VBScript

Lesson 1: Introduction to VBScript

Lesson Objectives

- What is VBScript?
- Understand purpose of VBScript
- Advantages and disadvantages
- Sample Code
- Basics of VBScript

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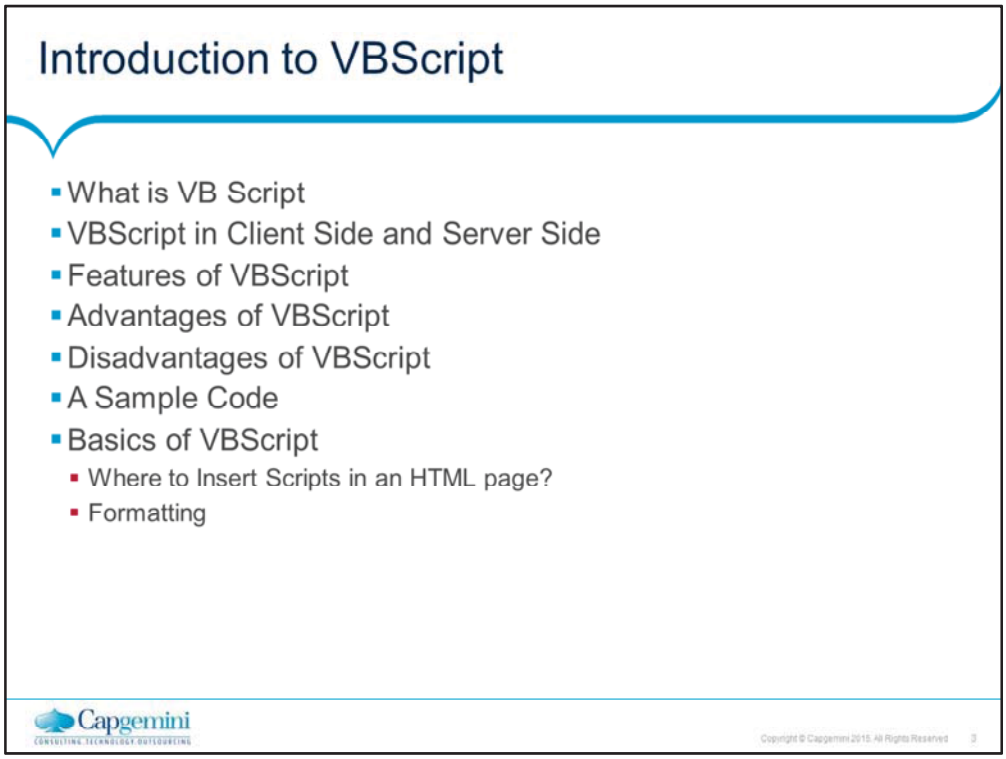

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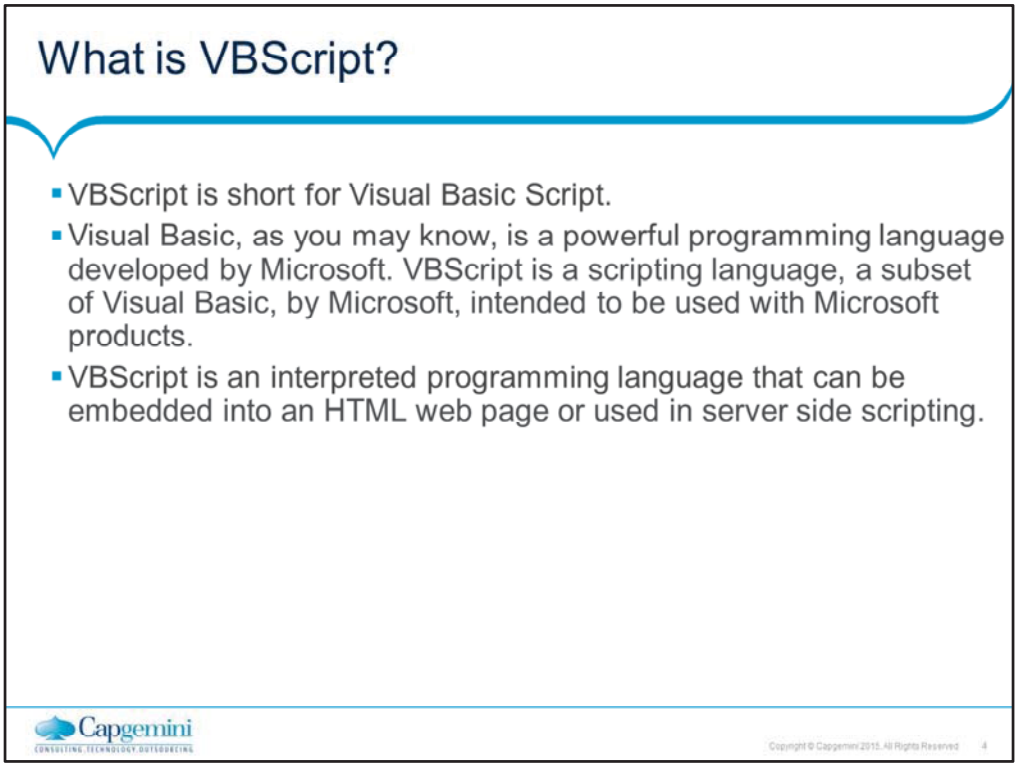

Interpreted programming languages tend to be simpler to program but slower to execute in general. Each time a program is run, it has to be interpreted (interrogated) line by line, based on the flow of execution (you will see later how branches and loops affect the flow of execution).

Compiled programming languages have a more complex syntax, and require more strict programming practices. With a compiled programming language, you first write the source code, then you feed it to a compiler (a special computer program), which produces an executable binary program. On the Windows platform, the output of the compiler usually ends in the ".exe" file extension. The program that comes out of the compilation process tends to be platform (operating system) specific. The key benefit for the programmer is that no other programmer can look at the source code once it is compiled. The other key factor is that the language used to write the source code becomes irrelevant once it has been compiled.
Visual Basic is a compiled language, whereas VBScript is an interpreted language

VBScript in Client Side and Server Side

- Client Side Scripting
  - VBScript code is executed/interpreted when an event is triggered. When the code is executed it is interpreted one line at a time. There are a number of events that will trigger the execution of a VBScript, like clicking on a form button, or the completion of a web page loading.
- Server Side Scripting
  - Server-side scripts are completely processed by the servers instead of clients. When clients request a page containing server-side scripts, the applicable server processes the scripts and returns an HTML page to the client
  - VBScript is the default scripting language for ASP(Application Service Provider). When the web server loads an .asp page from the disk into memory, it automatically knows to interpret the code in this document. Once the code has been interpreted, the resulting HTML page is sent to the browser (client) making the request.

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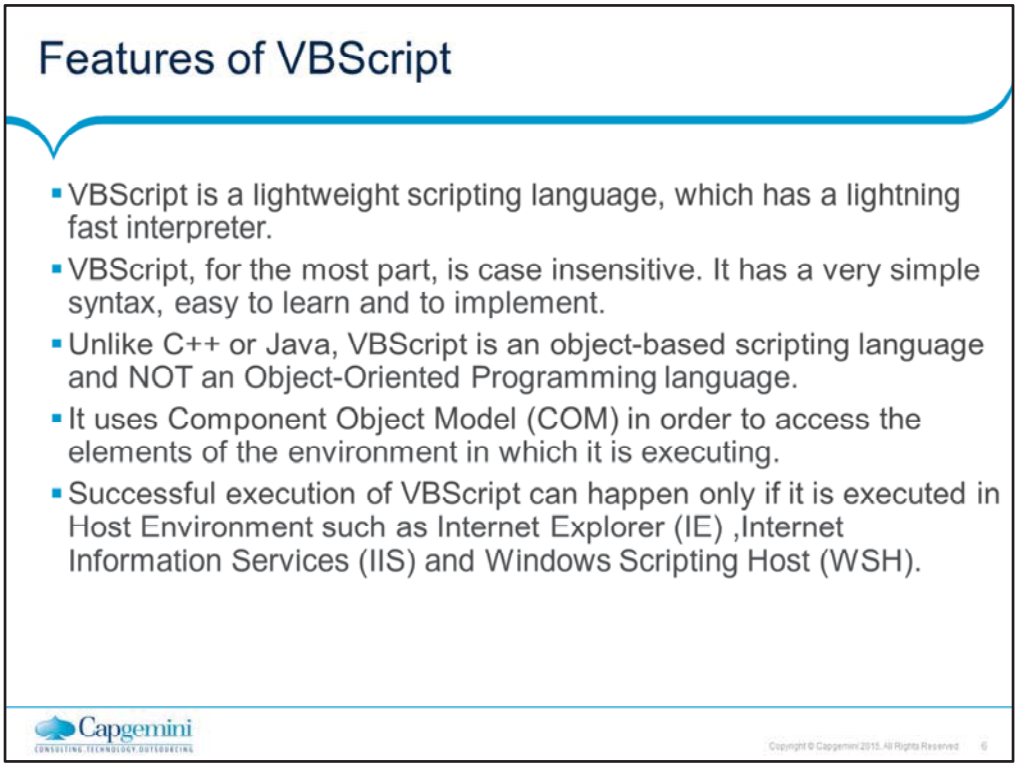

VBScript was introduced by Microsoft way back in 1996 and the first version was 1.0. The Current Stable version of VBScript is 5.8, which is available as part of IE8 or Windows 7

Advantages of VBScript

- VBScript has a good platform coverage. It can be run in many environments. Currently there are VBScript script engines for the 32-bit Windows API, 16-bit Windows API, and the Macintosh.
- VBScript is used as a scripting language in one of the popular Automation testing tools – Quick Test Professional abbreviated as QTP.
- VBScript is used for Client side scripting in Microsoft Internet Explorer.
- The ability to implement VBScript in our own applications. The VBScript source implementation can be licensed from Microsoft, completely free of charge, for use in any products and applications.

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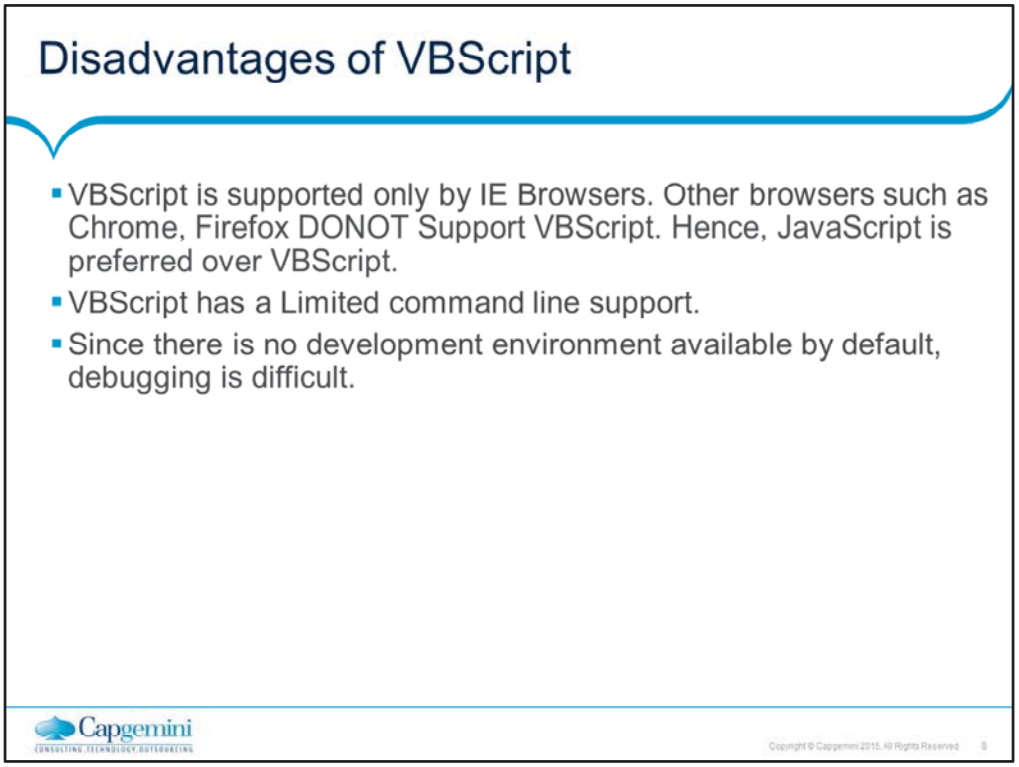
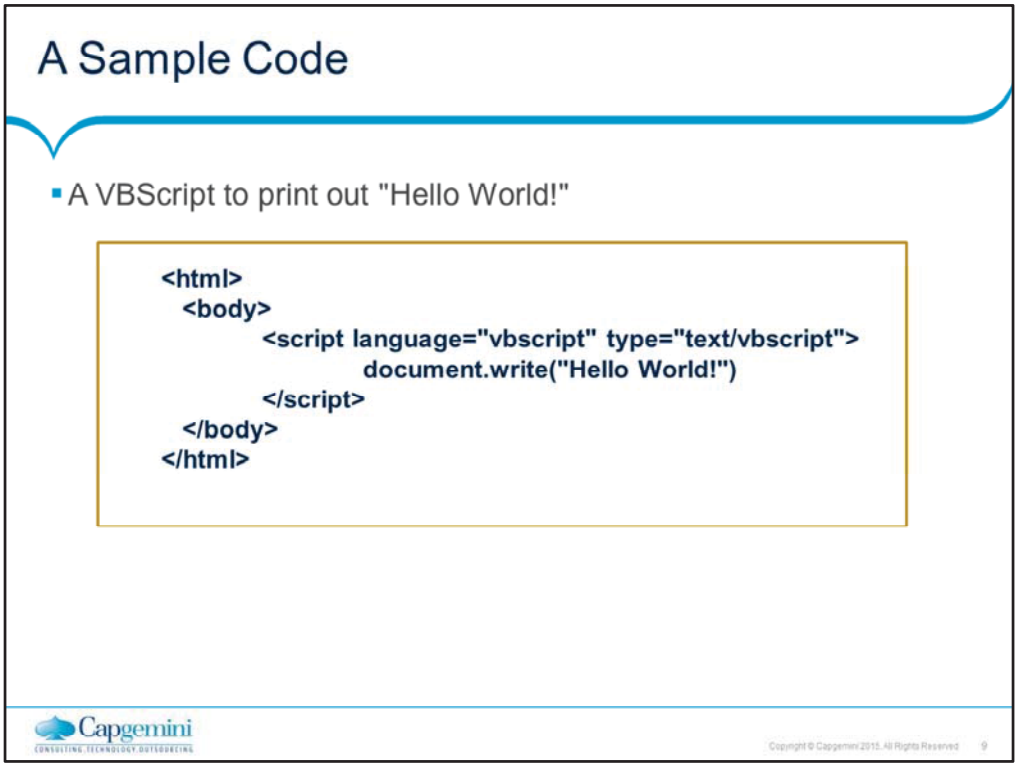


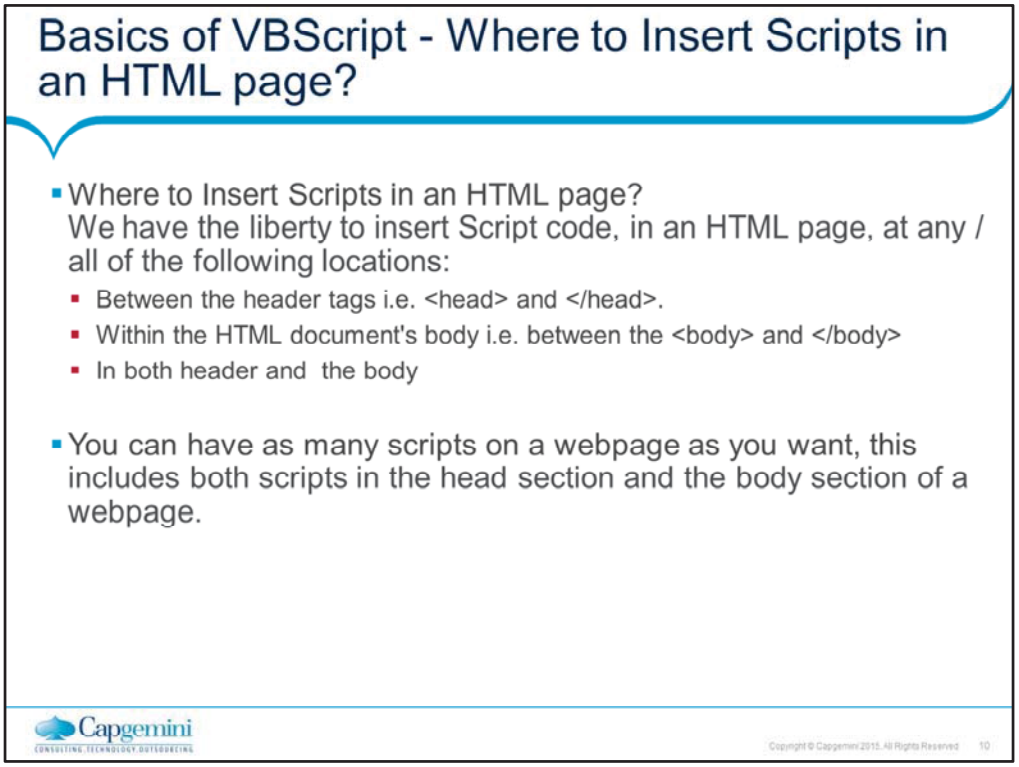
The current version of VBScript is 5.8, and with the recent development of .NET framework, Microsoft has decided to provide future support of VBScript within ASP.NET for web development.
Hence, there will NOT be any more new versions of VBScript engine but the entire defect fixes and security issues are being addressed by the Microsoft sustaining Engineering Team.
However, VBScript engine would be shipped as part of all Microsoft Windows and IIS by default



We write the VBScript code in an HTML file and save the same with .htm or .html extension.
In the above example, we called a function *document.write*, which writes a string into the HTML document. This function can be used to write text, HTML or both.

So, above code will display following result:

Hello World!



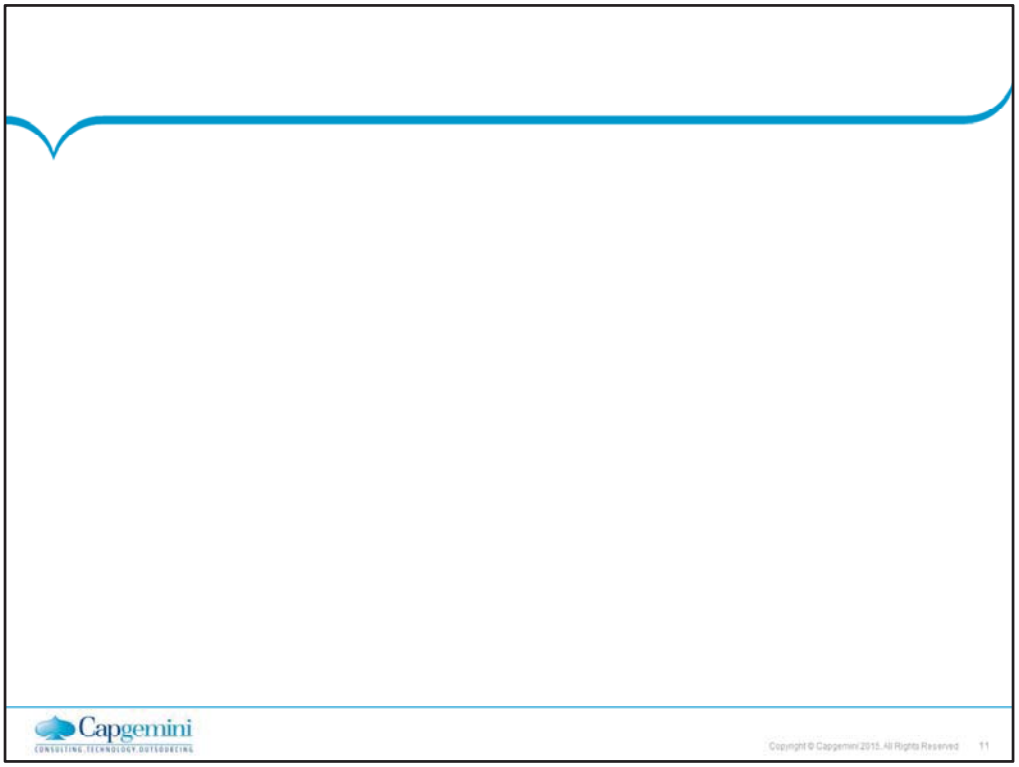
Example for Script Within the header tags :

A script placed in the head section of a webpage will be executed when it is called, or when certain events are triggered such as the clicking of a button or when a form is submitted

```
<html>
<head>
 <script type="text/vbscript">
                    document.write("This is a script")
</script>
 <title>VBScript script in the head section</title>
 </head>
<body>
</body>
</html>
```

Example for Script Within the body tags :

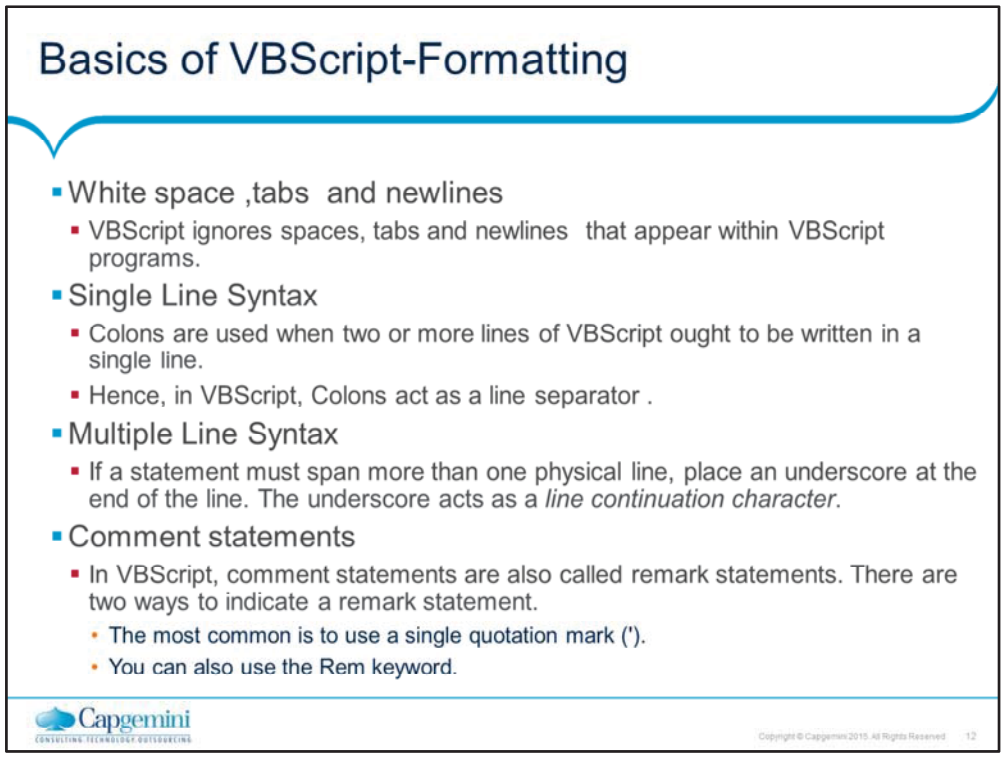
A script placed in the body section of a webpage will be executed when the page loads. A script placed in the body section of a webpage generates the content of the page.




```
<html>
<head>
<title>VBScript script in the body section</title>
</head>
<body>
<script type="text/vbscript">
                document.write("This is a script")
 </script>
</body>
 </html>
```

Example for Script in both head and body :

```
<html>
<head>
<script type="text/vbscript">
                document.write("This is a script")
</script>
 <title>VBScript script in the head and body sections</title>
 </head>
<body>
<script type="text/vbscript">
                document.write("This is a script")
</script>
</body>
</html>
```



Examples:

1. **Single Line Syntax**

```
<script language="vbscript" type="text/vbscript">
var1 = 10 : var2 = 20
</script>
```

2. **Multiple Line Syntax**

```
<script language="vbscript" type="text/vbscript">
 var1 = 10
 var2 = 20
 Sum = var1 + var2
 document.write("The Sum of two numbers"&_ "var1 and var2 is " &
Sum)
</script>
```

3. **Comments by use a single quotation mark**

```
 <script type="text/vbscript">
'this is a single line comment
 'this is another single line comment
document.write("Here is some text")
 </script>
```

4. **Comments By Using the Rem keyword:**

```
Sub cmdButton1_Click
Rem Comments describing the event procedure should go here
Rem and probably here too
End Sub
```

Lab

- Lab 1

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Lesson Summary

- VBScript is an interpreted programming language that can be embedded into an HTML web page or used in server side scripting.
- Advantages and disadvantages of scripting.
- Formatting and basics in VBScript.

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Review - Questions

- Question 1: Comments in VB Script can be created using
  - Option 1: <!-- -->
  - Option 2: “
  - Option 3: ’
  - Option 4: rem
- Question 2: We can insert VBScript tags only in the header section of html page. State True or False
- Question 3: Only _____browser supports VBScript.

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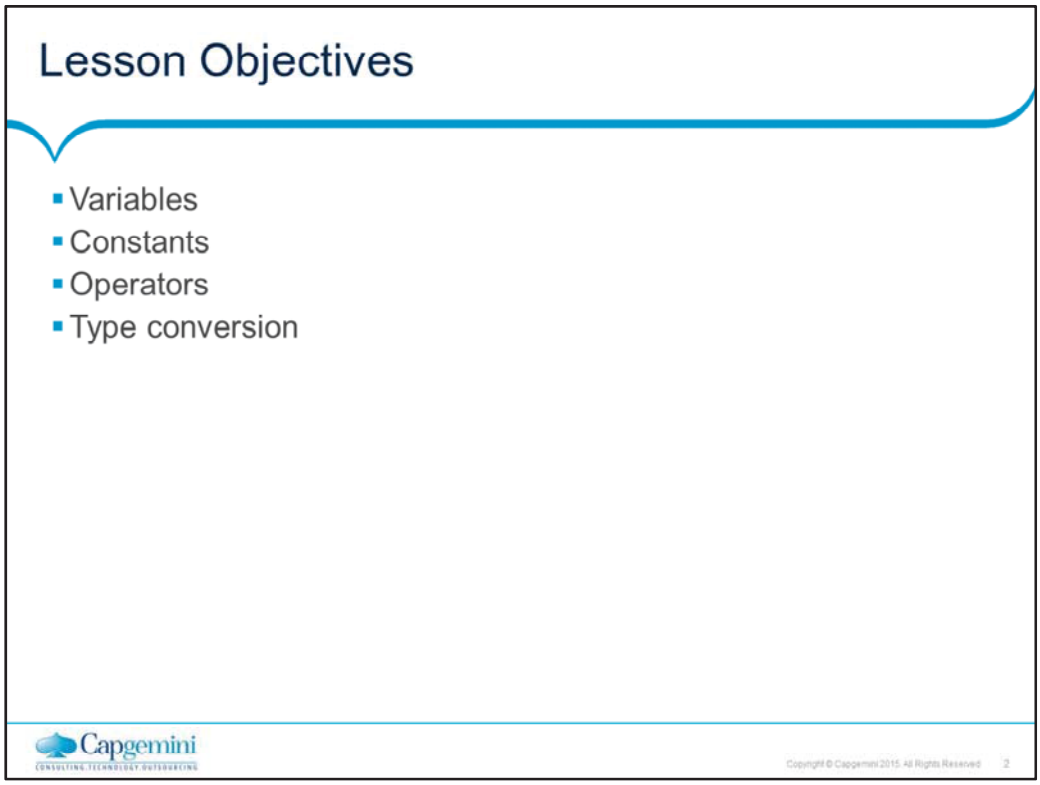
VBScript

Lesson 2: Variables ,Constants and Operators in VBScript


Lesson Objectives
Variables
Constants
Operators
Type conversion
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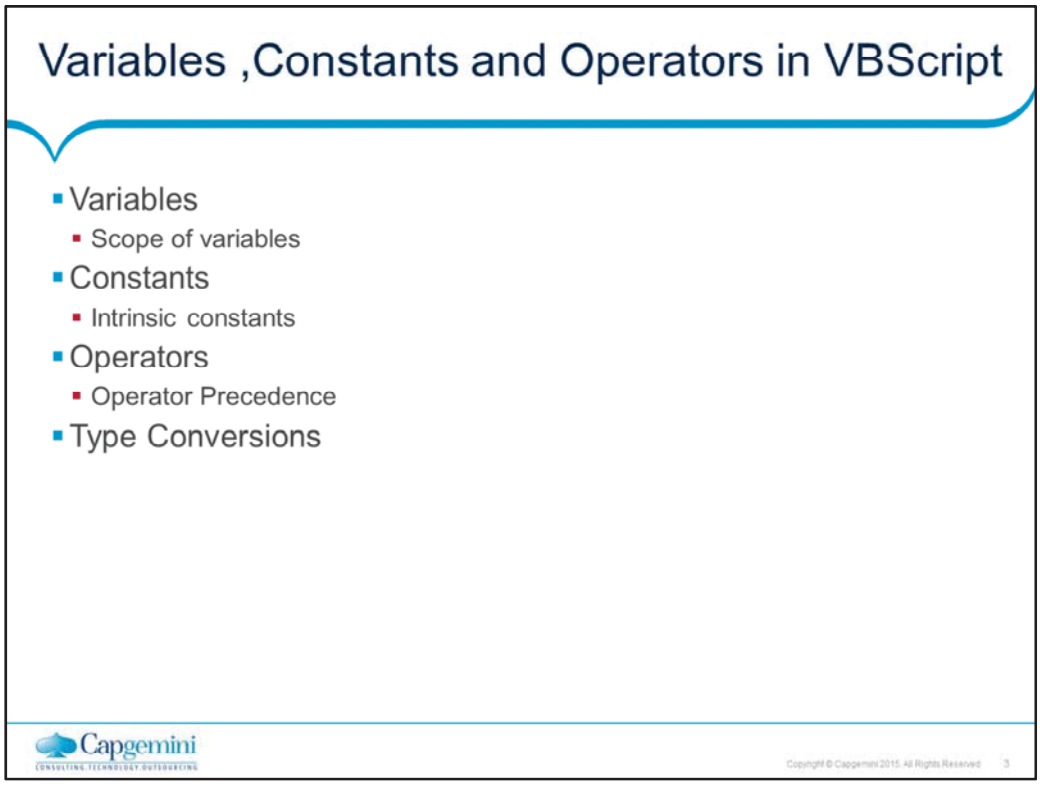

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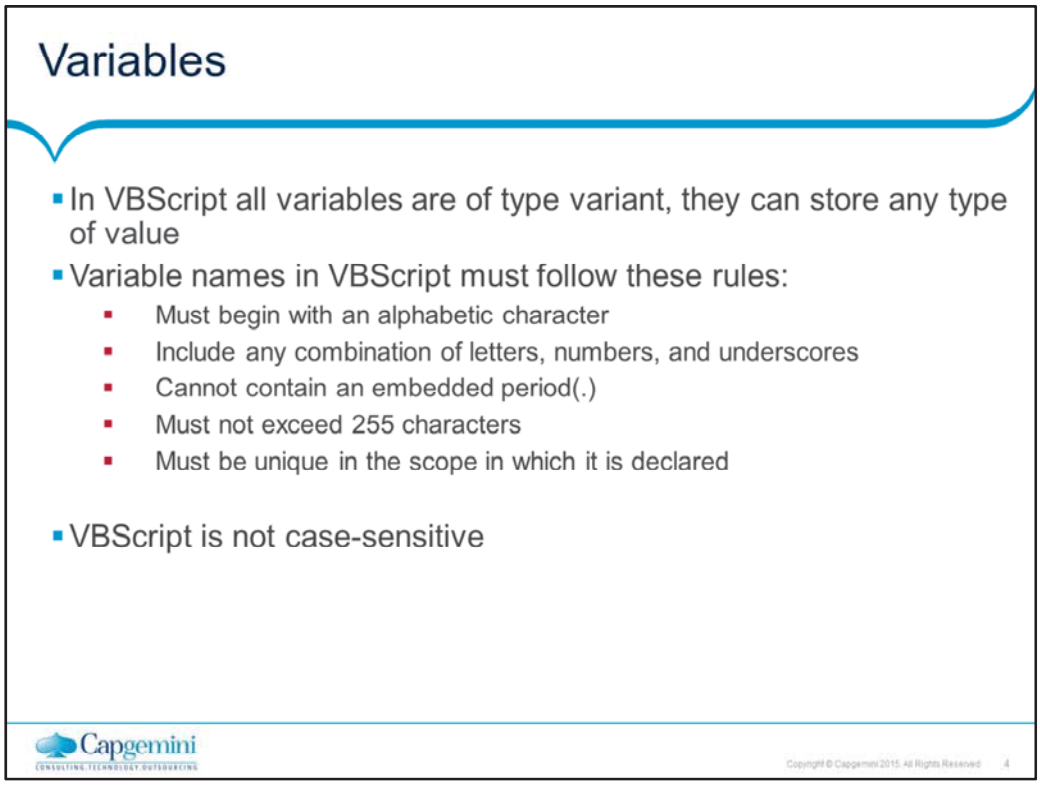
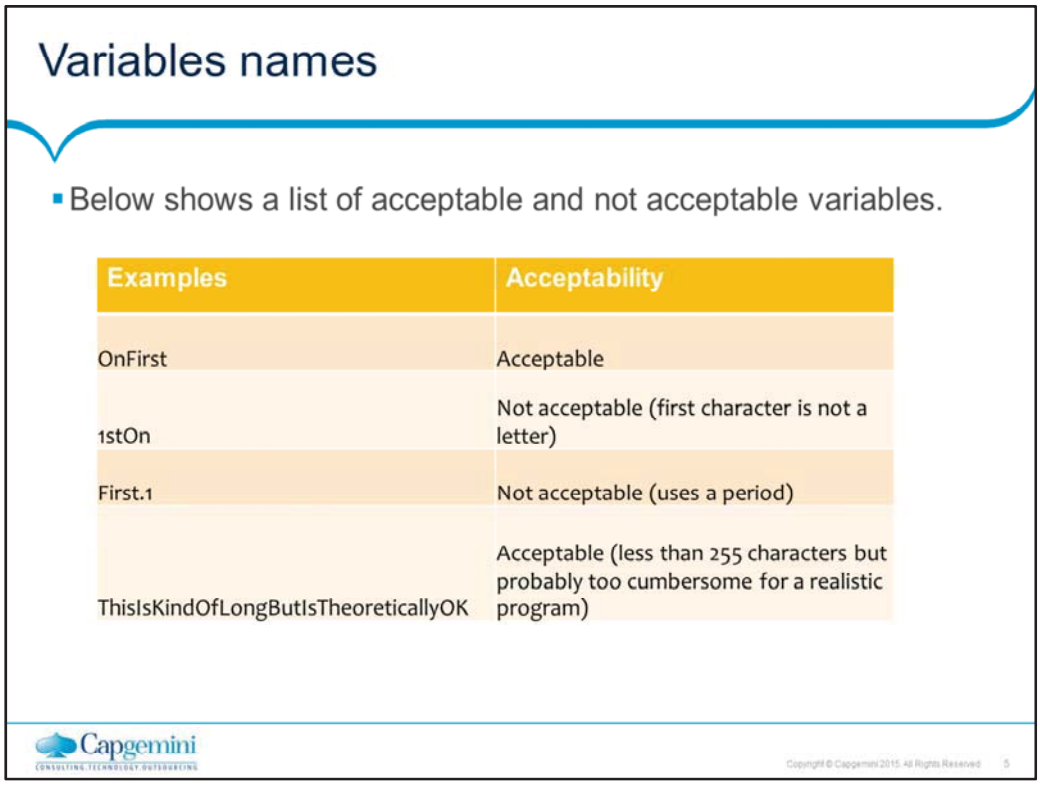


Variables

Variables in VBScript hold information (values). Whenever you use a variable, VBScript sets up an area in the computer's memory to store the information.

