CoGrammar

Welcome to this session:

Functional Programming I (Scope and Closures)

The session will start shortly...

Questions? Drop them in the chat. We'll have dedicated moderators answering questions.

Safeguarding & Welfare

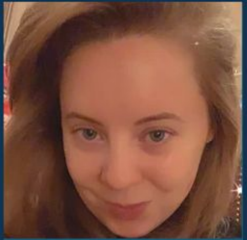
We are committed to all our students and staff feeling safe and happy; we want to make sure there is always someone you can turn to if you are worried about anything.

If you are feeling upset or unsafe, are worried about a friend, student or family member, or you feel like something isn't right, speak to our safeguarding team:

Ian Wyles
Designated Safeguarding Lead

Simone Botes

Rafiq Manan


Charlotte Witcher

Nurhaan Snyman

Ronald Munodawafa

Tevin Pitts

Scan to report a safeguarding concern

or email the Designated Safeguarding Lead:
Ian Wyles
safeguarding@hyperiondev.com

CoGrammar HyperionDev

Skills Bootcamp Cloud Web Development

- The use of disrespectful language is prohibited in the questions, this is a supportive, learning environment for all - please engage accordingly. **(Fundamental British Values: Mutual Respect and Tolerance)**
- No question is daft or silly - **ask them!**
- There are **Q&A sessions** midway and at the end of the session, should you wish to ask any follow-up questions. Moderators are going to be answering questions as the session progresses as well.
- If you have any questions outside of this lecture, or that are not answered during this lecture, please do submit these for upcoming Academic Sessions. You can submit these questions here: **Questions**

Skills Bootcamp Cloud Web Development

- For all **non-academic questions**, please submit a query:

  www.hyperiondev.com/support

- **Report a safeguarding incident: *www.hyperiondev.com/safeguardreporting***

- We would love your feedback on lectures: Feedback on Lectures

- If you are hearing impaired, please kindly use your computer's function through Google chrome to enable captions.

Stay Safe Series:

Mastering Online Safety One week at a Time

While the digital world can be a wonderful place to make education and learning accessible to all, it is unfortunately also a space where harmful threats like online radicalization, extremist propaganda, phishing scams, online blackmail and hackers can flourish.

As a component of this BootCamp the *Stay Safe Series* will guide you through essential measures in order to protect yourself & your community from online dangers, whether they target your privacy, personal information or even attempt to manipulate your beliefs.

Safeguard Your Digital Life:

The Importance of Backups

- Data Loss Prevention.
- Protection Against Cyber Threats.
- Peace of Mind.
- Version Control.
- Compliance and Legal Reasons.
- Easier Recovery.

Which is the correct syntax for creating a while loop in JavaScript?

A. while: (condition) { // code block }
B. while [condition] { // code block }
C. while (condition) { // code block }
D. while {condition} // code block

CoGrammar

When would it be better to use a for loop instead of a while loop? (Select all that apply)

A. When you know the exact number of iterations beforehand.
B. When the loop condition depends on user input.
C. When you want to iterate over an array or string.
D. When you need to run an infinite loop.

CoGrammar

Learning Outcomes

- Define and use functions in JavaScript, including understanding local and global scope.
- Understand closures and how they preserve a function's scope after execution.
- Implement arrow functions for concise function expressions.

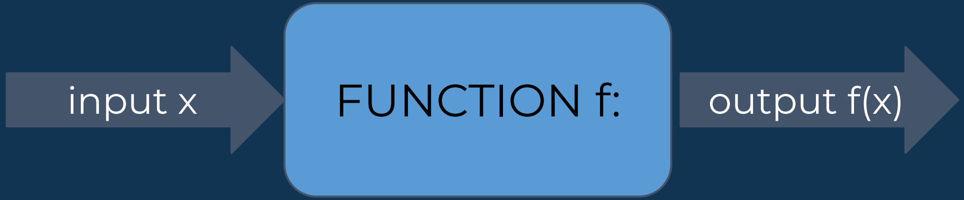
Lecture Overview

- → Basic JavaScript functions
- → Scope
- → Nested Functions
- → Arrow Functions

Functions

A block of organised, reusable code that accomplishes a specific task.

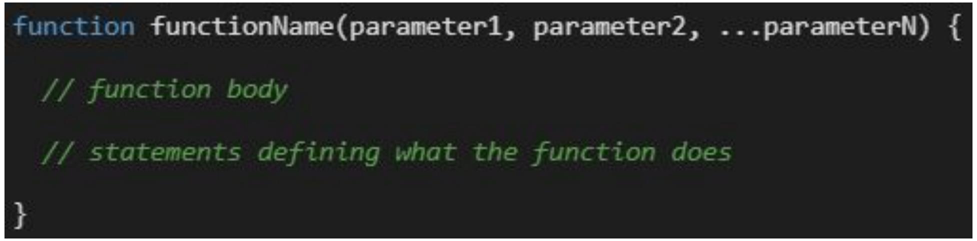
- A function can be **called repeatedly** throughout your code.
- Functions can either be **user-defined** or **built-in**.
- This helps us **minimise repeating lines of code** unnecessarily.
- The main benefits of using functions are:
  - It improves code **modularity, management** and **maintenance**.
  - It makes our code more **readable**.
  - It **reduces potential errors**.



