



CSC309: Introduction to Web Programming

Lecture 5

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Debugging

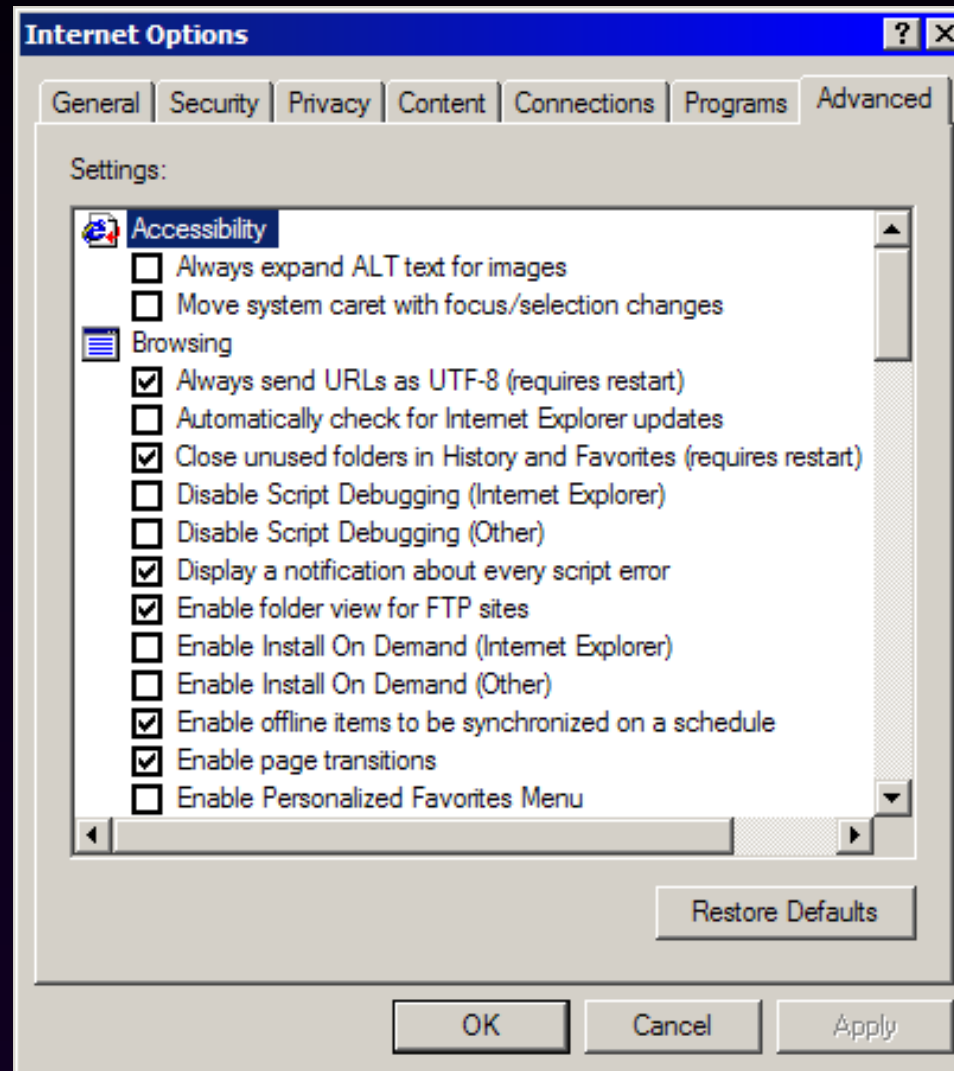
- IE
 - Microsoft Script Debugger
 - Office 2003
 - Visual Studio
 - Mozilla
 - Venkman
 - Firebug
 - Safari
 - Drosera
-



