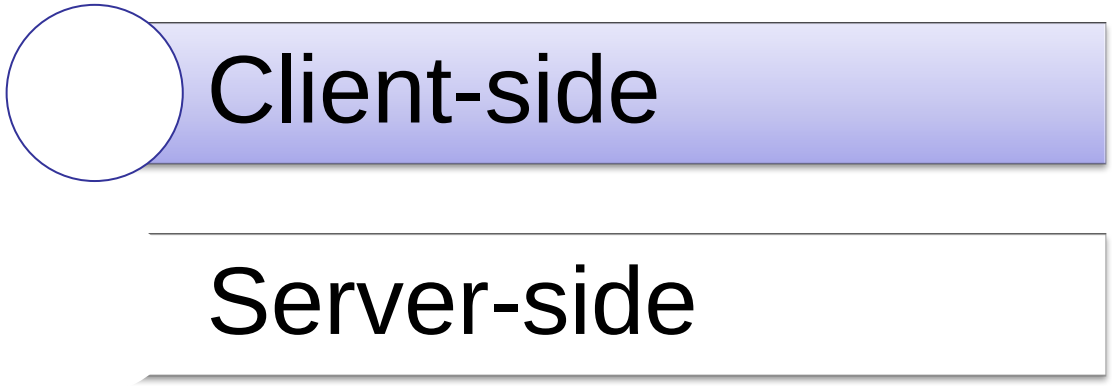
Objectives

- In this session, you will learn to:
  - Understand scripting
  - Implement JavaScript in Web pages
  - Use variables, operators, and control structures
  - Implement functions

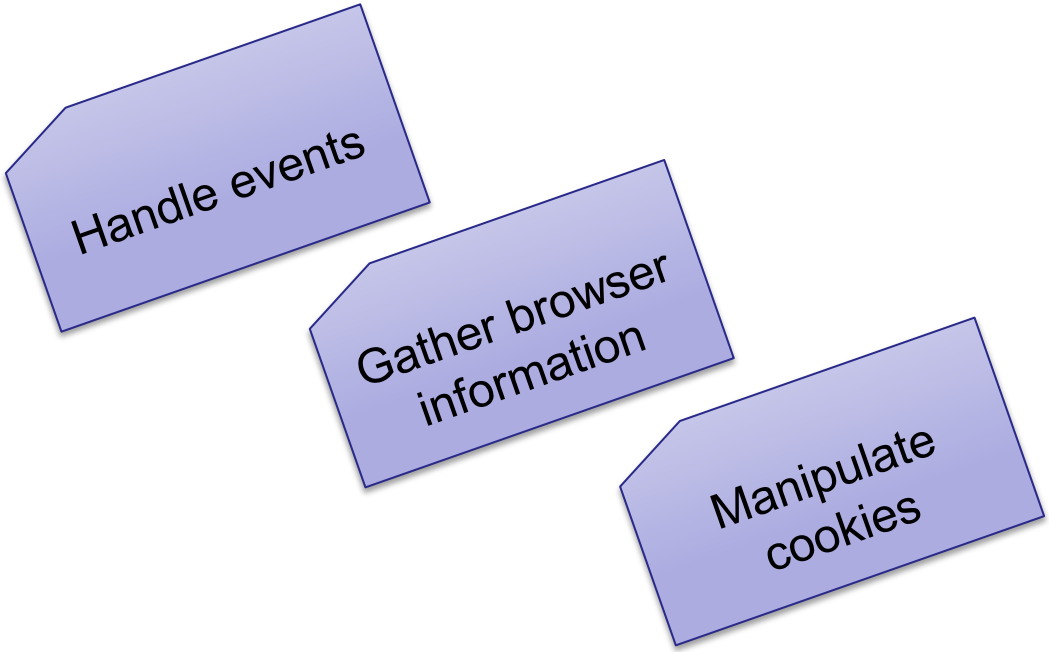
Types of Scripting

- A script:
  - Is a block of code that is incorporated in Web pages to make them dynamic and interactive.
  - Can be of two types:



Identifying the Benefits of JavaScript

- JavaScript provides the following benefits:

