Chapter 8
Introduction to HTML

Part 1

Terms

In this lecture, you will learn:

Common terms in Web technologies that you need to know before learning how to create Web pages

Terms

- Web pages
  Documents that are written in a language called HTML

- HTML
  Stands for Hypertext Markup Language

- HTML Markup tags
  Special codes that tell the Web browser how to display the HTML document

Terms

- Web browser
  - An application that can interpret HTML and display the document in the format and layout according to the markup tags
  - Examples: Firefox, Internet Explorer, Safari, Chrome, Opera

Terms

- HTML Document
  - A plain text file, that can be created using:
    - a text editor (Notepad in Windows, or TextEdit in Mac OS)
    - a Web page editor
- Web page editor
  - Example: Adobe Dreamweaver
  - Allows you to create and edit the page visually without having to manually add markup tags

Term

- URL
  - Stands for Uniform Resource Locator
  - This is the standard for specifying the address of Web pages and other resources on the World Wide Web
  - Example:

    http://www.schoolname.edu/departments/compsci/index.html

URL

- Example:
  http://www.schoolname.edu/departments/compsci/index.html
- The address is made up of segments of standard information:
  1. http://
     - http stands for Hypertext Transfer Protocol
     - The protocol specifies a set of rules that govern how the information transfer between the Web server and the Web client (the computer that requests to view the page)

URL

- Example:
  http://www.schoolname.edu/departments/compsci/index.html
- The address is made up of segments of standard information:

2. www.schoolname.edu
   - This is the domain name of the Web server

URL

- Example:
  http://www.schoolname.edu/departments/compsci/index.html
- The address is made up of segments of standard information:

3. departments/compsci/index.html
   - This is the file path of the document index.html
   - The file path is the location information of the page on the Web server
   - In this example, the document index.html is in a folder called compsci, which in turn is located in a folder called departments

Term

- XHTML
  - Stands for Extensible Hypertext Markup Language
  - Intended to be a replacement for HTML
  - Most of the tags are the same as those in HTML
  - Has stricter rules for writing HTML
  - These stricter rules are also supported but not enforced in HTML

Term

- Cascading Style Sheets (CSS)
  - Widely used for Web page design and layout
  - Style sheets allow you to define styles to display HTML elements
  - Multiple style definitions can be combined or cascaded into one—thus the term cascading style sheets
  - Style sheet files are text files
  - The styles defined in the files follow specific rules and syntax

Cascading Style Sheets (CSS)

Example:

```
h1 {
        margin-bottom: -0.5em;
}
body{
        font-family: Arial, Helvetica, sans-serif;
        font-size: 10pt;
}
a {
        text-decoration: none;
}
a:visited {
        color: #CC9900;
}
a:link {
        color: #CC3300;
}
.mycode {
        font-family: "Courier New", Courier, monospace;
        color: #666666;
}
```

Term

- JavaScript
  - A scripting language for Web pages
  - Can be used to:
    - add interactivity
    - generate content on the Web page based on the viewer’ s choice
    - validate online forms before submission
    - create and track cookies

Term

- HTML 5
  - The newest standard of HTML
  - Its specifications are still a work in progress (at the time of writing the book)
  - New features of HTML 5 include:
    - video and audio tags
    - content-specfic tags: footer, header, nav, article, section, figure, summary, aside
    - tags for form elements
    - canvas element:
      - allows drawing graphics and displaying images dynamically using JavaScript
      - commonly used for HTML 5 game development
    - allowing storage and retrieval of data on the user's device using JavaScript

Chapter 8
Introduction to HTML

Part 2

Basic Structure of an HTML Document

In this lecture, you will learn:

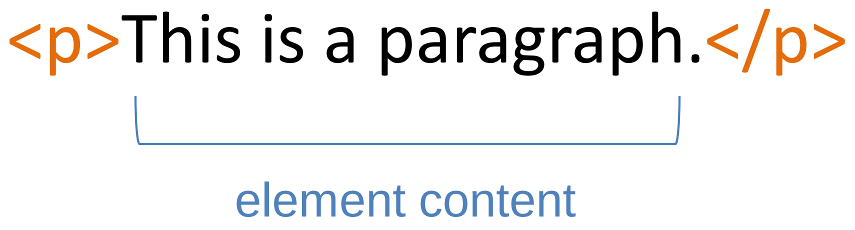
- Basic structure of an HTML document
- What tags and attributes are
- XHTML vs. HTML

Markup Tag

- Tells the Web browser the format of the text
- Surrounded by < and >
- Examples:
  - paragraph tag: <p>

Markup Tag

- In pairs: start tag and end tag (closing tag)
- Example:
  - start tag: <p>
  - end tag: </p>
- Placement of start and end tags
  - Example:



<p>This is a paragraph.</p>

element content

Tags That Do Not Have Element Content

Examples:

- line break: <br></br>
  can be written as: <br />
- image tag: <img></img>
  can be written as: <img />

Attributes of a Tag

- To specify properties of the element that is marked up the tag
- Example:
  - id attribute:
    <p id="introduction">This is a paragraph.</p>
- Placed inside the start tag
- In name-value pairs like this:
  name = "value"

Basic Structure of an HTML Document

```
<html>
<head>
<title>This is a title.</title>
</head>
<body>
This is the content of the Web page.
</body>
</html>
```

<html> tag

- First tag in an HTML document
- Tells the browser that this is the start of an HTML document
- End tag </html> is placed at the end of the HTML document

<head> tag

- Its element content is the header information
  - <title>
  - function definitions of JavaScript
  - links to external JavaScript and style sheets
- Header information is not displayed in the body of the browser window

<title> Tag

- Its element content is the title of the document
- The title is displayed on the Window bar of the browser window
- The title is used as the bookmark for the page

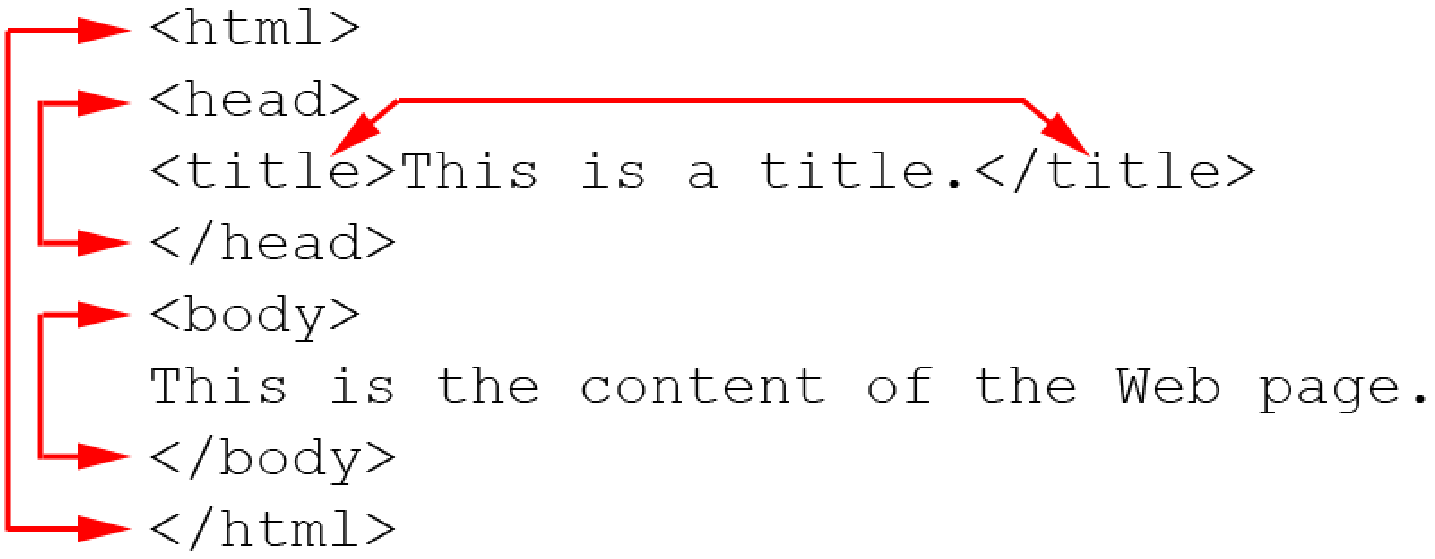
<body> Tag

- Its element content is what will be displayed in the browser window

Nested Tags

- Markup elements can be nested in another element (i.e., placed within another element’s content.)
- Example:
  - header and body elements are nested inside <html>
  - title element is nested inside <head>

End Tag Placement in Nested Tags



```
<html>
<head>
<title>This is a title.</title>
</head>
<body>
This is the content of the Web page.
</body>
</html>
```

Similar to how parentheses are paired in a mathematical equation

Basic Structure of an XHTML Document

- Same basic structure as an HTML document
- Plus a DOCTYPE declaration before <html> tag

Basic Structure of an XHTML Document

Example:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<title>This is a title.</title>
</head>
<body>
This is the content of the Web page.
</body>
</html>
```

DOCTYPE Declaration

- DOCTYPE stands for document type
- Uses the <!DOCTYPE> tag
- Placed in the very first line in the document
- Tells the browser which HTML or XHTML specification the document uses
- If the code used in the document does not match the DOCTYPE declared, then some of the elements may not be displayed as expected
- A Web page editor, such as Adobe Dreamweaver, usually inserts it for you

3 Document Types

The XHTML 1.0 specifies three document types:

- Strict

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
```

