Caltech | Center for Technology & Management Education

Full Stack Java Developer

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JavaScript

TECHNOLOGY

Getting Started with JavaScript

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Learning Objectives

By the end of this lesson, you will be able to:

- Understand the basics of JavaScript
- Identify and categorize the primitive types and write their syntax
- Define objects in JavaScript
- Define arrays and discuss how it is used in JavaScript
- List the methods used in the array

A Day in the Life of a Full Stack Developer

You are working in an organization and have been assigned a project. After understanding the client's requirements, you analyze that a few tasks are repetitive in most modules.

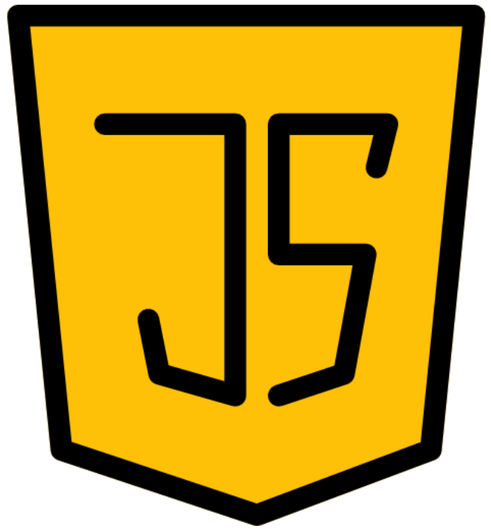
You decide to use functions and global variables instead of writing the code separately. This will reduce the code and also reduce the effort. This will also improve the performance of the application and provide a better developer experience.

To do so, you will explore arrays, variables, and methods in JavaScript to accomplish the given task.

What Is JavaScript?

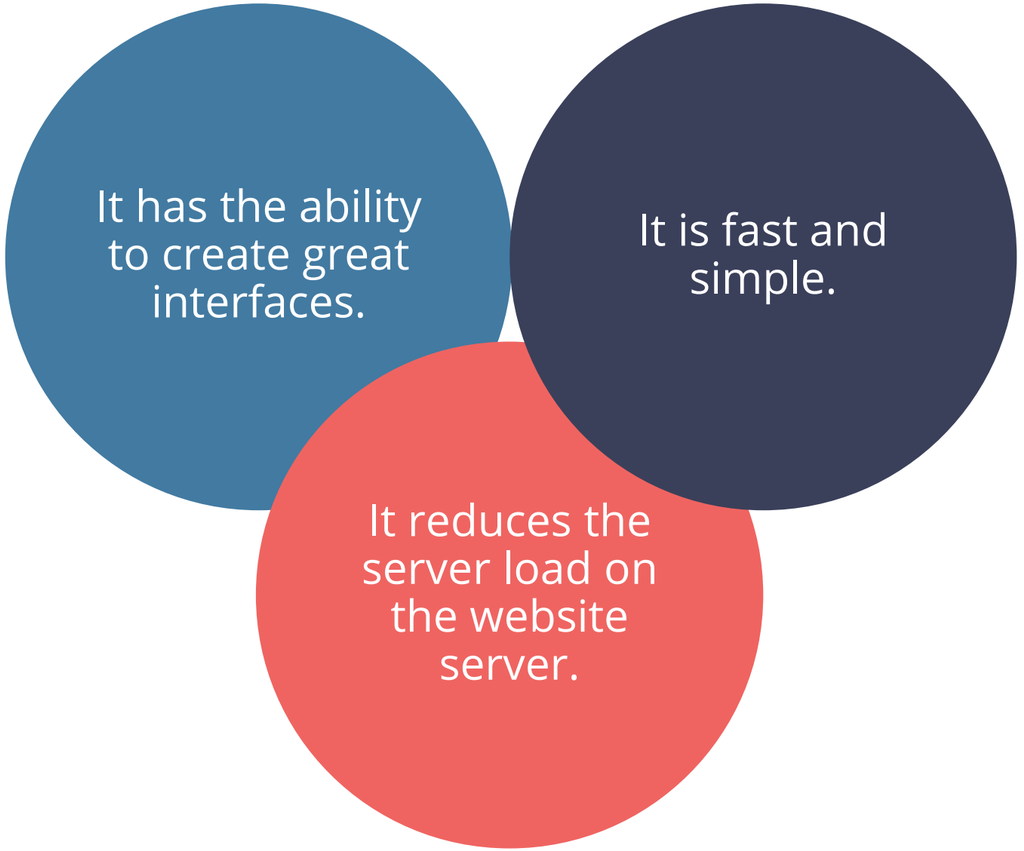
What Is JavaScript?