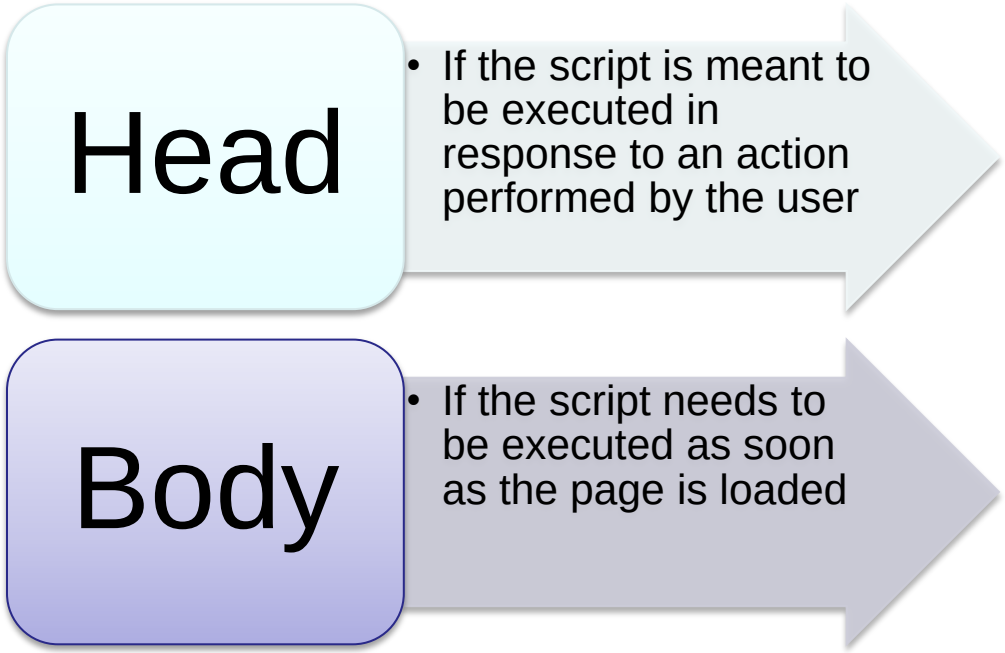


Implementing JavaScript in Web Pages

- JavaScript:
  - Is a client-side scripting language.
  - Can be directly embedded into a Web page by writing the code inside the `<SCRIPT>` tag.
  - Code can also be written in an external JavaScript (.js) file.

Embedding a Script into a Web Page

- The JavaScript code:
  - Can be inserted in the following sections of the HTML document by using the `<SCRIPT>` tag:



  - Can be embedded into a Web page by using the following syntax:

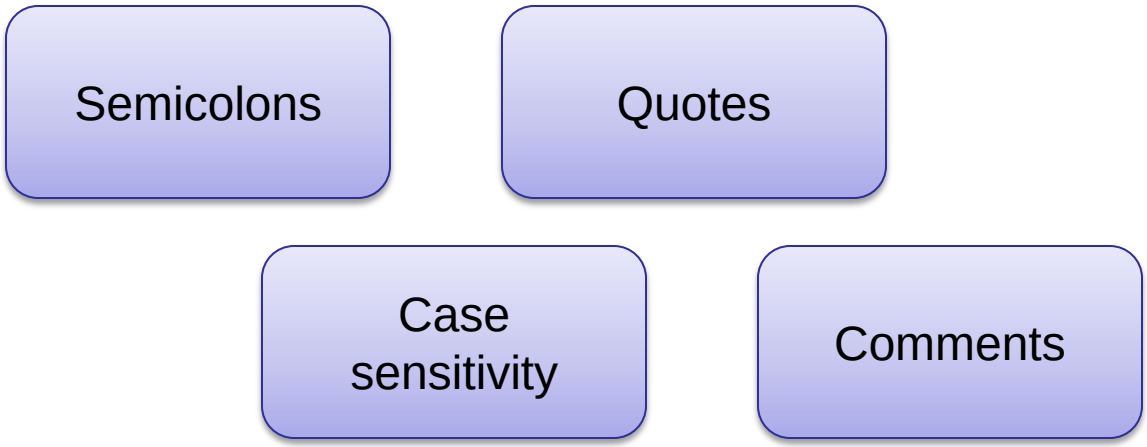
```
<SCRIPT type="text/javascript"> JavaScript statements
</SCRIPT>
```

Creating and Using an External File

- An external JavaScript file:
  - Is saved with the .js extension.
  - Can be referred inside an HTML document using the `src` attribute of the `<SCRIPT>` tag.

