Unit – 1

Computer Hardware

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Question

☐ What are the three essential components of a modern computer?

– Be general or specific

Definition of a Computer

- A computer is an 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
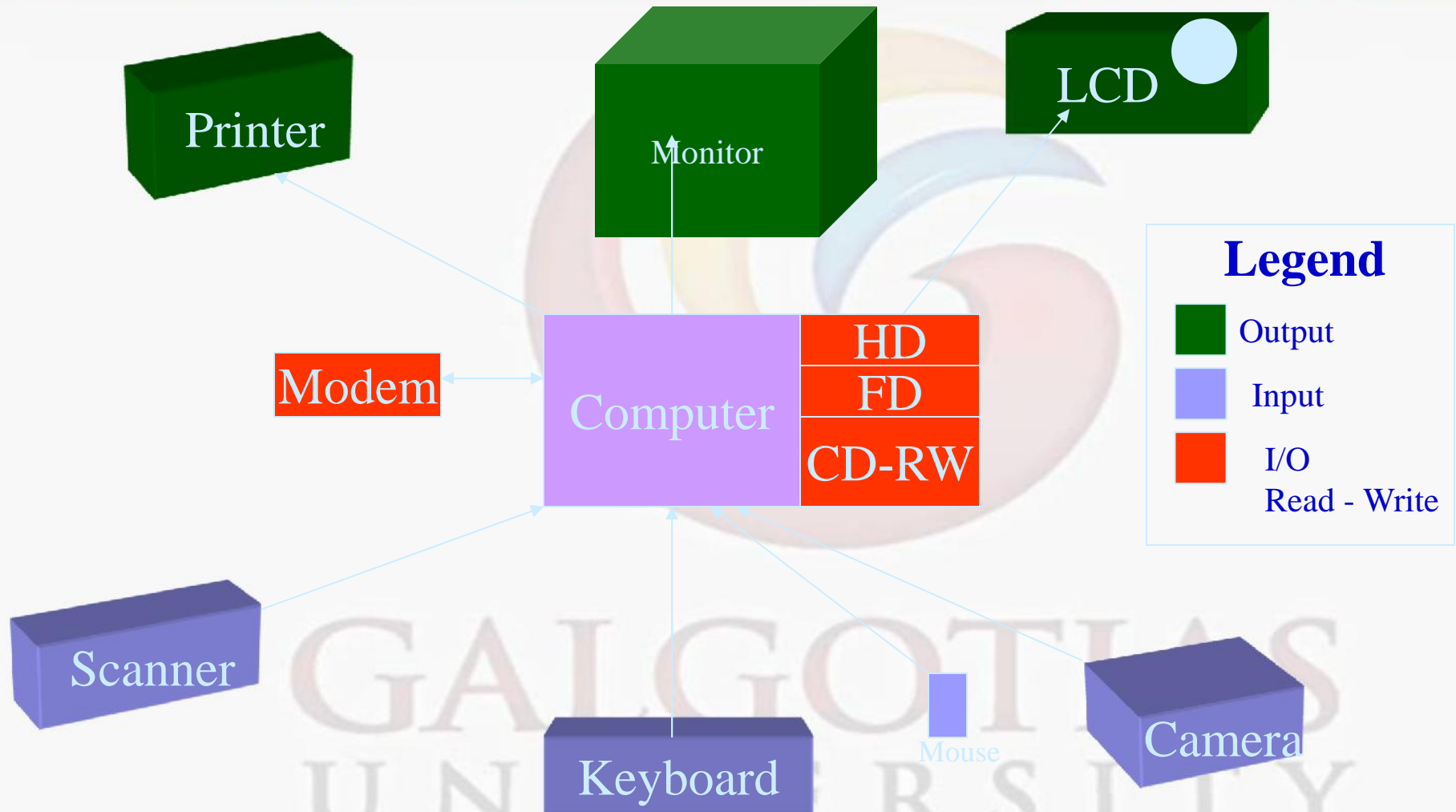
Input vs. Output?

