ACS-1809-050
Web Design and Development

Chapter 3

ACS-1809-050 – Slides Used In The Course

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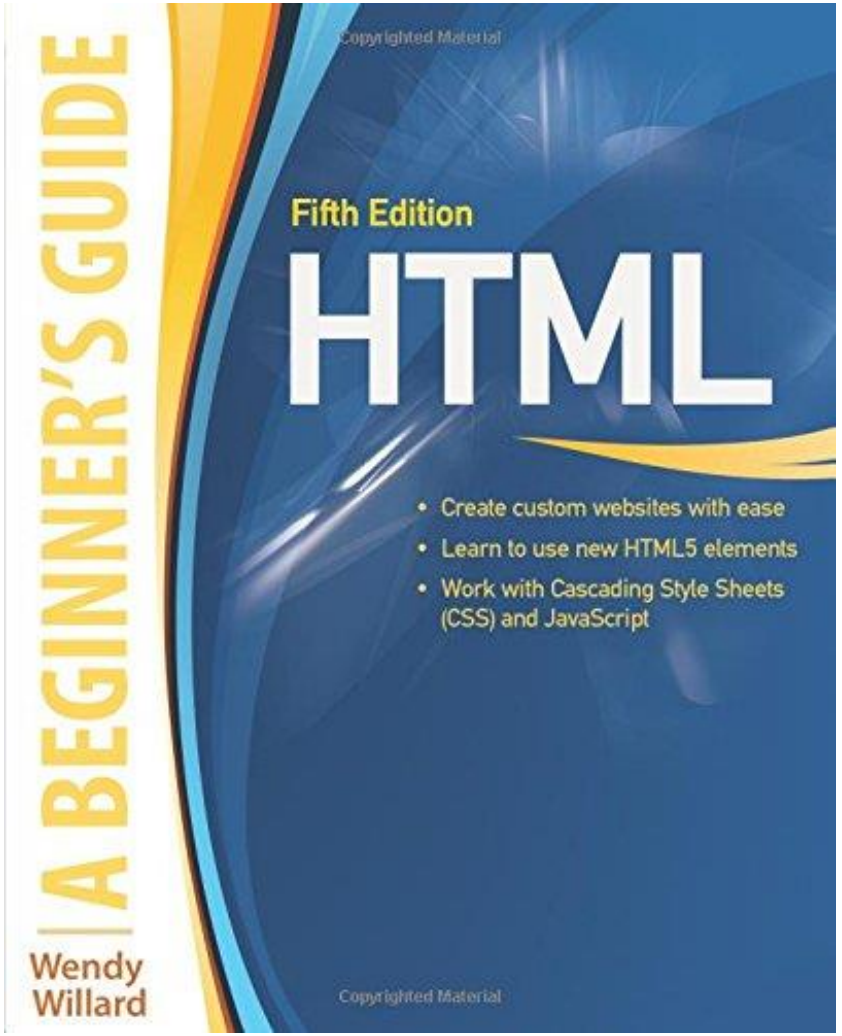

Cascading Style Sheets

- *CSS* - style sheet language
  - maintained by World Wide Web Consortium (W3C)
  - today's standard
  - is a whole new way of formatting web pages
  - provides several tools not available with standard HTML
  - used as a design tool
  - makes website more flexible
  - easier to maintain and modify
  - more aesthetically interesting
  - consistent look
  - ***separates the document's style from its content***

Style Sheets

- The purpose of *cascading style sheets* (abbreviated CSS) is to separate the *style* of a web page from its *content*
- The current HTML "rules" dictate that we only use HTML to identify the content of a page, and then use a style sheet to specify the presentation of that content
- This not only makes web pages more accessible and usable to all users, but also to search engines and other types of software

Define the Style

- To define a basic formatting style, you first must identify which tag you want to affect. This tag is then called a *selector* in CSS
  - Level 2 headlines (<h2>) ⟶ Selector: h2
  - The selector is essentially the tag without the brackets

Define the Style

- Once you have a selector, you can define its properties
- Similar to how attributes work in HTML, CSS *properties* alter specific attributes of a selector
  - Font-family, font-style, font-size, color : properties
- When you specify values for properties, you are creating a *declaration* for that selector
- The declaration and selector together are then referred to as a set of *rules*, or *ruleset*

Example

h2 ← Selector (HTML: tag)

font-family ← Property (HTML: attribute)

Calibri ← Value (HTML: value)

{font-family : Calibri;} ← Declaration

All together:

```
h2  {font-family : Calibri;}
h2  {font-family : Calibri;
        font-size : 14pt;
        color : blue;
        font-style : italic; }
```

Note the ";" at the end of declaration or at the end of each multiple declaration .

