

# Lab # 03: Improved Web Design using CSS/Bootstrap

## OBJECTIVES OF THE LAB

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This lab aims at the understanding of:

- *The concept of Dynamic HTML*
  - *Cascaded Style Sheets (CSS)*
  - *Various attributes of CSS such as font, color, background, text, border, margin, and list*
  - *User-Defined Selectors including Class and ID*
  - *Span and Div Tags*
  - *External Style Sheets and their benefits.*
- 

## DYNAMIC HTML (DHTML)

The requirements of a good website are:

**First Impression** – i.e. Did the initial page grab attention?

**Interface Design** – i.e. Is the menu interface interactive enough and visually interesting?

**Corporate Mildew** – i.e. Is the site trapped in a web of corporate look, feel, and canned marketing speak?

**Coriolis Effect** – i.e. Does the site generate enough currents of interest based on design and content for the user to come back?

Dynamic HTML is a way to design an eye- and mind-catching web sites fulfilling above requirements. It combines HTML with Cascading Style Sheets (CSSs) and Scripting Languages. HTML specifies a web page's elements like table, frame, paragraph, bulleted list, etc. CSS can be used to determine an element's size, color, position, and a number of other features. Scripting Languages (JavaScript and VBScript) can then be used to manipulate the web page's elements so that styles assigned to them can change in response to user's input.

This lab covers the CSS part of DHTML.

## CASCADED STYLE SHEETS (CSSs)

Style Sheets are powerful mechanism for adding styles (e.g. fonts, colors, spacing) to Web documents. They enforce uniformity throughout web site and provide numerous attributes to

create dynamic effects. With Style Sheets, text and image formatting properties can be predefined in a single list. HTML elements on a web page can then be bound to the style sheet. The advantages of Style Sheet include the ability to make global changes to all documents from a single location.

The style assignment is accomplished using `<style>` and `</style>` tags. Specific style attributes are specified between `<style>` tags, which itself are written between `<head>` tags.

#### Syntax:

```
<style type="text/css">
    tag {attribute: value; attribute: value; attribute: value; ...}
    .
    .
    .
</style>
```

Note: To protect browsers that do not support `<style>` element, insert comment tags around the declaration within the style element.

```
<style type="text/css">
    <!--
    /*declaration*/
    -->
</style>
```

The attributes that can be specified to the `<style>` tag are Font attributes, Color and Background attributes, Text attributes, Border attributes, Margin attributes, and List Attributes. Following subsections covers these attributes briefly.

### 1) Font Attributes

Table 3.1 covers various font attributes that can be defined with CSS.

**TABLE 3.1: FONT ATTRIBUTES**

Attributes	Values
<b>font-family</b>	A comma delimited sequence of font family names (Times, Arial, Garamond, etc.)
<b>font-style</b>	Normal, italic, or oblique
<b>font-weight</b>	Normal, bold, bolder, lighter, or one of the nice numerical values (100-900)
<b>font-size</b>	A term that denotes absolute size (xx-small, x-small, small, medium, large, x-large, xx-large), relative size (larger, smaller), a number (of pixels), percentage (of the parent element's size)

### Example 1: Usage of Font Attributes

This example demonstrates the usage of font attributes listed in Table 3.1. Figure 3.1 shows the output web page.

```
1. <html>
2.   <head>
3.     <title> Working with Style Sheets using Font Attributes </title>
4.     <style type="text/css">
5.       h1{font-family: arial, helvetica}
6.       p {font-size: 12pt;
7.         font-style: italic;
8.         font-weight: normal}
9.     </style>
10.  </head>
11.
12.  <body>
13.    <h1>Silicon Chip Technologies</h1>
14.    <p> Silicon Chip Technologies, a private limited company, was founded in
15.      December 1989.
16.    <p> The vision of this company is to provide any corporate client a single
17.      entity which addresses all their Software Development, Technical and
18.      User Documentation, Training and Manpower Recruitment needs.
19.  </body>
20. </html>
```

