

04 – HTML, CSS & JavaScript

LBSCI 700 | Spring 2019

Queens College, CUNY

04-js.pdf

More about HTML

More about CSS

Page Layout and Navigation

JavaScript introduction

Recap

Last Things

More about HTML

Elements, Tags & Attributes

- An HTML element
 - `<tag-name attr1="attrval">content</tag-name>`
 - A semantic property by tag-name
 - Modification by attributes
- Nested HTML elements
 - “content” can contain other elements
 - Don’t “overlap”
- Two-sided vs. one-sided tags
- Use lowercase tags
- Properly name your files

Basic HTML Structure

- Comments:

`<!-- ... -->`

- Structure

`<html>`

`<head>`

`...`

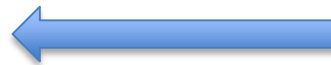
`</head>`

`<body>`

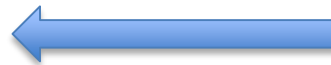
`...`

`</body>`

`</html>`



`title`, meta-tags, etc.
(not displayed)



main content
(displayed)

Hyperlink to a Web Page in the Same Web Site

- The Web is based on hyperlinks

` ... `

- Using partial paths and filenames

- Main page/default page/index
- Linking to specific page must specify the complete file name

- Using absolute and relative paths

- A complete address

`About Me`

- From page A (e.g., index.html) to page B (e.g., about.html)

`About Me`

***A and B must be in the same folder**

- Setting a target window

`About Me`

Creating and Hyperlinking to Anchors

- An anchor is a marker within an HTML document
 - Define a specific location in HTML an anchor name
 - hyperlink directly to that anchor
- It is useful in long documents with multiple sections
 - Jump rather than scrolling
 - Creating a list of hyperlinks internally/externally
- Two parts to the process
 - Mark an anchor location
 - Create a hyperlink that refers to the anchor

Lab Exercises #1

- Download folder “CreatingAnchors” from Bb
 - Open the spray file in Notepad and in a browser
1. Locate the Equipment heading (not the list item), enclose it with an anchor tag, and include equipment with the name= attribute.

```
<a name="equipment"><h2>Equipment</h2></a>
```

2. Repeat step 1 for the other <h2> level headings using the lowercase title of each one as the anchor name.

```
<a name="mixing"><h2>Mixing</h2></a>
```

...

```
<a name="spraying"><h2>Spraying</h2></a>
```

...

```
<a name="cleanup"><h2>Cleanup</h2></a>
```


Lab Exercises #1 (cont.)

3. In the bulleted list at the top of the document, create a hyperlink from the Equipment list item to the corresponding heading.

```
<a href="#equipment"><li>Equipment</li></a>
```

4. Repeat step 3 for each of the other list items.

```
<a href="#mixing"><li>Mixing</li></a>
```

```
<a href="#spraying"><li>Spraying</li></a>
```

```
<a href="#cleanup"><li>Cleanup</li></a>
```

5. Save the file, and then refresh the browser
6. Click each of the hyperlinks in the bulleted list; click the back button after each one to return to the top of the page.

Lab Exercises #1 (cont.)

7. Open the index file in Notepad.
8. Under HTML version, link each of the bulleted list items to the corresponding anchor point you created in the spray file.

```
<ul><li><a href="spray.htm">HTML version</a>
```

```
  <ul><a href="spray.htm#equipment"><li>Equipment</li></a>
```

```
  <a href="spray.htm#mixing"><li>Mixing</li></a>
```

