ART 250 Lecture 01:
Computer Basics
Hardware, Software & Mac OS X

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<computer> can be programmed to manipulate symbols ... can perform complex and repetitive procedures quickly, precisely and reliably ... can quickly store and retrieve large amounts of data.
The physical components from which a computer is constructed are known as hardware: CPU, memory, and input/output.
What we do with a computer is more important than what it does for us.
Storage
RAM
Software

I. Operating System (OS)

II. Applications

III. Documents
Interface

Hardware

Software
Mac OS Demo

- Finder
- Dock
- Mission Control
- Dashboard
- System Preferences
Maintenance

I. Hardware Care
II. Disk First Aid/Defragmenting/Optimizing
III. Software Updates
IV. Security - Intrusion/Virus/Spyware
Bits & Bytes: Digital Measurement
- bit (b)
- byte (B)
- kilobyte (kB)
- Megabyte (MB)
- Gigabyte (GB)
- Terabyte (TB)
BIT (b) is a single binary unit, the smallest unit of information on a computer

- on or off
- 1 or 0
- + or -
- 2 possible colors (black or white)
BYTE (B) is a group of 8 bits

- one byte can hold one alpha-numeric character
- can represent 256 possible colors or grays
kilobyte

KILOBYTE (kB) = 1024 bytes.

- 1K of memory would hold about one page of text.
Megabyte

MEGABYTE (MB) = 1024 KB (1048576 bytes)

• about 175,000 words
Gigabyte

GIGABYTE (GB) = 1024 MB
(1,073,741,284 bytes).
## Storage Media Sizes

<table>
<thead>
<tr>
<th>media</th>
<th>size</th>
<th>type</th>
<th>usage</th>
<th>cost/GB</th>
</tr>
</thead>
<tbody>
<tr>
<td>floppy disk</td>
<td>1.3MB</td>
<td>magnetic</td>
<td>ancient history</td>
<td></td>
</tr>
<tr>
<td>USB Jump Drive</td>
<td>2 – 32GB</td>
<td>flash memory</td>
<td>transportation only!</td>
<td></td>
</tr>
<tr>
<td>CD-ROM</td>
<td>750MB</td>
<td>optical</td>
<td>archives: data, music</td>
<td></td>
</tr>
<tr>
<td>DVD-R</td>
<td>4.75GB single, 9GB double</td>
<td>optical</td>
<td>archives: data; movies</td>
<td></td>
</tr>
<tr>
<td>Blu-ray</td>
<td>25GB sl, 50GB dl</td>
<td>optical</td>
<td>HD Movies</td>
<td></td>
</tr>
<tr>
<td>flash memory</td>
<td>4 – 512GB</td>
<td>flash memory</td>
<td>mobile devices, some laptops &amp; desktops</td>
<td></td>
</tr>
<tr>
<td>hard drive</td>
<td>500GB - 4TB</td>
<td>magnetic</td>
<td>Desktops &amp; Laptops</td>
<td></td>
</tr>
</tbody>
</table>
Bit Depth - Displays

Video: No. of bits of video memory (VRAM) assigned to each pixel on screen or to each sample point on a scanner or camera.

1 BIT: $2^1 = 2$ colors: 2 grays (black or white)

2 BIT: $2^2 = 4$ colors or 256 grays

4 BIT: $2^4 = 16$ possible colors

8 BIT: $2^8 = 256$ possible colors or grays

16 BIT: $2^{16} = 65536$ possible colors (thousands)

24 BIT: $2^{24} = 16.7$ million possible colors
Bit Depth-Images

The more bits that are dedicated to describing the tone of a pixel in each channel of an image, the more number of tones can be recorded.

<table>
<thead>
<tr>
<th>Bit Depth</th>
<th>Tones per Channel per Pixel</th>
<th>Total Possible Tones</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 bit</td>
<td>256</td>
<td>16.78 million</td>
</tr>
<tr>
<td>10 bit</td>
<td>1024</td>
<td>1.07 billion</td>
</tr>
<tr>
<td>12 bit</td>
<td>4095</td>
<td>68.68 billion</td>
</tr>
<tr>
<td>14 bit</td>
<td>16,383</td>
<td>4.39 trillion</td>
</tr>
<tr>
<td>16 bit</td>
<td>65,532</td>
<td>281 trillion</td>
</tr>
</tbody>
</table>

http://photo.tutsplus.com/articles/post-processing-articles/bit-depth-explained-in-depth/
Bit Depth - Audio

Audio: No. of bits of information recorded for each sample.

Corresponds to resolution of each sample in a set of digital audio data.

CD = 16-bit

DVD & Blu-Ray = 24-bit