**Scope**

Anytime a **variable** or **function** or **object** is declared in JavaScript, and other programming languages, they can only be accessed in the right scope. For instance trying to alert a string called **name** before it is defined and assigned a value would cause problems.

**Scope** is a term used to define the area in our code where a variable or function or object is recognized and can be used correctly. Remember in JavaScript curly brackets **{ }** define blocks of code. If variables are declared inside of functions which have **{ }** then they won’t be recognized outside of them because JavaScript is function scoped.

Variables can be described in 2 different ways according to their scoping:

* **Global** Variables – these variables are known throughout your code. All functions and areas of your code can access them and knows their values. This can be done by declaring variables (any type) at the top of your script outside of any function or block of code. You can also do it by omitting the **var**, **let** or **const** keyword when creating a variable. Think of Britney Spears being a global celebrity! Everyone knows who she is.
* **Local** Variables –these variables have been defined inside a function or are encapsulated inside **{ }**. Therefore, these can only be accessed by the function that encapsulates it (if it is function scoped - **var**) or elements inside the block of code it is in (if it is block scoped – **let** and **const**). Think of James Finn being a local celebrity! Only his friends and family know who he is.

You may remember when declaring variables the different keywords confer different abilities.

**var** **Function Scope** Hoisted

**const** **Block Scope** Not Hoisted

**let** **Block Scope** Not Hoisted

**Block Scope Variables**

Block scoped variables (**let** and **const**) are confined to the block of code they are declared in. This includes any part of code where you see **{}**, so, if else conditionals, functions, loops etc. Note that blocks of codes inside of blocks of codes are considered within scope. Also, because these variables are also **not hoisted**, their declaration must occur in the code before they are used.

**console.log( name ); //** *ERROR* ***name*** *is not defined*

**let name = "Global"; //** because **let** & **const** not hoisted

**const c\_1 = "C1";**

**if ( true )**

**{**

**const c\_2 = "C2";**

**if ( true )**

**{**

**const c\_3 = "C3";**

**//** *This log works. All variables are defined*

**console.log( c\_1 + " " + c\_2 + " " + c\_3 );**

**}**

**//** *ERROR.* ***c\_3*** *is not defined*

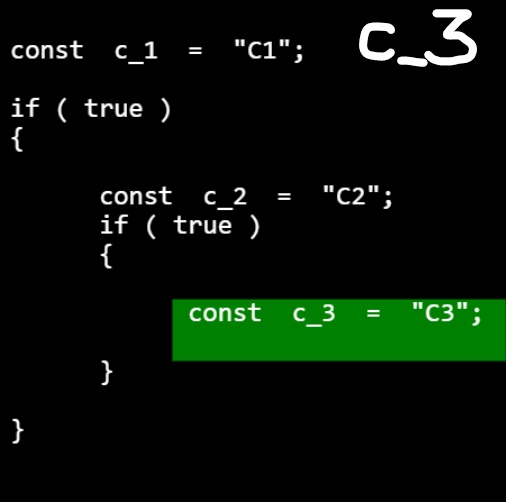
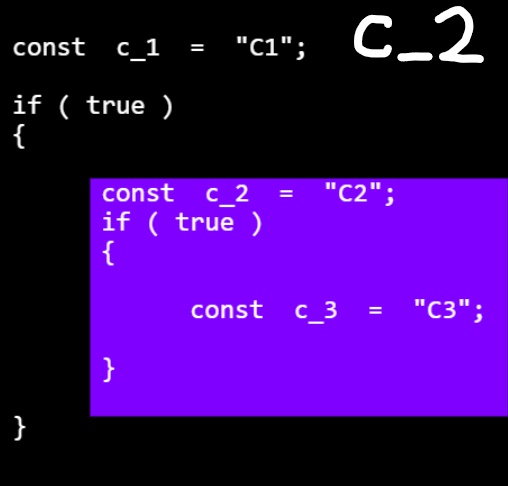
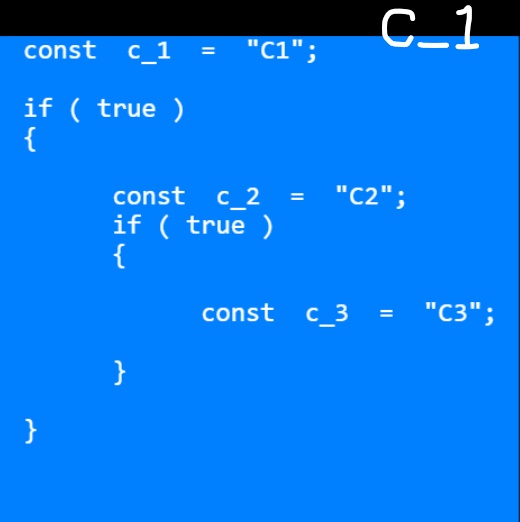
**console.log( c\_1 + " " + c\_2 + " " + c\_3 );**

**}**

**//** *ERROR.* ***c\_2*** *and* ***c\_3*** *are not defined*

**console.log( c\_1 + " " + c\_2 + " " + c\_3 );**

Visual Representation of **Block**, **Not Hoisted Scope** for three variables. The coloured areas show where the variables are known.



