

Lecture 2.2

Introduction to JavaScript

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JavaScript

- Client-side scripting language.
- Designed to add interactivity to HTML pages.
- Used to improve the design, validate forms, detect browsers, create cookies, and much more.

Advantages of Client-Side Scripting

- Reduced server load as it does not have to send messages to the user's browser about missing or incorrect data.
- Reduced network traffic as the form's data is sent only once instead of many to's and from's.

JavaScript

- JavaScript is an **interpreted language** (means that scripts execute without preliminary compilation)
- JavaScript is usually embedded directly into HTML pages.
- Everyone can use JavaScript without purchasing a license.

JavaScript: Common uses

- JavaScript can react to events.
- JavaScript can read and write HTML elements.
- JavaScript can be used to validate data.
- JavaScript can be used to detect the visitor's browser.
- JavaScript can be used to create cookies.

Embedding JavaScript in HTML

- There are two methods to embed JavaScript in to HTML code
 - Internal Script: directly written in HTML code
 - External Script: written in separate file
- `<script>` tag is used to tell the browser that a script follows.

Internal Scripts

- The `<SCRIPT>` tag is used to embed JavaScript code in HTML documents
 - `<SCRIPT LANGUAGE="JavaScript">`
 - [JavaScript Statements...]
 - `</SCRIPT>`
- JavaScript can be placed anywhere between `<HTML>` and `</HTML>` tags
- Two possibilities are the `<HEAD>...</HEAD>` portion and the `<BODY>...</BODY>` portion

External Scripts

- SRC attribute of the <SCRIPT> is used to include the external JavaScript file in HTML
- `<script src="myscripts.js"> </script>`
- Are useful when you have lengthy scripts
- Improve the readability.

JavaScript Conventions

- Using the Semicolon:
- `document.write("Hello"); alert("Good bye")`
- `document.write("Hello")`
- `alert("Good bye")`
- `document.write("Hello");`
- `alert("Good bye");`

JavaScript Conventions

- JavaScript is case sensitive.
- Comments: single line `//`, Multiple lines `/* */`
- Using Quotes:
- `document.write("Hello World")`
- `document.write("Hello World")`

Writing JavaScript

```
<HTML>
<HEAD>
<TITLE>Hello World.</TITLE>
</HEAD>
<BODY>
<script language="javascript">
document.write("<h1>Hello world</h1>");
</script>
</BODY>
</HTML>
```

Start of JS script

Writing on webpage

HTML code in JS

End of JS script

Data Types in JavaScript

- There are four common data types in JavaScript: numbers, strings, Boolean, null values.
- JavaScript is a loosely typed language.