- Transitional

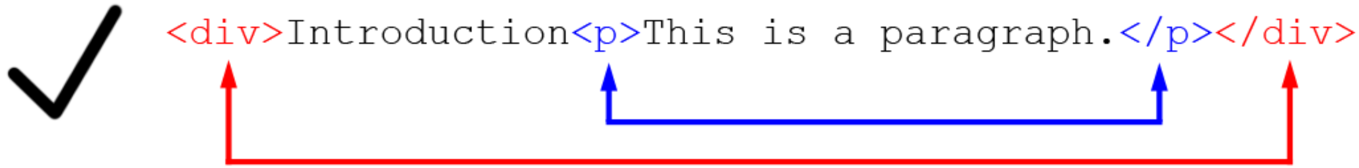
```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
```

- Frameset

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Frameset//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-frameset.dtd">
```

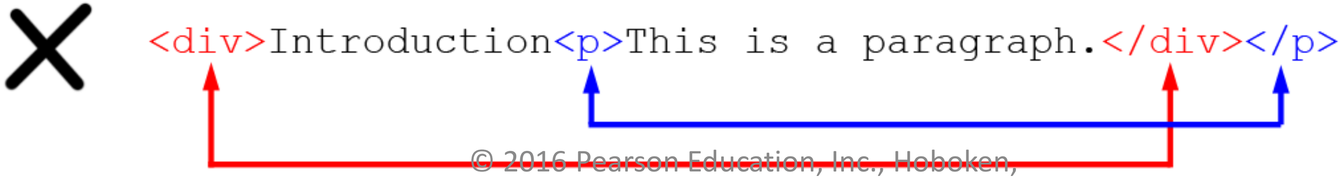
XHTML vs. HTML

- XHTML elements must always be closed or paired
  - Any start tag must be paired with an end tag
- XHTML tags and attributes must be in lowercase
- XHTML elements mus be properly nested within each other



✓

```
<div>Introduction<p>This is a paragraph.</p></div>
```



✗

```
<div>Introduction<p>This is a paragraph.</div></p>
```

XHTML vs. HTML

- An XHTML document must have one root element (i.e., the topmost element)
  - <html> is the root element of an XHTML document
  - The HTML element must designate the XHTML namespace, like this:
    <html xmlns=" http://www.w3.org/1999/xhtml ">
  - xmlns is the namespace attribute

- There must be a DOCTYPE declaration in the document prior to the root element (i.e., <html>)

Chapter 8
Introduction to HTML

Part 3

HTML5

In this lecture, you will learn:

- A list of new features in HTML5
- Key differences between HTML5 and XHTML
- Basic structure of an HTML5 document

HTML 5

- Latest revision of HTML
- Backward compatible
- New key features:
  - video and audio tags
  - content-specific tags
  - tags for form elements
  - canvas element
  - storage of user data

Video and Audio Tags

- Allow simple code for adding video and audio on Web pages
- Video and audio are played back by the Web browser's built-in player, not plug-ins

Content-Specific Tags

- Examples: <footer>, <header>, <nav>, <article>, <section>, <figure>, <summary>, <aside>
- Allow mark up content by semantics
- Provide a standardized system to classify the information on Web pages

Form Elements

- Examples: date picker, color picker, numeric stepper, new input types (email, url, and search)
- To enhance user experience of filling out forms

Canvas

- Allows drawing graphics and placing images dynamically inside it using JavaScript
- Visual content inside it can be scripted to change over time (hence animation) and in response to the user interaction (mouse clicks and key presses)
- Used for animation and game development

Storage of User Data

- Approx. 5 MB depending on browsers
- Larger data limit than cookies (4 KB limit)
- Storage and retrieval of data on the user's device;
  i.e., no need for databases or user accounts set up on the server

XHTML vs. HTML 5

- DOCTYPE declaration
- Character encoding
- Cases for tag and attribute names
- Values of attributes
- Boolean attribute
- End tag

DOCTYPE Declaration

XHTML	HTML 5
Three doctypes: Strict, Transitional, and Frameset For example: `<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd ">`	Only one simplified doctype declared like this: `<!DOCTYPE HTML>`

Character Encoding

XHTML	HTML 5
<meta http-equiv="Content-Type" content="text/html;charset=utf-8" />	Simplified as follows: <meta charset"UTF-8"/>

Cases for Tag and Attribute Names

XHTML	HTML 5
All lowercase	No restriction

Value of an Attribute

XHTML	HTML 5
Enclosed in quotation marks	Does not have to be in quotation marks

Boolean Attribute

XHTML	HTML 5
The value "true" or "false" has to be written out and enclosed in quotation mark; for example: `<div hidden="true" />`	No need to write out the value—just the presence of the attribute means it is true; for example: `<div hidden />`

End Tag

XHTML	HTML 5
Required for each start tag	Not required; thus, self-closing is not required for those tags without content, such as br and img

HTML 5 Basic Structure

```
<!doctype html>
<html lang="en">
<head>
<meta charset="utf-8" />
<title>This is a title of the page</title>
</head>
<body>
<p>This is the content of the Web page
</body>
</html>
```

An HTML 5 Document

OK to still follow the rules of XHTML

```
<!doctype html>
<html lang="en">
<head>
<meta charset="utf-8" />
<title>This is a title of the
   page</title>
</head>
<body>
<p>This is the content of the
   Web page.<br>
<img src="images/demo.png"
   alt="demo">
</p>
</body>
</html>
```

Easy to read

Arbitrary: cases for tags, pairing tags, uses of quotation marks.

Still a valid HTML 5 document.

```
<!doctype html>
<HtML lang=en>
<hEAd>
<meta charset=utf-8>
<TITLe>This is a title of the
   page</tiTLE>
<boDY>
<P>This is the content of the
   Web page.<br>
<IMg src=images/demo.png
   alt=demo>
```

Hard to read

Markup Validator

http://validator.w3.org/

to validate Web documents

Chapter 8
Introduction to HTML

Part 4
Common HTML Tags

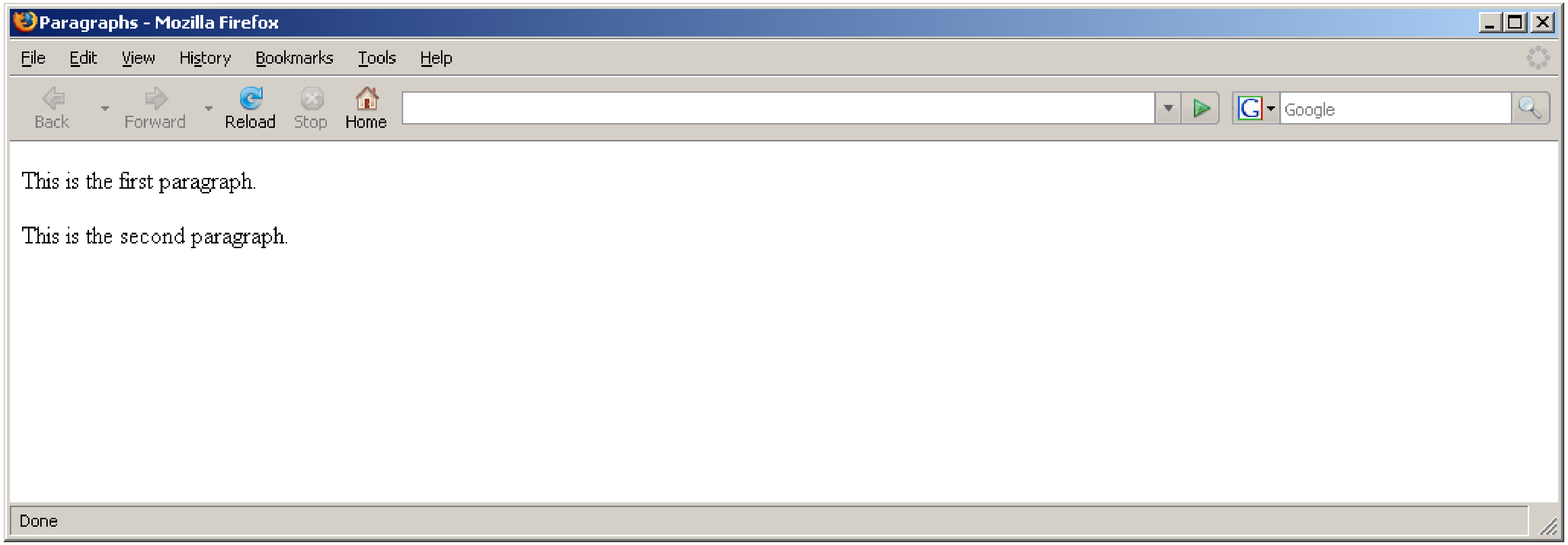
In this lecture, you will learn:

How to use the HTML tags: <p>, <br>, <h1>-<h6>, <b>, <i>, <strong>, <em>, <a>, <img>, and tags for tables

Paragraph: <p></p>

Example:

```
<p>This is the first paragraph.</p>
<p>This is the second paragraph.</p>
```



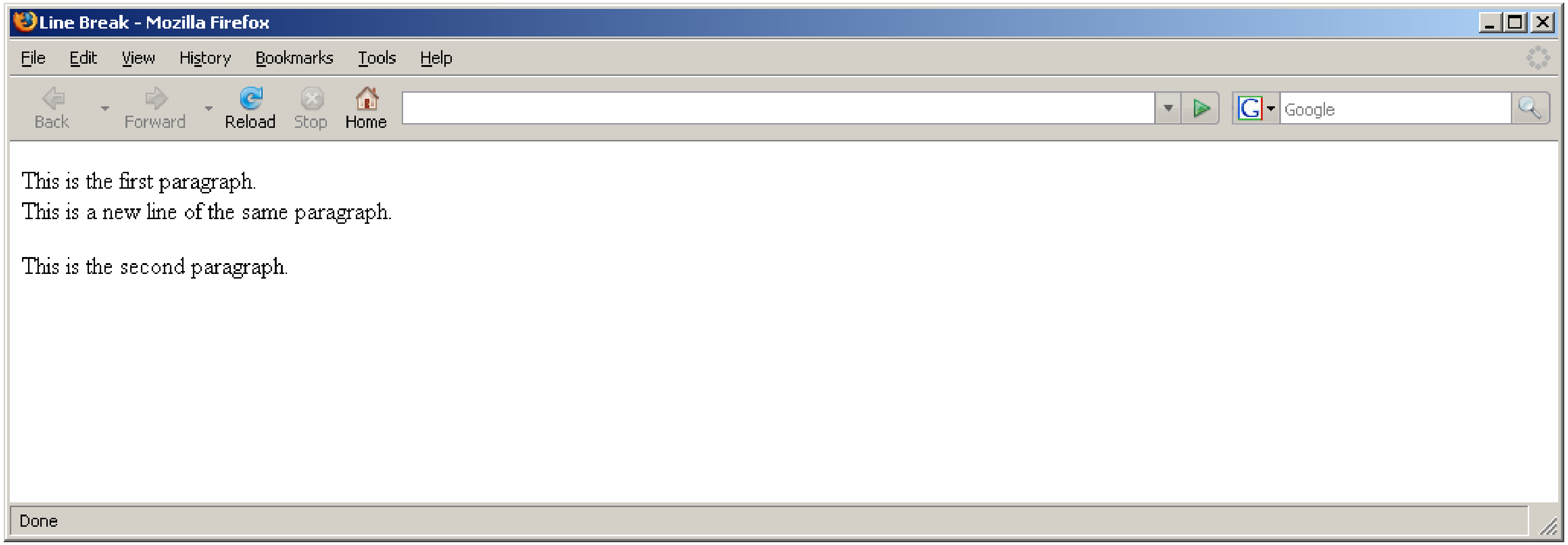
This is the first paragraph.

This is the second paragraph.

Line Break: <br />

Example:

```
    <p>This is the first paragraph.<br />This is a new line of the same
same paragraph.</p>
    <p>This is the second paragraph.</p>
```



Line Break - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Back
Forward
Reload
Stop
Home
Google
Done

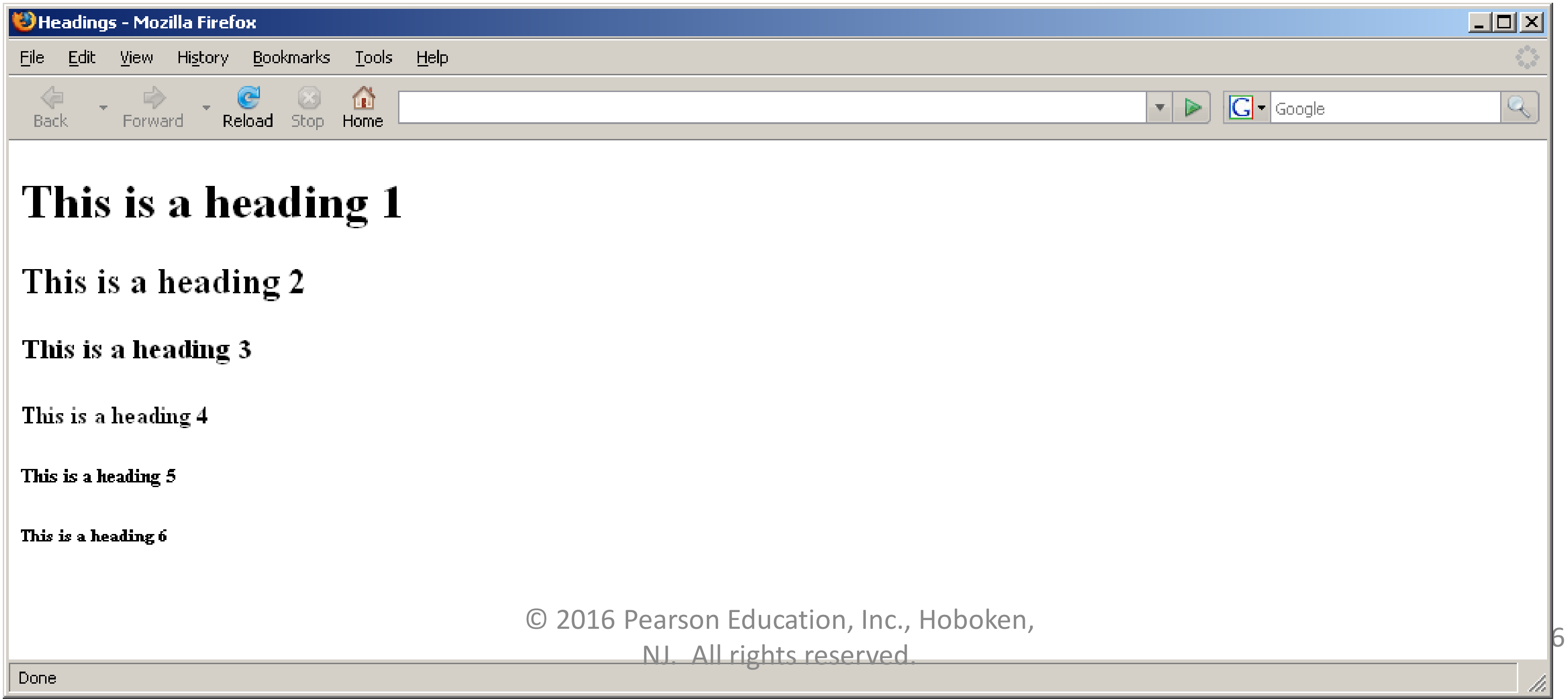
```
This is the first paragraph.
This is a new line of the same paragraph.

This is the second paragraph.
```

Headings: <h1> - <h6>

Example:

```
<h1>This is a heading 1</h1>
<h2>This is a heading 2</h2>
<h3>This is a heading 3</h3>
<h4>This is a heading 4</h4>
<h5>This is a heading 5</h5>
<h6>This is a heading 6</h6>
```


Headings - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Back Forward Reload Stop Home
Google
Done

This is a heading 1

This is a heading 2

This is a heading 3

This is a heading 4

This is a heading 5

This is a heading 6

Bold and Italics

- Bold:
  - <b> </b>
  - <strong> </strong>
- Italics:
  - <i> </i>
  - <em> </em>

Bold and Italics

Example:

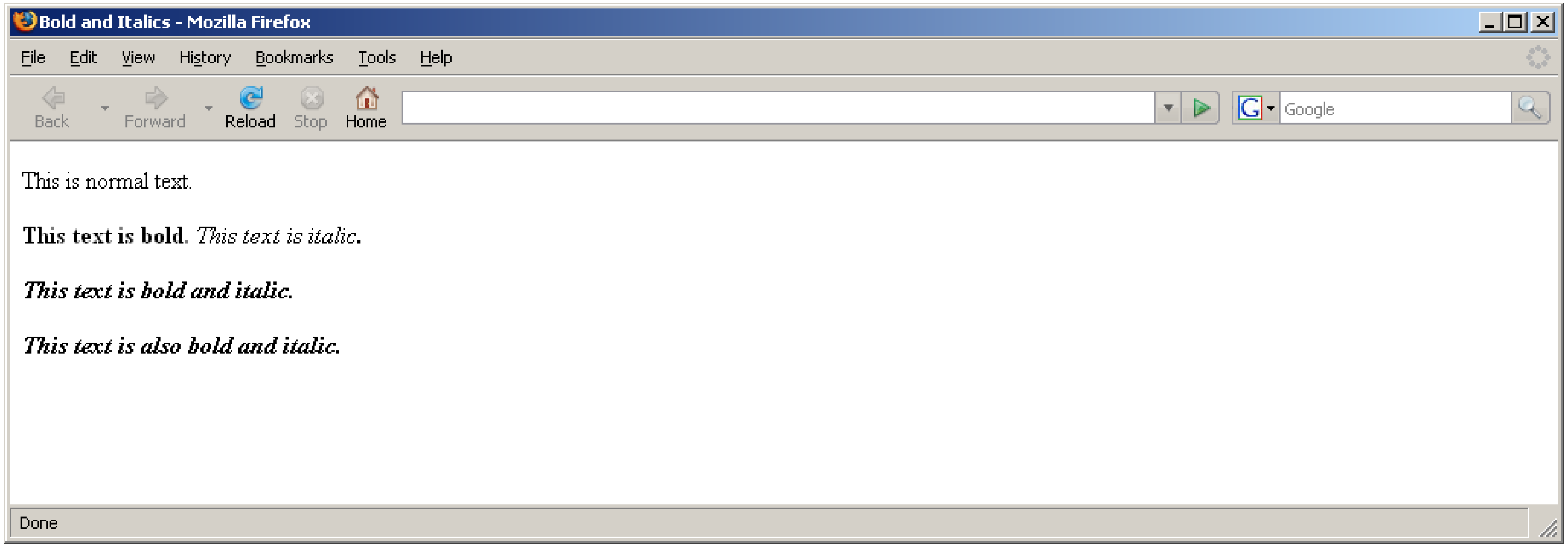
```
    <p>This is normal text.</p>
    <p>
    <b>This text is bold. </b>
    <i>This text is italic.</i>
    </p>
    <p>
    <b><i>This text is bold and italic.</i></b>
    </p>
    <p>
    <i><b>This text is also bold and italic.</b></i>
    </p>
```

Bold and Italics

Example:

```
    <p>This is normal text.</p>
    <p>
    <strong>This text is bold. </strong>
    <em>This text is italic.</em>
    </p>
    <p>
    <strong><em>This text is bold and italic.</em></strong>
    </p>
    <p>
    <em><strong>This text is also bold and italic.</strong></em>
    </p>
```

Bold and Italics



Bold and Italics - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Back
Forward
Reload
Stop
Home
Google
Done

This is normal text.

This text is bold. *This text is italic.*

This text is bold and italic.

This text is also bold and italic.

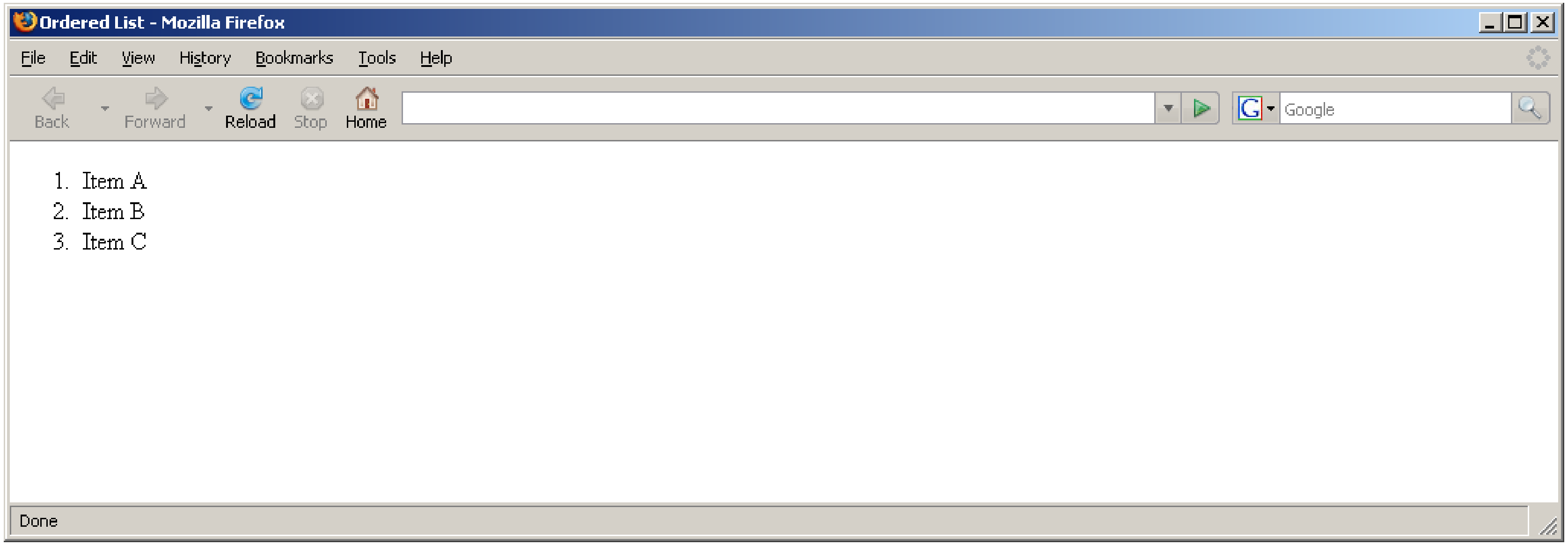
List

- Ordered list: <ol> </ol>
- Unordered list: <ul> </ul>
- List item: <li> </li>

List

Ordered list example:

```
<ol>
  <li>Item A</li>
  <li>Item B</li>
  <li>Item C</li>
</ol>
```



Ordered List - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Back
Forward
Reload
Stop
Home
Google
Done

1. Item A
2. Item B
3. Item C

Link: <a href="..."></a>

- General Syntax:

  <a href="url or file path">whatever to be displayed as a clickable link</a>

- href is the attribute
- Example:

  <a href="http://www.google.com/">Google Web Site</a>

Image: <img src="..."></img>

- General Syntax:

  ```
  <img src="url or file path" />
  or
  <img src="url or file path"></img>
  ```

- No element content
- src is the attribute
- Example:

  ```
  <img src="logo.jpg" />
  ```

Table

- Table: <table></table>
- Table row: <tr></tr>
- Table data: <td></td>

Table

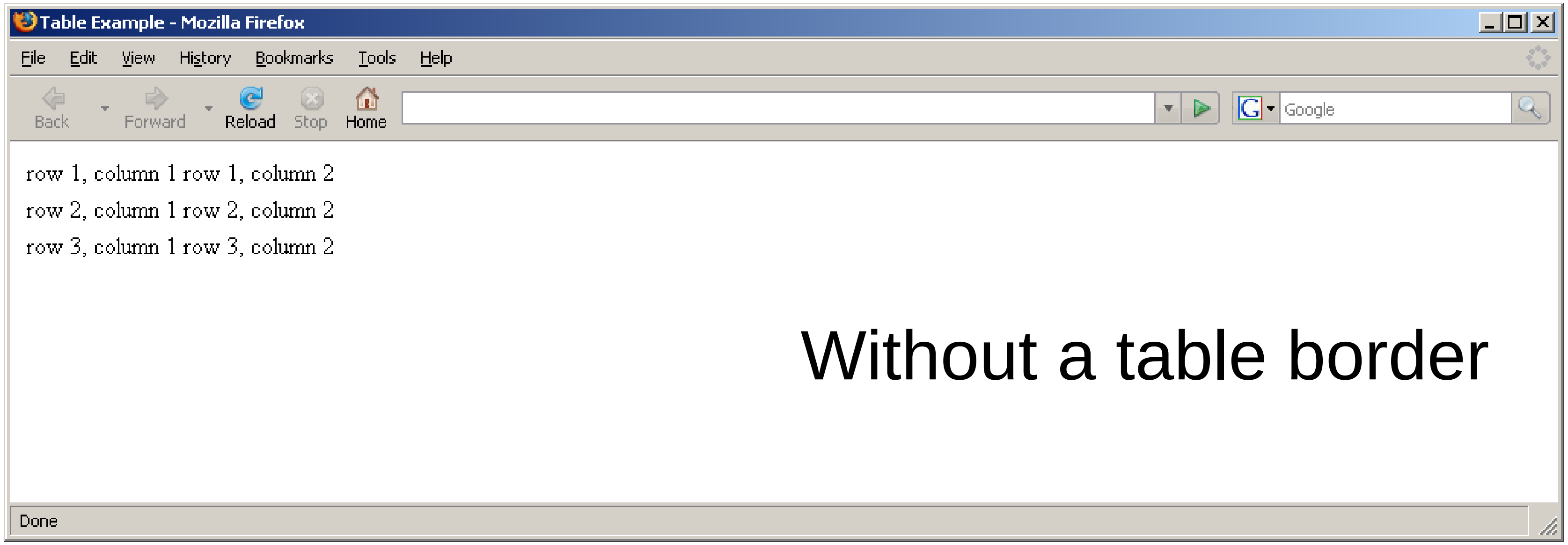
Example: A table without a border

