

CIS 4004: Web Based Information Technology Spring 2011

Introduction To JavaScript – Part 1

Instructor : Dr. Mark Llewellyn
markl@cs.ucf.edu
HEC 236, 407-823-2790
<http://www.cs.ucf.edu/courses/cis4004/spr2011>

Department of Electrical Engineering and Computer Science
University of Central Florida



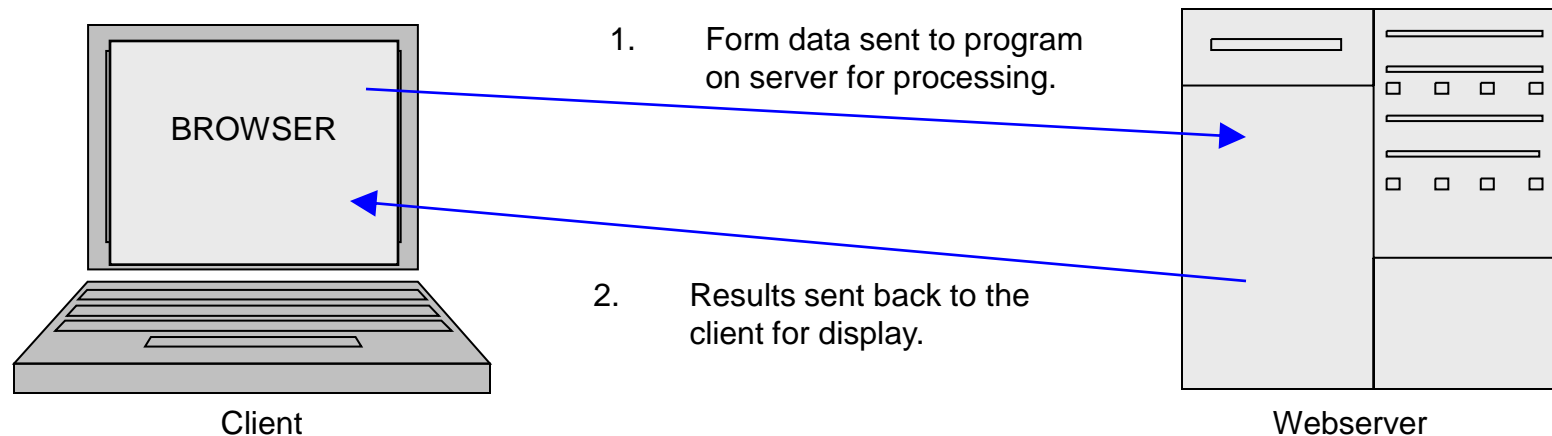
Introduction to JavaScript

- Before we go any further let's get one thing very clear: JavaScript is **not** Java!
- JavaScript is a **scripting** language. (XHTML is a mark-up language.)
- JavaScript was originally developed by Brendan Eich of Netscape under the name *Mocha*, later renamed to *LiveScript*. The change of name from LiveScript to JavaScript occurred in a co-marketing deal between Netscape and Sun in exchange for Netscape bundling Sun's Java runtime environment with their browser, which was the dominate browser at the time. The key design principles in JavaScript are inherited from the Self programming language, although JavaScript copies many of the names and naming conventions of Java and shares a common C-like syntax with Java. To avoid trademark issues, Microsoft named its dialect of the language Jscript. Netscape submitted JavaScript to ECMA International (European Computer Manufacturer's Association) for standardization resulting in the standardized version named ECMAScript.
- Using JavaScript, you can incorporate techniques and effects that will make your Web pages come alive for the visitor allowing them a great deal of interaction with your site.
- We'll examine many aspects of JavaScript as we go along, but first some background material.



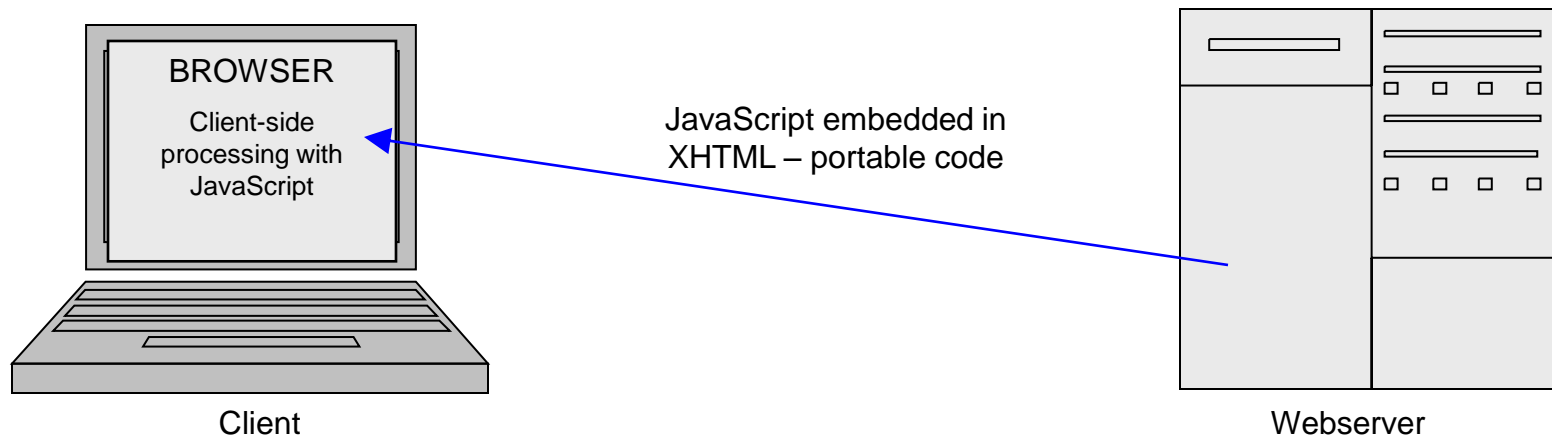
Server-side and Client-side Programming

- Server-side scripts are programs that reside on a Web server and are executed on behalf of a client (in response to their requests typically from elements in Web pages).
 - For example, in a future assignment you will be utilizing a server-side script (written in PHP which is also a server-side scripting language) to process the contents of your XHTML form.



Server-side and Client-side Programming

- Client-side scripts are programs that reside on the client's machine (they are downloaded to your machine as part of the Web browser's cache memory) and are executed on behalf of the client's request.