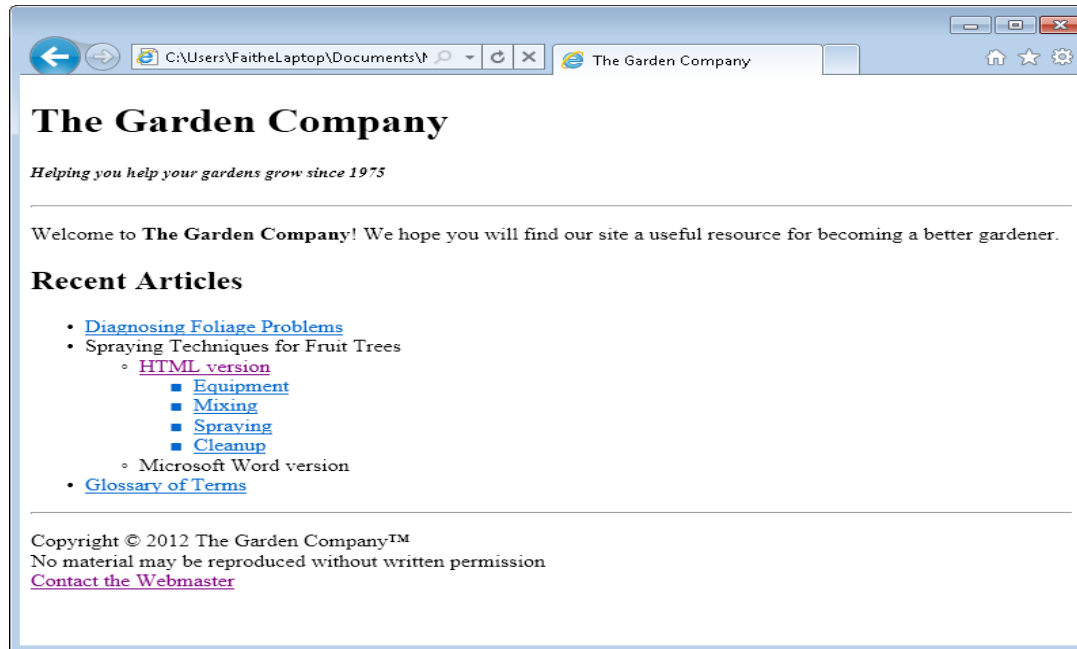
```
  <a href="spray.htm#spraying"><li>Spraying</li></a>
```

```
  <a href="spray.htm#cleanup"><li>Cleanup</li></a></ul></li>
```

9. Save the file, and then refresh the Internet Explorer display.

Lab Exercises #1 (cont.)

9. Save the file, and then refresh the Internet Explorer display.



10. Click each of the hyperlinks. Click the Back button each one to return to the referring Web page.

Basic & Useful Tags

- Text display
 , , ...
- Structure
 <h1>, <h2>, <h3>
 <p>
 , , <blockquote>
- Attributes
 Align, text, bgcolor, ...
- Links
 ...
- Images
 an empty tag
- Tables
- Forms

More HTML

- Learn on your own
- Understand HTML to code in JavaScript etc.
- Understand HTML to know limitations on how docs on the web can be structured

More about CSS

Creating Styles for Nested Tags

- Apply a specific formatting when one tag is nested within another
- Lab exercises #2 – “CreatingNested” folder

Creating Classes and IDs for Applying Styles

- make your own styles by creating classes and IDs.
 - Classes and IDs mark certain elements so that you can refer to them in your style sheet.
 - A class can be applied to multiple selections,
 - An ID uniquely identifies a specific selection within a document.
- *Different documents can use the same ID.**
- Lab exercises #3 – “CreatingClasses” folder

Applying Styles to Hyperlinks

- Use pseudo-classes to apply different hyperlink colors
- A pseudo-class is a class that uses a variable to determine membership.
 - Create the style rule in the <style> section

```
<style>
a:link {color: black}
a:visited {color: magenta}
</style>
```
 - Two additional pseudo-classes
 - hover
 - active

Formatting Text by Using Style Sheets

- Specifying a font family
- Specify a font size and color
- Applying bold and italics
- Applying strikethrough and underlining
- Create inline spans
- Adjusting spacing between letters

Formatting Paragraphs by Using Style Sheets

- Indenting paragraphs
- Applying a border to a paragraph
- Specifying the horizontal alignment of a paragraph
- Applying strikethrough and underlining
- Specifying the vertical space within a paragraph
- Adjusting spacing between letters

Displaying Graphics

- Inserting graphics
- Arranging elements on the page
- Controlling image size and padding
- Hyperlinking from graphics
- Using thumbnail graphics
- Including alternate text for graphics

