



CS604, Spring 2005

Introduction to JavaScript

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Administrativa

- ⑥ The due date for the 1st take-home exercise is on Friday at 12:00 (noon)

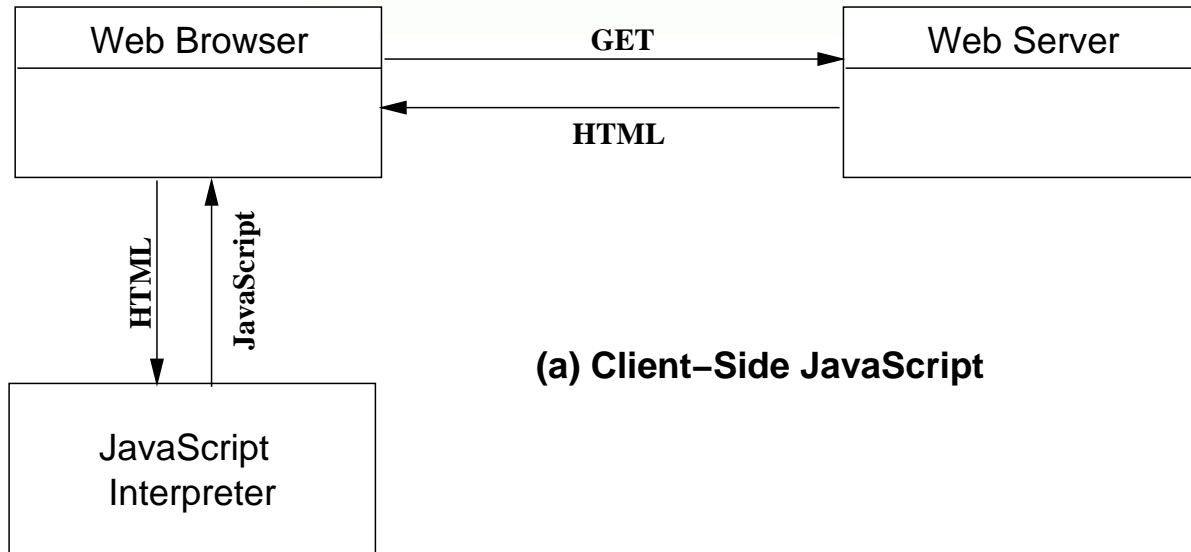
The Syllabus' Actual State

- ⑥ Introduction to the client/server computing paradigm
- ⑥ The HTML standard
- ⑥ Cascading Stylesheets (CSS)
- ⑥ The scripting language JavaScript
- ⑥ The document object model (DOM)
- ⑥ An in-depth coverage of PHP programming techniques
- ⑥ The MySQL backend databases and PHP
- ⑥ Security aspects in client/server systems
- ⑥ Distributed objects, RMI, CORBA