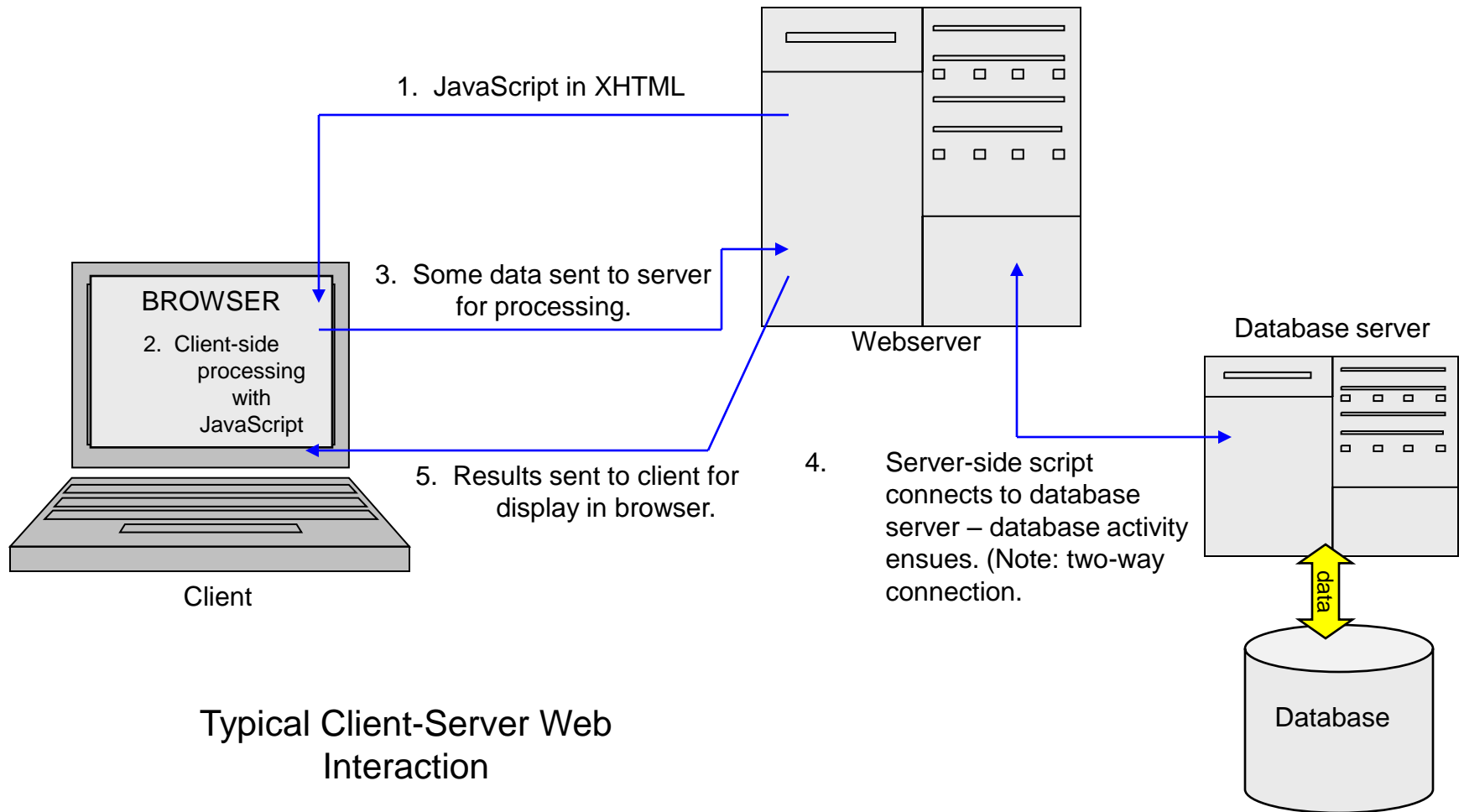


Server-side and Client-side Programming

- While there are certain advantages to client-side scripting, client-side programs can never completely replace server-side scripts.
- Tasks such as running a database search, or processing a purchase order form, or e-commerce situations must be run from a central server because only the server has connections to the databases needed to complete these types of operations.
- Indeed one of the primary reasons for using a server-side scripting language is to develop interactive Web sites that communicate with a database.
- With this in mind a more realistic picture of typical client-server interaction is shown on the next page where both client-side and server-side processing are occurring in parallel.



Server-side and Client-side Programming



Typical Client-Server Web Interaction



Server-side and Client-side Programming

- JavaScript is a client-side object-oriented scripting language that is interpreted by a Web browser.
- JavaScript is considered object-oriented because it is used to work with the objects associated with a Web page document: the browser window, the document itself, and the elements such as forms, images, and links contained within the page.



How To Use JavaScript

- JavaScript is designed to work inside Web pages and within Web browsers. In this spirit, it extends the XHTML philosophy of using tags.
- The `<script>` tag is used to embed JavaScript in XHTML documents.
- The `<script>` tag can appear either in the HEAD or BODY sections of an XHTML document.
- Comments within the `<script>` tag, i.e., JavaScript comments begin with `/*` and end with `*/`. If the comment fits on a single line you can use `//` to start the comment with no ending delimiter.