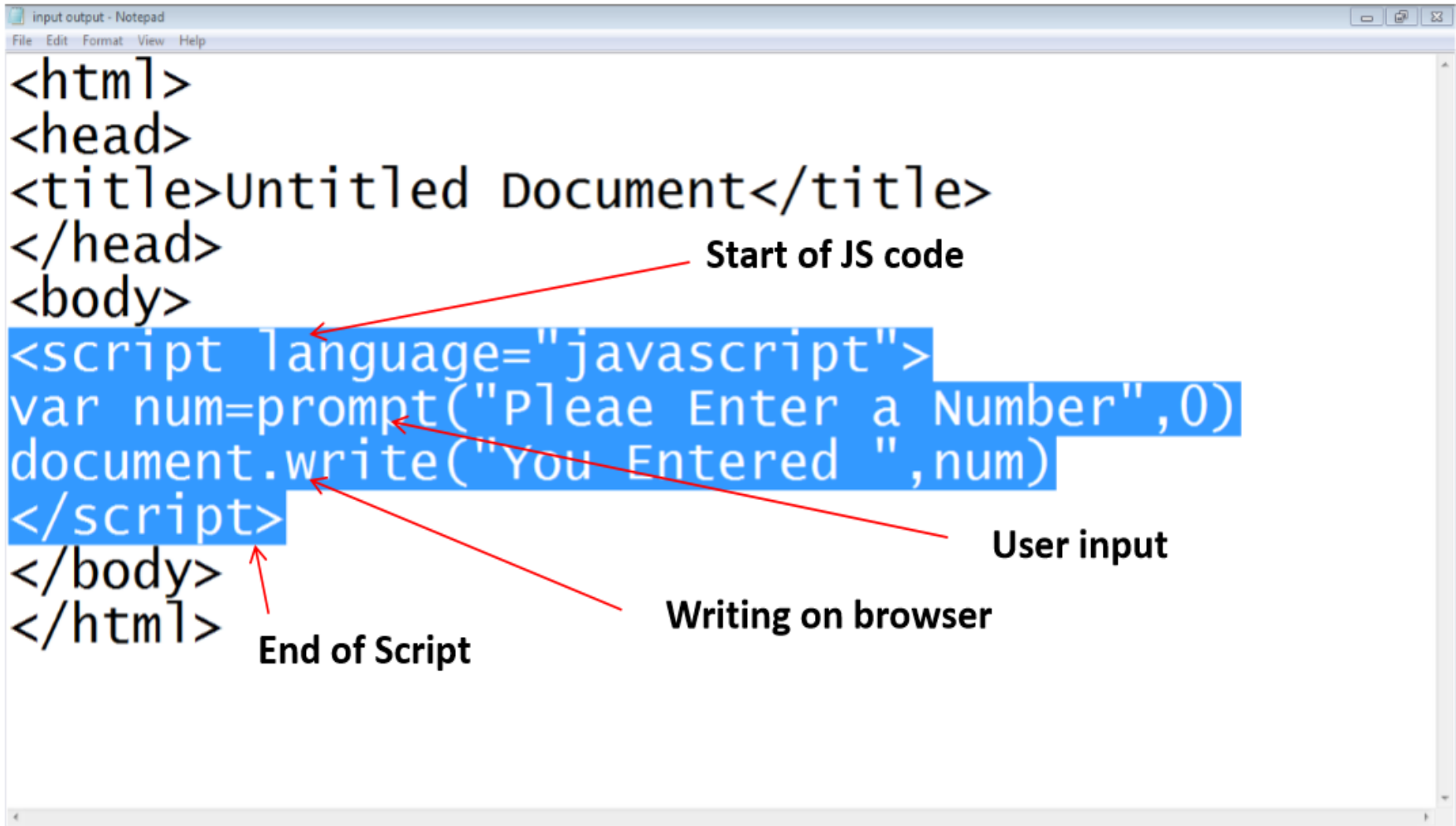
Variables in JavaScript

- The word “var” is used to declare a variable
- `var LastName = “Smith”`
- `var AccountNumber = 1111`
- Variable Naming:
 - First character can not be a digit
 - Other characters may be digits, letters or underscore
 - Reserved words can not be used
 - Case sensitive

Input Out put in JavaScript

- `write();` is used to write on browser
 - `document.write("hello world")`
 - `document.write(a)`
- `prompt();` is used to take input from users
 - `var num = prompt("Please Enter a Number", 0)`

Input Out put in JavaScript



The image shows a Notepad window titled "input output - Notepad" with a menu bar (File, Edit, Format, View, Help). The code inside is as follows:

```
<html>
<head>
<title>Untitled Document</title>
</head>
<body>
<script language="javascript">
var num=prompt("Pleae Enter a Number",0)
document.write("You Entered ",num)
</script>
</body>
</html>
```

Annotations with red arrows point to specific parts of the code:

- Start of JS code**: Points to the opening tag of the script: `<script language="javascript">`.
- User input**: Points to the prompt function: `prompt("Pleae Enter a Number",0)`.
- Writing on browser**: Points to the `document.write` function.
- End of Script**: Points to the closing tag of the script: `</script>`.