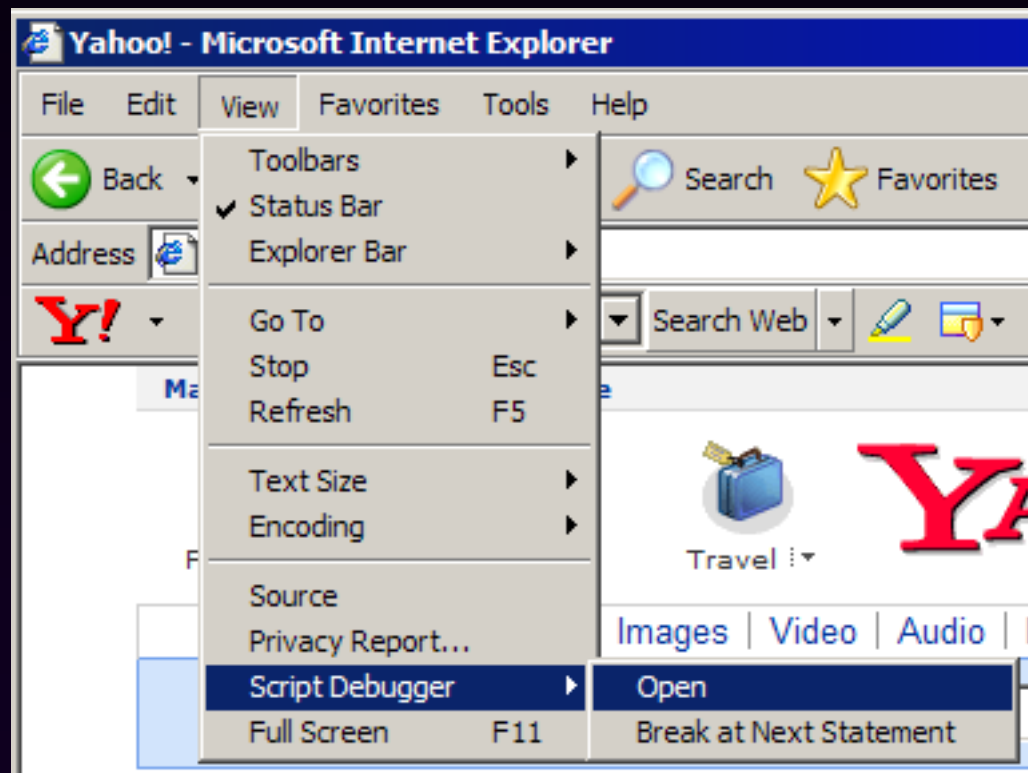
Microsoft Script Debugger

The screenshot shows the Windows 'Add or Remove Programs' control panel window. The 'Currently installed programs' list includes various software like iTunes, J2SE Development, Java 2 Runtime Env, LiveUpdate 2.0, Macromedia Extens, Macromedia FreeHa, MacromediaDreamv, Microsoft .NET Fran, Microsoft Office Pro, Microsoft Office, and Mozilla Firefox (1.5). A dialog box titled 'Microsoft Office 2003 Setup' is overlaid on top, showing the 'Advanced Customization' screen. The dialog box title bar reads 'Microsoft Office 2003 Setup' and the window size is 27.43MB. The main heading is 'Microsoft Office Standard Edition 2003' with the Microsoft Office logo. Below this, it says 'Advanced Customization'. The primary instruction is 'Choose update options for applications and tools.' A tree view shows 'Office Tools' expanded, with the following items and their selection status: 'Microsoft Forms 2.0 .NET Programmability Support' (unchecked), 'Smart Tag .NET Programmability Support' (unchecked), 'Microsoft Office Picture Manager' (checked), 'Equation Editor' (checked), 'Document Update Utility' (checked), 'HTML Source Editing' (checked), 'Web Scripting' (checked), and 'Web Debugging' (checked). Below the tree view, there is a 'Description' section: 'Office programs, plus additional content and tools.' At the bottom right, it indicates 'Space Required on C: 1444 KB' and 'Space Available on C: 23 GB'. At the bottom of the dialog box are buttons for 'Help', '< Back', 'Update', and 'Cancel'.

