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>

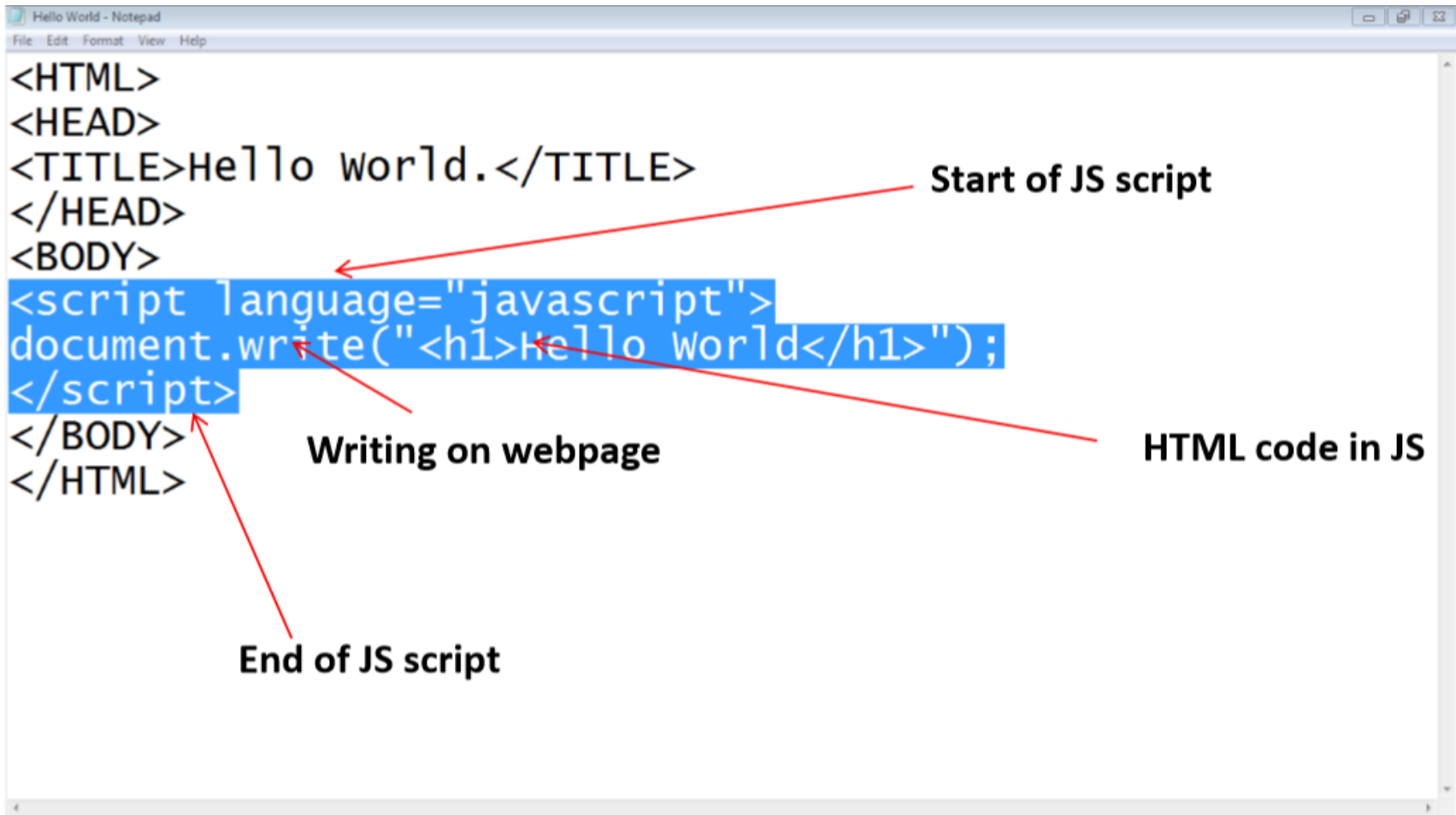- Are useful when you have lengthy scripts

- 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


```
Hello World - Notepad
File  Edit  Format  View  Help
<HTML>
<HEAD>
<TITLE>Hello World.</TITLE>
</HEAD>
<BODY>
<script language="javascript">
document.write("<h1>Hello World</h1>");
</script>
</BODY>
</HTML>
```

Start of JS script

HTML code in JS

Writing on webpage

End of JS script

Data Types in JavaScript

- There are four common data types in JavaScript: numbers, strings, Boolean, null values.