JavaScript is a lightweight, text-based programming language.



- It is employed on the client side as well as the server side.
- It enables developers to make web pages more interactive.
- It can be used to add interactive elements to website operations.

Advantages of JavaScript



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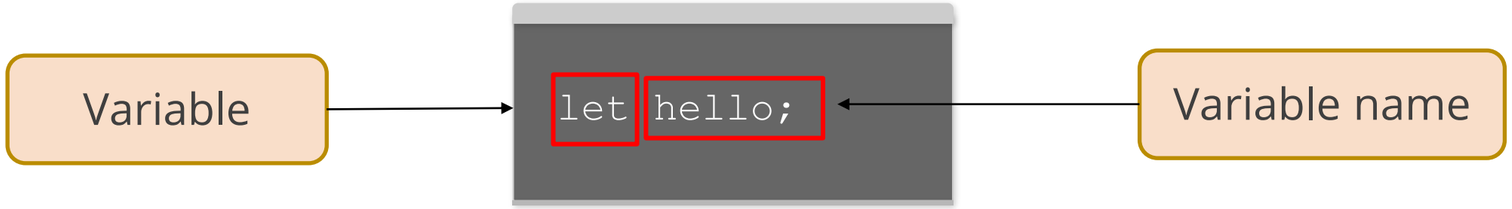
Variables

Variables

In JavaScript, a variable stores the data value that can be changed later.

Syntax:



Data in the hello is within the assignment operator(=).

```
let hello;
hello = ' how are you! ';
```

Variables

The string is saved in the variable's related region.

```
let hello;
hello = ` how are you! `;
alert (hello) ;
```

The variable declaration and assignment can be combined into a single line.

```
let hello = ` how are you! `;
alert (hello) ;
```

Variables

The value is changed in the variable.

```
let hello;
hello = ' how are you! ';
hello = 'I am fine' ;
alert (hello) ;
```

In older scripts, the "var" variable is used instead of the "let".

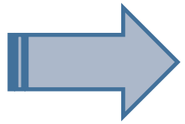
The var key term is identical to the let key term.

```
var hello = ' how are you! ';
```

Variables

Example:

```
<! DOCTYPE html>
<html>
<body>
  <script>
      let hello;
      hello = “Hello User!! Welcome to XYZ Page”;
Alert(hello);
</script>
</body>
</html>
```



Output:

```
127.0.0.1:5500 says
Hello User!! Welcome to
XYZ Page
```

Constants

Constants

In JavaScript, the constant use the **const** instead of the let.

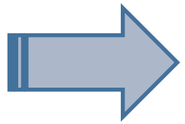
```
const avgHeight = "Average Man Height is 177cm" ;
```

The variable is declared using the const, also called constants.

Constants

Example:

```
<!DOCTYPE html>
<html>
<body>
  <script>
      const avgHeight = "Average Men Height
      is 177cm";
alert(avgHeight);
  </script>
</body>
</html>
```