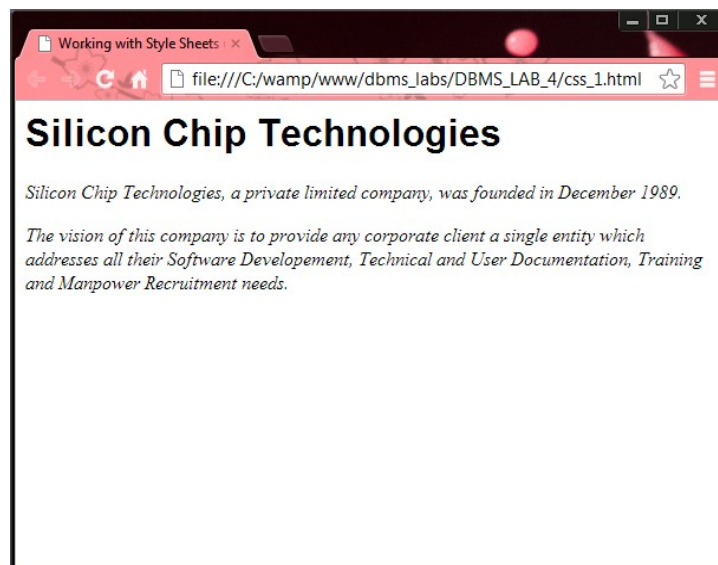


Figure 3.1 – Example 1 output

## 2) Color and Background Attributes

Table 3.2 covers various color and background attributes that can be used with CSS.

TABLE 3.2: COLOR AND BACKGROUND ATTRIBUTES

Attributes	Values
<b>Color</b>	Sets an element's text-color. It can be a color name or a color code
<b>background-color</b>	Specifies the color in an element's background. It can be color name or color code.
<b>background-image</b>	Sets the background image. It is a URL or none.
<b>background-repeat</b>	With a background image specified, sets up how the image repeats throughout the page. Allowed values are repeat-x (repeats horizontally), repeat-y (repeats vertically), repeat (both), no-repeat

### Example 2: Usage of Color and Background Attributes

This example demonstrates the use of color and background attributes listed in Table 3.2. Figure 3.2 shows the output web page

```

1.  <html>
2.    <head>
3.      <title>Working with Style Sheets using Color and Background
4.      Attributes</title>
5.      <style type="text/css">
6.        h1 {font-family:arial, helvetica;
7.          font-size:26pt;
8.          background-image:url(images/logo2.jpg)}
9.        h2 {font-family:arial, helvetica;
10.         font-size:26pt;
11.         background-image:url(images/logo2.jpg);
12.         background-repeat:no-repeat}
13.        p {font-size:12pt;
14.          font-style:italic;
15.          font-weight:bold;
16.          color:#23238e;
17.          background-color:red;
18.          background-position:bottom-left}
19.      </style>
20.    </head>
21.    <body>
22.      <b><u>With background repeat</u></b>
23.      <h1>Silicon Chip Technologies</h1>
24.      <p>A private limited company, which was founded in December 1989.The
25.      vision of this company is to provide any corporate client a single entity

```

27. which addresses all their Software Development, Technical and User
28. Documentation, Training and Manpower Recruitment needs. </p><br>
29. <b><u>With background no-repeat</u></b>
30. <h2>Silicon Chip Technologies</h2>
31. </body>
32. </html>

