Chapter 6
Client side Scripting using JavaScript

JavaScript

It is a client side scripting language. The script or program code is written in HTML file within **<SCRIPT>** tag pair. The script is mainly used for data validations in the Forms at the client side. The **<SCRIPT>** tag uses **Language** attribute and its value will be **JavaScript**. Every browser has a JavaScript engine. The script code is interpreted at runtime by the JavaScript engine.

A sample JavaScript function is given below. It is usually written in <HEAD> section.

```
<SCRIPT Language= "JavaScript">
    function print()
    {
        document.write("Welcome to JavaScript.");
    }
 </SCRIPT>
```

Name of this function is print() and it can be called by the following code segment:

```
<BODY>
    <SCRIPT Language= "JavaScript">
        print();
    </SCRIPT>
</BODY>
```

When this html file is opened in a browser, we can see Welcome to JavaScript in the browser window. The keyword **`document`** refers to the web page being opened and **`write()`** is a built-in function in JavaScript to display a text.

Data Types in JavaScript

(i) **Number**: All numbers fall into this category.

(ii) **String**: Any combination of characters, numbers or any other symbols, enclosed within double quotes.

(iii) **Boolean**: Only two values fall in this type. They are `true` and `false`. Note that the values are not in double quotes.

Variables

Variables are used for storing values. They are declared using the keyword **var** as: **`var x;`**

The variable definition is complete only when it is assigned a value as follows.

```
var x, y;
x = 25;
y = "INDIA";
```

In the above example, the variable x is of Number type and y is of String type.

Operators

Arithmetic operators	+ – * / %
Increment, decrement	++ – –
Assignment operators	= += –= *= /= %=
Relational operators	< <= > >= == !=
Logical operators	|| && !
String concatenation	+

An example for String concatenation:

```
x = "Java";
y = "Script";
z = x + y;
```

The + operator will add the two strings and the variable z will have the value **JavaScript**.

Another example:

```
x = "23";
y = 5;
z = x + y;
```

The value of z will be 235. But the output of the statement `z = Number(x) + y;` will be 28. The Number() function coverts the string "23" into the number 23.

Control Statements

if statements	if (test_expression) Statement;

	if (test_expression)
	  statement_1;
	else
	  statement_2;

	if (test_expression1)
	  statement_1;
	else if (test_expression2)
	  statement_2;
	:
	:
	else
	  statement_n;

switch statement	switch (variable/expression)
	{
	  case value1: statement1; break;
	  case value2: statement2; break;
	  :
	  :
	  default: statement;
	}

for loop	for (initialization; test; update) body;

while loop	initialization;
	while (test_expression)
	{
	  body;
	  update;
	}

Built-in Functions

Function	Use	Syntax / Example
alert()	To display a text in a message window.	alert("Welcome");
isNaN()	Returns True if the given value is not a number. That is, the argument contains a non-numeric character. Returns False is the argument is numeric.	isNaN("welcome"); and isNaN("A123"); return True. isNaN("13"); and isNaN(13); return False
toUpperCase()	Returns the upper case form of the given string.	Output of "Java".toUpperCase(); will be JAVA.
toLowerCase()	Returns the lower case form of the given string.	Output of "JavaSCIPT".toLowerCase(); will be javascript.
charAt()	Returns the character at a particular position. charAt(0) gives the 1st character of a string.	"JavaScript".charAt(4); gives S, the 5th character.
length property	Returns the length (number of characters) of the string.	"JavaScript".length will give 10.

Accessing Values from the Input controls of a Form

The data from a text box in a Form is accessed by the following format:

Variable = document.Form_Name.TextBox_Name.Value;

Form_Name is the value of the **Name** attribute of the Form. TextBox_Name is the value of the **Name** attribute of the text box. The data in the text box is stored as String type even though we input a number. The data is to be converted into numeric using Number() function is necessary.

Consider the following line of code:

```
<INPUT Type= "button" Value= "Show" onClick= "showSquare()">
```

Here, `onClick= "showSquare()"` means that when the user clicks this button in the Form, the function with the name `showSquare()` is called.