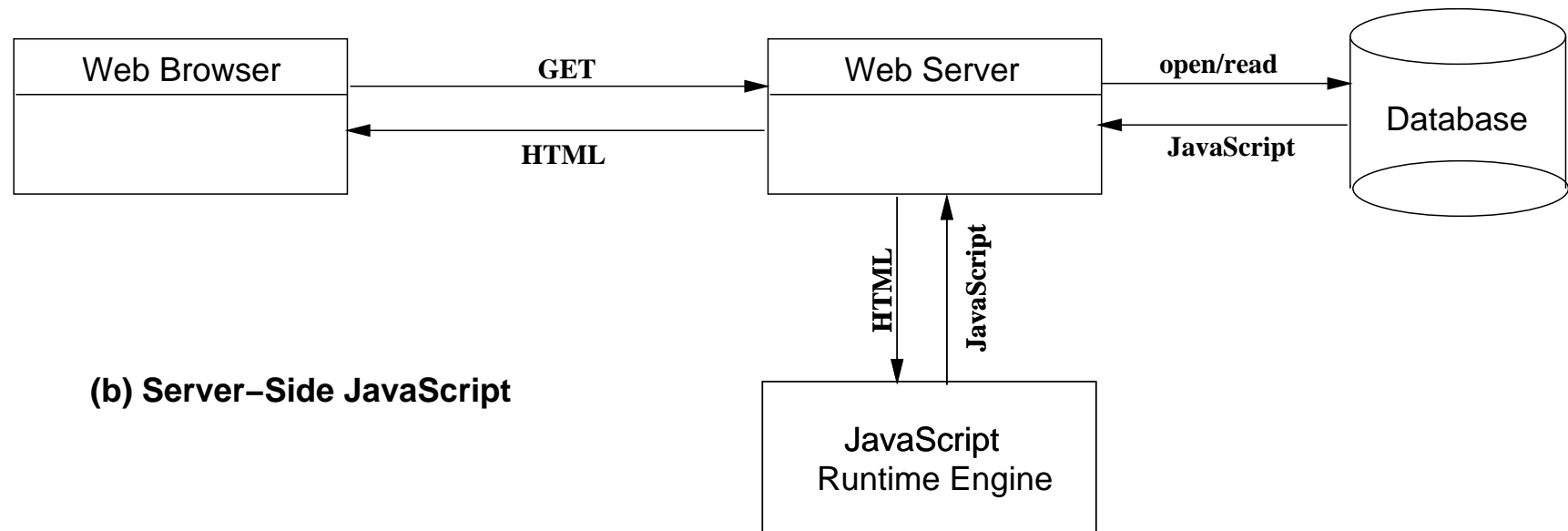
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Architecture of the c/s JavaScript



(a) Client-Side JavaScript



(b) Server-Side JavaScript

A Short History

- ⑥ Invented at Netscape in 1995, originally called LiveScript
- ⑥ The joint effort of Netscape and Sun Microsystems: the JavaScript support in the Netscape Navigator
- ⑥ Shortly thereafter: Microsoft's JScript
- ⑥ JavaScript and JScript almost identical, but with different underlying object models!
- ⑥ ECMA worked with Netscape and Microsoft to standardize a core to be the same for both JavaScript and JScript
⇒ the ECMAScript standard scripting language

What is a JavaScript?

A scripting language designed for the Web; Its recipe for the fame: the high level of interactivity in Web pages

- ⑥ An object-oriented language, but not to the extend of C++, or Java
- ⑥ A lightweight, interpreted language, like Perl (the regular expressions and arrays)
- ⑥ Untyped, i.e., a variable may exist without specifying its type

In this course

- ⑥ First, the core JavaScript language
- ⑥ Then the web-scripting part of JavaScript