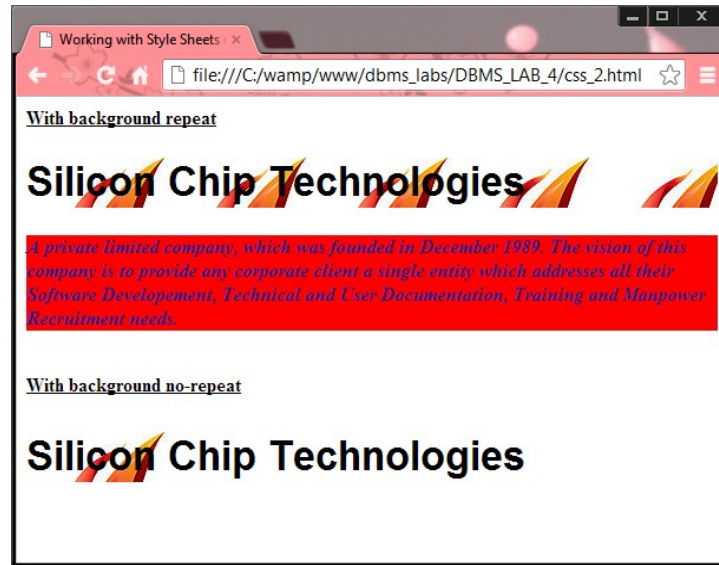


Figure 3.2 – Example 2 output

### 3) Text Attributes

Table 3.3 covers different text attributes that can be used with CSS.

TABLE 3.3: TEXT ATTRIBUTES

Attributes	Values
<b>text-decoration</b>	Adds decoration to an element's text. Allowed values are None, underline, overline, line-through, and blink.
<b>vertical-align</b>	Determines an element's vertical position. Allowed values are baseline, sub, super, top, text-top, middle, bottom, text-bottom, also percentage of the element's height.
<b>text-transform</b>	Applies a transformation to the text. Allowed values are capitalize (i.e. puts the text into initial caps), uppercase, lowercase, or none.
<b>text-align</b>	Aligns text within an element. Allowed values are left, right, center, or justify.
<b>text-indent</b>	Indents the first line of text. It can be a percentage of element's width or a length

#### Example 3: Usage of Text Attribute

This example demonstrates usage of text-decoration, text-align, and text-indent attributes as defined in Table 3.3. Figure 3.3 shows the output web page.

```
1. <html>
2.   <head>
3.     <title>Working with Style Sheets using Text Attributes</title>
4.     <style type="text/css">
5.       h1 {font-family:arial, helvetica;
6.         font-size:26pt;
7.         text-decoration: blink;
8.         color:red;}
9.       p {font-size:12pt;
10.        font-style:normal;
11.        font-weight:bold;
12.        color:#23238e;}
13.       h6 {font-size:12pt;
14.         font-style:italic;
15.         font-weight:bold;
16.         color:#23238e;
17.         text-align:justify;
18.         text-indent:.5in;}
19.     </style>
20.   </head>
21.
22.   <body>
23.     <h1>Silicon Chip Technologies</h1>
24.     <b><u>Without text align, first line indent</u></b>
25.     <p> A private limited company, which was founded in December 1989. The
26.       vision of this company is to provide any corporate client a single entity
27.       which addresses all their Software Development, Technical and User
28.       Documentation, Training and Manpower Recruitment needs. </p>
29.
30.     <b><u>With text align (justify), first line indent</u></b>
31.     <h6> A private limited company, which was founded in December 1989.
32.       The vision of this company is to provide any corporate client a single
33.       entity which addresses all their Software Development, Technical and
34.       User Documentation, Training and Manpower Recruitment
35.       needs. </h6>
36.   </body>
37. </html>
```

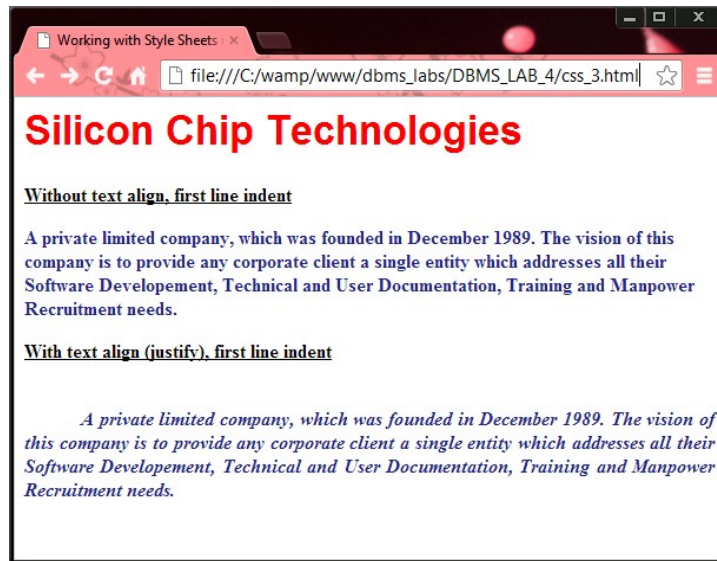


Figure 3.3 – Example 3 output

#### 4) Border Attributes

Table 3.4 specifies different border attributes that can be used with CSS.

