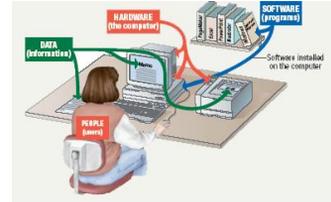Looking Inside the Computer System
NOS 116, 118, 218, 222
Handout 10
Hardware & Software

1

Parts of the Computer System

- Computer systems have four parts
  - Hardware
  - Software
  - Data
  - User

1B-2

Parts of the Computer System

- Hardware
  - Mechanical devices in the computer
  - Anything that can be touched
- Software
  - Tell the computer what to do
  - Also called a program
  - Thousands of programs exist
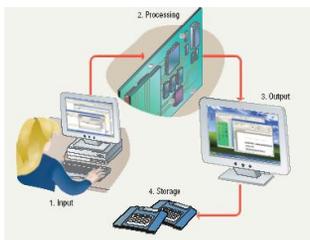
1B-3

Parts of the Computer System

- Data
  - Pieces of information
  - Computer organize and present data
- Users
  - People operating the computer
  - Most important part
  - Tell the computer what to do
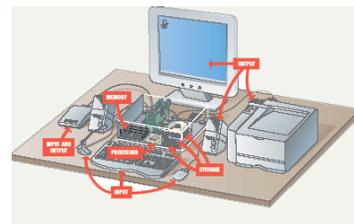
1B-4

Information Processing Cycle

- Steps followed to process data
- Input
- Processing
- Output
- Storage

1B-5

Essential Computer Hardware

- Computers use the same basic hardware
- Hardware categorized into four types

1B-6

Essential Computer Hardware

- Processing devices
  - Brains of the computer
  - Carries out instructions from the program
  - Manipulate the data
  - Most computers have multiple processors
  - Central Processing Unit (CPU)
  - Secondary processors
  - Processors made of silicon and copper

1B-7

Essential Computer Hardware

- Memory devices
  - Stores data or programs
  - Random Access Memory (RAM)
    - Volatile
    - Stores current data and programs
    - More RAM results in a faster system
  - Read Only Memory (ROM)
    - Permanent storage of programs
    - Holds the computer boot directions

1B-8

Essential Computer Hardware

- Input and output devices
  - Allows the user to interact
  - Input devices accept data
    - Keyboard, mouse
  - Output devices deliver data
    - Monitor, printer, speaker
  - Some devices are input and output
    - Touch screens

1B-9

Essential Computer Hardware

- Storage devices
  - Hold data and programs permanently
  - Different from RAM
  - Magnetic storage
    - Floppy and hard drive
    - Uses a magnet to access data
  - Optical storage
    - CD and DVD drives
    - Uses a laser to access data

1B-10

Software Runs The Machine

- Tells the computer what to do
- Reason people purchase computers
- Two types
  - System software
  - Application software

1B-11

Software Runs The Machine

- System software
  - Most important software
  - Operating system
    - Windows XP
  - Network operating system (OS)
    - Windows Server 2003
  - Utility
    - Symantec AntiVirus

1B-12

Software Runs The Machine

- Application software
  - Accomplishes a specific task
  - Most common type of software
    - MS Word
  - Covers most common uses of computers

1B-13

Computer data

- Fact with no meaning on its own
- Stored using the binary number system
- Data can be organized into files

1B-14

Computer users

- Role depends on ability
  - Setup the system
  - Install software
  - Mange files
  - Maintain the system
- "Userless" computers
  - Run with no user input
  - Automated systems

1B-15

Computer Categories

- Before:
  - Computers are categorized into three main categories from least powerful to most powerful:
    - *microcomputers*
    - *minicomputers*
    - *mainframe computers*
- Today:
  - A computer is categorized based on its technology, function, size, performance, and cost

1B-16

Computer Categories

- Old Computer Categories
  - *Mainframe computers* were the first type of computer that were very large, and were usually housed in a closet-sized metal frame
    - This term also applies to a category of large, expensive computers that were sold to big corporations and government agencies
  - *Minicomputers* (1968) were smaller, less expensive, and less powerful than mainframes, and were used by small businesses
  - *Microcomputers* (1971) were a newer type of computer whose CPU had a single chip, called a *microprocessor*
- Today, just about any computer, no matter how large or small, uses one or more microprocessors as its CPU – so these terms are no longer valid

1B-17

Computer Categories

- Today's Computer Categories
  - Personal computers
  - Handheld computers
  - Workstations
  - Videogame Consoles
  - Mainframes
  - Supercomputers
  - Servers

1B-18

What is a handheld?