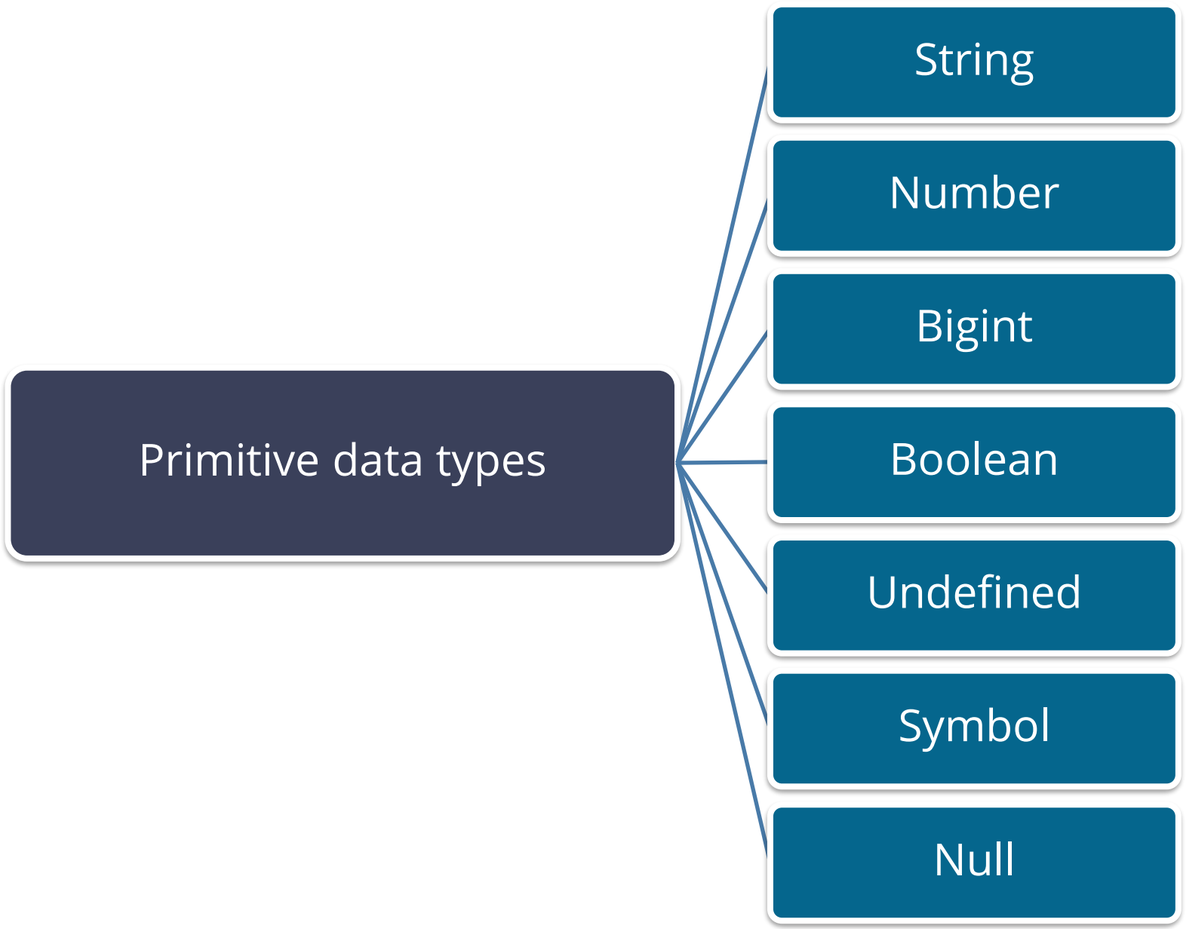
Output:

```
127.0.0.1:5500 says
Average Men Height is
177cm
```

Primitive Types

Primitive Types

In JavaScript, a primitive is data that is not an object and has no methods.



String

A string is a series of characters in JavaScript.

```
let std1Name = "Jack";
let std2Name = "Dave";
```

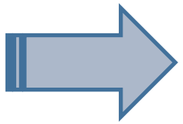

The string is written in double or single quotes.

String

Example:

```
<!DOCTYPE html>
<html>
<body>
  <script>
      let std1Name = “Jack”;
      alert(std1Name);
  </script>
</body>
</html>
```

Output:



```
127.0.0.1:5500 says
Jack
```

Number

JavaScript has only one type of number. It contains only the numeric values.

The operations applied to numbers are:

Addition

Subtraction

Multiplication

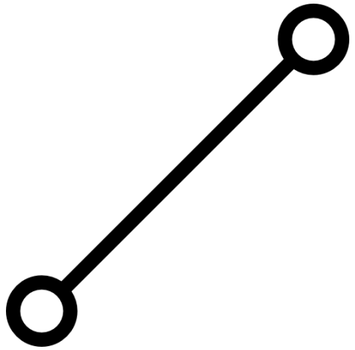
Division

Number

The number data types include special numeric values in addition to conventional numbers.