Ways to add JavaScript to a Web Page

Inside the <BODY>: Here, the scripts will be executed while the content of the web page is being loaded.

Inside the <HEAD>: Usually functions are written here. They are called from body. The script in this section will be loaded first. Mixing of web page content and scripts can be avoided also.

External JavaScript file: Scripts can be placed into an external file and it can be linked to with the HTML document. This file is saved with the extension '.**js**'. The advantage is that the same script can be used across multiple HTML pages or a whole website. The linking is done through the attribute **Src** of <SCRIPT> tag.

Questions from Previous Years' Question Papers (Computer Science)

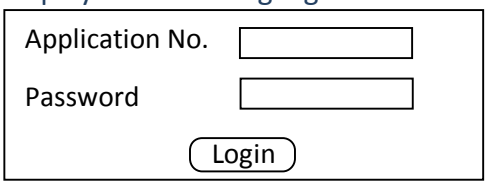
1. "TRUE and False are used to represent Boolean values". State if the given statement is correct or not. (1) (March 2016)
2. Explain the use of for loop with an example. (3) (March 2016)
3. Develop a web page that implements a JavaScript function that takes two numbers as input and displays their product. (2) (March 2016)
4. Give the function in JavaScript that converts a string type data containing numbers to number type. (1) (SAY 2016)
5. Design a web page with form tag which accepts a number in a textbox and another textbox which should display either odd or even. Write a function in JavaScript to check whether the number is odd or even. (2) (SAY 2016)
6. Develop a web page that accepts a number after validation and prints the factorial of it. (2) (SAY 2016)
7. JavaScript provides a large number of built-in functions.
   (a) Name any two of them with an example. (2) (SAY 2016)
   (b) The property which returns the size of the string is _____. (1) (SAY 2016)
8. A virtual machine for executing JavaScript code is _____. (1) (March 2017)
9. Discuss about six built-in functions used in JavaScript. (3) (March 2017)
10. Design a procedure in JavaScript that takes two strings as input and displays the concatenated string as output. (2) (March 2017)
11. State whether the following statements are true or false:
    (a) JavaScript is the only client side scripting language.
    (b) JavaScript is a case sensitive language.
    (c) The keyword used to declare a variable in JavaScript is VAR. (3) (SAY 2017
12. Predict the output of the following code:

```
<HTML>
   <BODY>
        <SCRIPT Language="JavaScript">
             var i, s=0;
             for (i=1;i<=10; i+=2)
                  s=s+i;
             document.write("sum="+s);
        </SCRIPT>
   </BODY>
</HTML>
```

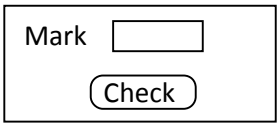
(2) (SAY 2017)

Questions from Previous Years' Question Papers (Computer Applications)

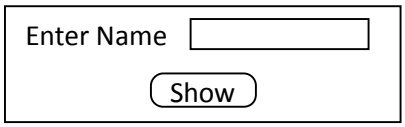
1. Develop a web page to display the following login screen.



   Write JavaScript to do the following validation:
   (a) The application number should be in the range 10000 to 99999.
   (b) The password should contain at least 8 characters. (3) (March 2016)
2. Design the following web page to enter the mark of a student:



   (a) Write HTML code for the web site.
   (b) Provide validations for the text box using JavaScript. The mark should be in the range 0 to 100 and should be a number. The textbox should not be empty. (3) (SAY 2016)
3. What is an external JavaScript file? Write the advantage of using an external JavaScript file. (3) (March 2017)
4. Develop a web page to display the following screen:



   The user can enter a name in the textbox. On clicking the 'show' button the name entered should be changed into uppercase. Include JavaScript code in the HTML for doing this. (3) (March 2017)
5. Write a JavaScript which inputs the name, rollno and date_of_birth of a student. Date of birth contains month, day and year. Month should be selected from a drop-down list. (3) (SAY 2017)