JavaScript Functions

- User defined functions
- Predefined function

JavaScript Functions

- Functions are defined using the keyword `function`, followed by the name of the function and list of parameters
- `function functionName([parameters])`
 - {
 - [statements]
 - }

JavaScript Functions

```
JS_Function.html x
1 <html>
2 <head>
3   <title> JavaScript </title>
4   <script language = "javascript">
5     function getname ()
6     {
7       var name = prompt("Please enter your name", name);
8       document.write("welcome Miss.  ", name);
9     }
10  </script>
11 </head>
12
13 <body>
14   <script language = "javascript">
15     getname ();
16   </script>
17 </body>
18 </html>
```

JavaScript Functions

- Common events
- onClick
- onDbClick
- onChange
- onFocus
- onMouseOver
- onMouseOut
- onSubmit
- onload

JavaScript Functions

- Some common predefined math functions
- `Math.sqrt`
- `Math.pow`
- `Math.abs`
- `Math.max`
- `Math.min`
- `Math.floor`
- `Math.ceil`
- `Math.round`
- `Math.random`

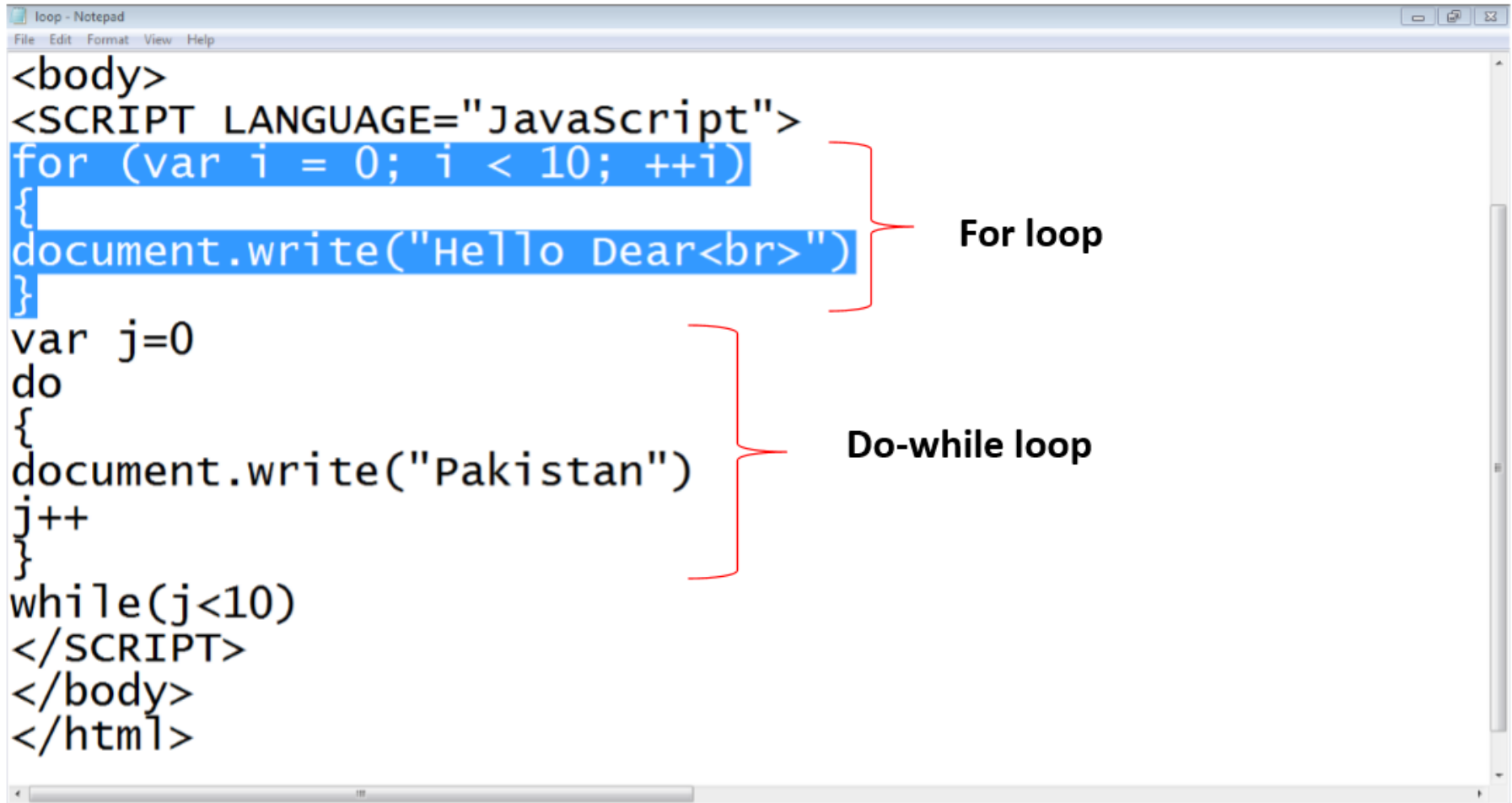
Conditional Statements

```
Conditional.html x
1 <html>
2 <head>
3   <Title> Using If condition </title>
4   <script language = "javascript">
5     function playgame()
6     {
7       var res = parseInt(Math.random()*10);
8       var num = prompt("Please enter a number",0);
9       if(num == res)
10        document.write("You Won");
11      else
12        document.write("You lost, correct answer is ",res);
13    }
14  </script>
15 </head>
16 <body>
17   <script language = "javascript">
18     playgame();
19   </script>
20 </body>
21 </html>
```