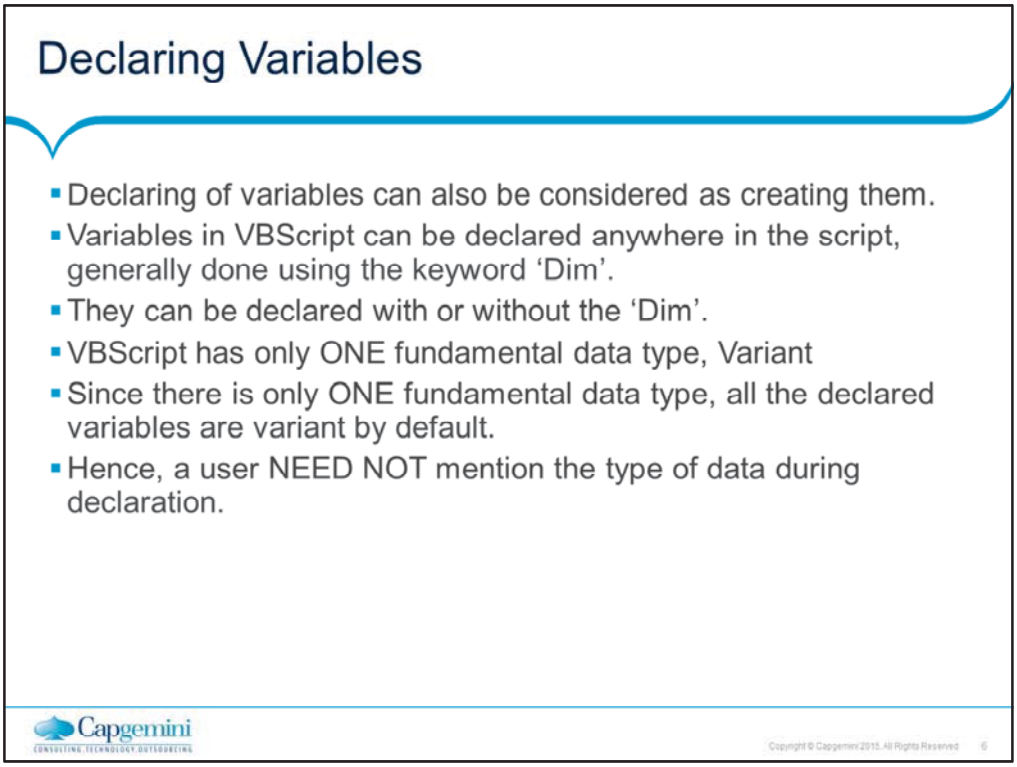
To VBScript, MyName and myname are the same variable name.



All characters in a variable name are significant. Base is a different variable from Base1, and both are different from Base_1.

You can't use names reserved by VBScript for variable names;
for example, Sub is not acceptable as a variable name.

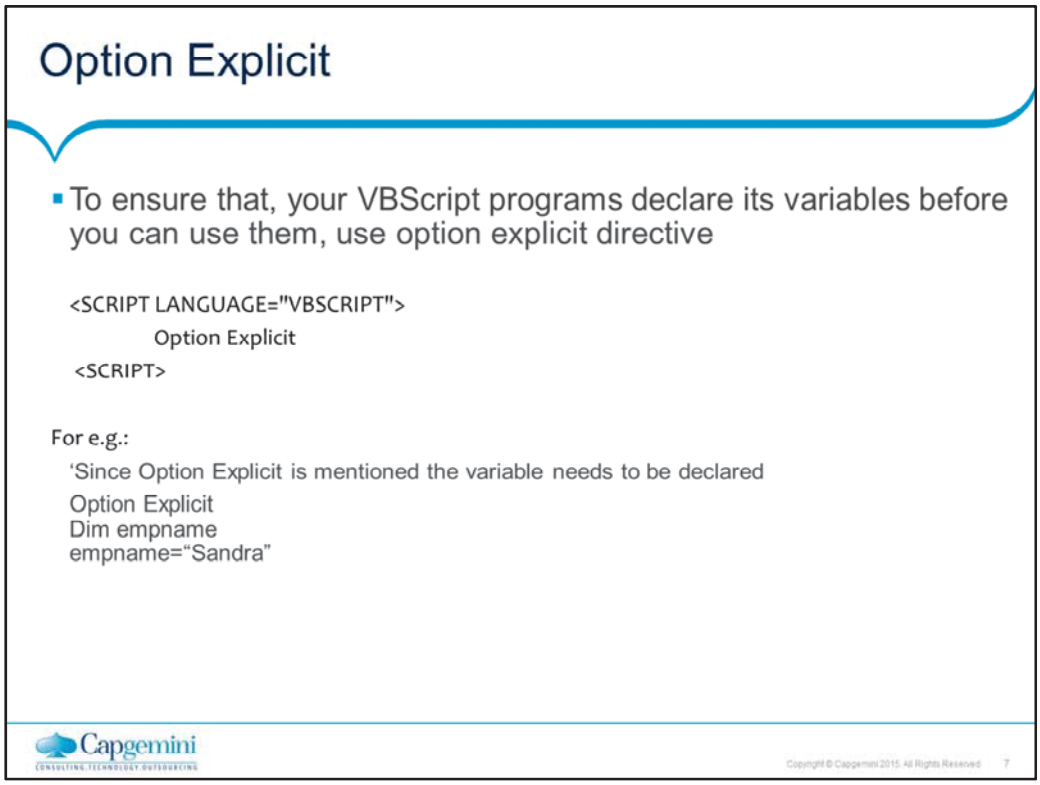
However, you can embed reserved words within a variable's name.
For example, Substitute is a perfectly acceptable variable name.



You can also declare variables by using its name in a script. Like this:

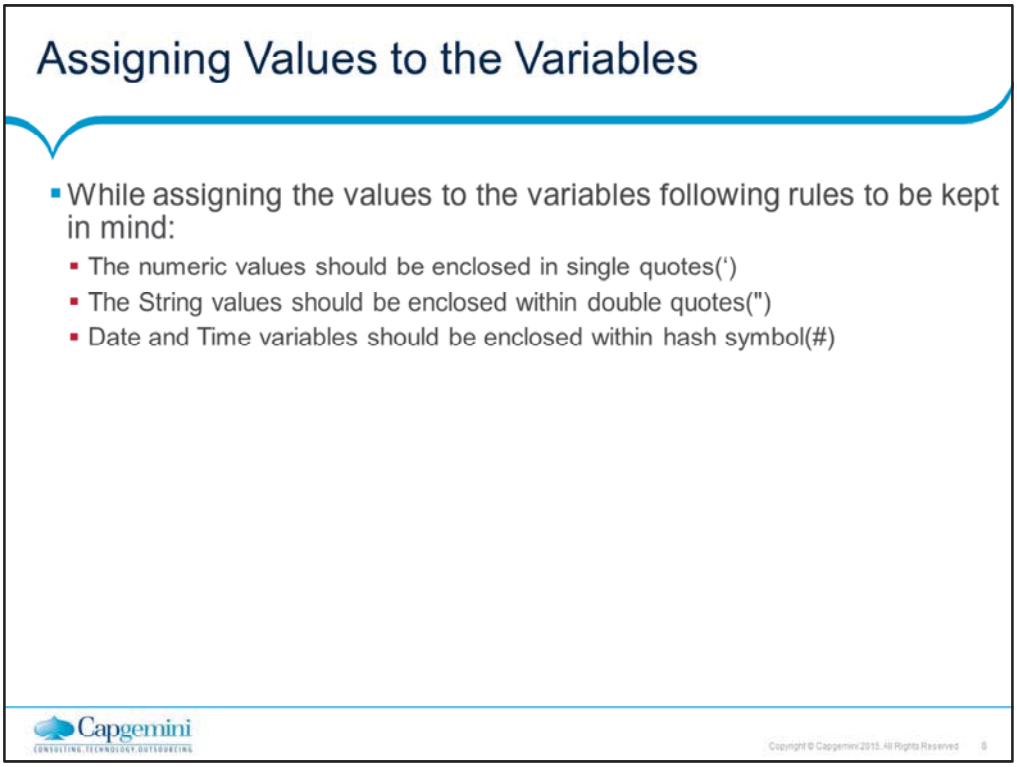
empname="Sandra"

Now you have also created a variable. The name of the variable is "empname".
However, this method is not a good practice, because you can misspell the variable name later in your script, and that can cause strange results when your script is running.
If you misspell for example the "empname" variable to "empnime", the script will automatically create a new variable called "empnime".
To prevent your script from doing this, you can use the Option Explicit statement. This statement forces you to declare all your variables.



Explicit **Declaration**

After VBScript processes an Option Explicit statement, it will no longer allow you to use a variable unless you declare it first. If you try to use a variable without declaring it, an error message will appear. Finally, the first time you use a variable, VBScript temporarily assigns it the default value "empty." This basically means that the variable doesn't contain a value. The "empty" value disappears the moment you assign a value to the variable.
You shouldn't hesitate to assign initial values to your variables. Otherwise, you risk creating a breeding ground for hard-to-find bugs. It is therefore quite common to use the first few statements in an event procedure to initialize the variables.



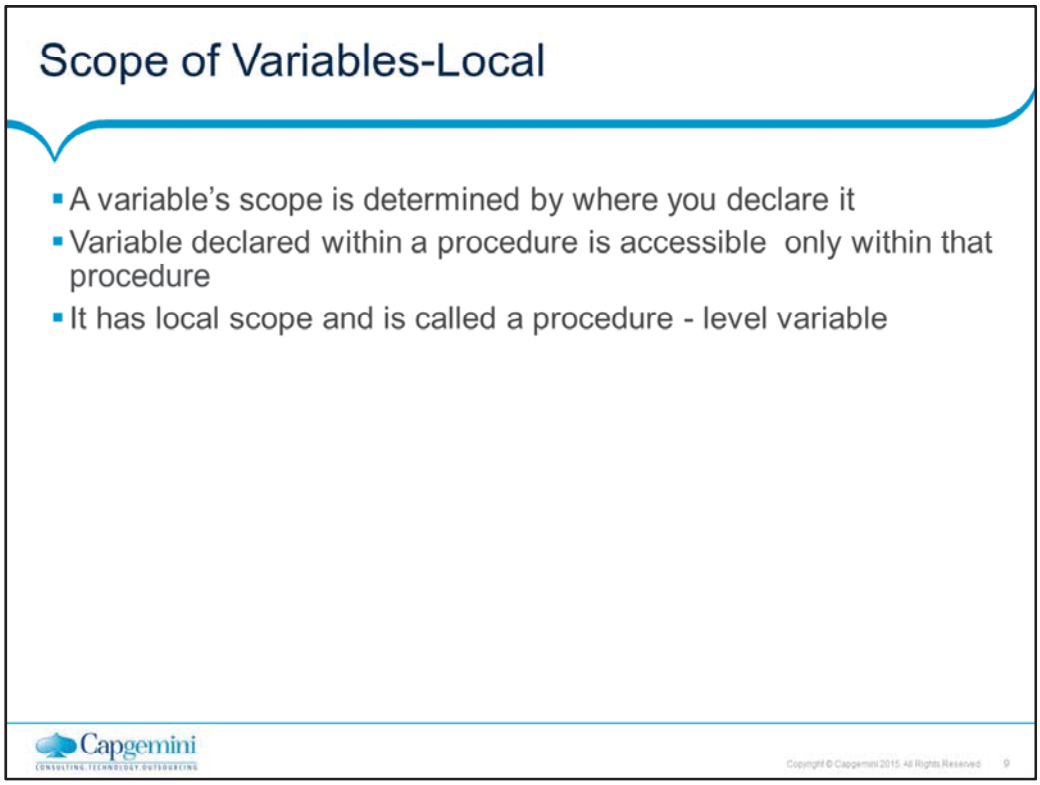
Examples :

' Below Example, The value 20 is assigned to the variable.
Number1 = 20 '

A String Value ‘Come’ is assigned to the variable StrValue.
StrValue = “Come”

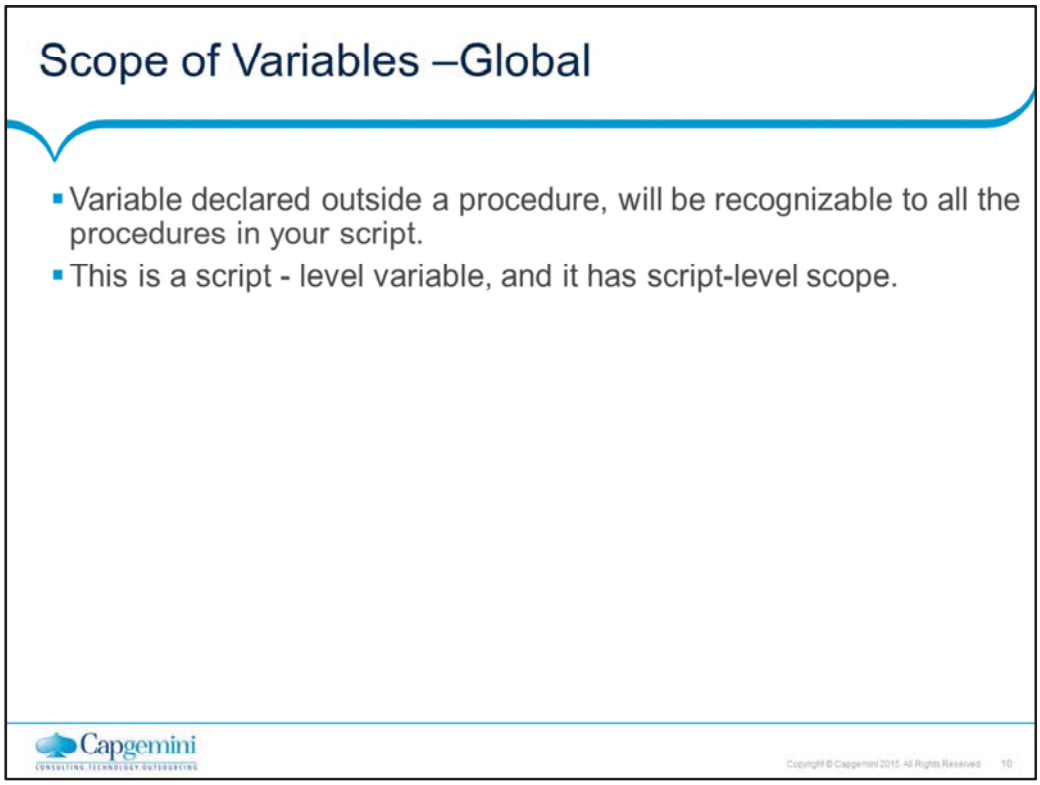
' The date 01/01/2020 is assigned to the variable DToday.
DToday = #01/03/2010#

' A Specific Time Stamp is assigned to a variable Time1
Time1 = #12:20:24 PM#



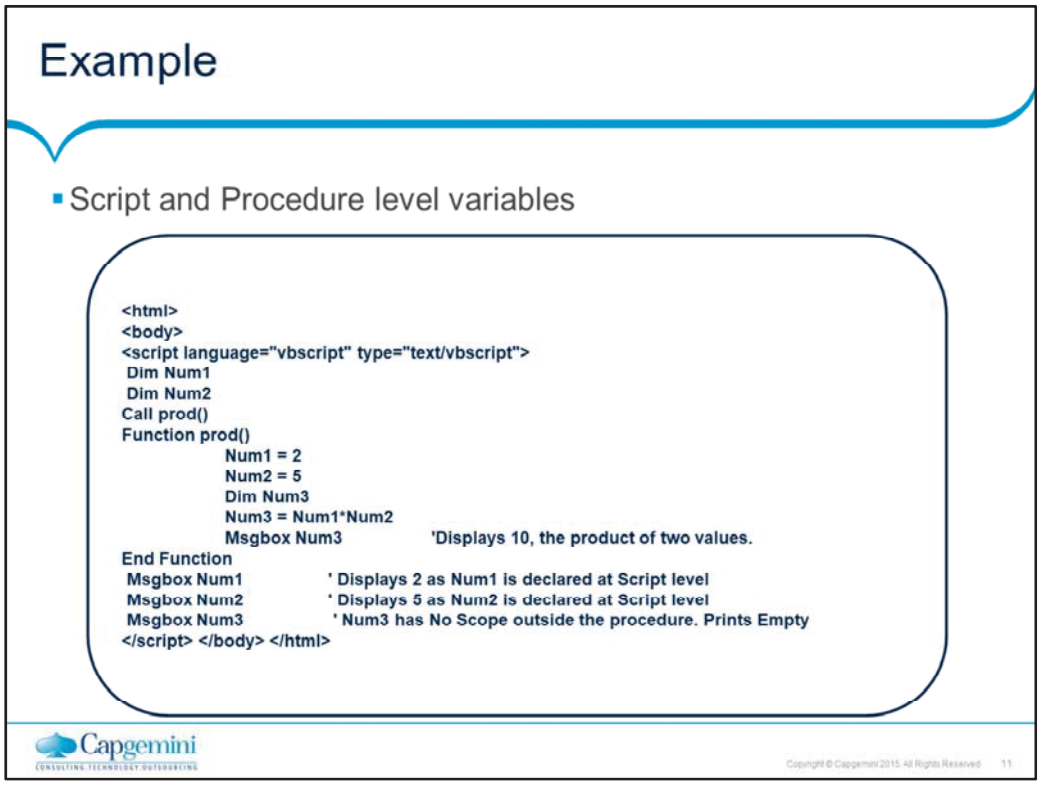
Sharing values within the procedure

When programmers discuss the availability of a variable used in one part of the program to the other parts of the program, they refer to the scope of variables. An event procedure will not normally have access to the value of a variable changed in another event procedure. As always, it is not a good programming practice to rely on defaults. If you want to be sure that a variable is local within an event procedure, use the Dim statement inside the event procedure to declare all its variables.

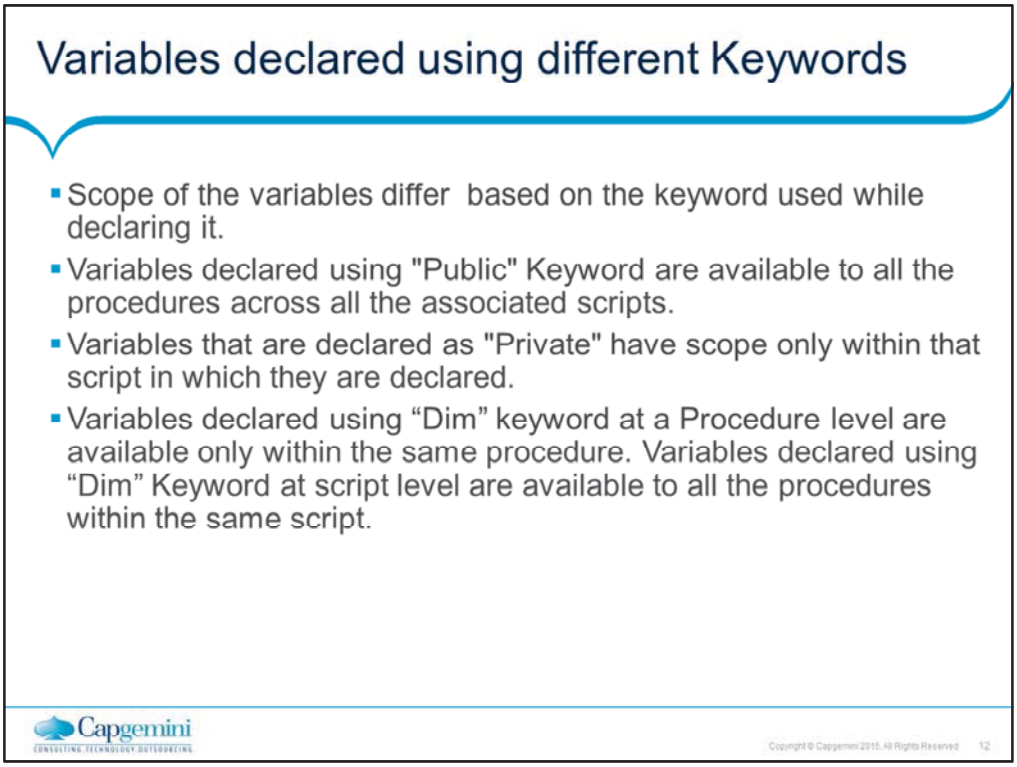


Sharing values across procedures

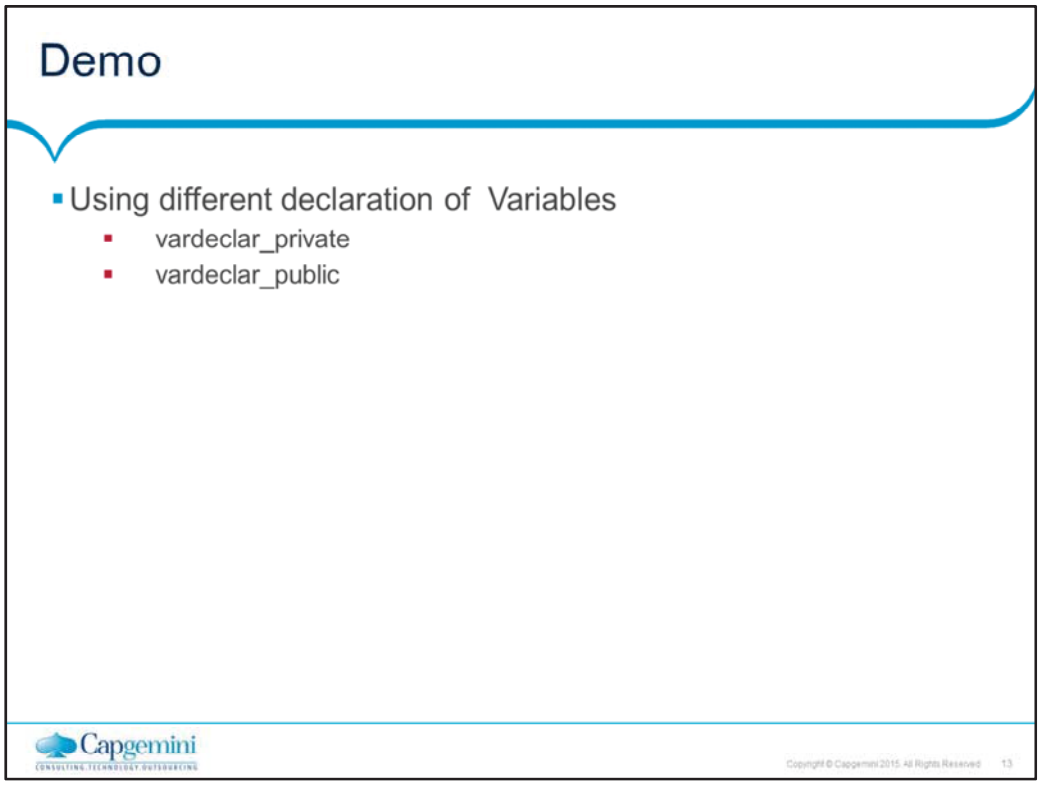
Occasionally you will want the value of a variable to be available to all the VBScript code for your Web page. For example, if an application is designed to perform a calculation involving a single interest rate at a time, that rate should be available to all the procedures for the page. Variables that are shared in this way are called script-level variables. Just as with the Option Explicit statement, you put the declaration statements for script-level variables outside any event procedures.



In the above example:
the values of Num1 and Num2 are declared at script level while Num3 is declared at procedure level.



Variables declared using "Public" Keyword are available to all the procedures across all the associated scripts. When declaring a variable of type "public", Dim keyword is replaced by "Public



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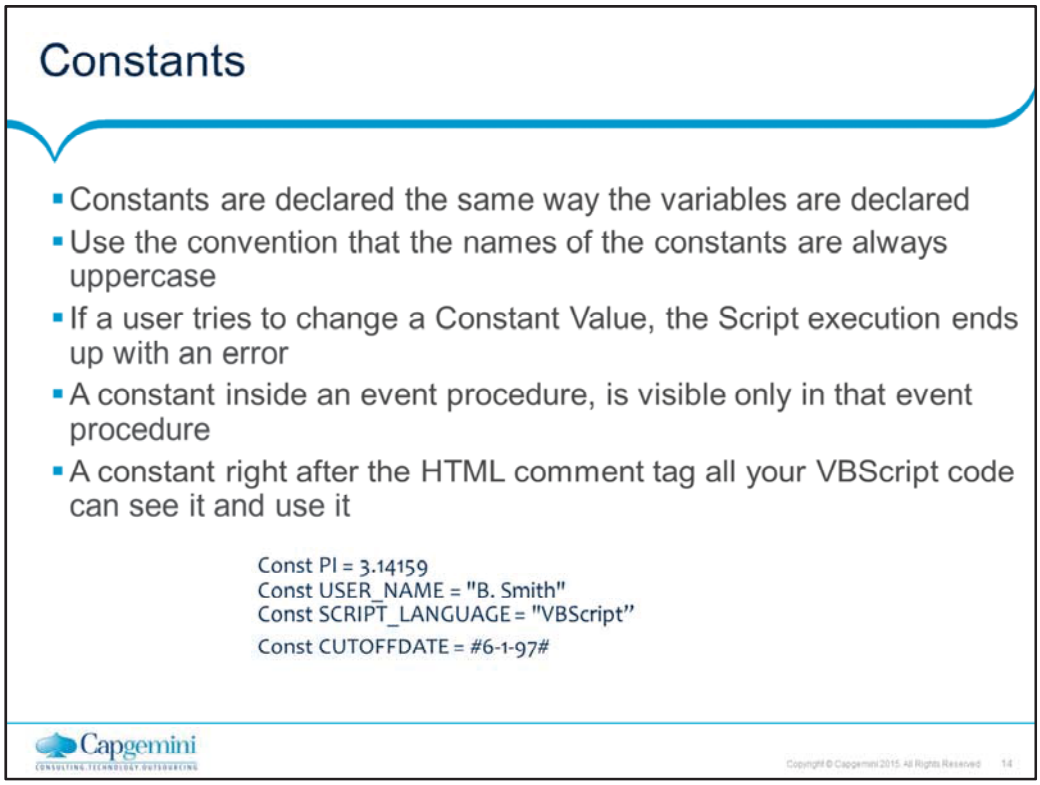


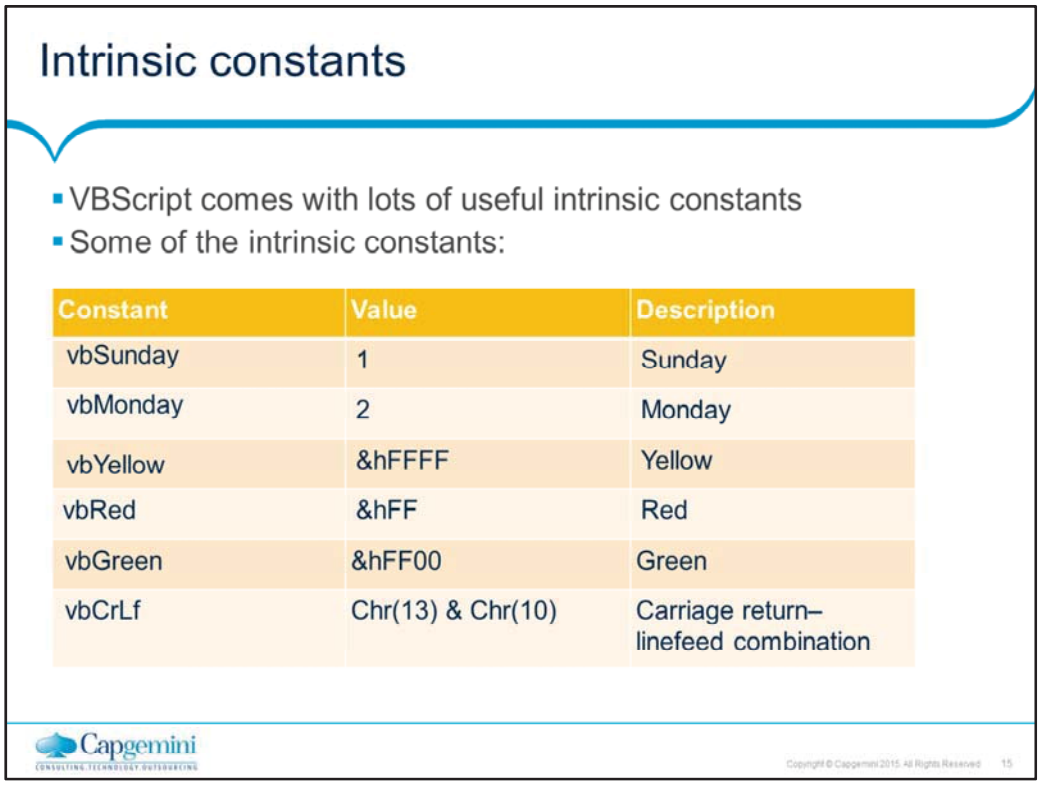
Constants

The keyword for telling VBScript that something is a constant is simply const, as shown in the following example:

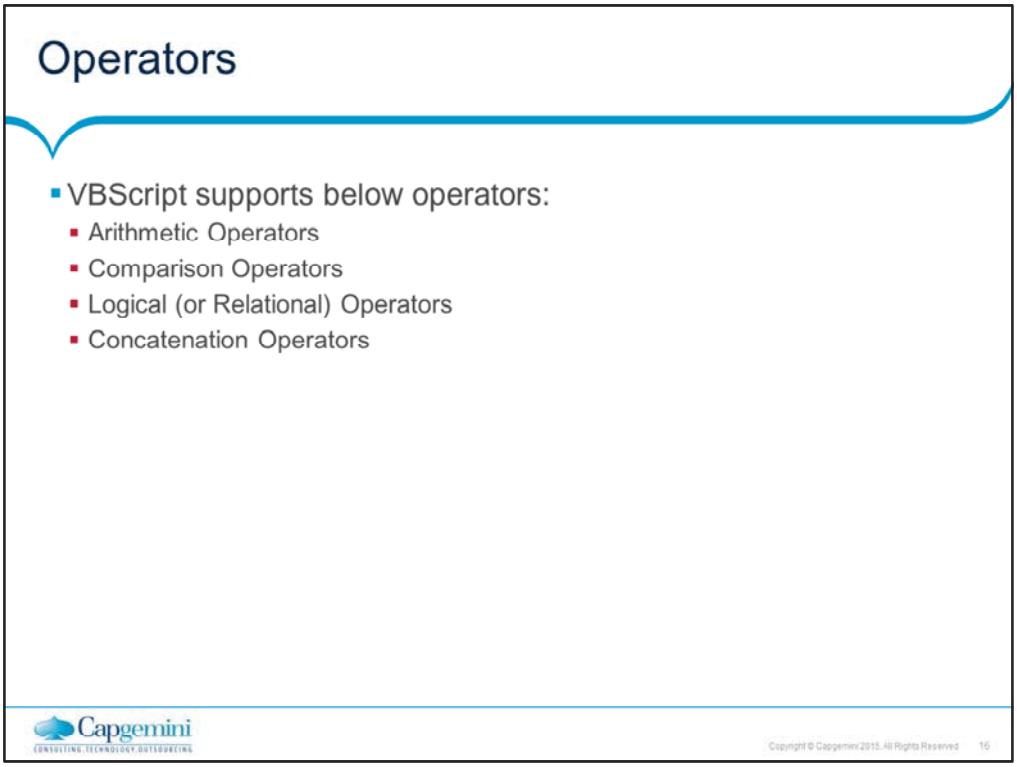
Const PI = 3.14159

You might also set up string constants using the same keyword:

Const USER_NAME = "B. Smith"
Const SCRIPT_LANGUAGE = "VBScript"



VBScript comes with lots of useful built-in constants. These are constants such as vbRed and vbYellow for colors, and vbSunday and vbMonday for date functions. VBScript does not follow the convention that built-in constants are uppercase.


Operators
VBScript supports below operators:
Arithmetic Operators
Comparison Operators
Logical (or Relational) Operators
Concatenation Operators
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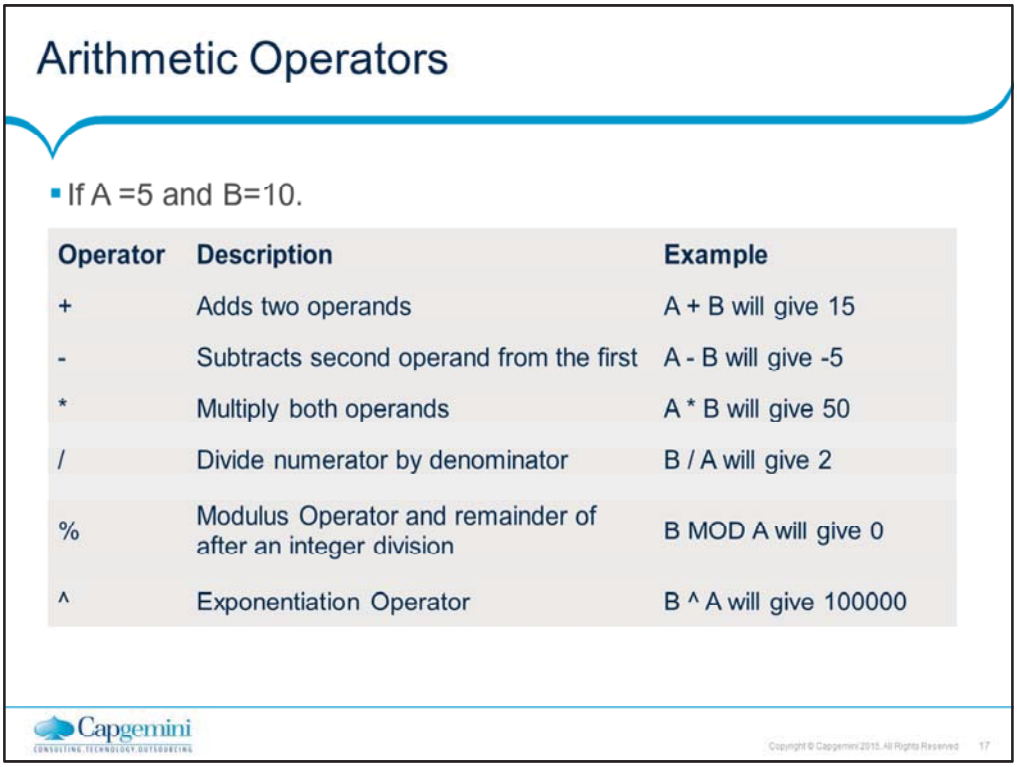
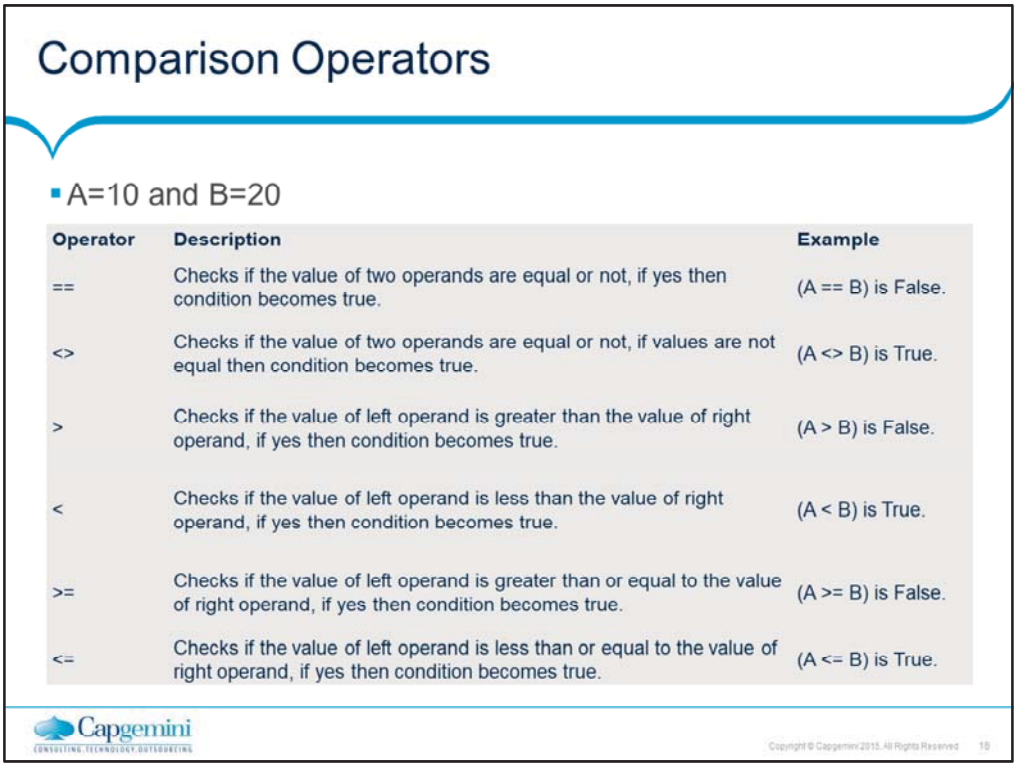


The ordinary division symbol (/) gives you a value that has a decimal point. The integer division symbol (\) throws away the remainder in order to give you an integer.
For example, 7\3 = 2.