```
<table>
  <tr>
    <td> row 1, column 1</td>
    <td> row 1, column 2</td>
  </tr>
  <tr>
    <td> row 2, column 1</td>
    <td> row 2, column 2</td>
  </tr>
  <tr>
    <td> row 3, column 1</td>
    <td> row 3, column 2</td>
  </tr>
</table>
```

Example: A table with a border

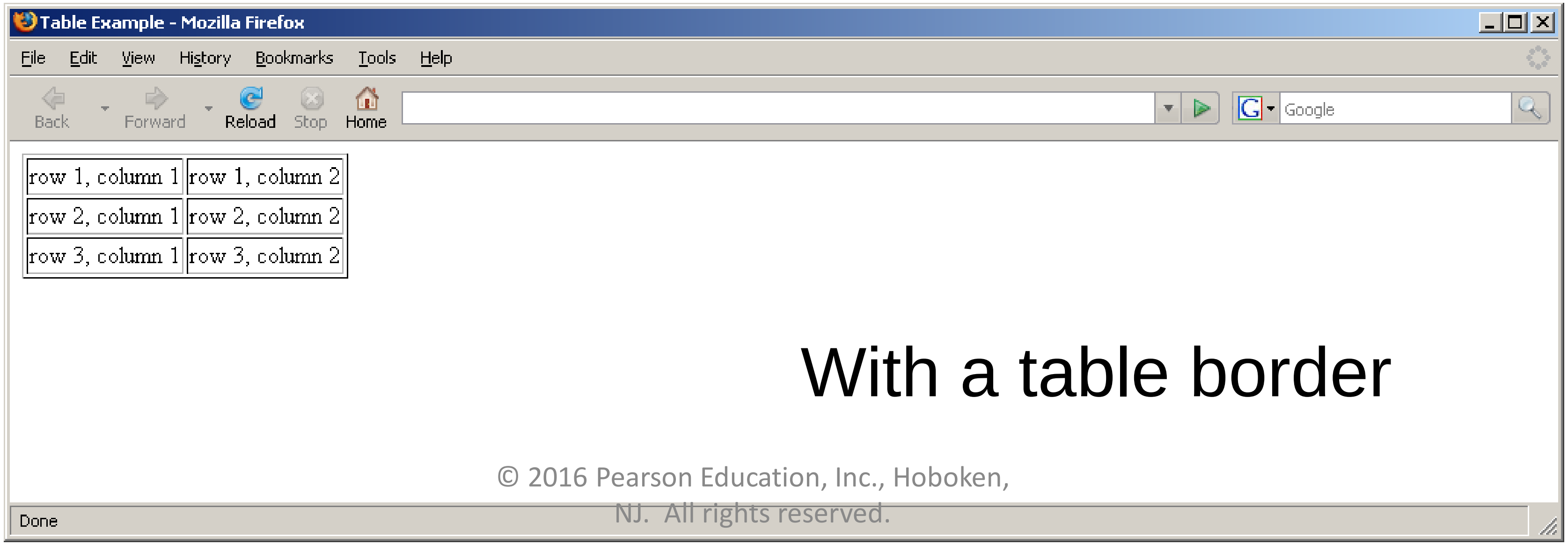
```
<table border="1">
  <tr>
    <td> row 1, column 1</td>
    <td> row 1, column 2</td>
  </tr>
  <tr>
    <td> row 2, column 1</td>
    <td> row 2, column 2</td>
  </tr>
  <tr>
    <td> row 3, column 1</td>
    <td> row 3, column 2</td>
  </tr>
</table>
```

Table



row 1, column 1	row 1, column 2
row 2, column 1	row 2, column 2
row 3, column 1	row 3, column 2

Without a table border



row 1, column 1	row 1, column 2
row 2, column 1	row 2, column 2
row 3, column 1	row 3, column 2

With a table border

Chapter 8
Introduction to HTML

Part 5

File Paths

In this lecture, you will learn:

- Types of file paths
- How to construct a document-relative file path for writing HTML documents

File Path

- Location of a file on a computer
- Like an address to a house
- Start with the outermost folder to the inner folders
- Folder names are separated by a slash (/)

Types of File Paths for Web Documents

- Absolute paths
- Document-relative paths
- Site root-relative paths

Absolute Paths

- Example:
  http://www.mysite.com/products/coffee/french-roast.html
- Full URL to a Web page or any media
- Used for linking to files that are on a different Web site

Document-Relative Paths

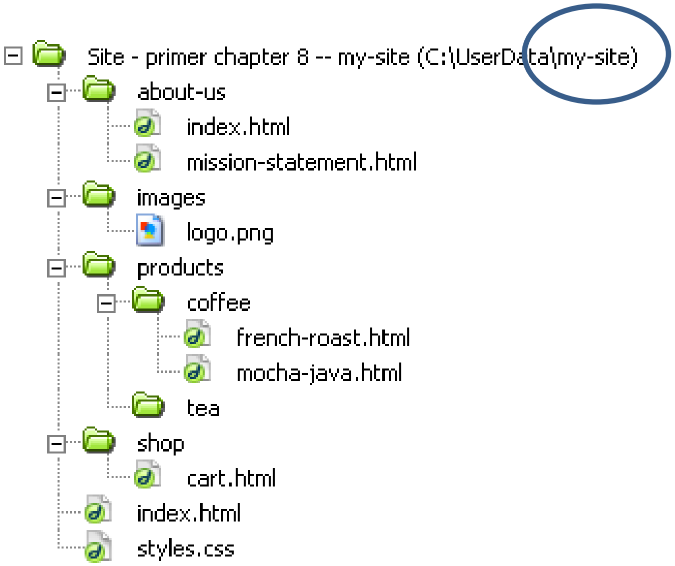
- Example:
  products/coffee/french-roast.html
- Most commonly used in Web authoring
- The path is relative to the page that french-roast.html is being requested

Site Root-Relative Paths

- Example:
  /products/coffee/french-roast.html
- Starts with a slash (/), meaning starting from the root folder of the site
- A root folder is the outermost folder of the site

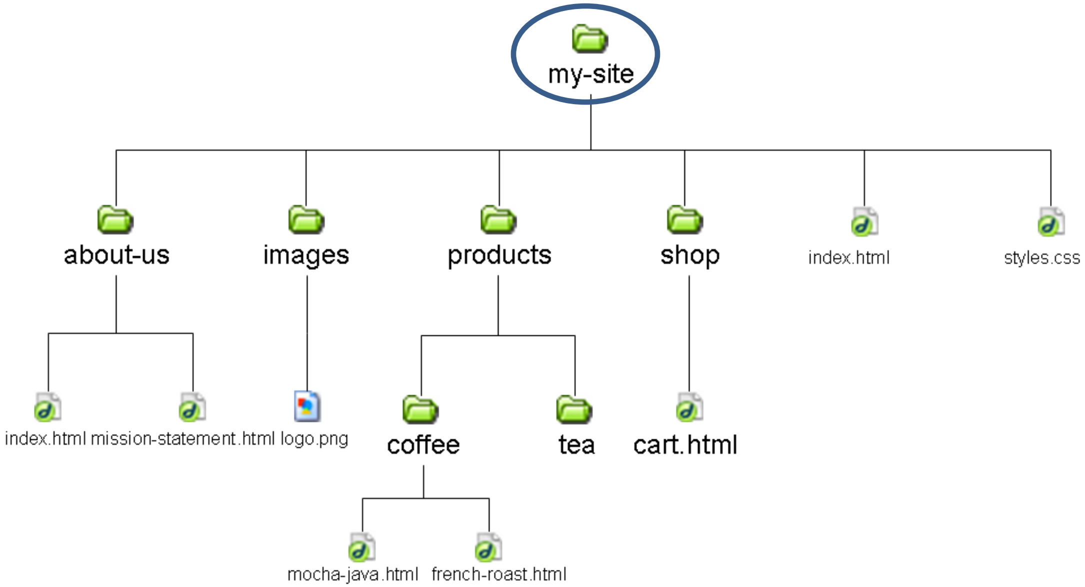
Example Folder Structure of a Site

Root folder

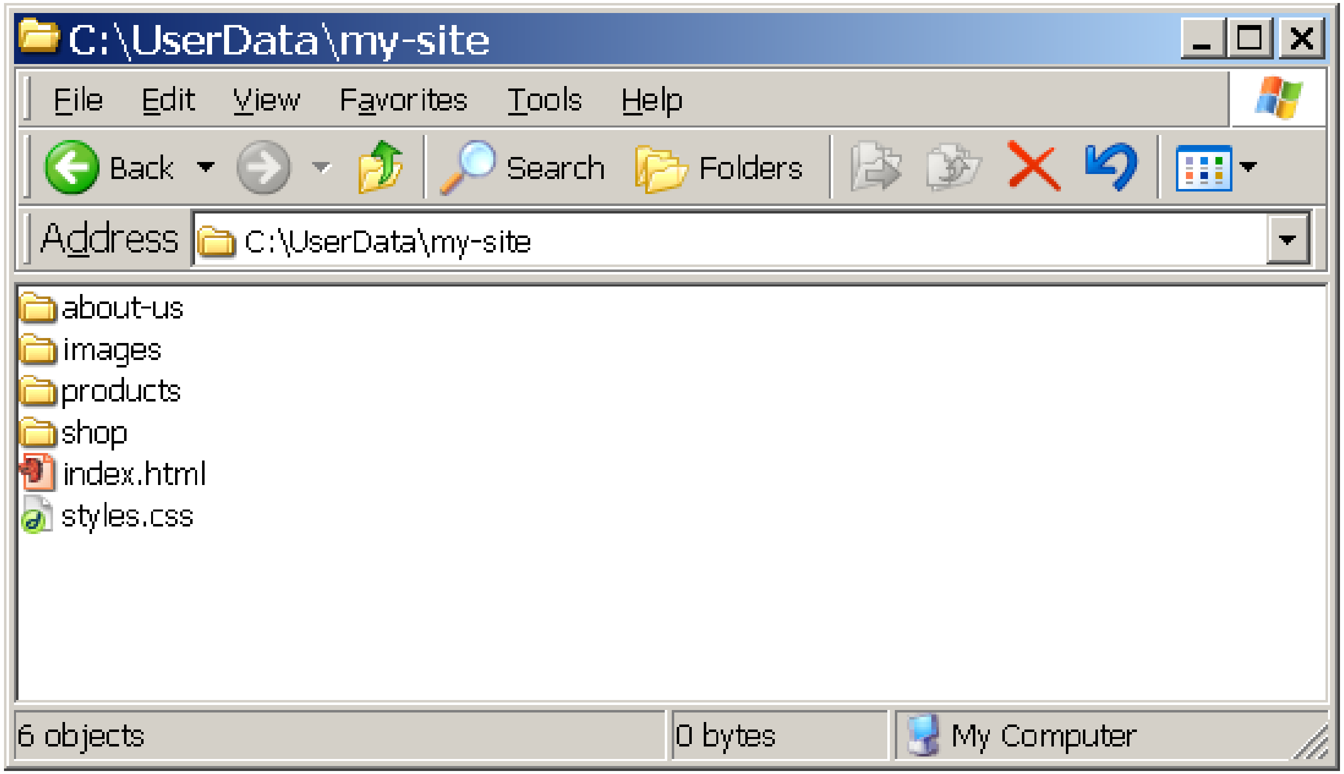