More CSS

- More lab exercises

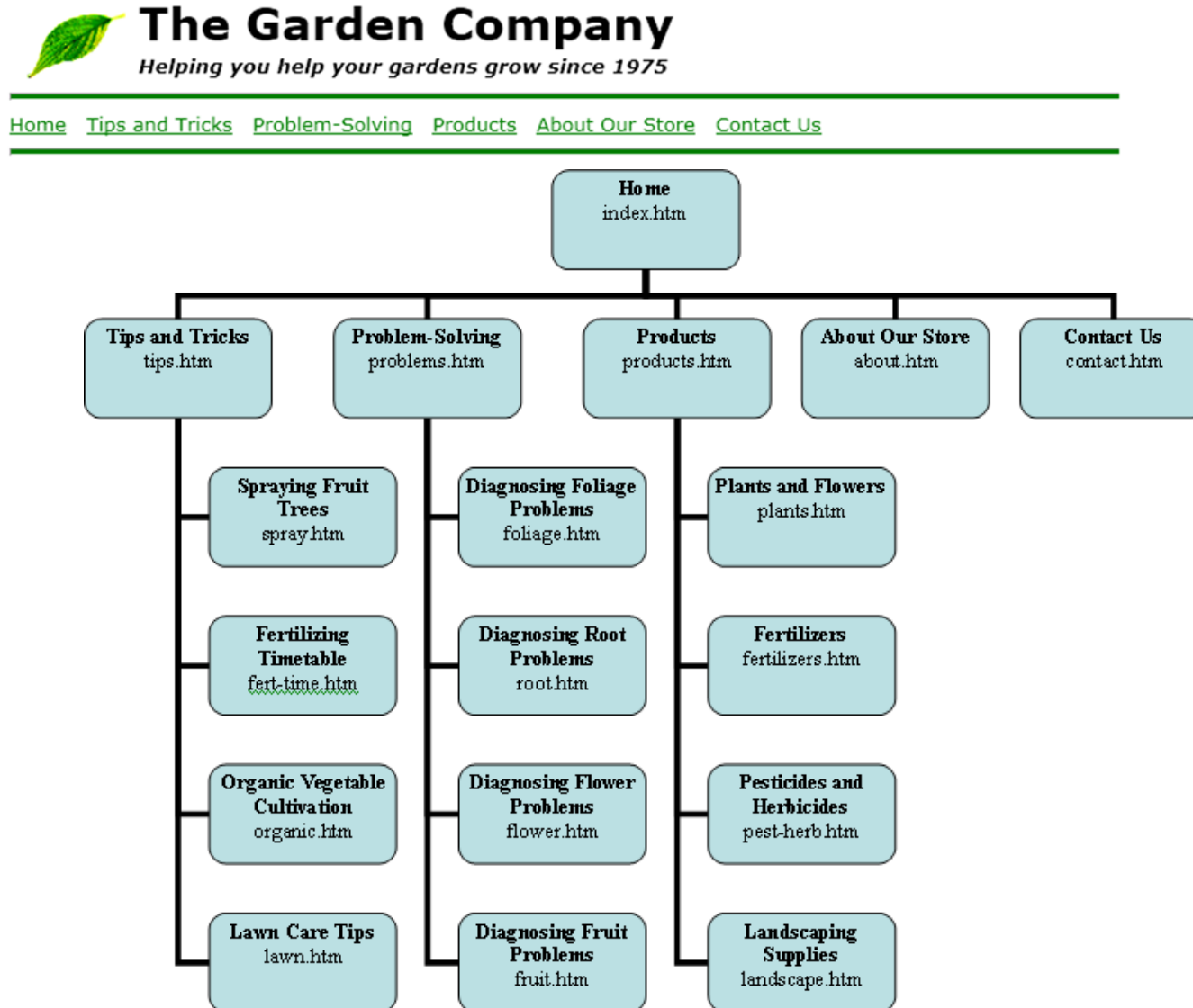
Page Layout and Navigation

Placing a consistent navigation bar on each page

- A navigation bar is a set of hyperlinks that connect to the major pages of your Web site.
- The hyperlinks can be either text-based or graphical.
- The navigation bar should not contain hyperlinks to every page in the site unless the site is extremely **small and simple**.
 - [QC Libraries](#)
 - Personal Website

Planning Your Site's Organization

- Create a diagram that outlines the site's planned structure



Your Turn #1

- Add a text-based navigation bar to the top and bottom of a Web page.

Download folder “CreatingTextBar,” Open the index file in Microsoft Notepad and in a browser.

1. At the first `<hr>` tag, add a `<nav>` container and add the text for a navigation bar.

```
<nav>
```

```
<hr>
```

```
<p>Home Tips and Tricks Problem-Solving Products About Our Store Contact  
Us</p>
```

```
</nav>
```

2. Save the file, and then refresh the browser.

Home Tips and Tricks Problem-Solving Products About Our Store Contact Us

Your Turn #1 (cont.)