Since ordinary division always produces a number with a decimal point, use integer division or the Mod operator if you really want to work with integers. The Mod operator gives you the remainder after integer division.
For example, 7 Mod 3 = 1.

When one integer perfectly divides another, there is no remainder, so the Mod operator gives 0: 8 Mod 4 = 0.
The term for a combination of numbers, variables, and operators from which VBScript can extract a value is numeric expression



As an example, suppose you want to prevent a "divide-by-zero" error when a user enters data in a text box. Use a fragment like this:

```
Do
Number = InputBox("Please enter a nonzero number.")
Loop Until Number <> 0
```

Logical Operators:

- A=10 and B=0

Operator	Description	Example
AND	Called Logical AND operator. If both the conditions are True then Expression becomes true.	a<>0 AND b<>0 is False.
OR	Called Logical OR Operator. If any of the two conditions are True then condition becomes true.	a<>0 OR b<>0 is true.
NOT	Called Logical NOT Operator. Use to reverses the logical state of its operand. If a condition is true then Logical NOT operator will make false.	NOT(a<>0 OR b<>0) is false.
XOR	Called Logical Exclusion. It is the combination of NOT and OR Operator. If one, and only one, of the expressions evaluates to True, result is True.	(a<>0 XOR b<>0) is false.

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Concatenation Operators

- A=5 and B=10 (for 1st 2 rows) and A="Microsoft" and B="VBScript" (for last 2 rows)

Operator	Description	Example
+	Adds two Values as Variable Values are Numeric	A + B will give 15
&	Concatenates two Values	A & B will give 510
+	Concatenates two Values	A + B will give MicrosoftVBScript
&	Concatenates two Values	A & B will give MicrosoftVBScript

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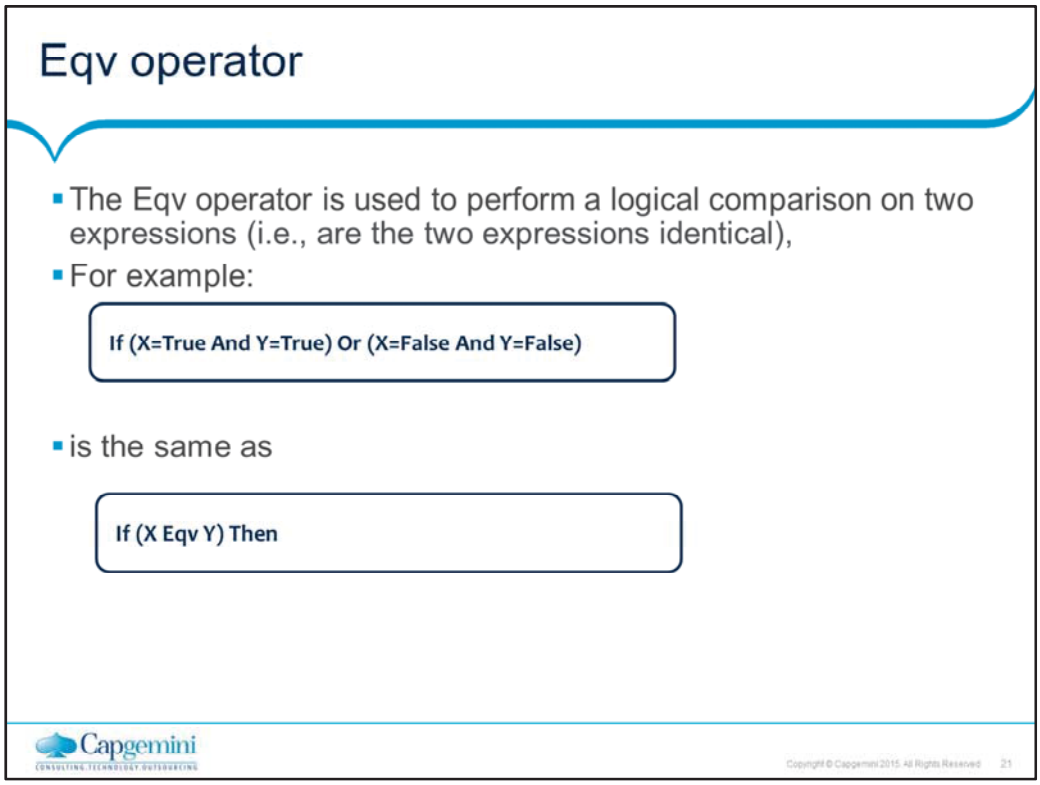
Eqv operator
The Eqv operator is used to perform a logical comparison on two expressions (i.e., are the two expressions identical),
For example:
If (X=True And Y=True) Or (X=False And Y=False)
is the same as
If (X Eqv Y) Then
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Eqv Operator –Examples

- The truth table for Eqv is as follows:

Expr1	Expr2	Expr1 EQV Expr2
True	True	True
True	False	False
False	True	False
False	False	True

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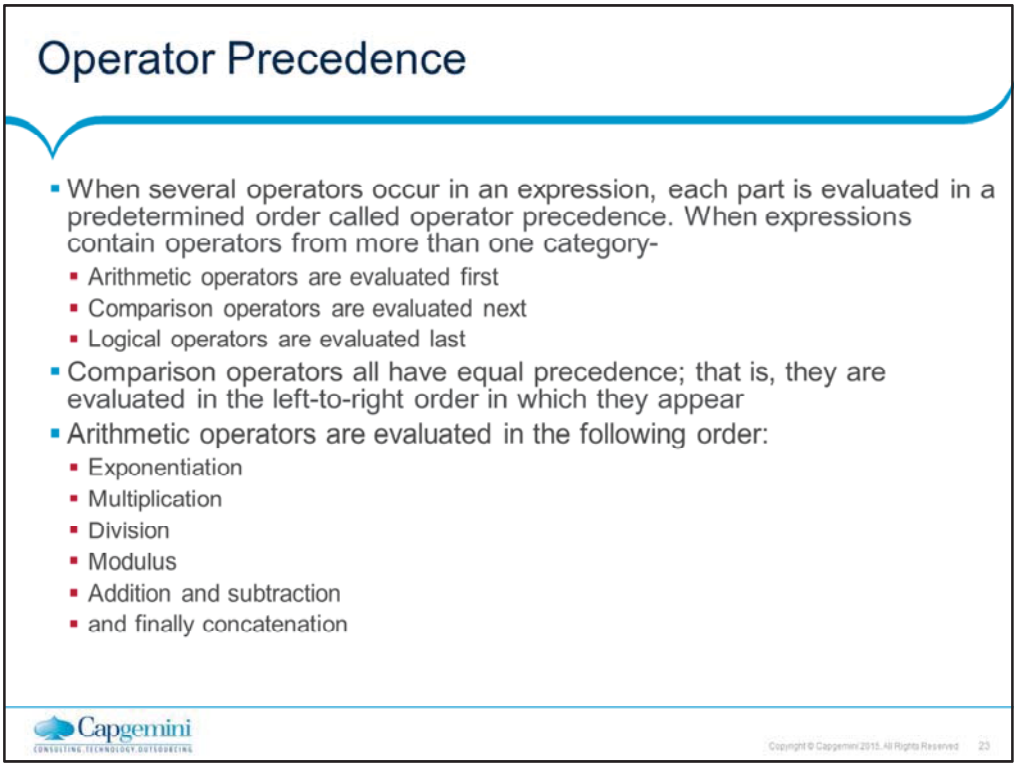
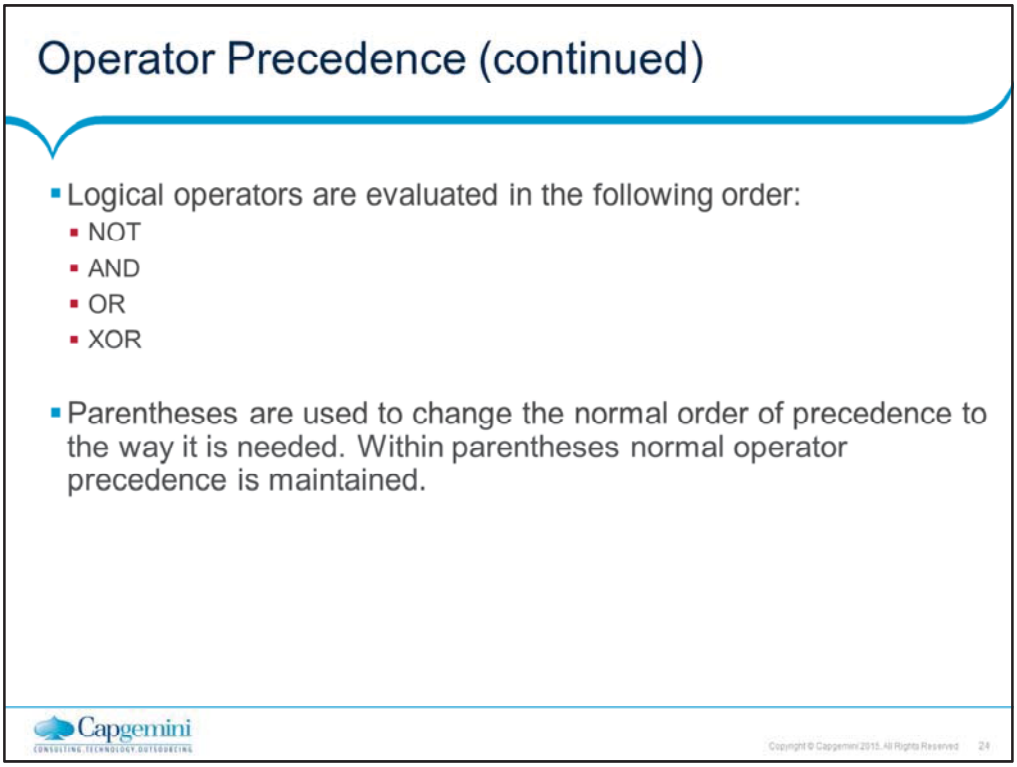


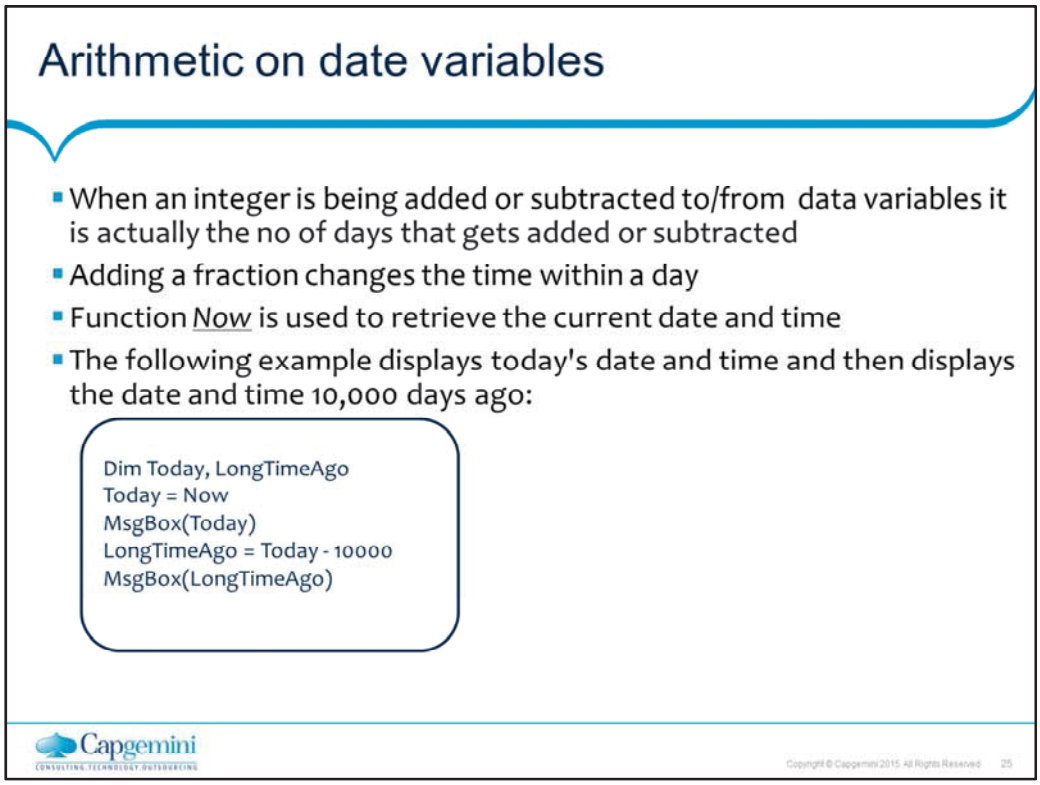
For example, if you try to calculate the expression a = 5-4*3/5^6, what you expect as the result?

The result will be 4.999232
How? The exponentiation comes first, then come multiplication and division and finally comes subtraction.
So the above expression gets calculated like this: 5-4*3/(5^6) --> 5-(4*3)/30--> 5-(12/30) --> 5-.04 --> 4.999232



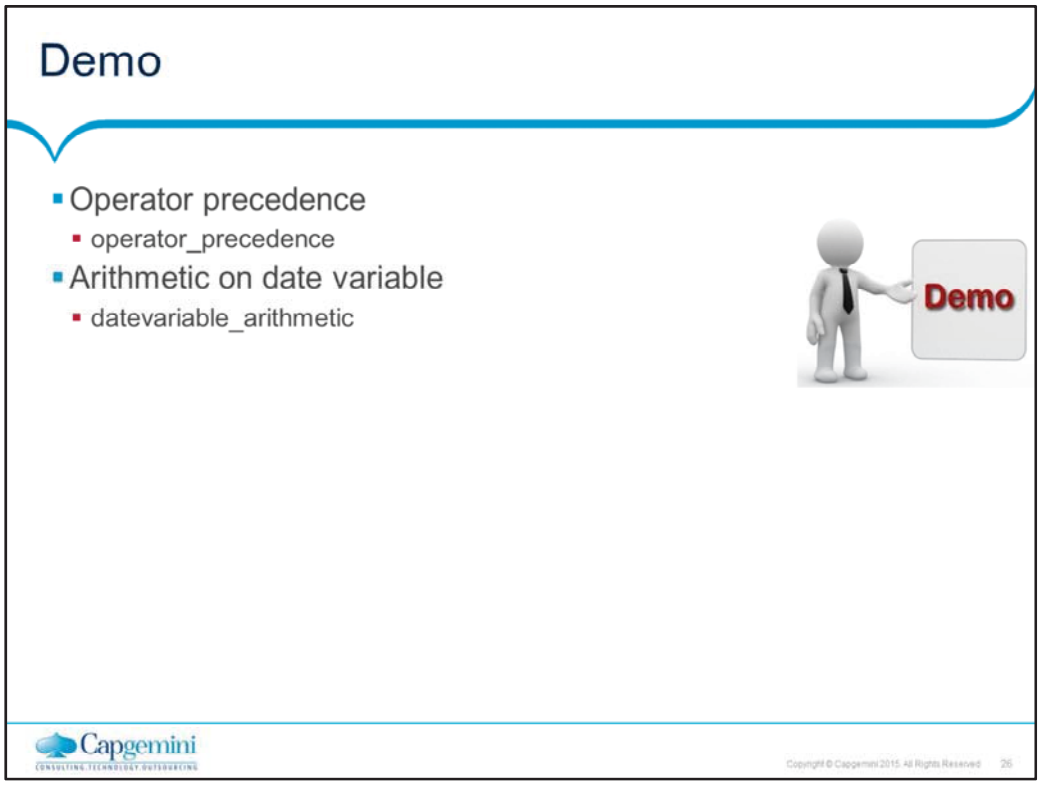
In the earlier example Suppose, you want to calculate 5-4 first, then you should write the expression as a = (5-4)*3/5^6.

Now you get the value of as a as 1*3/5^6 --> 1*3/30-->3/30--> 0.1



Arithmetic on date variables

VBScript makes it easy to do calculations with date variables. If you add or subtract an integer, you add or subtract that many days.
Adding a fraction changes the time within a day. You can use the function Now to retrieve the current date and time.



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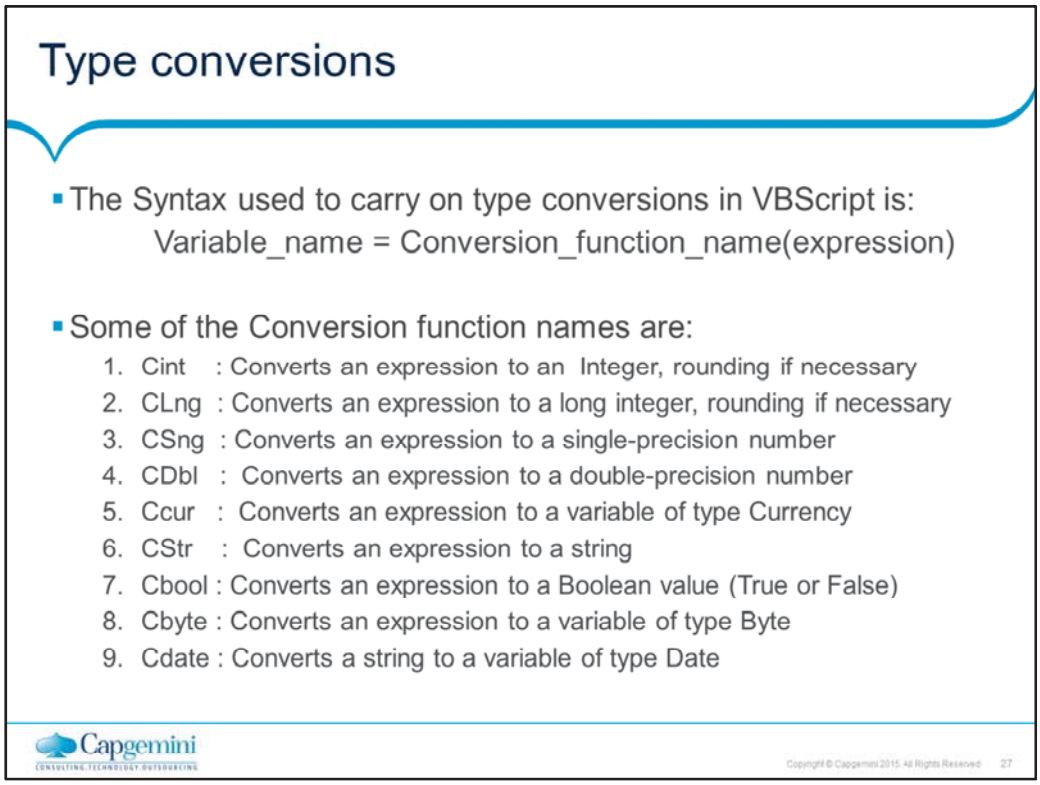
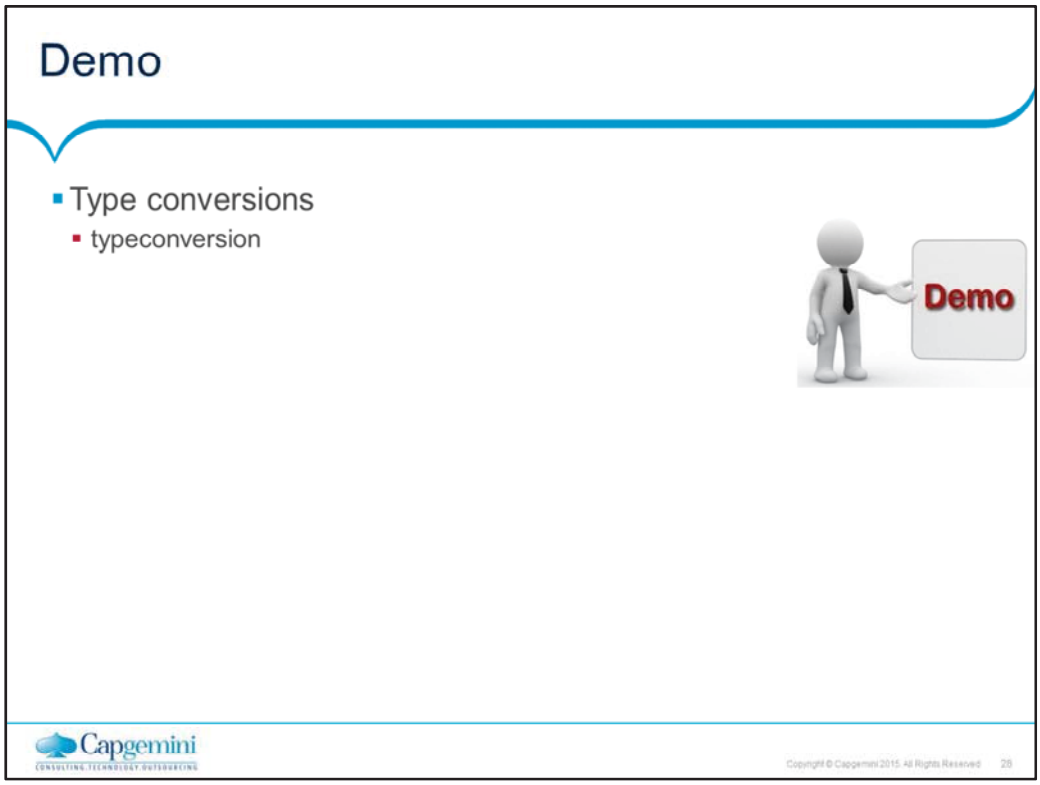


For example, the following line ensures that VBScript regards the zip code as a text string and not as a number:

ZipCode = CStr(22203)



Add the notes here.

Lab

- Lab 2

Lesson Summary

- Variables can be declared as DIM or PUBLIC or PRIVATE
- Option Explicit ensures that the variable is always declared before it is used
- Type conversion functions help in conversion from one data type to other

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Review - Questions

- Question1: Intrinsic Constants should always be in upper case. State True or False.
- Question 2:_____Operators are operated at the end.
- Question 3: _____ is used to retrieve the current date and time.

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VBScript

Lesson 3: Using Conditional Statements and Loops in VBScript

Lesson Objectives

- Conditional Statements
- Loops

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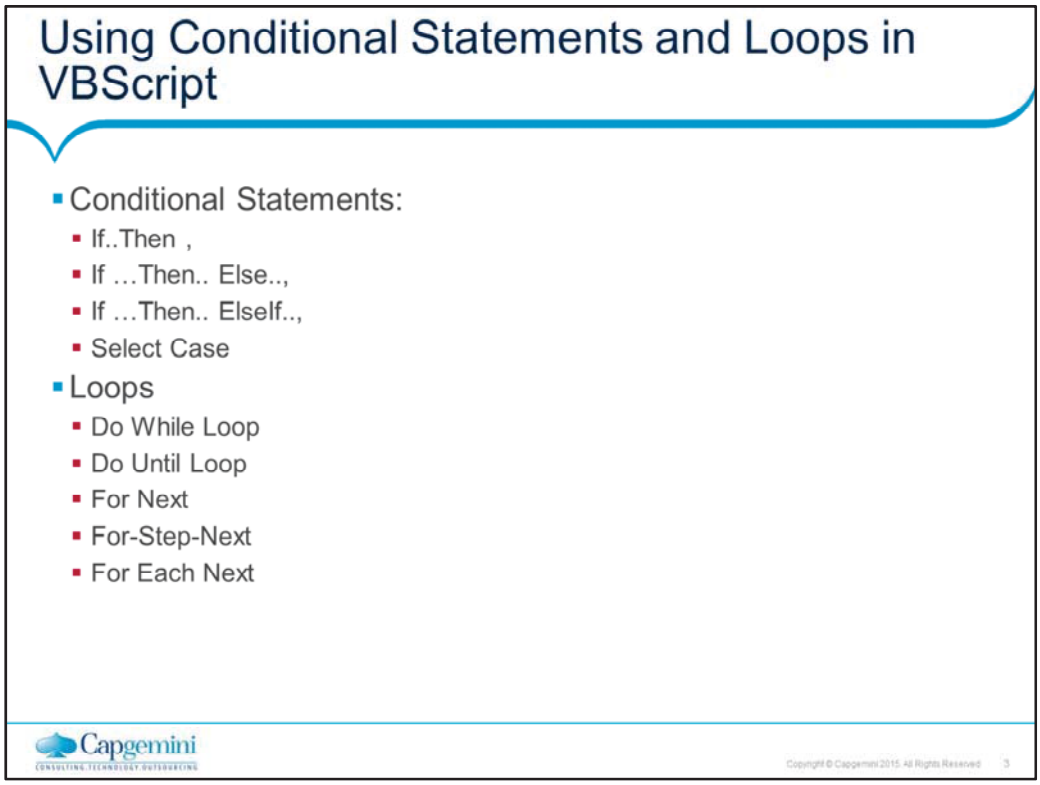

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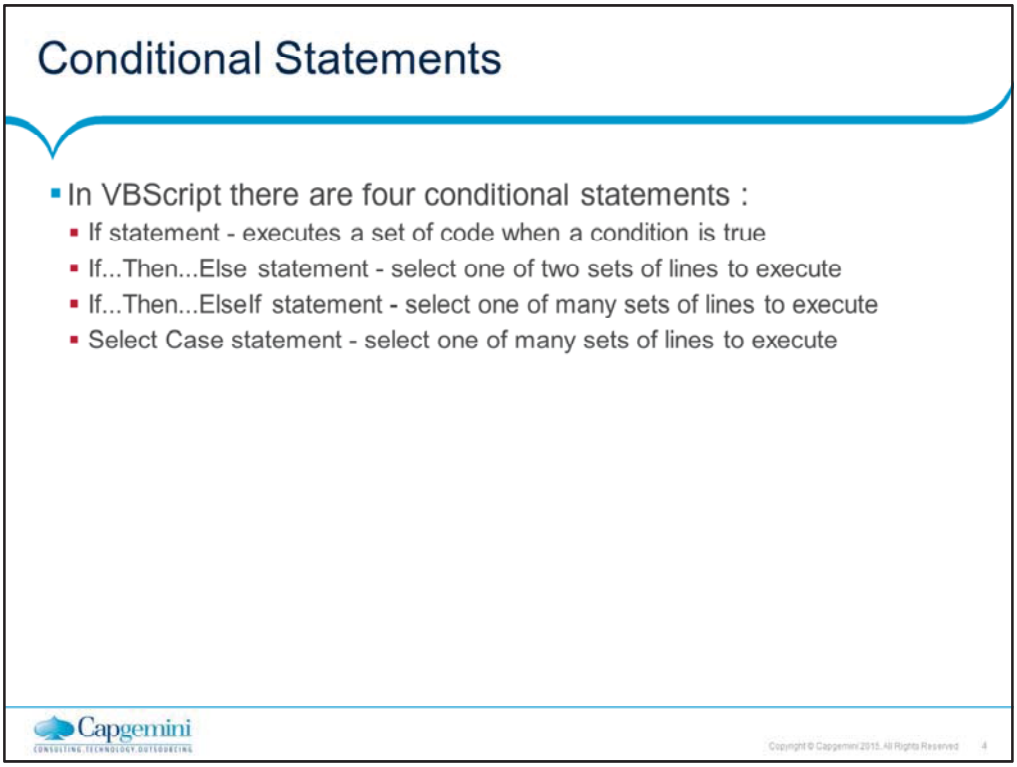
Conditional Statements
In VBScript there are four conditional statements :
If statement - executes a set of code when a condition is true
If...Then...Else statement - select one of two sets of lines to execute
If...Then...ElseIf statement - select one of many sets of lines to execute
Select Case statement - select one of many sets of lines to execute
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If Statements

- An If statement consists of a Boolean expression followed by one or more statements. If the condition is said to be True, the statements under If condition(s) are Executed. If the Condition is said to be False, the statements after the If loop are executed.
- The syntax of an If statement in VBScript is:

```
If(boolean_expression) Then
Statement 1 ..... ..... Statement n
End If
```

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If Else Statements

- An If statement consists of a boolean expression followed by one or more statements. If the condition is said to be True, the statements under If condition(s) are Executed. If the Condition is said to be False, the statements under Else Part would be executed.
- The syntax of an if statement in VBScript is:

```
If(boolean_expression) Then
    Statement 1
    ......
    ....
    Statement n
Else
    Statement 1
    .....
    ....
    Statement n
End If
```

If..ElseIf..Else Statements

- An If statement followed by one or more ElseIf Statements that consists of boolean expressions and then followed by a default else statement, which executes when all the condition becomes false.
- The syntax of an If-ElseIf-Else statement in VBScript is:

```
If(boolean_expression) Then
        Statement 1
        .....
        Statement n
 ElseIf (boolean_expression) Then
        Statement 1
        .....
        Statement n
ElseIf (boolean_expression) Then
        Statement 1
        .....
        Statement n
 Else
        Statement 1
        .....
        Statement n
End If
```

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Nested If Statement

- An If or ElseIf statement inside another If or ElseIf statement(s).
- The Inner If statements are executed based on the Outermost If statements. This enables VBScript to handle complex conditions with ease
- The syntax of a Nested if statement in VBScript is:

```
If(boolean_expression) Then
        Statement 1
        Statement n
        If(boolean_expression) Then
                Statement 1
                Statement n
        ElseIf (boolean_expression) Then
                Statement 1
                Statement n
        Else
                Statement 1
                Statement n
        End If
Else
        Statement 1
        Statement n
End If
```

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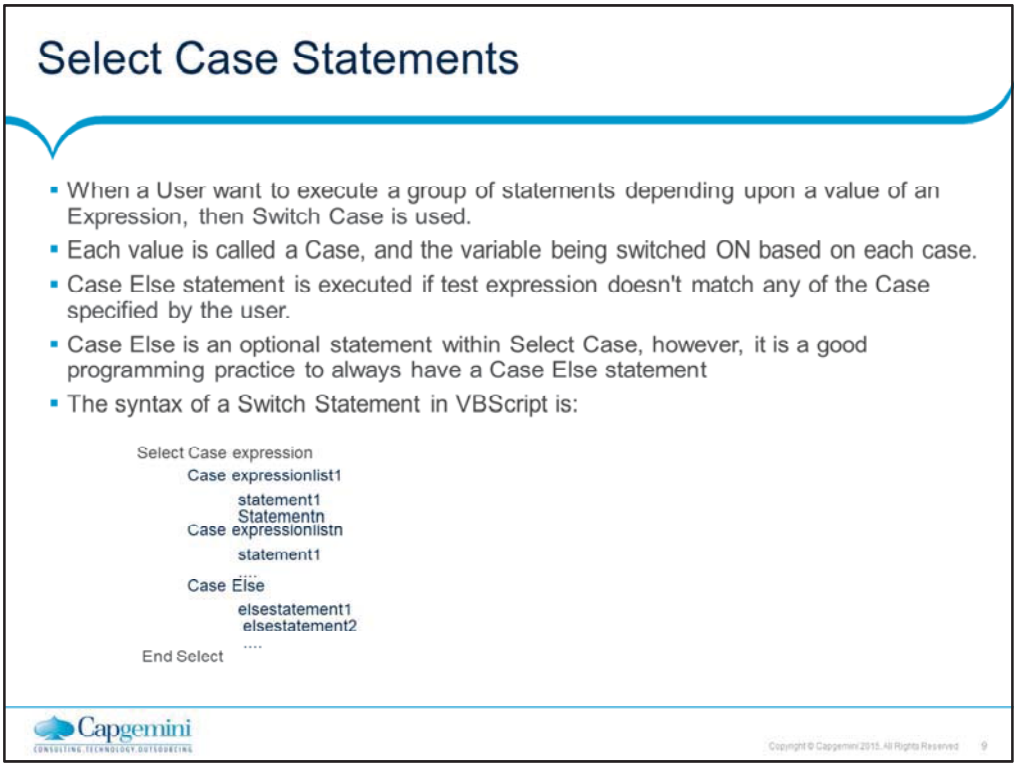


The Select-Case Statement

Suppose you were designing a program to decide whether to hire people for programming jobs based on their grades on the final exam in their VBScript programming course. You'll make an offer to those who received an A; you'll bring those who received a B in for an interview; you won't consider anybody else. For example, you could write this:

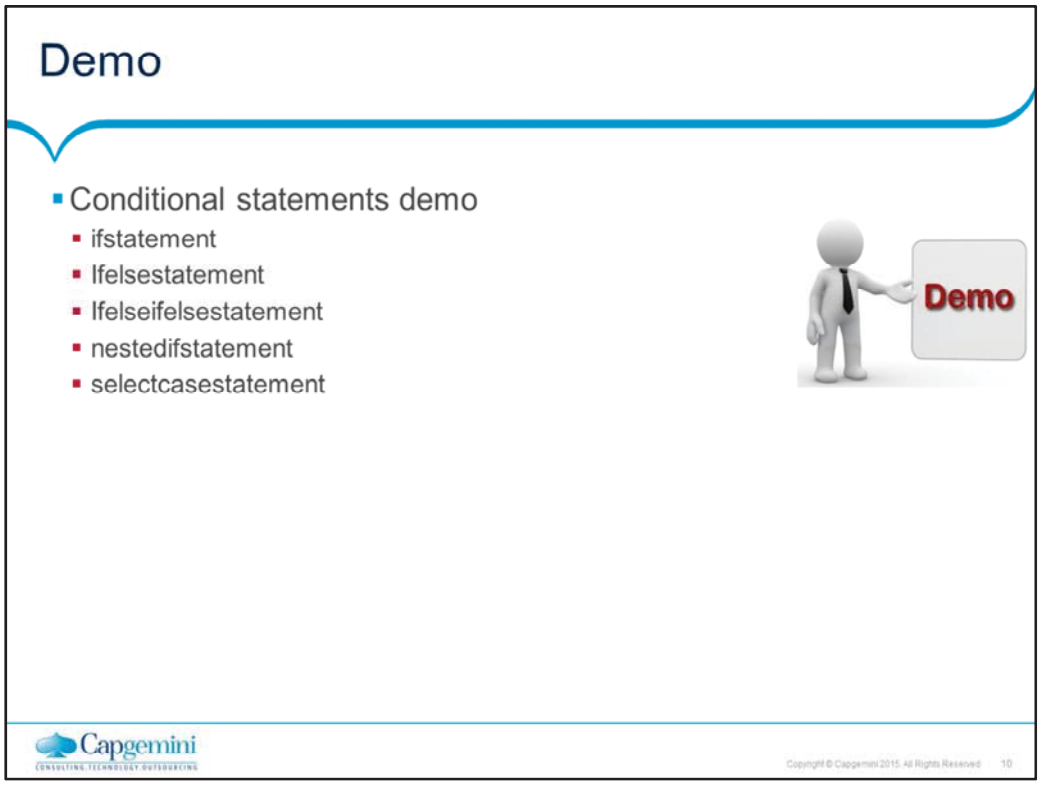
```
If Grade = "A" Then
MsgBox "We would like to hire you!"
If Grade = "B" Then
MsgBox "Please schedule an interview."
If (Grade <> "A") And (Grade <> "B") Then
MsgBox  "I am sorry, we won't be able to consider your application."
```

Using the Select-Case statement, however, you can write this:

```
Select Case Grade
  Case "A”
   MsgBox "We would lik e to hire you!"
Case "B"
   MsgBox "Please s chedule an interview.“
 Case "C"
    MsgBox "I am sorry, we won't be able to consider your application."
End Select
```

The Select-Case statement makes it clear that a program has reached a point with many branches; multiple If-Then statement's do not.
(And the clearer a program is, the easier it is to debug.)

The elimination of all cases that require special testing is so common that VBScript has a way of lumping all the remaining cases into one. This is represented (naturally enough) by the keywords Case Else



Add the notes here.

Loops

- A loop statement allows us to execute a statement or group of statements multiple times.
- VBScript provides the following types of loops to handle looping requirements:
  - Do While Loop
  - Do Until Loop
  - While...Wend Loop
  - For Next
  - For-Step-Next
  - For Each Next

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Do..While Loop and Do…Until Loop

- A Do..While and Do…Until loop is used when one wants to repeat a set of statements as long as the condition is true. The Condition may be checked at the beginning of the loop or at the end of the loop.
- The syntax of a Do..While loop in VBScript is:

```
Do While/Until condition
    [statement 1]
    [statement 2]
     ...
    [statement n]
    [Exit Do]
    [statement 1]
    [statement 2]
    [statement n]
Loop
```

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While…Wend Loop

- In a While…Wend loop, if the condition is True, all statements are executed until Wend keyword is encountered.
- If the condition is false, the loop is exited and the control jumps to very next statement after Wend keyword
- The syntax of a While…Wend loop in VBScript is:

```
While condition(s)
    [statements 1]
    [statements 2]
    ...
    [statements n]
Wend
```

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For....Next Loop

- The For...Next statement is used to run a block of code a specified number of times.
- The For statement specifies the counter variable, and its start and end values. The Next statement increases the counter variable by one.

