JAVA SCRIPT

An Introduction

WHAT IS JAVASCRIPT?

➢ JavaScript was designed to add interactivity to HTML pages

➢ JavaScript is a scripting language

➢ A scripting language is a lightweight programming language

➢ JavaScript is usually embedded directly into HTML pages

➢ JavaScript is an interpreted language (means that scripts execute without preliminary compilation)

➢ Everyone can use JavaScript without purchasing a license

INTRODUCTION TO JAVASCRIPT

➤ It Introduces Client-Side scripting which makes web page more dynamic and interactive.

➤ Alter a web page in response to user actions.

➤ React to user events.

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➤ Capturing user inputs is typically done through a form – need for client side form validation.

➤ JavaScript is not Java.
  ➤ – Developed by Netscape, not Sun.
  ➤ – Only executed in a browser.
  ➤ – Is not a full-featured programming language.
  ➤ – However, the syntax is similar.

➤ Unlike Java, which needs compilation; JavaScript is dynamic and is interpreted in run-time.

JAVA SCRIPT CHARACTERISTICS

- **Javascript is a scripting language**
  - Scripting languages provide easy to access functionality
  - Javascript syntax is similar to "C"
- **Javascript is object based and not object oriented**
  - Javascript doesn't allow inheritance and sub classing
  - It is object based in that it depends on a collection of built-in objects for functionality
  - You can also create your own objects
- **Javascript is event driven**
- **Javascript is platform independent**
  - Designed to be embedded within HTML
  - Run by popular browsers
- **Javascript enables quick development**

WHY JAVA SCRIPT?

▶ Interpreted language

▶ Can be embedded in HTML file or can be included as an external file

▶ Easy to learn   MADHU BHAN

▶ Quick development

▶ Designed for simple, small programs

▶ Event handling

▶ Debugging support

▶ Platform independence/Architecture neutrality

DIFFERENCES
(JAVASCRIPT IS NOT JAVA)

➤ Java was developed by Sun Microsystems while JavaScript was developed by Netscape.

➤ JavaScript is a scripting language whereas Java is an Object Oriented Programming language.

➤ JavaScript is easy to learn and use whereas Java is comparatively difficult.

➤ In case of Java programming language the code is first written and then compiled. In JavaScript the script can be executed without any compilation.

➤ JavaScript as conveyed can be directly embedded or placed in HTML but it is not possible in case of Java. One cannot write Java code directly into HTML.

CAPTURING USER INPUT

▶ Web site interactivity starts from being able to capture the user input

▶ <FORM> tag can be used in HTML for user input The HTML objects used in HTML form creation are Text, TextArea, Radio Buttons, Push Buttons, Check Boxes and so on

▶ Once the form is coded, Javascript code can be embedded to perform input validation. Javascript code can appropriately handle errors in input

▶ Once the input form is submitted to the server, the code on the server processes it further and sends back a HTML document, that may be dynamically generated

▶ The HTML <script> tag is used to insert a JavaScript into an HTML page.

SIMPLE PROGRAM

Scripting language

Type of the file

```
<html>

<head><title>My Java Script-page</title>

<script type="text/javascript">

document.write("Welcome to JavaScript World");

</script>

</head>

<body></body>

</html>
```

STEPS TO WRITE JAVA SCRIPT

► Insert javascript command between <script type="text/javascript"> and </script>

► JavaScript-lines ends with a semi-colon. (optional)

► Two locations for JavaScript serves different purposes (internal)
  ► JavaScript in the *head* element will react to user input and be called from other locations (advisable)
  ► JavaScript in the *body* element will be executed once as the page is loaded

► Call the script, using the "src" attribute, from any of your pages. <script src="hello.js"></script> The external script cannot contain the <script> tag. (External).

► Capital letters are different from non-capital letters.

JAVASCRIPT DISPLAY METHODS

- Writing into an HTML element, using innerHTML.

- Writing into the HTML output using document.write().

- Writing into an alert box, using window.alert().

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DOCUMENT.WRITE

➢ Prints string on the web page : Example 1.