Value

- Values are not placed between quotation marks
- Most values can be specified in terms of color, keyword, length, percentage, or URL
- Table 3-1 in the textbook shows the types of CSS values

CSS Structure

- CSS offers 3 types of style sheets:
  - Inline: Styles are embedded right within the HTML elements they affect
  - Internal: Styles are placed within the header information of the web page, and then affect all corresponding tags *on this single page it resides in*
  - External: Styles are coded in a separate document, referenced from within the header of the actual web page

Inline

- Inline styles are created right within the HTML elements of the page
- Inline declarations are enclosed in straight quotes using the *style* attribute of tag.

  Example: <p style="font-family:verdana;">
- You can separate multiple rules by semicolons, but the entire declaration should be included within the quotes

  Example: <p style ="font-family:verdana; color:red;">

Use quote to enclose the entire declaration and semicolon to separate the attributes.

Internal

- *Internal* or *embedded* style sheets
  - Instead of adding the style attribute to a tag, use the *style tag* to contain all the information for the page
  - *style tag*: in the header of the page, in between the opening and closing *head* tags

Example

```
<head>
 <title>CSS Example</title>
 <style type="text/css">
   h2  {font-family:  verdana;   color:  blue;}
   h3  {font-family:  Calibri;   color:  red;}
 </style>
</head>
```

```
h2
 {font-family:  verdana;
color:  blue;}
```

The entire ruleset can be on a single line or broken up into multiple lines.

```
h3  {font-family:  Calibri;
color:  blue;}
```

- The selector is placed before the declaration.
  - Declaration in curly brackets.

    h2 {font: verdana 12pt;}

External

- *An external* style sheet essentially holds the same information as an internal one.
  - With exception: the information is contained in its own text file(.css) and then referenced from within the web page
  - External style sheets don't use *style* tag or attribute
    - They simply list the rulesets as instructions for browser

Example

```
<head>
  <title>Using an external style sheet</title>
  <link rel="stylesheet" href="styles.css" >
</head>
```

This is where the name of your style sheet is placed.

In file "styles.css" :

```
h1 { font: georgia 14pt bold; color: #0000FF}
h2 { font: georgia 12pt bold; color: #0066FF}
h3 { font: georgia 11pt bold; color: #6666FF}
```

Understand the Cascade

- Cascade
  - In some sense can be understood as “combined”
    - When multiple style declarations can be applied to one block of content in an html file
      - The web browser essentially combines all the style declarations into one single declaration
      - This can be analyzed using a very complex scale point system
      - But for now to simplify the analysis we would just say: Inline > Internal > External

“!Important” Declaration

- It is used to declare a style more important
  - An !important declaration ultimately takes precedence over a normal style sheet declaration.
  - The keyword must be prefaced by an exclamation mark in order to be properly interpreted by the browser

```
P {color: blue !important;}
```

Colors in HTML

- Using color will make your web pages:
  - visually interesting
    - eye-catching for the reader
- HTML is a text-based language, requiring you to define your colors in textual terms.
- HTML identifies a color in one of two ways:
  - by the color value
  - by the color name

Colors in HTML

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- You can define colour in the following format:
  - RGB (Red, Green, Blue) values
  - RGB percentages
  - Hexadecimal values
  - Hexadecimal shorthand
  - Color names

Hexadecimal numbers

- Decimal:

  2909 = 2*1000 + 9*100 + 0*10 + 9*1

  or

  $2909 = 2*10^3 + 9*10^2 + 0*10^1 + 9*10^0$

- Hexadecimal:

  255(dec) = (15*16) + 15 = FF

  21(dec) = (1* 16) + 5 = 21

Hex	Bin	Dec
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
A	1010	10
B	1011	11
C	1100	12
D	1101	13
E	1110	14
F	1111	15

Convert Dec to Hex numbers

1. Divide the decimal number by 16. Treat the division as an integer division.
2. Write down the remainder (in hexadecimal).
3. Divide the result again by 16. Treat the division as an integer division.
4. Repeat step 2 and 3 until result is 0.
5. The hex value is the digit sequence of the remainders from the last to first.