- A *handheld computer* is one that is designed to fit into a pocket, run on batteries, and be used while you are holding it
- Also called a *PDA* (Personal Digital Assistant)
  - Send and receive e-mail
  - Use maps and global positioning
  - Maintain expense account, contacts, to-do lists, memos, etc.
  - Make voice calls using cellular service
- Designed to be a computing accessory, not your main computer

Chapter 1: Computer, Internet, Web, and E-Mail Basics   1B-19

What types of computers can be classified as workstations?

- The term "workstation" has two meanings
  - Powerful desktop models designed for specialized tasks, such as 3D graphics
  - Ordinary personal computers connected to a local area network
- A *computer network* is two or more computers or other devices that are connected for the purpose of sharing data and programs

1B-20

Is a PlayStation a computer?

- A *videogame system (i.e. Sony's Playstation)* is a computer, but typically it has not been considered a computer category because of its history as a dedicated game device that connects to a TV set and provides only a pair of joysticks for input
- Today's videogame systems contain microprocessors that are equivalent to those found in a fast personal computer, as they are equipped to produce graphics that rival those on sophisticated workstations

1B-21

What makes a computer a server?

- A *server* serves the computers on a network by supplying them with data or resources (Internet, network files, printing, e-mail, etc.)
- A *client* receives data or uses resources from a server
- Any computer can be a server or a client
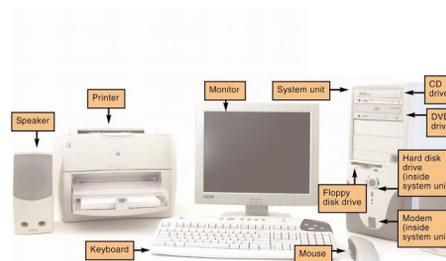- High performance servers are needed when there is a need for lots of users and rapid response

1B-22

What's a personal computer system?

- A *personal computer system* consists of the following:
  - *System unit*: case that holds the main circuit boards, microprocessor, power supply, and storage devices
  - *Display device*: Monitor or LCD screen
  - *Keyboard*: Primary input device
  - *Mouse*: Secondary input device
  - *Floppy disk drive*: Storage for small amounts of data
  - *Hard disk drive*: Storage for large amounts of data
  - *CD and DVD drives*: Storage or audio
  - *Sound card and speakers*: Plays audio
  - *Modem*: Connects to the Internet
  - *Peripheral devices*: Printers, scanners, etc.

1B-23

What is a personal computer system?

1B-24

4

What is a peripheral device?

- A *peripheral device* designates equipment that might be added to a computer system to enhance its functionality
  - Printer
  - Digital camera
  - Scanner
  - Joystick
  - Graphics tablet

1B-25

Quizes

1. A computer does four things:
   a) _____
   b) _____
   c) _____
   d) _____
2. _____ is an area of a computer that temporarily holds data.
3. A keyboard is an example of a(n) _____ device.
4. A computer processes data in the _____ processing unit.
5. The idea of a(n) _____ program means that a series of instructions for a computing task can be loaded into a computer's memory.

1B-26

1. The three old categories of computers were
   a) _____
   b) _____
   c) _____
2. Desktop computers and laptops are examples of _____ computers.
3. Microsoft's Xbox gaming system is considered to be a computer. True or false?
4. A personal computer or workstation that requests data from a server is known as a(n) _____.
5. The _____ is the case that holds the main circuit boards, microprocessor, power supply, and storage devices for a personal computer system.

1B-27