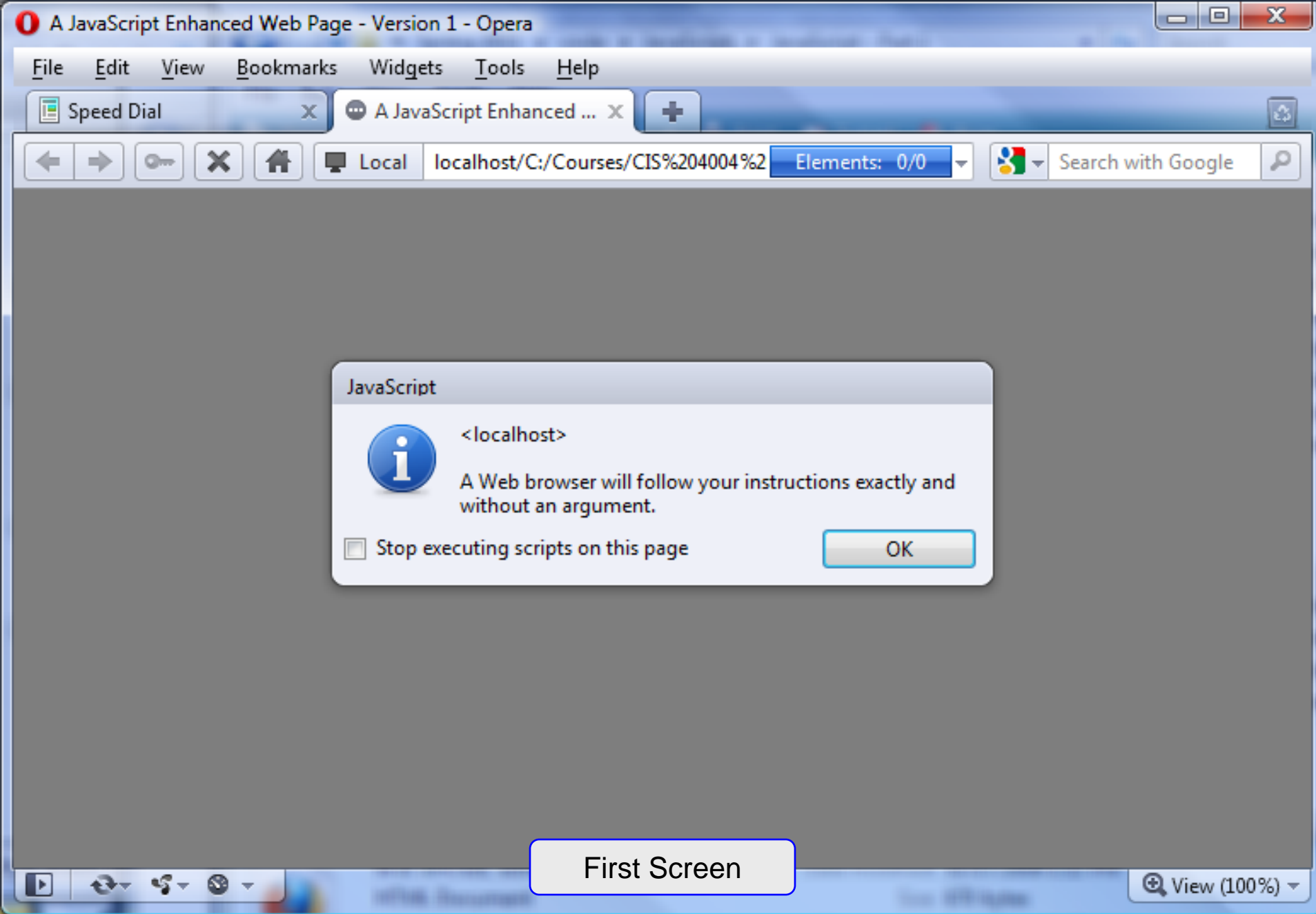


A JavaScript Enhanced Web Page – Version 1

The JavaScript appearing in the HEAD of the XHTML document.

```
1 <?xml version="1.0" encoding="UTF-8" standalone="no"?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4 <html xmlns="http://www.w3.org/1999/xhtml">
5 <head>
6 <title> A JavaScript Enhanced Web Page - Version 1 </title>
7 <script type="text/javascript">
8   //this script simply pops up an alert window.
9   window.alert("A Web browser will follow your instructions exactly and without an argument
10 </script>
11 <style type="text/css">
12   <!--
13     body {background-color:yellow; }
14   -->
15 </style>
16 </head>
17 <body>
18   <h1>Isn't it nice how computers do what they are told?</h1>
19 </body>
20 </html>
21
```

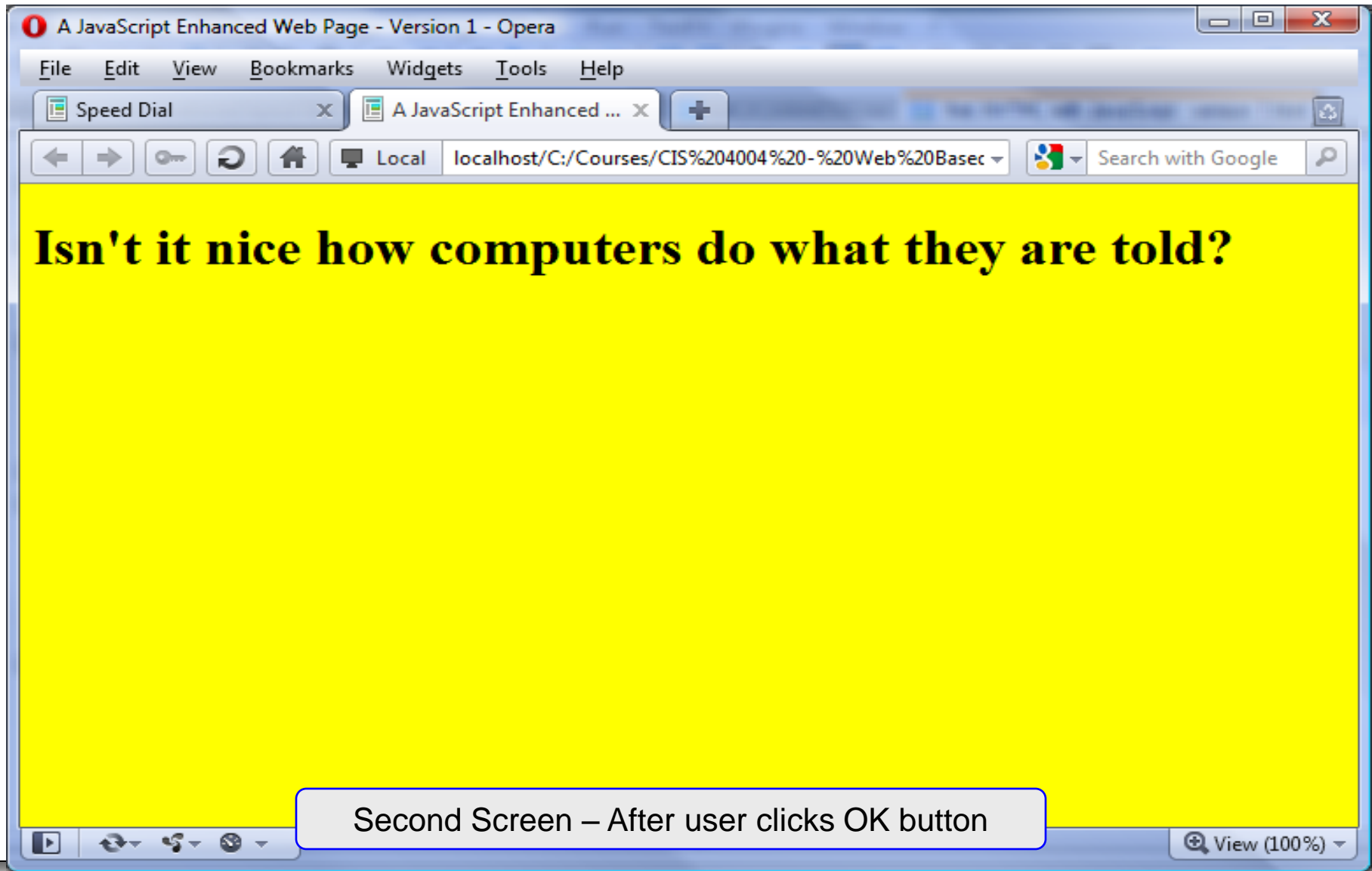




First Screen



A JavaScript Enhanced Web Page – Version 1



Second Screen – After user clicks OK button



About The First Version Of The Example

- When you render the XHTML document that contains the JavaScript script on page 9, notice that the initial screen the user sees is the one with the JavaScript pop-up window that contains the line of text that appears in line 9 of the XHTML document on page 9. Notice that the main window has a white background.
- Once the user clicks the OK button in the alert window, the pop-up window disappears and is replaced by the contents of the `<body>` element in the document.
- This is because elements that appear in the `<head>` element of an XHTML document are executed before the elements that appear in the `<body>` of the document.
- Would it make any difference if the elements inside the head element appeared in a different order? {Answer: No!}