Example: Convert the number 1128 DECIMAL to HEXADECIMAL

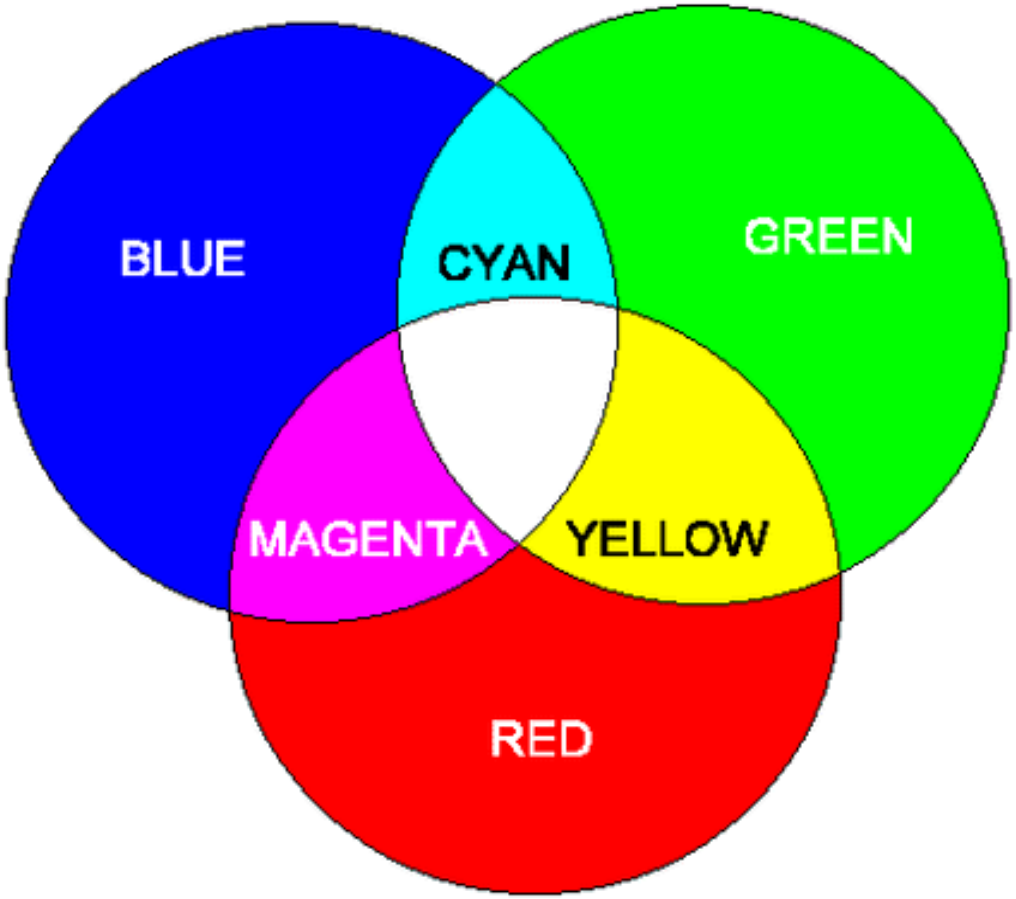
	Result	Reminder
1128/16	70	8
70/16	4	6
4/16	0	4