TABLE 3.4: BORDER ATTRIBUTES

Attributes	Values
<b>border-style</b>	Allowable style includes solid, double, groove, ridge, inset, outset.
<b>border-color</b>	It can be a color name or color code.
<b>border-width</b>	Allowed values are thin, medium, thick or length.
<b>border-top-width</b>	Allowed values are thin, medium, thick or length.
<b>border-bottom-width</b>	Allowed values are thin, medium, thick or length.
<b>border-left-width</b>	Allowed values are thin, medium, thick or length.
<b>border-right-width</b>	Allowed values are thin, medium, thick or length.
<b>border-top</b>	It specifies the width, color, and style.
<b>border-bottom</b>	It specifies the width, color, and style.
<b>border-left</b>	It specifies the width, color, and style.
<b>border-right</b>	It specifies the width, color, and style.
<b>Border</b>	It sets all the properties at once.

#### 5) Margin Attributes

Table 3.5 specifies various margin attributes such as top, bottom, left, and right that can be used with CSS.

TABLE 3.5: MARGIN ATTRIBUTES

Attributes	Values
<b>margin-top</b>	Possible set of values are length, percent, or auto.
<b>margin-bottom</b>	Possible set of values are length, percent, or auto.
<b>margin-left</b>	Possible set of values are length, percent, or auto.
<b>margin-right</b>	Possible set of values are length, percent, or auto.
<b>Margin</b>	Possible set of values are length, percent, or auto.

**Example 4: Usage of Margin Attribute**

This example demonstrates the usage of various margin attributes such as top, left, and right. Figure 3.4 shows the output webpage where top margin is set to 10%; while both left & right margins are set to 15%

```

1. <html>
2.   <head>
3.     <title> Use of Margin Attributes </title>
4.     <style type="text/css">
5.       body {margin-top:10%}
6.       h1 {font-family:arial, helvetica;
7.         font-size:26pt;
8.         color:red;}
9.       p {font-size:12pt;
10.        font-style:italic;
11.        font-weight:bold;
12.        color:#23238e;
13.        text-align:justify;
14.        margin-left:15%;
15.        margin-right:15%;}
16.     </style>
17.   </head>
18.
19.   <body>
20.     <h1>Silicon Chip Technologies</h1>
21.     <b><u>Without text align, first line indent</u></b>
22.     <p>A private limited company, which was founded in December 1989. The
23.       vision of this company is to provide any corporate client a single entity
24.       which addresses all their Software Development, Technical and User
25.       Documentation, Training and Manpower Recruitment needs. </p>
26.   </body>
27. </html>

```





Figure 3.4 – Example 4 output

## 6) List Attributes

Table 3.6 specifies different list attributes that can be used with CSS.

TABLE 3.6: LIST ATTRIBUTES

Attributes	Values
<b>list-style-type</b>	Allowed set of values include disc, circle, square, decimal, lower-roman, upper-roman, lower-alpha, upper-alpha, none, etc.
<b>list-style-image</b>	It sets the image that will be used as the list item marker.
<b>list-style-position</b>	It specifies the position of the marker box in the principle black box.
<b>list-style</b>	It sets all the above three properties simultaneously.

## USER-DEFINED SELECTORS

In addition to setting a style for HTML element, CSS allows user to specify personal choices using "class" and "id" selectors.

