Lecture 2.3
Introduction to DOM,
Document, Window, History, Navigator, and Screen Objects

Course Instructor
Engr. Madeha Mushtaq

Document Object Model (DOM)

- Once html element are rendered in the browser window, browser can not recognize them.
- To create interactive web pages it is vital that the browser continues to recognize HTML elements.
- JavaScript enabled browsers to do this because it recognizes and uses DOM.

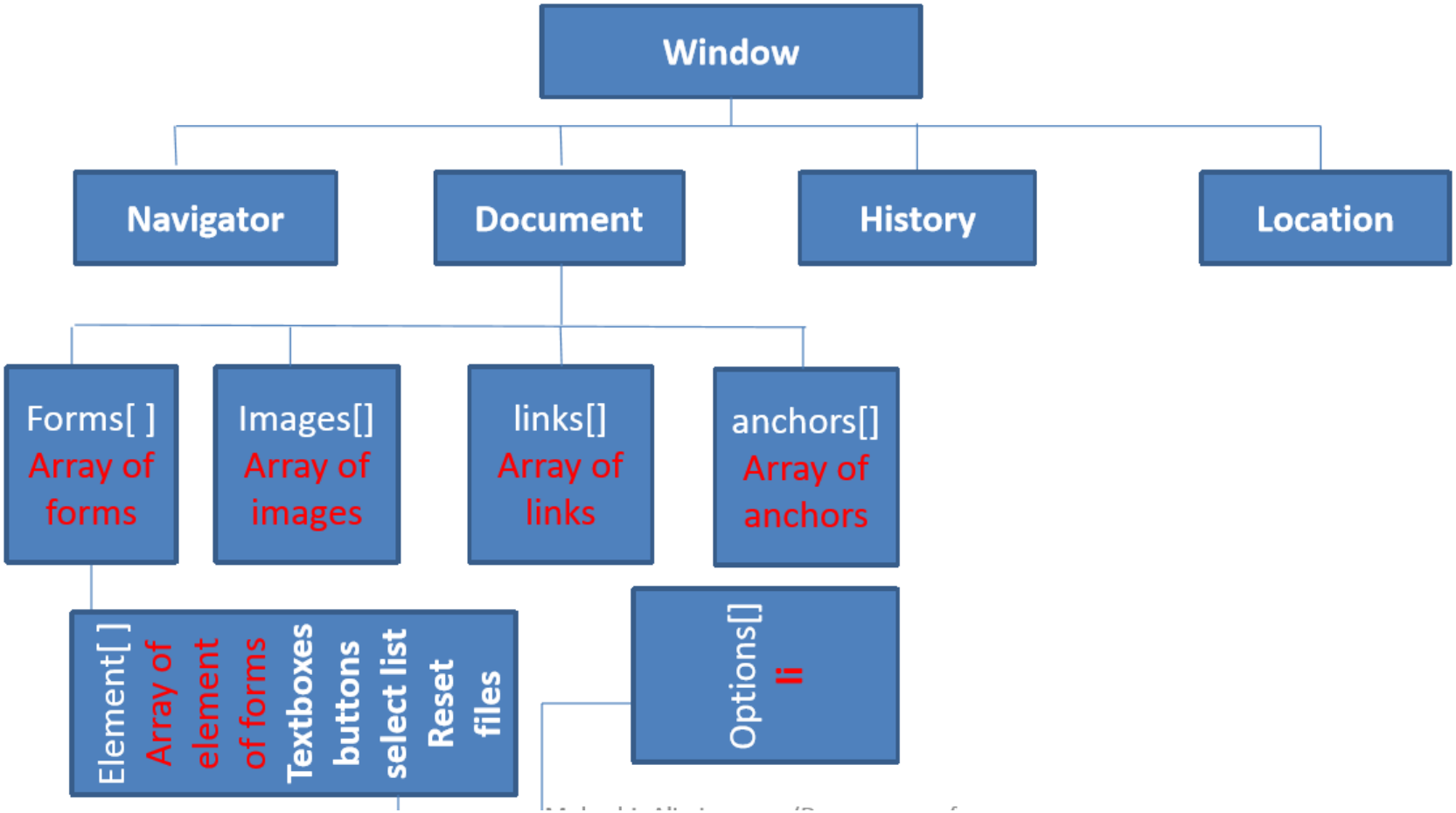
Document Object Model (DOM)

- All HTML elements, along with their text and attributes, can be accessed through the DOM
  - The contents can be modified or deleted, and new elements can be created.