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For-Step-Next Loop

- With the Step keyword, you can increase or decrease the counter variable by the value you specify.
- In the example below, the counter variable (m) is Increased by 3, each time the loop repeats
  - For m=1 To 10 Step 3
    some code
    Next
- To decrease the counter variable, you must use a negative Step value. You must specify an end value that is less than the start value.
- In the example below, the counter variable m is decreased by 3, each time the loop repeats.
  - For m=10 To 3 Step -3
    some code
    Next

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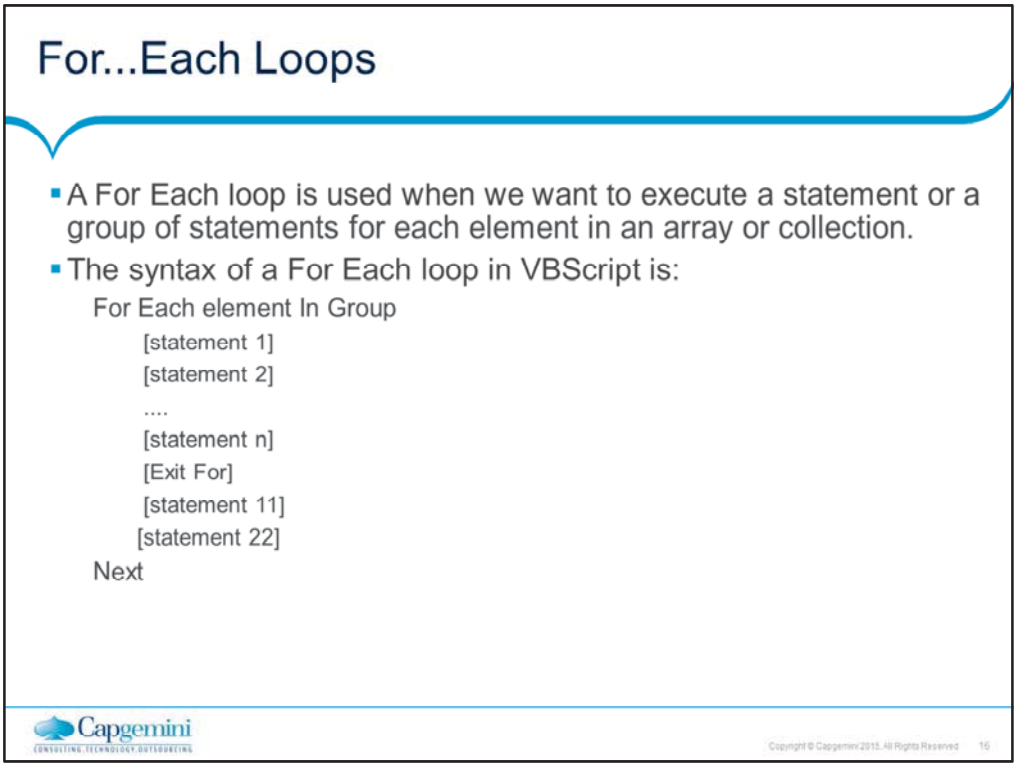
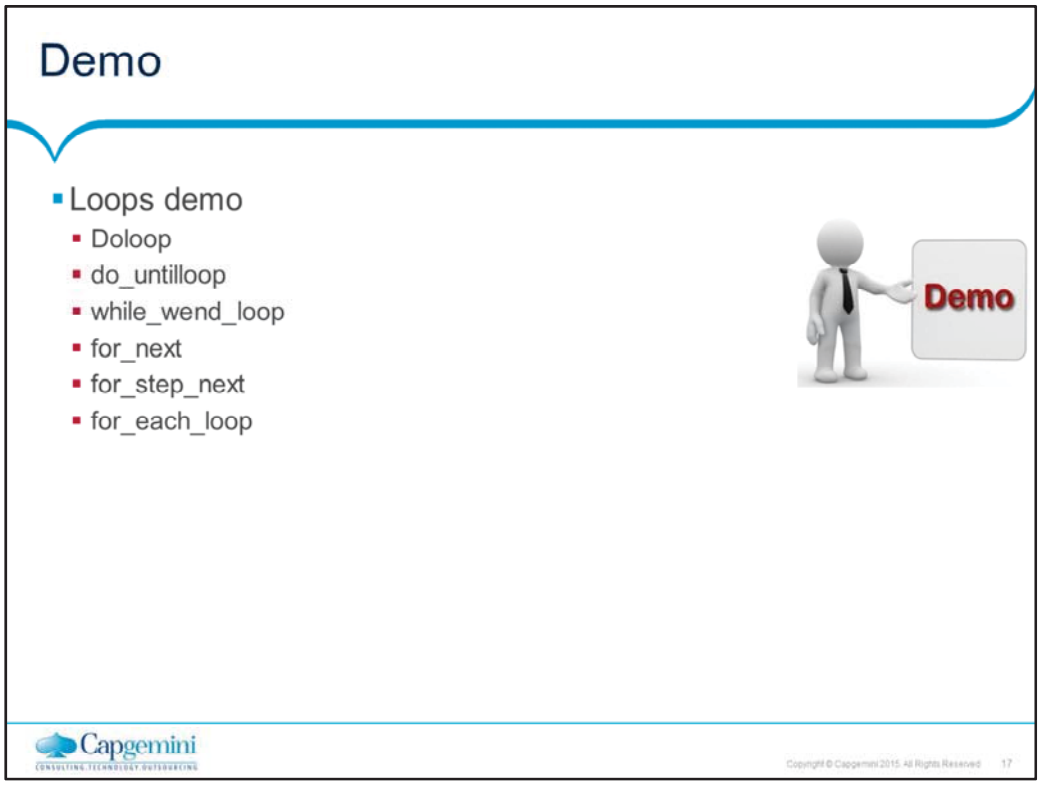


A **For Each** loop is similar to For Loop; however, the loop is executed for each element in an array or group. Hence, the step counter won't exist in this type of loop and it is mostly used with arrays or used in context of File system objects in order to operate recursively



Add the notes here.

Lab

- Lab 3

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Lesson Summary

- Decision making allows programmers to control the execution flow of a script or one of its sections. The execution is governed by one or more conditional statements.
- When you need to execute a block of code several number of times we use loops.

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Review - Questions

- Question 1:The optional statement in Select Case is _____. (Case or Select Case)
- Question 2: In For–step-Next loop ,you must specify an end value that is less than the start value.
  - True or False
- Question 3: In a While..Wend loop, if the condition is True, all statements are executed until _____ keyword is encountered.

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VBScript

Lesson 4: Using Functions and Arrays in VBScript

Lesson Objectives

- **Functions**
- Arrays

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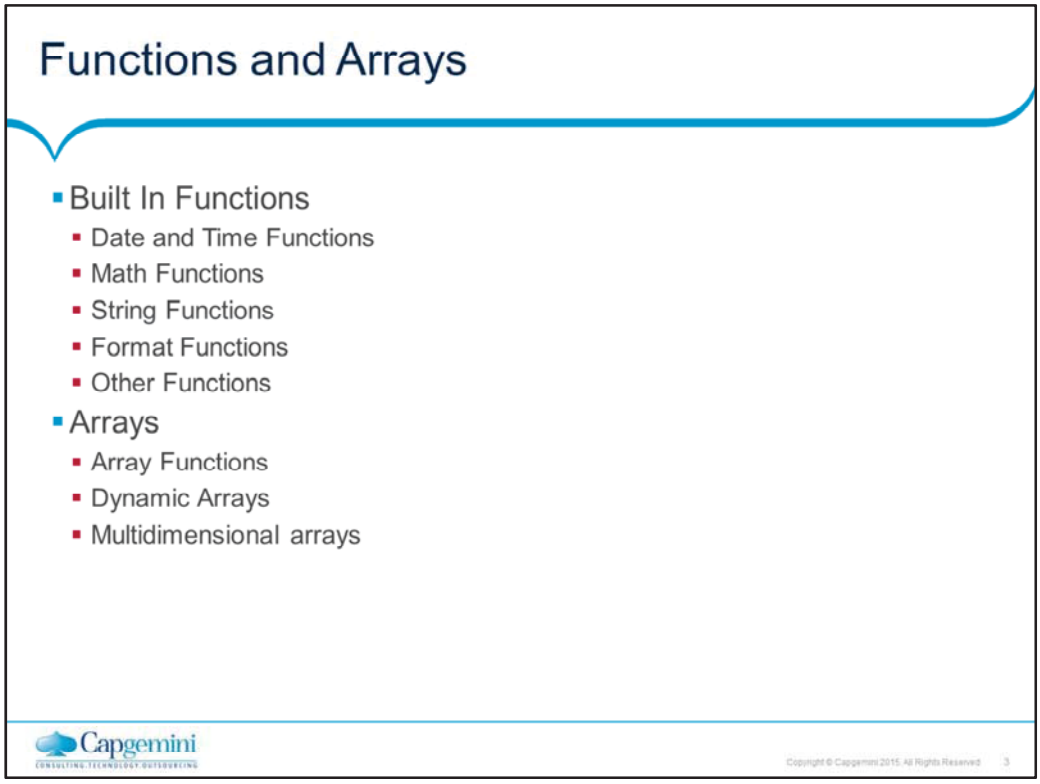

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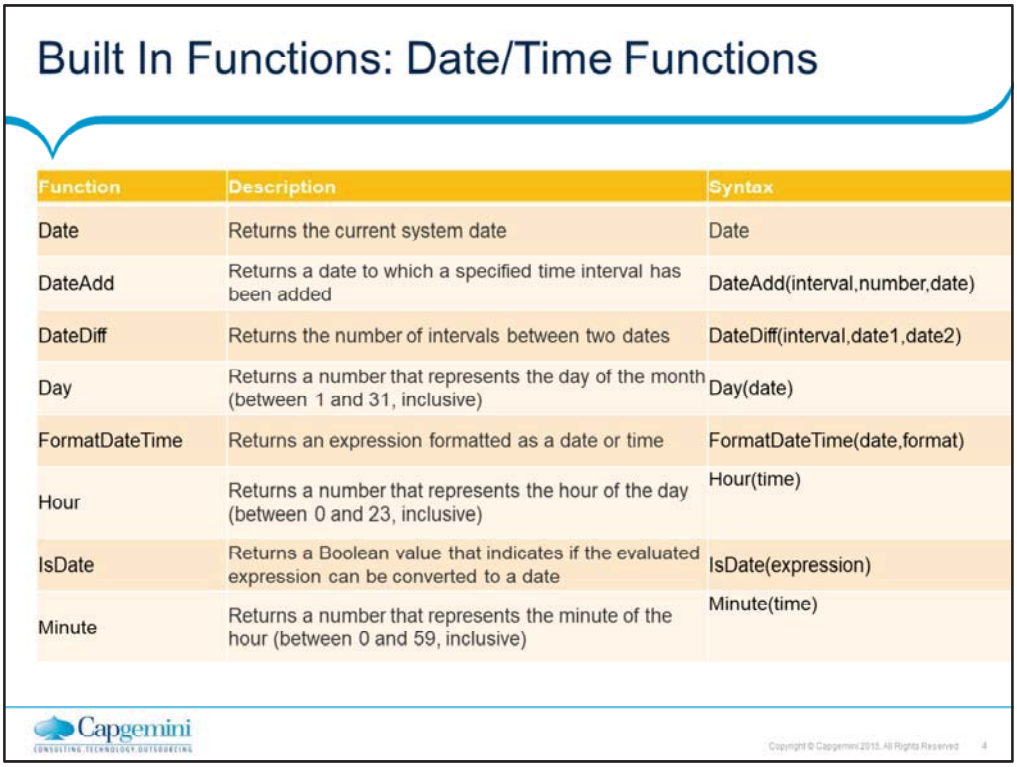

Please note only those parameters mentioned in square brackets are optional.

Explanation of some of the parameters:

- **DateAdd function**
  - the 'interval' parameter can take the following values:
    - yyyy - Year
    - q - Quarter
    - m - Month
    - y - Day of year
    - d - Day
    - w - Weekday
    - ww - Week of year
    - h - Hour
    - n - Minute
    - s - Second
  - The 'number' parameter is the number of interval you want to add. Can either be positive, for dates in the future, or negative, for dates in the past
  - The 'date' parameter is the Variant or literal representing the date to which interval is added

- **DateDiff Function:**
  - The ‘interval’ parameter is the interval you want to use to calculate the differences between date1 and date2.It can take the same values as that of DateAdd function.
  - The ‘date1’, ’date2’ parameters are two dates you want to use in the calculation.

Built In Functions: Date/Time Functions

Function	Description	Syntax
Month	Returns a number that represents the month of the year (between 1 and 12, inclusive)	Month(date)
MonthName	Returns the name of a specified month	MonthName(month[,abbreviate])
Now	Returns the current system date and time	Now
Second	Returns a number that represents the second of the minute (between 0 and 59, inclusive)	Second(time)
Time	Returns the current system time	Time
Weekday	Returns a number that represents the day of the week (between 1 and 7, inclusive)	Weekday(date[,firstdayofweek])
WeekdayName	Returns the weekday name of a specified day of the week	WeekdayName(weekday[, abbreviate[,firstdayofweek]])
Year	Returns a number that represents the year	Year(date)

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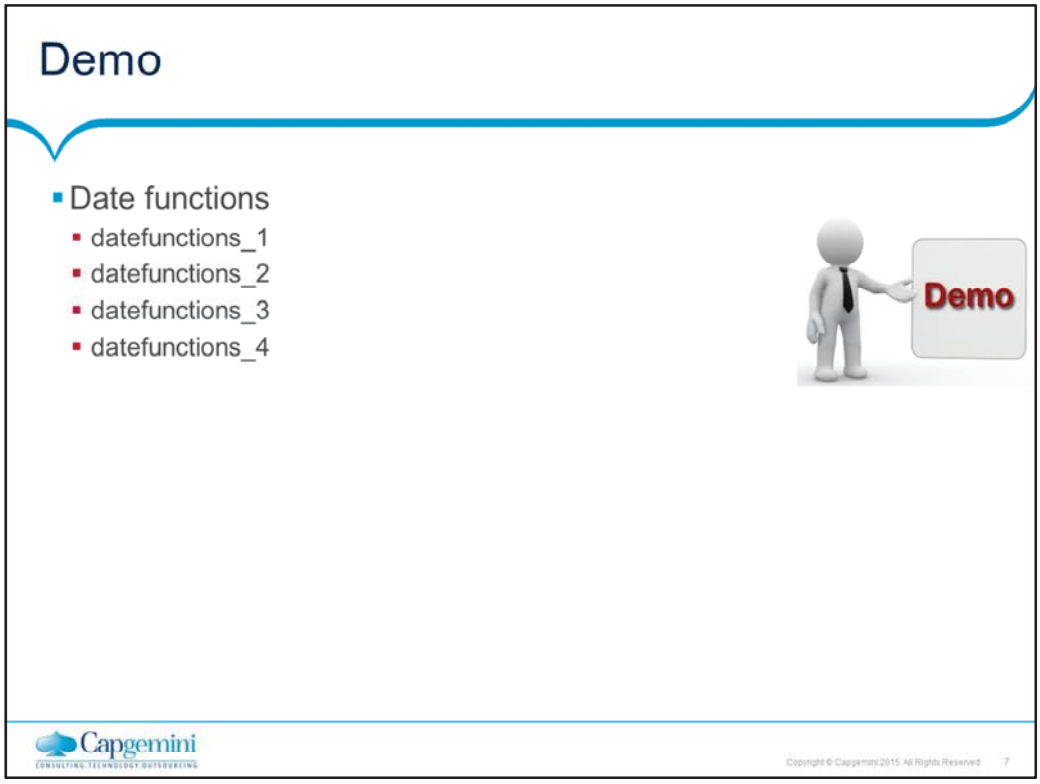
- **Weekday and WeekdayName Function:**

➢ The parameter 'firstdayofweek' is Optional. It specifies the first day of the week. It can take the following values:

- 0 = vbUseSystemDayOfWeek - Use National Language Support (NLS) API setting
- 1 = vbSunday - Sunday (default)
- 2 = vbMonday - Monday
- 3 = vbTuesday - Tuesday
- 4 = vbWednesday - Wednesday
- 5 = vbThursday - Thursday
- 6 = vbFriday - Friday
- 7 = vbSaturday - Saturday

- **MonthName and weekdayName Function:**

➢ The 'abbreviate' parameter is optional. It can take a boolean value that indicates if the weekday name is to be abbreviated



Add the notes here.

Built In Functions: Math Functions

Function	Description	Syntax
Abs	Returns the absolute value of a specified number	Abs(number)
Exp	Returns e raised to a power	Exp(number)
Int	Returns the integer part of a specified number	Int(number)
Log	Returns the natural logarithm of a specified number	Log(number)
Rnd	Returns a random number less than 1 but greater or equal to 0	Rnd[(number)]
Sgn	Returns an integer that indicates the sign of a specified number	Sgn(number)
Sqr	Returns the square root of a specified number	Sqr(number)
Abs	Returns the absolute value of a specified number	Abs(number)

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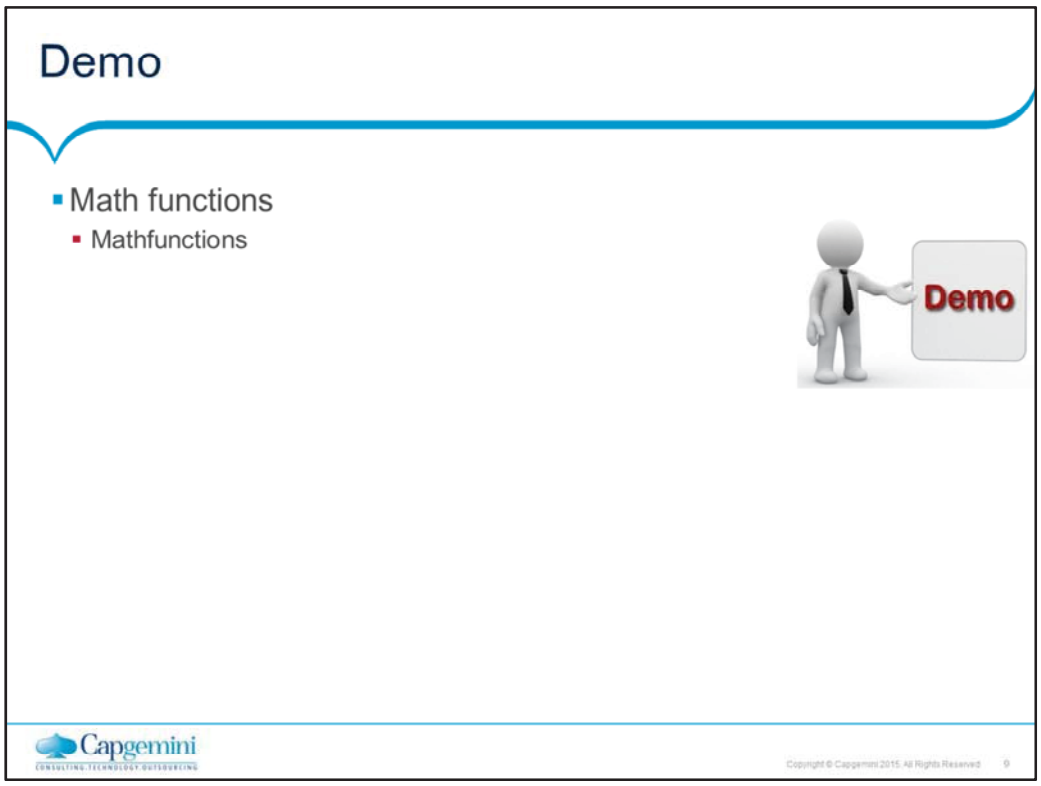

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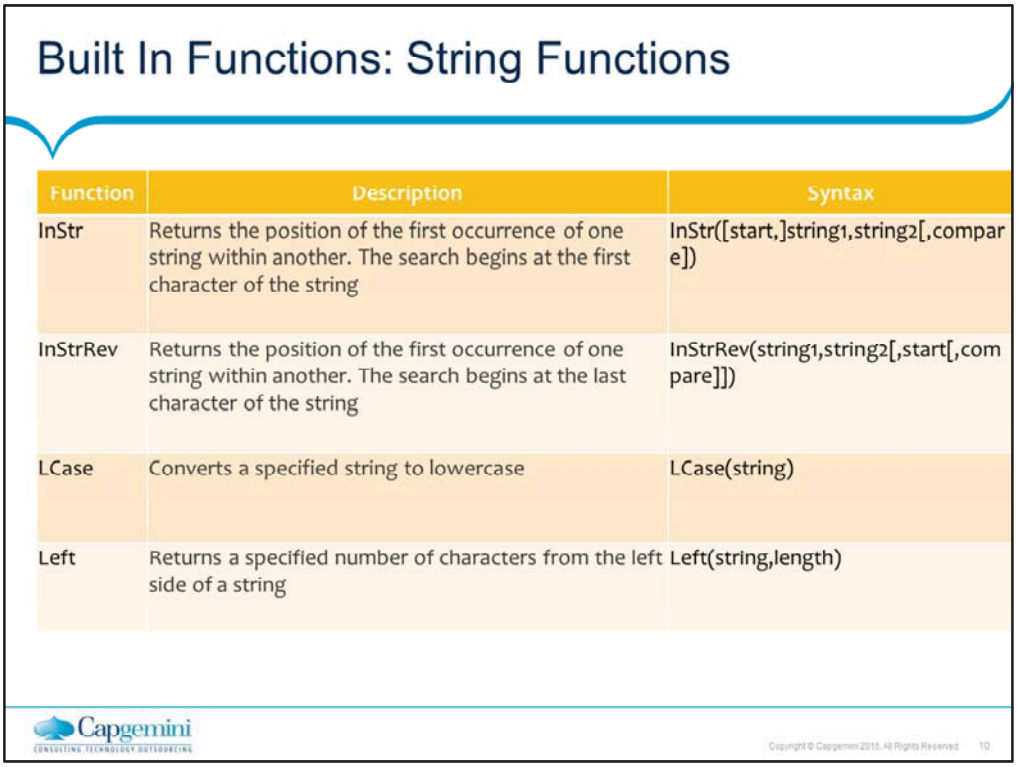


Explanation of some of the parameters:

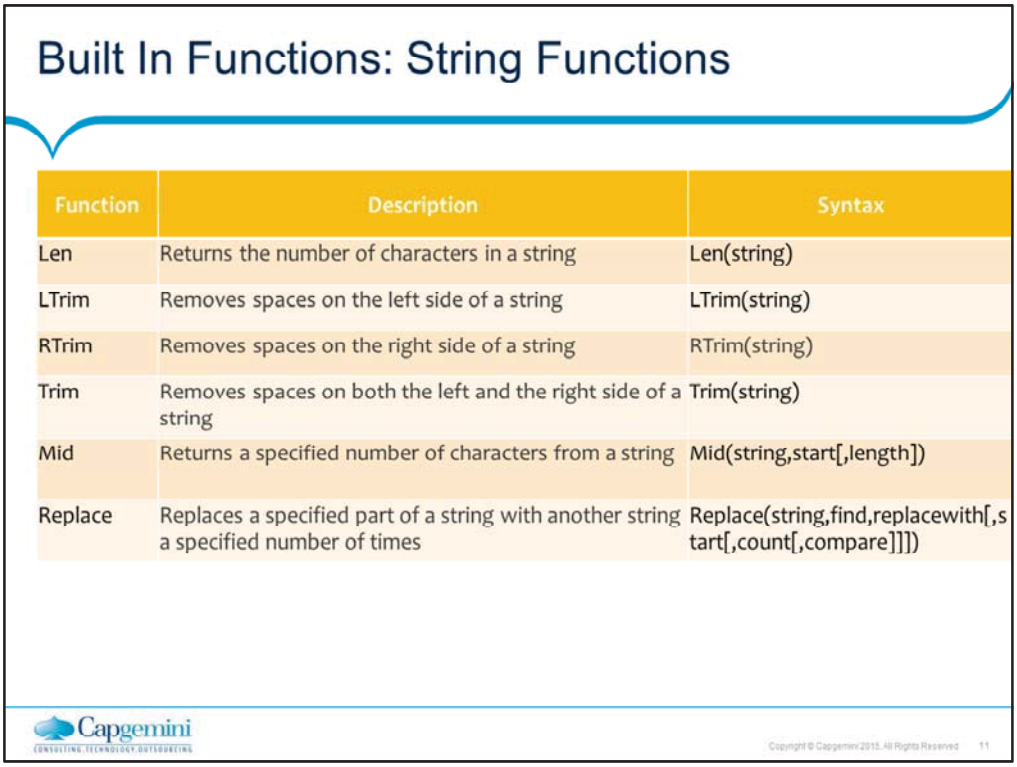
➢ **For the Functions InStr and InStrRev :**

- The parameter 'start' is Optional. It Specifies the starting position for each search. The search begins at the first character position (1) by default. This parameter is required if compare is specified.
- The parameter 'string1' is required. This is the string to be searched.
- The parameter 'string2' is required. This is the string expression to search for .
- The 'compare' parameter is optional. It specifies the string comparison to use. Default is 0.

  It can have one of the following values:

  - 0 = vbBinaryCompare - Perform a binary comparison
  - 1 = vbTextCompare - Perform a textual comparison

•If string1 is "" - InStr and InStrRev returns 0
•If string1 is Null - InStr and InStrRev returns Null
•If string2 is "" - InStr and InStrRev returns start
•If string2 is Null -InStr and InStrRev returns Null
•If string2 is not found - InStr and InStrRev returns 0
•If string2 is found within string1 - InStr and InStrRev returns the position at which match is found
•If start > Len(string1) - InStr and InStrRev returns 0



➢ **For the Replace Function:**

- The 'string' parameter is required. It is the string to be searched.
- The 'find' parameter is required. This is the part of the string that will be replaced.
- The 'replacewith' parameter is required. It is the replacement substring.
- The 'start' parameter is optional. It specifies the start position. Default is 1. All characters before the start position will be removed.
- The 'count' parameter is also optional. It specifies the number of substitutions to perform.Default value is -1, which means make all possible substitutions
- The 'compare' parameter is optional. It specifies the string comparison to use. Default is 0

  It can have one of the following values:
  - 0 = vbBinaryCompare - Perform a binary comparison
  - 1 = vbTextCompare - Perform a textual comparison

Built In Functions: String Functions

Function	Description	Syntax
Right	Returns a specified number of characters from the right side of a string	Right(string,length)
Space	Returns a string that consists of a specified number of spaces	Space(number)
StrComp	Compares two strings and returns a value that represents the result of the comparison	StrComp(string1,string2[,compare])
String	Returns a string that contains a repeating character of a specified length	String(number,character)
StrReverse	Reverses a string	StrReverse(string)
UCase	Converts a specified string to uppercase	UCase(string)

The StrComp function can return one of the following values:

- -1 (if string1 < string2)
- 0 (if string1 = string2)
- 1 (if string1 > string2)
- Null (if string1 or string2 is Null)

Demo

- String functions
  - stringfunctions_1
  - stringfunctions_2
  - stringfunctions_3

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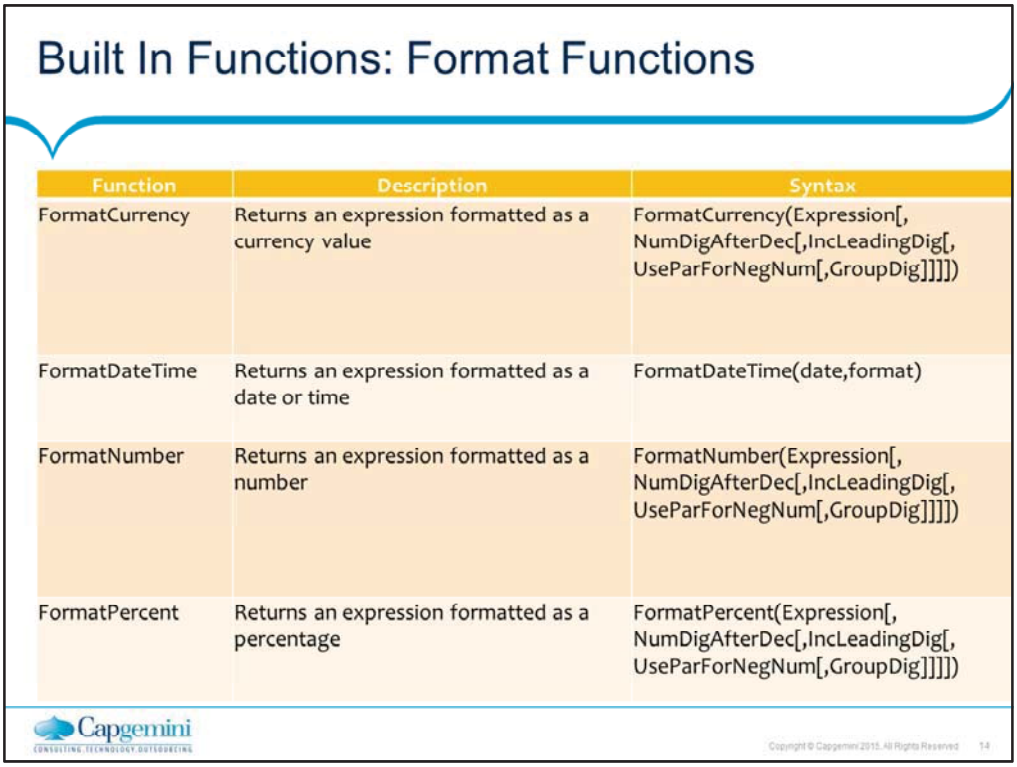
Add the notes here.



Vbscript FormatCurrency function provides the functionality to format the simple number
expression into currency formatted numbers with grouping, specified number of digits
after decimal point, leading zero for fractional numbers before decimal point etc.
You can also format the negative currency value numbers using vbscript FormatCurrency
function.

Syntax:
FormatCurrency (expression, NumDigitsAfterDecimal,IncludeLeadingDigit, UseParensForNegativeNumbers, GroupDigits)

FormatCurrency accepts 5 types of parameters as shown in the above syntax:

1. expression: first parameter accepts number expression that is to formatted into currency format.
2. NumDigitsAfterDecimal: accepts the number value to specify the number of digits after decimal points.
3. IncludeLeadingDigit: accepts 3 types of values to specify whether to display leading zero for fractional decimal numbers. e.g.: 0.9 or .9
IncludeLeadingDigit accepts following values:
-2 : Use the computer default regional settings.
-1 : True
0 : False
4. UseParensForNegativeNumbers: accepts 3 types of values to specify whether to display parenthesis () for negative numbers or not. E.g.: -9 or (9)
UseParensForNegativeNumbers accept following values:
-2 : Use the computer default regional settings.
-1 : True
0 : False

5. GroupDigits: also accepts 3 types of values to specify whether to group the numbers using default delimiter symbol specified in computer regional settings or not.
   GroupDigits accepts the following values:
   -2 : Use the computer default regional settings.
   -1 : True
   0 : False

All parameters of FormatCurrency function are optional except first parameter i.e. number expression that accepts the number value which is to be formatted.

FormatDateTime Function:

- The 'date' parameter is required. Any valid date expression (like Date() or Now()) format Optional. A value that specifies the date/time format to use It can take the following values:
  - 0 = vbGeneralDate - Default. Returns date: mm/dd/yy and time if specified: hh:mm:ss PM/AM.
  - 1 = vbLongDate - Returns date: weekday, monthname, year
  - 2 = vbShortDate - Returns date: mm/dd/yy
  - 3 = vbLongTime - Returns time: hh:mm:ss PM/AM
  - 4 = vbShortTime - Return time: hh:mm

Vbscript FormatNumber function provides the functionality to format the simple number expression into numbers with grouping, specified number of digits after decimal point, leading zero for fractional numbers before decimal point etc. You can also format the negative numbers using vbscript FormatNumber function.

FormatNumber (expression, NumDigitsAfterDecimal, IncludeLeadingDigit, UseParensForNegativeNumbers, GroupDigits)

FormatNumber accepts 5 types of parameters as shown in the above syntax:

1. expression: first parameter accepts number expression that is to formatted.

2. NumDigitsAfterDecimal: accepts the number value to specify the number of digits after decimal points.

3. IncludeLeadingDigit: accepts 3 types of values to specify whether to display leading zero for fractional decimal numbers. e.g.: 0.9 or .9

IncludeLeadingDigit accepts following values:

-2 : Use the computer default regional settings.
-1 : True
0 : False

4. UseParensForNegativeNumbers: accepts 3 types of values to specify whether to display parenthesis () for negative numbers or not. E.g.: -9 or (9)
   UseParensForNegativeNumbers accept following values:
   -2 : Use the computer default regional settings.
   -1 : True
   0 : False

5. GroupDigits: also accepts 3 types of values to specify whether to group the numbers using default delimiter symbol specified in computer regional settings or not.

GroupDigits accepts the following values:
-2 : Use the computer default regional settings.
-1 : True
0 : False

All parameters of FormatNumber function are optional except first parameter i.e. number expression that accepts the number value which is to be formatted.

Vbscript FormatPercent function provides the functionality to format the simple number expression multiplying it with 100 and display the number values with grouping of digits, specified number of digits after decimal point, leading zero for fractional numbers before decimal point etc. You can also format the negative numbers as percentage using vbscript FormatPercent function.
Syntax:
FormatPercent (expression, NumDigitsAfterDecimal, IncludeLeadingDigit, UseParensForNegativeNumbers, GroupDigits)

FormatPercent accepts 5 types of parameters as shown in the above syntax:

1. expression: first parameter accepts number expression that is to formatted as percentage with % as trailing character.

2. NumDigitsAfterDecimal: accepts the number value to specify the number of digits after decimal points.

3. IncludeLeadingDigit: accepts 3 types of values to specify whether to display leading zero for fractional decimal numbers. e.g.: 0.9 or .9

IncludeLeadingDigit accepts following values:

-2 : Use the computer default regional settings.
-1 : True
0 : False

4. UseParensForNegativeNumbers: accepts 3 types of values to specify whether to display parenthesis () for negative numbers or not. E.g.: -9 or (9)

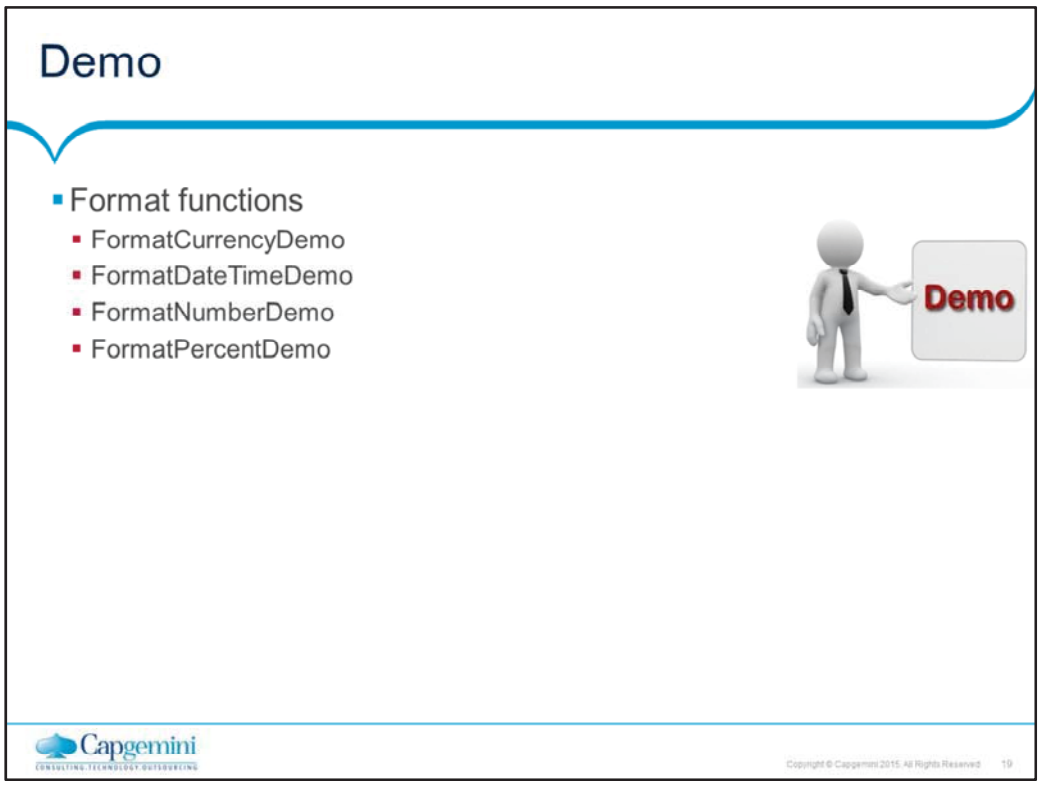
UseParensForNegativeNumbers accept following values:

-2 : Use the computer default regional settings.
-1 : True
0 : False

5. GroupDigits: also accepts 3 types of values to specify whether to group the numbers using default delimiter symbol specified in computer regional settings or not.

