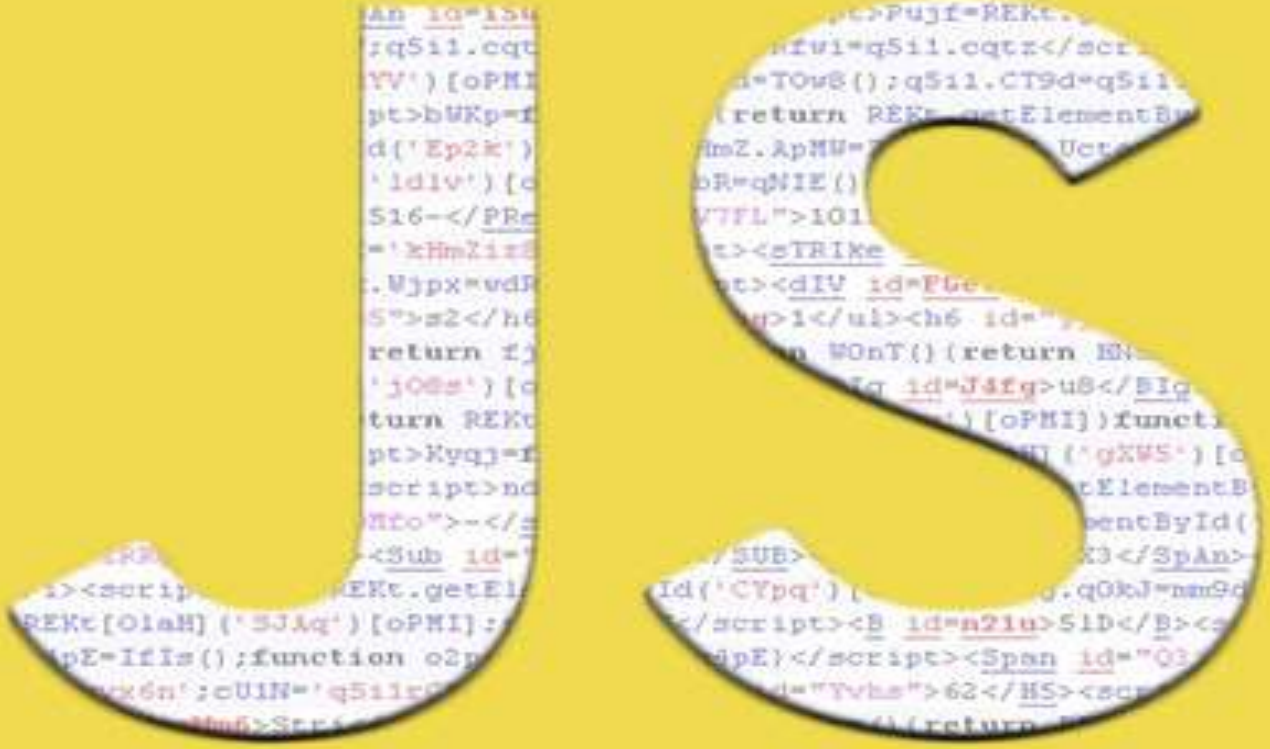