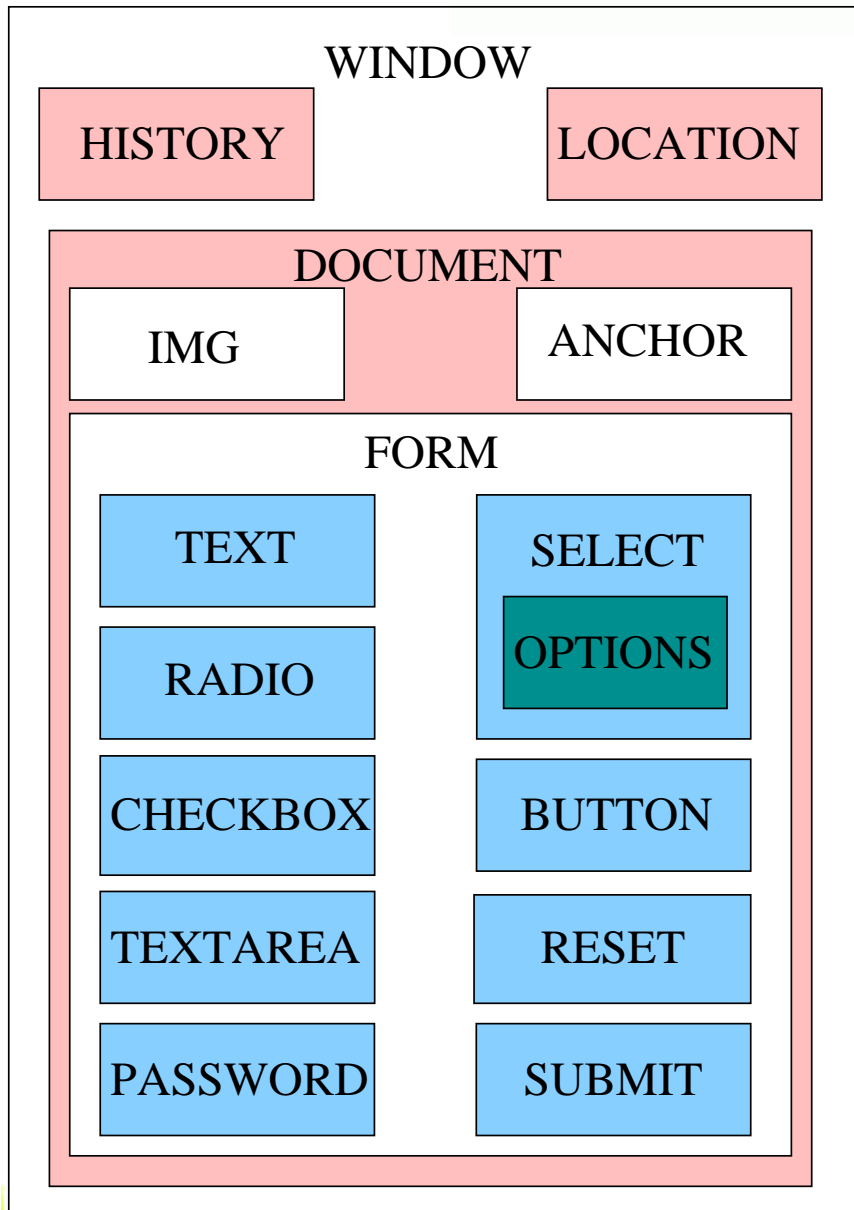
The Document Object Model (DOM)

- ⑥ Netscape's and Internet Explorer's proprietary DOMs
- ⑥ In 2000: Standardized by the W3C as DOM1