- Using nonbreaking space code ();
3. Insert a nonbreaking space (and a normal space following it) between each section title, like this:

```
<p>Home &nbsp; Tips and Tricks &nbsp; Problem-Solving &nbsp; Products &nbsp;  
About Our Store &nbsp; Contact Us</p>
```
 4. Save the file, and then refresh the browser.
 5. To help set off the navigation bar from the rest of the text, insert **a second horizontal line** below the navigation bar text, but above the closing `</nav>` tag.
 6. Save the file, and then refresh the browser.

Home Tips and Tricks Problem-Solving Products About Our Store Contact Us

Your Turn #1 (cont.)

7. Set the margin for the paragraph to zero.

```
<p style="margin:0px">Home &nbsp; Tips and Tricks &nbsp; Problem-Solving  
&nbsp; Products &nbsp; About Our Store &nbsp; Contact Us</p>
```

8. Save the file, and then refresh the browser.

Home Tips and Tricks Problem-Solving Products About Our Store Contact Us

Your Turn #1 (cont.)

9. Add hyperlinks to each of the six items in the navigation bar to the corresponding pages.

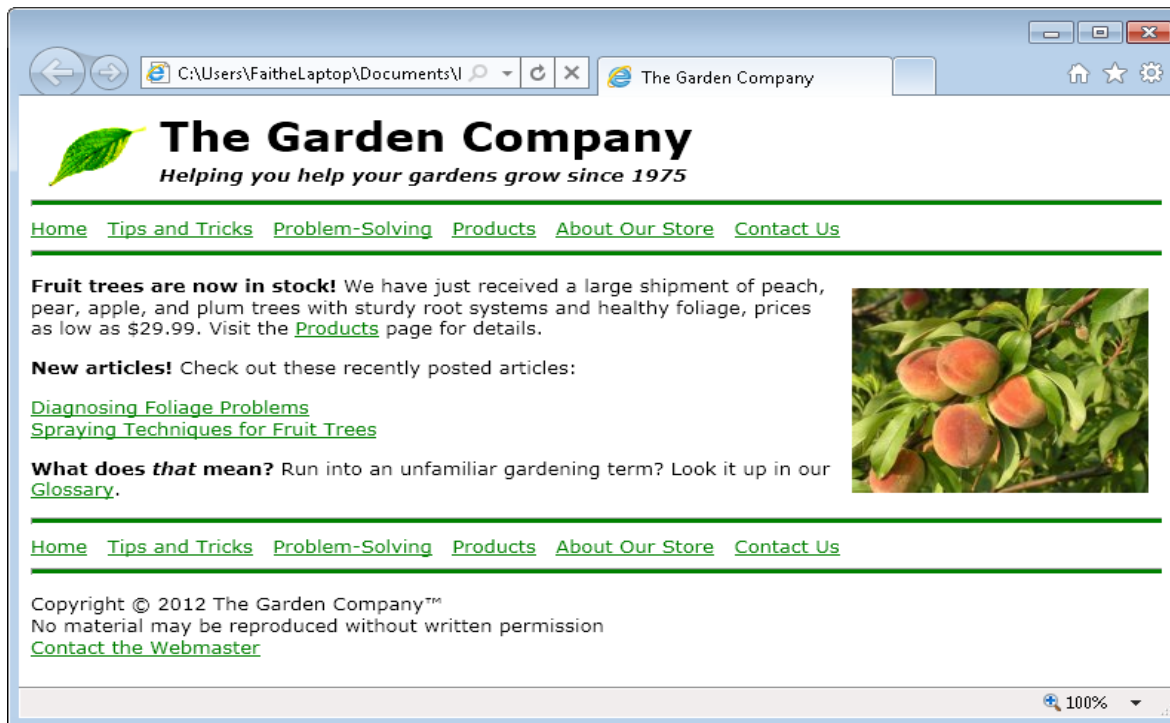
```
<nav>
<hr>
<p style="margin:0px">
<a href="index.htm">Home</a> &nbsp;
<a href="tips.htm">Tips and Tricks</a> &nbsp;
<a href="problems.htm">Problem-Solving</a> &nbsp;
<a href="products.htm">Products</a> &nbsp;
<a href="about.htm">About Our Store</a> &nbsp;
<a href="contact.htm">Contact Us</a></p>
<hr>
</nav>
```

10. Save the file, and then refresh Internet Explorer.

[Home](#) [Tips and Tricks](#) [Problem-Solving](#) [Products](#) [About Our Store](#) [Contact Us](#)

Your Turn #1 (cont.)