### 1) The CLASS Selector

Style sheets support "classes" or "sets of style changes" for a document. A class can be defined to change the style in a specific way for any element it is being applied. Consider a particular paragraph that needs to look different from other paragraphs e.g. a question and answer page where questions are in bold, while the answers are in plain text. The appearance of a paragraph is a function of the content of the paragraph.

Classes can be used to identify logical sets of style changes that can be different for different HTML elements. The style changes can be applied directly to each HTML element or applied to part of a document with the <span> and </span> tags. If any element is member of a class by inserting

Class = "ClassName" into its opening tag, it conforms to that class's specification.

For question and answer example, there are two classes of paragraph – question and answer. So, in the style sheet there need to be two statements, one of which affects only a paragraph of *class* question, and one which only affects paragraph of *class* answer.

### Example 5: Usage of Class with CSS

This example demonstrates both creation and usage of class with style sheet. Here, two classes **question** and **answer** are created. All the HTML elements with class = "question" will be italic and brown while all elements with class = "answer" will be blue. Figure 3.5 shows the output webpage.

```
1. <html>
2.   <head>
3.     <title> Use of Margin Attributes </title>
4.     <style type="text/css">
5.         p {font-size:12pt;
6.           font-weight:bold;
7.           text-align:justify;
8.           margin-left:10%;
9.           margin-right:10%;}
10.    .question {color: brown; font-style: italic;}
11.    .answer {color:#23238e}
12.    </style>
13.  </head>
14.
15.  <body>
16.    <p class="question">How to create style sheet to alter an HTML
17.    element? </p>
18.
19.    <p class="answer">The Style assignment process can be accomplished with
20.    the &lt;STYLE&gt;...&lt;/STYLE&gt; tags. The syntax for making the
21.    assignment is simple. Between &lt;STYLE&gt; and &lt;/STYLE&gt;, HTML tags
22.    to which styles are to be assigned are to be listed ad each tag with a pair of
23.    curly brackets in which specific style attributes are to be specified. This
24.    &lt;STYLE&gt; tag should be within &lt;HEAD&gt;...&lt;/HEAD&gt;;
25.    element. </p>
26.
27.    <br>
28.
29.    <p class="question">What are the attributes that can be specified? </p>
30.
```

31. `<p class="answer">`The attributes that can be specified are: Font attributes,
32. Color and Background attributes, Text attributes, Border attributes, Margin
33. attributes, and List attributes. `</p>`
34. `</body>`
35. `</html>`

Note that only specific HTML element can be made affected by a class. For instance, **p.center {text-align: center;}** affects all p (paragraph) elements where class = "center" is specified into center-aligned paragraphs.

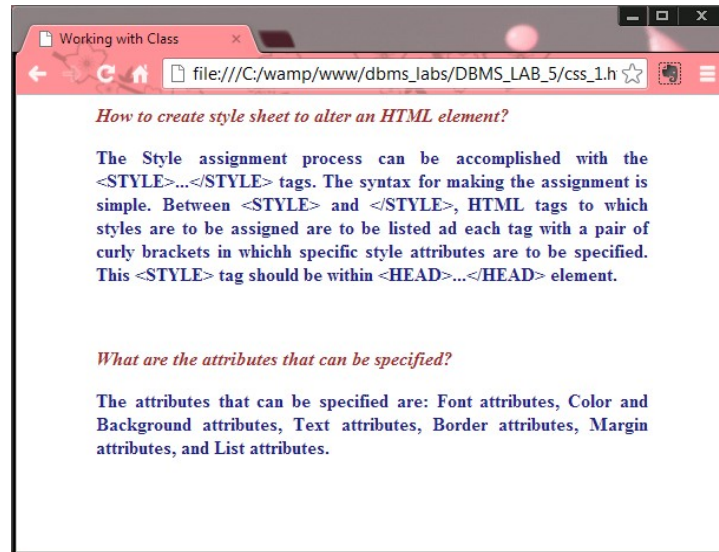


Figure 3.5 – Example 5 output

## 2) The ID Selector

The id selector is used to specify style for a single, unique element. It uses the id attribute of the HTML element, and is defined with a '#'. For example, **#para1 {text-align: center; color: red;}**. This rule will be applied to the element with id = "para1". Such as `<h1 id = "para1"> Journey to the Edge </h1>`. The difference between ID and class is that an ID selector can be called only once in a document, while a class selector can be called multiple times in a document.

