

cis3.5 fall2009 color lecture notes

topics:

- computer color models

resources:

- http://www.w3schools.com/Html/html_colors.asp

notes on computer color models

- there are several ways to define color when using a computer
- the method most commonly used in web-based programming is the “RGB” color model
- with this model, colors are defined as combinations of Red, Green and Blue
- you can visualize having three tiny lightbulbs joined together inside each pixel on the computer screen
- each lightbulb has a slider that controls how much intensity (i.e., color) is produced
- when the slider is at the minimum position (i.e., off), then no color is produced, which is represented numerically as 0
- when the slider is at the maximum position (i.e., full on), then the amount of color produced is most intense, represented as 255
- values in between 0 and 255 indicate intermediary amounts of color

colors by value

- color values are typically represented using 2-digit *hexadecimal* notation, or base 16
- this means that each digit is a value between 0 and *F*
- in base 10 (decimal notation), digits are values between 0 and 9, where the largest value (9) is one less than the base
- similarly, in base 16 (hexadecimal notation), digits are values between 0 and 15 — but the letters *A* through *F* are used to represent values 10 through 15 (since a digit is a single symbol)
- this means that the least intensity color value is #00 and the highest intensity color value is #FF
- the # before the two digits indicates that the digits are in base 16, or hexadecimal, or “hex” for short
- so **white** is defined as:
(Red = #FF, Green = #FF, Blue = #FF),
more commonly displayed using 6-digit hexadecimal format: #FFFFFF

- and **black** is defined as:
(Red = #00, Green = #00, Blue = #00), or #000000
- and **red** is defined as:
(Red = #FF, Green = #00, Blue = #00), or #FF0000
- and **green** is defined as:
(Red = #00, Green = #FF, Blue = #00), or #00FF00
- and **blue** is defined as:
(Red = #00, Green = #00, Blue = #FF), or #0000FF
- and **yellow** is defined as:
(Red = #FF, Green = #FF, Blue = #00), or #FFFF00
- and **cyan** is defined as:
(Red = #00, Green = #FF, Blue = #FF), or #00FFFF
- you can also use in between color values, for example:
#CC0000 is a medium red color
#540000 is a dark red

colors by name

- for convenience, there are 16 pre-defined *color names*
- the named colors (and their hex values) are:

black	(#000000)	green	(#008000)
silver	(#C0C0C0)	lime	(#00FF00)
gray	(#808080)	olive	(#808000)
white	(#FFFFFF)	yellow	(#FFFF00)
maroon	(#800000)	navy	(#000080)
red	(#FF0000)	blue	(#0000FF)
purple	(#800080)	teal	(#008080)
fuchsia	(#FF00FF)	aqua	(#00FFFF)

web safe colors

- sets of colors are defined in “color tables”
- one such color table is called “web safe” colors, which are colors that are supposed to look the same on every computer
- for each color component (red, green, blue), only the following 2-digit hex values can be used: #00, #33, #66, #99, #AA, #CC, #FF
- even though many other values exist in between... (but they won't necessarily look quite the same on every machine)
- but there are still many web safe colors
- or you can throw caution to the wind and not use web safe colors...