```
Site - primer chapter 8 -- my-site (C:\UserData\my-site)
  about-us
    index.html
    mission-statement.html
  images
    logo.png
  products
    coffee
      french-roast.html
      mocha-java.html
    tea
  shop
    cart.html
  index.html
  styles.css
```

Root folder

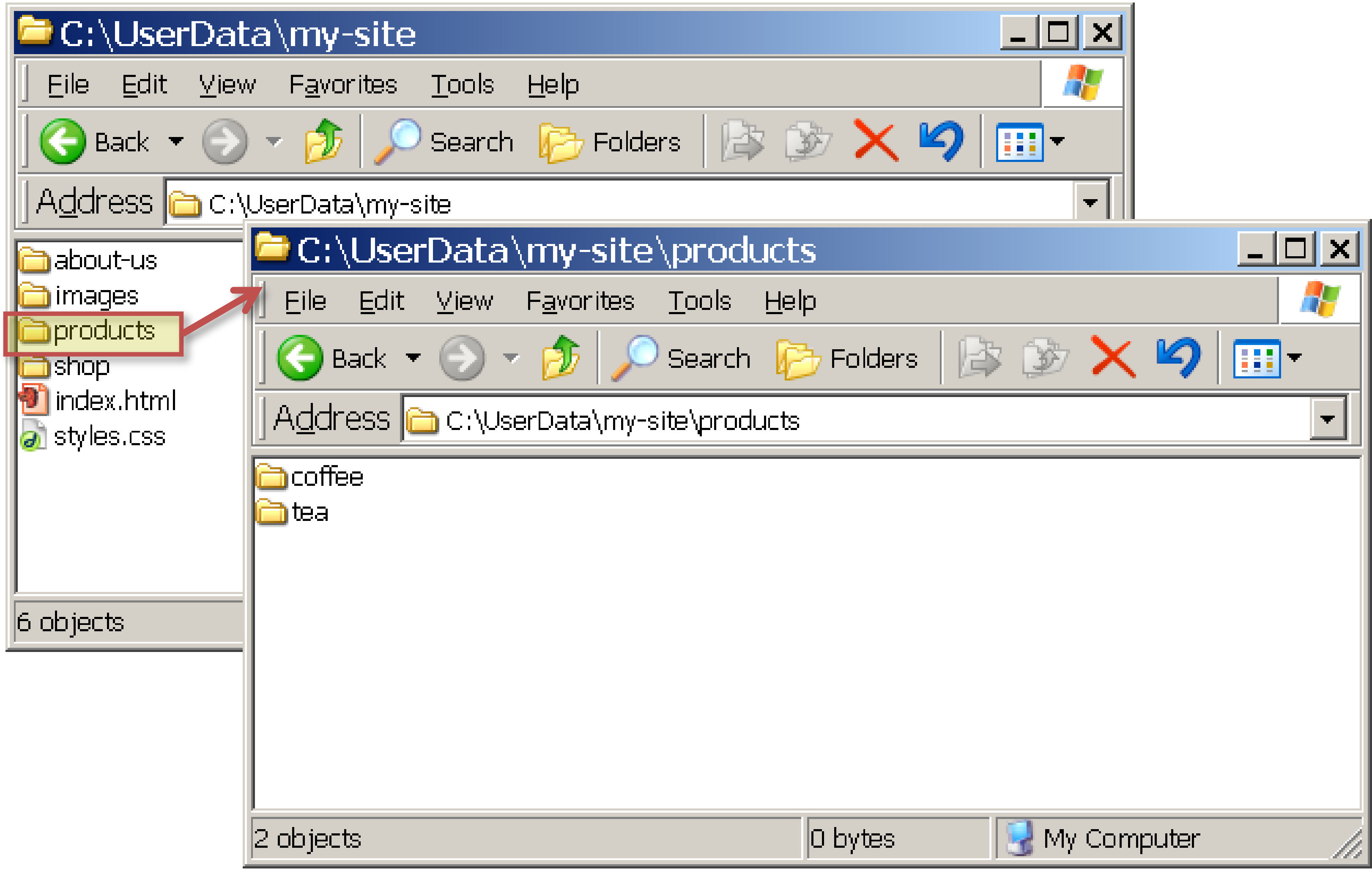


Navigating Folders

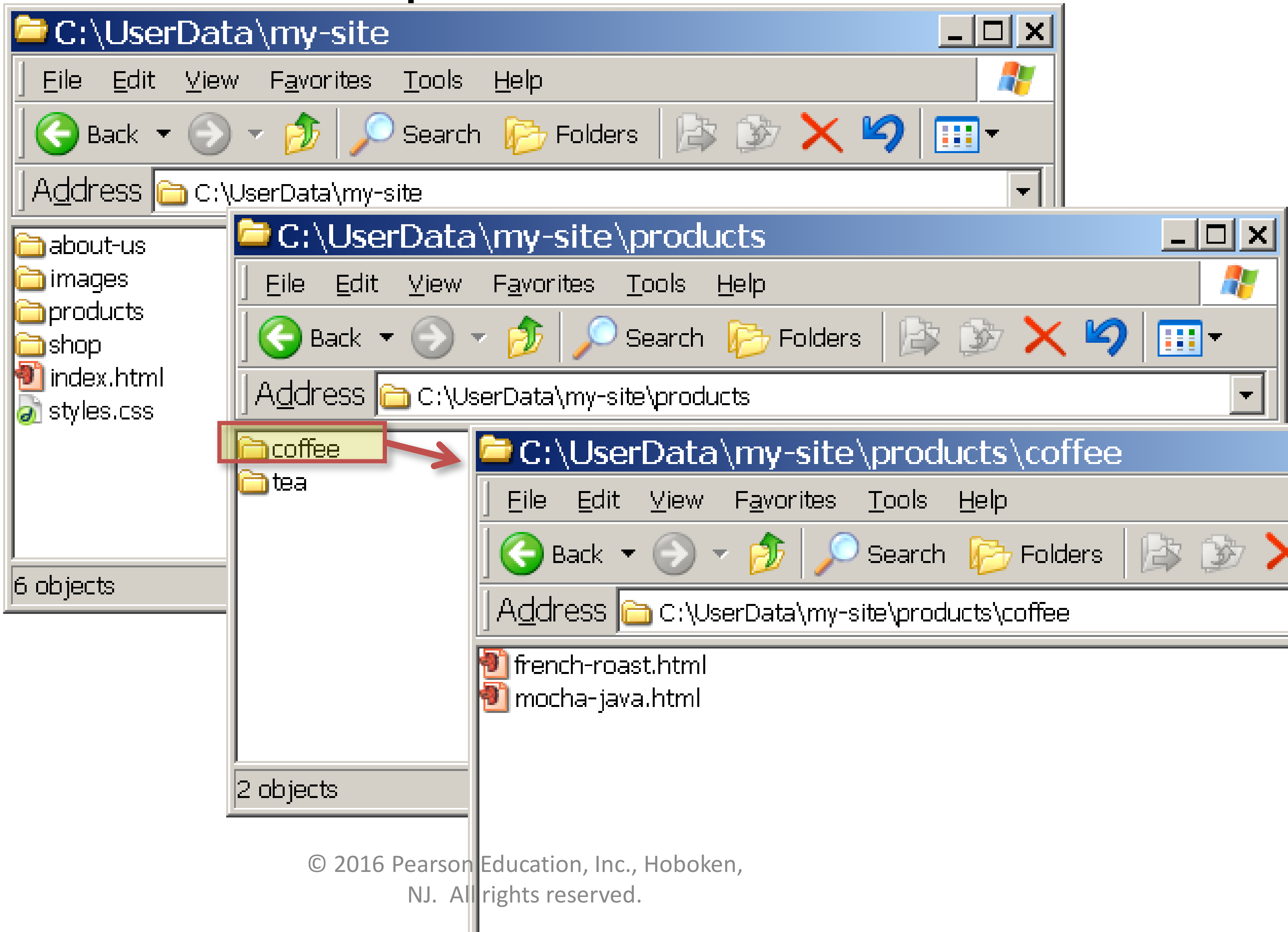


about-us
images
products
shop
index.html
styles.css

Opening the "products" folder



Opening the "coffee" folder that is inside "products"


C:\UserData\my-site
File Edit View Favorites Tools Help
Back Search Folders
Address

C:\UserData\my-site

about-us
images
products
shop
index.html
styles.css

6 objects

C:\UserData\my-site\products
File Edit View Favorites Tools Help
Back Search Folders
Address

C:\UserData\my-site\products

coffee
tea

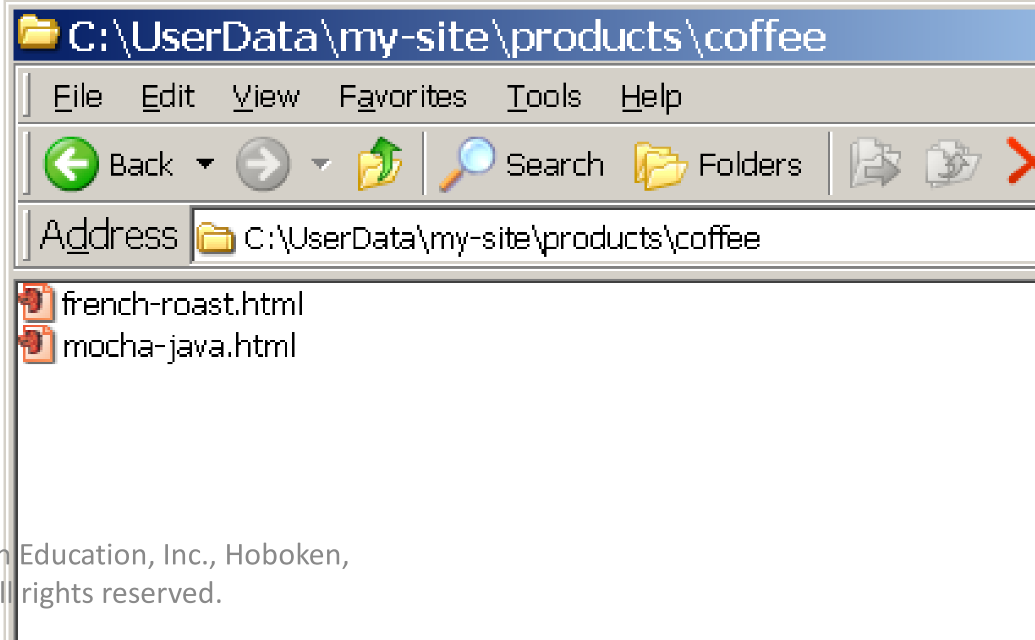
2 objects

C:\UserData\my-site\products\coffee
File Edit View Favorites Tools Help
Back Search Folders
Address

C:\UserData\my-site\products\coffee

french-roast.html
mocha-java.html

Now from the "coffee" folder let's navigate back up

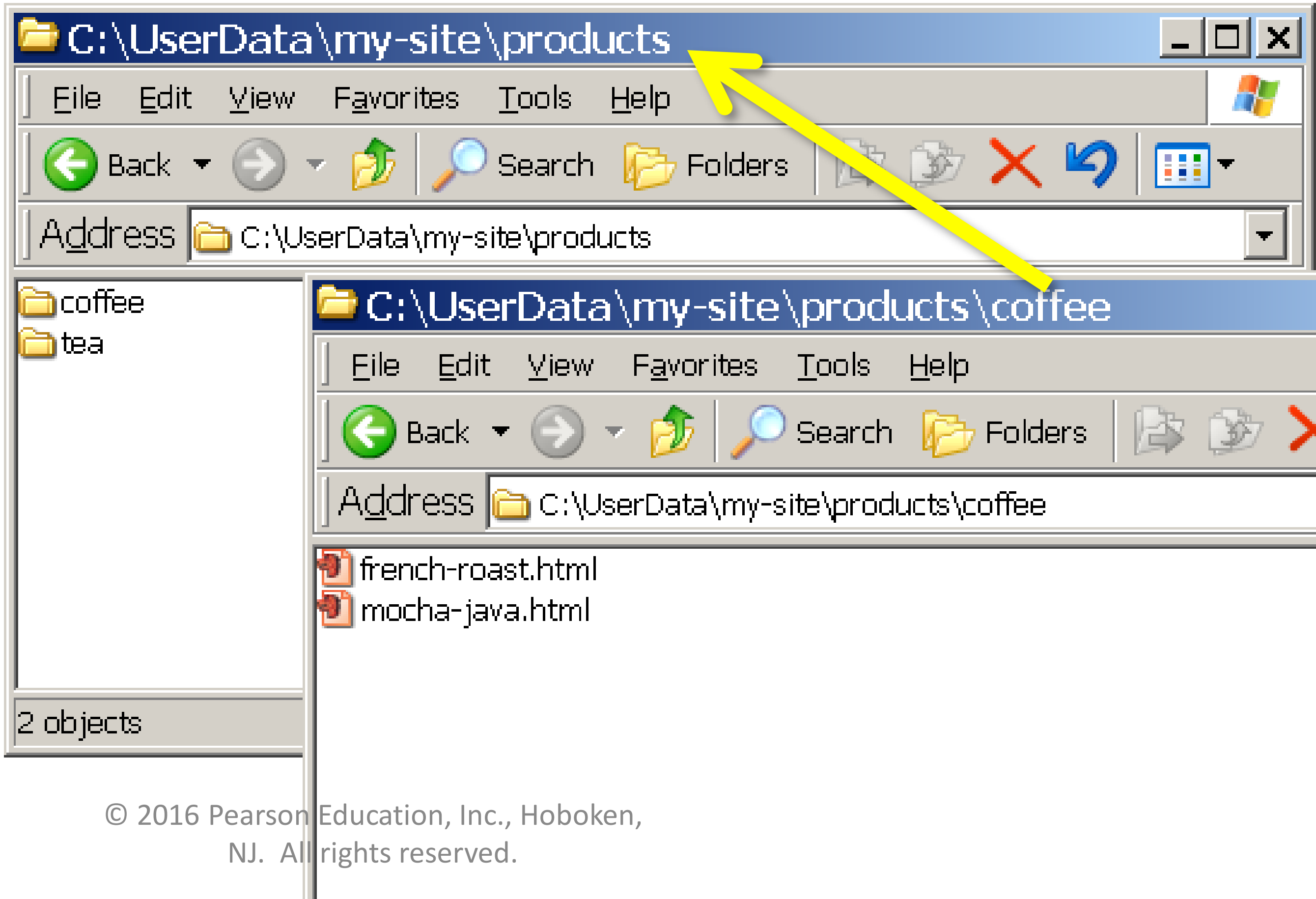


C:\UserData\my-site\products\coffee

C:\UserData\my-site\products\coffee

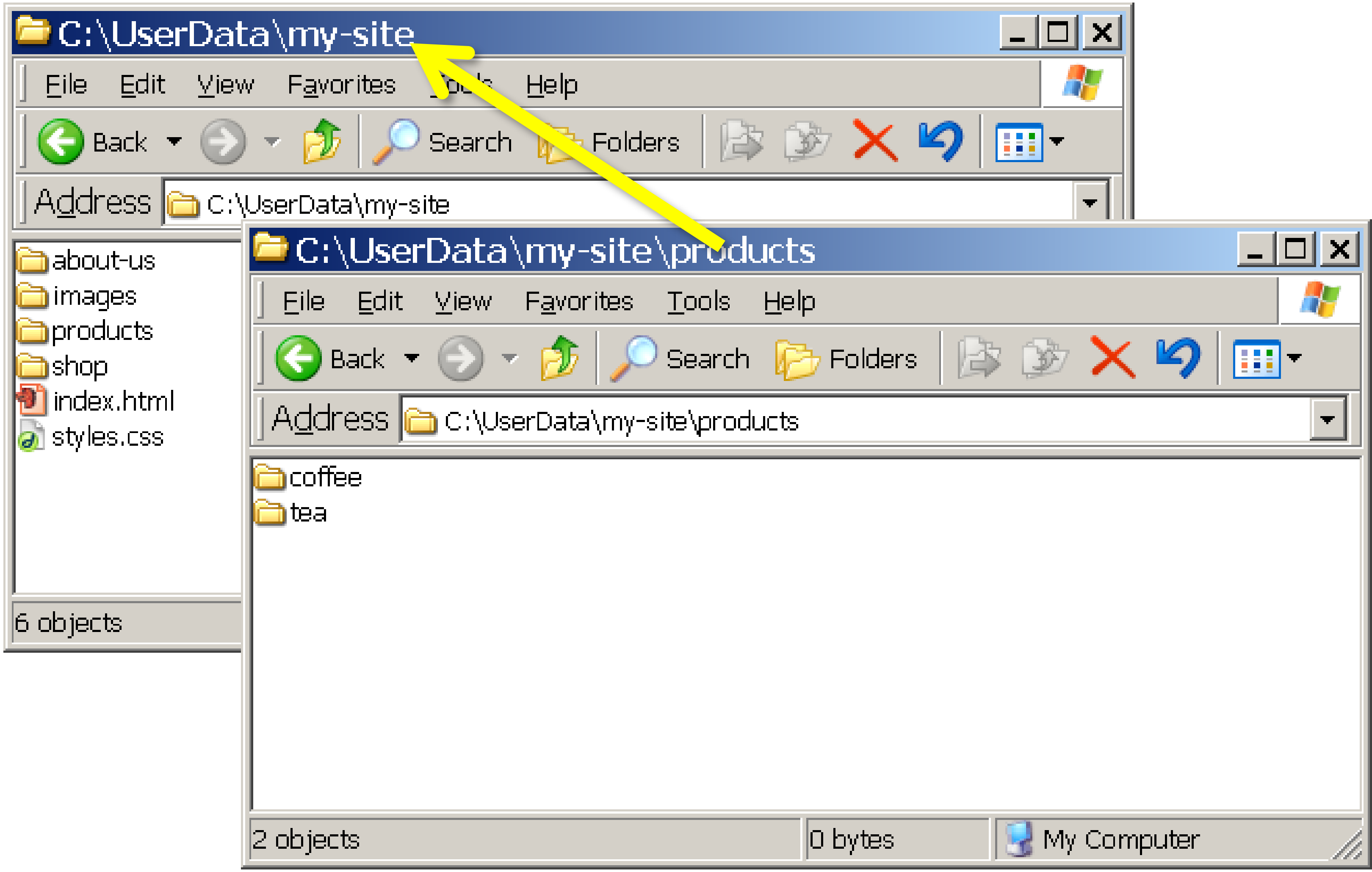
french-roast.html
mocha-java.html

Going Up One Level to "products"