Document Object Model (DOM)

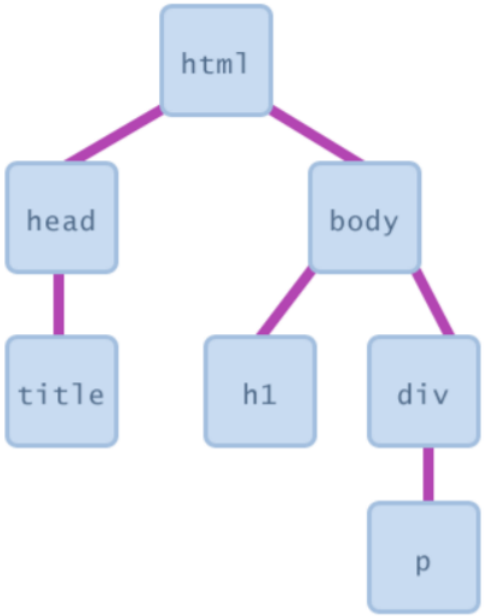
- The HTML DOM is platform and language Independent.
  - It can be used by any programming language like Java, JavaScript, and VBScript.
- The HTML DOM can be thought of as a hierarchy moving from the most general object to the most specific.

Document Object Model (DOM)



Document Object

- Document object represent the whole HTML document.
- Every HTML element in the document is an object.
- JS code can talk to these objects to examine elements' state
  - e.g. see whether a box is checked
- we can change state
  - e.g. insert some new text into a div
- we can change styles
  - e.g. make a paragraph red



Document Object

- document.forms[0].elements[0].value
- document.images[0].src
- document.links[0].href

Retrieving HTML elements

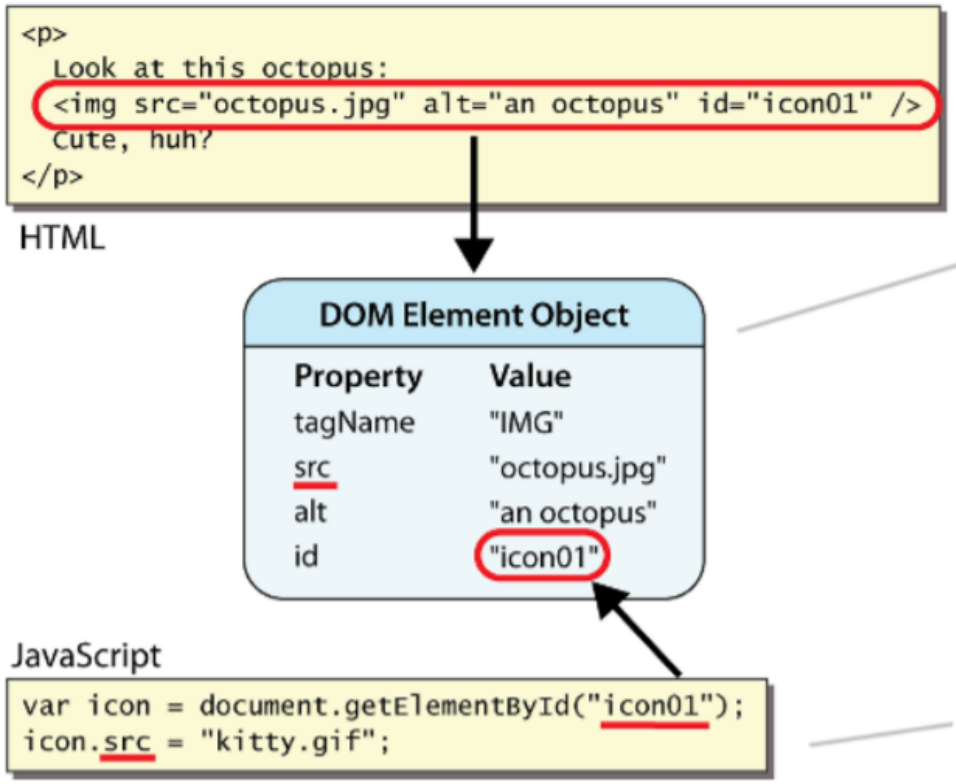
- The getElementById() method is the most used method of the DOM.
- To retrieve an element, it must have an unique id
- It retrieves a specified element of the HTML document and returns a reference to it.
  - document.getElementById(“element-id”)
- Other methods are getElementsByClassName, getElementsByTagName.