Hex = 468

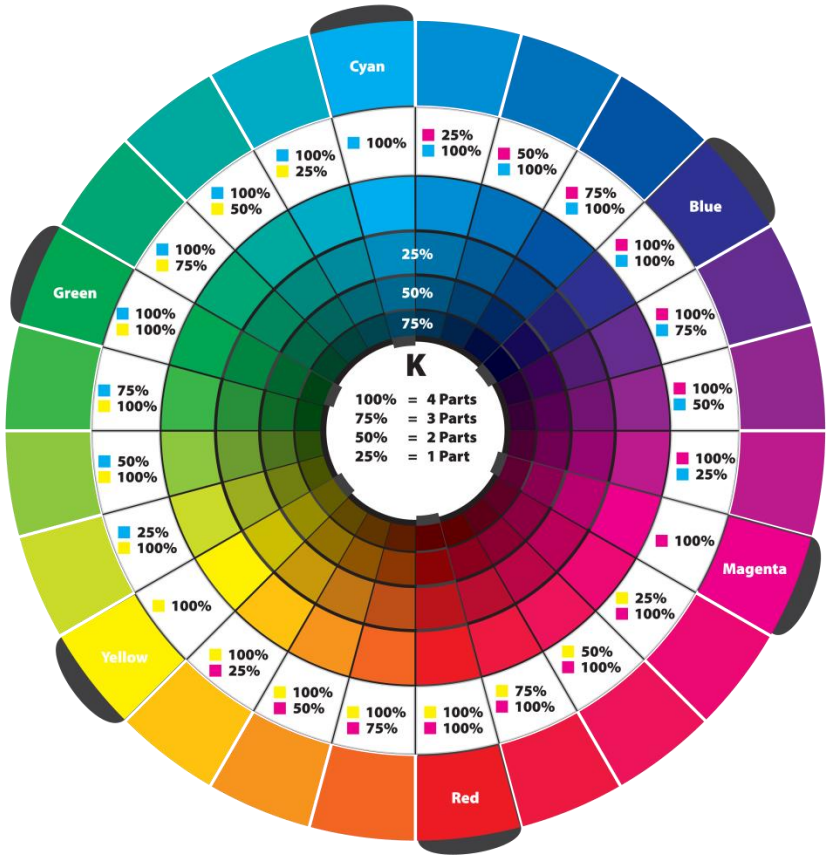
Basic Principles of Color Theory

- Any color can be thought of as a combination of three primary colors: **red**, **green**, and **blue**
- This principle allows a computer monitor to combine pixels of red, green, and blue to create the array of colors you see on your screen
- Hence the term *RGB*

