP, where you can associate objects with methods
- Can emulate private methods

Examples of Javascript Closures Pt. 1



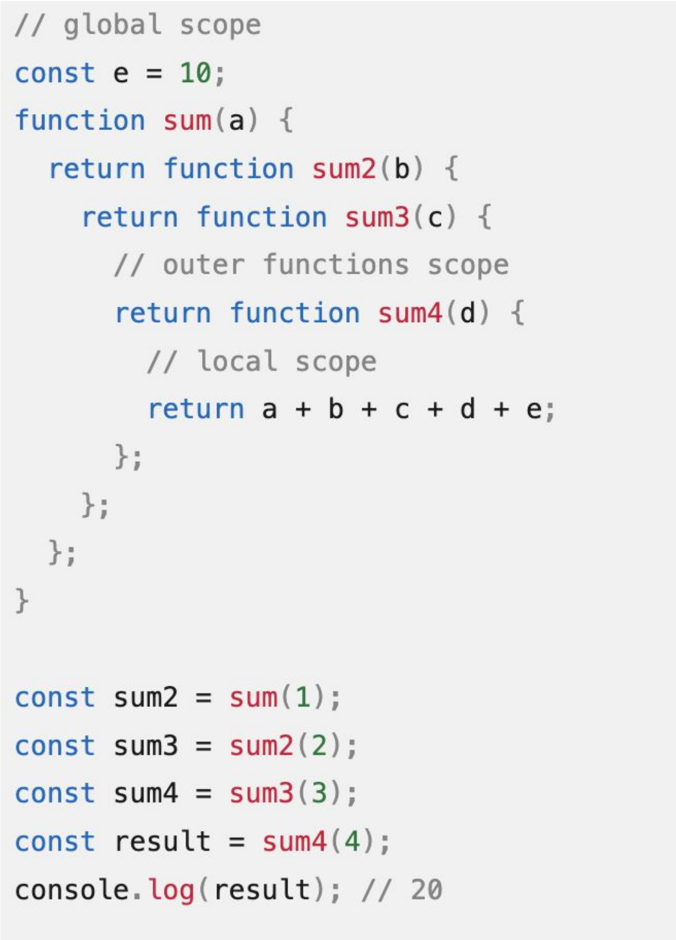
```
let message = "Hello";
function buildGreeting() {
  let audience = "World";
  console.log(message + " " + audience);
}

```

Examples of Javascript Closures Pt. 2



```javascript
function makeAdder(x) {
  return function (y) {
    return x + y;
  };
}

const add5 = makeAdder(5);
const add10 = makeAdder(10);

console.log(add5(2)); // 7
console.log(add10(2)); // 12
```

Examples of Javascript Closures Pt. 3

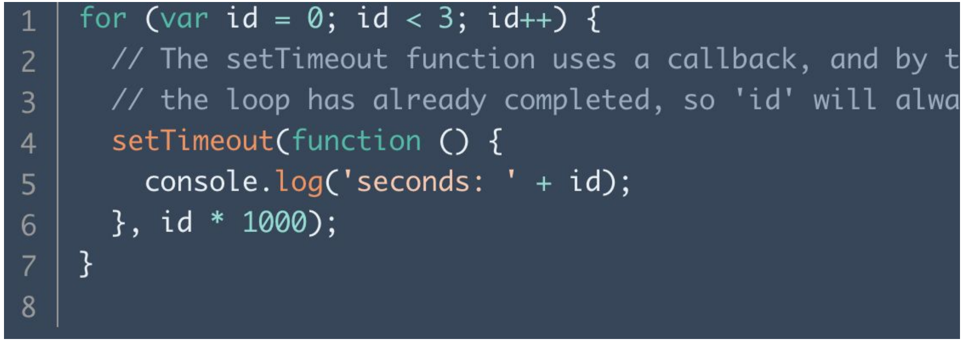


```
// global scope
const e = 10;
function sum(a) {
  return function sum2(b) {
    return function sum3(c) {
      // outer functions scope
      return function sum4(d) {
        // local scope
        return a + b + c + d + e;
      };
    };
  };
}

const sum2 = sum(1);
const sum3 = sum2(2);
const sum4 = sum3(3);
const result = sum4(4);
console.log(result); // 20
```

Things To Be Aware of When Using Javascript Closures

- Try not to put closures in loop
- Be careful when using variables that have been set in the outer function
- Don’t use Closures if you don’t need to, they take up space and can actually make your code run slower!