Retrieving HTML elements

- The returned reference can be used to retrieve element attributes
  - document.getElementById(“elementid”).attribute
  - document.getElementById(“pic”).src
  - document.getElementById(“pic”).height

Retrieving HTML elements

- Access/modify the attributes of a DOM object with
  object Name.attribute Name
- Most DOM object attributes have the same names as the corresponding HTML attribute.
- img tag's src property
- a tag's href property



Retrieving HTML elements

```
<html>
<head>
<title>Retrieving Values </title>
<script type="text/javascript">
function notEmpty(){
    var myTextField = document.getElementById('myText');
    if(myTextField.value != "")
        alert("You entered: " + myTextField.value)
    else
        alert("Would you please enter some text?")
}
</script>
</head>
<body>
<input type='text' id='myText' />
<input type='button' onclick='notEmpty()' value='Form Checker' />
</body>
</html>
```

Retrieving the text of an element

- innerHTML property defines both the HTML code and the text that occurs between that element's opening and closing tags.
- document.getElementById(“element-id”).innerHTML

Retrieving the text of an element

```
<html>
<head>
<title>Retrieving text</title>
<script type="text/javascript">
function getText(){
    var a = document.getElementById("mypara");
    alert(a.innerHTML)
    a.innerHTML = "Hello World Again";
    alert(a.innerHTML)

}
</script>
</head>
<body>
<p id = "mypara"> Hello world </p>
<script>
getText();
</script>
</body>
</html>
```

Getting value of attributes

- getAttribute() method is used to retrieve values of attributes.
- document.getElementById(“elementid”).getAttribute(“attribute-name”)
- document.getElementById(“pic”).getAttribute(“src”)

Getting value of attributes

```
<html>
<head>
<title>Retrieving Values </title>
<a href="https://www.google.com/" target="_blank" id="myLink">Google</a>
</head>

<body>
<script>
var link = document.getElementById("myLink");

    // Getting the attributes values
var href = link.getAttribute("href");
    alert(href); // Outputs: https://www.google.com/

var target = link.getAttribute("target");
    alert(target); // Outputs: _blank
</script>
</script>
</body>
</html>
```

Setting value of attributes

- setAttribute() method is used to set values of attributes
- document.getElementById(“elementid”).setAttribute(“attribute-name”, ”Value”)
- document.getElementById(“pic”).setAttribute(“src”, ”abc.jpg”)

Setting value of attributes

SetAttribute_Link_4.html

```
1  <html>
2  <head>
3  <title>Set Attributes </title>
4  <script>
5  function setF()
6  {
7  var link = document.getElementById("myLink");
8  var google = link.getAttribute("href");
9      alert(google);
10 link.setAttribute("href", "http://www.uetpeshawar.edu.pk/");
11 var uet = link.getAttribute("href");
12     alert(uet);
13     }
14 </script>
15 </head>
16
17 <body>
18 <a href="https://www.google.com/" target="_blank" id="myLink">Link</a>
19 <script>
20  setF();
21 </script>
22 </body>
23 </html>
```

The Window object

- The window object represents the browser window in which the script is running.
- Window object Properties:
  - window.innerHeight - the inner height of the browser window (in pixels)
  - window.innerWidth - the inner width of the browser window (in pixels)
- Window object Methods:
  - window.open()
  - window.close()
  - moveTo()
  - resizeTo()