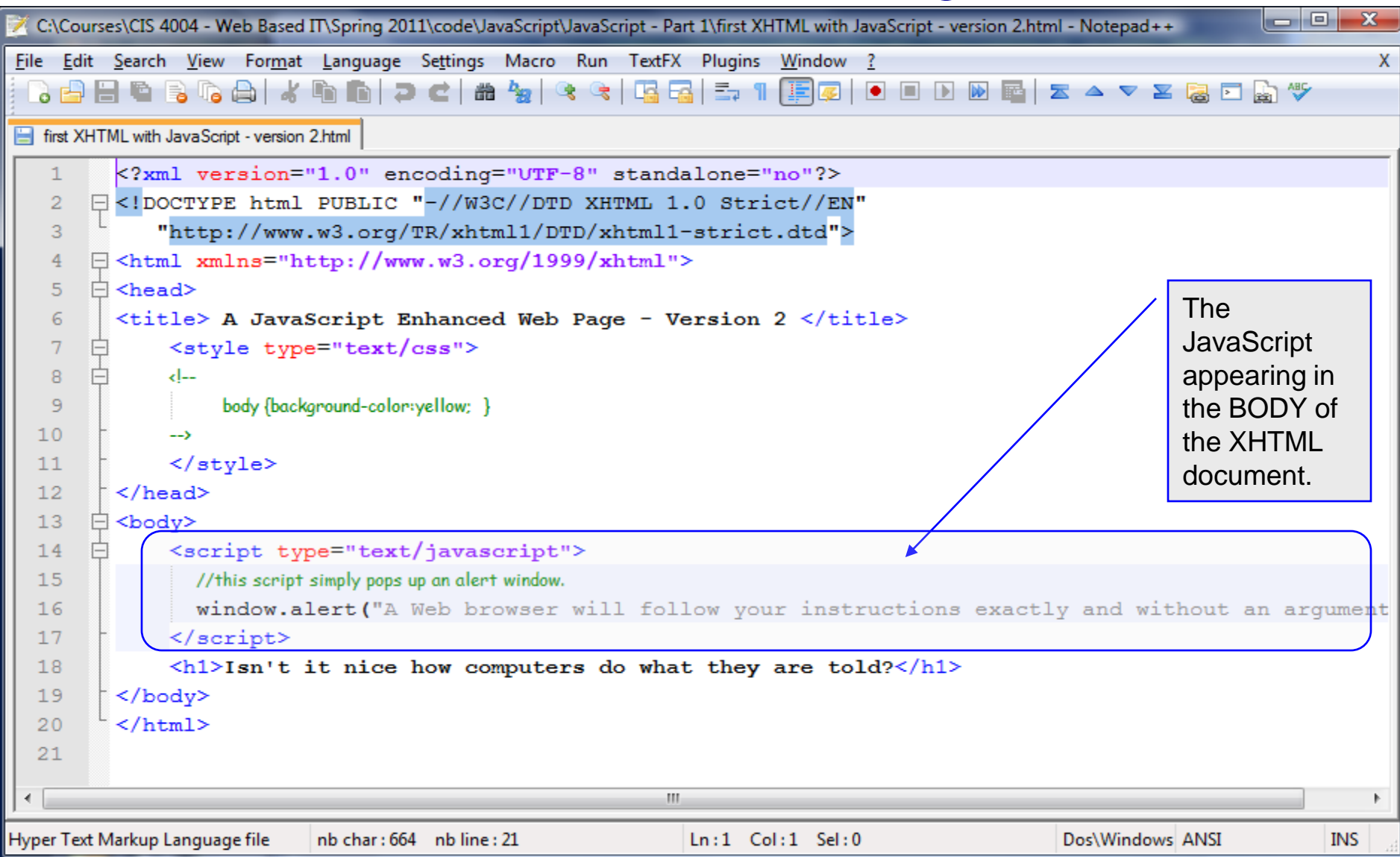


About The First Version Of The Example

- The second version of this document, shown on the next page, is designed with the JavaScript script inside the `<body>` element.
- Notice in the markup that the `<h1>` element appears after the JavaScript script.
- What do you expect will happen with the rendering by the browser?
 - What will appear first, the alert window or the `<h1>` element?
 - What color will the background be when the alert window appears?



A JavaScript Enhanced Web Page – Version 2



The screenshot shows a Notepad++ window titled "first XHTML with JavaScript - version 2.html". The code is as follows:

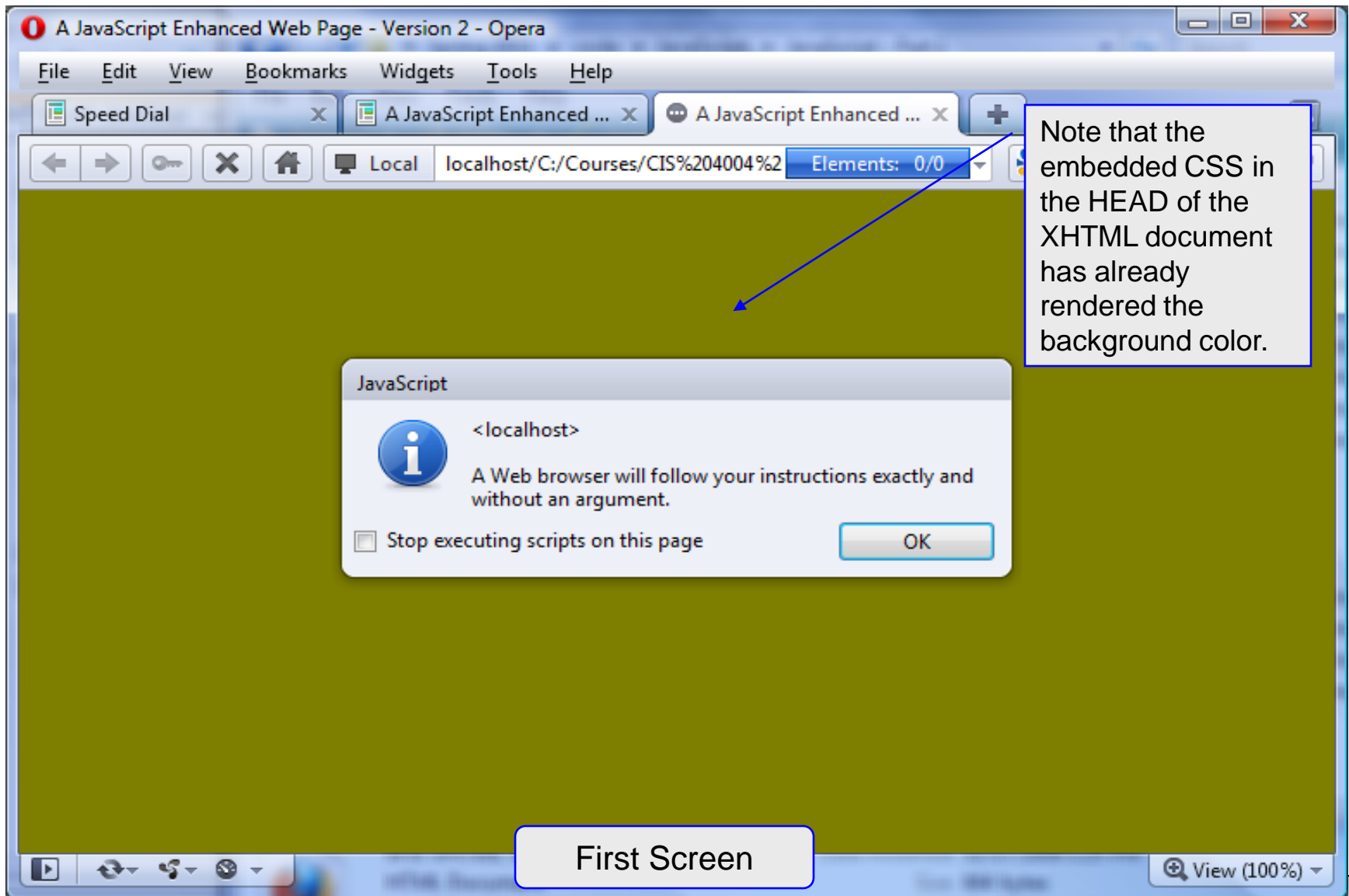
```
1 <?xml version="1.0" encoding="UTF-8" standalone="no"?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4 <html xmlns="http://www.w3.org/1999/xhtml">
5 <head>
6 <title> A JavaScript Enhanced Web Page - Version 2 </title>
7 <style type="text/css">
8 <!--
9   body {background-color:yellow; }
10 -->
11 </style>
12 </head>
13 <body>
14 <script type="text/javascript">
15   //this script simply pops up an alert window.
16   window.alert("A Web browser will follow your instructions exactly and without an argument
17 </script>
18 <h1>Isn't it nice how computers do what they are told?</h1>
19 </body>
20 </html>
21
```

A blue box highlights the JavaScript code block (lines 14-17). A blue arrow points from this box to a separate box on the right containing the text: "The JavaScript appearing in the BODY of the XHTML document."

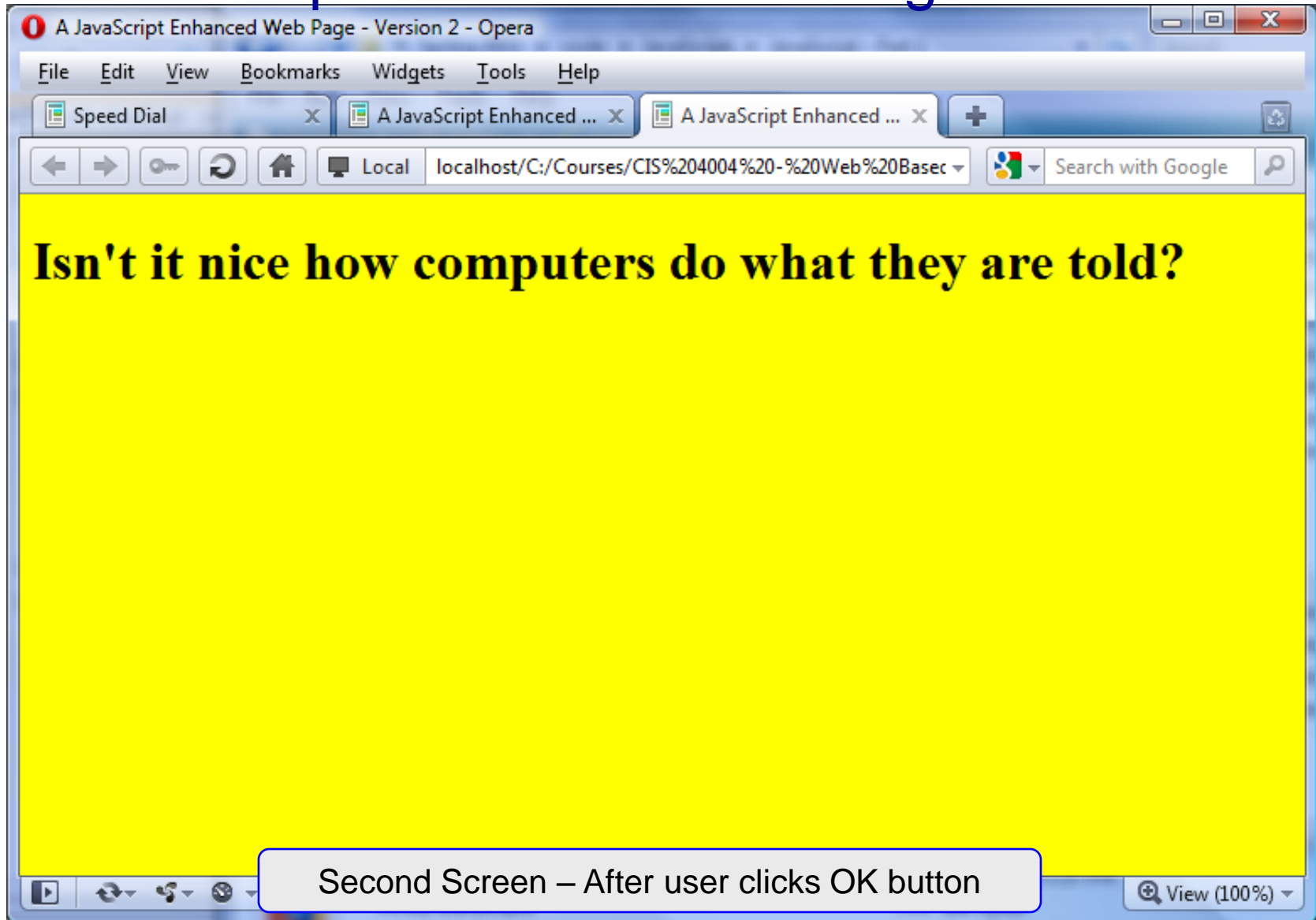
Hyper Text Markup Language file nb char : 664 nb line : 21 Ln : 1 Col : 1 Sel : 0 Dos\Windows ANSI INS



A JavaScript Enhanced Web Page – Version 2



A JavaScript Enhanced Web Page – Version 2



A Third Version Of The Example

- For the third version of this example of markup containing a JavaScript script, let's rearrange the elements in the body of the document so that the `<h1>` element appears before the `<script>` element.
- What effect will this have on the rendering?
 - Does the alert window appear before the text in the `<h1>` element or after it, or at the same time as it?



