CIS 4004: Web Based Information Technology
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Working With Color Values and Web Safe Color Charts

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Working With Colors In HTML5 And CSS

• If you’ve ever mixed colors in anything from finger paints to a watercolor set, you have an idea of what happens when you mix colors. For computer screens, red, green, and blue lights are mixed to generate different colors. For example, mixing equal parts red and green will produce yellow.

• To mix colors for Web pages, different values are mixed using integers, percentages, and hexadecimal numbers. CSS3 also has a limited number of named colors available that can be used.

• The W3C has listed 16 valid color names for HTML5 and CSS that can be used in place of the hex notation.

• These colors are: aqua, black, blue, fuchsia, gray, green, lime, maroon, navy, olive, purple, red, silver, teal, white, and yellow.
Working With Colors In HTML5 And CSS

• From this root base, you can also include another 131 names that seem to have no rhyme nor reason as to why they are called what they are called. They were all part of a set of colors created back in the 1980s called X11. They were adopted by early browsers and have been with us ever since. In the official W3C documentation, they’re listed under Scalable Vector Graphics (SVG), and all the names were adopted from the original X11. (see http://www.w3.org/TR/SVG/types.html see section 4.4).

• Rather than use these names, most webpage designers use either RGB or HSL percentages as shown on the next few pages.
RGB Percentages

• In mixing paint colors, the amount of paint is sometimes listed in percentages. A certain percent of red, green, and blue will give different colors. In setting colors in CSS3, you can use percentages in two different ways.

• First, you can assign a color value using the following format:

\[
\text{rgb}(r\%, \, g\%, \, b\%);
\]

• The first value is the percent red, the second green, the third, blue. For example, setting \(\text{rgb}(43.9\%, \, 50.2\%, \, 56.5\%)\) will generate the color that the Los Angeles Dodgers use.

• Note that the three percentages add up to more than 100\%, so you know that the percentage is a percent of the color itself and not the total.
RGB Percentages

• Also note that you can be very precise for the values, including fractions of percentages.

• The example on the following page illustrates the use of RGB percentages.
RGB Percentages Example

<!DOCTYPE html>
<html>
<head>
    <title>Dodger Blue</title>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <style type="text/css">
        body {background-color: rgb(43.9%, 50.2%, 56.5%);
        }
        h1 { background-color: rgb(11.8%, 56.5%, 100%);
            color: rgb(100%, 100%, 100%);
            font-family: "Arial Black", Gadget, sans-serif;
            font-style: italic;
            text-align: center;
        }
    
    </style>
</head>
<body>
    <h1>Los Angeles Dodgers</h1>
    (Formerly of Brooklyn)
</body>
</html>
RGB Percentages Example

Los Angeles Dodgers
(Formerly of Brooklyn)
HSL Percentages

• A second way to assign colors using percentages is to use a hue-saturation-light (HSL) model. The big advantage of HSL is that lightness is symmetrical. That makes it easier to tweak a color to what you’d like it to be.

• By thinking of a color circle arranged around 360 degrees like a compass, you select a hue. At the top, or 0 percent, you find the reds. Moving clockwise, at 30 percent (degrees) the hues turn red-yellow. At 60 percent (60 degrees), they’re yellow.

• See the HSL color wheel on the next page.
The HSL Color Wheel
HSL Percentages

• For web designers who understand the color spectrum, the HSL model makes choosing colors much easier.

• To create a lighter color, increase the light value, decrease the light value to make the color darker.

• The example on the next page illustrates this concept. When trying to get just the right shade of red, start with the following assignment:

\[ \text{hsl}(0, 100\%, 50\%); \]

• Notice that the first number is not a percentage. That’s because it has values between 0 and 359 – the 360 degrees of the circle. (0 and 360 are the same point on the circle.)
HSL Percentages

• By raising and lowering the light (the third parameter), you make the color lighter or darker – which is a bit more intuitive than changing RGB percentages.

• Examine the markup on the next page to see how the HSL model works. Try varying the hues and lightness for colors at different points on the color wheel.
<!-- HSL Percentages Example -->

```html
<!DOCTYPE html>
<html>
<head>
    <title> HSL Color Assignment </title>
    <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
    <style type="text/css">
        .redBase { color:hsl(0, 100%, 50%); }
        .redDarker { color:hsl(0, 100%, 25%); }
        .redLighter { color:hsl(0,100%,75%); }
    </style>
</head>
<body>
    <h1 class="redBase"> Red Base Color </h1>
    <h1 class="redDarker"> Red Darker Color </h1>
    <h1 class="redLighter"> Red Lighter Color </h1>
</body>
</html>
```
HSL Percentages Example

Red Base Color
Red Darker Color
Red Lighter Color
HSL Percentages

• When first using HSL, it helps to think of adding light by going higher to the sun or making it darker by going into a well.

• The tweaking process is easier for designers to get just what they want. Think of a slightly modified color wheel as shown on the next page.