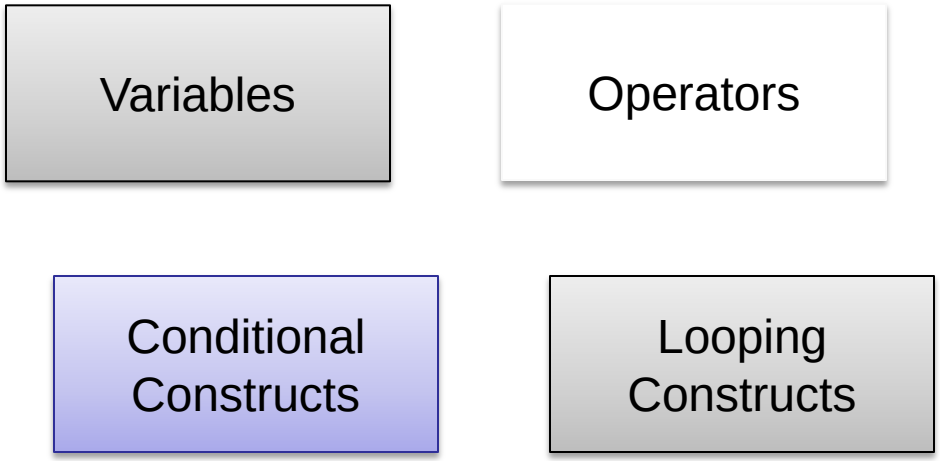
Identifying Rules and Conventions Used in JavaScript

- JavaScript rules and conventions:



Using Variables, Operators, and Control Structures

- In JavaScript, to compare values and evaluate expressions, you need:



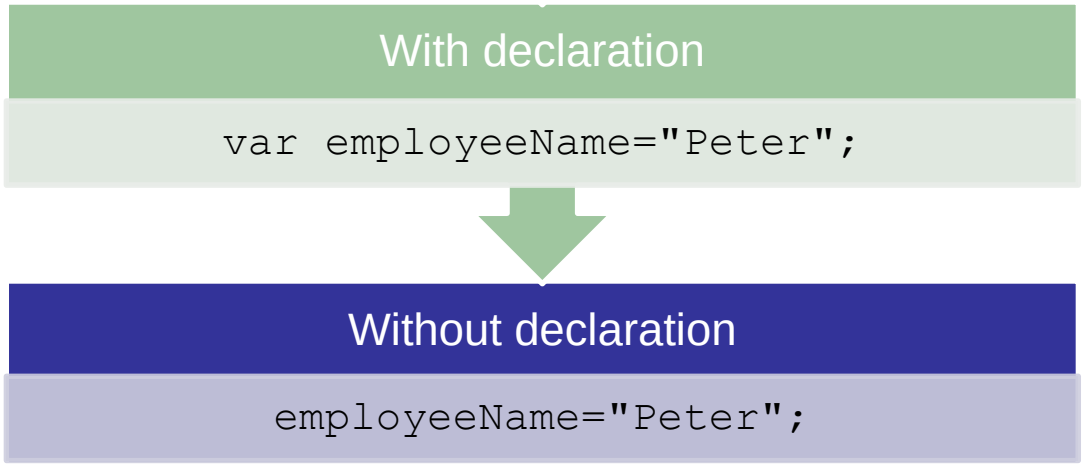
Defining Variables

- A variable:
  - Is a named location in memory that is used to store a value.
  - Is declared by using the following syntax:

```
var var_name;
```

