

Programming on the Web(CSC309F)

Tutorial 5: JAVASCRIPT

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JavaScript

➤ JavaScript vs. JScript:

- Jscript Homepage: <http://msdn.microsoft.com/scripting/default.htm>
- JavaScript Homepage: <http://developer.netscape.com/tech/javascript/index.html>

➤ JavaScript Built-in Data Types:

- Boolean (true or false)
- Null
- Number (double-precision 64-bit format)
- Object (encompassing the Array object)
- String
- Undefined

➤ JavaScript Built-in Objects:

Array ¹	Boolean	Date	Error ²
EvalError ²	Function ¹	Math	Number ¹
Object ¹	RangeError ²	ReferenceError ²	RegExp ³
String ¹	SyntaxError ²	TypeError ²	URIError ²

(1) ECMA Level 1

(2) ECMA Level 2

(3) ECMA Level 3

JavaScript Built-in Objects

➤ String Object:

▪ Properties:

- constructor

length

prototype

▪ Methods:

- charAt(index)
- indexOf(SearchString, StartIndex)
- match(regExpression)
- split(“delimiterCharacter”, limitInteger)
- toLocaleLowerCase()
- toUpperCase()

charCodeAt([index])
lastIndexOf(searchString, StartIndex)
replace(regExpression, replaceString)
substr(start, length)
toLocaleUpperCase()
toString()

concat(string2)
localeCompare(string2)
slice(startIndex, endIndex)
substring(indexA, indexB)
toLowerCase()
valueOf()

▪ Formatting methods:

- anchor(“anchorName”),
- fixed()
- italics()
- small()

blink()
fontcolor(colorValue)
link(locationOrURL)
strike()

bold()
fontsize(integer1-7)
big()
sub(), sup()

▪ Special inline characters:

- \" Double quote
- \\ Backspace
- \\r Carriage return

\\ Single quote
\\t tab
\\f form feed

\\ Blackslash
\\n new line

JavaScript Built-in Objects

➤ Math Object:

▪ Properties:

- | | | |
|------------------------------|--------------------------|-------------------------|
| • E(Euler's constant) | LN2(Natural log of 2) | LN10(natural log of 10) |
| LOG2E(log base-2 of E) | LOG10E(log base-10 of E) | PI |
| SQRT1_2(square root of 0.5) | SQRT2(square root of 2) | |

▪ Methods:

- | | | |
|-----------------------|-------------------------|-----------------------|
| • abs(value) | acos(value) | asin(value) |
| atan(value) | atan2(value1, value2) | ceil(value) |
| cos(value) | exp(value) | floor(value) |
| log(value) | max(value1, value2) | min(value1, value2) |
| pow(value1, value2) | random() | round(value) |
| sin(value) | sqrt(value) | tan(value) |

➤ Number Object:

• Properties:

- | | | |
|---------------|-------------------|-------------------|
| • constructor | MAX_VALUE | MIN_VALUE |
| NaN | NEGATIVE_INFINITY | POSITIVE_INFINITY |
| prototype | | |

▪ Methods:

- | | | |
|--------------------------|------------------|-------------------------|
| • toExponential(value) | toFixed(value) | toLocaleString(value) |
| toString(value) | toPrecision() | valueOf() |

JavaScript Built-in Objects (cont'd)

➤ Boolean Object:

• Properties:

- constructor

prototype

▪ Methods:

- toString(BooleanValue)

valueOf()

➤ Date Object:

▪ Methods:

- getFullYear()
- getDate()
- getMinutes()
- getMilliseconds()
- getUTCDate(value1, value2)
- getUTCMinutes()
- setYear(value)
- setDate(value)
- setSeconds(value)
- setUTCFullYear(value)
- setUTCHours(value)
- setUTCMilliseconds(value)
- toGMTString()
- toString()
- parse("a date string"

getFullYear()
getDay()
getSeconds(value)
getUTCFullYear(value1, value2)
getUTCDay()
getUTCSeconds()
setFullYear(value)
setHours(value)
setMilliseconds(value)
setUTCMonth(value)
setUTCMinutes(value)
getTimezoneOffset()
toLocaleString()
toTimeString()
UTC(date values)

getMonth()
getHours()
getTime(value)
getUTCMonth(value1, value2)
getUTCHours(value)
getUTCMilliseconds()
setMonth(value)
setMinutes(value)
setTime(value)
setUTCDate(value)
setUTCSeconds(value)
toDateString()
toLocaleTimeString()
toUTCString()

JavaScript Built-in Objects (cont'd)

➤ Array Object:

• Properties:

- constructor

prototype

▪ Methods:

- concat(array2)

push(value or Object)

reverse()

splice(StartIndex, DeleteCount, item)

join(SeparatorString)

shift()

slice(StartIndex , EndIndex)

toLocaleString

pop()

unshift()

sort(compareFunction)

toString()

JavaScript Control Structures

➤ If... Else:

```
var boolChecked = new Boolean( true );  
if( boolChecked.valueOf( ) ){  
}
```

➤ for Loops:

```
var nIndex, nCount = 10;  
for( var nIndex= 0; nIndex < nCount ; nIndex++ ) {  
    // statements  
}
```

➤ while Loops:

```
var nIndex, nCount = 10;  
while( nIndex < nCount ) {  
    // statements  
    nIndex++;  
}
```

➤ do-while Loops:

```
var nIndex, nCount = 10;  
do{  
    // statements  
    nIndex++;  
} while(nIndex < nCount )
```

➤ with Statement:

```
function seeColor( form )  
    with( form.colorsList ){  
        newColor = (options[selectedIndex].text);  
    }  
}
```

➤ switch Statement:

```
switch( nPrice ){  
    case 10:    // statements  
                break;  
    case 20:    // statements  
                break;  
    default:    // statements  
}
```

JavaScript Operators

➤ Comparison Operators:

`==` , `!=` , `===` (strictly equals), `!==` (strictly does not equal), `>` , `>=`, `<` , `<=`

➤ Arithmetic Operators:

`+`, `-`, `*`, `/`, `%` (module), `++`, `--`, `+value`, `-value`

➤ Assignment Operators:

`=`, `+=`, `-=`, `*=`, `/=`, `%=`, `<<=`, `>=`, `>>=`, `>>>=`, `&=`, `|=`, `^=`

➤ Boolean Operators:

`&&`, `||`, `!`

➤ Bitwise Operators:

`&`, `|`, `^`, `~`, `<<`, `>>`, `>>>`

➤ Object Operators:

`delete`, `in`, `instanceof`, `new`, `this`

➤ Other Operators:

`typeof`, `void`

JavaScript Global Functions and Statements

➤ Global Functions:

- `decodeURI( “encodedURI” )`
- `decodeURIComponent(“encodedURIComponent” )`
- `encodeURI( “URIString” )`
- `encodeURIComponent( “URIComponentString” )`
- `escape( “URIString” )`
- `unescape( “escapedURIString” )`
- `eval( “string” )` // evaluate any JavaScript statement or expression stored as string
- `isFinite( number )` // checks if number is beyond JavaScript ability to handle
- `isNaN( expression )` // tests whether a value is a number or not
- `Number( “string” )` // converts a string to a numeric value
- `parseFloat( “string” )` // converts a string to a float
- `parseInt( “string” , radix )` // converts a string to an integer
- `toString( )` // returns a string representation
- `unwatch( )` // for debugging purposes
- `watch( )` // for debugging purposes

➤ Statements:

- `const` // e.g. `const FREEZING_F = 32;`
- `var` // e.g.: `var temperature = 32;`
- `// comments`

JavaScript Events

Event	Supported By
OnAbort	Image
OnBlur	Button, Checkbox, FileUpload, Layer, Password, Radio, Reset, Select, Submit, Text, TextArea, Window.
OnChange	Select, text, input elements
OnClick	Select, text, input elements
onDbClick	Document, image button elements, Link
onDragDrop	Window elements
onError	Image, Window
onFocus	Button, Checkbox, FileUpload, Password, Radio, Reset, Select, Submit, Text, TextArea, Window.
onKeyDown	Document, Image, Link, TextArea.
onKeyPress	Document, Image, Link, TextArea
onKeyUp	Document, Image, Link, TextArea
onload	Image, Window.
onMouseDown	Button, Document, Link
onMouseOut	Layer, link, image
onMouseOver	Layer, link, image
onMouseUp	Document, image, button elements, link
onMove	Window
onReset	Form
onResize	Window
onSelect	Text, textarea
onSubmit	Form
onUnload	Window