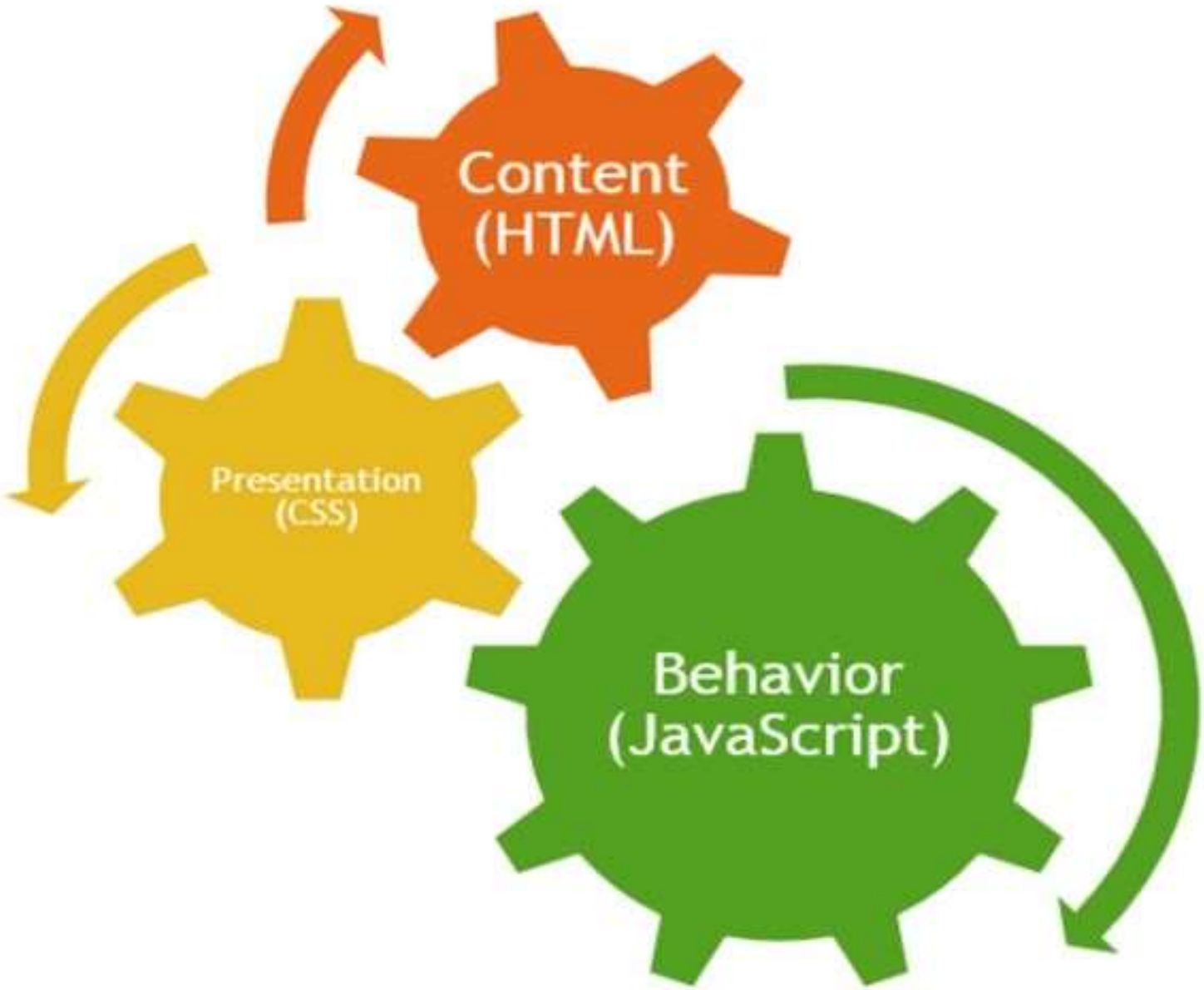