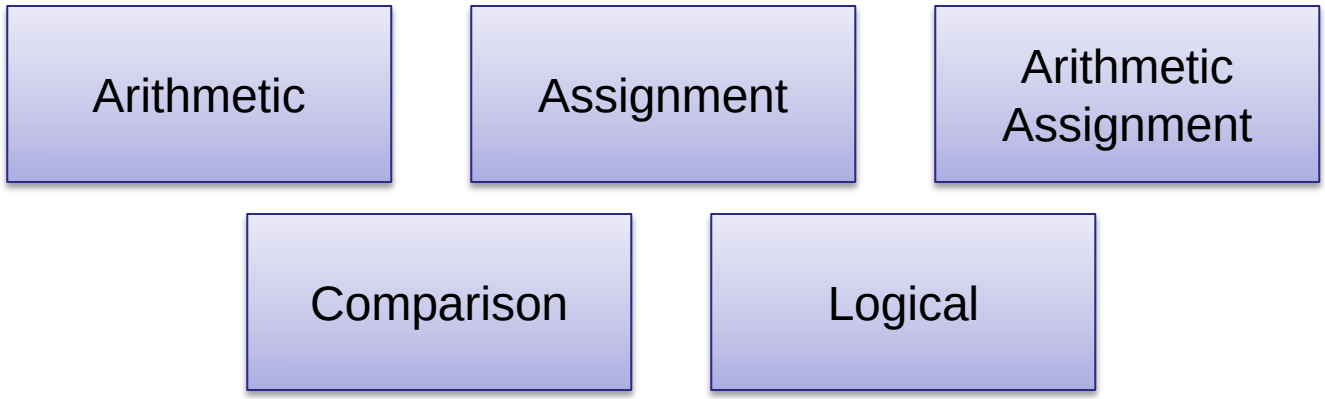
  - Can be assigned a value in the following ways:

```
var employeeName;
employeeName="Peter";
```



Using Operators

- An operator:
  - Is a set of one or more characters that is used for computations or comparisons.
  - Can be used to modify the values stored in the variables.
  - Can belong to any one of the following categories:



Using Operators (Contd.)

- An arithmetic operator:
  - Is used to perform arithmetic operations on variables and literals.
  - Can be of the following types:
    - +
    - –
    - *
    - /
    - %
- An assignment operator:
  - Is used to assign a value or a result of an expression to a variable.

Using Operators (Contd.)

- Arithmetic assignment operators:
  - Are used to perform arithmetic operations and assign the value to the variable at the left side of the operator.
  - Are of the following types:
    - +=
    - -=
    - *=
    - /=
    - %=

Using Operators (Contd.)

- Comparison operators:
  - Are used to compare two values and perform an action on the basis of the comparison.
  - Are of the following types:
    - <
    - >
    - <=
    - >=
    - ==
    - !=
    - ===

Using Operators (Contd.)

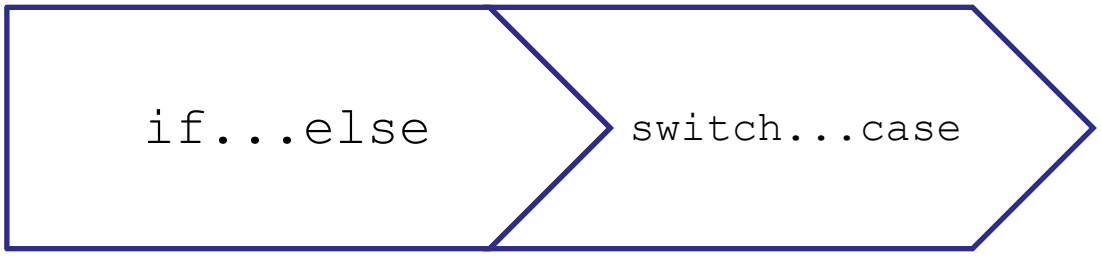
- Logical operators:
  - Are used to evaluate complex expressions.
  - Return a boolean value.
  - Are of the following types:
    - &&
    - !
    - ||

Using Operators (Contd.)

- Demo code for each operators

Using Conditional Constructs

- Conditional constructs:
  - Allow you to execute a block of statements based on the result of the expression being evaluated.
  - Can be of the following types:



Using Conditional Constructs (Contd.)