GroupDigits accepts the following values:
-2 : Use the computer default regional settings.
-1 : True
0 : False

All parameters of FormatPercent function are optional except first parameter i.e. number expression that accepts the number value which is to be formatted as percentage value i.e. number multiplied by 100 with % sign at the end.



Add the notes here.

Built In Functions: Other Functions

Function	Description	Syntax
Eval	Evaluates an expression and returns the result	Eval(expression)
IsEmpty	Returns a Boolean value that indicates whether a specified variable has been initialized or not	IsEmpty(expression)
IsNull	Returns a Boolean value that indicates whether a specified expression contains no valid data (Null)	IsNull(expression)
IsNumeric	Returns a Boolean value that indicates whether a specified expression can be evaluated as a number	IsNumeric(expression)

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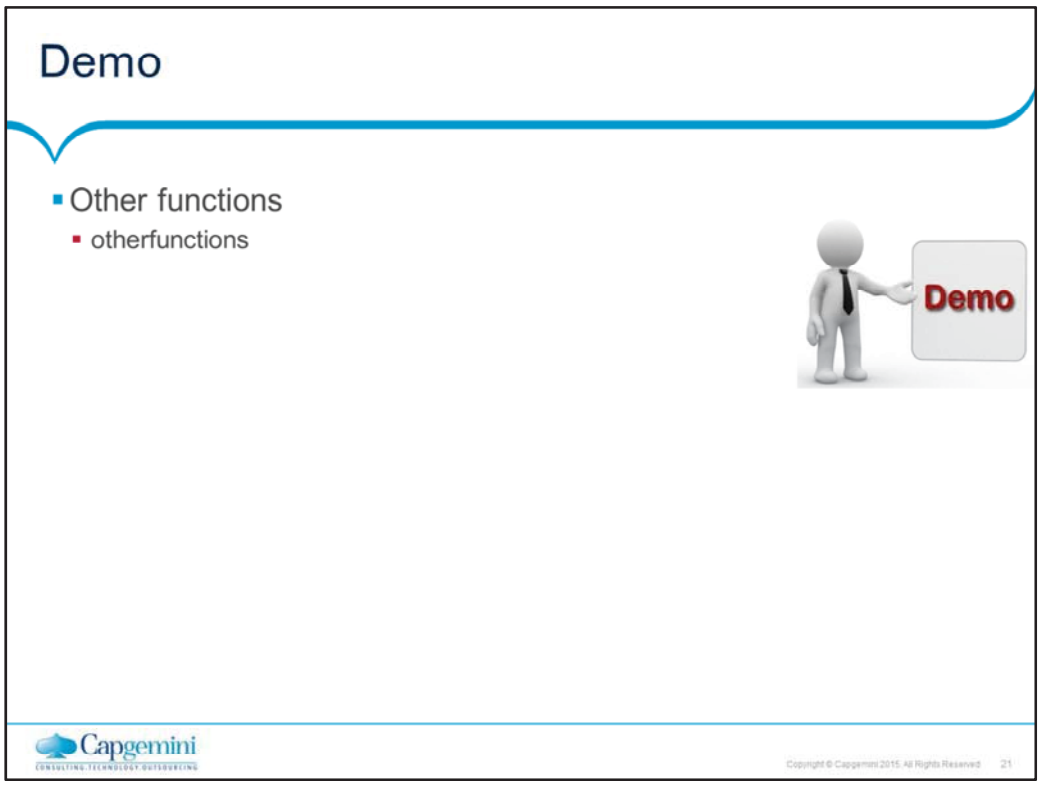

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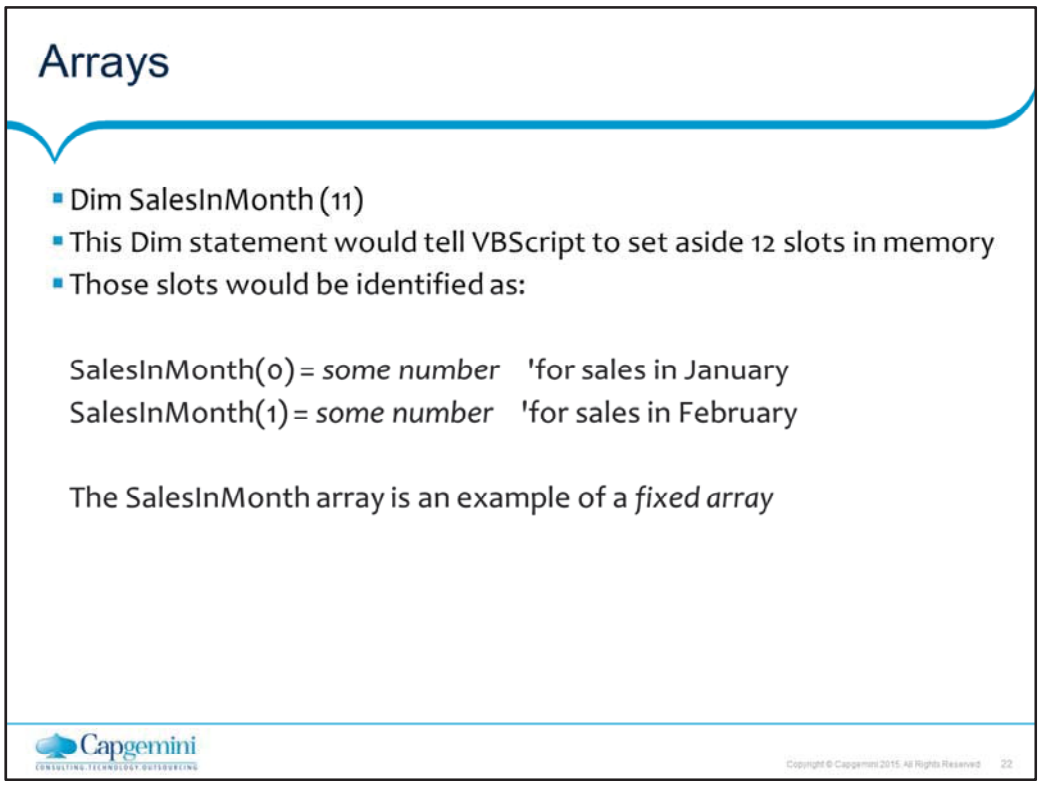
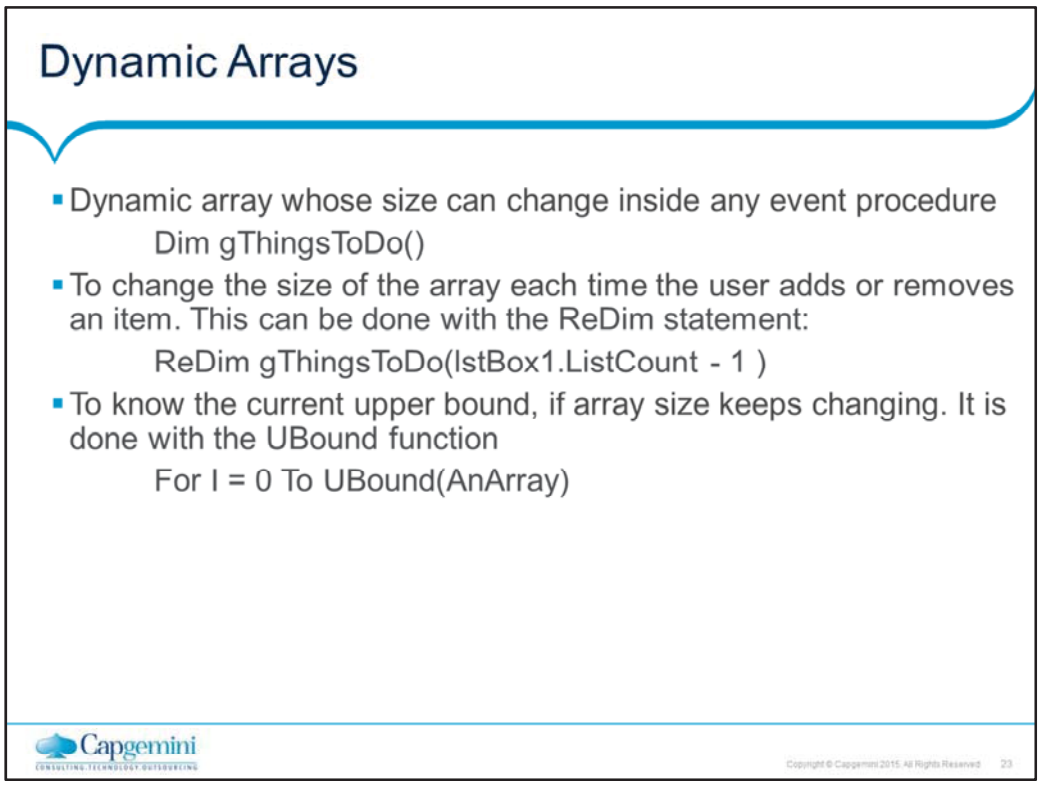


In general, a list (or one-dimensional array) is a way to group items so that you can refer to each item individually by means of its index. The index is simply the number you place inside the parentheses; it is the position of the item in the array.
The name of the list has to follow VBScript's rules for variable names. You tell VBScript that you will be working with a list by using a variation of the Dim statement that you have already seen. The only difference is that you need to add the parentheses with the maximum index. For example, the following statement could be used to identify the sales for a year: Dim SalesInMonth(11)
In general, a list (or one-dimensional array) is a way to group items so that you can refer to each item individually by means of its index. The index is simply the number you place inside the parentheses; it is the position of the item in the array. The name of the list has to follow VBScript's rules for variable names. You tell VBScript that you will be working with a list by using a variation of the Dim statement that you have already seen. The only difference is that you need to add the parentheses with the maximum index. For example, the following statement could be used to identify the sales for a year:

```
Dim SalesInMonth(11)
```

This Dim statement would tell VBScript to set aside 12 slots in memory. Those slots would be identified as:

```
SalesInMonth(0) = some number    'for sales in January
SalesInMonth(1) = some number    'for sales in February
. .
SalesInMonth(11) = some number   'for sales in December
```



Dynamic Versus Fixed Arrays

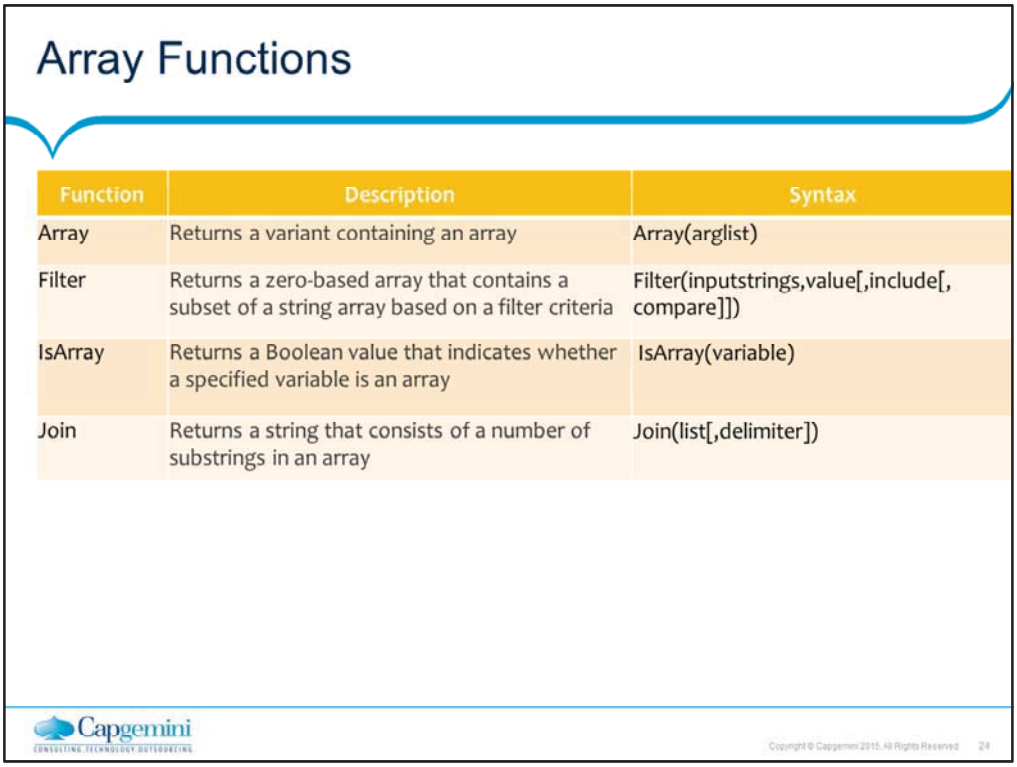
The SalesInMonth array is an example of a fixed array. That's because we fixed its size in the Dim statement. However, you might need an array whose size can change while the program is running. This is called a dynamic array. To create a dynamic array whose size you can change inside any event procedure, simply use parentheses without the maximum index and make sure that the array is a script-level variable Dim gThingsToDo( )

Now suppose, for example, we want to activate the Web page and we want to store the contents of the text-box in an array. We need to change the size of the array each time the user adds or removes an item. This can be done with the

ReDim statement:
ReDim gThingsToDo(lstBox1.ListCount - 1)

When you start enlarging or shrinking the size of an array, it becomes vital (in For-Next loops, for example) to have a way of knowing the current upper bound. This is done with the UBound function. A For-Next loop whose code starts like this will go through all the elements in the array:

For I = 0 To UBound(AnArray)



➢ **For the Filter Function:**

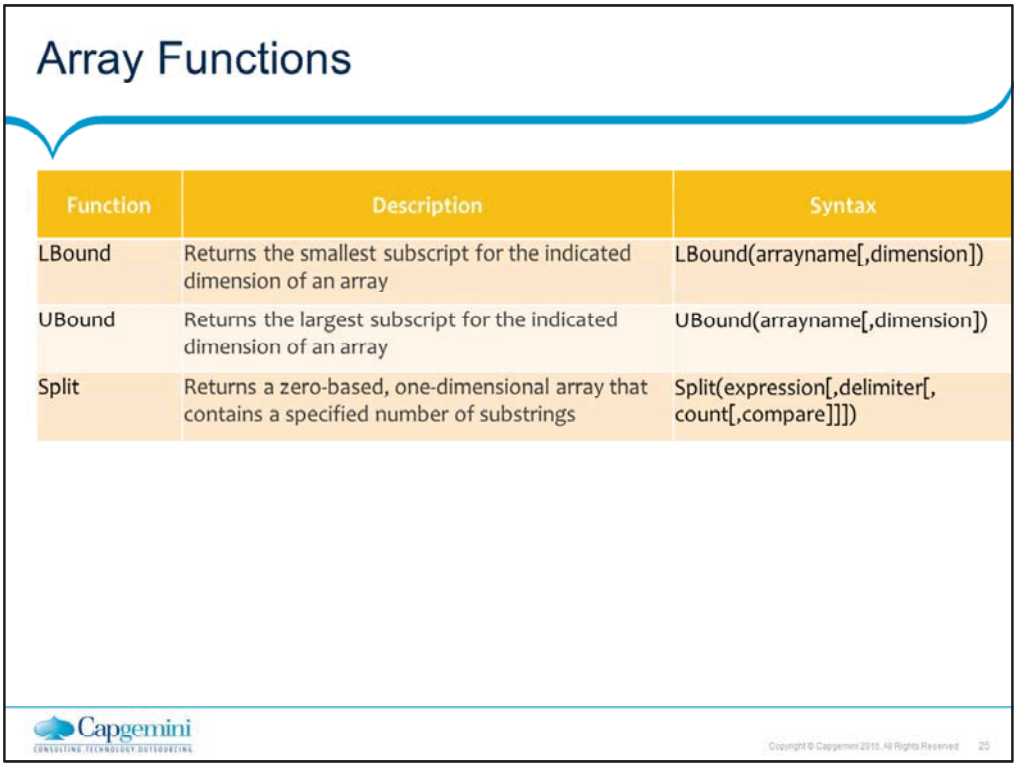
- The 'inputstrings' parameter is required. It is one-dimensional array of strings to be searched
- The 'value' parameter is required. It is the string to search for
- The 'include' parameter is optional. A Boolean value that indicates whether to return the substrings that include or exclude value. True returns the subset of the array that contains value as a substring. False returns the subset of the array that does not contain value as a substring. Default is True.
- The 'compare' parameter is optional. Specifies the string comparison to use.
  It can have one of the following values:
  - 0 = vbBinaryCompare - Perform a binary comparison
  - 1 = vbTextCompare - Perform a textual comparison

➢ **For The Join Function:**

- The 'list' parameter is required. A one-dimensional array that contains the substrings to be joined
- The 'delimiter' parameter is optional. The character(s) used to separate the substrings in the returned string. Default is the space character

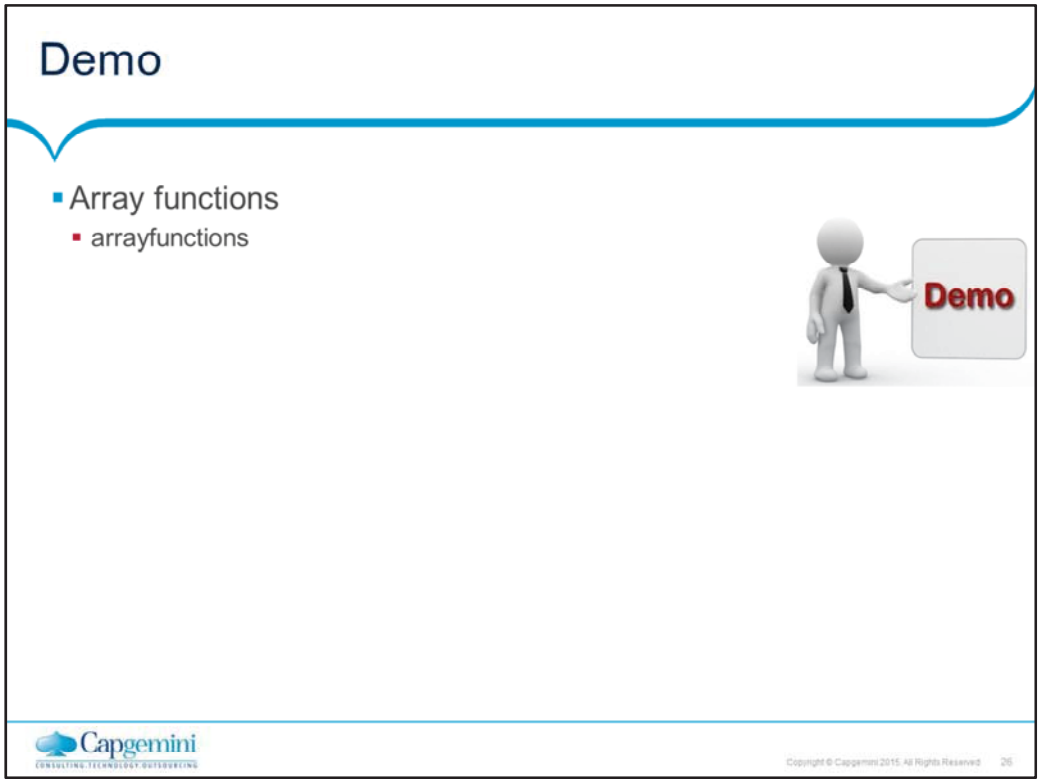
➢ **For the LBound and UBound Functions:**

- The LBound for any dimension is ALWAYS 0.
- We can use the LBound function with the UBound function to determine the size of an array



➢ **For the Spilt Function:**

- The 'expression' parameter is required. A string expression that contains substrings and delimiters
- The 'delimiter' parameter is optional. A string character used to identify substring limits. Default is the space character
- The 'count' parameter is optional. The number of substrings to be returned. -1 indicates that all substrings are returned
- The 'compare' parameter is optional. Specifies the string comparison to use. It can have one of the following values:
    - 0 = vbBinaryCompare - Perform a binary comparison
    - 1 = vbTextCompare - Perform a textual comparison



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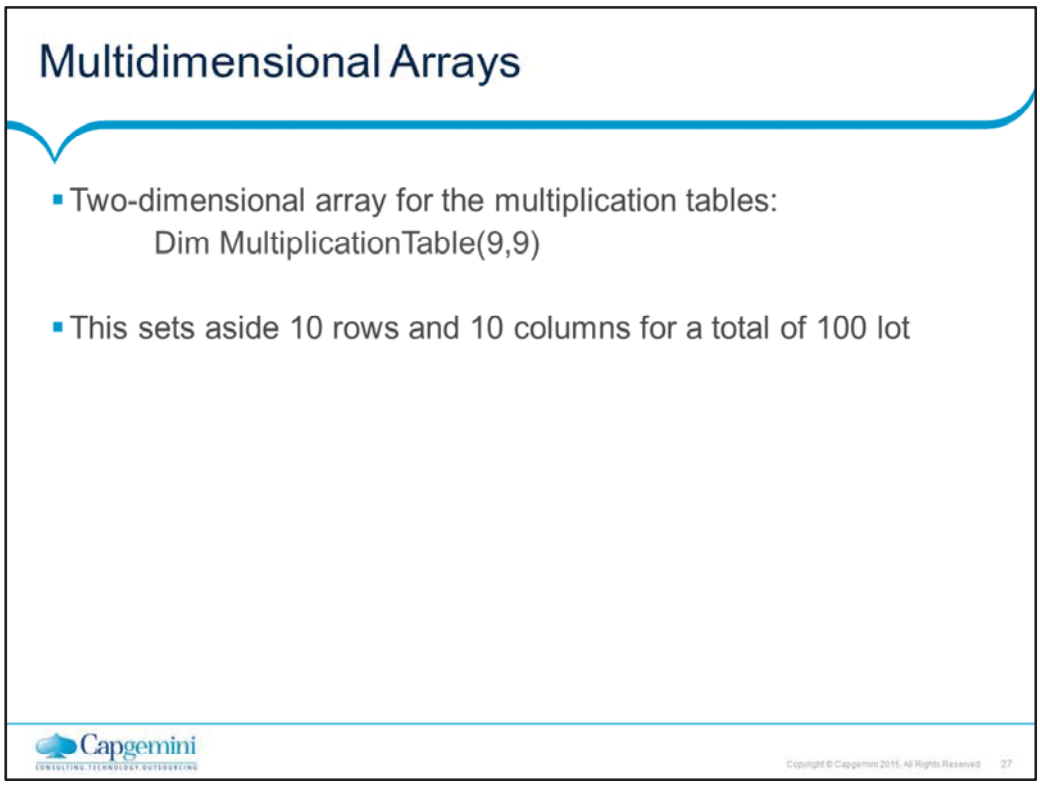


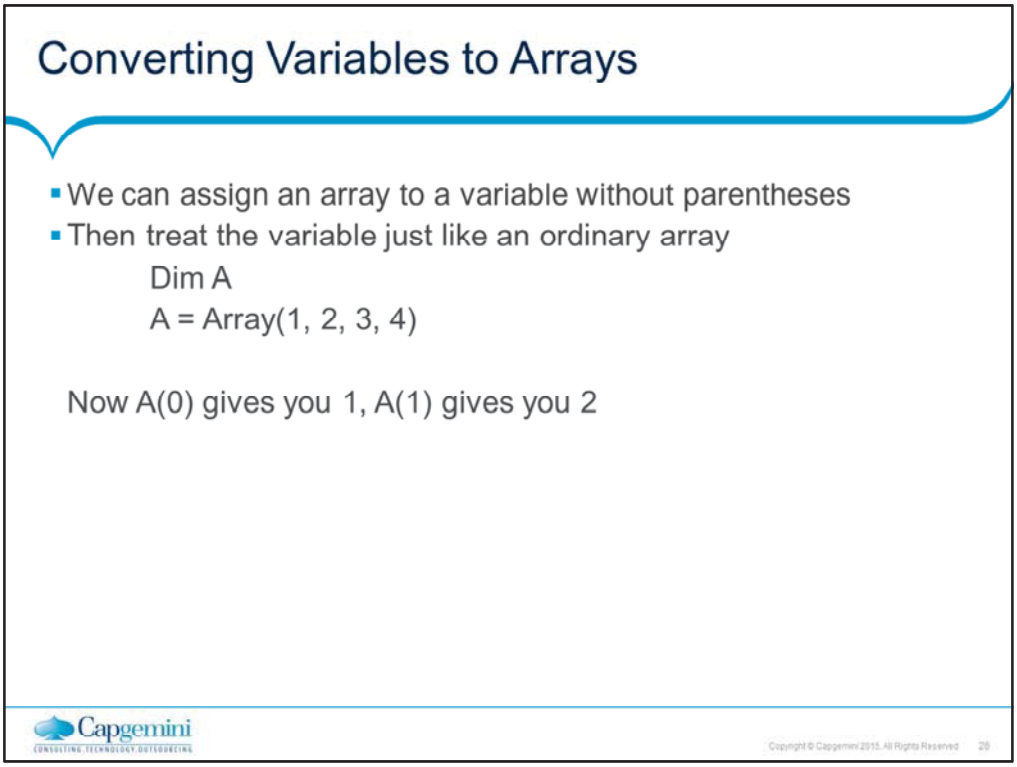
Multidimensional Arrays

Just as lists lead to one-dimensional arrays, tables lead to multidimensional arrays. For example, to make a two-dimensional array for the multiplication tables, you would write this: Dim MultiplicationTable(9,9)

This sets aside 10 rows and 10 columns for a total of 100 slots. (Remember that arrays start with a slot at position 0.).

To actually fill the table, use a nested For-Next loop:

```
For I = 0 To 9
   For J = 0 To 9
          MultiplicationTable(I,J) = (I+1) * (J+1)
    Next
Next
```



Converting Variables to Arrays

One of VBScript's most amazing abilities regarding arrays is that you can assign an array to a variable that doesn't use parentheses in its definition, and then treat the variable just like an ordinary array. VBScript provides two ways to do this. The first is with the Array function, which simply turns a bunch of data into an array:

```
Dim A
A = Array(1, 2, 3, 4)
```

Now A(0) gives you 1, A(1) gives you 2, and so on. You can also declare an array and then simply assign it to another variable:

```
Dim ATable, Multiplic ationTable(9,9)
ATable = MultiplicationTable
```

You can even use a variable to temporarily hold an array in order to "swap" two arrays.
Although List property of a list box is an array, this is true only in a restricted sense. It works exactly like an array as far as element access (via the index), but you cannot assign the List property of a list box to a variable.

Lab

- Lab 2
- Lab 3
- Lab 4

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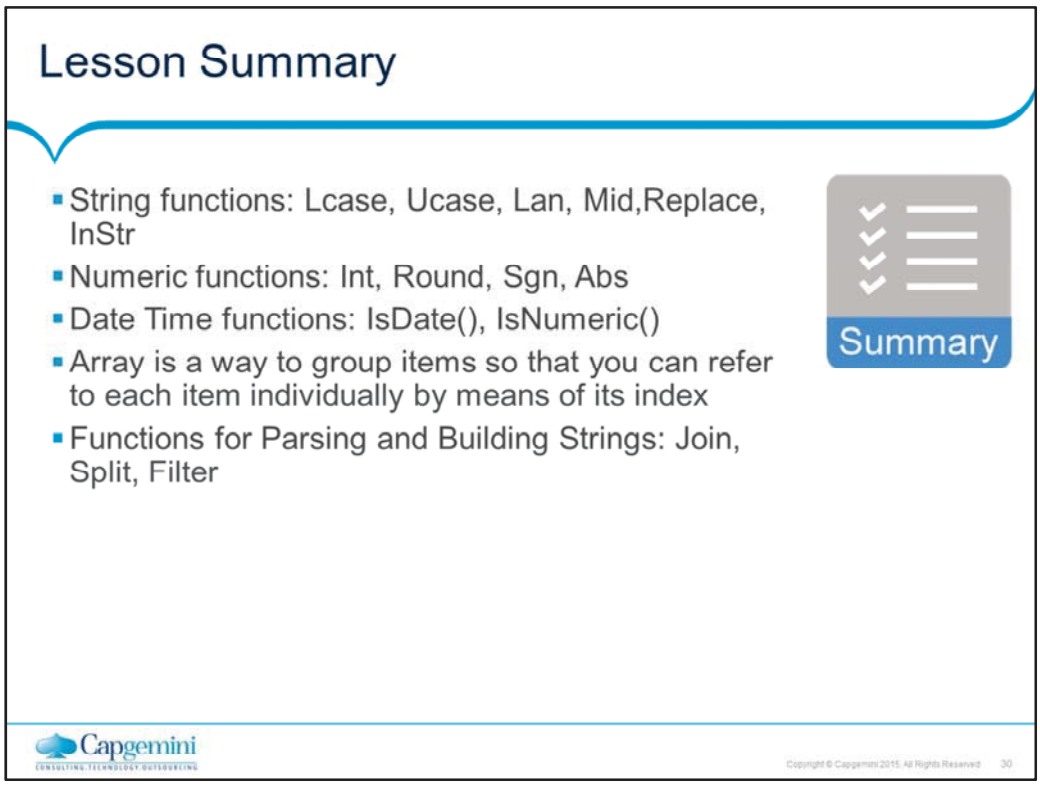

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Review - Questions

- To search a string or a part of string we can use:
  - Option 1: Find
  - Option 2: InStr
  - Option 3: InStrRev
- Question 2: Sgn function returns _____ for negative number.
- Question 3: _____ is used to change the size of an array dynamically.

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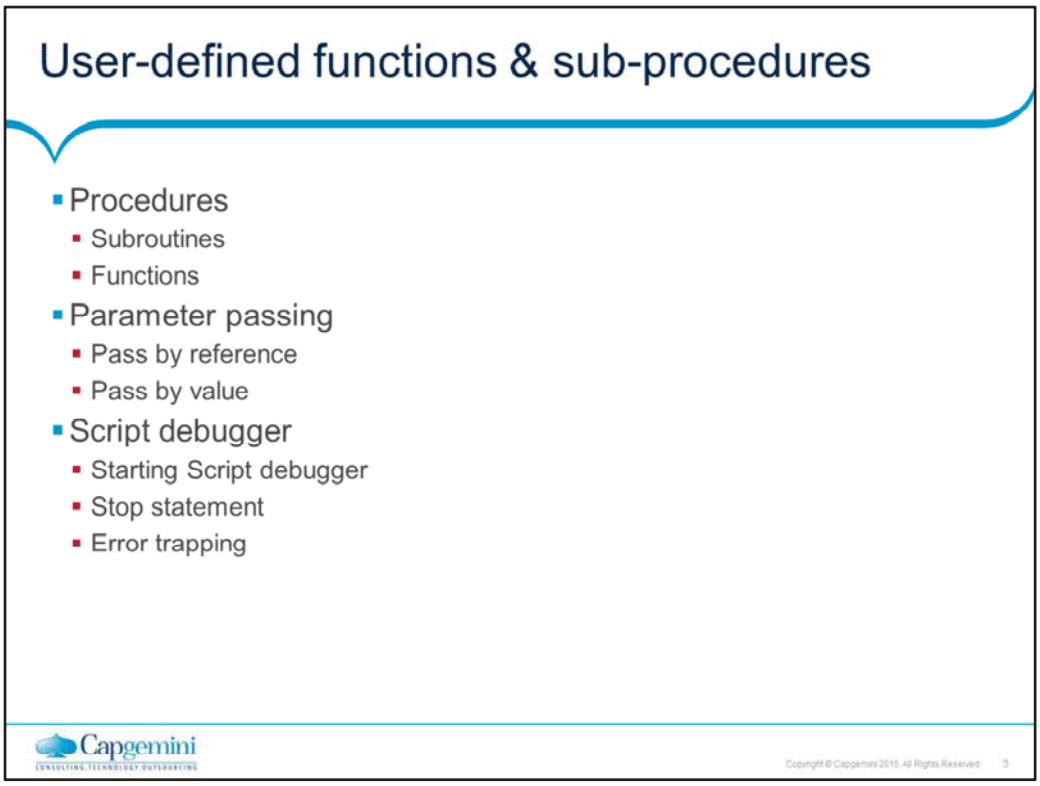
VBScript

Lesson 5: User-Defined Functions & Sub-Procedures in VBScript

Lesson Objectives

- User Defined Functions
- Sub-procedures
- Passing by reference and passing by value
- Script Debugger



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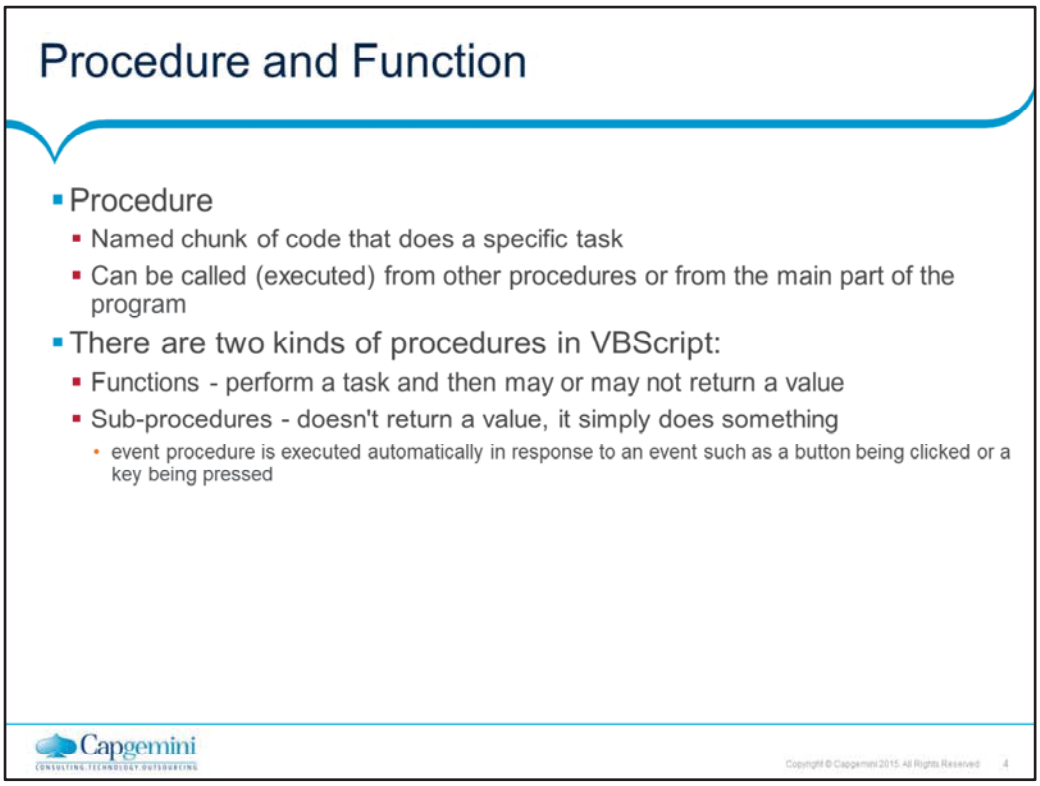
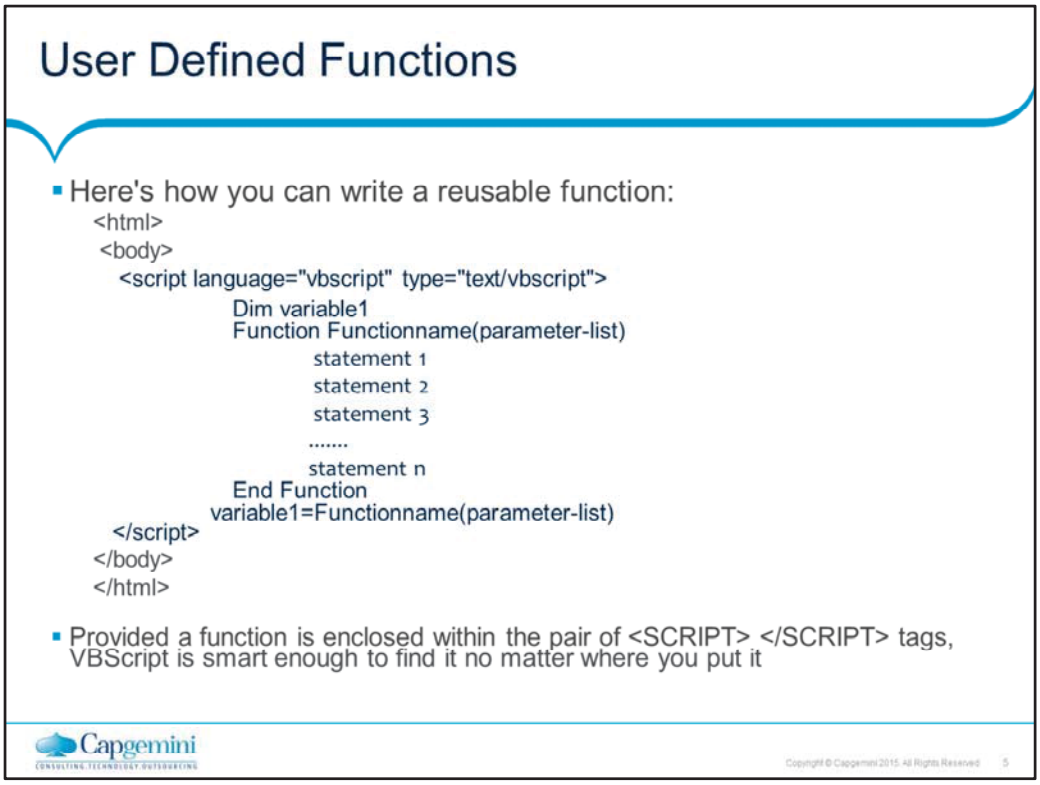
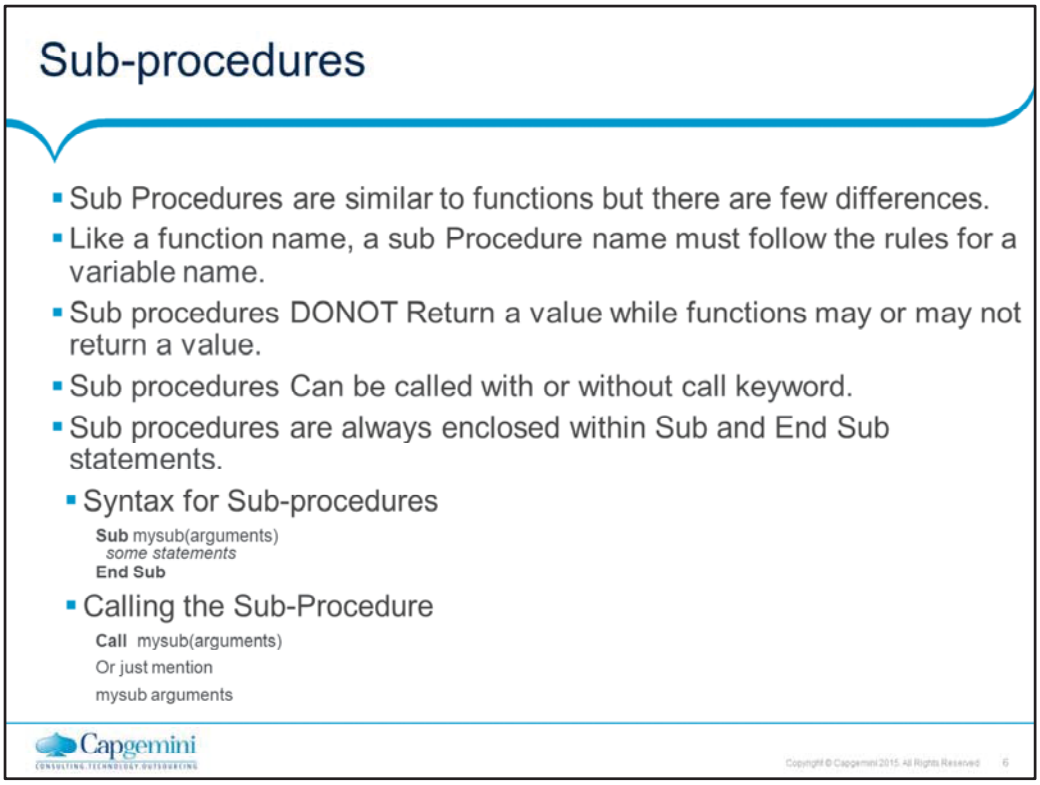


You can send data to both functions and sub-procedures by passing them parameters.
Usually, functions don't change the data they are sent; they are written primarily to return a value. If you do write a function that changes the information sent to it, the value the function returns is normally used to indicate success or failure.
Sub-procedures that accept data, on the other hand, are usually written to process that data. Therefore, if you direct it to do so, a sub-procedure changes the data it is sent.