• Hue and light are fairly intuitive to understand, but saturation can be a little murky. Essentially, saturation is the amount of colorfulness in a given color. A 100% saturation is the full colorfulness of a hue in a given light, while a lower percent subtracts from a hue – something like a color fading.

• For all colors, a midpoint light is going to be gray when saturation is 0%. Sometimes a faded or muted color is preferred, like blue jeans that have been washed many times.
RGB Decimal Integer Settings

- A second way of mixing your colors using the `rgb()` value is to insert values from 0 to 255, instead of the percentage values that were illustrated earlier.

- Each color, red, green, and blue, then as a range of 256 different values, for a total of 16,777,216 different colors!

- This format of the `rgb()` value is:

  \[ \text{rgb}(\text{integerR}, \text{integerG}, \text{integerB}) \];

- For example, yellow, which mixes red and green would be `rgb(255,255,0)`.

- The example on the following page illustrates this technique for specifying colors in HTML5 and CSS3.
RGB Decimal Integer Settings

• The RGB decimal notation is not as intuitive as HSL, but after a while, you’ll get used to mixing colors based on 256 values rather than percentages.

• The only difference between using RGB with values from 0 to 255 and 0% to 100% is in perception. You might think that you can be more precise with you colors using the 256 values instead of the percentages, but that isn’t the case because you can use fractional percentages.

• Which method you choose comes down mostly to personal preference.

• The example on the next page illustrates the RGB technique with integer values.
RGB Decimal Integer Setting - Example

```html
<!DOCTYPE html>
<html>
<head>
  <title>RGB Decimal Color Assignment</title>
  <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
  <style type="text/css">
    body { /* red background */
      background-color: rgb(255,0,0);
    }
    h1 { /* big yellow text */
      color: rgb(255,255,0);
      font-family: "Arial Black", Gadget, sans-serif;
    }
    h2 { /* blue text with a gray background */
      color: rgb(0,0,255);
      background-color: rgb(150,150,150);
    }
  </style>
</head>
<body>
  <h1> A Big Yellow Header </h1>
  <h2> A slightly smaller blue header with a gray background </h2>
  <h3> Unstyled header level 3 </h3>
</body>
</html>
```
RGB Decimal Integer Setting - Example

A Big Yellow Header

A slightly smaller blue header with a gray background

Unstyled header level 3
Hexadecimal Color Settings

• The final method specifying color assignments in HTML5 and CSS3 is using hexadecimal specification.

• There are 256 different values that can be expressed with two hexadecimal digits. (Each hex digit = 16 possible values, 16x16 = 256).

• This technique is essentially the same as the rgb() technique, except that the color is simply specified with a hexadecimal number, where the first two hex digits specify the red value, the second two hex digits specify the green value, and the last two specify the blue value.

• Thus, the color 6F001C would be red: 6F, green: 00, and blue: 1C.

• The example on the next page illustrates the hexadecimal technique and the color chart beginning on page 24, lists the web safe colors using their hexadecimal representation.
<!DOCTYPE html>
<html lang="en">
<head>
  <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
  <title>Hexadecimal with Palette</title>
  <style type="text/css">
/* Palette -- only use these colors!
69675C, 69623D, ECE8CF, E8D986, B5AA69
gray, olive, cream, dark cream, khaki */
body {
  font-family: "Comic Sans MS", cursive;
  background-color: #ECE8CF;
  color: #69675C;
}

h1 {
  font-family: "Arial Black", Gadget, sans-serif;
  color: #B5aa69;
  background-color: #E8D986;
  text-align: center;
}

h2 {
  font-family: "Lucida Sans Unicode", "Lucida Grande", sans-serif;
  color: #B5aa69;
}
</style>
</head>
</html>
Style with a Color Palette

Desert in the Fall

In the fall when the air cools a bit, the desert begins to settle down and cloak itself in a warmer set of hues.
Web Safe Colors – Page 1

For more information on colors visit: http://www.w3schools.com/html/html_colors.asp

HTML5/CSS3 color values are defined using a hexadecimal (hex) notation for the combination of Red, Green, and Blue color values (RGB). The smallest value is 0 (00 in hex) and the largest value is 255 (FF in hex) for each of the RGB values.

The HTML5/CSS3 color values are written as 3 double digit hex numbers and must begin with a # sign. Example: #45F43C.

All possible combinations of values are possible which leads to more than 16 million different colors (256 * 256 * 256). Most monitors available today will easily display more than 16000 colors.

The W3C has listed 16 valid color names for HTML5 and CSS3 that can be used in place of the hex notation.

These colors are: aqua, black, blue, fuchsia, gray, green, lime, maroon, navy, olive, purple, red, silver, teal, white, and yellow.

A set of 256 different colors that are considered “web safe” in that virtually every monitor in the world will be able to display these colors are shown on the next two pages. Note that this is not very important these days when monitors can display millions of colors, so any hex combination can be generally used and considered web safe.
## Web Safe Colors – Page 1

For more information on colors visit: [http://www.w3schools.com/html/html_colors.asp](http://www.w3schools.com/html/html_colors.asp)

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