**Question**

- What are the three essential components of a modern computer?  
  - Be general or specific

**Announcement**

**Definition of a Computer**

- A computer is a device that receives information (input), processes information, and outputs information
- *input/output device that processes information*

**Computer Hardware**

- Key parts of a computer
- Input vs. output
- Interconnection between parts

**Essential Parts**

- Box - Central Processing Unit (CPU)
- Monitor - main output device
- Keyboard - main input device

**The Box (CPU)**

- All processing goes through the box
- A simple input/output (I/O) device
- *Ports* on back for connection of input and output devices
- Disk *drives* on front for storage I/O
**Input vs. Output?**
Classify the following as input or output

- Monitor
- Keyboard
- CPU (The Box)
- Floppy Drive
- CD-ROM
- Printer
- Scanner
- Modem
- Digital Camera
- CD Writer/Burner
- Hard Drive
- LCD Projector
- Laser Pointer
- Network Card
- Bluetooth Card
- Speakers

**Inside the Box**

- Processor – e.g. Pentium IV
- Memory – e.g. 256 MB RAM
- Storage – e.g. Hard Drive, CD-RW
- Slots & Cards
- We will cover this on Monday

**Input: Keyboards**

- Standard keyboard - 101 key, letters, number-pad, function keys
- Microsoft Natural Keyboard - “Ergonomic” design, supposedly better for wrists
- **Wrist support is important**
- The future?

**Output: Types of Monitors**

- Cathode Ray Tube (CRT) - standard monitor, inexpensive, good resolution, good pixel size
- Flat Panel (Liquid Crystal Display - LCD) – more expensive, prices dropping

**Buying a Monitor**

- Size is most important factor
  - Get a 17” CRT or 15” LCD or bigger
  - Note 15” LCD is about the same as a 17” CRT
  - 15” CRT cheaper but will seem very small
- Dot size advertised, not that big of a factor
- Viewable Area – 15.8” for a 17” CRT
- Maximum resolution – look for at least 1280 x 1024
Input: Mice
- Standard Two-Button: Left button for selecting, right button for properties
- Wheeled Mouse - Wheel for scrolling
- Trackball - Inverted mouse
- Touchpad - Touch/tap sensitive
- "Eraser"/Joystick

Mice: Mechanics
- Most mice have a round ball and rollers – rollers must be cleaned
- Newer mice are OPTICAL, using LED and sensor to track movement

Input: Scanners
- Flatbed Scanners - Lay image flat on "copier"-like glass panel. Scanning element moves
- Photo Scanners - Run a single photo through a scanner - photo moves, scanning element stays stationary
- What you pay for: resolution, color quality, connectivity
- Speed: USB connection faster than Parallel
- All scanners on market sufficient for web

Input: Digital Cameras
- Camera without film
- Pixel resolution measures number of dots
- Pixel resolution is key: 640x480 vs. 1280x1024 (1.3 Megapixels) vs. 2048X1536 (3.3 Megapixels)
- Storage can be on flash memory cards, memory sticks, floppy disks, internal, or no storage (web cam)
- How to unload images is important

Question
- What is the common language in which input and output devices communicate?
Answer

- Ones and Zeros.
- 1000110101010100010100010111011101001010101000101000101111000110101010101010001010001011111000110101010101000101000101111100011010101010100010100010111111000101000101001010111001101111110001010001010010101110011011111100010100110 actually means something to a computer

Output: Printers

- Inkjet Printers - Tiny dots of ink on paper
  - Can print high quality photos
  - Ink is expensive!
- Laser Printers - Laser, plastic toner, and heat; drawback: no color
- Color Laser Printers - ~$600 and up
- Dot Matrix Printers

Output - LCD Projectors

- Similar to monitors but project image
- New to computer market (last 5 years)
- Expensive, becoming cheaper every day (some under $1000 now)
- For business and education, some people getting them for home theatre systems

Two-way Communication: Modem

- MDulator / DEModualter = MO-DEM
- Converts digital computer signal to analog telephone signal and vice versa
- Sends and receives information
- 56K is current standard
- Connect speeds often slower than 56K

Cable Modems

- Cable Modems convert from cable interface to Ethernet or USB interface.
- External, $50-$200 to buy
- Must subscribe to Broadband/ Cable Internet Service through your cable provider
- Best way to go from home but expensive ($45/month)
- Cable provider has a monopoly so prices won't drop

DSL

- Digital Subscriber Line
  - Works over phone line but doesn't interfere with phone calls
  - The speed is much higher than a regular modem (1.5 Mbps vs. 56 Kbps)
  - Works better closer to phone company
  - Not available everywhere
Network Cards

- Network cards allow connection to the Internet via ETHERNET
- Wireless network cards require a wireless router to connect
- Ethernet is FAST!

Storage Media

- Media refers to the objects on which information is stored
- Singular of word is medium
- A CD is a medium for storage, a floppy disk is a medium, ...

Storage: Magnetic Media

- "Drive" Storage: magnetic film stores 1s and 0s
- Hard Drives - Internal, sealed platters
- Floppy Drive - One flexible platter
- Zip Drive – Very high capacity floppy
- Most rewritable storage is magnetic

Storage: Optical Media Read Only

- CD-ROM – 650MB or 700 MB, read only, etched pits
  - drives 32X etc. for speed relative to normal
- DVD - stands for Digital Versatile Disc, 4.7 Gb (7X CD)

CD Burners – Optical Read/Write

- CD RW
  - 48x/16x/52x means 48x maximum write speed, 16x max. rewrite speed, and 52x max. read speed
- Media: CD-R is cheapest, write once
- CD-RW – good medium for transporting files

Media refers to the objects on which information is stored.