WSA | Forward looking IT finishing school

Function

JavaScript

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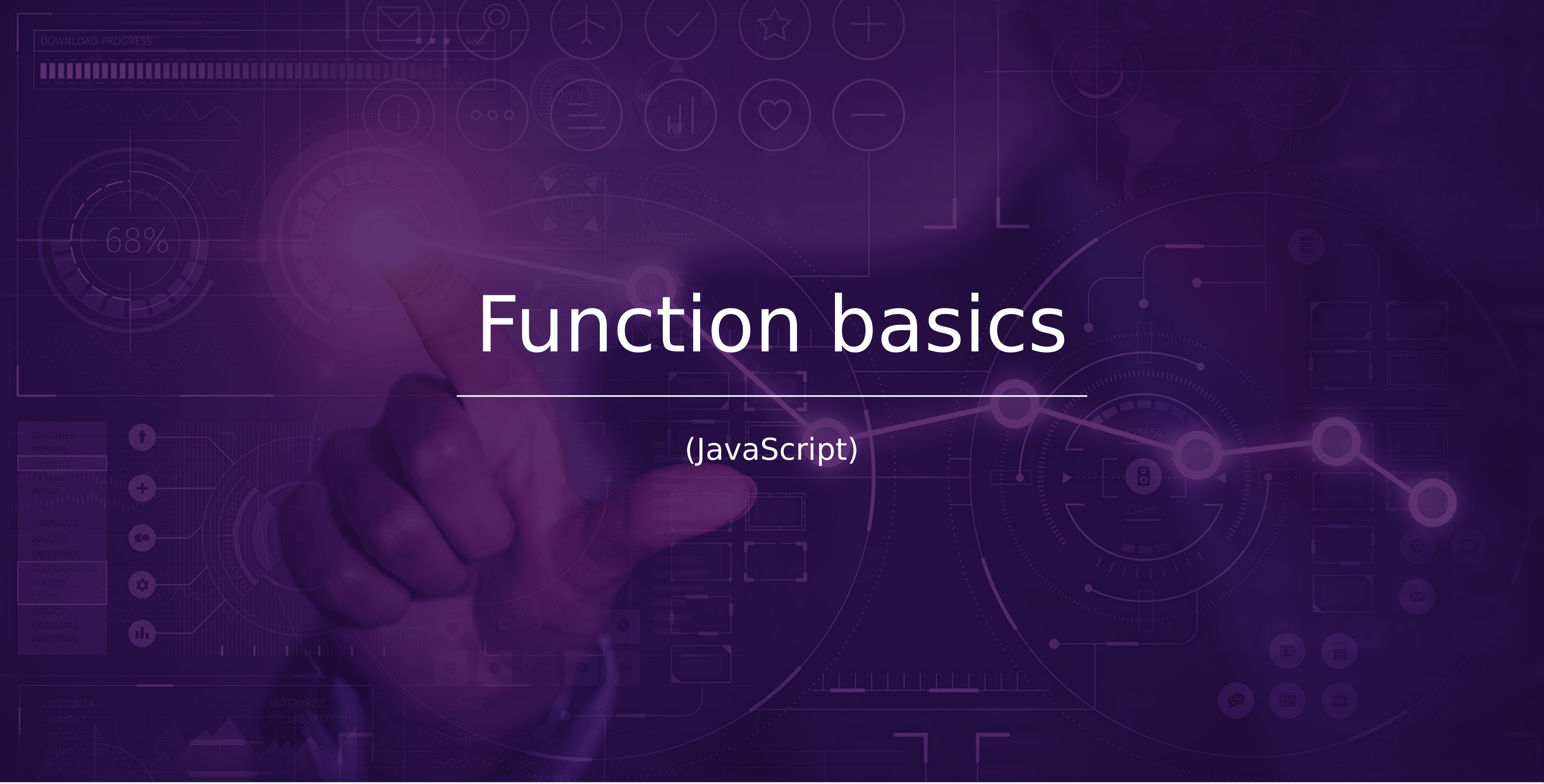


Function basics

(JavaScript)

What is function?