11. Select the code for the entire navigation bar, including the `<nav>` and `</nav>` tags, and press **Ctrl+C** to copy it to the Clipboard.
12. Select the `<hr>` tag at the bottom of the document, and press **Ctrl+V** to replace it with a copy of the navigation bar.
13. Save the file, and then refresh the browser.



Creating a Graphical Navigation Bar

- Keep the size of each button small (150 pixels wide at the most).
- Make each button the same size and shape. The only variation should be in the text that they present.
- Save each button as a separate file in GIF or JPG format.
- Free button-creation sites:

<http://www.crystalbutton.com>

<http://www.buttongenerator.com>

* You can search more sites.

Your Turn #2

- Convert a text-based navigation bar to a graphics-based one.

Download folder “CreatingGraphicBar,” Open the index file in Microsoft Notepad and in a browser.

Your Turn #2 (cont.)

1. In Notepad, in the upper navigation bar, change the hyperlinks so that they reference the button graphics in the /images folder rather than displaying text.

```
<nav>
```

```
<hr>
```

```
<p style="margin:0px">
```

```
<a href="index.htm"></a>
```

```
<a href="tips.htm"></a>
```

```
<a href="problems.htm"></a>
```

```
<a href="products.htm"></a>
```

```
<a href="about.htm"></a>
```

```
<a href="contact.htm"></a>
```

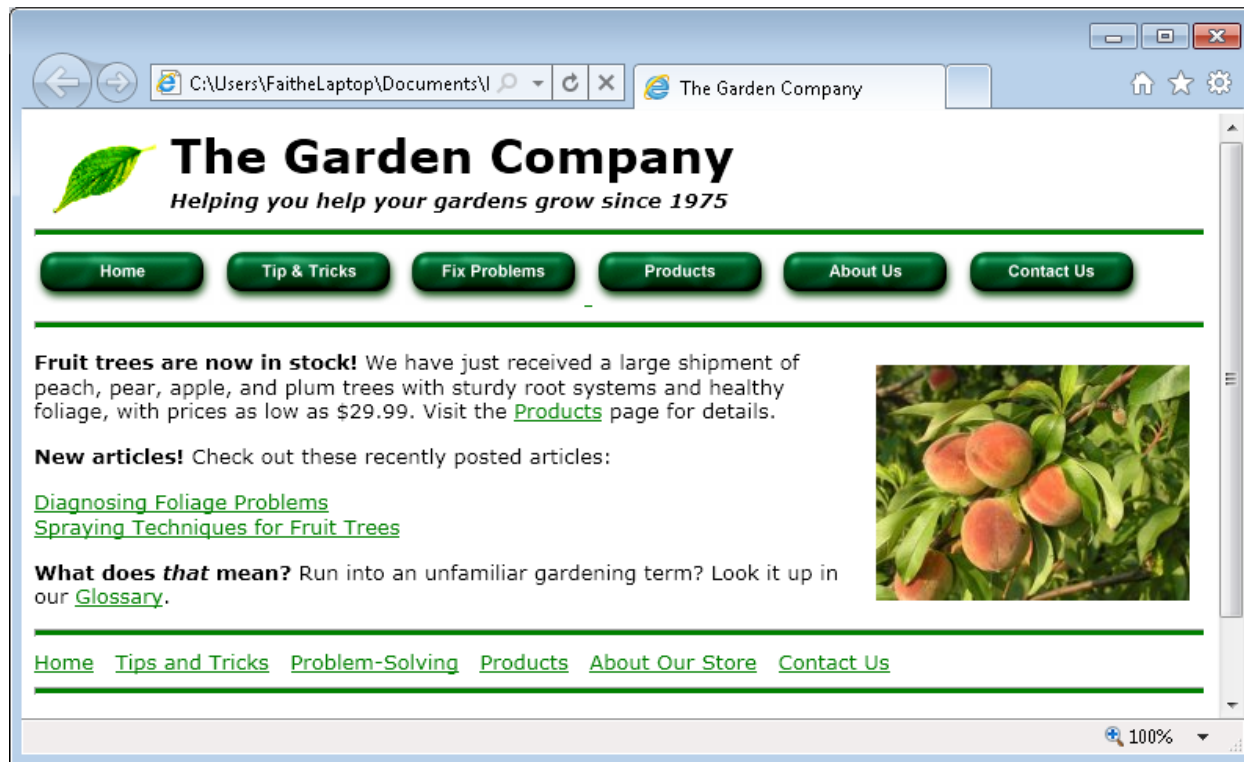
```
</p>
```

```
<hr>
```

```
</nav>
```


Your Turn #2 (cont.)

