college CDI

Fundamental notions of programming (NFP)

Class 4

Functions

A function is a block of instructions used to perform a single action. Whenever it is needed to perform a particular action within a program, the function is called. It is like a small program running within the big program.

Syntax

```
functionName()
```

To create a function

```
function myFunction() {
        Instruction 1;
        Instruction 2...
}
```

Explanation :
To create a function, the word « function » is written first. Then you write the name of the function followed by parenthesis and the instructions between brace brackets.

Example

```
<script>
let a = 2;                          // variables declaration/assignment
let b = 3;

function addition() {               // Creates the function
        document.write(a+b);
}

addition();                         // Runs the function : outputs 5
</script>
```

Naming functions

Basically, you can name your functions freely. It although is considered best practice for the function names to be descriptive in the way that they should inform on what the a given function does. It is also considered best pratice for the function names to start with a lower case and use camel case writing.

You may want to read the very famous Douglas Crockford's code conventions for JavaScript for more details : https://crockford.com/javascript/code.html.

Importance of data types

Let's make things a little more complicated by asking users to supply the values to be used in our function.

Explanation :
When using a method such as *prompt()*, the values assigned to variables are of type *string* and not *number*. So the result is two strings output one after the other. The string values need to be converted in number using *parseInt()* method.

```
<script>
let num1 = prompt("Enter a first number");
let num2 = prompt("Enter a second number");

function myAddition() {
        document.write(num1 + num2);
}

myAddition();
</script>
```

Result :
If the user provided numbers 2 and 3, instead of the sum being 5, the output result would be 23.

```
<script>
let num1 = prompt("Enter a first number");
let num2 = prompt("Enter a second number");

function myAddition() {
        document.write(parseInt(num1) + parseInt(num2));
}

myAddition();
</script>
```

Result :
Now the result is the sum of two numbers.

NaN

Standing for *Not a Number*, NaN is an error message that is output when an operation is expecting number type values and was supplied with something else such as a string.

isNaN()

Standing for *is Not a Number*, this global function tests a value in order to know if it is something else than a number and returns a boolean.

```
<script>
document.write(isNaN("100") + "<br>");
document.write(isNaN("aa10") + "<br>");
document.write(isNaN("100a") + "<br>");
</script>
```

Result :
false
true
true

Assignment 4 : using functions

Create pseudocode and flowcharts first, and then create the following programs using functions :

- The program first requests for the user to enter the diameter of a circle.
- A first function will calculate the circumference of the circle.
- A second function will calculate the surface area of the circle.
- The result will be output to screen alike the following :

For a circle of : *x* diameter
The circumference is : *y*
and the surface area is : *z*

Formulas to be used

Circumference :
$2\pi r$

Surface area :
πr^2