Primary Color Model for Light



Use of Color Wheel



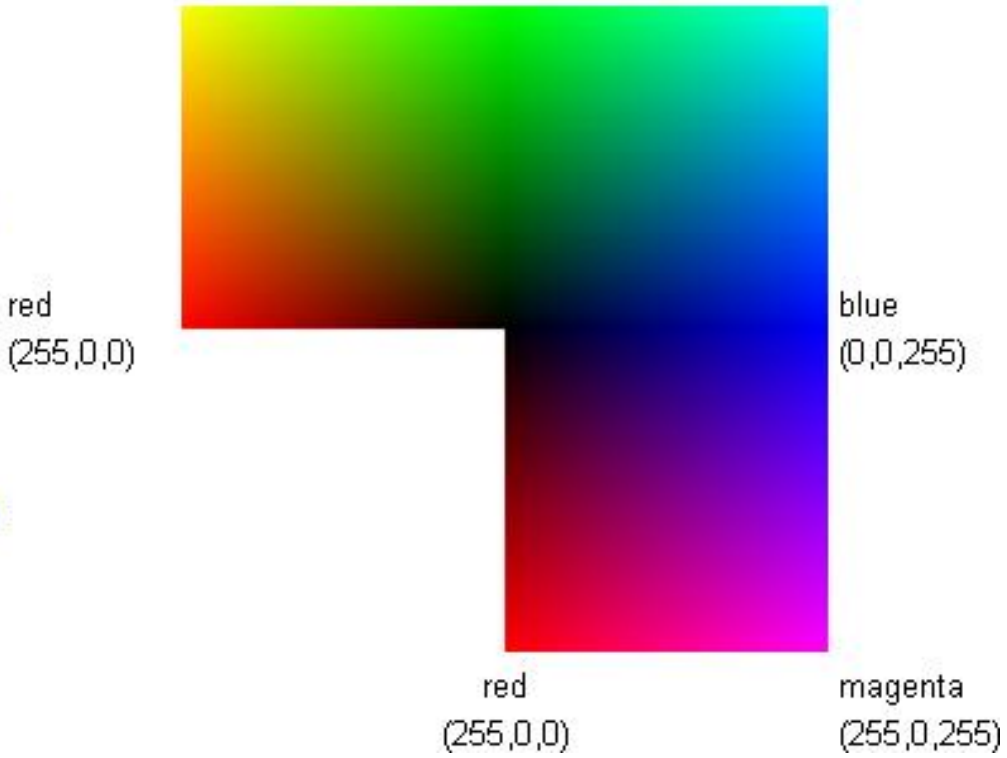
RGB (Red, Green, and Blue) Triplets

- Software programs, such as your Web browser, define color mathematically
- The intensity of each of three colors (RGB) is assigned a number from 0 (darkest) to 255 (lightest)
- In this way, 255^3, or more than 16.7 million, distinct colors can be defined
- Each color is represented by a triplet of numbers, called an **RGB triplet**, based on the strength of its **R**ed, **G**reen, and **B**lue components

Primary Color Model for Light

rgb (red, green, blue)

- (0, 0, 0) is black
- (255, 255, 255) is white
- (255, 0, 0) is red
- (0, 255, 0) is green
- (0, 0, 255) is blue
- (255, 255, 0) is yellow
- (0, 255, 255) is cyan
- (255, 0, 255) is magenta



RGB values and Percentages

Example:

<p style=“ color: rgb(0,0,255);”> (using decimal values)

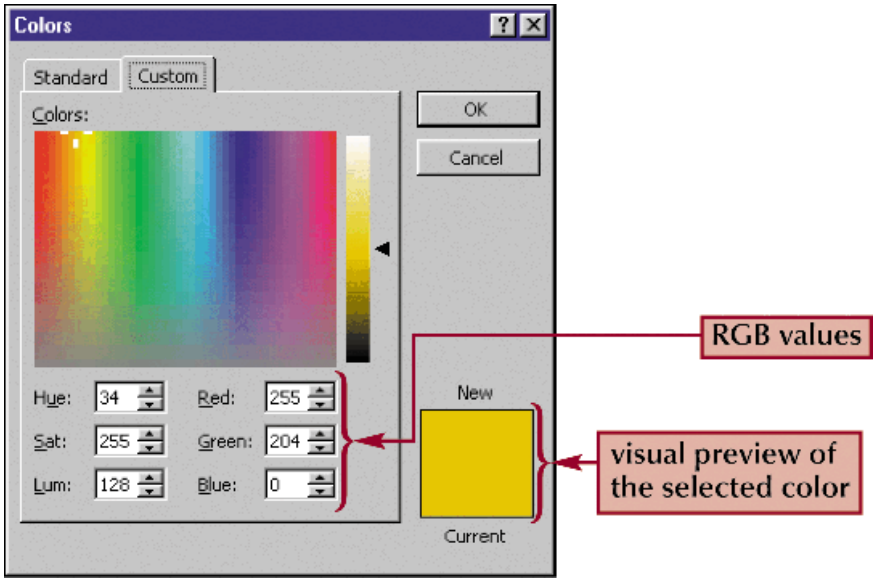
<p style=“ color: rgb(0%,0%,100%);”> (using percentage)

- RGB values and percentages are only used to describe color in style sheets, not the older HTML tags

A Typical Colors Dialog Box

- In most programs, you make your color choices with visual clues, usually without being aware of the underlying RGB triplet

- This figure shows a typical dialog box in which you would make color selections based on the appearance of the color, rather than on the RGB values



Hexadecimal Shorthand

- When referencing a color that has value pairs, you can use a bit of shorthand to reduce the amount of typing
  - #003366 →#036
  - #0000FF→#00F
  - #002277→#027
  - #003466→? (This has no shorthand)

16 Basic Color Names + Orange

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Color								
Name	Aqua	Black	Blue	Fuchsia	Gray	Green	Lime	Maroon
RGB	#00FFFF	#000000	#0000FF	#FF00FF	#808080	#008000	#00FF00	#800000

Color								
Name	Navy	Olive	Purple	Red	Silver	Teal	White	Yellow
RGB	#000080	#808000	#800080	#FF0000	#C0C0C0	#008080	#FFFFFF	#FFFF00

New and Notable Color Options

- RGBA
  - you can specify the “alpha value” with RGBA
    - It is the transparency of a color
    - The transparency is defined by a number between 0.0 (completely transparent) and 1.0 (fully opaque).