2. Save the file, and then refresh the browser to view your work.



Redirecting to Another URL

- Help your past visitors find the new page
- Make the old page automatically display the new page
- Redirect one page to another page automatically after five seconds.

Your Turn #3

Download “Redirecting” folder. Open the foliage file in Notepad and a browser.

1. In the <head> section, add a new <meta> tag as follows:

```
<meta http-equiv="refresh" content="5; url=foliage-new.htm">
```

2. In the <body> section, make the text click here into a hyperlink to foliage-new.htm.

```
<p>This page has been moved. <br>
```

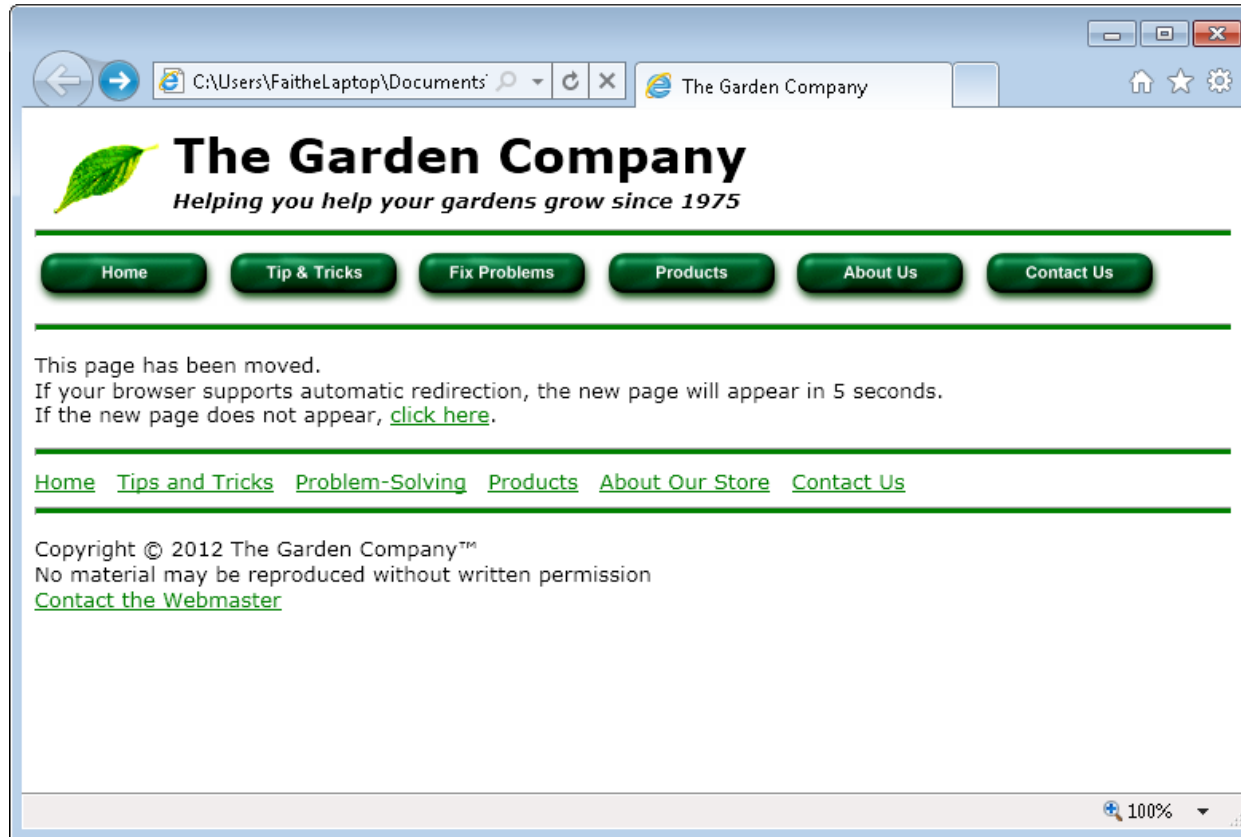
```
If your browser supports automatic redirection, the new page will appear in 5 seconds. <br>
```

```
If the new page does not appear, <a href="foliage-new.htm">click here </a>.</p>
```

3. Save the file, and then refresh Internet Explorer.

Your Turn #3 (cont.)