Infinity

Obtained by dividing any number by zero or just the reference directly.
Example : alert (1/0)



NaN

Represents the computational error.
Example : alert (not a number/2)

Number

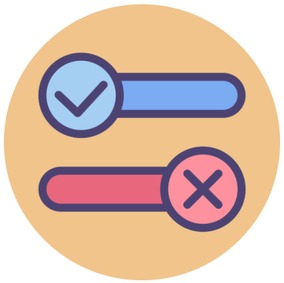
The bigInt type represents integers of any length.

```
const bigInt = 346789891823098210938109n;
```

Boolean

The Boolean type in JavaScript has only two values: true or false.

```
let termsAndConditions = true;
let subscriptionForNewsLetter = false;
```



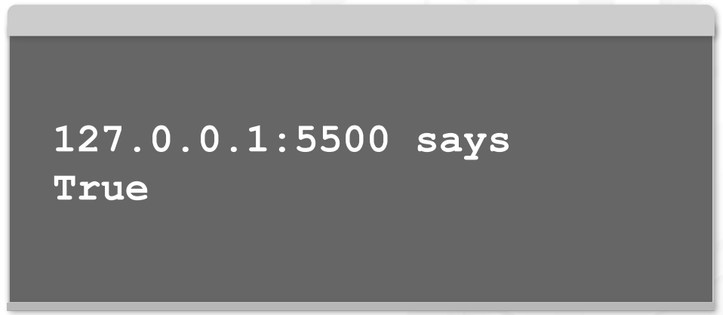
In this, one field is checked, and the other is not. It gives the result in a true or false format.

Boolean

Example:

```
<!DOCTYPE html>
<html>
<body>
  <script>
      let age = 19
      let isEligibleForDriving = age >= 18;
      alert(isEligibleForDriving);
  </script>
</body>
</html>
```

Output:



Undefined

Undefined appears when there is no value assigned to a variable.

```
let age;
Alert(age);
```

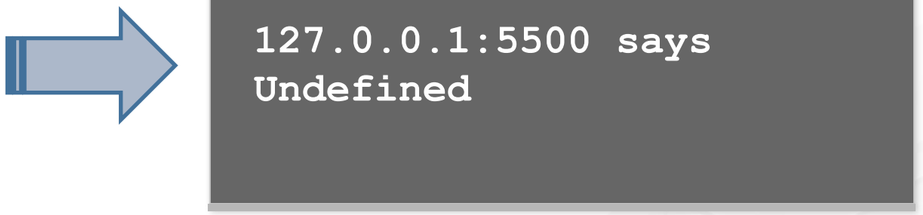
Although the variable is declared, no value is assigned to it.

Undefined

Example:

```
<!DOCTYPE html>
<html>
<body>
  <script>
      let age;
      alert(age);
  </script>
</body>
</html>
```

Output:



Symbol

This data type defines a property that is private to the object.

To create a new symbol, the function Symbol() is used.

Note that every symbol is unique. Two symbols, even with the same key values are not the same.

Null

This data creates its own separate type, which contains only the null values in it.

```
Let name = null;
```

Null basically is a unique value that means "nothing," "empty," or "nothing at all."

Dynamic Typing

Dynamic Typing

In JavaScript, the type of variable used for declaration is not specified.

```
Var s = 10;
```

```
S = " Hello, how are you
```

S is changed into the string.

Objects

Objects

An object can be created using the figure brackets {……}.

```
let car = new Object();
let car = { };
```

Objects

A property is a "key: value" pair in which the key is a string, and the value is any value.

```
let user = {
  name: "JACK",
  age: 24
}
```

Arrays

Arrays

An array in JavaScript is a type of variable that can hold more than one value in it.

There are two syntaxes for creating arrays:

```
let arr = new Array ();
let arr = [];
```

```
let colors = [ "green", "yellow", "blue", "white" "grey", "red"
];
```

Arrays

'alert' is used to display the array values.

```
alert( colors[0] );
alert( colors[1] );
alert( colors[2] );
alert( colors[3] );
alert( colors[4] );
alert( colors[5] );
```



```
color[1] = “black“;
```

Arrays

The element can be added by adding an index. The new element and its value will be added to the array at the seventh position.

```
color[6] = “purple“;
```

To get the total count of an array index, 'length' is used.

```
let colors = [ "green", "yellow", "blue", "white" "grey", "red"
];
Alert ( colors.length );
```

Arrays

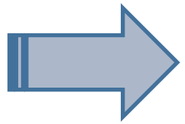
Add the name of the array within the alert to display the whole array

```
let colors = [ "green", "yellow", "blue", "white" "grey", "red"
];
alert (colors);
```