C:\UserData\my-site\products
File Edit View Favorites Tools Help
Back
Search
Folders
Address
C:\UserData\my-site\products
coffee
tea
2 objects
C:\UserData\my-site\products\coffee
File Edit View Favorites Tools Help
Back
Search
Folders
Address
C:\UserData\my-site\products\coffee
french-roast.html
mocha-java.html

Going Up One More Level to "my-site"



C:\UserData\my-site
File Edit View Favorites Tools Help
Back
Search
Folders
Address C:\UserData\my-site
about-us
images
products
shop
index.html
styles.css
6 objects
C:\UserData\my-site\products
File Edit View Favorites Tools Help
Back
Search
Folders
Address C:\UserData\my-site\products
coffee
tea
2 objects
0 bytes
My Computer

To Construct a Document-Relative Path

Need to know:

- **Target page**:
  The page being linked ***to***
- **Source page**:
  The page containing the link or the page being linked ***from***

Think of the document-relative path as the direction to navigate from the source page to the target page.

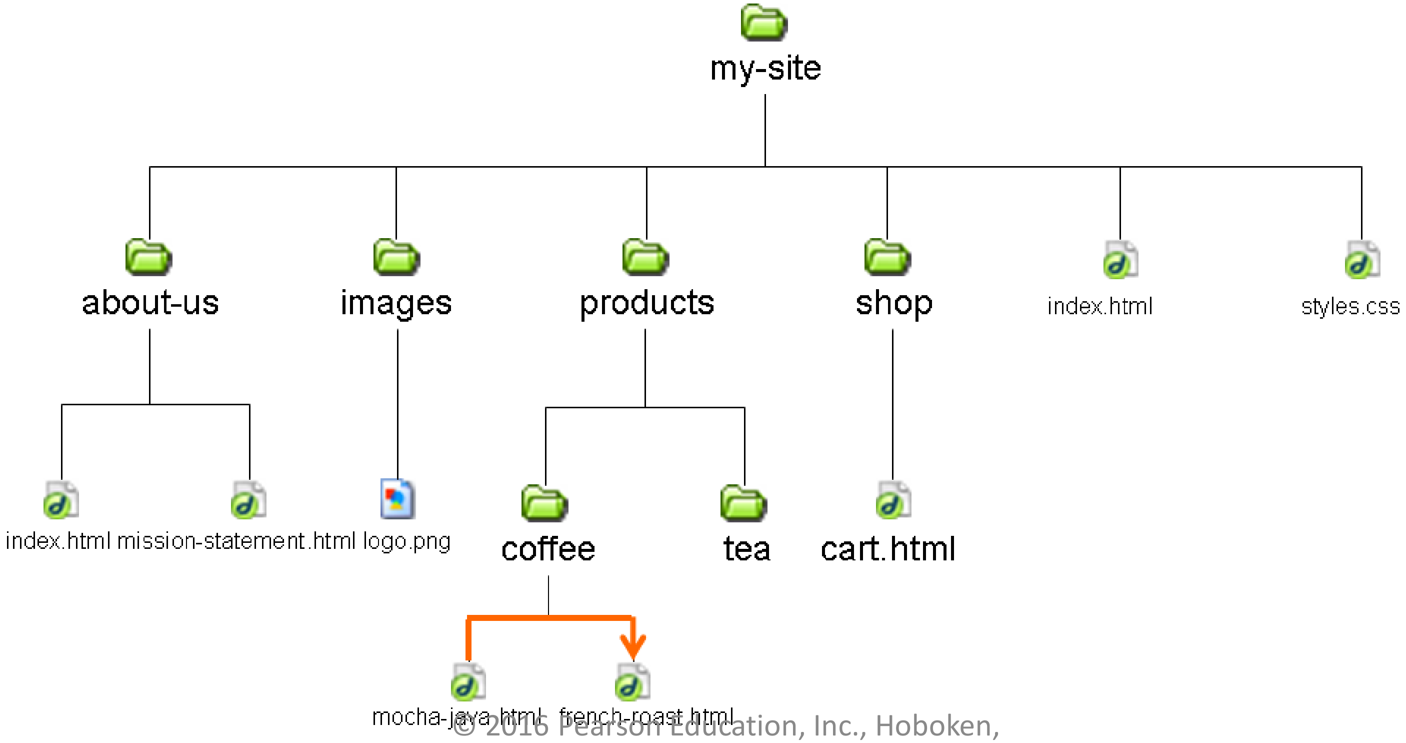
To Construct a Document-Relative Path

Rule #1:

To link to another file that is in the same folder as the current document, simply use the filename as the path.

To Construct a Document-Relative Path

Example: To add a link in **mocha-java.html** (source page) to link to **french-roast.html** (target page), the file path is simply the filename `french-roast.html`