3. Save the file, and then refresh the browser.



Key Points

- A navigation bar contains a list of hyperlinks to the major pages on your site. It need not include every page in the site. The optimal number of links is between four and seven.
- In HTML5, you can use the `<nav>` tag as a container to indicate that a group of links constitutes a navigation element.
- Plan your site's organization before you create the navigation bar. Draw a diagram of all the pages and their connections to one another, and choose a file name for each page.
- Navigation bars are traditionally placed at the top or left side of a page.

Key Points (cont.)

- Many Web designers place a text version of their navigation bar at the bottom of each page for user convenience.
- A text-based navigation bar is simply a series of hyperlinks.
- A graphical navigation bar uses small graphics for the hyperlinks. You can create these graphics using a graphics program such as Photoshop or a utility designed specifically for creating Web buttons.
- To redirect a page to a different URL, create a *<meta>* tag in the *<head>* section with the *http-equiv* attribute, like this:
<meta http-equiv="refresh" content="5; url=http://support.microsoft.com">.

More Exercises Later

- Creating division-based layouts
- Creating & formatting tables
- Creating user forms
- ...

W3C Standards

- The World Wide Web Consortium (W3C)
- [W3C Standards](#)
 - Define an Open Web Platform for application development
 - Ensure high technical and editorial quality
 - Standards for HTML, CSS, and other technologies

JavaScript Basics

What is JavaScript?

- JavaScript is a “scripting” language designed for client-side web development
 - Client-side refers to the fact that it is executed in the client (software) that the viewer is using. In the case of JavaScript, the client is the browser.
 - A server-side language is one that runs on the Web server (e.g., PHP, Python)
- JavaScript is embedded in HTML documents
- JavaScript vs. Java

History

- First web scripting language
- Developed by Netscape and Sun
- Initiated by Netscape and called LiveScript
- In parallel with this, Sun was developing Java

Why Use JavaScript?

- It can enhance the functions of your web pages, making interactive Web pages
- It can be fun!

What Can a JavaScript Do?

- To create interactive user interface in a web page (e.g., menu, pop-up alert, windows, etc.)
- Manipulating web content dynamically
 - Change the content and style of an element
 - Replace images on a page without page reload
 - Hide/Show contents
- Generate HTML contents on the fly
- Form validation
- etc.

Embedding JavaScript in HTML

- Two ways to add JavaScript to Web pages
 - Use the `<script>...</script>` tag
 - Include the script in an external file
`<script src="myjavascript.js" type="text/javascript"> </script>`

General Format

```
<!Doctype ...>
<html>
  <head>
    <title> Name of web page </title>
    <script type="text/javascript">
      ...script goes here
    </script>
  </head>
  <body>
    ...page body here: text, forms, tables
    ...more JavaScript if needed
    ...onload, onclick, etc. commands here
  </body>
</html>
```

Characteristics

- Case sensitive
- Object oriented
- Produces an HTML document
- Comments
 - Single line comments start with `//`.
 - Multi-line comments start with `/*` and end with `*/`.
- Semicolons separate JavaScript statements

```
<script>
```

```
var a, b, c;
```

```
a = 5;
```

```
b = 6;
```

```
c = a + b;
```

```
document.getElementById("demo1").innerHTML = c;
```

```
</script>
```


JavaScript Terminology

- JavaScript programming uses specialized terminology.
- Understanding JavaScript terms is fundamental to understanding the script.

Objects, Properties, Methods, Events, Functions,
Values, Variables, Expressions, Operators.

Objects

- Objects refers to windows, documents, images, tables, forms, buttons or links, etc.
- Objects should be named.
- Objects have properties that act as modifiers.

Properties

- Properties are object attributes.
- Object properties are defined by using the object's name, a period, and the property name.

document.bgcolor

object

property

Methods

- Methods are actions applied to particular objects.
- Methods are what objects can do.

`document.write("Hello World")`

object method

Events

- JavaScript's interaction with HTML is handled through events
- Events are "things" that happen to HTML elements
 - Loading a page
 - Clicking a button
 - Closing a window,
 - ...
- Use these events to execute JavaScript coded responses
 - Messages to be displayed to users
 - Data to be validated
 - Virtually any other type of response imaginable.
- Every HTML element contains a set of events which can trigger JavaScript Code.