Arrays

Example:

```
<!DOCTYPE html>
<html>
<body>
  <script>
      let colors = [
“green”,
“yellow”,
“blue”,
“white”,
“grey”,
“red”
      ]
      alert(colors);
  </script>
</body>
</html>
```



Output:

```
127.0.0.1:5500 says
green,yellow,blue,white,gr
ey,red
```

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Methods in Arrays

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Methods in Arrays

There are four common methods in an array:

- Push
- POP
- Shift
- Unshift

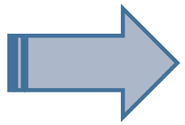
Push

Push appends the part to the end of the array and adds an element at the end of the array.

Example:

```
<!DOCTYPE html>
<html>
<body>
  <script>
      let colors = [
“green”,
“yellow”,
“blue”,
“white”,
“grey”,
“red”
      ]
      colors.push(“violet”)
      alert(colors);
  </script>
</body>
</html>
```

Output:



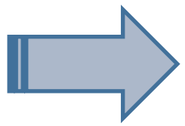
```
127.0.0.1:5500 says
green,yellow,blue,white,gr
ey,red,violet
```

POP

POP takes an element from the end.

Example:

```
<!DOCTYPE html>
<html>
<body>
  <script>
      let colors = [
"green",
"yellow",
"blue",
"white",
"grey",
"red"
      ]
      colors.pop()
      alert(colors);
  </script>
</body>
</html>
```



Output:

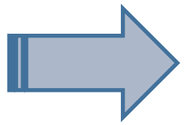
```
127.0.0.1:5500 says
green,yellow,blue,white,gr
ey,red
```

Shift

In this method, the first element of the array is extracted and returned in this procedure.

Example:

```
<!DOCTYPE html>
<html>
<body>
  <script>
      let colors = [ “red”, “yellow”, “green”];
      alert ( colors.shift () );
      alert(colors);
  </script>
</body>
</html>
```



Output:

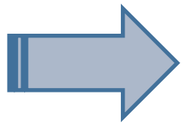
```
This page says
red
```

Unshift Method

It helps to add the element at the beginning of the array.

Example:

```
<!DOCTYPE html>
<html>
  <script>
      let colors = [ “red”, “yellow” ];
      colors.unshift(“green”);
      alert(colors);
  </script>
</html>
```



Output:

```
This page says
green,red,yellow
```

Functions

Functions

Functions are the program's main building blocks.

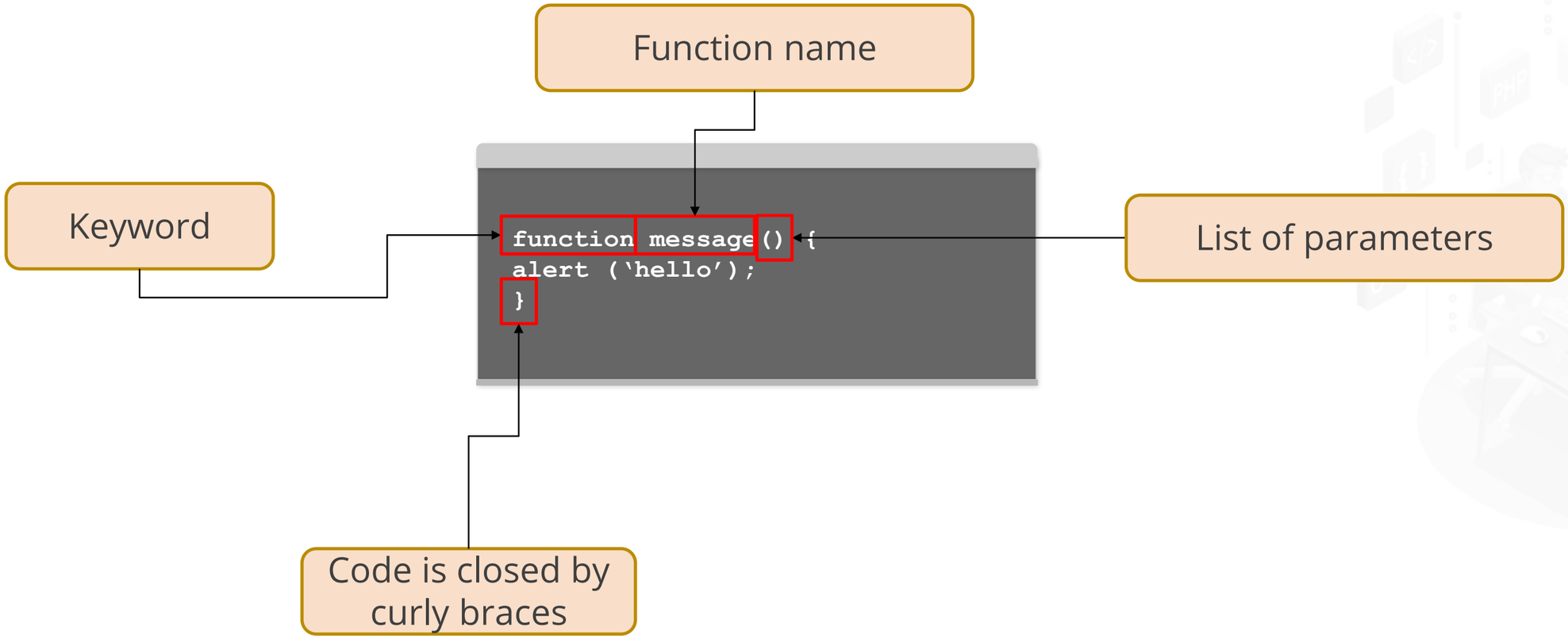
In JavaScript, a function is a procedure with a set of statements that performs a task or calculates a value.