JavaScript – Applet Communication

➤ test.html

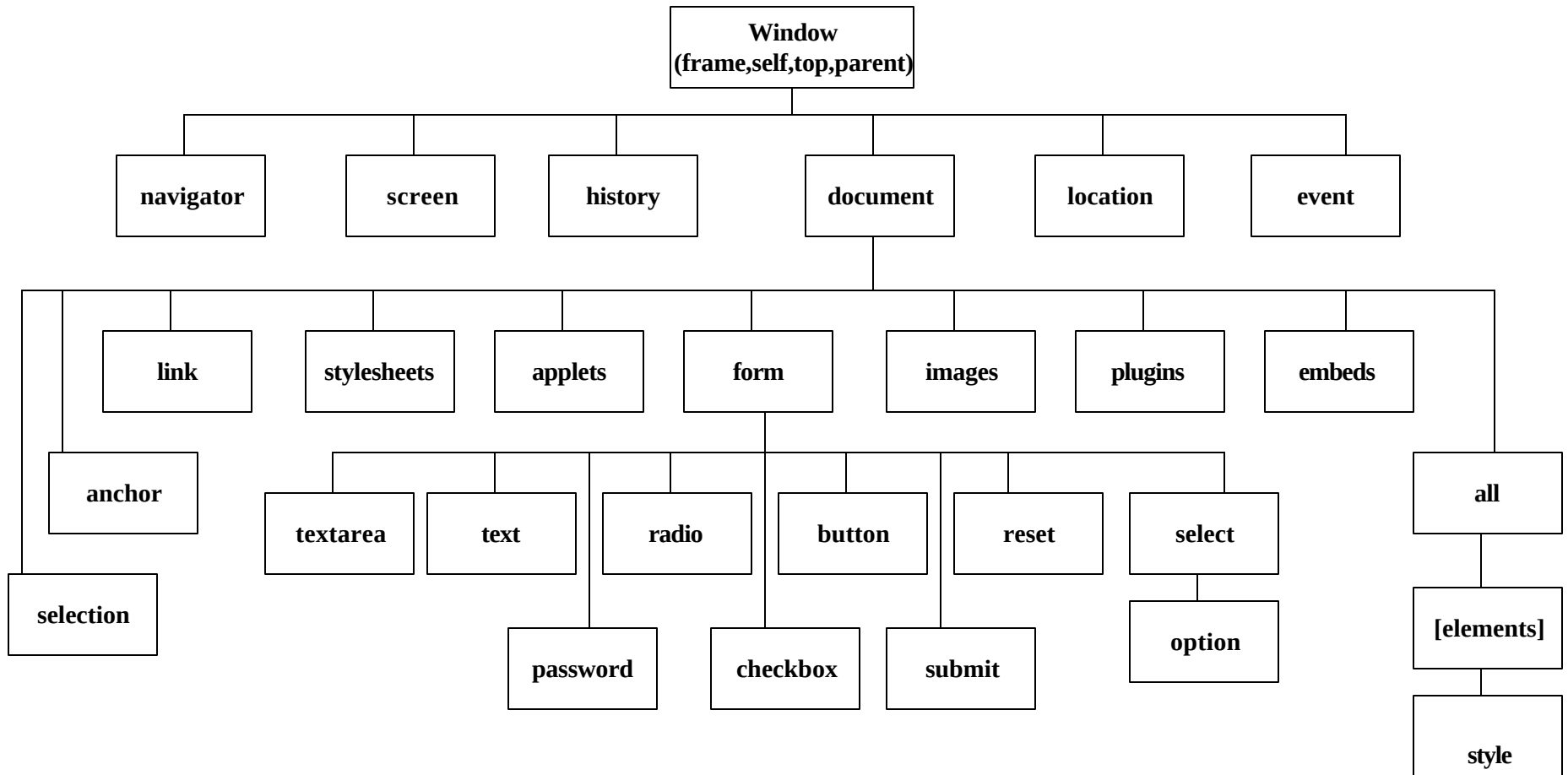
```
<html>
<head><title>test</title></head>
<body>
  <h1>This is a test of applets</h1>
  <hr></hr>
  <applet name="testapplet" code="TestApplet.class" height="300" width="300">
    <param name="text" value="Grizzly Dave!"></param>
    Text displayed by non-java enabled browsers
  </applet>
  <hr></hr>
  <form>
    <input type="button" onclick="alert(document.testapplet.getText())" value="Get Data From Applet">
  </form>
</body>
</html>
```

➤ TestApplet.java

```
import java.applet.*;
import java.awt.*;

public class TestApplet extends Applet {
  String text = "error";
  public void init() {
    text = getParameter("text");
  }
  public void paint(Graphics g) {
    g.drawString(text,50,50);
  }
  public String getText() {
    return text;
  }
}
```

DOM Hierarchy



Sites:

➤ JavaScript

- <http://developer.netscape.com/docs/manuals/javascript.html>
- <http://www.gatescript.com/>
- http://www.devguru.com/Technologies/ecmascript/quickref/javascript_intro.html
- <http://webdeveloper.earthweb.com/webjs/>
- <http://www.jsworld.com/>

➤ Dynamic HTML

- <http://www.dynamicdrive.com/>
- <http://www.htmlguru.com/guru.html>
- <http://www.w3schools.com/dhtml/>