## SPAN AND DIV TAGS

### 1) Using `<span>` Tag

Span is an HTML element that plays prominent role in style sheets. In the body of the document, `<span>` and `</span>` tags are used to divide the content into individual sections. It goes to finer level and can be used to format a single character if needed.

#### Example 6: Usage of SPAN Tag

This example demonstrates usage of `<span>` tag. Figure 3.6 shows the output webpage.

```

1. <html>
2.   <head>
3.     <title> Working with Span </title>
4.     <style type="text/css">
5.       p {font-size:12pt;
6.         font-weight:bold;
7.         text-align:justify;}
8.       .question {color:brown; font-style:italic;}
9.       .answer {color:#23238e}
10.      .big {font-size:14pt;
11.        text-decoration:underline;
12.        text-transform:uppercase;
13.        color:red;}
14.    </style>
15.  </head>
16.
17.  <body>
18.    <p class="question">How to create <span class="big">style sheet</span> to
19.    alter an HTML element? </p>
20.
21.    <p class="answer">The Style assignment process can be accomplished with
22.    the <STYLE>...</STYLE> tags. The syntax for making the
23.    assignment is simple. Between <STYLE> and </STYLE>, HTML tags
24.    to which styles are to be assigned are to be listed ad each tag with a pair of
25.    curly brackets in which specific style attributes are to be specified. This
26.    <STYLE> tag should be within <HEAD>...</HEAD>
27.    element. </p>
28.
29.    <br>
30.
31.    <p class="question">What are the <span class="big">attributes</span> that
32.    can be specified? </p>
33.
34.    <p class="answer">The attributes that can be specified are: Font attributes,
35.    Color and Background attributes, Text attributes, Border attributes, Margin
36.    attributes, and List attributes. </p>
37.  </body>
38. </html>

```

## 2) Using <div> Tag

Div (short for division) divides the content into individual sections. Each section can then have its own formatting, as specified by the CSS.

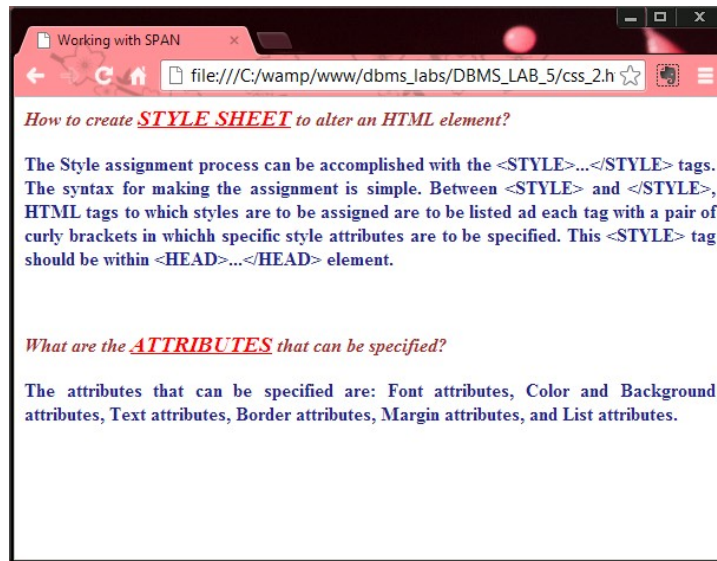


Figure 3.6 – Example 6 output

Individual sets of <div> tags can be given names using the "id" and "class" attributes i.e.:

<pre>&lt;div id = "sidebar"&gt;   &lt;!--content --&gt; &lt;/div&gt;</pre>	Or	<pre>&lt;div class = "articlebox"&gt;   &lt;!--content --&gt; &lt;/div&gt;</pre>
--	----	--

The difference between "id" and "class" is that there can be only one id per page, but there can be as many classes as required. For instance, pages might only have one sidebar; but they might have a lot of different boxes with articles in them.