- A function is a block of JavaScript code that is defined once but may be executed, or invoked, any number of times
- A function can be used to return a value, construct an object, or as a mechanism to simply run code
- JavaScript functions are defined with the function keyword
- Either function declaration or a function expression can be used

Function Declaration

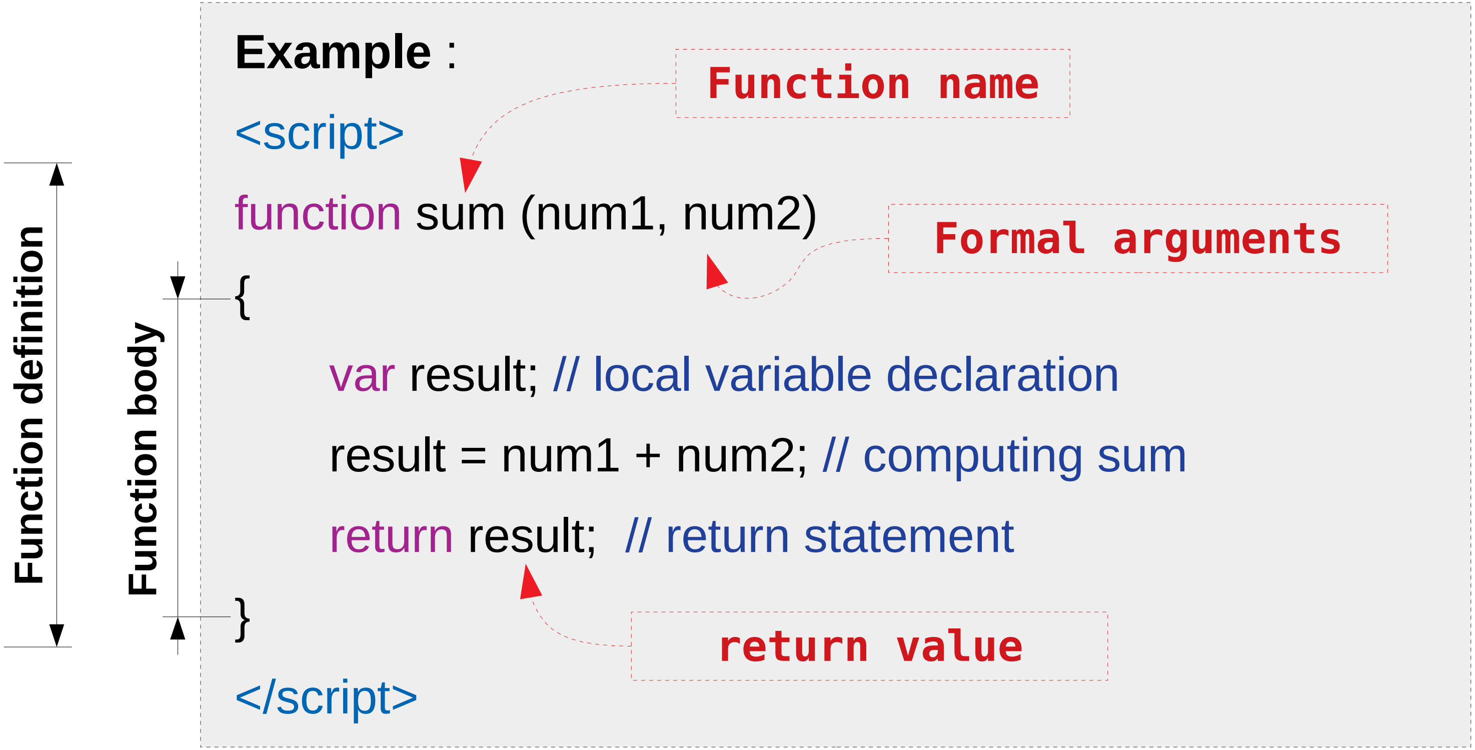
Syntax:

```
function functionName (param-1, param-2, . . . , param-n) {
  statement(s);
}
```

Parts of functions

- Name – A unique name given by developer
- Parameters / arguments – to pass on input values to function
- Body – A block of statement(s) to be executed
  - Local variable declaration
  - Flow of computing statement(s)
  - Return statement

Function Example



Example :

```
<script>
function sum (num1, num2)
{
        var result; // local variable declaration
        result = num1 + num2; // computing sum
        return result;  // return statement
}
</script>
```

Function name

Formal arguments

return value

Function definition

Function body

Function Execution

- Merely defining a function does not result in execution of the function; it must be called for execution

```
<script>
        . . . function definition . . .
        var x = 3, y = 5, z;  // global variable declaration

        z = sum (x, y);   // calling function for execution
        document.write(“The sum of numbers is : “ + z);
</script>
```