Example of a Closure in a Loop

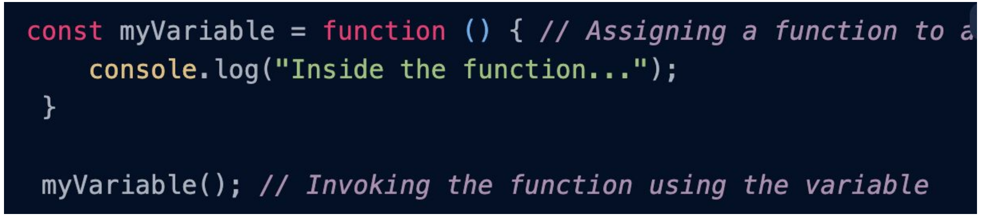


```javascript
for (var id = 0; id < 3; id++) {
  // The setTimeout function uses a callback, and by t
  // the loop has already completed, so 'id' will alwa
  setTimeout(function () {
    console.log('seconds: ' + id);
  }, id * 1000);
}

```

What is a First Class Function?

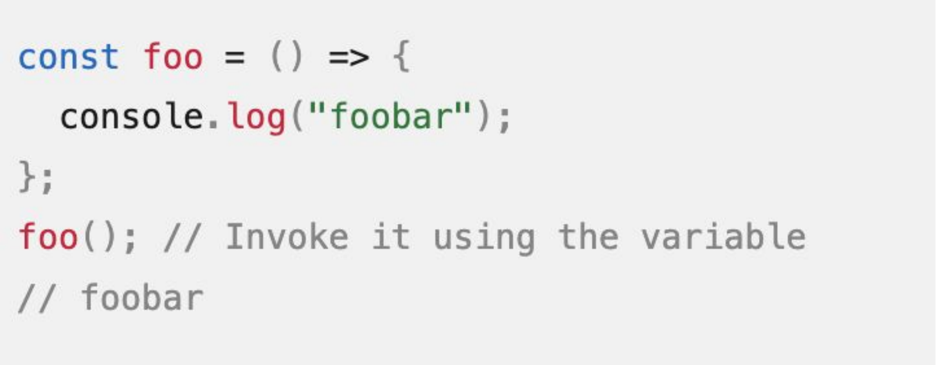
- A First Class Function is a function that can be
  - Assigned as a value to a variable
  - Passes as an argument into another function
  - Be returned by a function
- They are able to be treated as variables

Examples of First Class Functions Pt. 1



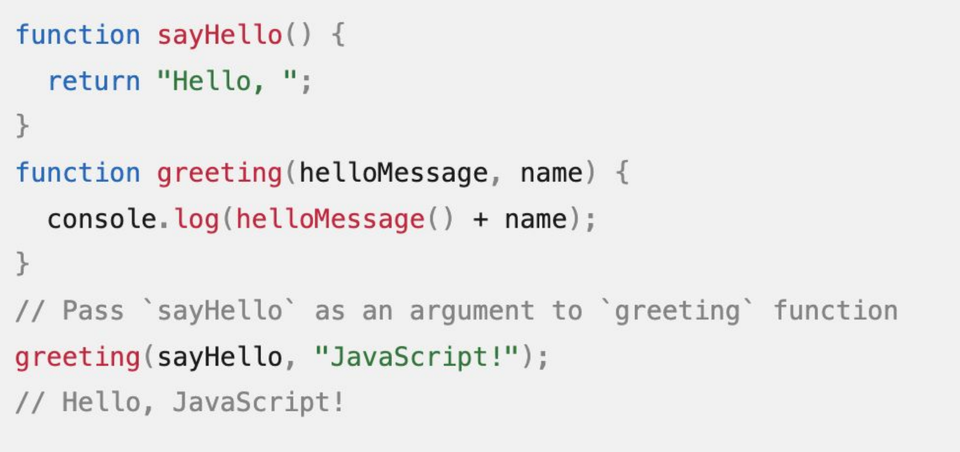
```
const myVariable = function () { // Assigning a function to a
    console.log("Inside the function...");
 }

 myVariable(); // Invoking the function using the variable
```

Examples of First Class Functions Pt. 2



```
const foo = () => {
  console.log("foobar");
};
foo(); // Invoke it using the variable
// foobar
```

Examples of First Class Functions Pt. 3



```
function sayHello() {
  return "Hello, ";
}
function greeting(helloMessage, name) {
  console.log(helloMessage() + name);
}
// Pass `sayHello` as an argument to `greeting` function
greeting(sayHello, "JavaScript!");
// Hello, JavaScript!
```

Sources

https://developer.mozilla.org/en-US/docs/Web/JavaScript/Closures

https://blog.hubspot.com/website/javascript-closure

https://developer.mozilla.org/en-US/docs/Glossary/First-class_Function

https://www.scaler.com/topics/first-class-function-in-javascript/