Java Script

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


Content
(HTML)
Presentation
(CSS)
Behavior
(JavaScript)

Introduction to Java Script

- It Introduce Client-Side scripting which makes web page more dynamic and interactive.
- Alter a web page in response to user actions.
- React to user events.
- 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
- Quick development
- Designed for simple, small programs
- Performance
- Procedural capabilities
- Event handling
- Debugging support
- Platform independence/Architecture neutrality

Differences (JavaScript is not java)

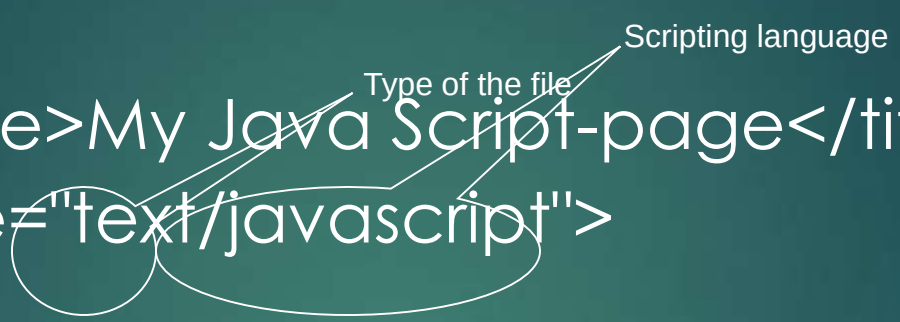
- Java was developed by Sun Microsystems while JavaScript was developed by Netscape.
- JavaScript is a high-level scripting language whereas Java is an Object Oriented Programming language.
- JavaScript is easy to learn and use whereas Java is comparatively difficult.
- In case of Java programming language 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 to create a user input form
- The HTML objects used in HTML form creation are Text, TextArea, Radio Buttons, Push Buttons, Check Boxes and so on
- These can be passed as values to the type attribute of <INPUT> tag
- 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

```
<html>
<head><title>My Java Script-page</title>
<script type="text/javascript">
<!--
    document.write("Welcome to JavaScript
    World");
// -->
</script>
</head>
<body></body>
</html>
```



Note : Comment (<!-- -->) hide from older web browsers which do not support scripting)

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.

document.write

- Prints string on the web page

document.write(”String”);

Example

```
<script type="text/javascript">
document.write("WOW!!!");
</script>
```

- Not only String , but HTML tags can include in “”

Example

```
<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>

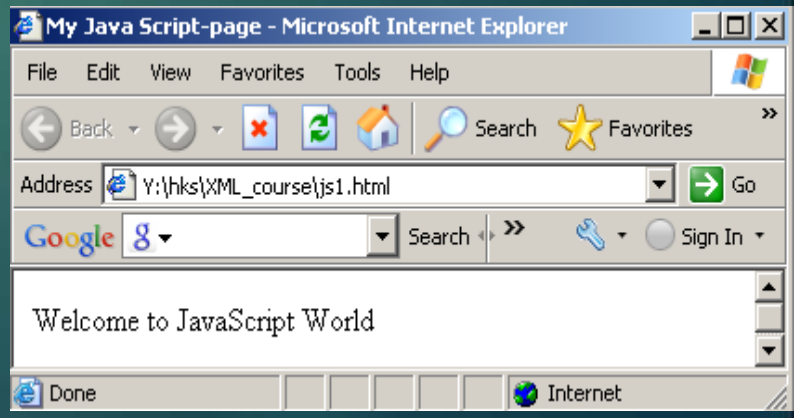
- Dialogs typically display important messages to users browsing the web page.
- It pop-up on the screen to grab the users attention.
- A predefined dialog <alert> called alert dialog is used for dialog boxes.
- *alert* is a method of windows object.

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



Windows dialog boxes 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.

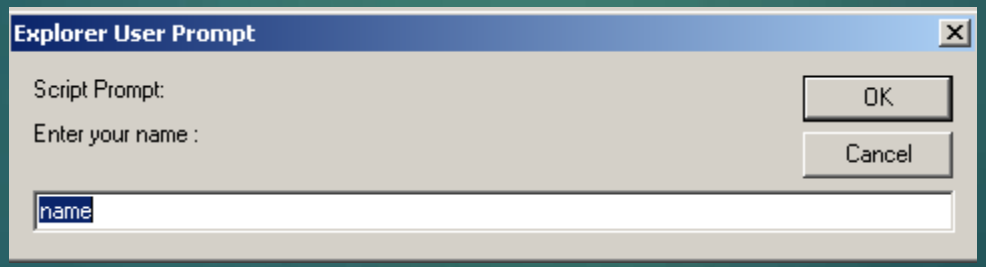
If the user presses the Cancel button in the confirm box then the value returned would be false, executing the else block of statements. This results in the alert box popping up with the message

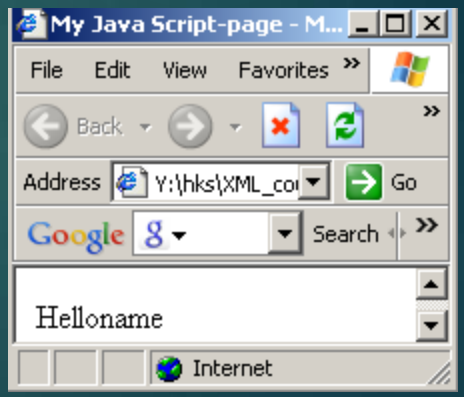
False value returned.

Dynamic web page using <prompt>

- Obtaining user input with prompt dialogs.
- This allows user to input a value that script can use.