A JavaScript Enhanced Web Page – Version 3

```
C:\Courses\CIS 4004 - Web Based IT\Spring 2011\code\JavaScript\JavaScript - Part 1\first XHTML with JavaScript - version 3.html - Notepad++
File Edit Search View Format Language Settings Macro Run TextFX Plugins Window ?
first XHTML with JavaScript - version 2.html first XHTML with JavaScript - version 3.html
1 <?xml version="1.0" encoding="UTF-8" standalone="no"?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3 "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4 <html xmlns="http://www.w3.org/1999/xhtml">
5 <head>
6 <title> A JavaScript Enhanced Web Page - Version 3</title>
7 <style type="text/css">
8 <!-- body {background-color:yellow; }
9 -->
10 </style>
11 </head>
12 <body>
13 <h1>Isn't it nice how computers do what they are told?</h1>
14 <script type="text/javascript">
15 //this script simply pops up an alert window.
16 window.alert("A Web browser will follow your instructions exactly and without an argument
17 </script>
18 </body>
19 </html>
20
Hyper Text Markup Language file nb char : 663 nb line : 20 Ln : 1 Col : 1 Sel : 0 Dos\Windows ANSI INS
```

The JavaScript appearing in the BODY of the XHTML document, but after the line of text.



A JavaScript Enhanced Web Page – Version 3

Isn't it nice how computers do what they are told?

JavaScript

<localhost>

A Web browser will follow your instructions exactly and without an argument.

Stop executing scripts on this page

OK

Note that the line of text appears at the same time as the alert window (actually it appears first, but is very rapidly followed by the alert window since it is rendered in normal flow).

The Only Screen

View (100%)

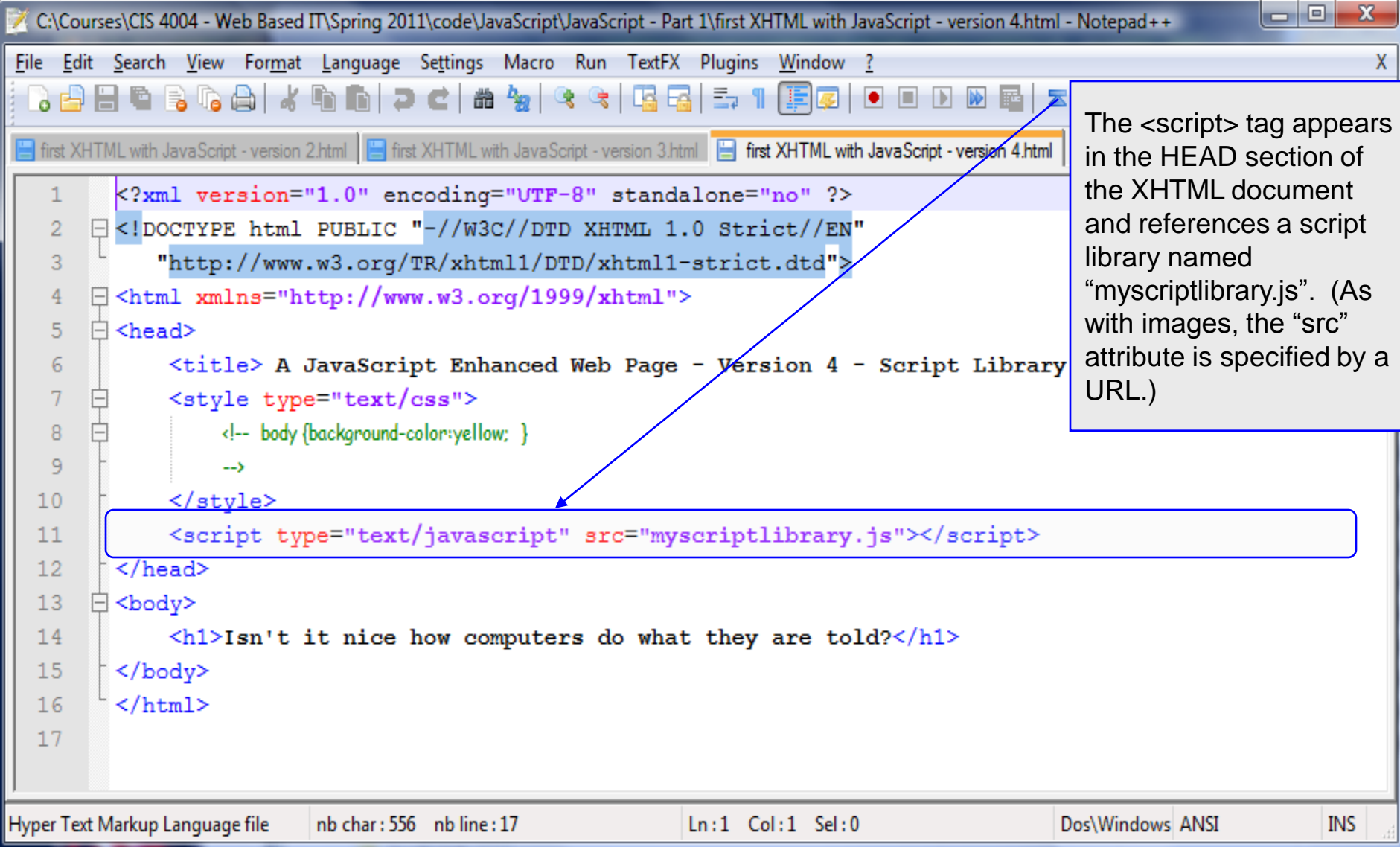


How To Use JavaScript

- In keeping with the modern convention of separating content from presentation in Web pages, another very common technique for locating scripts is to place them in a file external to the XHTML document in which they will be activated.
- As we did with CSS, where one external style sheet could be used by several different XHTML documents to style their presentation, we can do the same with scripts.
- By creating a library (a file) of scripts in an external file and linking the XHTML pages to the library any XHTML document can utilize any of the scripts in the library.
- The next couple of pages we'll rework the same example, but this time use an external library for the script itself.