**Function Scope Variables**

Function scoped variables (**var**) are confined to the function they are declared in. They break out of simple code blocks like if else statements and loops. Since these variables are **hoisted** as well, accessing the variable in the correct scope before it is declared won’t cause an error. Instead, the variable will equate to undefined as its value has been read yet.

**console.log( v\_1 ); //** *logs “undefined” but doesn’t break the script*

**var v\_1 = "Global";**

**function myFunc()**

**{**

**alert( v\_1 + " " + v\_2 + " " + v\_3 ); //** *Global undefined undefined*

**var v\_2 = "Local 1";**

**alert( v\_1 + " " + v\_2 + " " + v\_3 ); //** *Global Local1 undefined*

**if ( true )**

**{**

**var v\_3 = "Local 2";**

**alert( v\_1 + " " + v\_2 + " " + v\_3 ); //** *Global Local1 Local2*

**}**

**alert( v\_1 + " " + v\_2 + " " + v\_3 ); //** *Global Local1 Local2*

**}**

**alert( v\_1 + " " + v\_2 + " " + v\_3 ); //** *This will break*

The reason why the **blue** and **green** alerts work yet show “undefined” as opposed to breaking the script is because of **hoisting**.

**Hoisting**

In JavaScript **hoisting** happens by bringing all variable declarations to the top of the scope first before the interpreter reads the code, even though the values haven’t been assigned yet. The script knows that **v\_2** and **v\_3** exist but aren’t sure what their values are. The **purple** alert breaks because it is outside the function scope and hasn’t a clue what **v\_2** and **v\_3** are. No alert is made and JavaScript breaks. Hoisting is confined inside the current function scope and doesn’t hoist things outside of it. Also note that functions are hoisted as well. This is why we can call a function before it is declared in code

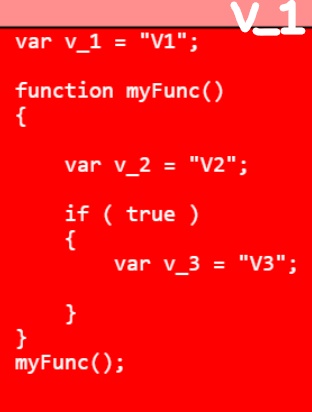
**myFunct(); //** *this works*

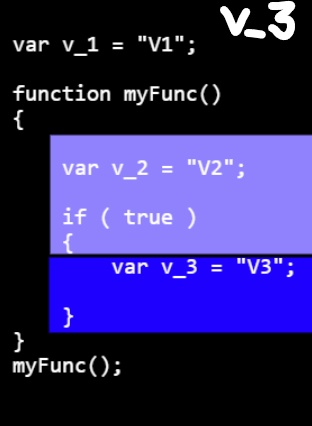
**function myFunct() {**

**console.log( "Hello" );**

**}**

Visual Representation of **Hoisted Function Scope** for three variables. The coloured areas show where the variables are known. The lighter-coloured areas are where the variable is accessible but would have an undefined value thanks to hoisting.

![Graphical user interface, application, PowerPoint

Description automatically generated](data:image/jpeg;base64,/9j/4AAQSkZJRgABAQEAAAAAAAD/4RCyRXhpZgAATU0AKgAAAAgAAodpAAQAAAABAAAIMuocAAcAAAgMAAAAJgAAAAAc6gAAAAgAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAFkAMAAgAAABQAABCAkAQAAgAAABQAABCUkpEAAgAAAAMwNgAAkpIAAgAAAAMwNgAA6hwABwAACAwAAAh0AAAAABzqAAAACAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA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**Declaring Global Variables Inside of Function Scope**

There is however a way to declare a variable inside a function and to make it global instead of local. You can do this by removing the **var** before declaring it. Note **we are not assigning a new value** to a variable that has already been declared somewhere else. We are declaring a brand new variable.

**function mississippi() {**

**britneySpears = "Global superstar!";**

**}**

**mississippi();**

**alert( britneySpears ); //** *This will alert* **"***Global superstar!***"**

It is important to keep in mind scope when coding. If you need multiple functions to use a variable then it’s a good idea to declare it globally at the top of the page. Take note however that if a function is called that assigns a new value to that variable, then that variable assumes that value throughout.