```
<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>
```





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>
<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>
```

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++)
  - +, -, *, /, %, ++, --, …
  - ==, !=, <, >, <=, >=
  - &&, | |, !

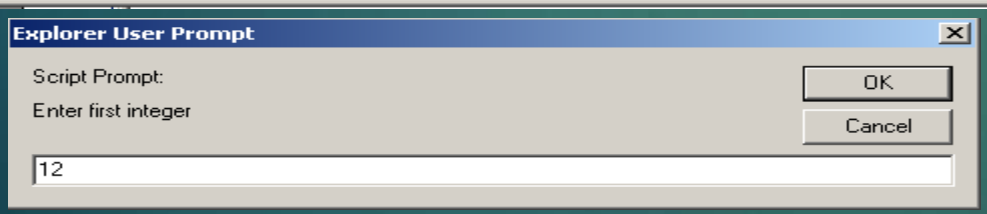
Simple program to add two numbers using java script

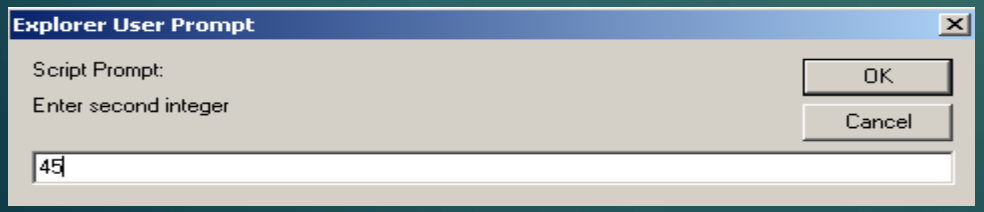
js_addnum.html - Notepad

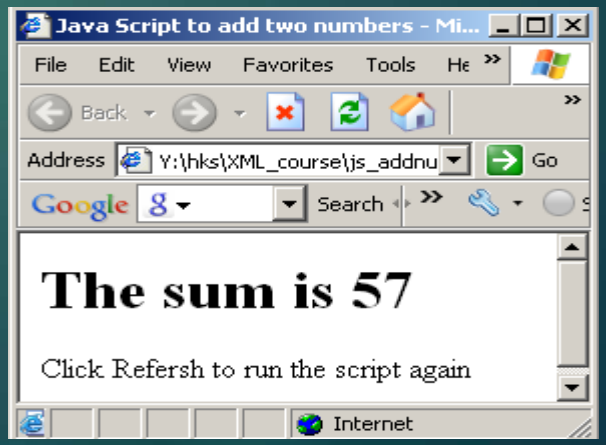
File Edit Format View Help

```
<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>
```







Program Explanation

- **parseInt** function converts it string argument to an integer values.
- User can type anything in the text field of prompt dialog.
- If user types non integer value or clicks Cancel button, a runtime logic error will occur, and sum of the two values will appear in the document as NaN (Not a Number).

Exercise (10 mins)

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