CoGrammar

BASIC JAVASCRIPT FUNCTIONS

- Declaring a function in JavaScript involves using the keyword **function**, providing a **function name**, followed by a list of **parameters** enclosed in **parentheses ()**, and the **function body** enclosed within curly braces **{}**.
- Basic syntax of a function:



```
function functionName(parameter1, parameter2, ...parameterN) {
  // function body
  // statements defining what the function does
}
```

CoGrammar

BASIC JAVASCRIPT FUNCTIONS

- A JavaScript function has three key components:
  - **Parameters** - These are variables listed as a part of the function definition. They act as placeholders for the values on which the function operates, known as arguments.
  - **Function body** - Enclosed between curly braces {}, the function body consists of statements that define what the function does.

CoGrammar

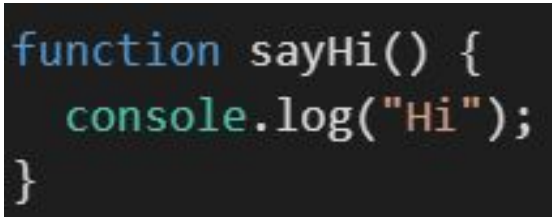
BASIC JAVASCRIPT FUNCTIONS

➢ **Return statement** - How a function sends the result of its operations back to the caller. Not all functions have to return a value; those that don't are often used for their side effects, such as modifying the global state or producing an output.

CoGrammar

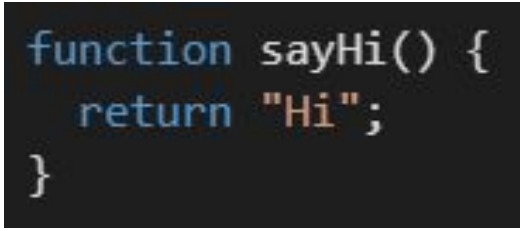
BASIC JAVASCRIPT FUNCTIONS

- Example of a function that doesn’t return anything:



```
function sayHi() {
  console.log("Hi");
}
```

- Example of a function that returns something:



```
function sayHi() {
  return "Hi";
}
```

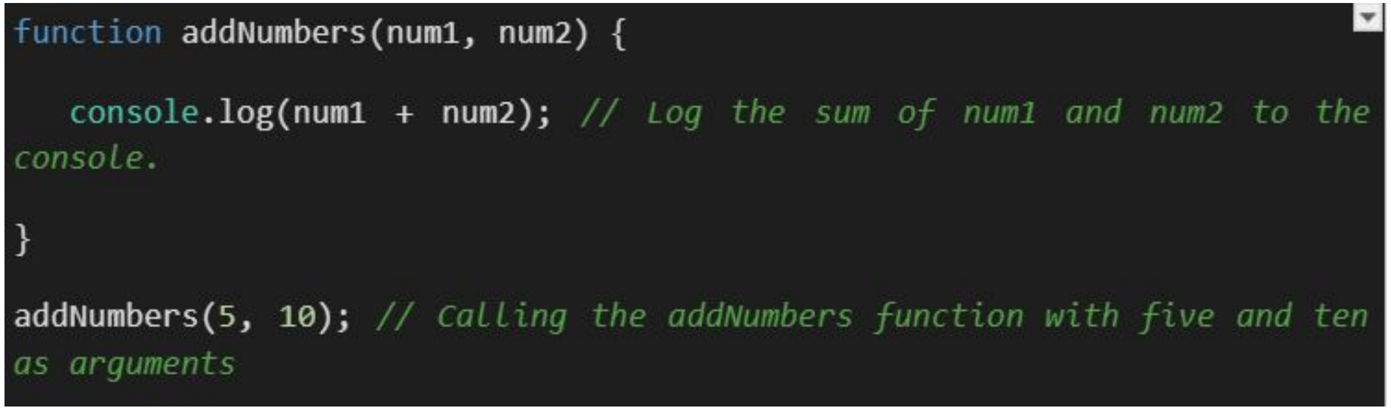
CoGrammar

CALLING A FUNCTION

- After a function has been declared, it can be invoked or called anywhere in your code by using its name followed by parentheses ().
- If the function requires parameters, you'll include **arguments** within the parentheses.
- Each argument corresponds to the position of the parameter in the function declaration.