The Window Object

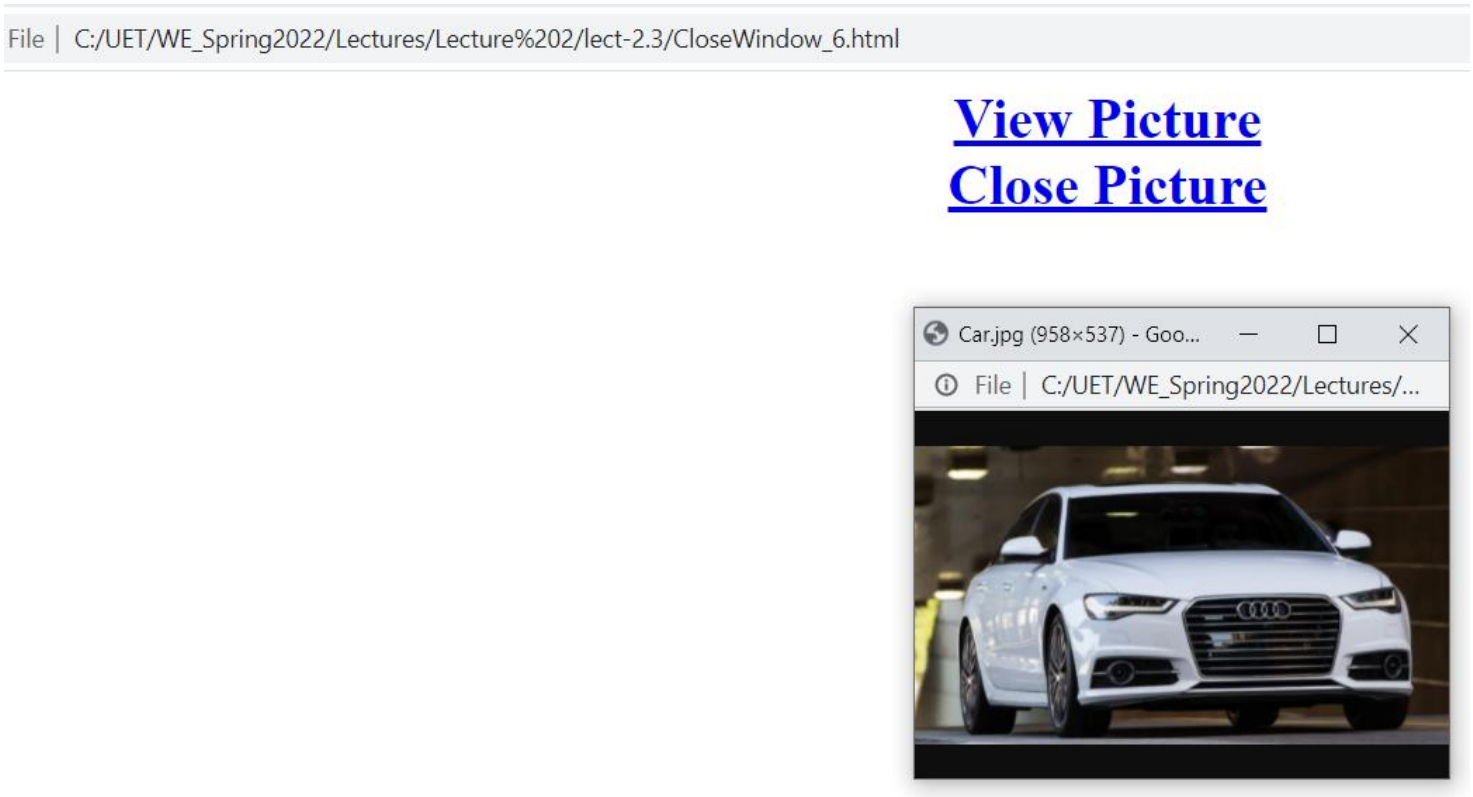
```
<HTML>
<HEAD>
<TITLE>Open a New Window</TITLE>
<SCRIPT LANGUAGE="JavaScript">
function OpenWindow()
 { var NewWindow = window.open("image.jpg", "NewWindow","width=350,height=400")
 }
</SCRIPT>
</HEAD>
<BODY BGCOLOR=White>
<SCRIPT>
OpenWindow();
</SCRIPT>
 </BODY>
 </HTML>
```