Microsoft Script Debugger



Microsoft Script Debugger





Microsoft Script Debugger

The screenshot shows the Microsoft Script Debugger interface. The main window displays the source code of a JavaScript script. A red line indicates the error location at line 5: `var now=new Date, t1=0, t2=0, t3=0, t4=0, t5=0, t6=0, cc=' ', ylp=''; t1=now.getTime();`. The error message is "SyntaxError: Unexpected token".

The **Locals** window shows the following variables:

| Name | Value | Type |
|--------|------------------|--------|
| window | {...} | Object |
| err | {...} | Object |
| now | Fri Mar 24 10:46 | Object |
| t1 | 1143225966085 | Double |
| t2 | 0 | Long |
| t3 | 0 | Long |
| t4 | 0 | Long |
| t5 | 0 | Long |
| t6 | 0 | Long |
| cc | " " | String |
| ylp | " " | String |

The **Watch** window shows the following variables:

| Name | Value | Type |
|----------|-------------------------|--------|
| location | {...} | Object |
| href | "http://www.yahoo.com/" | String |
| protocol | "http:" | String |
| host | "www.yahoo.com" | String |
| hostname | "www.yahoo.com" | String |
| port | " " | String |
| pathname | "/" | String |
| search | " " | String |
| hash | " " | String |
| this | {...} | Object |

The **Call Stack** window shows the following call stack:

| Name | Lang |
|---------------------|---------|
| JScript global code | JScript |

The **Command Window - Immediate** shows the following output:

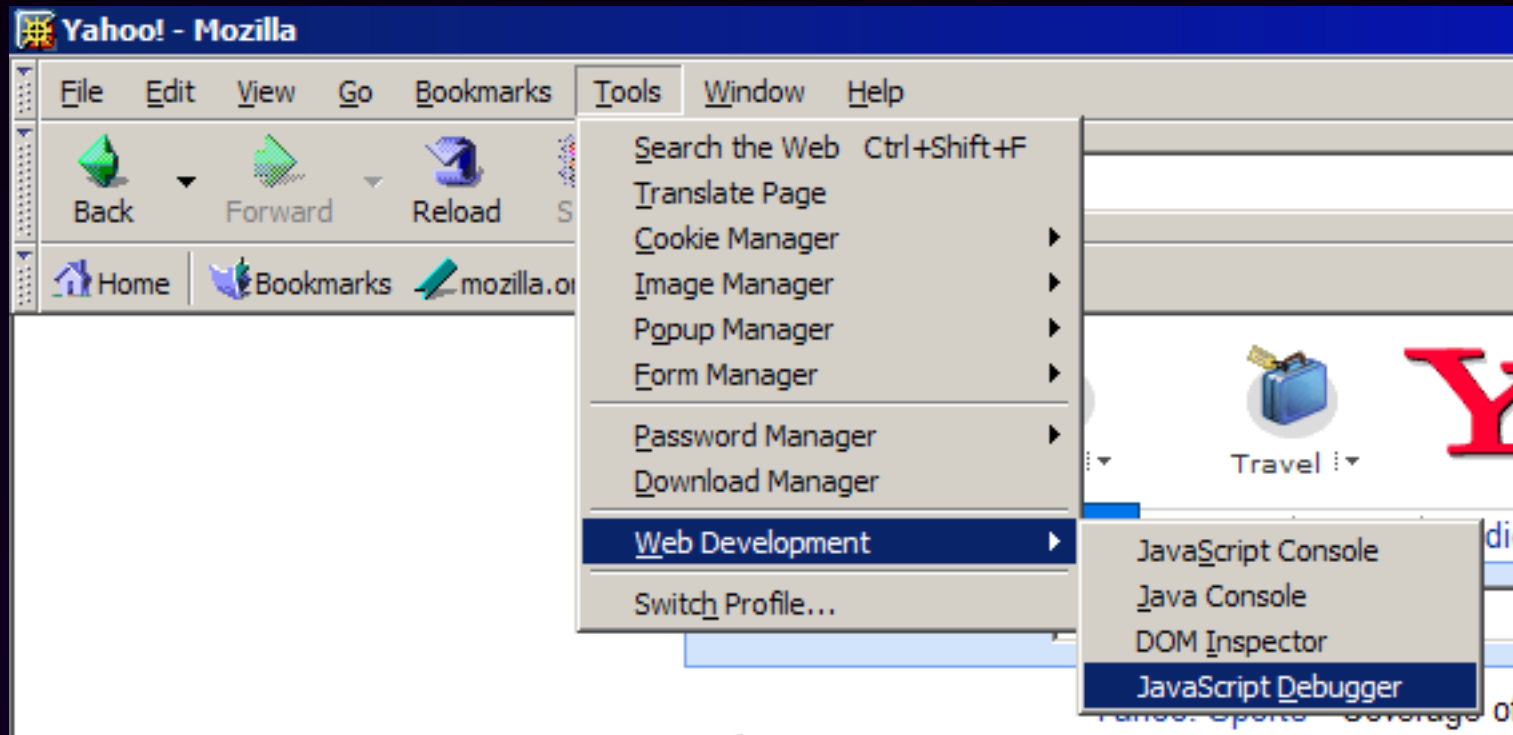
```
t1  
1143225966085
```

Venkman





Venkman





Venkman

The screenshot shows the JavaScript Debugger interface with the following components:

- Loaded Scripts:** A list of scripts including `http://www.yahoo.com/`, `ult3_1.3.js`, `XStringBundle`, and `y_1.9.0.js`.
- Local Variables:** A table showing the current scope and variables:

| Name | Value |
|-------|-----------------------------------|
| scope | {Call} |
| a | "FPB=ur1hk95qa1228jss; B=0c13..." |
| c | "CRZY9" |
| e | 58 |
| s | 55 |
| v | {Array} |
| this | {Window} |
- Source Code:** The code for the `getCook` function is displayed. Line 519, `return parseInt(v[1]);`, is highlighted in yellow and marked with a red 'B' for breakpoint.
- Call Stack:** Shows the current call stack with `getCook` at `http://www.yahoo.com/, line 519, pc 139` and `__toplevel__` at `http://www.yahoo.com/, line 521, pc 233`.
- Interactive Session:** A console window showing the execution flow, including the breakpoint at line 519 and the subsequent execution of `return parseInt(v[1]);`.



Debugging

- Check the browser's error console message
- With Firefox
 - Check the DOM in Venkman (or Firebug)
 - Use `console.log("message");` to write to the console



Coding Efficiency Tips

- Common subexpression removal
- Loop invariant removal



Before

```
for (var i = 0; i < divs.length; i += 1) {  
  divs[i].style.color = "black";  
  divs[i].style.border = thickness +  
    'px solid blue';  
  divs[i].style.backgroundColor = "white";  
}
```



After

```
var border = thickness + 'px solid blue',  
    nrDivs = divs.length;  
  
for (var i = 0; i < nrDivs; i += 1) {  
    var ds = divs[i].style;  
    ds.color = "black";  
    ds.border = border;  
    ds.backgroundColor = "white";  
}
```



Strings

- Concatenation with +
Each operation allocates memory

```
foo = a + b;
```

- Concatenate with array.`join('')`
The contents of an array are concatenated into a single string

```
foo = [a, b].join('');
```



Minification vs Obfuscation

- Reduce the amount of source code to reduce download time.
- Minification deletes whitespace and comments.
- Obfuscation also changes the names of things.
- Obfuscation can introduce bugs.



`<script></script>`

- Script files can have a big impact on page loading time.
1. Place `<script src>` tags as close to the bottom of the body as possible. (Also, place CSS `<link>` as high in the head as possible.)
 2. Minify and gzip script files.
 3. Reduce the number of script files as much as possible.
-



`<script></script>`

- `<!-- // -->`
Hack for Mosaic and Navigator 1.0.
 - `language=javascript`
Deprecated.
 - `type=text/javascript`
Ignored.
 - `src=URL`
Highly recommended.
Don't put code on pages.
-