Announcements

- Lab #2 due today (5:00pm).
  - Folder in CS office

- Writing Assignment #3 Due on 7/19 (Monday)
  - Post to your CSC101 webpage (index.html)

Objectives

- Understand the basics of computer I/O
- We will not cover these slides in class, and they are mainly for your information.
- You should review them and be familiar with the basic types of input and output devices.
Input and Output

• A computer is completely useless if we can’t get information into it and out of it
• Input and output devices come in many forms for many purposes
• In general, they’re called peripherals because they are in some sense ‘around the outside’ of the computer’s main computational activities

Input Peripherals

• Devices for converting information into a form understandable by computers
  – After all, computers don’t have eyes and ears
• Since computers work with binary data, input devices convert information into a binary form that the computer can use

Input Peripherals

• Keyboard
  – American “QWERTY” layout
  – Was designed to slow down old mechanical typewriters
    • No longer necessary
  – An alternative, the Dvorak keyboard, hasn’t really caught on
Input Peripherals

- Mice and similar devices
  - Originally just a pointing device; now many more functions
  - One, two, three or more buttons
  - Scroll wheels
- Mouse equivalents
  - Track balls
  - Touch pads
  - Pointing sticks (TrackPoint)
  - Etc.

Other Input Peripherals

- Scanner
  - Digitize photographs, other flat images
- Digital camera (still or video)
  - Images directly captured to digital – no film involved
- Digitizing tablet
  - Freehand drawing
- Sound and video digitizers
  - Create digital files from analog sound or video input
- Etc.

Output Peripherals

- Video displays
  - CRT (Cathode Ray Tube)
  - LCD (Liquid Crystal Display)
  - Plasma
- Printers
- Speakers
- Etc.
 CRT Displays

- Glass screen coated with phosphorus, which glows when excited (glow-in-the-dark)
- Beams of electrons (“cathode rays”) are focused on the screen – one each for Red, Green, Blue
- Brightness is varied by varying the strength of the beam

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- Brightness is varied by varying the strength of the beam
- The beam scans over the entire screen to build the whole picture
- Re-scans many times a second (refresh rate)

 CRT Displays

- If you look very closely at a CRT display screen, you can see the red, green and blue phosphors:
LCD Displays

- This is what you have on your laptop
  - Also many flat-panel televisions
- Behind the glass screen are thin layers of dyed liquid crystals (red, green, blue)
- Electrical charge is applied across those thin layers causing the crystals to align such that they are either visible or invisible

Plasma Displays

- Good for larger displays
  - Including larger flat-panel televisions
- Beneath the glass screen are many small bubbles filled with special gasses
- The gasses glow when an electric charge is applied across them (similar to neon tubes)
- Different gasses give different colors (red, green, blue)

LCD vs. Plasma

- Screen Size
  - Same for both
- Viewing angle
  - Image on LCD degrades at higher angles (150° – 176°)
- Burn in
  - Plasma suffers from Burn in / LCD does not
- Durability
  - Plasmas are fragile / LCD’s can withstand more
- Weight
  - Plasmas are heavier than LCD’s (typically)
- Power Consumption
  - Plasmas use more power than LCD’s

http://www.projectorpeople.com/resources/lcd-plasma-projector.asp
Printers

• Two main types of printers
  - Character-based printers
    • Print individual letters or characters (like a typewriter)
    • Poor or useless for graphics
  - Page-based printers
    • Laser or inkjet printers
    • Print each dot (pixel) to create an entire page
      • Highly versatile
      • Text and/or graphics
    • Becoming very inexpensive, even for high resolution and photo-quality color