Exiting a function prematurely

Occasionally, you will want to exit a function prematurely without assigning a return value. In that case, the default return value is 0 for numbers and "" for strings.
The statement that lets you do this is the Exit Function statement.



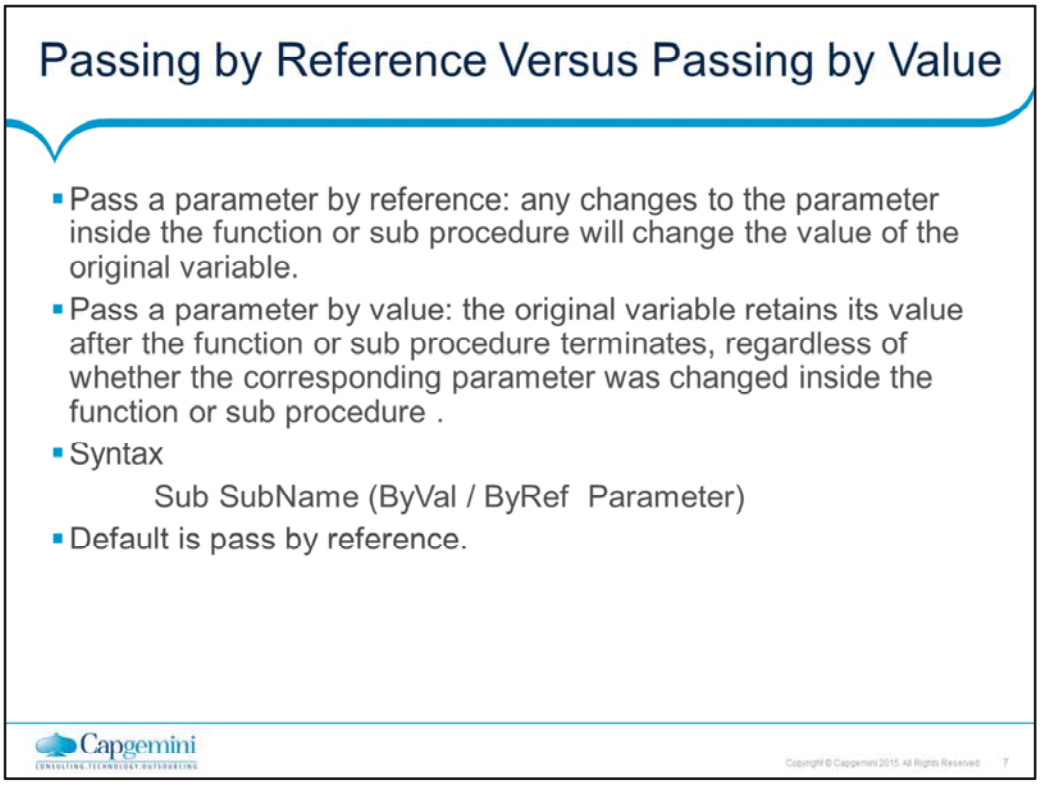
Sub-procedures

You write a function to automate a task and then receive a value.
Let's suppose, however, that you want to automate a task but you don't need to receive a value. In this case, you would write a sub-procedure.

For example, you might want to automate the display of text at a certain heading level. You've gotten tired of writing this:
Document.Write "<H" & I & ">" & TheText & "</H>"
Here's a sub-procedure that has two parameters, one for the heading level and one for the text to display:

```
Sub WriteInHeadingLevel(HeadingLevel, TheText)
  Document.Write "<H" & (HeadingLevel & ">" & TheText & "</H>"
End Sub
```

In general, as this example shows, the first line of a subprocedure has the keyword Sub followed by the subprocedure's name.
Next comes the parameter list, enclosed in parentheses. (If your subprocedure uses no parameters, the parentheses are optional.) After the parameter list come the statements that make up the body of the subprocedure.
Finally there are the keywords End Sub, which end the subprocedure.



If **ByVa**l is specified, then the arguments are sent as byvalue when the function or procedure is called.
If **ByRef** is specified, then the arguments are sent as a reference when the function or procedure is called

Example for Pass ByVal

```
Function GetValue( ByVal var )
   var = var + 1
End Function

'Pass the variable x to the GetValue function ByVal
Dim x: x = 5
Call GetValue(x)

MsgBox "x = " & x
```

Output:
X=5

In other words, when the variable x is passed to GetValue, simply a copy is being passed. When GetValue executes, var stores a copy of the variable x and increments itself by 1. Because a copy of x has been passed, it cannot be modified.

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Example for Pass By Ref

```
Function GetReference( ByRef var )
   var = var + 1
End Function

'Pass the variable x to the GetReference function ByRef
Dim x: x = 5
Call GetReference(x)

MsgBox x
```

- Output: 6

Variable x was incremented by 1. Both x and var are incremented unlike the 'pass by val case).
When the function GetReference executes, var becomes a reference of x so any changes made to var would also impact x

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Demo

- Sub Procedures
  - procedure_withoutCall
- Functions
  - Function
  - function_return
- Passby Value
  - passbyvalue
- PassBy Reference
  - passbyreference

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Dialog Boxes

- VBScript allows the developers to interact with the user effectively with the help of dialog boxes.
- Types of Dialog Boxes in VBScript :
  - MsgBox:
    Is used to display a message to a user
  - InputBox :
    with which user can enter the values

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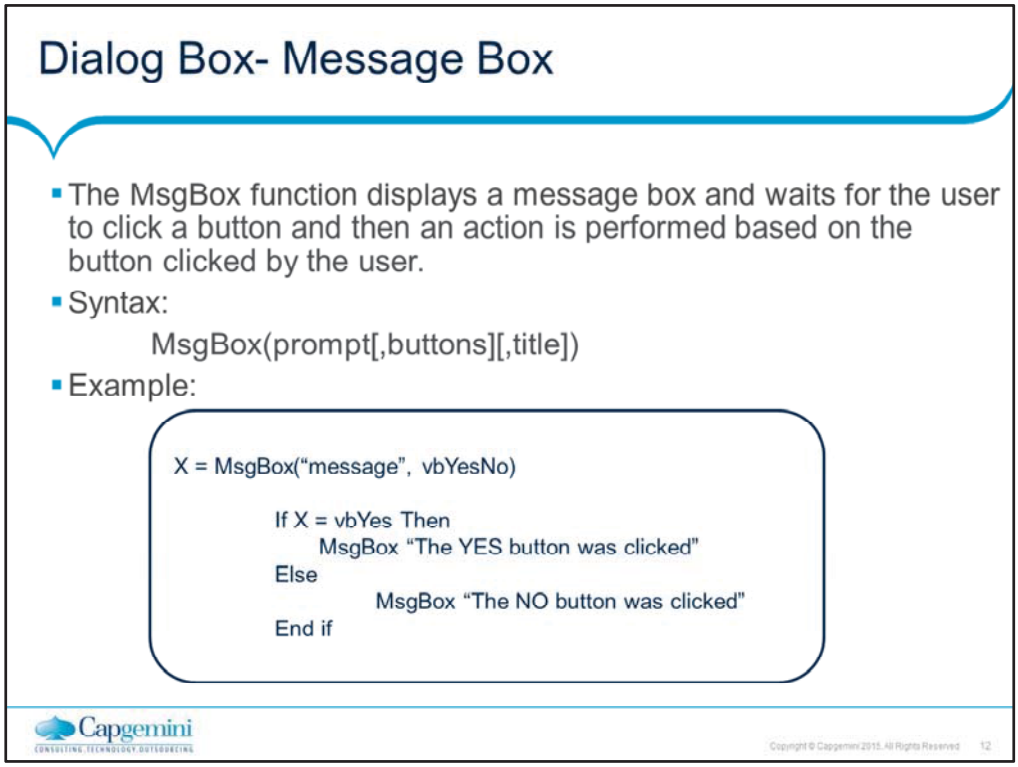

Parameter explaination:

Prompt – It is a required parameter. A String that is displayed as a message in the dialog box. The maximum length of prompt is approximately 1024 characters. If the message extends to more than a line, then we can separate the lines using a carriage return character (Chr(13)) or a linefeed character (Chr(10)) between each line.
buttons – It is an optional parameter. A Numeric expression that specifies the type of buttons to display, the icon style to use, the identity of the default button, and the modality of the message box. If left blank, the default value for buttons is 0.
Title – It is an optional parameter. A String expression displayed in the title bar of the dialog box. If the title is left blank, the application name is placed in the title bar

Dialog Box- Message Box

- The various Buttons that can be displayed in a message box :

Constant	Value	Description
vbOKOnly	0	Displays OK button only
vbOKCancel	1	Displays OK and CANCEL buttons
vbAbortRetryIgnore	2	Displays Abort, Retry and Ignore buttons
vbYesNoCancel	3	Displays Yes, No & Cancel buttons
vbYesNo	4	Displays Yes and No buttons
vbretryCancel	5	Displays Retry and Cancel buttons

Dialog Box- Message Box

- Built-in constants that can be used to display icons, in a message box

Constant	Value	Description
vbCritical	16	Displays Critical Message icon.
vbQuestion	32	Displays Warning Query icon.
vbExclamation	48	Displays Warning Message icon.
vbInformation	64	Displays Information Message icon.

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Dialog Box- Message Box

- Below constants indicates which button must be the default, in a message box

Constant	Value	Description
vbDefaultButton1	0	First button is default.
vbDefaultButton2	256	Second button is default.
vbDefaultButton3	512	Third button is default.
vbDefaultButton4	768	Fourth button is default.

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Dialog Box- Message Box

- The MsgBox function can return one of the following values:

Constant	Value	Description
vbOK	1	OK was clicked
vbCancel	2	Cancel was clicked
vbAbort	3	Abort was clicked
vbRetry	4	Retry was clicked
vbIgnore	5	Ignore was clicked
vbYes	6	Yes was clicked
vbNo	7	No was clicked

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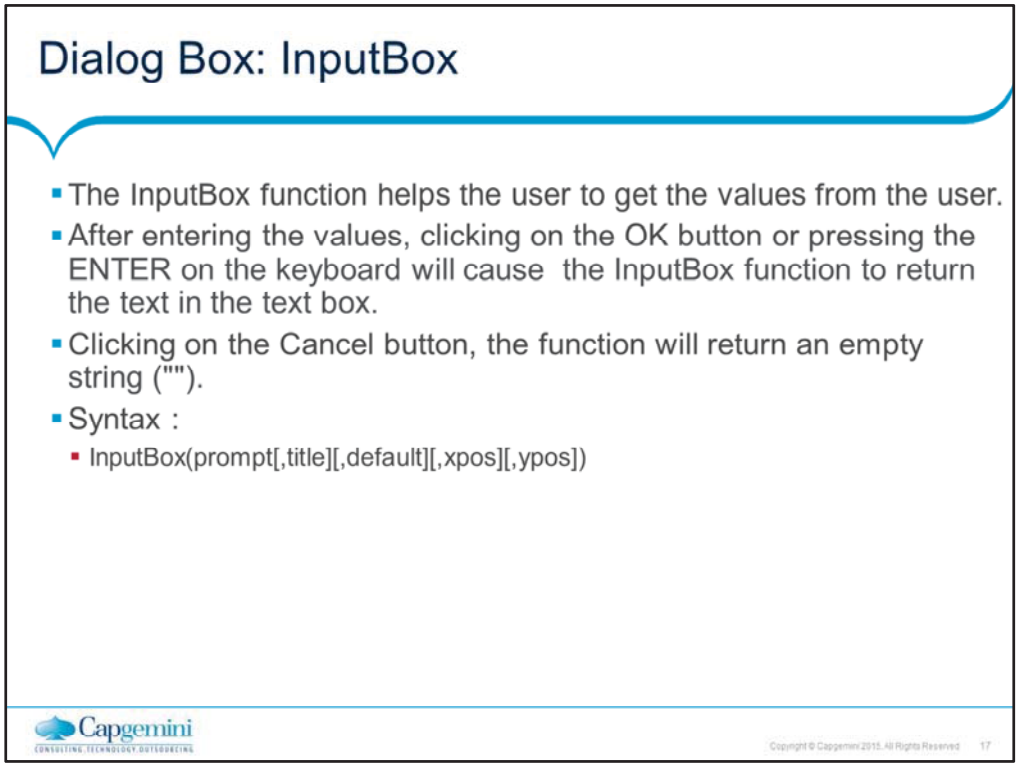

Prompt - A Required Parameter. A String that is displayed as a message in the dialog box. The maximum length of prompt is approximately 1024 characters. If the message extends to more than a line, then we can separate the lines using a carriage return character (Chr(13)) or a linefeed character (Chr(10)) between each line.

Title - An Optional Parameter. A String expression displayed in the title bar of the dialog box. If the title is left blank, the application name is placed in the title bar.
Default - An Optional Parameter. A default text in the text box that the user would like to be displayed.

XPos - An Optional Parameter. The Position of X axis which represents the prompt distance from left side of the screen horizontally. If left blank, the input box is horizontally centered.

YPos - An Optional Parameter. The Position of Y axis which represents the prompt distance from left side of the screen Vertically. If left blank, the input box is Vertically centered.

Demo

- Message Box
  - messageBox
- Input box
  - InputBox

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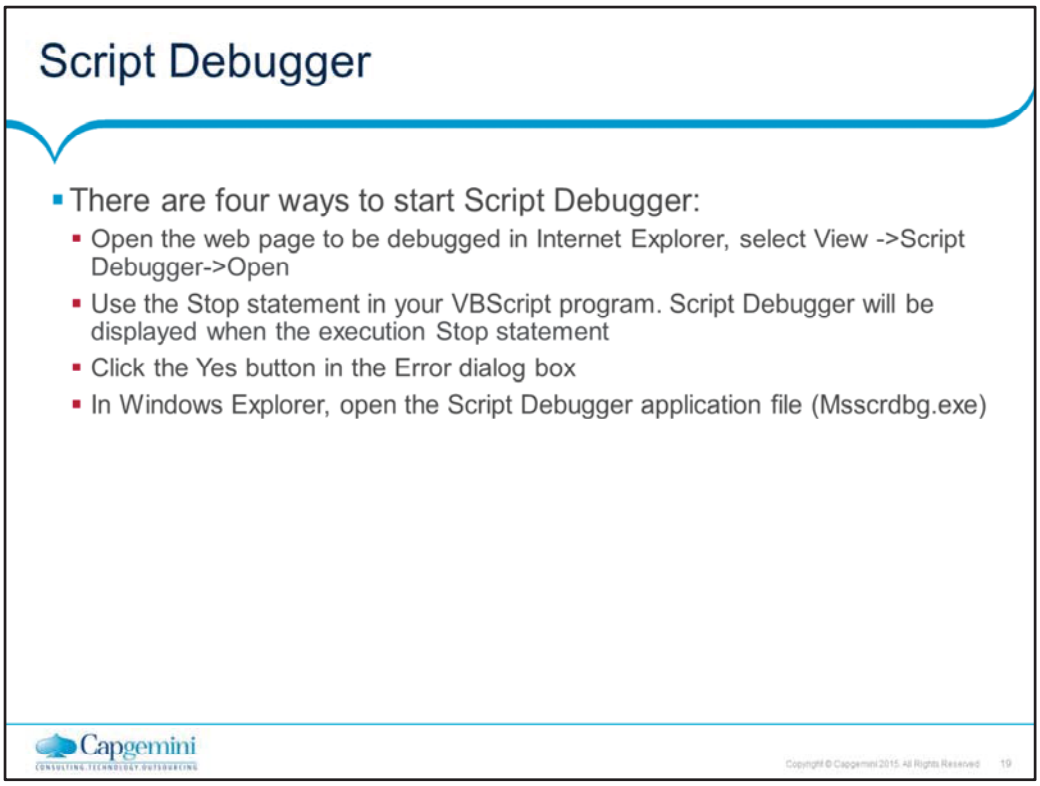
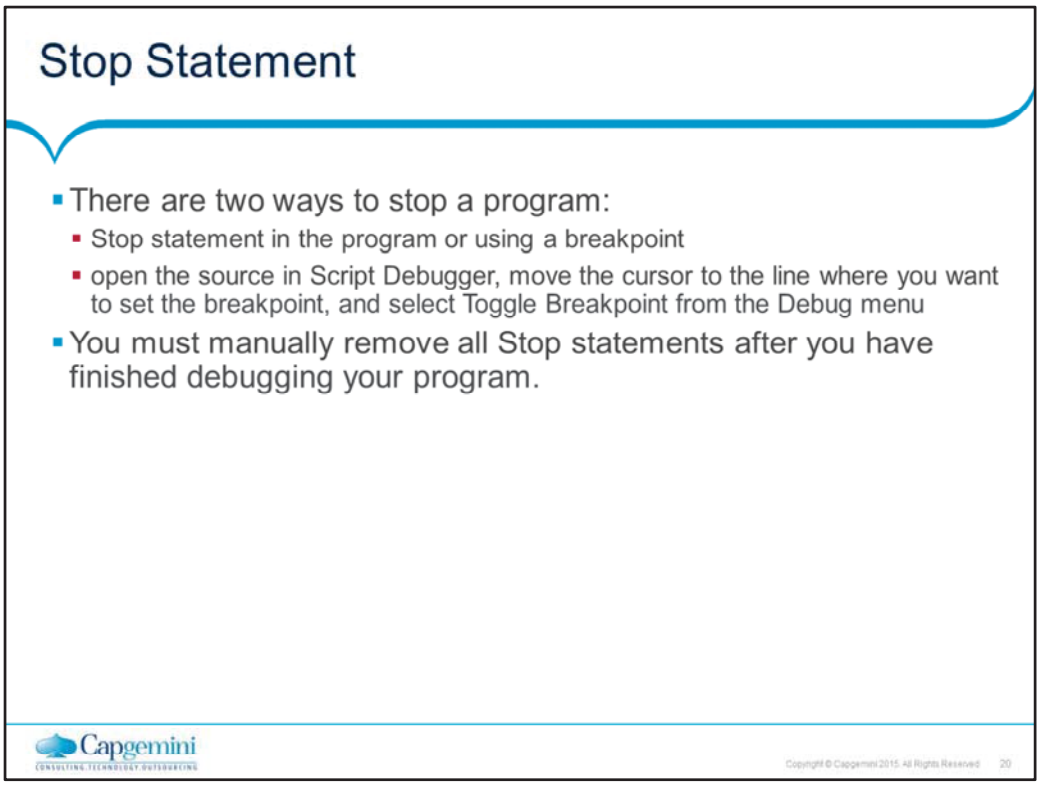


Or you can put a shortcut to this file on your desktop, which is a lot easier to ge to.

In all but the last case, you will be working with the Web page that is currently displayed in Internet Explorer. In the last case, you can open the source for an existing Web page by selecting Open from Script Debugger's File menu, or you can create a new page from scratch by selecting New from the File menu. Once Script Debugger is running, you can debug any page that is currently running in Internet Explorer by choosing Running Documents from the View menu.



There are two ways to stop a program:

- placing a Stop statement in the program.
- Using a breakpoint.

When Internet Explorer reaches a Stop statement, it stops executing the script at that point. The other way is to open the source in Script Debugger, move the cursor to the line where you want to set the breakpoint, and select Toggle Breakpoint from the Debug menu.

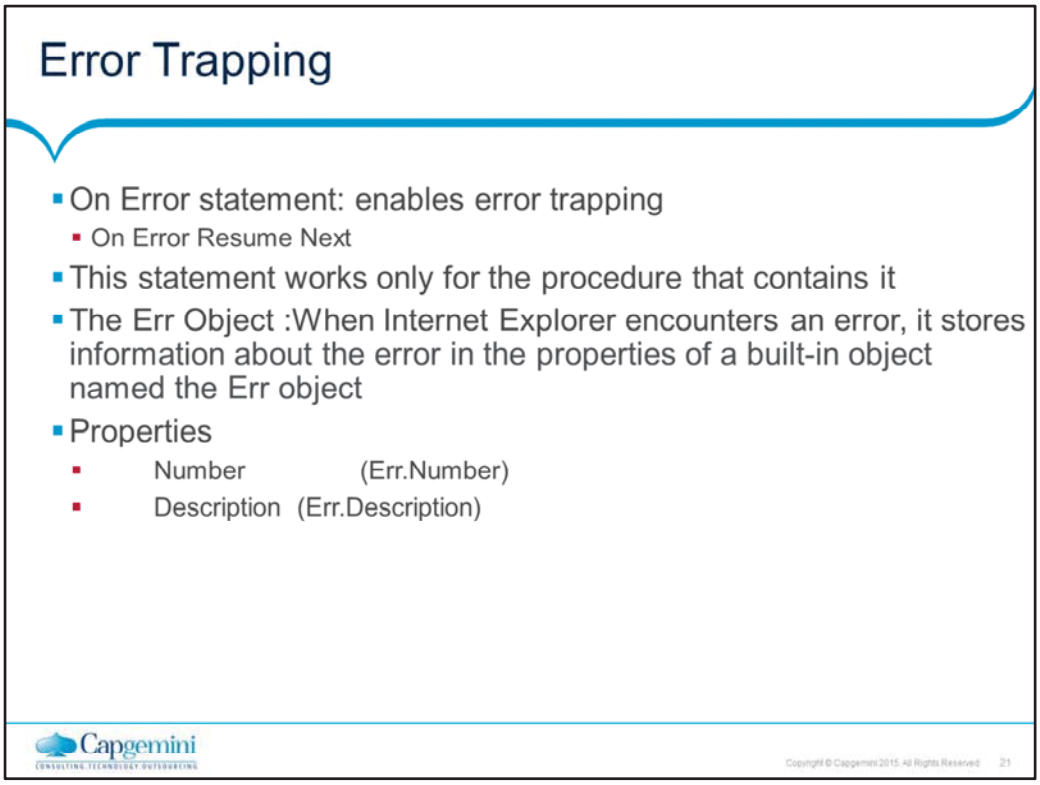
Unfortunately, clicking the Refresh button in Internet Ex plorer cancels the breakpoint in Script Debugger. For this reason, It is preferred to use Stop statements a lot more than breakpoints.

You must manually remove all Stop statements after you have finished debugging your program.

Now let's assume that we used Notepad to add a Stop statement right after the statements that get the input. Here's what the code would look like:

```
Option Explicit
Dim I, A(4), Average
 For I = 1 To 4
 A(I) = InputBox("What is the student's grade on exam " _    & I & "?") Next Stop  I
```

would save the file, click the Refresh button, and enter four 100s again. When Internet Explorer encounters the Stop statement, it automatically opens Script Debugger.



Error Trapping

The On Error statement, which enables error trapping in VBScript, looks like the following: On Error Resume Next This tells Internet Explorer that if it encounters an error to simply forget about it and move to the next statement. This statement works only for the procedure that contains it. This means that you might want to include an On Error statement in each procedure in your program. If you don't do this and an error occurs in a called procedure, Internet Explorer will move to the statement following the call (not to the next statement in the called procedure).

The Err Object

When Internet Explorer encounters an error, it stores information about the error in the properties of a built-in object named the Err object. The value of the Description property is a string describing the error, and the value of the Number property is an integer representing the error. For example, if a user attempts to divide by 0, the Description property would be set to "Division by zero" and the Number property would be set to 11.
If you do use error trapping in a procedure you always add a fragment similar to the one.

Lab

- Lab

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Lesson Summary

- Functions perform a task and then return a value
- Sub-procedures simply does something, it does not return a value
- Pass a parameter by reference makes changes to the parameter inside the function
- Pass a parameter by value retains original value of the variable after the function terminates
- MsgBox helps display an alert
- Debug your script using Script debugger

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Review - Questions

- Which of the following returns a value?
  - Option 1: function
  - Option 2: Sub routine
  - Option 3: procedure
- Question 2: While debugging a program the execution stops at _____ statement.
- Question 3: Error information is stored in _____.

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VBScript

Lesson 6: Working with Browser Object Model And Form Validation

Lesson Objectives

- What is Browser Object Model?
- Browser Objects – Window, Document, Form
- Intrinsic HTML Controls
- Event Driven Programming in VBScript
- Data Validation in VBScript & DOM
- Using Regular Expressions in VBScript

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What is Browser Object Model?

- The browser object model is the interface between the code written to control or react to the browser and the internal workings of the browser itself.
- All of the interactions between the code and the browser take place via the object model.
- One can access the browser object model from Microsoft Visual Basic, Scripting Edition.
- This level of abstraction allows us to manipulate the browser without worrying about how the instructions we give are carried out.
- In Browser Object Model, the browser has one top level object called Window.
- The rest of the browser's objects are located beneath the Window object in a logical hierarchy of functionality.

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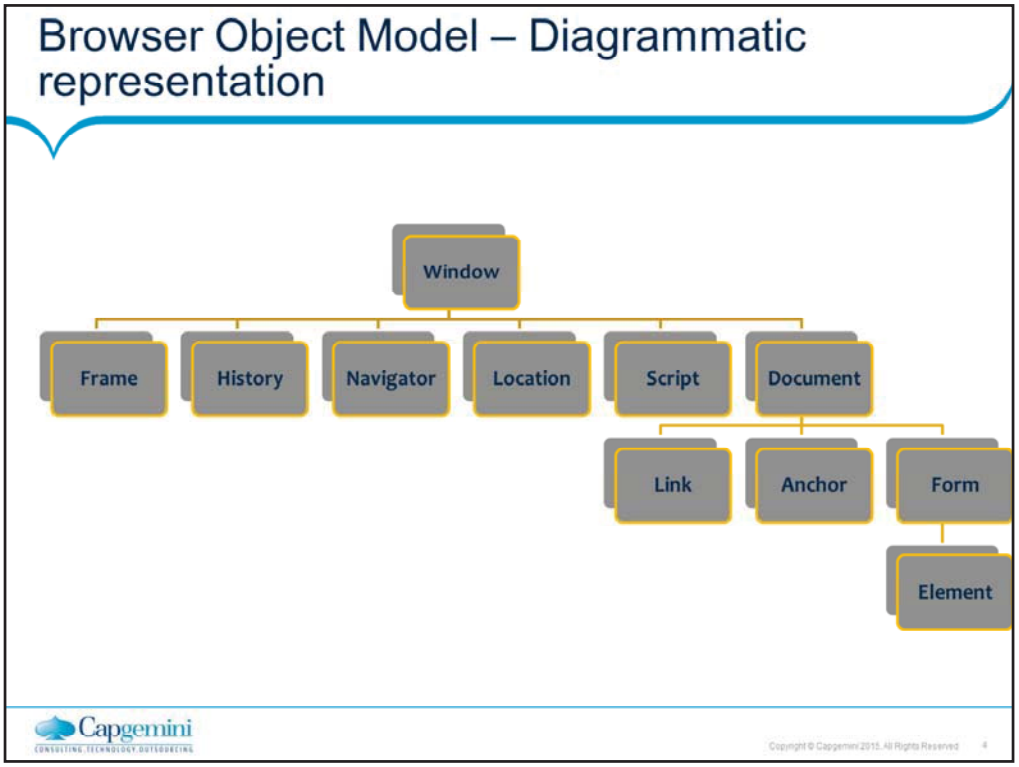


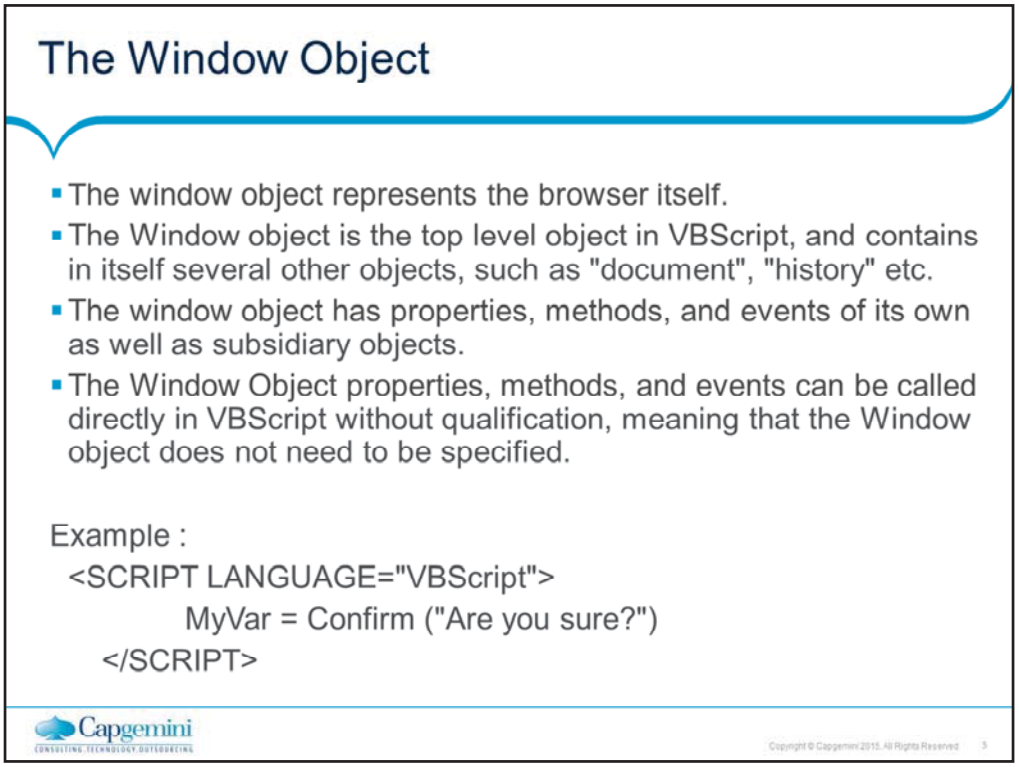
One of the main foundations of Dynamic HTML is the browser object model. Netscape 2 was actually the first browser that provided a documented object model, which allowed users to access both the browser environment and page contents with scripting code. However certain contents of the page such as text and images weren't accessible, until the advent of Dynamic HTML. If we are going to be able to program the object model using Dynamic HTML, then we need to understand the whole hierarchy of objects inside the browser first and what they all do.

What is the Browser Object Model?

In short, the browser object model is the interface between the code we write to control or react to the browser and the internal workings of the browser itself. This level of abstraction allows us to manipulate the browser without worrying about how the instructions we give are carried out. In effect, the guts of the browser become a 'black box' – we perform some action and get a result, but we don't need to know how our input is translated into output by the browser.

The Object Model Diagram

This diagram is intended to give you a feel for each object's place in the object model. The object model shows the 'hierarchical' relationships between different objects. The connections between the objects in model are arranged in a hierarchy because one object can often contain one (or more) of another object, rather like a parent having one or more children. There are also a number of important objects (like the style object that we talked about in the last chapter) that aren't an intrinsic part of the model at a high level, but are very important when we get into actually working with objects that the model provides. As you can see, the top-level object is the window object. This is the parent object of the entire model – we can think of all the other objects as being children of window. This object contains the document object – think of it in the same way as the browser window contains the HTML document. The window object also contains a collection called frames. Each object in the frames collections represents a frame currently displayed in the browser. In addition to document and frames, the window object also exposes (makes available to the programmer) five separate objects: history, navigator, location, event, and Screen.



The Window Object

The window object represents the browser itself.
Since we start IE to view HTML documents and perform any other task using the browser it makes sense that the window object's properties, methods, and events concern themselves with the state and operations of the browser.
The window object has properties, methods, and events of its own as well as subsidiary objects. We'll cover the intrinsic interface elements below before moving onto the objects.