Your Turn #4

https://www.w3schools.com/js/js_events.asp

Functions

- Functions are named statements that performs tasks.

doWhatever () {statement here}

- The curly braces contain the statements of the function.
- JavaScript has built-in functions, and **you can write your own.**

Values

- Values are bits of information.
- Values types
 - Number: 1, 2, 3, etc
 - String: characters enclosed in quotes
 - Boolean: true or false

Variables

- Variables contain values and use the **equal** sign to specify their value.
- Variables are created by **declaration** using the *var* command with or without an initial *value* state.

e.g. `var month;`

e.g. `var month = April;`

The diagram illustrates the components of the code `var month = April;`. A red bracket under the word `month` has a blue arrow pointing to the word `variable`. Another red bracket under the word `April` has a blue arrow pointing to the word `value`.

The HTML DOM (Document Object Model)

https://www.w3schools.com/js/js_htmlDOM.asp

Your Turn #5

1. In Notepad, type the following:

```
<!DOCTYPE HTML>
```

```
<html>
```

```
<head>
```

```
<meta http-equiv="Content-Type" content="text/html; charset=utf-8">
```

```
<title>JavaScript 101</title>
```

```
</head>
```

```
<body>
```

```
<div id="contentDiv">Your first JavaScript page.</div>
```

```
</body>
```

```
</html>
```

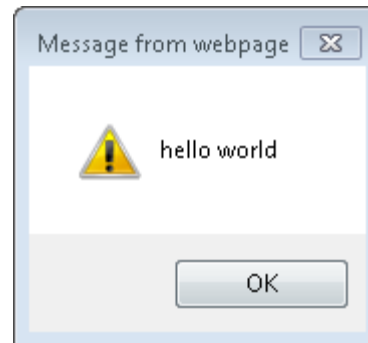
Your Turn #5 (cont.)

2. Add some JavaScript to the page, placing it just before the closing `</body>` tag:

```
<!DOCTYPE HTML>
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8">
<title>JavaScript 101</title>
</head>
<body>
<div id="contentDiv">Your first JavaScript page.</div>
<script type="text/javascript">
    alert("hello world");
</script>
</body>
</html>
```

Your Turn #5 (cont.)

3. Save the file in Notepad as javascript01.html.
4. View the page within a Web browser. You should receive an alert such as this:



Your Turn #6

1. Delete the following line from the code:

```
alert("hello world");
```

2. Between the `<script>` and `</script>` tags, place the following:

```
<script type="text/javascript">
```

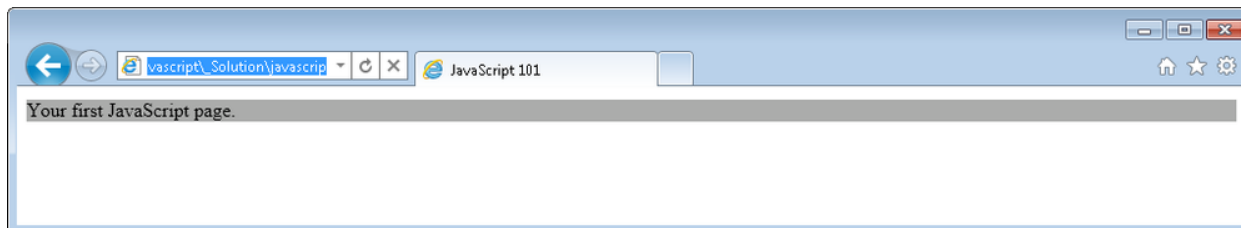
```
    var divContent = document.getElementById("contentDiv");
```

```
    divContent.style.backgroundColor = "#abacab";
```

```
</script>
```

3. Save your work in Notepad.

4. Open the file in the browser to test it.



JavaScript Events and jQuery

- jQuery is an open source JavaScript file
- jQuery handles cross-browser incompatibilities
- An excellent tool for working with JavaScript events
- Obtaining jQuery

<http://jquery.com/>

```
<script src="https://ajax.googleapis.com/ajax/libs/jquery/3.3.1/jquery.min.js">
```

HTML5 Canvas Element

- The `<canvas>` element enables advanced graphics and interactions via JavaScript
- The `<canvas>` element is only a container for graphics. You must use JavaScript to actually draw the graphics.
- Canvas has several methods for drawing paths, boxes, circles, text, and adding images.

Download “Javascript02.html” file

Recap

Recap

- Do Exercises
- Comments, Indentions, Modifying, Debugging
- Terminology & Syntaxes

Last Things

ToDo

- Start homework
 - Look for email
 - Check Bb weekly folder
- Note any questions from reading and homework
- Class 5 on March 4 (online, look for email)