<div> tags are "block" elements, meaning that each time it is created, it exists on its own line by default. Inline elements, on the other hand, can be default exist on the same line as something else. The inline version of <div> is <span>. Inline elements can go inside block elements, but it can't be the other way round; for instance, <span> tag can't be stick around a <div> block.

### Example 7: Usage of DIV Tag

This example demonstrates usage of <div> tag applied to paragraph. Figure 3.7 shows webpage.

```

1. <html>
2.   <head>
3.     <title> Product Brochure </title>
4.     <style type="text/css">
5.       div { font-weight: bold; }
6.       div#sidebar { font-family: Arial; float: inherit; color: red;
7.         width: 200px; text-align: justify;}
8.       div.articlebox {width:500px; border: 1px solid black;}
9.     </style>
10.  </head>
11.
```

```

12. <body>
13.     <div id="sidebar">
14.         <p>
15.             Congratulations on the purchase of your sword! Using a sword is fun
16.             and easy. Just be sure to follow these important safety tips.
17.         </p>
18.     </div>
19.
20.     <div>
21.         <p>
22.             <em>Never</em> hold your sword by the pointy end.
23.         </p>
24.         <p>
25.             <em>Always</em> be sure to stick the pointy end
26.             into the other guy before he does the same to you.
27.         </p>
28.     </div>
29.
30.     <div class="articlebox">
31.         <p>
32.             And remember, if you or your surviving kinsfolk are not fully satisfied,
33.             we have a money-back guarantee!
34.         </p>
35.     </div>
36. </body>
37. </html>

```

## EXTERNAL STYLE SHEETS

External Style Sheets are composed of standard text, which consists of a series of entries, each composed of a selector and a declaration. The selector indicates the HTML elements affected by the properties in the declaration. These are then saved as file with extension .css, which can be linked to a web page using the <link> tag i.e. <link rel = stylesheet href = "stylesheet file name">.

### Example 8: Usage of External Style Sheet

In this example, style attributes are written in external style sheet and then linked in the HTML using <link> tag as specified earlier. The result is same as shown in Figure 3.7.

#### *Code for mystyle.css*

```

1. p {font-size:12pt; font-weight: bold; text-align: justify;}
2. .question {color: brown; font-style: italic;}
3. .answer {color:#23238e}
4. .big {font-size:14pt; text-decoration: underline; text-transform: uppercase;
   color: red;}