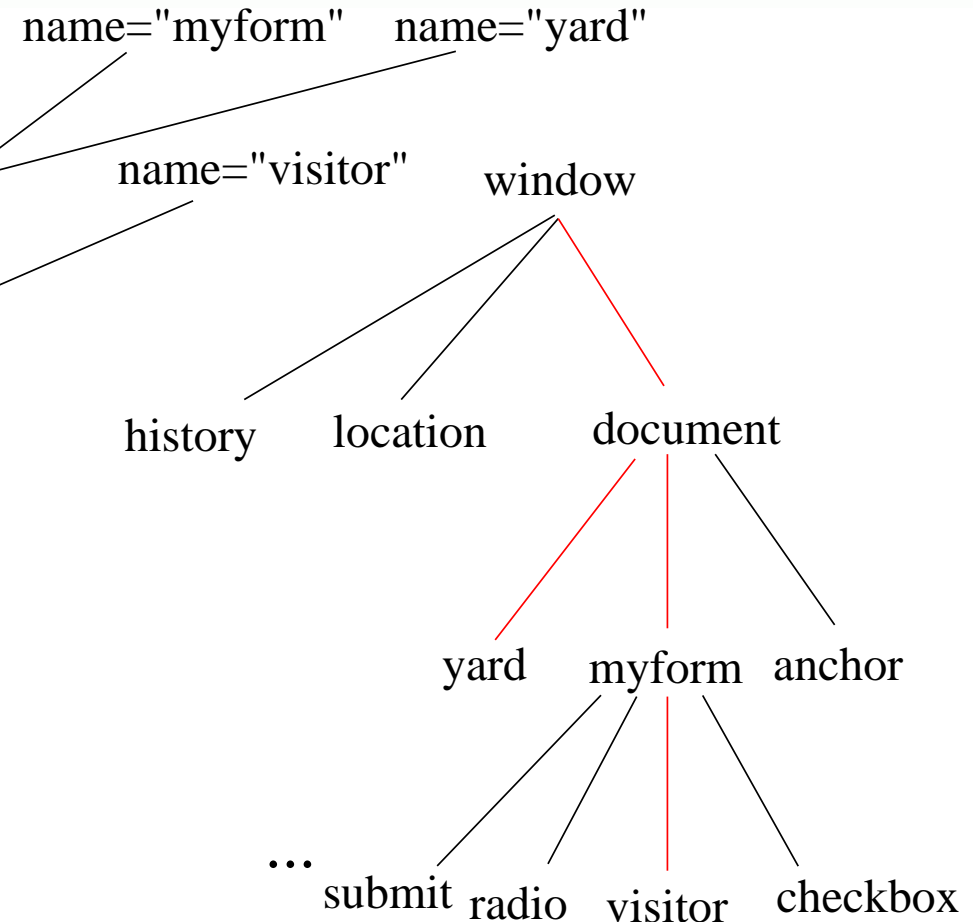
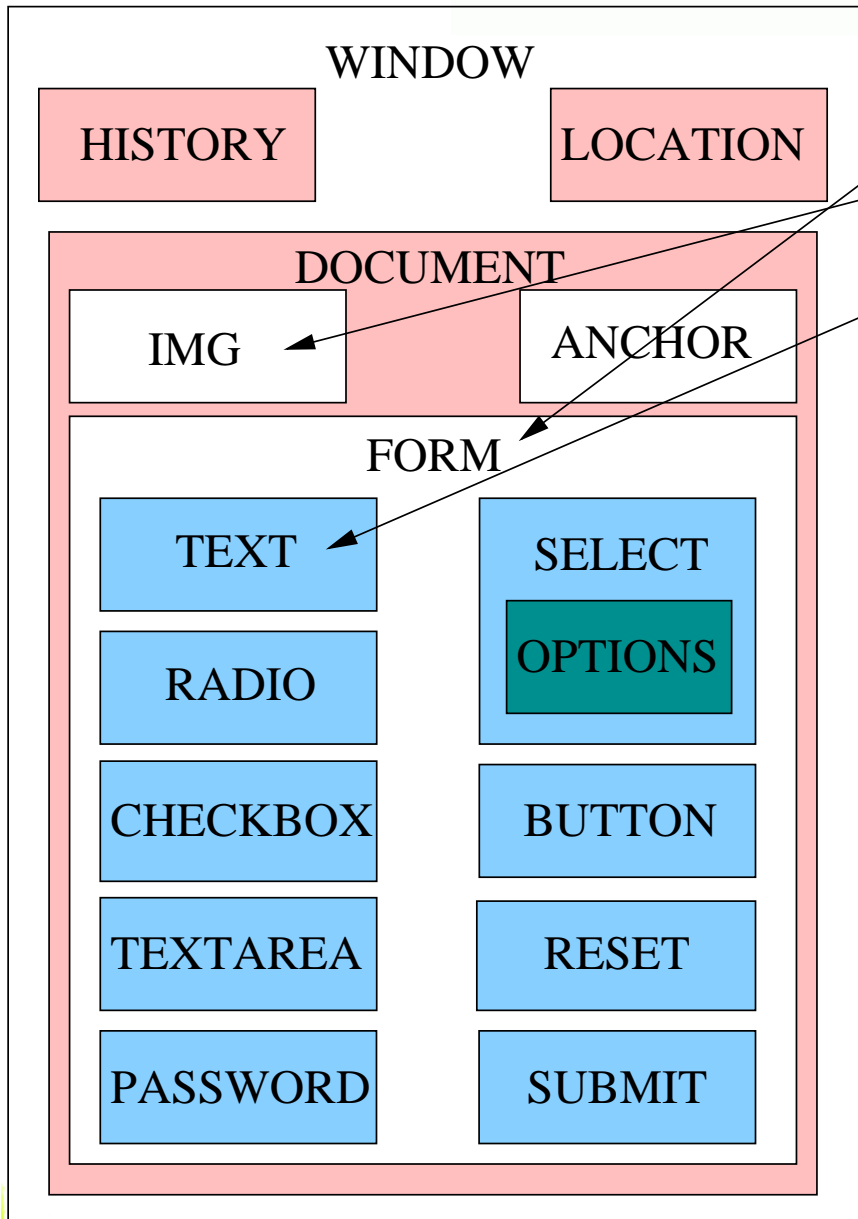
A **hierarchical model** to represent the objects created by a Web browser