      h1 {color: rgba (255, 68, 253, 0.5);}
    - Safari, Firefox, and Google Chrome have all supported RGBA color specification for a while
      - Internet Explorer only started supporting it in version 9

New and Notable Color Options

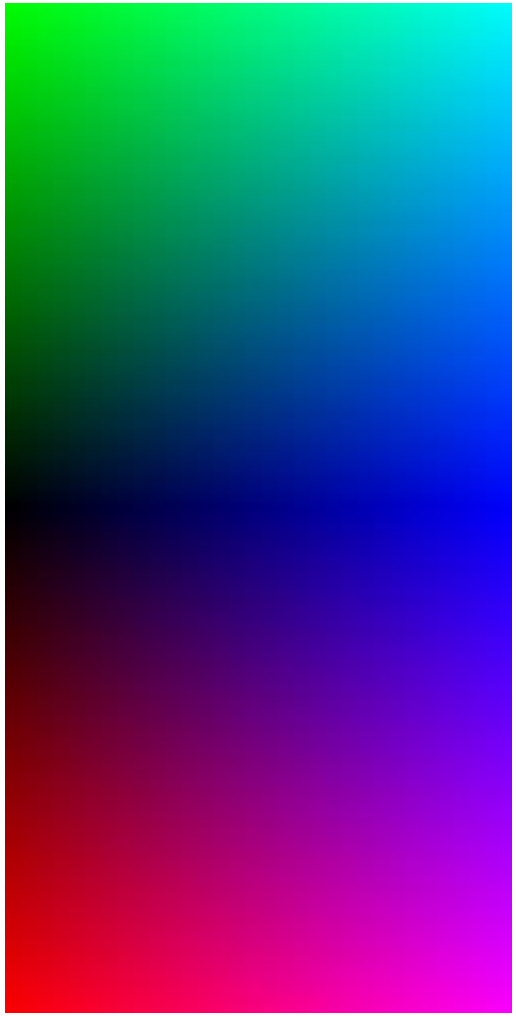
- Opacity
  - Similar to the RGBA
  - Opacity values are defined between 0.0 (completely transparent) and 1.0 (fully opaque).

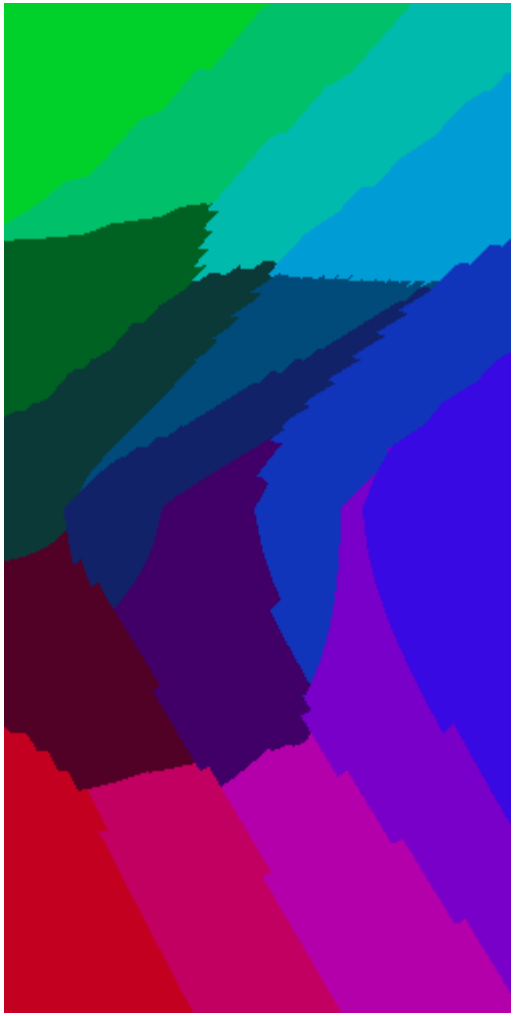
```
h1 {color: rgb(255, 68, 253); opacity: 0.5;}
```