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

Legend

Output

Input

I/O
Read - Write

Inside the Box

- Processor – e.g. Pentium IV
- Memory – e.g. 256 MB RAM
- Storage – e.g. Hard Drive, CD-RW
- Slots & Cards

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
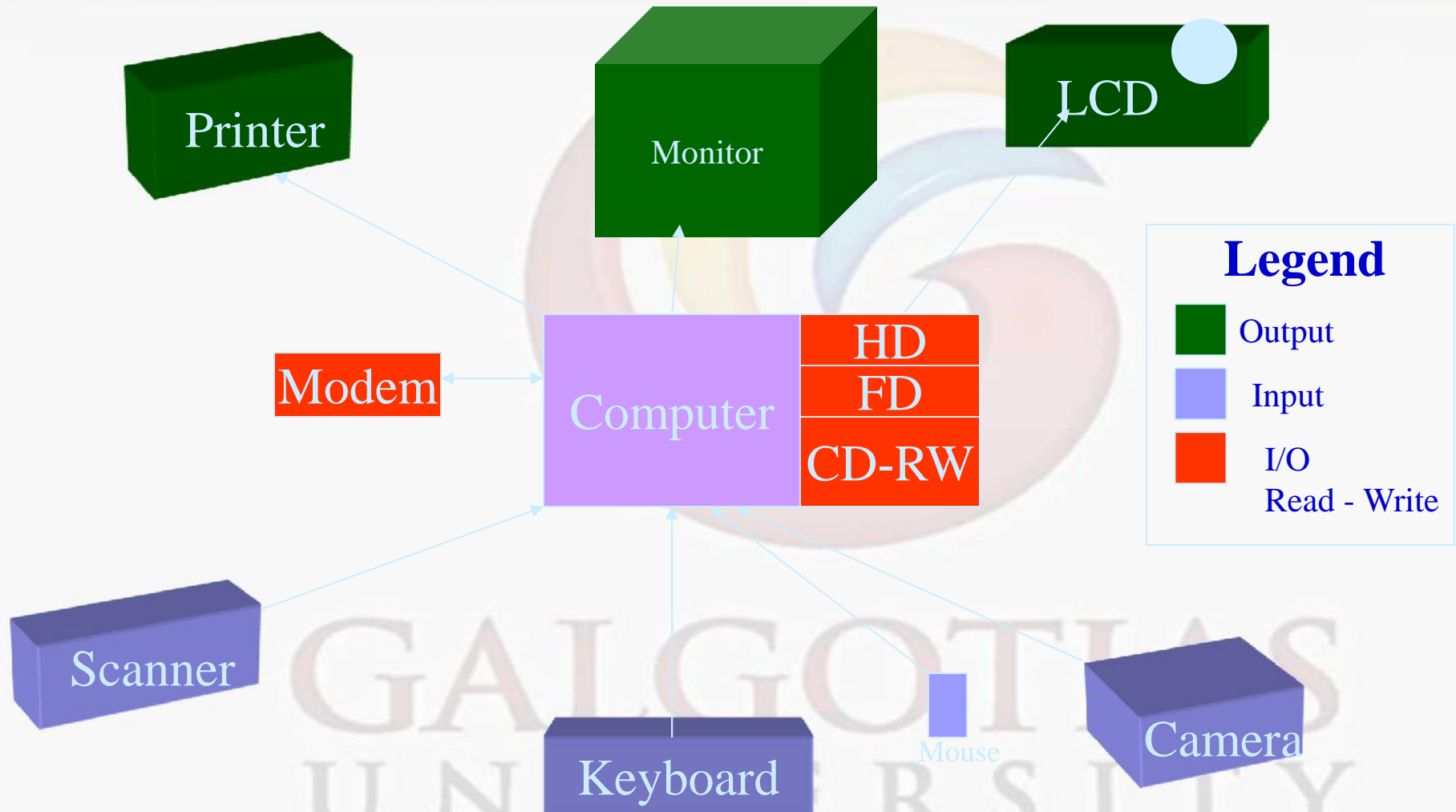
Buying a Monitor

◻ 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

Printer

Monitor

LCD

Modem

Computer

HD

FD

CD-RW

Legend

Output

Input

I/O
Read - Write

Scanner

Mouse

Camera

Keyboard

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.

- 10001101010101010101000010100010111110010101001010101010101001010100110000010100010101011100110111111100010100110 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

- ☐ MOdulator / 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