



INTRODUCTION TO JAVASCRIPT PART TWO

INTRODUCTION TO JAVASCRIPT

- String Manipulation
- Math Object
- Date Object
- Functions
- Arrays

STRING MANIPULATION

- Examples of strings are as follows:

```
var string1 = "blue";
```

```
var string2="Today is Monday";
```

```
var string3 = "12";
```

STRING MANIPULATION

- String Manipulation allows us to:
 - Combine these strings into a sentence i.e. take these strings and concatenate them into one.
 - Break a string into smaller ones.
 - Convert a string into upper case or lowercase.
 - See if a particular character exists in a string.
 - Find the length of a string.
 - Convert a string into a number.

STRING MANIPULATION

- In addition to the concatenation operator (+) JavaScript supports several advanced string operations as well.
- These functions are accessed by referring to various methods of the String object.
- Moreover, this object also contains the 'length' property.

EXAMPLE

```
name = "BHOLA" ;
```

```
document.write( "The length of the string 'name' is ", name.length ) ;
```

The length of the string 'name' is 5

STRING METHODS

FORMAT: *string.methodName()*

EXAMPLE:

```
name = "Bhola" ;
```

```
document.write( name. ) ;
```

```
document.write( name.toUpperCase( ) ) ;
```

BholaBHOLA

STRING METHODS: ALL OTHERS

toLowerCase()
toUpperCase()

charAt(*n*)
substring(*n*, *m*)

indexOf(*substring*, *n*)
lastIndexOf(*substring*, *n*)

split(*delimiter*)

TOLOWERCASE(), TOUPPERCASE()

```
person = "Bhola" ;  
document.write( person ) ;  
document.write( person.toLowerCase( ) ) ;  
document.write( person.toUpperCase( ) ) ;
```

BholabholaBHOLA

CHARAT(*N*)

Returns a string containing the character at position *n* (the position of the 1st character is 0).

```
mister = "Bhola" ;  
document.write( mister.charAt( 0 ) ) ;  
document.write( mister.charAt( 2 ) ) ;
```

Bo

SUBSTRING(*N*, *M*)

Returns a string containing characters copied from positions *n* to *m* – 1.

```
s = "Bhola" ;
```

```
document.write( s.substring( 1, 3 ) ) ;
```

```
document.write( s.substring( 0, s.length ) ) ;
```

hoBhola

INDEXOF(*SEARCHSTRING*, *N*)

Returns the position of the first occurrence of *searchstring*. The search begins at character 0 unless specified by a value of *N*.

-1 is returned if the *searchstring* is **not** found.

```
s = "Bhola" ;
```

```
document.write( s.indexOf( "ola" ) ) ;
```

```
document.write( s.indexOf( "z" ) ) ;
```

2-1

SPLIT(*DELIMITER*)

Returns an array of strings, created by splitting string into substrings, at *delimiter* boundaries.

```
s = "Hello: I must be going!" ;  
data = new Array( ) ;  
data = s.split( " " ) ;  
document.write( "<TABLE>" ) ;  
for( I in data ) {  
    document.write( "<TR><TD>", data[ i ], "</TD></TR>" ) ;  
}  
document.write( "</TABLE>" ) ;
```

Hello:
I
must
be
going!

AUTOMATIC CONVERSION TO STRINGS

- Whenever a non-string is used where JavaScript is expecting a string, it converts that non-string into a string.
- Example:
 - The `document.write()` method expects a string (or several strings, separated by commas) as its argument.
 - When a number or a Boolean is passed as an argument to this method, JavaScript automatically converts it into a string before writing it onto the document.

THE '+' OPERATOR

- When '+' is used with numeric operands, it adds them.
- When it is used with string operands, it concatenates them.
- When one operand is a string, and the other is not, the non-string will first be converted to a string and then the two strings will be concatenated.

THE '+' OPERATOR: EXAMPLES

`document.write(2 + 3) ;`

5

`document.write("2" + "3") ;`

23

`document.write("2" + 3) ;`

23

STRINGS IN MATHEMATICAL EXPRESSIONS

When a string is used in a mathematical context, if appropriate, JavaScript first converts it into a number. Otherwise, a “NaN” is the result.

```
document.write( "2" * 3 );
```

6

```
document.write( "2" + 3 );
```

23

THE 'TOSTRING' METHOD

EXPLICIT CONVERSION TO A STRING

EXAMPLE:

Convert 100.553478 into a currency format

```
a = 100.553478 ;
```

```
b = a.toString( ) ;
```

```
decimalPos = b.indexOf( ".", 0 ) ;
```

```
c = b.substring( 0, decimalPos + 3 ) ;
```

```
document.write( c ) ;
```

100.55

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JAVASCRIPT MATH OBJECT

- In addition to the simple arithmetic operations (e.g. +, *, etc.) JavaScript supports several advanced mathematical operations as well.
- These functions are accessed by referring to various methods of the **Math** object.
- Moreover, this object also contains several useful mathematical constants as its properties. For example **Math.PI**.