Window Object Properties

Name	Description	Usage
Name	Returns the name of the current window.	MsgBox Name
Parent	Returns a reference to the Parent Set object.	Returns a reference to the Parent Set object.
Self	Returns a reference to the Window object itself.	Returns a reference to the Window object itself.
Top	Returns a reference to the topmost Window object.	Set MyObject=Top
DefaultStatus	Sets or returns the default text in the status bar of a window	DefaultStatus="Ready"
Status	Sets the text in the status bar of a window	Status="Busy"

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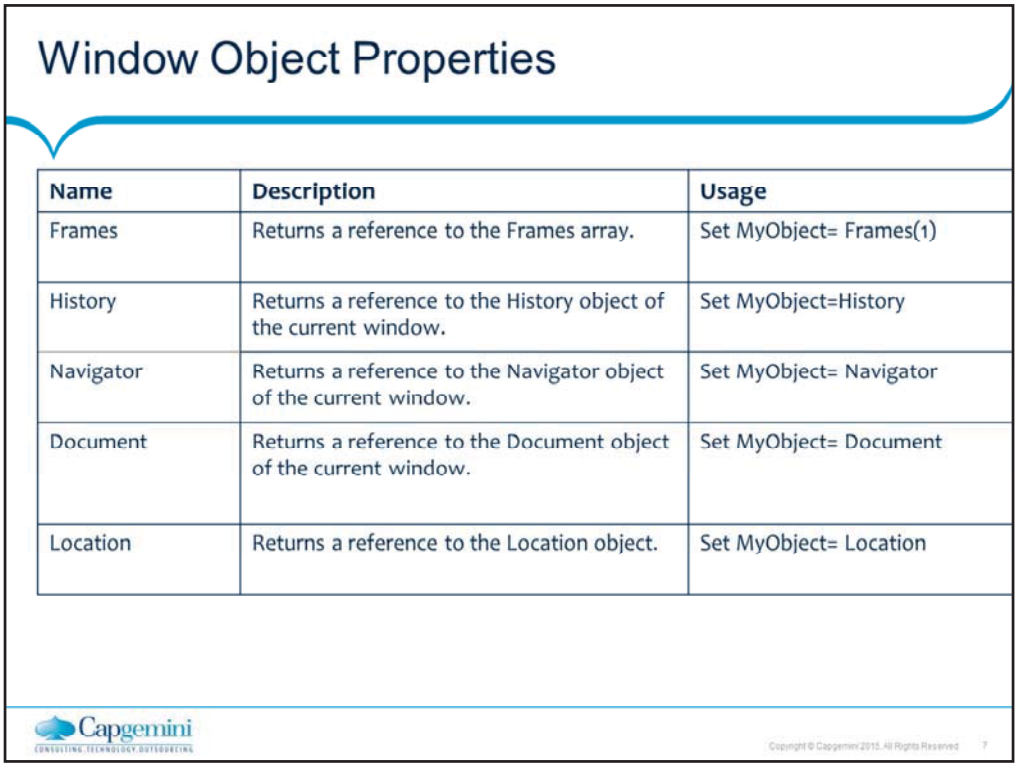
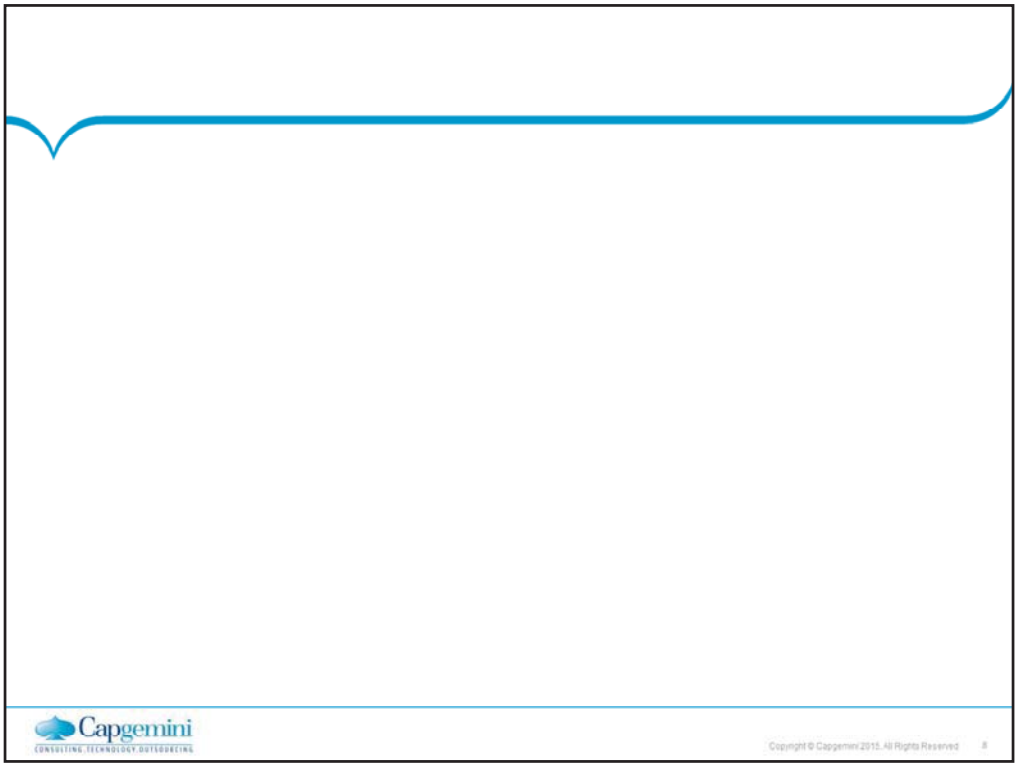


1. **Frames** - The last major element of the window object, aside from its descendant objects, is the frames collection. This collection exists to give a developer access to all of the frames in any frameset currently displayed in the browser. The frames collection is indexed from 0 so that a three-frame frameset, has three elements in the frames collection, numbered from 0 to 2. Each frame is a window object itself, and each frame reference returns a reference to a window object. All we need is a reference to a window object to enable our use of the properties and methods. It shouldn't be surprising then that the frames collection allows us to control each frame in a frameset as if we're controlling a separate window. In fact, this is exactly what we're doing. Each element in the frames collection is a reference to a new window object.

2. **History** : The history object contains information about all of the different URLs that a client has visited, stored in the history list of the browser. Property length: tells you how many items are stored in the History List.

Methods :

a. **back -** Takes an integer and moves back this many places in the history list
b. **forward -** Takes an integer and moves forward this many places in the history list
c. **go -** Takes a string that represents actual URL and attempts to move to this URL in the history list also takes a positive or negative integer



3. **Navigator -** Using the navigator object we can retrieve information about the capabilities and nature of the browser that is executing our code

Properties

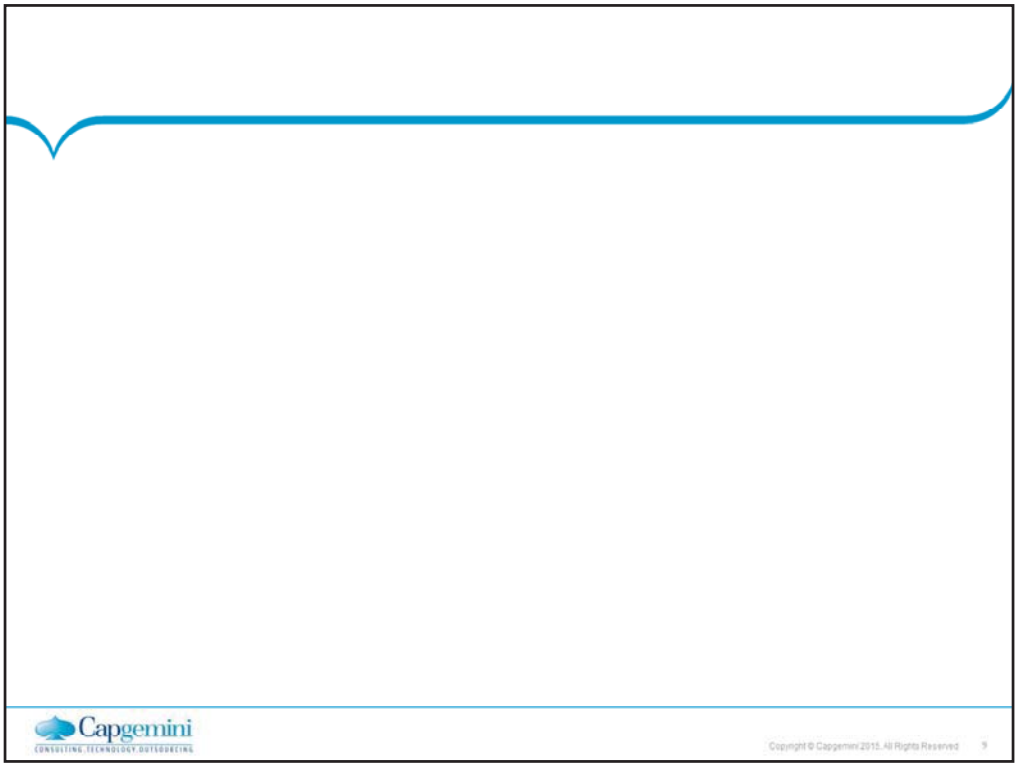
a. **AppName -** Microsoft Internet Explorer
b. **AppVersion -** 4.0 (compatible; MSIE 4.0; Windows NT)
c. **AppCodeName -** Mozilla UserAgent Mozilla/4.0 (compatible; MSIE 4.0; Windows NT)
d. **CookieEnabled -** True

Methods - There are two methods of the navigator object.

a. **JavaEnabled -** Returns true or false depending on whether a Java VM is installed or not
b. **TaintEnabled -** Returns false, included for compatibility with Netscape Navigator

Collections - There are two collections of the navigator object as well

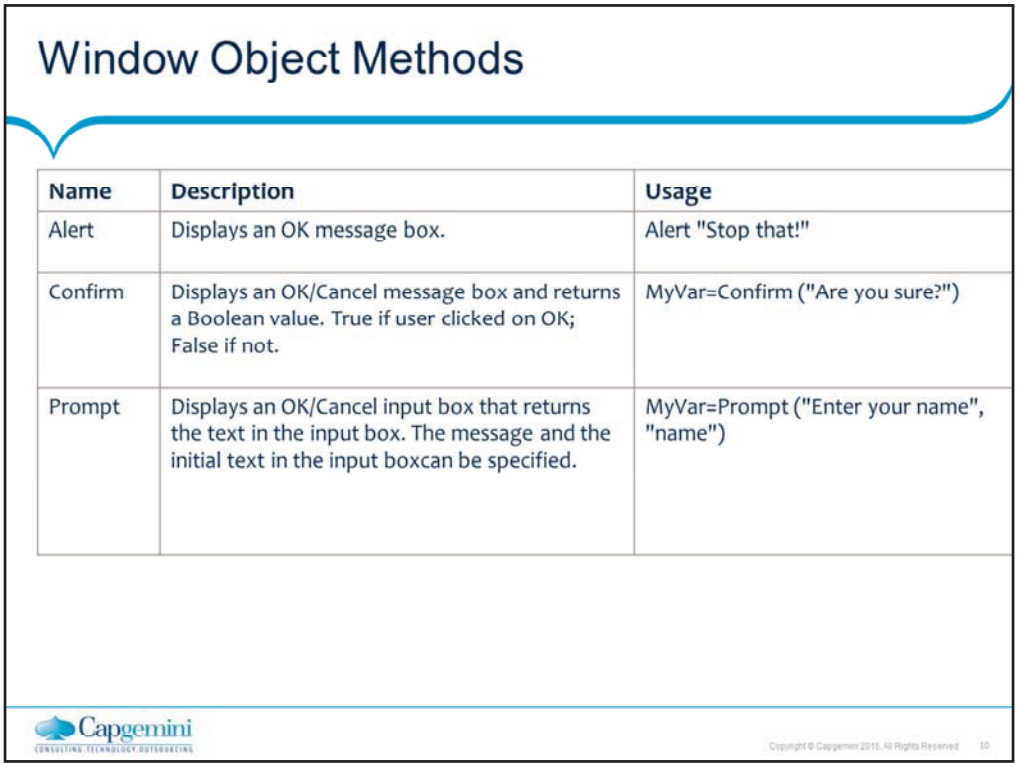
a. **Plugins -** An alias for the collection of all the <EMBED>ded objects in the page
b. **MimeTypes -** Collection of all the document and file types supported by the browser



4. **Document Object -** When an HTML document is loaded into a web browser, it becomes a **document object**. The document object is the root node of the HTML document and the "owner" of all other nodes: (element nodes, text nodes, attribute nodes, and comment nodes).
   The document object provides properties and methods to access all node objects,
   from within JavaScript. The document is a part of the window object and can be accessed as window.document.

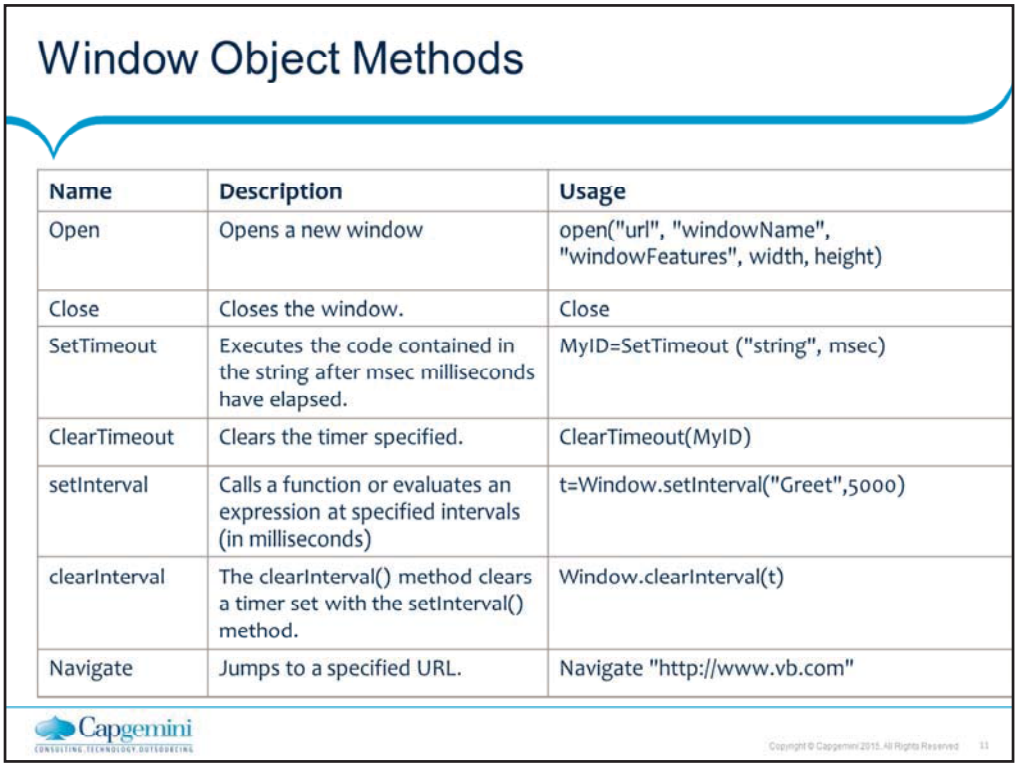
   Note – The Document Object would be discussed separately in the later part of this lesson.

5. **Location -** The location object contains information about the current URL. The location object is part of the window object and is accessed through the window.location property.



The **window** object provides three methods that can be used to display dialogs commonly used for simple messages, confirmations, or prompts

1. The **alert** method displays a dialog with a text message and a single OK button; use it to give the user a message.
2. **Confirm** is identical to alert but the dialog includes an additional Cancel button.
3. The **prompt** method displays a dialog with a single line text box that can be used for input



Window Object Methods

Name	Description	Usage
Open	Opens a new window	open("url", "windowName", "windowFeatures", width, height)
Close	Closes the window.	Close
SetTimeout	Executes the code contained in the string after msec milliseconds have elapsed.	MyID=SetTimeout ("string", msec)
ClearTimeout	Clears the timer specified.	ClearTimeout(MyID)
setInterval	Calls a function or evaluates an expression at specified intervals (in milliseconds)	t=Window.setInterval("Greet",5000)
clearInterval	The clearInterval() method clears a timer set with the setInterval() method.	Window.clearInterval(t)
Navigate	Jumps to a specified URL.	Navigate "http://www.vb.com"

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Open() Method - The Open() method opens a new browser window.

Syntax
window.open(*URL,name,specs,replace*)
Example - window.open("http://www.yahoo.com")
window.open('','','width=200,height=100')

Close() Method - The close() method closes the current window.

Syntax
window.close()
Example – window.Close()

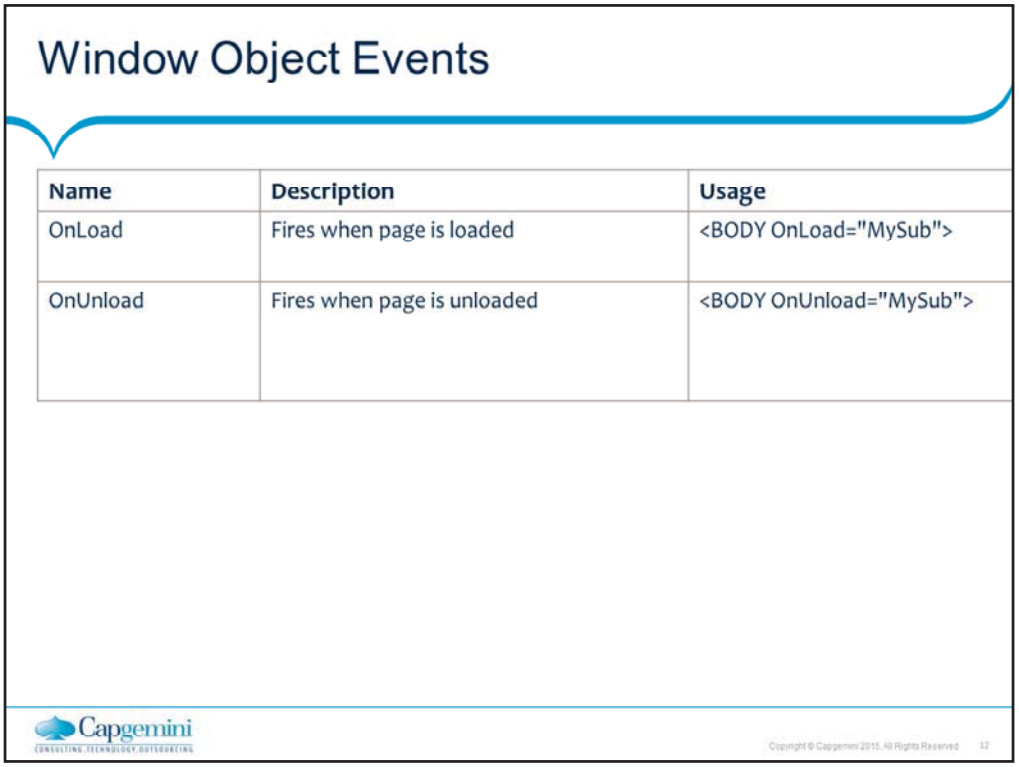
Timer

Using the setTimeout, clearTimeout, setInterval, and clearInterval methods of the window object we can automatically execute any code we've written after some time interval (that we set) has elapsed.

SetTimeout and ClearTimeout

setTimeout takes the name of a function, and a time value in milliseconds. After the time value has passed, the function is called automatically. For example, the following code calls a routine named TimerFunc after 5000 Milliseconds (5 seconds):
TimeoutID = Window.setTimeout ("TimerFunc",5000) Once you've started a timer with setTimout, you may find that you want to cancel it so the function specified in the setTimeout call is not executed. This is where the

Navigate - Used to load a different page into the current browser window.
Example - navigate http://www.vbscript.com



Window Events –

These events are very useful for executing any code that needs to coincide with the loading or unloading of the browser.

1. The **onLoad** is fired when the HTML for the current page has been downloaded, but may fire before all images, controls, or applets have finished loading.
2. The **onUnload** event is not only fired before the browser navigates to a new page, but also immediately before the browser is shut down (which is understandable, because the page is indeed being unloaded in preparation for application shutdown).

Demo

- Demo on Window Object – Properties, Methods & Events
  - Window object

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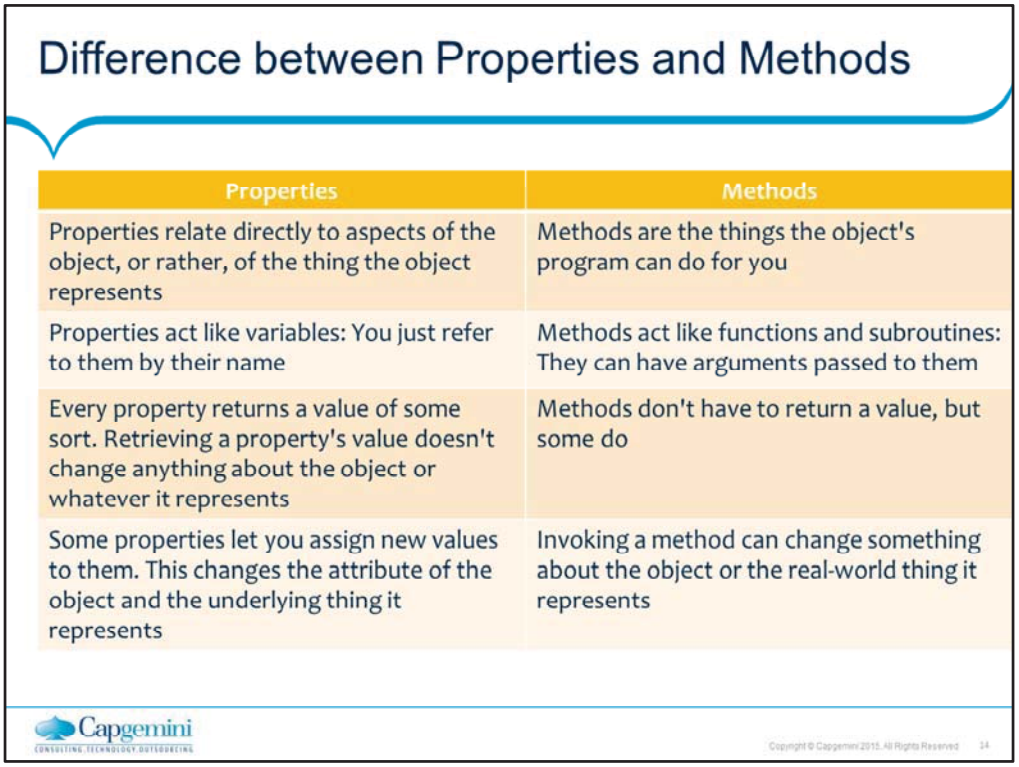

Difference between Properties and Methods

Properties	Methods
Properties relate directly to aspects of the object, or rather, of the thing the object represents	Methods are the things the object's program can do for you
Properties act like variables: You just refer to them by their name	Methods act like functions and subroutines: They can have arguments passed to them
Every property returns a value of some sort. Retrieving a property's value doesn't change anything about the object or whatever it represents	Methods don't have to return a value, but some do
Some properties let you assign new values to them. This changes the attribute of the object and the underlying thing it represents	Invoking a method can change something about the object or the real-world thing it represents

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The Document Object

- The Document object represents the current HTML page in the browser
- Document object also represents any object on the HTML page, such as a link, a form, a button, or an ActiveX object
- The document object represents all of the properties and methods associated with the actual HTML document itself
- This object allows write access to the page, let HTML *form* input areas be examined and/or changed, and so on
- The properties and methods for the Document object must be fully qualified when used
- Example –

```
document.write("Good Morning!!")
```

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Document Object Properties

Name	Description	Usage
BGColor	Returns or sets the background color	Document.BGColor="#FF0000" Document.BGColor="Red"
FGColor	Returns or sets the foreground color.	Document.FGColor = "#FF0000" Document.FGColor = "Red"
LinkColor	Returns or sets the link color.	Document.LinkColor= "#FF0000" Document.LinkColor= "Red"
ALinkColor	Returns or sets the anchor color.	Document.ALinkColor="#FF0000" Document.ALinkColor="Red"
VLinkColor	Returns or sets the visited link color.	Document.VLinkColor="#FF0000" Document.VLinkColor="Red"
Title	Returns the read-only title of the current HTML page.	MyVar= Document.Title
Location	Returns a string representing the complete URL for the current document.	MyVar= Document.Location

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The Objects inside Document Object

Name	Description
All	All the HTML tags and elements on the page (often too big to work with effectively)
Anchors	All the anchors in the document
Frames	All the frames in the document
Forms	All the HTML forms on the page
Images	All the images on the page
Links	Returns the read-only title of the current HTML page.

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The Form Object

- The Form object represents a form created by the <FORM></FORM> tags.
- The Form object offers properties and methods for any form on the current page.
- The Form object can be accessed as a property of the Document object.
- Any controls contained within the <FORM></FORM> tags are accessed with the *Form.Control.Property* syntax.
- Additionally, the Internet Explorer provides complete support for all of the events for a control contained in a form.
- Form object also contains an Element object that can reference any control on the form either by array or by name.

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The Form Object Properties

Name	Description	Usage
Action	Returns or sets the ACTION attribute	MyForm.Action="http://www.vb-bootcamp"
Encoding	Returns or sets the ENCODING attribute	MyForm.Encoding="text/html"
Method	Returns or sets the METHOD attribute.	MyForm.Method="POST"
Target	Returns or sets the TARGET attribute.	MyForm.Target= "NewWindow"
Elements	Returns the read-only title of the current HTML page.	MyVar= Document.Title

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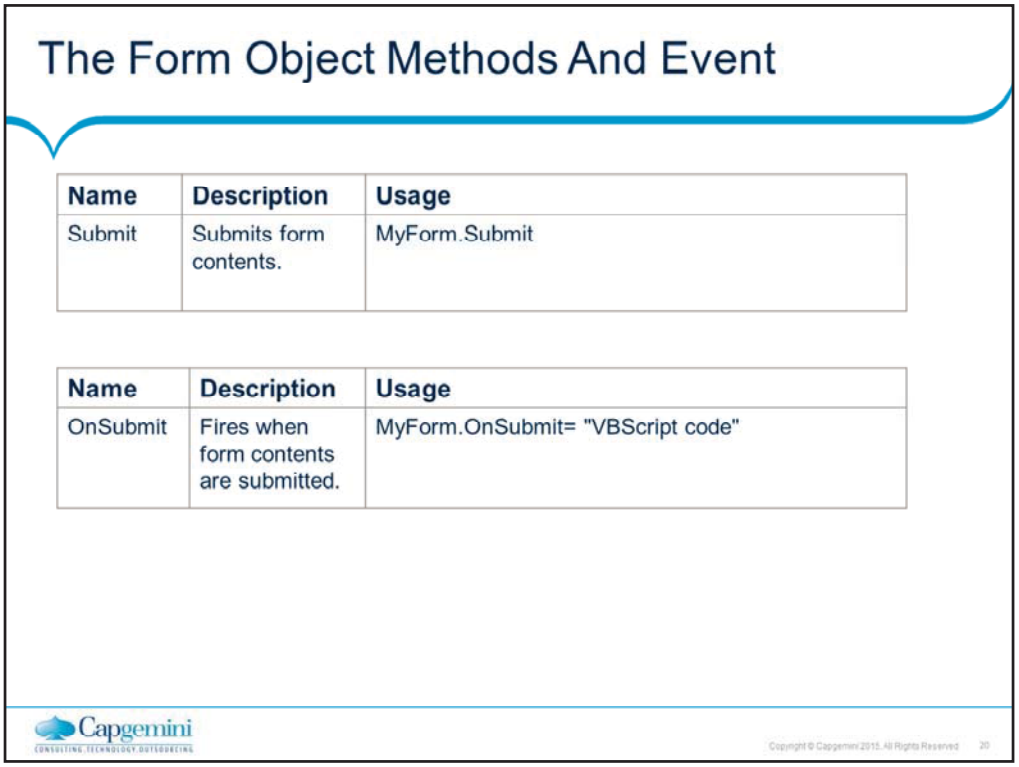
The Form Object Methods And Event
Name
Description
Usage
Submit
Submits form contents.
MyForm.Submit
Name
Description
Usage
OnSubmit
Fires when form contents are submitted.
MyForm.OnSubmit= "VBScript code"
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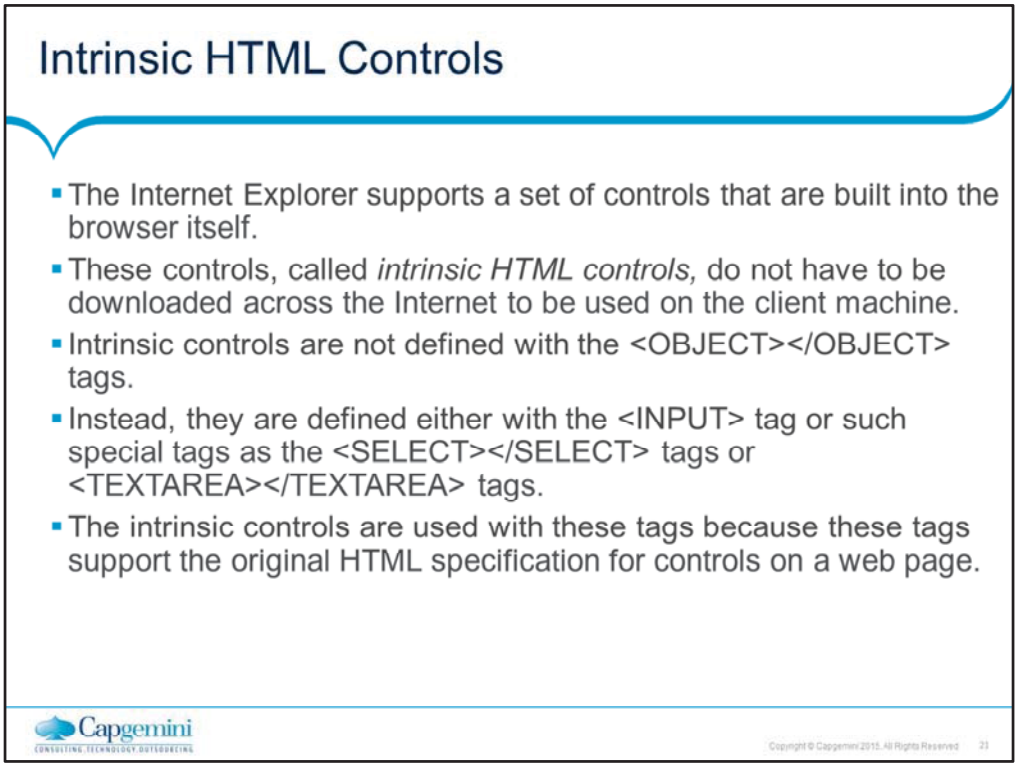

Intrinsic HTML controls existed before VBScript, so the Internet Explorer supports them for backward compatibility.
For example: The OnClick event is defined in the HTML standard, not in Visual Basic for Applications.

Intrinsic HTML controls exist to support the original use of controls in HTML. Intrinsic HTML controls are part of the Internet Explorer architecture.

Although the intrinsic HTML controls support ActiveX concepts such as properties, events, and methods, they are typically defined with standard HTML syntax

Intrinsic HTML Controls

Name	Description
Button	Equivalent to a command button
Text	A one line area for user entry of text
Textarea	A multiline area for user entry of text
Password	A text control that displays asterisks instead of echoing what the user enters
Radio	A group of controls that show multiple options, allowing the user to select one of them
Checkbox	A control that lets the user select one or more possibilities from a group of options
Select	Used for a list of possibilities (resembles a list box ActiveX control)

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Intrinsic HTML Controls

Name	Description
Reset	A button that lets you restore the controls on an HTML form to their initial values
Submit	A button that sends information to the server when the user clicks it
Hidden	Used to store information that the user isn't supposed to see

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Event Driven Programming in VBScript

- Event driven programming is the predominant paradigm in today's modern programming.
- As the name implies, the event driven code gets executed when a certain event occurs.
- If an event occurs, and there is no code associated with that event, then that event gets ignored.
- When you write code for a specific event, it is called an event handler.
- VBS events can originate in the Internet Explorer, HTML Intrinsic controls, or ActiveX custom controls.

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Example – Event Handling in VBScript

```
<HTML>
<HEAD><TITLE>A Simple First Page</TITLE>
<SCRIPT LANGUAGE="VBScript">
  Sub Button1_OnClick
    MsgBox "Welcome to VBScript!!"
  End Sub
</SCRIPT>
</HEAD>
<BODY>
<H3>A Simple First Page</H3>
<FORM><INPUT NAME="Button1" TYPE="BUTTON" VALUE="Click Here"></FORM>
</BODY>
</HTML>
```

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Data Validation in VBScript & DOM

- One of the best uses of Client-Side scripting is to validate user input before processing it.
- The Document Object Model (DOM) provides a means for you to interact programmatically with the document loaded in the browser.
- Window object is the parent of all other objects in DOM.
- The Internet Explorer DOM is a rich environment which provides you great control over the document in the browser.
- The Document Object Model gives us the rich set of objects & properties which can be used to perform state of art data validate in web pages.
- We can create more robust, reliable & dynamic web pages with the help of available control level properties, events & methods.

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Intrinsic HTML Controls – Properties, Events & Methods

Name	Properties	Events	Methods
Button	Form, Enabled, Name ,Value	OnClick ,OnFocus	Click ,Focus
CheckBox	Form, Enabled Name Value Checked DefaultChecked	OnClick, OnFocus	Click ,Focus
Password	Form, Enabled, Name,Value DefaultValue	OnFocus, OnBlur	Focus ,Blur, Select
Radio	Form, Enabled ,Name ,Value, Checked	OnClick ,OnFocus	Click ,Focus
Reset	Form, Enabled, Name, Value	OnClick , OnFocus	Click ,Focus
Select	Name, Length, Options, SelectedIndex	OnFocus, OnBlur, OnChange	Focus ,Blur

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Intrinsic HTML Controls – Properties, Events & Methods

Name	Properties	Events	Methods
Submit	Form, Enabled, Name, Value	OnClick, OnFocus	Click, Focus
Text ,TextArea	Form, Enabled ,Name, Value, DefaultValue	OnFocus ,OnBlur, OnChange ,OnSelect	Focus, Blur, Select

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Demo

- Demo on Intrinsic HTML Controls
  - intrinsic_control

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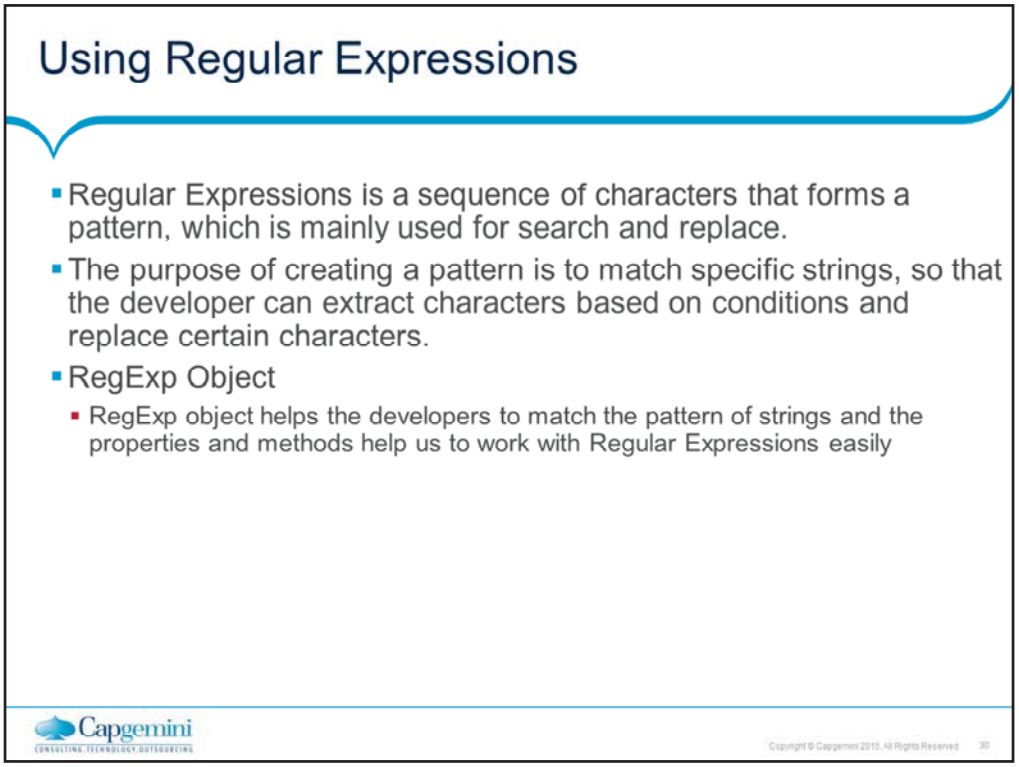
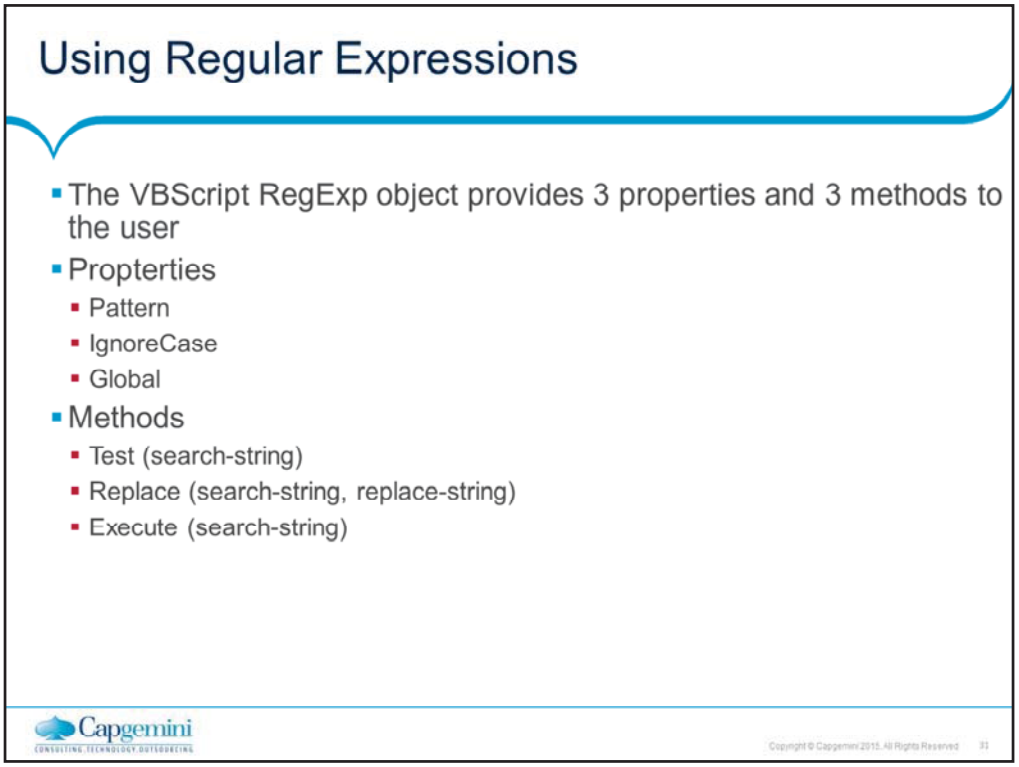


Regular expressions provide tools for developing complex pattern matching and textual search-and-replace algorithms. Regular expressions are one of the most powerful utilities available for manipulating text and data.
By creating patterns to match specific strings, a developer has total control over searching, extracting, or replacing data. In short, to master regular expressions is to master your data.