CALLING A FUNCTION

❖ Example of calling a function:

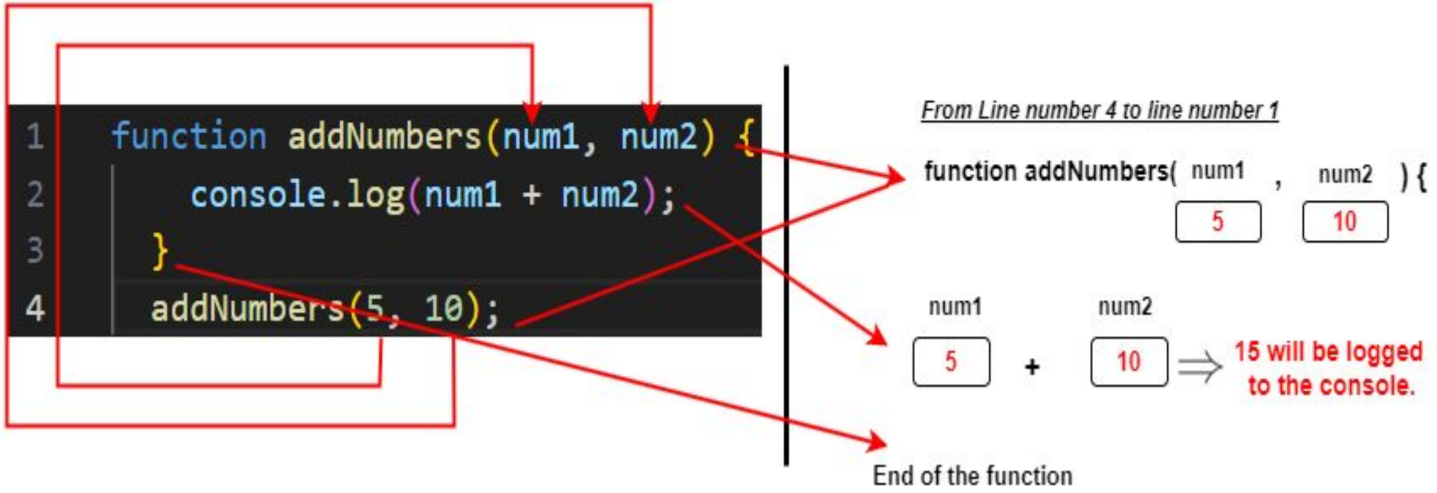


```
function addNumbers(num1, num2) {

   console.log(num1 + num2); // Log the sum of num1 and num2 to the
console.

}

addNumbers(5, 10); // Calling the addNumbers function with five and ten
as arguments
```

CoGrammar

CALLING A FUNCTION

❖ Let's trace through this function:



```
function addNumbers(num1, num2) {
    console.log(num1 + num2);
}
addNumbers(5, 10);
```

From Line number 4 to line number 1
function addNumbers(num1 , num2) {
5
10
num1
num2
5
+
10
15 will be logged to the console.
End of the function

CoGrammar

CALLING A FUNCTION

- The primary difference between parameters and arguments:
  - **Parameters** - Parameters are used when defining a function. They represent the **‘input’** the function needs to do its job, and they act as placeholders for actual data.
  - **Arguments** - Arguments are used when calling a function. They represent the actual **‘input’** that will be operated on by the function's code.

CoGrammar

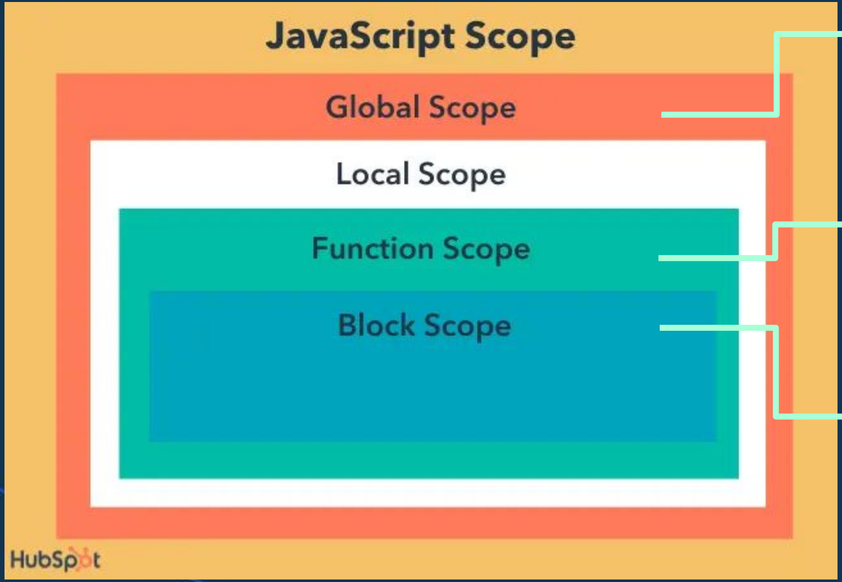
Scope

The area of visibility and accessibility of a variable in a program.