Loops

- For loop
- `for(var i=1; i<10; i++)`
- `{ Document.write("hello world") }`
- While loop
- `While(condition) { }`

Loops



```
<body>
<SCRIPT LANGUAGE="JavaScript">
for (var i = 0; i < 10; ++i)
{
document.write("Hello Dear<br>")
}
var j=0
do
{
document.write("Pakistan")
j++
}
while(j<10)
</SCRIPT>
</body>
</html>
```

For loop

Do-while loop

Loops

Hello Dear!
Hello Dear!
Hello Dear!
Hello Dear!
Hello Dear!
Hello Dear!
Hello Dear!
Hello Dear!
Hello Dear!
Hello Dear!

Output of for loop

PakistanPakistanPakistanPakistanPakistanPakistanPakistanPakistanPakistanPakistan

Output of do-while loop

Dialog boxes in JavaScript

- JavaScript provides the ability to pickup user input or display small amounts of text to the user by using dialog boxes.
- These dialog boxes appear as separate windows and their content depends on the information provided by the user.

Alert Box

- An alert box is simply a small message box that pops up and gives the user some information.
- An alert dialog box is mostly used to give a warning message to the users.
- When an alert box pops up, the user will have to click "OK" to proceed
- Syntax: – alert(“message”)

Alert Box

```
alertbox.html x
1 <HTML>
2 <HEAD>
3 <TITLE>Alert Box</TITLE>
4 <SCRIPT LANGUAGE="JavaScript">
5   function alertMe(message)
6   {
7     alert(message)
8   }
9   alertMe("Welcome to my web page!")
10 </SCRIPT>
11 </HEAD>
12 <BODY>
13 </BODY>
14 </HTML>
```

Prompt Box

- A prompt box is often used if you want the user to input a value before entering a page
- When a prompt box pops up, the user will have to click either "OK" or "Cancel" to proceed after entering an input value
- If the user clicks "OK" the box returns the input value.
- If the user clicks "Cancel" the box returns null

Prompt Box



The image shows a code editor window titled "JS_prompt.html". The code is as follows:

```
1 <html>
2 <head>
3   <title> JavaScript </title>
4 </head>
5 <body>
6 <script language = "javascript">
7   var name = prompt("please enter your name", "name");
8   document.write("Hello Miss. ", name)
9 </script>
10 </body>
11 </html>
```

Confirm Box

- A confirm box is often used if you want the user to verify or accept something
- When a confirm box pops up, the user will have to click either "OK" or "Cancel" to proceed
- If the user clicks "OK", the box returns true
- If the user clicks "Cancel", the box returns false

Class task

- Write a JavaScript code that prompts the user to enter his/her name and then uses confirm box to confirm whether to display the name on the web page or display anonymous.

References

- **Chapter 11** Beginning HTML, XHTML, CSS, and JavaScript, by Jon Duckett, Wiley Publishing; 2009, ISBN: 978-0-470-54070-1.
- **Chapter 2**, Learn JavaScript, by Chuck Easttom, Wordware Publishing; 2002, ISBN 1-55622-856-2