Input

Output

Functions

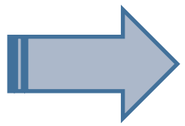
To create the function, a function declaration is a must.



Functions

Example:

```
<!DOCTYPE html>
<html>
  <script>
      function message()[
      alert("How are you");
      ]
      message();
  </script>
</html>
```



Output:

```
This page says
How are you
```

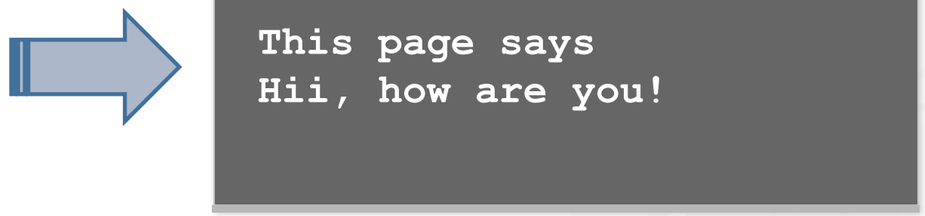
Local Variables

In a local variable, only the variables declared within the function are accessible by the function.

Example:

```
<!DOCTYPE html>
<html>
  <script>
      function message () {
      let msg = [ "Hii, how are you !" ];
      alert (msg);
      }
      message();
      alert(msg);
  </script>
</html>
```

Output:

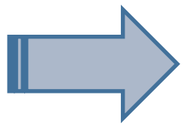


Outer Variables

In the outer variable, the variable declared outside the function is also accessible by the function.

Example:

```
<!DOCTYPE html>
<html>
  <script>
      let user = “Reet”;
      function message () {
      let msg = [ ‘Hello,’ + user;
      alert (msg);
      }
      message();
</script>
</html>
```



Output:

```
This page says
Hello, Reet
```

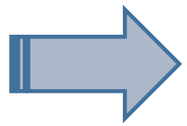
Parameters

Parameters are used to pass the arbitrary data to the function.

Example:

```
<!DOCTYPE html>
<html>
  <script>
      function message (from, text) {
      alert (from + ':' +text);
      }
      message('preet', 'hello');
</script>
</html>
```

Output:



```
This page says
preet:hello
```

Default Values

If a function is called without any value or argument in it, then the value becomes undefined.

Example:

```
<!DOCTYPE html>
<html>
  <script>
      function message (from, text = "there is no
text given") {
      alert (from + ':' +text);
      }
      message('hello');
</script>
</html>
```

Output:

```
This page says
hello:there is no text
given
```

Key Takeaways

- JavaScript is a lightweight, text-based programming language.
- In JavaScript, a variable stores the data value that can be changed later.
- The constant use the const instead of the let.
- The type of variable used for declaration is not specified in JavaScript.
- A function is a procedure with a set of statements that performs a task or calculates a value.

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Thank You

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