- The **scope** of a variable determines **where in the code it can be seen**.
- JavaScript has **function scope**, meaning variables declared **inside a function** are only **accessible within** that function.
- Variables declared outside of a function, known as **global variables**, can be accessed anywhere (**hoisting** allows for variables to be accessed before their definition).
- JavaScript has **three types of scope:**
  - Global Scope
  - Function Scope
  - Block Scope

CoGrammar

Scope



Source: HubSpot

Global Scope: variables declared outside all functions or blocks. They can be accessed from any part of the code.

Function Scope: variables declared within a function. They are only accessed within their function body.

Block Scope: variables declared with the **let** or **const** keyword inside a block. They can only be accessed in their block (does not apply to **var** keyword).

CoGrammar

SCOPE

- Global scope:
  - When a variable is declared outside all functions or block scopes, its scope is global.
  - Global variables can be accessed from any part of the code, whether within a function or outside.

SCOPE

- Function scope:
  - Variables declared within a function are accessible only within the function body and are said to have the function scope.
  - They cannot be accessed outside of the function in which they are declared.
  - Attempting to access a function-scoped variable from outside the function will result in a reference error.

CoGrammar

SCOPE

- Block scope:
  - Variables declared with let or const are confined to the block in which they are declared.
  - Attempting to access block-scoped variables outside their block results in a reference error, as they are only accessible within the block where they were defined.

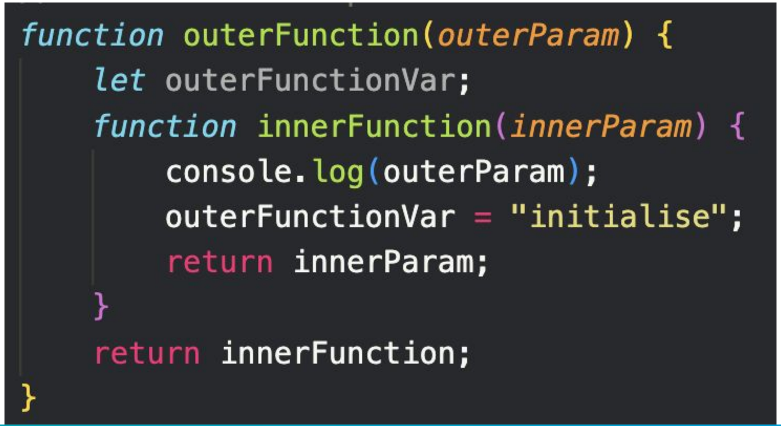
CoGrammar

NESTED FUNCTIONS

- A nested function is a function defined inside another function.
- This allows the inner function to access variables and parameters of the outer function.
- Nested functions help organise code and keep related functionality together, making code more modular and maintainable:

NESTED FUNCTIONS

- A nested function forms a closure, the function has its own local variables and parameters and is able to reference and use its containing function's function variables and parameters.

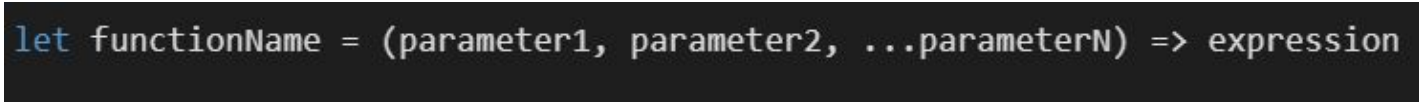


```
function outerFunction(outerParam) {
    let outerFunctionVar;
    function innerFunction(innerParam) {
        console.log(outerParam);
        outerFunctionVar = "initialise";
        return innerParam;
    }
    return innerFunction;
}
```

CoGrammar

ARROW FUNCTIONS

- ❖ Arrow functions in JavaScript are a shorthand syntax for writing function expressions.
- ❖ They're called “arrow” functions because of the => symbol used, which resembles an arrow.
- ❖ Syntax of arrow functions:



```
let functionName = (parameter1, parameter2, ...parameterN) => expression
```

CoGrammar

What is the primary purpose of a function in JavaScript?

A. To execute a block of code only when called.
B. To store data in variables.
C. To define the structure of an HTML document.
D. To create loops for repetitive tasks.

CoGrammar

What is the purpose of parameters in a JavaScript function?

A. To pass values into a function for processing.
B. To define the function's name.
C. To create local variables within the function.
D. To specify the return type of the function.

Let's take a break

CoGrammar

Questions and Answers

CoGrammar

Thank you for attending

CoGrammar

SKILLS FOR LIFE SKILLS BOOTCAMPS

Department for Education