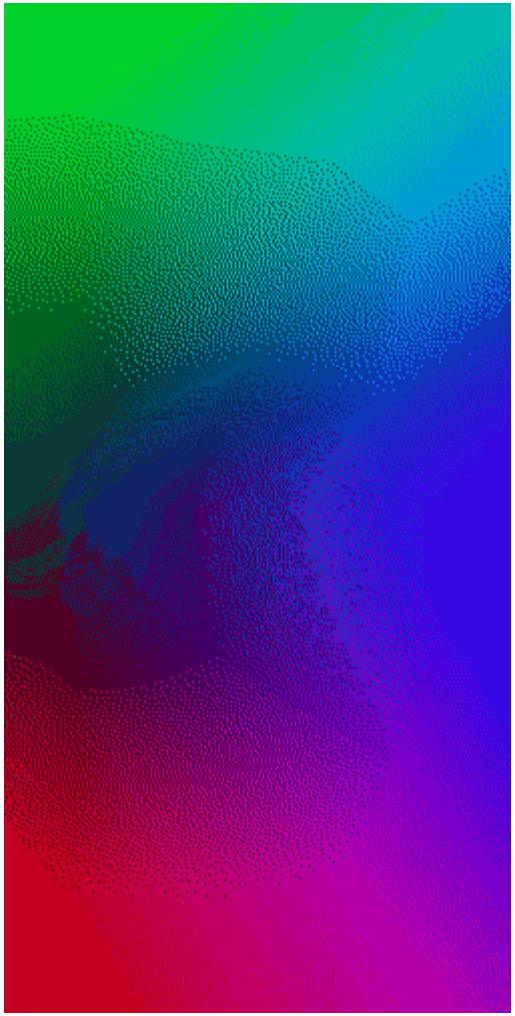
Colors in HTML

- Not all monitors can display all the colors
  - Some are not capable of displaying all 255 levels of all 3 primary colors
    - True color – 24 bit
    - A lesser (often seen on hand-held devices) – 16 bit
- Dithering – a way to combining similar colors from available palette to approximate the original color's appearance

Dithering







Web Safe Colors in HTML

- 216 colors guaranteed not to be dithered by any web browser
- Values for each color are limited to
  - 0, 51, 102, 153, 204, 255 in decimal

  or
  - 00, 33, 66, 99, CC, FF in hexadecimal

Colors in HTML (Name and hex)

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Color Name	Color HEX	Color
AliceBlue	#F0F8FF	
AntiqueWhite	#FAEBD7	
Aqua	#00FFFF	
Aquamarine	#7FFFD4	
Azure	#F0FFFF	
Beige	#F5F5DC	
Bisque	#FFE4C4	
Black	#000000	
BlanchedAlmond	#FFEBCD	
Blue	#0000FF	
BlueViolet	#8A2BE2	
Brown	#A52A2A	
BurlyWood	#DEB887	
CadetBlue	#5F9EA0	
Chartreuse	#7FFF00	
Chocolate	#D2691E	
Coral	#FF7F50	
CornflowerBlue	#6495ED	
Cornsilk	#FFF8DC	
Crimson	#DC143C	
Cyan	#00FFFF	
DarkBlue	#00008B	
DarkCyan	#008B8B	

Color Name	Color HEX	Color
DarkGoldenRod	#B8860B	
DarkGray	#A9A9A9	
DarkGrey	#A9A9A9	
DarkGreen	#006400	
DarkKhaki	#BDB76B	
DarkMagenta	#8B008B	
DarkOliveGreen	#556B2F	
Darkorange	#FF8C00	
DarkOrchid	#9932CC	
DarkRed	#8B0000	
DarkSalmon	#E9967A	
DarkSeaGreen	#8FBC8F	
DarkSlateBlue	#483D8B	
DarkSlateGray	#2F4F4F	
DarkSlateGrey	#2F4F4F	
DarkTurquoise	#00CED1	
DarkViolet	#9400D3	
DeepPink	#FF1493	
DeepSkyBlue	#00BFFF	
DimGray	#696969	
DimGrey	#696969	
DodgerBlue	#1E90FF	
FireBrick	#B22222	

Colors in HTML (Name and hex)