Pattern- A string that is used to define the regular expression. This must be set before use of the regular expression object. **Patterns** are described in more detail below.

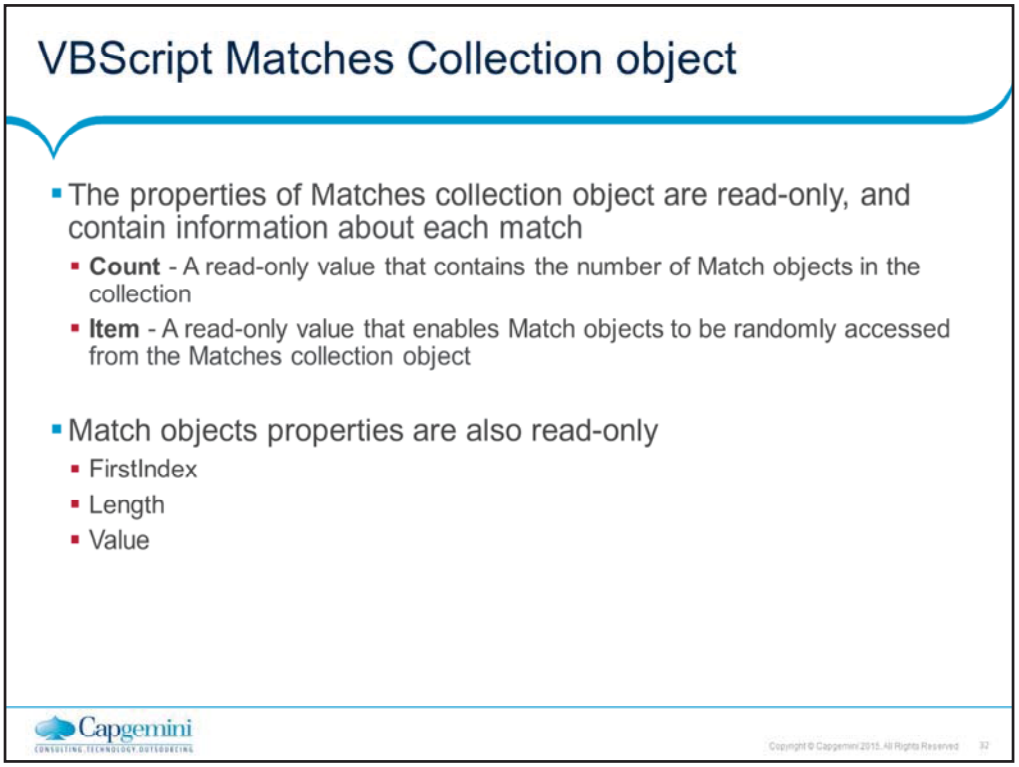
IgnoreCase - A Boolean property that indicates if the regular expression should be tested against all possible matches in a string. By default, IgnoreCase is set to False.

Global - A Boolean property that indicates if the regular expression should be tested against all possible matches in a string. By default, **Global** is set to **False**.

Test (string) - The **Test** method takes a string as its argument and returns True if the regular expression can successfully be matched against the string, otherwise False is returned.

Replace (search-string, replace-string) - The **Replace** method takes 2 strings as its arguments. If it is able to successfully match the regular expression in the search-string, then it replaces that match with the replace-string, and the new string is returned. If no matches were found, then the original search-string is returned.

Execute (search-string) - The **Execute** method works like **Replace**, except that it returns a **Matches** collection object, containing a **Match** object for each successful match. It doesn't modify the original string.



The **Matches** collection object is only returned as a result of the **Execute** method. This collection object can contain zero or more **Match** objects, and the properties of this object are read-only. Contained within each Matches collection object are zero or more Match objects. These represent each successful match when using regular expressions. The properties of these objects are also read-only, and contain information about each match.

Regular Expression Match Patterns

- Position Matching
- Literal
- Character Classes
- Repetition
- Alteration and Grouping

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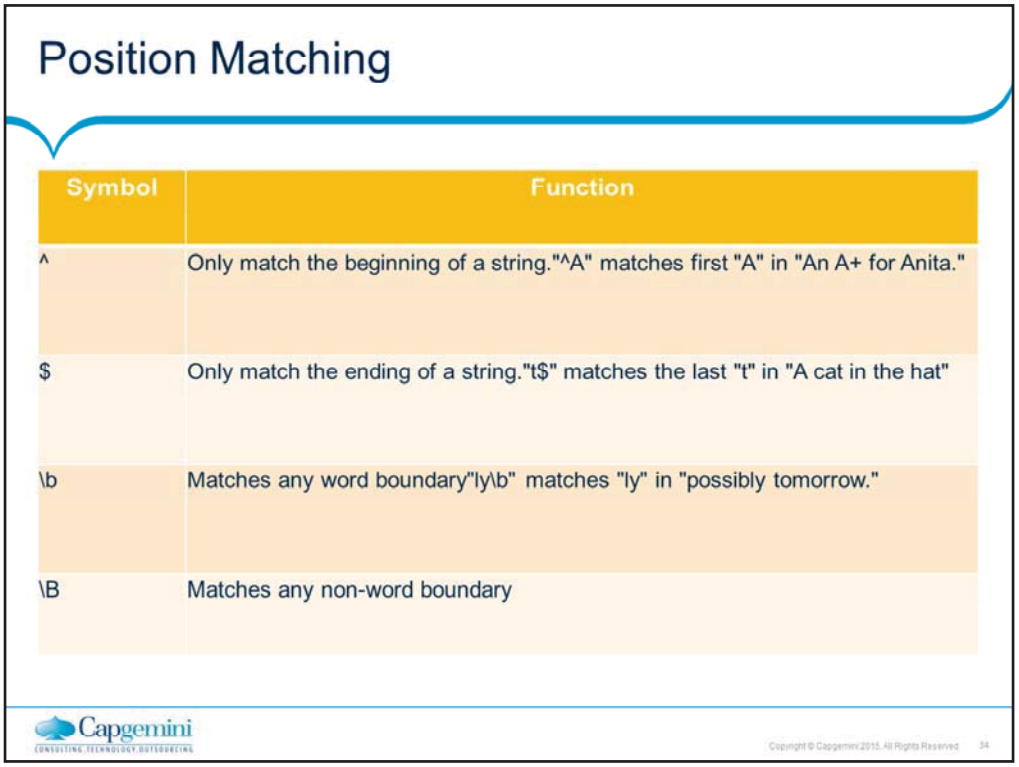
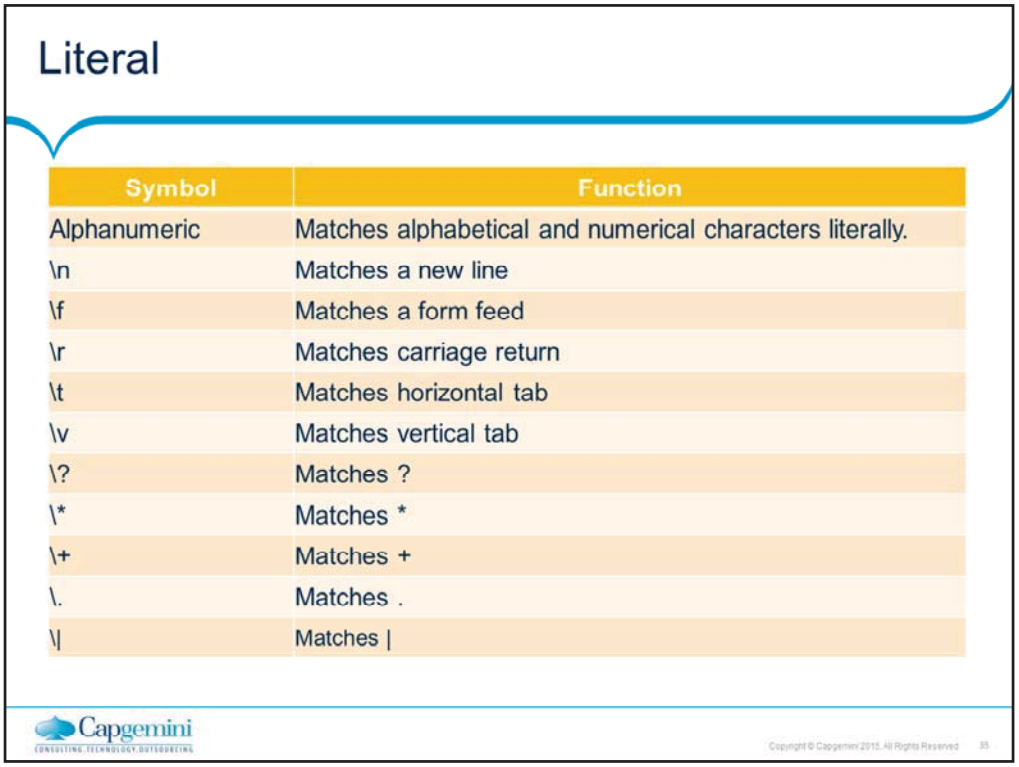


The significance of position matching is to ensure that we place the regular expressions at the correct places



Any form of characters such as alphabet, number or special character or even decimal, hexadecimal can be treated as a Literal. Since few of the characters have already got a special meaning within the context of Regular Expression, we need to escape them using escape sequences

Literal

Symbol	Function
\{	Matches {
\}	Matches }
\\	Matches \
\[	Matches [
\]	Matches]
\(	Matches (
\)	Matches)
\xxx	Matches the ASCII character expressed by the octal number xxx."\50" matches "(" or chr (40).
\xdd	Matches the ASCII character expressed by the hex number dd."\x28" matches "(" or chr (40).
\uxxxx	Matches the ASCII character expressed by the UNICODE xxxx."\u00A3" matches "£".

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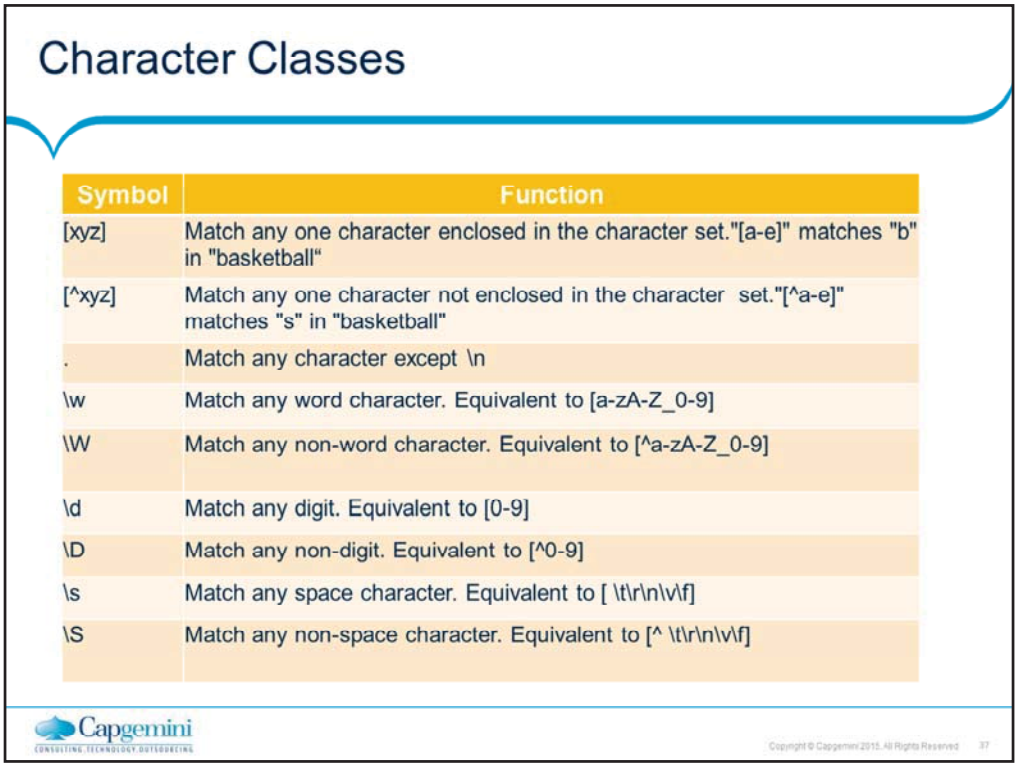

Character Classes

Symbol	Function
[xyz]	Match any one character enclosed in the character set."[a-e]" matches "b" in "basketball"
[^xyz]	Match any one character not enclosed in the character set."[^a-e]" matches "s" in "basketball"
.	Match any character except \n
\w	Match any word character. Equivalent to [a-zA-Z_0-9]
\W	Match any non-word character. Equivalent to [^a-zA-Z_0-9]
\d	Match any digit. Equivalent to [0-9]
\D	Match any non-digit. Equivalent to [^0-9]
\s	Match any space character. Equivalent to [\t\r\n\v\f]
\S	Match any non-space character. Equivalent to [^ \t\r\n\v\f]

The character classes are the Pattern formed by customized grouping and enclosed within [ ] braces.
If we are expecting a character class that should not be in the list, then we should ignore that particular character class using the negative symobol, which is a cap ^.

Repetition

Symbol	Function
{x}	Match exactly x occurrences of a regular expression."\d{5}" matches 5 digits
(x,}	Match x or more occurrences of a regular expression."\s{2,}" matches at least 2 space characters
{x,y}	Matches x to y number of occurrences of a regular expression."\d{2,3}" matches at least 2 but no more than 3 digits
?	Match zero or one occurrences. Equivalent to {0,1}."a\s?b" matches "ab" or "a b"
*	Match zero or more occurrences. Equivalent to {0,}
+	Match one or more occurrences. Equivalent to {1,}

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Alteration and Grouping

Symbol	Function
()	Grouping a clause to create a clause. May be nested "(ab)?(c)" matches "abc" or "c"
|	Alternation combines clauses into one regular expression and then matches any of the individual clauses "(ab)|(cd)|(ef)" matches "ab" or "cd" or "ef"

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Demo

- Demo on Regular Expressions
  - Regular expression

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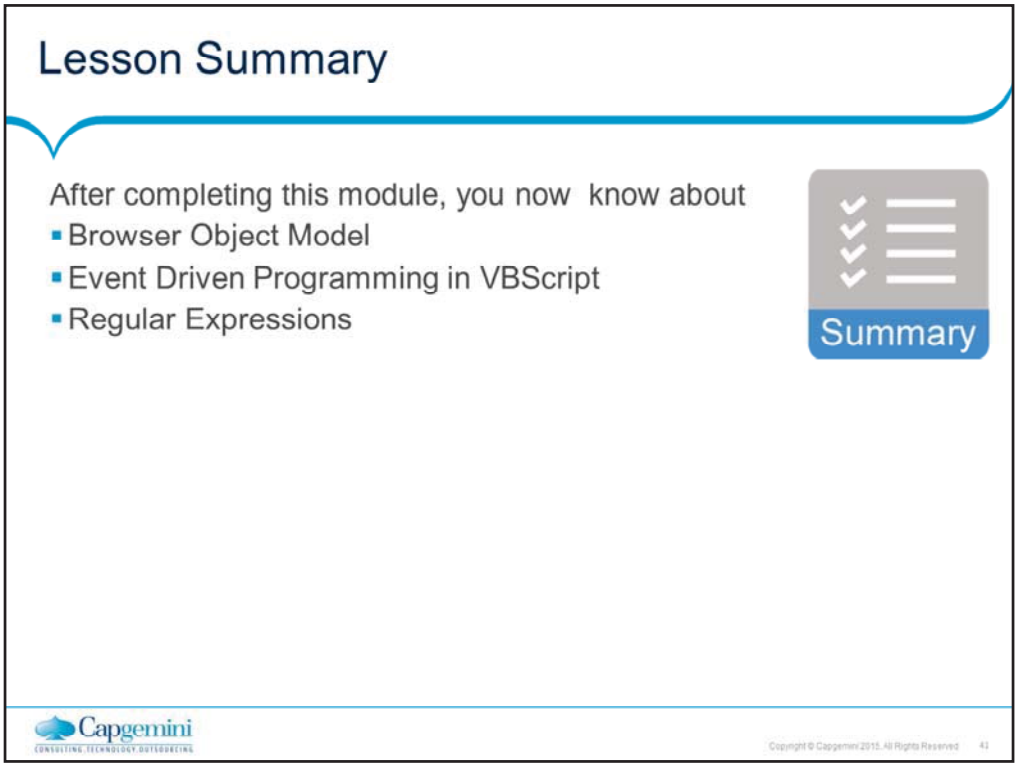
Lesson Summary
After completing this module, you now know about
Browser Object Model
Event Driven Programming in VBScript
Regular Expressions
Summary
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Review - Questions

- Which of the following matches the '?' (question mark) in an expression?
  - Option 1: ?
  - Option 2: ?\
  - Option 3: \?
- Question 2: When a code is written for a specific event it is called as_____.
- Question 3: _____returns the read-only title of the current HTML page.

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VB Script
Lab Book Version 1.2

Document Revision History

Date	Revision No.	Author	Summary of Changes
June 2011	1.1	Vaishali Kunchur	Material Revamp
April 2015	1.2	Alphy Thomson	Material Revamp

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Getting Started

Overview

This lab book is a guided tour for learning VB Script. It comprises solved examples and 'To Do' assignments. Follow the steps provided in the solved examples and work out the 'To Do' assignments given.

Setup Checklist for VBScript

Here is what is expected on your machine in order for the lab to work.

Minimum System Requirements

- Intel Pentium 90 or higher (P166 recommended)
- Microsoft Windows 95, 98, or NT 4.0, 2k, XP.
- Memory: 512MB of RAM
- Internet Explorer 6.0 or higher
- A text editor like Notepad or Visual Studio 2005 is installed

Instructions

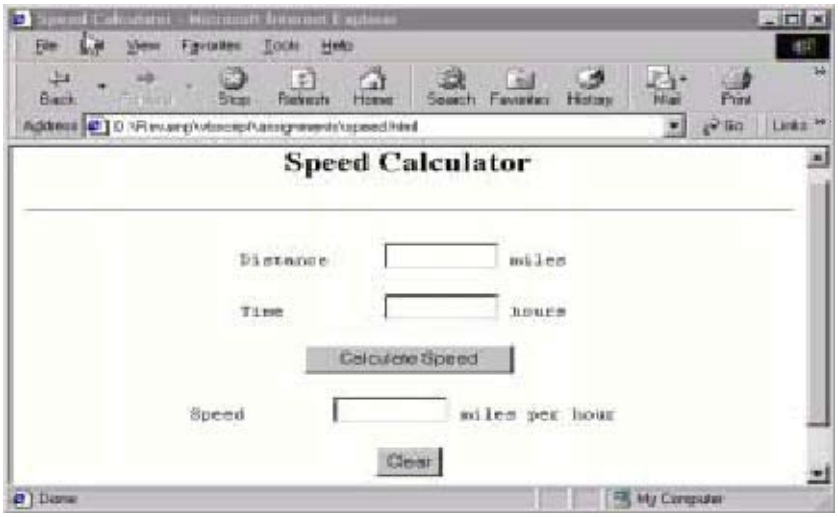
- For all coding standards refer Appendix A. All lab assignments should refer coding standards.
- Create a directory by your name in drive <drive>. In this directory, create a subdirectory VBScrip_Assign. For each lab exercise create a directory as lab <lab number>.

Lab 1. VB Script Basics

Goals	• Understand the process of creating an HTML page and viewing it in a browser window. • Learn to apply physical or logical character effects. • Learn to manage document spacing
Time	60 minutes

Create HTML Page with VB Script that will be a Speed Calculator as shown in figure.

Solution:



Step 1: From the **Start** menu navigate to **Programs, Accessories, and Notepad**

Step 2: Write the html program in notepad.

Step 3: Mention comments wherever applicable.

Lab 2. Variables ,Constants and Operators in VBScript

Goals	Use Variables ,Constants and Operators in VBScript
Time	120 minutes

Please ensure that the variables have to be defined before it is being used.

1. Create an HTML page with a VBScript program in it to print the colors of the rainbow (use Intrinsic Constants only)

2. Create an HTML page with a VBScript program in it which would take care of the following conversions

Value	Convert to
4.5	Integer, rounding if necessary
8.9	long integer, rounding if necessary
9.6	single-precision number
89.9	double-precision number
85.8	variable of type Currency
44	string
65	Boolean value (True or False)
78	variable of type Byte
89	variable of type Date

3. Create an HTML page with a VBScript program which would return the date and time of 2 months and 15 days from today

4. Create an HTML page with a VBScript program which would declare two constants with values 52 and 54.The program should return the results of the action of the following operators on these 2 constants:

Operator
<>
<=
%
&
EQV

5. State whether the following statement is true or false. Justify your answer by writing VB Script programs.

“When expressions contain operators from more than one category, the
orderof evaluation is as follows:
comparison operators are evaluated first
arithmetic operators are evaluated next
logical operators are evaluated last”

Lab 3. Using Conditional Statements and Loops in VBScript

Goals	Use Conditional statements and loops in VBScript
Time	120 minutes

1. Write a VB Script Program that would print the sentence 'Programming level 1' till the 6th level.
   Use the html tags to get this statement in different html heading levels.
   Do this program using Do loop, Do until, for each, for next.

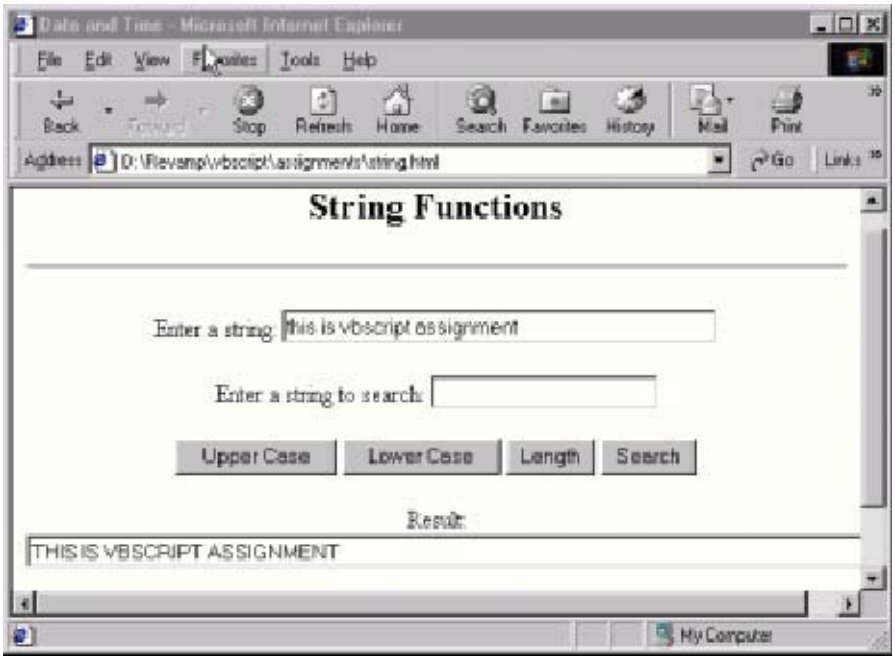
2. Write a VB Script program to get the above executed for alternate levels using for step next loop.

3. Write a VB Script program to print the month of the year on the choice given by the user.
   Eg: if choice 1 is given print January

Lab 4. Using Functions and Arrays in VBScript

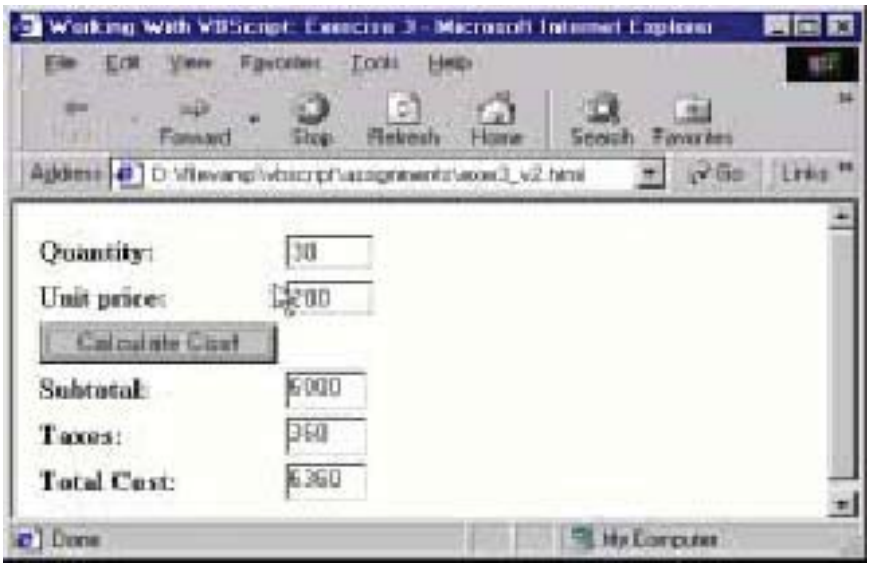
Goals	Use Functions and Arrays in VBScript
Time	120 minutes

1. Create a web page to handle string manipulation. Create a web page containing String Manipulation as shown in figure.



2. Create a web page to use Numeric function

   Develop html form as shown in figure. User enters values for quantity and unit price. These fields accept numeric values only. When user clicks on calculate cost, the result of the calculation is shown in Taxes, subtotal and total cost fields. The tax is 20 percent if subtotal is more than 40000 else it is 10 percent.



3. Develop simple calculator to perform arithmetic operations

Lab 5. Using User-defined functions & sub-procedures

Goals	Use User-defined Functions and Sub-procedures in VBScript
Time	60 minutes

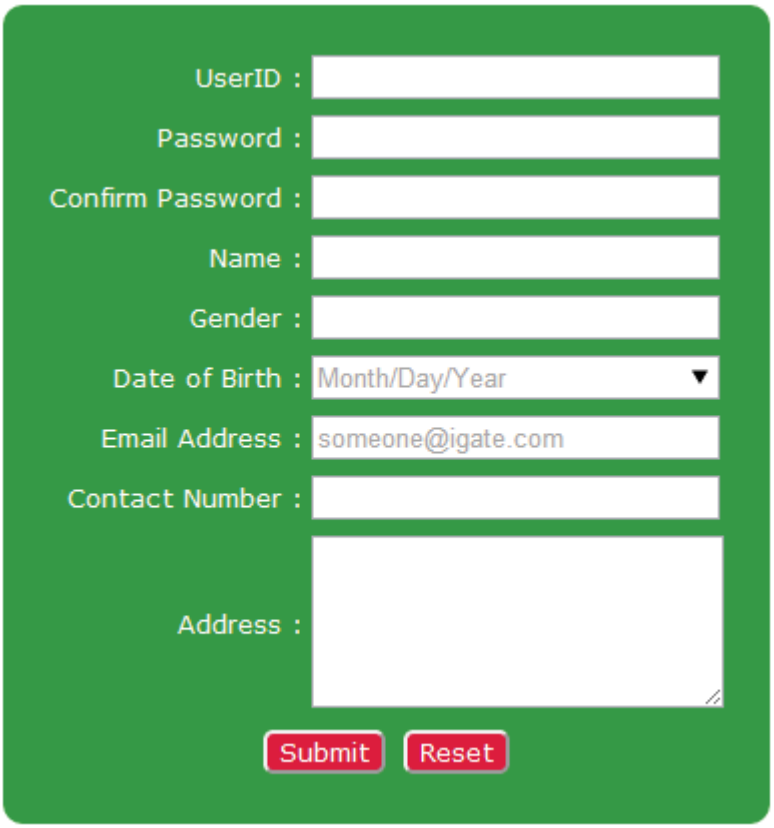
1. Create an HTML page with a VBScript program in it that would take the name of the user and wish him depending on the time of the day.

2. Create an HTML page with a VBScript program in it that would convert the feet into inches and vice versa on clicking on the appropriate button.

Lab 6. Implementing Form Validation in VBScript

Goals	• Create HTML Web Page • Implement Form Validation using VBScript DOM & Regular Expression
Time	120 minutes

1. Create an Email Registration Form using HTML5 & CSS3 with its new enhanced Form Elements like given below.

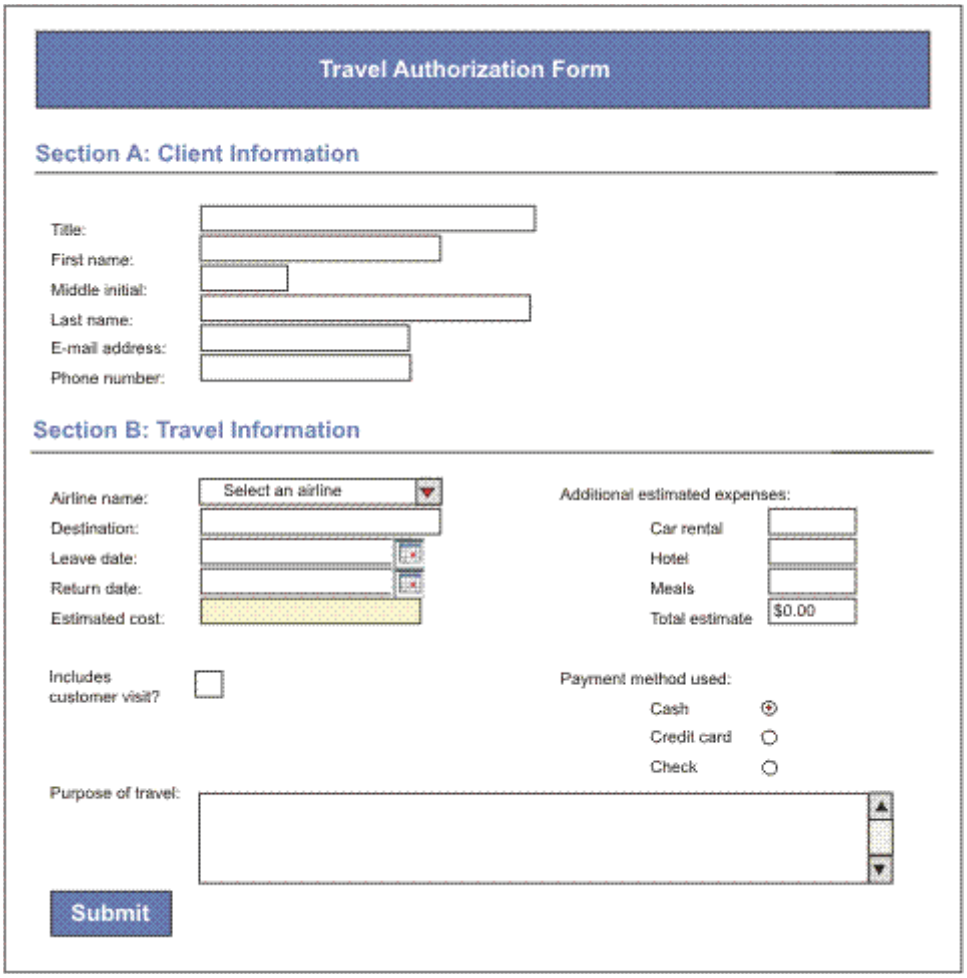


Following are the specifications needs to be implemented while designing the Registration page.

Field Name	Specification
Username	• Mandatory field • It should have max 10 characters
Password	• Mandatory field
Confirm Password	• Mandatory field
Name	• Mandatory Field • Only Alphabets allowed (3-10 characters)
Gender	• Mandatory field

	• It should provide users the list of options including values like Male, Female & Transgender
Date of Birth	• Mandatory • It should allow the user to select from the calendar
Email ID	• Mandatory field • It should also check for correct format of Email id • A text “someone@igate.com" in a lighter shade should be displayed in the input box till the time it’s not selected by user to enter the information.
Address	• Mandatory field • Address can span up to 5 rows
Phone	• Mandatory field • It should accept only numbers in xxx-xxxx-xxxx format
Submit	• Submit Data
Reset	• Reset Button • It should reset the form by clearing all the controls.

1. Create the below form and add the necessary validations as required.



Field Name	Specification
Title	• Mandatory field • Values are Mr./Mrs./Miss
First Name	• Mandatory field • Only Alphabets allowed (3-10 characters)
Middle Initial	• Mandatory field • Only Alphabets allowed (2 characters)
Last name	• Mandatory Field • Only Alphabets allowed (1-20 characters)
Email Address	• Mandatory field • It should also check for correct format of Email id • A text “someone@igate.com" in a lighter shade should be displayed in the input box till the time it’s not selected by user to enter the information.
Phone Number	• Mandatory

	• It should accept only numbers in xxx-xxxx-xxxx format
Airline Name	• Mandatory field • It should provide users the list of options including values like Indigo, Air India, Jet Airways, Spice Jet and GoAir
Designation	• Mandatory field • Only Alphabets allowed (1-10 characters)
Leave Date	• Mandatory field • It should allow the user to select from the calendar
Return Date	• Mandatory field • It should allow the user to select from the calendar
Estimated Cost	• Mandatory field • Only digits allowed
Car Rental	• Optional field • Only digits allowed
Hotel	• Optional field • Only digits allowed
Meals	• Optional field • Only digits allowed
Total Estimate	• Mandatory field • Only digits allowed
Includes Customer visit?	• Checkbox
Payment method used	• Radio buttons provided for Cash, credit card and check
Purpose of Travel:	• Mandatory Field • It can span up to 5 rows

Appendices

Appendix A: HTML Standards

Key points to keep in mind:

HTML standards help you reach the widest possible audience.
There are many technologies that are associated with HTML because they are used on web pages or in conjunction with HTML. Technologies that are not HTML are:

- Common Gateway Interface (CGI)
- Java
- JavaScript (JavaScript is also not *Java*)
- Dynamic HTML (DHTML)
- Extensible Markup Language (XML) and
- A variety of other emerging technologies.

For each of the above, please follow coding conventions specified by that technology.

Sometimes you are going to have to break rules and use non-standard syntax for good reason. Try to keep this to the minimum.

How to follow HTML standards:

Identify which version of HTML you are using in your document through the DOCTYPE line at the top of your file.

See the W3C site for more information on document types and DOCTYPE statements.

The important thing to remember is that a DOCTYPE statement is essential to assisting validation software in checking your document.

Use tools (supported by W3C) that support standards. In particular, install and use the Tidy program or Tidy GUI on your computer.

Use W3C validation markup service to check the syntax of documents you create.

Refer to W3C for technical and syntax information.

Some simple HTML standards:

Names of HTML files should always end with the extension *.html*.

Correct: foo.html

Incorrect: foo.bar

Always include a <HTML> tag.