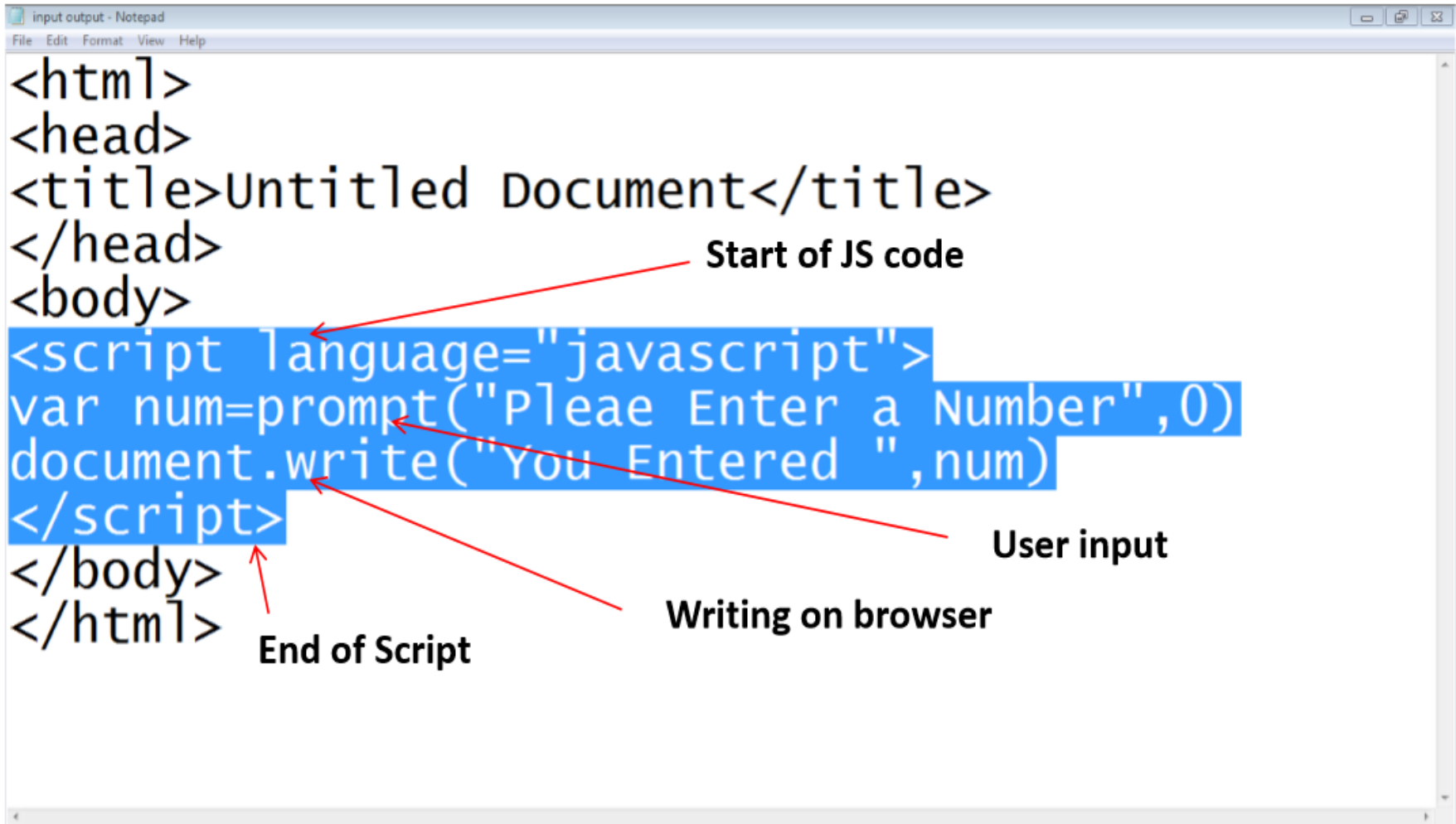- JavaScript is a loosely typed language.