- ⑥ What relates Javascript and DOM? All objects within the hierarchy are scriptable
- ⑥ A *dot notation* to walk through the objects in a hierarchy up to the object to be 'scripted'

The DOM Objects



The DOM Tree and JavaScript



`window.document.myform.visitor.value = "Hello"`

`window.document.yard`

`document.all.someObjectName`

`document.getElementById(idValue)`

Properties and Values

- ⑥ Each object might have many associated properties
- ⑥ An example built-in property for the *document* object
`window.document.backgroundColor`
- ⑥ Properties may have values assigned
`window.document.backgroundColor = "yellow"`
- ⑥ The most common use: for generating **rollover** graphics
`document.theYardPhoto.src = "myDog"`
where `src` is a property of the `img` tag object named `theYardPhoto`
- ⑥ When to 'rollover' the image?

Events and Event Handlers

- ⑥ An is an action initiated by the visitor, e.g. mouseover
- ⑥ An event handler is a response action – a code – to events initiated by visitors

```
<html>
<head><title>The rollover effect</title></head>
<body bgcolor="white">
<a href="#"
onmouseover="document.theYardPhoto.src='myDog.jpg';"
onmouseout="document.theYardPhoto.src='yard.jpg';">


</a>
</body>
</html>
```

Lexical Structure

- ⑥ The supported character set is UNICODE (16 bit); ASCII (7 bit) is a subset of UNICODE
- ⑥ Different from HTML, JavaScript is a case-sensitive language
- ⑥ Semicolon at the end of a statement is optional, still a good programming style
- ⑥ Comments with "//", or "/*" and "*/"
- ⑥ Reserved words, like `typeof`, `do`, `while`, `this`, `false`, etc

Variables, Arrays and Methods

- ⑥ Use the keyword `var` to create/initialize a variable
- ⑥ When a variable contains a value, it can be used as a right operand of the assignment operator for the property of an object specified on the left

```
var myBgColor = "red";  
window.document.bgColor = myBgColor;
```

- ⑥ Arrays may be processed recursively using a loop
- ⑥ The actions associated to an object are called methods
`document.write("Hello again");`

Operators

- ⑥ assignment operator ("="):
- ⑥ add-by-value (+=), subtract-by-value (-=)
- ⑥ multiply-by-value (*=), divide-by-value (/=)
- ⑥ concatenation ("+")
- ⑥ comparison operators (equality "==", "<", "<=", "!=", etc.)
- ⑥ boolean expressions (and "&&", or "||", etc.)

```
var yourName = "Joe";  
var yourAge = 25;  
  
yourAge += 5;  
yourAge /= 1;  
yourName += " Dove"; / results in "Joe Dove"  
(10 == 7+2) && (29 >= 30);  
"JavaScript" != "Java";
```

Functions

```
<html><head><title>A basic function</title>
<script type="text/javascript" language="JavaScript">
<!-- Hides scripts from really old browsers.
  function doSomething(){
    var theVisitor = document.myform.visitor.value;
    window.alert("Is this OK, " + theVisitor + "?");
  }
//Ends script hiding -->
</script></head>
<body bgcolor="white">
<p>Please type your name and click the button.</p>
<form name="myform">
<input type="text" size="30" name="visitor"><br>
<input type="button" name="myB" value="Do Something"
  onclick="doSomething();" >
</form></body>
</html>
```


Any Questions?

- ⑥ Next week more on JavaScript and DOM