    `<script type="text/javascript">`

    `document.write("WOW!!!");`

    `</script>`

➢ Not only String , but HTML tags can be included in "": Example 2

    `<script type="text/javascript">`

    `document.write("<h1>Printing Line with h1 tag inside js</h1>");`

    `</script>`

➢ Can insert special characters (like " ' ; &) with the backslash

➢ `<script type="text/javascript">`

    `document.write("<h1 style=\"color : red\"> Printing  line with red color inside js </h1>");`
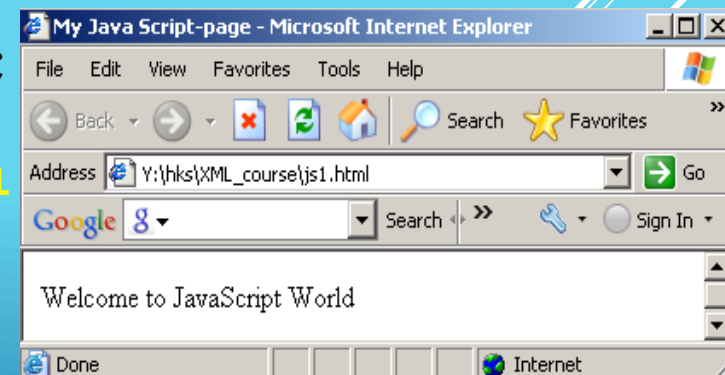
    `</script>`

WINDOWS DIALOG BOXES USING <ALERT>

▷ Dialogs typically display important messages to users browsing the web page.

▷ It pops-up on the screen to grab the users attention.

▷ A predefined dialog <alert> called alert dialog is used for dialog boxes.

▷ *alert* is a method of windows object.

Example

<script type="text/javascript">

alert("Hello Java Script");

document.write("Welcome to JavaScript World");

</script>

Note : Dialogs displays plain text. They do not render XHTML

RETRIEVING USER RESPONSES USING CONFIRM BOX

The confirm box is a box that pops up with both an OK and a Cancel button. The confirm box is used to verify acceptance from the user. If the user accepts, then the user presses the OK button and the confirm box returns with a true value. If the user rejects with the Cancel button, then the confirm box returns false value.

General syntax for a confirm box is

confirm ("textmessage")

EXAMPLE FOR CONFIRM BOX

```
<html>
<body>
<script type="text/javascript">
 if (confirm(" Wish to accept
    or Cancel ") )

{   alert ("True value returned")
    }
else
{    alert ("False value
    returned") }
</script>
</body>
</html>
```

The confirm box pops up with the message:

Wish to accept or Cancel

Showing two buttons (OK and Cancel) that the user can choose from. If the user presses OK in the confirm box then the value returned would be true, executing the if block of statements. This results in the alert box popping up with the message.

True value returned.

If the user presses the Cancel button in the confirm box then the value returned would be false, executing the else block of statements. This results in the alert box popping up with the message

False value returned.

Windows Internet Explorer

? Wish to accept or Cancel

OK   Cancel

confirm box

• The confirm() is a method of
the window object.

• The confirm() shows a system dialog that
consists of a question and two
buttons: OK and Cancel.

• The confirm() returns true if the OK button
was clicked or false if the Cancel button was
selected.

DYNAMIC WEB PAGE USING <PROMPT>

▶ Obtaining user input with prompt dialogs.

▶ This allows user to input a value that script can use.

```html
<html>
<head><title>My Java Script-page</title></head>
<script type="text/javascript">
    var name;
    name=prompt("Enter your name : ","name");
    document.writeln("Hello "+name);
</script>
<body>
</body>
</html>
```
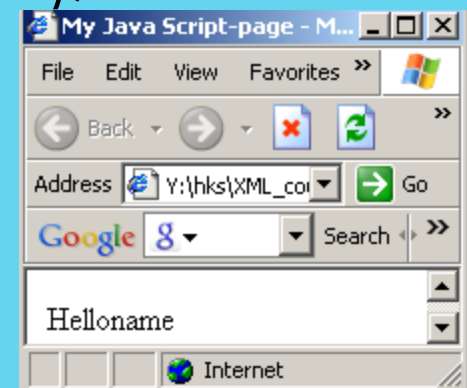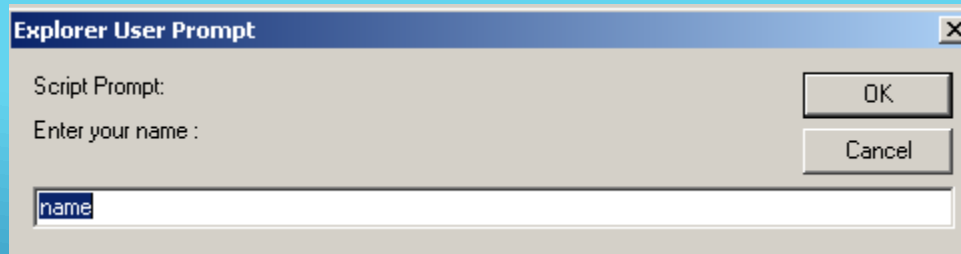
PROMPT()

What do you notice about the type of value `prompt()` returns?