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


```
input output - Notepad
File  Edit  Format  View  Help

<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>
```

Start of JS code

User input

Writing on browser

End of 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 ☒
 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
- onDblClick
- 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
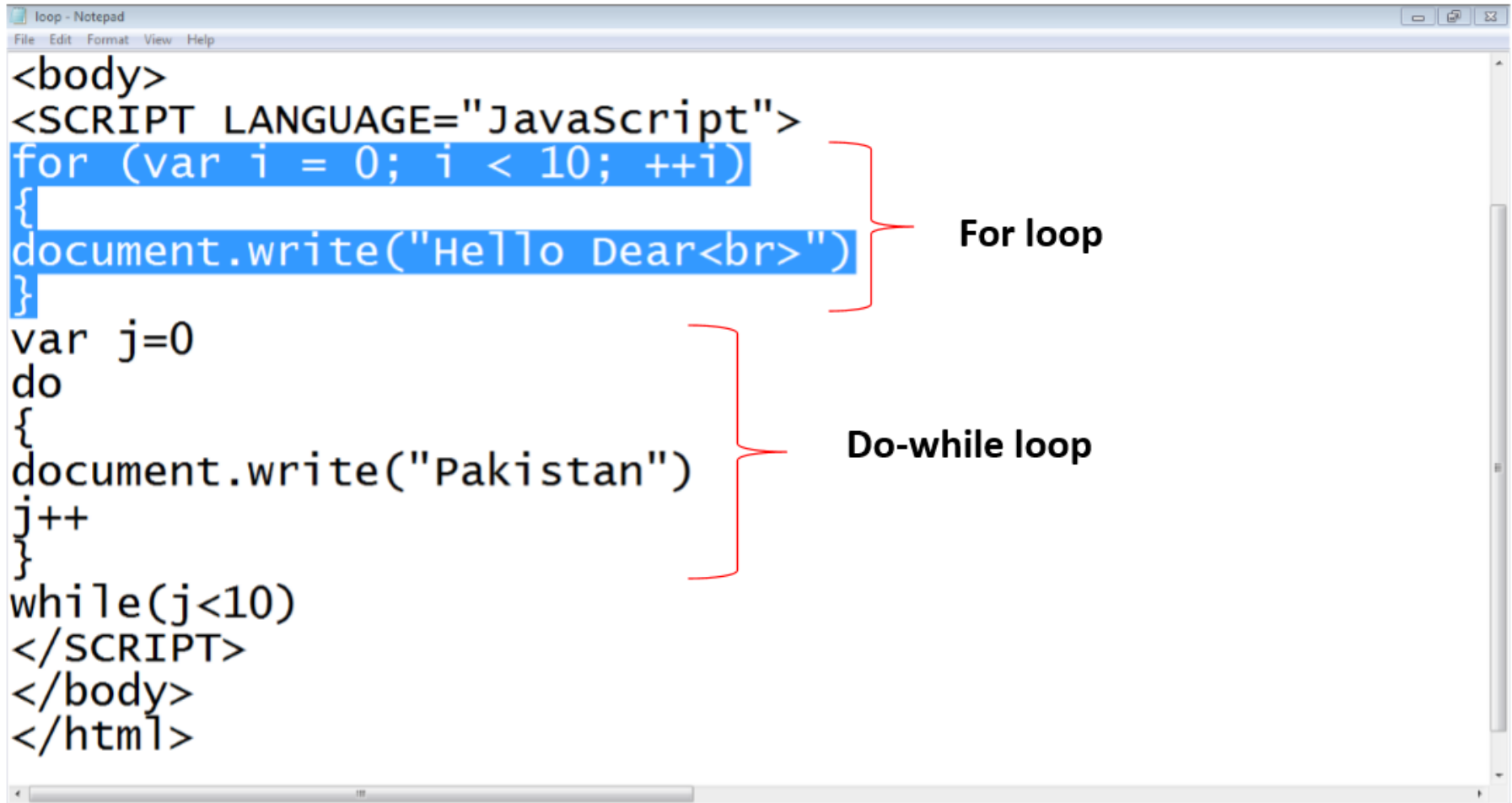
```html
1  <html>
2  <head>
3   <Title> Using If condition </title>
4  <script language = "javascript">
5   function playgame()
6  {
7   var res = parseInt(Math.random()*10);
8   var num = prompt("Please enter a number",0);
9   if(num == res)
10  document.write("You Won");
11  else
12  document.write("You 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>")
}
```
For loop

```
var j=0
do
{
document.write("Pakistan")
j++
}
while(j<10)
```
Do-while loop

```
</SCRIPT>
</body>
</html>
```

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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

 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

```
JS_prompt.html ✕
 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