METHODS

`sin(r)`

`cos(r)`

`tan(r)`

`asin(x)`

`acos(x)`

`atan(x)`

`atan2(x, y)`

`sqrt(x)`

`pow(x, y)`

`exp(x)`

`log(x)`

`round(x)`

`floor(x)`

`ceil(x)`

`abs(x)`

`max(x, y)`

`min(x, y)`

`random()`

`sqrt(x)`

Returns the
square root of
x

`Math.sqrt(9)`
→ 3

`pow(x, y)`

Returns x
raised to the
power y

`Math.pow(2, 3)`
→ 8

round(x)

Returns
integer nearest
to x

1.1 \rightarrow 1

12.5 \rightarrow 13

12.9 \rightarrow 13

floor(x)

Returns largest
integer that is
less than or
equal to x

1.1 \rightarrow 1

12.5 \rightarrow 12

12.9 \rightarrow 12

ceil(x)

Returns
smallest
integer that is
greater than or
equal to x

1.1 \rightarrow 2

12.5 \rightarrow 13

12.9 \rightarrow 13

abs(x)

Returns the
absolute value
of x

1.1 \rightarrow 1.1

-12.5 \rightarrow 12.5

0 \rightarrow 0

$\text{min}(x, y)$

Returns the
smaller of x
and y

$2, 4 \rightarrow 2$

$-12, -5 \rightarrow -12$

$\text{max}(x, y)$

Returns the
larger of x and
 y

$2, 4 \rightarrow 4$

$-12, -5 \rightarrow -5$

random()

Returns a
randomly-
selected,
floating-point
number
between 0 and 1

`Math.random()`

→

0.960111965589273

RANDOM(): EXAMPLE

Write JavaScript code that will display the result of the rolling of a 6-sided dice on user command.

If you want to get a random number between 1 and another number, just multiply the random() method by the uppermost number and add 1 to the total.

For Example: to generate a random number from 1 to 6:

```
var mynumber=Math.floor(Math.random()* 6 + 1);
```

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DATE OBJECT

Date()

Constructs an empty date object.

For example: `var now=new Date();`

getDate()

Returns the day of the month.

```
var dayNum =  
now.getDate();
```

getDay()

Returns an integer representing the day of the week, Sunday is 0 and Saturday is 6.

```
var day =  
now.getDay();
```

getMonth()

Returns the month field of the Date object, represented by an integer, January is 0 and December is 11.

```
var month =  
now.getMonth();
```

getFullYear()

Returns the year as a four digit number.

```
var thisyear =  
now.getFullYear()  
;
```

DATE: OTHER RETRIEVAL METHODS

getHours()
getMinutes()

getSeconds()
getMilliseconds()

getTime()

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FUNCTIONS

- Functions:
 - consist of one or more *statements* (i.e., lines of program code that perform some operation).
 - are separated in some way from the rest of the program, for example, by being enclosed in curly brackets, {.....}
 - are given a unique name, so that they can be *called* from elsewhere in the program.
- Functions are used where the same operation has to be performed many times within a program.

FUNCTIONS

In JavaScript, functions are created in the following way:

```
function name()  
{  
    statement;  
    statement;  
}
```

FUNCTIONS

However, it is often necessary to supply information to a function so that it can carry out its task.

```
function addVAT(price)

{
    price *= 1.21;
    alert(price);
}
```

We would call this function in the following way:

```
addVAT(costPrice);
```

FUNCTIONS

Sometimes we also need to get some information back from a function.

```
function addVAT(price)

{
    price *= 1.21;
    return price;
}
```

We would call this function in the following way:

```
var newPrice = addVAT(costPrice);
```

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ARRAYS

- The Array object is used to store a set of values in a single variable name.

```
var data= new Array();  
data[0] = "Hurling";  
data[1] = "Rugby";  
data[2] = "Football";  
data[3] = "Soccer";  
data[4] = "Tennis";
```

```
document.write(data);
```

ARRAY MANIPULATION

```
for (count=0; count<len; count++) {  
    document.write(data[count] + "<br>");  
}
```

```
for (x in data) {  
    document.write(data[x] + "<br>");  
}
```


OBJECT BASED ARRAY FUNCTIONS

- Arrays have lots of nifty built in functions such as `join()`, `push()`, `pop()`, `sort()`, `slice()`, `splice()`, and more.

`join()`

The `join()` method is used to put all the elements of an array into a string. The elements will be separated by a specified separator.

```
data.join(', ');  
data.join('<br>');
```

push()

The **push()** method adds one or more elements to the end of an array and returns the new length.

```
data.push('golf');
```

unshift()

The **unshift()** method adds one or more elements to the start of an array and returns the new length.

```
data.unshift('golf');
```

pop()

The **pop()** method is used to remove and return the last element of an array.

```
data.pop();
```

shift()

The **shift()** method is used to remove and return the first element of an array.

```
data.shift();
```

splice()-delete

The **splice()** command must specify where it should begin deleting (index number of first item to be deleted) and how many items it should delete.

```
data.splice(2,2);
```

splice()-add

The **splice()** command must specify where the new items should be located, 0 to indicate that you do not want to delete any items, then the list of items to be inserted: one or more values separated by commas.

```
data.splice(2,0, "Cricket", "Snooker");
```

splice()-replace

The process is the same as adding an item, but instead of specifying 0 for the second piece of information, you supply the number of items to be replaced. This is followed by the list of items that are replacing the deleted (replaced) items.

```
data.splice(2,2, "Cricket", "Snooker");
```

reverse()

The **reverse()** method is used to reverse the order of the elements in an array.

```
data.reverse();
```

concat()

The **concat()** method is used to join two or more arrays.

```
data.concat(data);
```

sort()

The sort() method is used to sort the elements of an array.

```
data.sort();
```

sort() - numeric

To sort numbers, you must add a function that compare numbers.

```
data.sort(function(a,b){return a - b});
```