Announcements

● Chapter 8 for today
More Digitization

Light, Sound, Magic: Representing Multimedia Digitally

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Decimal number system has ten possible numbers in the first position.

1. True
2. False
Binary has two possible numbers in the first position

1. True
2. False
Black and White Colors

- A byte is allocated to each RGB intensity
  - The smallest intensity is 0000 0000
  - The largest is 1111 1111 in binary
    - = 255 in decimal
    - = FF in hexadecimal
- Black (#000000) is no color
- White (#FFFFFF) has full intensity for each RGB color
Practice

- **RGB**
  - #FFFFFF = ________________
  - #000000 = ________________
  - #333333 = ________________
  - #888888 = ________________
  - #00FF00 = ________________
  - #FF0000 = ________________
  - #0000FF = ________________
<table>
<thead>
<tr>
<th>Color Code</th>
<th>Hex Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>#00FFFF</td>
<td>\textcolor{#00FFFF}{\texttt{(0 0 255)}}</td>
</tr>
<tr>
<td>#FF00FF</td>
<td>\textcolor{#FF00FF}{\texttt{(255 0 0)}}</td>
</tr>
<tr>
<td>#FFFF00</td>
<td>\textcolor{#FFFF00}{\texttt{(0 255 0)}}</td>
</tr>
<tr>
<td>(255, 0, 0)</td>
<td>\textcolor{(255, 0, 0)}{\texttt{(255 0 0)}}</td>
</tr>
<tr>
<td>(0, 255, 0)</td>
<td>\textcolor{(0, 255, 0)}{\texttt{(0 255 0)}}</td>
</tr>
<tr>
<td>(255,255,0)</td>
<td>\textcolor{(255,255,0)}{\texttt{(255 255 0)}}</td>
</tr>
<tr>
<td>(255,255,255)</td>
<td>\textcolor{(255,255,255)}{\texttt{(255 255 255)}}</td>
</tr>
<tr>
<td>#AA8866</td>
<td>\textcolor{#AA8866}{\texttt{#AA8866}}</td>
</tr>
<tr>
<td>#00CCFF</td>
<td>\textcolor{#00CCFF}{\texttt{#00CCFF}}</td>
</tr>
</tbody>
</table>
Lighten Up: Changing Color by Addition

- What color does this represent:
  1100 1000 1100 1000 1100 1000

- Each byte contains the decimal value 200. The color is RGB(200,200,200).
  - In HTML, write in hexadecimal #C8C8C8
  - Equal amounts of red, green, and blue, closer to white than black (medium gray)
  - All colors with equal RGB values are black, white, or gray
To Increase Intensity: Add in Binary

- To make a lighter color of gray, change the common values to be closer to white (larger numbers)
  - For example, add 0001 0000 (decimal 16) to each color:
    
    \[
    \begin{array}{cccccc}
    1101 & 1000 & 1101 & 1000 & 1101 & 1000 \\
    \end{array}
    \]
    RGB(216,216,216)

\[
\begin{array}{cccccc}
1100 & 1000 & \text{binary representing decimal number} & 200 \\
+ & 1 & 0000 & \text{binary representing decimal number} & 16 \\
1101 & 1000 & \text{binary representing decimal number} & 216 \\
\end{array}
\]

**Figure 11.1.** Adding 16 to an RGB value.
Video

- **NetPoint Video on Digital Imaging**
  - [http://uweoconnect.extn.washington.edu/digitalimagingdslfit7/](http://uweoconnect.extn.washington.edu/digitalimagingdslfit7/)
Digital Colors

- **Color Synthesis site**
How a Computer Works
Videos

- Computer Tour
  [http://www.youtube.com/watch?v=VWzX4MEYOBk&feature=user](http://www.youtube.com/watch?v=VWzX4MEYOBk&feature=user)

- Build a computer: CPU, RAM, and Mobo
  [http://www.youtube.com/watch?v=YFrB3rC9Avs&feature=related](http://www.youtube.com/watch?v=YFrB3rC9Avs&feature=related)