A JavaScript Enhanced Web Page – Version 4

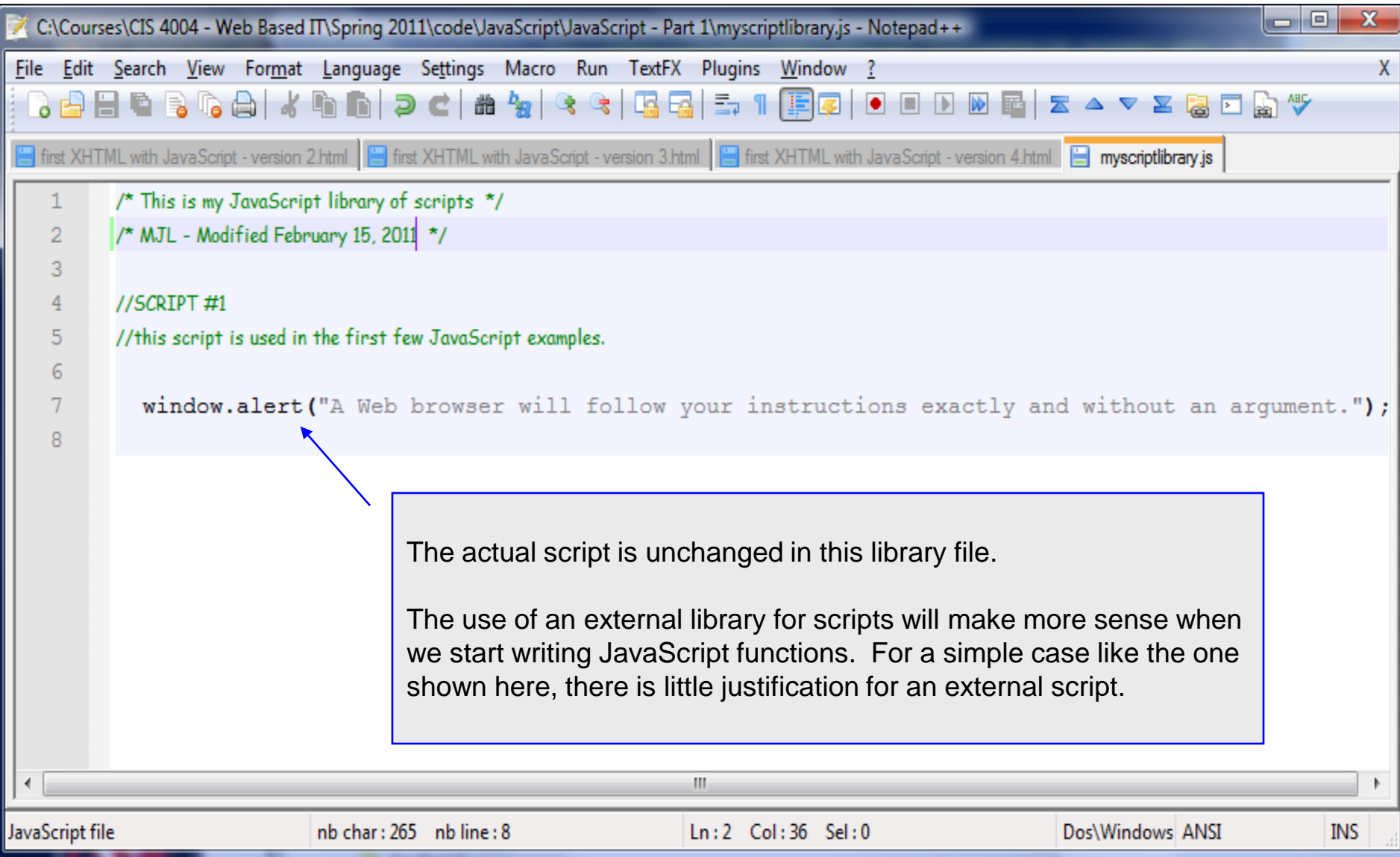


```
1 <?xml version="1.0" encoding="UTF-8" standalone="no" ?>
2 <!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
3   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
4 <html xmlns="http://www.w3.org/1999/xhtml">
5 <head>
6   <title> A JavaScript Enhanced Web Page - Version 4 - Script Library
7   <style type="text/css">
8     <!-- body {background-color:yellow; }
9     -->
10  </style>
11  <script type="text/javascript" src="myscriptlibrary.js"></script>
12 </head>
13 <body>
14   <h1>Isn't it nice how computers do what they are told?</h1>
15 </body>
16 </html>
17
```

The <script> tag appears in the HEAD section of the XHTML document and references a script library named "myscriptlibrary.js". (As with images, the "src" attribute is specified by a URL.)



A JavaScript Library



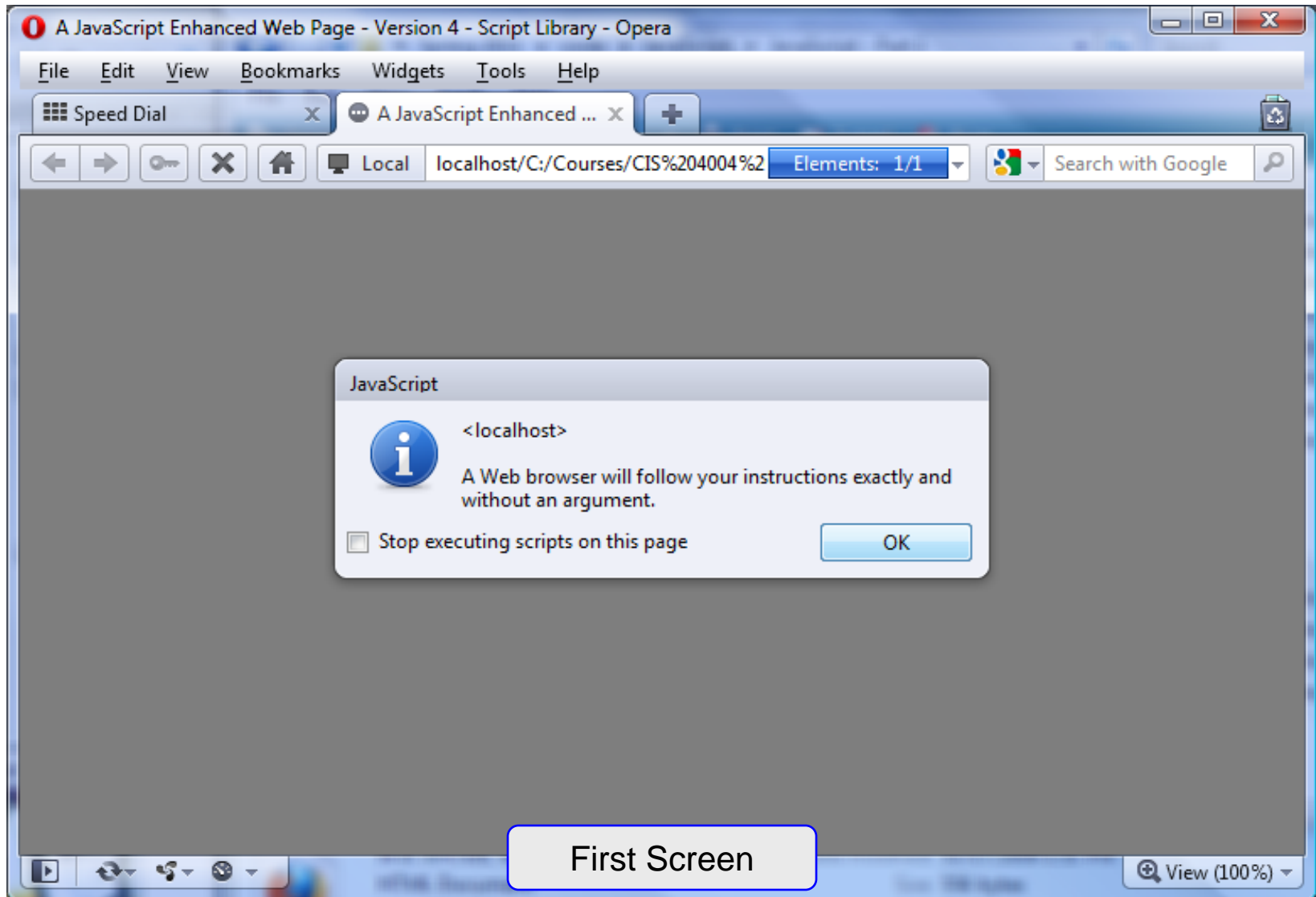
```
1  /* This is my JavaScript library of scripts */
2  /* MJL - Modified February 15, 2011 */
3
4  //SCRIPT #1
5  //this script is used in the first few JavaScript examples.
6
7  window.alert("A Web browser will follow your instructions exactly and without an argument.");
8
```