x and y are actual arguments

Function Execution

- Actual arguments can be variables or literals

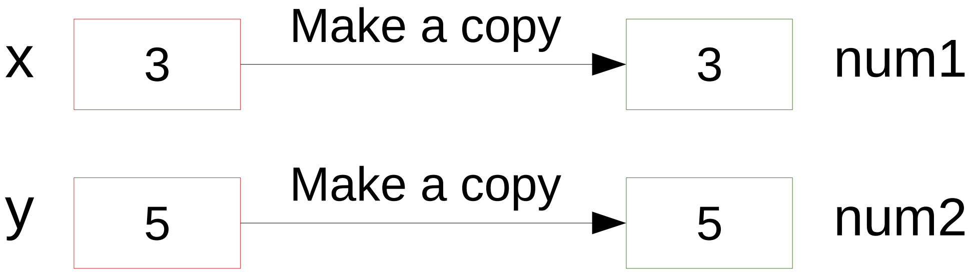
```
<script>
        . . . function definition . . .
        var z = sum (4, 7);   // passing literals (constants) to function
        document.write(“The sum of numbers is : “ + z);
</script>
```

Actual Vs formal arguments

- Formal arguments are the names listed within parenthesis in function definition (also known as function parameters)
- Formal arguments are initialized through actual arguments at run time
- Actual arguments are variables or literals passed to the function at the time of invocation (call to execute)
- The formal arguments are visible to function only

Actual Vs formal arguments

- The value from actual argument is copied to formal arguments before executing the body of function



The return statement

- By default a function returns undefined
- Return statement is used to return primitive value or reference of an object
- The return value or reference
  - Can be directly passed on to expressions
  - Must be collected using assignment operator to store in a variable and further utilization
- There could be more than one return statements present in the function; but, only one value or reference can be returned
- The function exits after execution of return statement

Class Work

- Write a function to find the square of a given number
- Write a function to find sum of cubes of two numbers
- Write a function to reverse a number

  [Hint n =12345 output : 54321]
- Write a function to print all numbers between 1 and 100 which is divisible by given number z

Local and Global Variables

- Local variables : declared inside the function
- Global variables: declared outside the function
- Local variables are visible to function only and can’t be shared across functions
- Global variables can be shared across functions

Global Variables

- Variables declared outside function are called global variables

```
<script>
        var x = 3;      // global variable
        var y = 4;      // global variable
        function sum() {
                return x + y;
        }
</script>
```

Function objects

- JavaScript functions are objects
- JavaScript typeof operator returns "function" for functions

Function Parameters

- JavaScript is a weekly typed language
- JavaScript function definitions do not specify data types for parameters
- JavaScript does not cross check the number of arguments received against defined parameters

Function Parameters

```
<script>
      . . . function definition . . .
      var x = 3, y = 5, z;
      z = sum (x, y, 7, 8);   // No exception will be thrown here
      document.write(“The sum of numbers is : “ + z);
</script>
```

Arguments Object

- JavaScript functions have a built-in object called the arguments object
- The arguments object contains an array of the arguments used when the function was called
- “arguments.length” property returns number of arguments received by function when it was invoked

Arguments Object

```
<script>
    function addAll() {
        var i, sum = 0;
        for (i = 0; i < arguments.length; i++) {
            sum += arguments[i];
        }
        return sum;
    }
    document.write(addAll(45, 56, 64, 53, 44, 68));
</script>
```

Robust parameter handling

- Function object contains length property which tells us about defined arguments

```
<script>
        function square (num) {
                return num * num;
        }
        document.write(“number of formal arguments = “ + square.length);
</script>
```

Robust parameter handling

- Checking passed arguments against defined

```
<script>
    function square (num) {
        if(square.length != arguments.length)
            throw “square function require only one argument”;
        return num * num;
    }
</script>
```

Function Arguments

- Primitive types are passed by value
  - Value from primitive type actual argument is copied to formal arguments
  - If a function changes value through formal argument, it does not change the original value in actual arguments
- Objects are Passed by Reference
  - In JavaScript, object references are values
  - Because of this, objects will behave like they are passed by reference
  - If a function changes an object property, it changes the original value

Function constructor

- The Function constructor creates a new Function object
- The Function() constructor expects any number of string arguments
- The last argument is the body of the function; JavaScript statements are separated from each other by semicolons
- Calling constructor directly can create functions dynamically, but suffers from security and performance

Function constructor

```
Syntax:
var variablename = new Function(Arg1, Arg2..., "Function Body");
```

```
<script>
        var fullname = new Function("firstname", "lastname", “return firstname + ‘ ’ + lastname;”);
        document.write("Full name is " + fullname(“Tenali”, “Raman”));
</script>
```

Thank you

Web Stack Academy (P) Ltd

#83, Farah Towers,
1st floor,MG Road,
Bangalore – 560001

M: +91-80-4128 9576
T: +91-98862 69112
E: info@www.webstackacademy.com