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Color Name	Color HEX	Color
LightCyan	#E0FFFF	
LightGoldenRodYellow	#FAFAD2	
LightGray	#D3D3D3	
LightGrey	#D3D3D3	
LightGreen	#90EE90	
LightPink	#FFB6C1	
LightSalmon	#FFA07A	
LightSeaGreen	#20B2AA	
LightSkyBlue	#87CEFA	
LightSlateGray	#778899	
LightSlateGrey	#778899	
LightSteelBlue	#B0C4DE	
LightYellow	#FFFFE0	
Lime	#00FF00	
LimeGreen	#32CD32	
Linen	#FAF0E6	
Magenta	#FF00FF	
Maroon	#800000	
MediumAquaMarine	#66CDAA	
MediumBlue	#0000CD	
MediumOrchid	#BA55D3	
MediumPurple	#9370D8	
MediumSeaGreen	#3CB371	

Color Name	Color HEX	Color
FloralWhite	#FFFAF0	
ForestGreen	#228B22	
Fuchsia	#FF00FF	
Gainsboro	#DCDCDC	
GhostWhite	#F8F8FF	
Gold	#FFD700	
GoldenRod	#DAA520	
Gray	#808080	
Grey	#808080	
Green	#008000	
GreenYellow	#ADFF2F	
HoneyDew	#F0FFF0	
HotPink	#FF69B4	
IndianRed	#CD5C5C	
Indigo	#4B0082	
Ivory	#FFFFF0	
Khaki	#F0E68C	
Lavender	#E6E6FA	
LavenderBlush	#FFF0F5	
LawnGreen	#7CFC00	
LemonChiffon	#FFFACD	
LightBlue	#ADD8E6	
LightCoral	#F08080	

Colors in HTML (Name and hex)

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Color Name	Color HEX	Color
Pink	#FFC0CB	
Plum	#DDA0DD	
PowderBlue	#B0E0E6	
Purple	#800080	
Red	#FF0000	
RosyBrown	#BC8F8F	
RoyalBlue	#4169E1	
SaddleBrown	#8B4513	
Salmon	#FA8072	
SandyBrown	#F4A460	
SeaGreen	#2E8B57	
SeaShell	#FFF5EE	
Sienna	#A0522D	
Silver	#C0C0C0	
SkyBlue	#87CEEB	
SlateBlue	#6A5ACD	
SlateGray	#708090	
SlateGrey	#708090	
Snow	#FFFAFA	
SpringGreen	#00FF7F	
SteelBlue	#4682B4	
Tan	#D2B48C	
Teal	#008080	

Color Name	Color HEX	Color
MediumSlateBlue	#7B68EE	
MediumSpringGreen	#00FA9A	
MediumTurquoise	#48D1CC	
MediumVioletRed	#C71585	
MidnightBlue	#191970	
MintCream	#F5FFFA	
MistyRose	#FFE4E1	
Moccasin	#FFE4B5	
NavajoWhite	#FFDEAD	
Navy	#000080	
OldLace	#FDF5E6	
Olive	#808000	
OliveDrab	#6B8E23	
Orange	#FFA500	
OrangeRed	#FF4500	
Orchid	#DA70D6	
PaleGoldenRod	#EEE8AA	
PaleGreen	#98FB98	
PaleTurquoise	#AFEEEE	
PaleVioletRed	#D87093	
PapayaWhip	#FFEFD5	
PeachPuff	#FFDAB9	
Peru	#CD853F	

Colors in HTML (Name and hex)

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Color Name	Color HEX	Color
Thistle	#D8BFD8	
Tomato	#FF6347	
Turquoise	#40E0D0	
Violet	#EE82EE	
Wheat	#F5DEB3	
White	#FFFFFF	
WhiteSmoke	#F5F5F5	
Yellow	#FFFF00	
YellowGreen	#9ACD32	

Foreground and Background Color

- To set the foreground color use style:
  - color: *col*
- To set the background color use style:
  - background-color: *col*

where *col* is in the form: *color_name*, *#XXXXXX*

- Attributes:
- bgcolor="*col*"
- text="*col*"
- *text*

Deprecated

Example

```
<style type="text/css">
    body {background-color: white; color: gray;}
    a:link {color: blue;}
    a:visited {color: purple;}
    a:active {color: orange;}
</style>
```

ACS-1809-050 – Questions?