The actual script is unchanged in this library file.

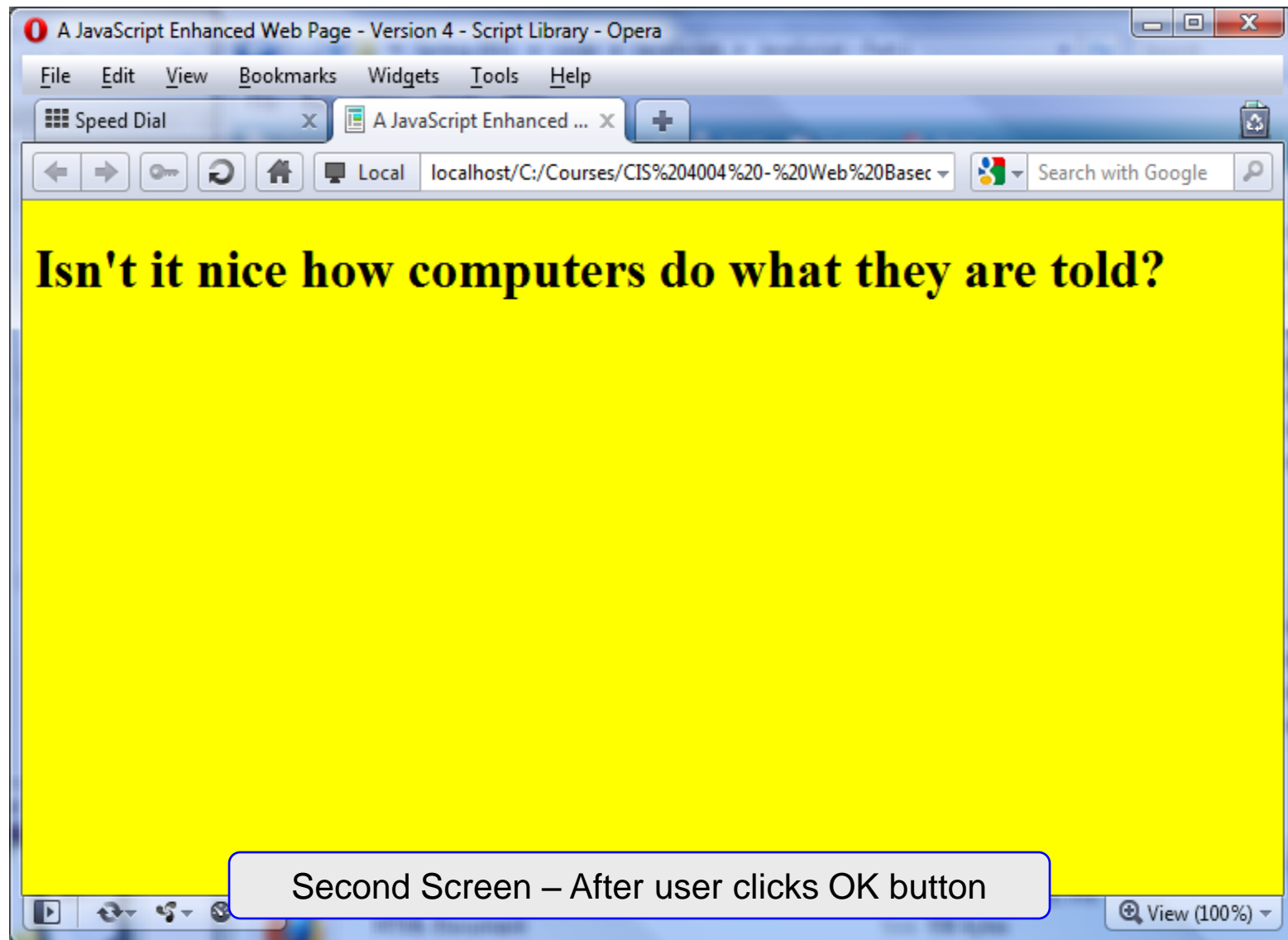
The use of an external library for scripts will make more sense when we start writing JavaScript functions. For a simple case like the one shown here, there is little justification for an external script.



A JavaScript Enhanced Web Page – Version 4



A JavaScript Enhanced Web Page – Version 4



Practice Problems

1. Create a 5th and 6th version of the XHTML document in this set of notes using the external script library. In version 5, put the `<script>` element before the `<h1>` element and in version 6, put the `<script>` element after the `<h1>` element. What effect does this have on the way the browser displays the page? Is the effect similar to any of the other versions we already created?
2. Using version 2 (page 14) of the XHTML document in this set of notes as a template. Modify the document using the JavaScript statement `document.writeln(" your text here ");` so that the new version of the document simply prints a message in the user's browser as shown on the next page.



Practice Problems