The Window Object

```
<HTML>
<HEAD>
<TITLE>Close Windows</TITLE>
<SCRIPT LANGUAGE="JavaScript">
var childwindow = null
function opennewwindow()
 {
 childwindow = window.open("Car.jpg","childwindow", "width=300,height=200,toolbar=yes,scrollbars=yes,")
 }
 function closenewwindow()
 {
 if (childwindow && !childwindow.closed)
 {
 childwindow.close()
 }
 }
 </SCRIPT>
 </HEAD>
 <BODY BGCOLOR=White>
 <CENTER>
<H1> <A HREF="javascript:opennewwindow()">View Picture</A>
 <BR>
 <A HREF="javascript:closenewwindow()">Close Picture</A>
 </H1>
 </CENTER>
 </BODY>
 </HTML>
```

The Window Object

- Output:



The History object

- The history object contains the URLs visited by the user (within a browser window)
- The history object is part of the window object and is accessed through the window. history property.
- Used to move forward and backward through the visitor's browsing history.

The History object

- History object properties:
  - Length: Returns the number of URLs in the history list
- History object methods:
  - back(): Loads the previous URL in the history list
  - forward(): Loads the next URL in the history
  - listgo(): Loads a specific URL from the history list

The History object

HistoryObject_7.html

```
<html>
<head>
<title>History Object</title>
<script language = "javascript">
document.write(history.length)
function goback()
{
window.history.back()
}
function goforward()
{
window.history.forward()
}
</script>
</head>
<body>
<h1> This is the first page </h1>
<a href = "RetrieveHTMLElements_1.html"> Go to the next page</a> <br>
<input type = "button" value = "Go Back!" onclick = "javascript:goback()">
<input type = "button" value = "Go forward!" onclick = "javascript:goforward()">
</body>
</html>
```

The Navigator object

- The navigator object contains information about the browser.
- Provides several properties that assist in the detection of various elements of the visitor's browser and environment.

The Navigator object

- Navigator object properties:
  - appCodeName: Returns the code name of the browser
  - appName: Returns the name of the browser
  - appVersion: Returns the version information of the browser
- Navigator object methods:
  - javaEnabled(): Specifies whether or not the browser has Java enabled

Detecting Users browser

- Used to write browser specific code.
- Can also be used to restrict users to use a specific browser.

Detecting Users browser

NavigatorObject.html

```
1  <html>
2  <head>
3  <title>Detecting Browser</title>
4  </head>
5  <body bgcolor = white>
6  <script language ="text/javascript">
7  var browsername = window.navigator.appname;
8  var browserversion= navigator.appversion;
9  document.write("you are using", browsername + "version" + browserversion);
10 </script>
11 </body>
12 </html>
```

The Screen object

- The screen object contains information about the visitor's screen.
- You might need this information to determine which images to display or how large the page can be.

The Screen object

- The screen object properties:
- availHeight: Returns the height of the screen (excluding the Windows Taskbar)
- availWidth: Returns the width of the screen (excluding the Windows Taskbar)
- colorDepth: Returns the bit depth of the color palette for displaying images.

The Screen object

- height: Returns the total height of the screen
- width: Returns the total width of the screen

The Screen object

```
<html>
<head>
    <title>JavaScript Screen Object</title>
</head>
<body>

<h1>JavaScript Screen Object Example</h1>
<script type="text/javascript">
    document.write("<b>Total Height = </b>" + screen.height + "<br/>");
    document.write("<b>Total Width = </b>" + screen.width + "<br/>");
    document.write("<b>Available Width = </b>" + screen.availWidth + "<br/>");
    document.write("<b>Available Height = </b>" + screen.availHeight + "<br/>");
    document.write("<b>Screen Color Depth = </b>" + screen.colorDepth + "<br/>");
    document.write("<b>Screen Pixel Depth = </b>" + screen.pixelDepth + "<br/>");
</script>

</body>
</html>
```

References

- Chapter 11 Beginning HTML, XHTML,CSS, and JavaScript, by Jon Duckett, Wiley Publishing; 2009, ISBN: 978-0-470-54070-1.
- Chapter 3,6,11 Learn JavaScript, by Chuck Easttom, Wordware Publishing; 2002, ISBN 1-55622-856-2