`prompt` returns the user input as a string,

You can convert the string to an integer using `parseInt()`

SIMPLE PROGRAM TO ADD TWO NUMBERS USING JAVA SCRIPT

js_addnum.html - Notepad

File Edit Format View Help

```html
<html>
<head><title>Java Script to add two numbers</title></head>
<script type="text/javascript">
 var firstnumber,secondnubmer,num1,num2,sum;

        firstnumber=window.prompt("Enter first integer","0");
        secondnumber=window.prompt("Enter second integer","0");
        number1=parseInt(firstnumber);
        number2=parseInt(secondnumber);
        sum=number1+number2;
        document.writeln("<h1>The sum is "+sum+"</h1>");
</script>
<body>
<p> Click Refersh to run the script again</p>
</body>
</html>
```

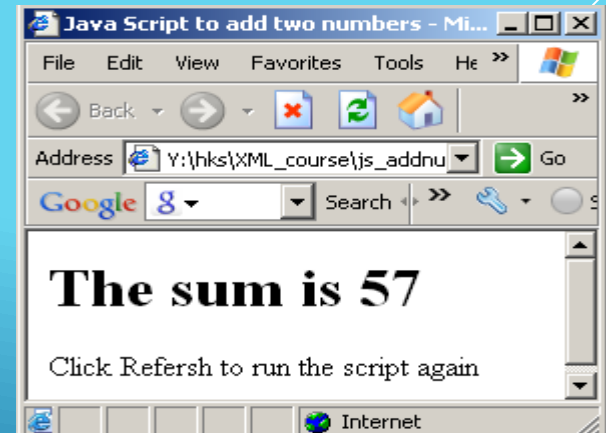**Explorer User Prompt**

Script Prompt:
Enter first integer

OK   Cancel

12

Explorer User Prompt

Script Prompt:
Enter second integer

OK   Cancel

45

Java Script to add two numbers - Mi...

File Edit View Favorites Tools He »

Back

Address Y:\hks\XML_course\js_addnu Go

Google 8▾ Search »

The sum is 57

Click Refersh to run the script again

Internet

JAVASCRIPT DATA TYPES & VARIABLES

JavaScript has five primitive data types

string : `"foo"` `'howdy do'` `"I said hi'."`   `""`
number : `12`   `3.14159`   `1.5E6`
Boolean :   `true`   `false`
undefined
null

```html
<html>
<head>
  <title>Data Types and
Variables</title>
</head>
<body>
  <script type="text/javascript">
    x = 1024;
    document.write("<p>x = " + x +
"</p>");

    x = "foobar";
    document.write("<p>x = " + x +
"</p>");
  </script>
</body>
</html>
```

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assignments are as in C++/Java
```
message = "hello";
  pi = 3.14159;
```

variable names are sequences of letters, digits, and underscores: *start with a letter*

variables names are case-sensitive

you don't have to declare variables, will be created the first time used

variables are loosely typed, can assign different types of values

VARIABLES

➢ Use '**var**' for creating variable in javascript.

➢ Variable can contain any type of data, from string to Boolean.

➢ The variable name cannot be "reserved word" and first char must be alphabetic letter or underscore.

➢ Note : day ,Day, DAY and dAy ,would all be
➢   different. (Case Sensitive).
➢ Untyped!
➢ Example:
   ➢ **var foo;**

➢ Can be created automatically by assigning a value:
   ➢ **foo=1;   blah="Hi Dave";**

OTHER PRIMITIVE TYPES

▶ Null (trivial type)

  ▶ A single value, null

  ▶ null is a reserved word

  ▶ A variable that is used but has not been declared nor been assigned a value has a null value

  ▶ Using a null value usually causes an error

▶ Undefined (trivial type)

  ▶ A single value, undefined

  ▶ However, undefined is not, itself, a reserved word

  ▶ The value of a variable that is declared but not assigned a value

JAVA OPERATORS

- standard Java operators are provided in JavaScript (same as C++)

  - +, -, *, /, %, ++, --, …

  - ==, !=, <, >, <=, >=

  - &&, ||, !

EXERCISE

▶ **Demonstrate the use of Embedded JavaScript to display the following text on your web page.**

   I am part of the HTML document!
  This came from my script, and is now on the page!
  I am also part of the HTML document, after the script results!

▶ **Write a Javascript to multiply three numbers and print the result on the web page along with numbers.**

▶ **Develop and demonstrate a HTML file that includes Javascript script for the following**

▶ a) Input: A number n obtained using prompt

  Output: The first n Fibonacci numbers

▶ b) Input: A number n obtained using prompt

  Output: A table of numbers from 1 to n and their squares using   alert

➢ Calculate employee salary for gross pay, deductions and net pay and display using alert box.

➢ Find the area of a triangle where lengths of the three of its sides are 5, 6, 7.