- The `if…else` construct:
  - Is used to evaluate the specified condition and perform actions on the basis of the result of evaluation.
  - Has the following syntax:

```
if (exp)
{
// Statements;
}
else
{
// Statements;
}
```

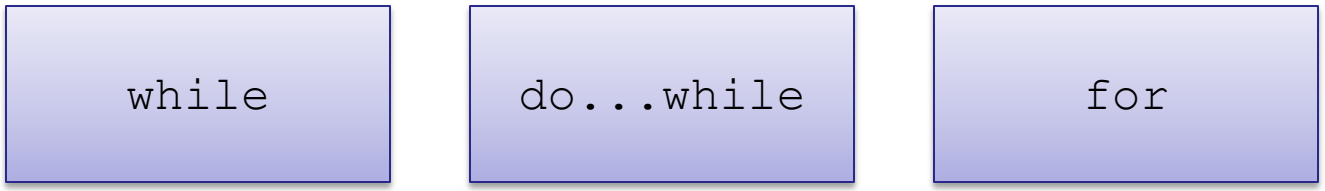
- The `switch…case` construct is used when you need to evaluate a variable for multiple values.
- The following embedded Notepad file contains the code to understand the use of `switch…case` construct in HTML:

Using Conditional Constructs (Contd.)

- Demo code for if..else and switch..case construct

Using Loop Constructs

- Loop structures:
  - Are used to repeatedly execute one or more lines of code.
  - Can be of the following types:



Using Loop Constructs (Contd.)

- The `while` loop:
  - Is used to repeatedly execute a block of statements till a condition evaluates to true.
  - Always checks the condition before executing the statements in the loop.
  - Has the following syntax:

```
while (expression)
{
statements;
}
```

Using Loop Constructs (Contd.)

- The `do…while` loop:
  - Is executed at least once, even if the condition evaluates to false.
  - Has the following syntax:

```
do
{ Statements;
}
while(condition)
```

Using Loop Constructs (Contd.)

- The `for` loop:
  - Allows the execution of a block of code depending on the result of the evaluation of the test condition.
  - Has the following syntax:

```
for (initialize variable; test condition; step value)
{
// code block
}
```

Using Loop Constructs (Contd.)

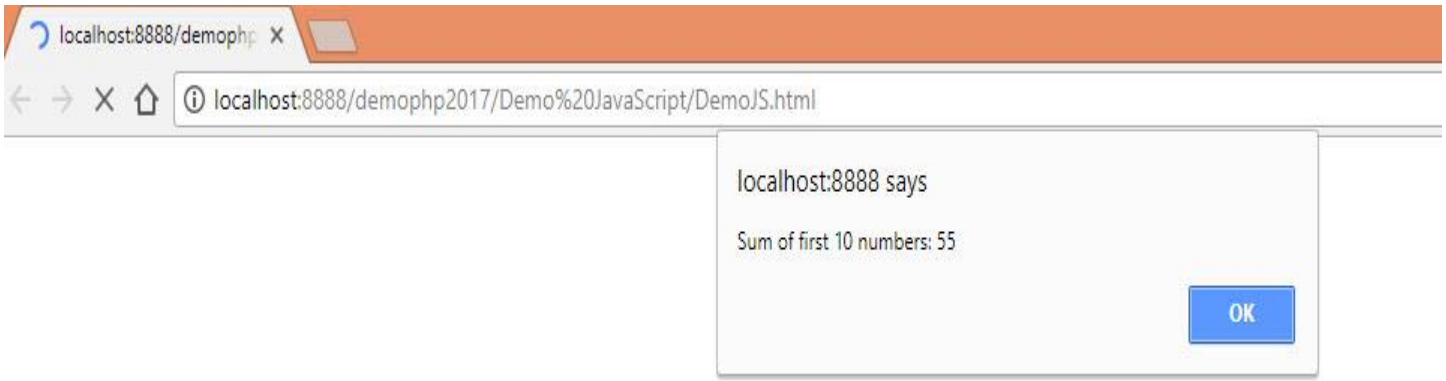
Example:

```
<script type="text/javascript">
    var i=0;
    var sum=0;
    while (i<=10)
    {
        sum=sum + i ;
        i = i + 1;
    }

    alert("Sum of first 10 numbers: " + sum);

</script>
```

Output:



Using Loop Constructs (Contd.)