```

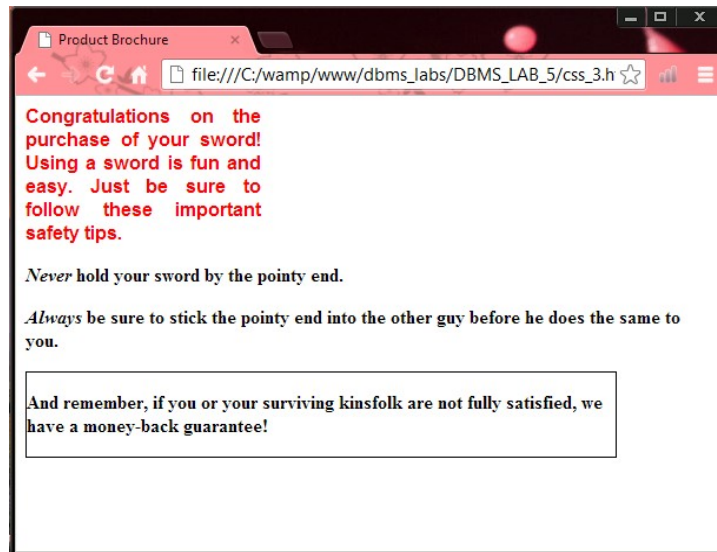


Figure 3.7 – Example 7 output

**Code for the HTML page**

```

1. <html>
2.   <head>
3.     <title>Working with External Style Sheet</title>
4.     <link rel=stylesheet href="mystyle.css">
5.   </head>
6.
7.   <body>
8.     <p class="question">How to create <span class="big">style sheet</span> to
9.     alter an HTML element? </p>
10.    <p class="answer">The Style assignment process can be accomplished with
11.    the <STYLE>...</STYLE> tags. The syntax for making the
12.    assignment is simple. Between <STYLE> and </STYLE>, HTML tags
13.    to which styles are to be assigned are to be listed ad each tag with a pair of
14.    curly brackets in which specific style attributes are to be specified. This
15.    <STYLE> tag should be within <HEAD>...</HEAD>
16.    element. </p>
17.    <br>
18.    <p class="question">What are the <span class="big">attributes</span> that
19.    can be specified? </p>
20.    <p class="answer">The attributes that can be specified are: Font attributes,
21.    Color and Background attributes, Text attributes, Border attributes, Margin
22.    attributes, and List attributes. </p>
23.  </body>
24. </html>

```

## -----Task 3.1-----

**LAB PERFORMANCE:** Read the provided lab document carefully, prepare your lab report during the lab and submit it to your lab instructor during lab timing. (10 Marks)

1. **Practical 1:** Understand and go through all the 8 examples provided in this lab. Try each one in your favorite IDE. Check the output in browser. In your lab report, write comment about each example you have covered in your own words with that example output. (6 Marks)
2. **Practical 2:** Write the HTML code with CSS that generates the web page shown in Figure 3.8 with following specification:
  - a) Heading 1 has font value of Arial and Helvetica, size 26 pts, and red color.
  - b) Each paragraph is 12 pts, bold, and italic. Take paragraph color value: #23238e
  - c) Use groove border style and thick border width. For reference, go to Table 4.4 for further details about the border attributes.

Provide the HTML and CSS codes in your lab report. (4 Marks)



Figure 3.8 – Task 1 output

## -----Task 3.2-----

**Homework 1:** Write the HTML code with CSS that generates the web page shown in Figure 3.9 with following specification:

- 1) Heading 1 has font value of Garamond, size 26 pts, and red color.
- 2) Set top margin to 5%.
- 3) Create unordered list with values: HTML, JavaScript, CGI, Java, Oracle Developer 2000, and Oracle DBA. Use square list style type.

## -----Task 3.3-----

**Homework 2:** Write the HTML code along with CSS file that generates the output web page shown in Figure 3.9.

## -----Task 3.4-----

**Homework 3:** Rewrite Example 5 using ID Selector instead of class Selector and show its output.





Figure 3.9 – Task 2 output

## -----Task 3.5-----

### Homework 4: Bootstrap 5.2.3 Examples:

Go through the following examples in bootstrap-5.2.3-examples.zip: **sign-in**, **cover**, **checkout**, and **blog**. Modify these examples for a real-world application. Submit the modified web pages and respective HTML and CSS files with description.

## -----Task 3.6-----

**Homework 5:** Modify your CV designed using plain HTML in lab 02 by adding the CSS and Bootstrap in it. Upload both original one and modified one on the hosting site. Provide the link.

## References

- 1) **HTML and CSS Tutorial – Create a Website for Beginners**  
[https://www.youtube.com/watch?v=kMT54MPz9oE&ab\\_channel=freeCodeCamp.org](https://www.youtube.com/watch?v=kMT54MPz9oE&ab_channel=freeCodeCamp.org)
- 2) **HTML5 & CSS Development: Learn How to Build a Professional Website | Udemy, Jordan Hudgens**  
<https://www.youtube.com/watch?v=5bMdjkvONE>
- 3) **Flexbox Tutorial (CSS): Real Layout Examples**  
[https://www.youtube.com/watch?v=k32voqQhODc&ab\\_channel=LearnWebCode](https://www.youtube.com/watch?v=k32voqQhODc&ab_channel=LearnWebCode)
- 4) **How to Put a Website Online: Template, Coding, Domain, Hosting, and DNS**  
<https://www.youtube.com/watch?v=NQP89ish9t8>