To Construct a Document-Relative Path

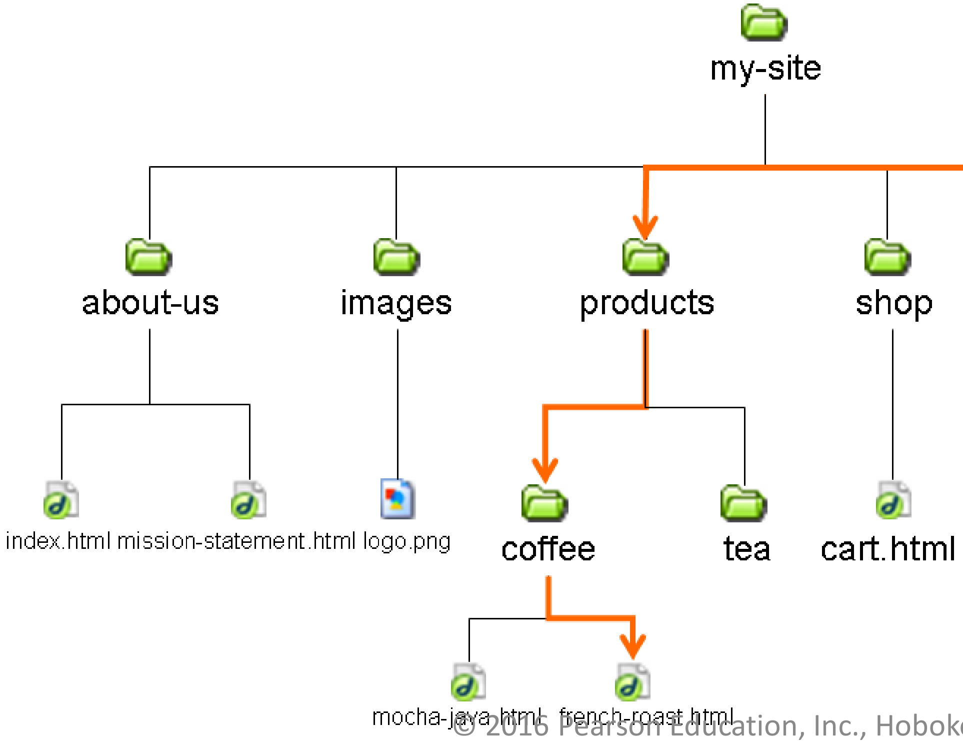
Rule #2:

To link to a file (target page) that is in a subfolder of the current document’s (source page's) folder, use the subfolder name followed by a forward slash (/) and then the filename.

Each forward slash (/) represents moving down one level in the folder.

To Construct a Document-Relative Path

Example: To add a link in index.html (in my-site folder) to link to french-roast.html (target page), the relative path is: `products/coffee/french-roast.html`



To Construct a Document-Relative Path

Rule #3:

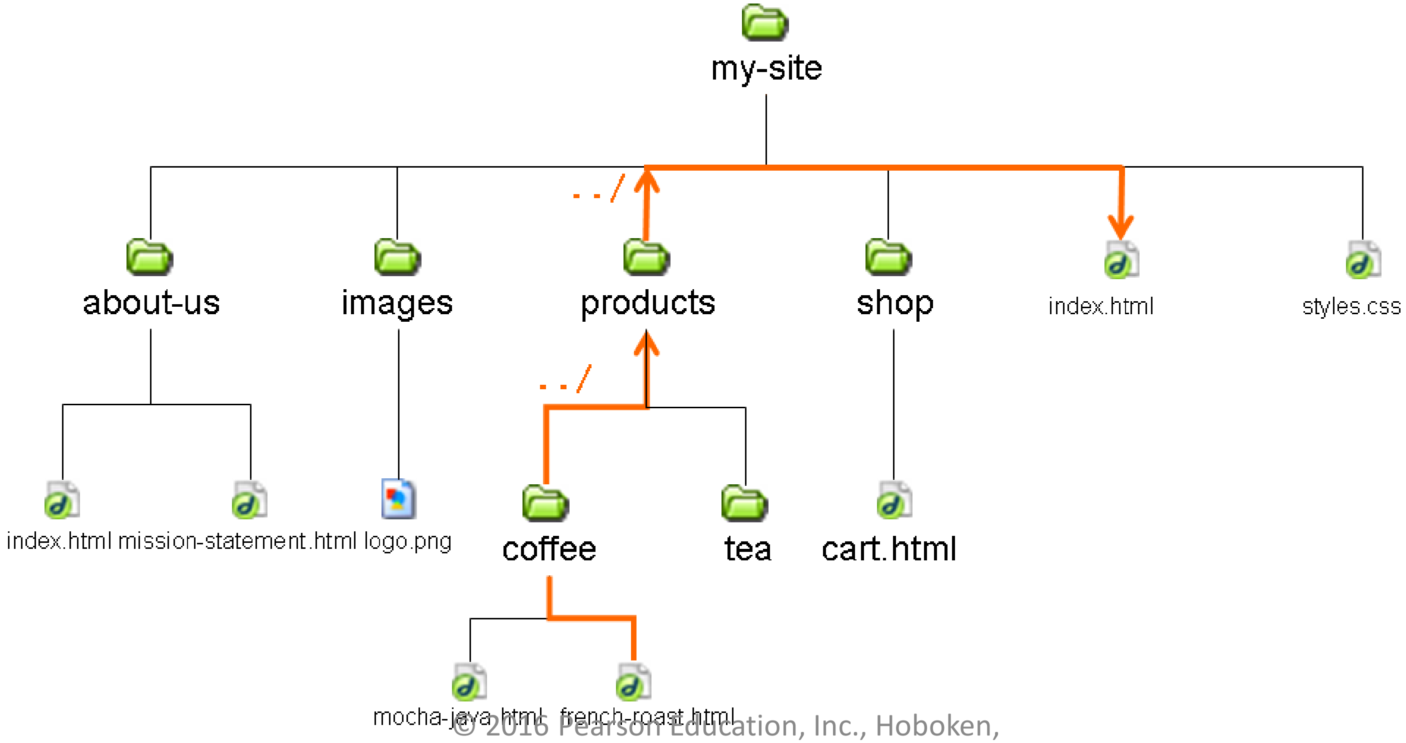
To link to a file that is outside of the current document's folder, start the path with ../ followed by the folder name, a forward slash (/), and then the filename.

Multiple ../ can be appended for going up multiple levels in the folder hierarchy

../ means going up one level in the folder hierarchy

To Construct a Document-Relative Path

Example: To add a link in french-roast.html (source page) to link to index.html (in my-site folder), the relative path is: `../../index.html`


my-site
../
about-us
images
products
shop
index.html
styles.css
../
index.html
mission-statement.html
logo.png
coffee
tea
cart.html
mocha-java.html
french-roast.html