Example:

```
<!doctype html>
<html>
<head>
<meta charset="utf-8">
<script language="javascript">
for(var i = 1; i <= 10; i++) {
    document.writeln('<BR>i = ' + i);
}
</script>
</head>
<body>
</body>
</html>
```

Output:

i = 1
i = 2
i = 3
i = 4
i = 5
i = 6
i = 7
i = 8
i = 9
i = 10

Break and Continue Statements

- The `break` statement:
  - Is used to exit the loop.
  - Prevents the execution of the remaining statements of the loop.
  - Is usually placed within an `if` construct inside the loop.
- The `continue` statement:
  - Is used to skip all the subsequent instructions and take the control back to the beginning of the loop.

Implementing Functions

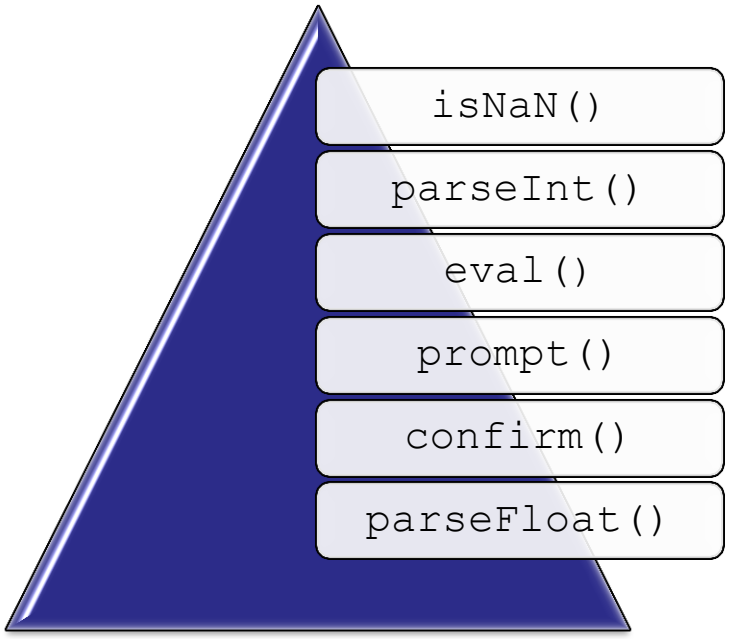
- Functions are used to write the code that needs to reused.
- They optimize the performance of the code.

Introducing Functions

- Functions:
  - Are a self-contained block of statements that have a name.
  - Are of the following types:

Introducing Functions (Contd.)

- Built-in functions:
  - Are ready to use as they are already coded.
  - For example:



- User-defined functions:
  - Are defined according to the need of the user.

Accessing Functions

- A function is called by using the following syntax:

```
functionName ();
```

or

```
functionName (parameter1, parameter 2...);
```

- A function returns a value by using the `return` statement as displayed in the following example:

```
function functionName()
{
var variable=10;
return variable;
}
```

Creating Functions

- Functions:
  - Are created by using the keyword, `function`, followed by the function name and the parentheses.
  - Are normally defined in the head section of a Web page.
  - Can optionally accept a list of parameters.
  - Are created using the following syntax:

```
function [functionName] (Variable1, Variable2)
{
//function statements
}
```

Example

Example:

```
<script type="text/javascript">
function add()
{
    var num1=parseInt(prompt("Nhap so thu nhat:"));

    var num2=parseInt(prompt("Nhap so thu hai:"));

    var result=num1+num2;
    alert("Tong hai so: "+result);
}

function calling_add()
{
    add();
}

calling_add();
</script>
```

Summary

- In this session, you learned that:
  - In JavaScript, the following conditional constructs can be used:
    - `if...else`
    - `switch...case`
  - In JavaScript, the following loop structures can be used:
    - `while`
    - `do...while`
    - `for`
  - A function is a self-contained block of statements that has a name.
  - Some of the built-in functions supported by JavaScript are:
    - `isNaN()`
    - `parseInt()`
    - `parseFloat()`
    - `eval()`
    - `prompt()`
    - `confirm()`
  - Functions are created by using the keyword, `function`, followed by the function name and the parentheses.
  - Functions can return a value using the `return` statement.