Introduction to Information and Communication Technology

Week 1: Lecture 1

Topics:

1) Introduction to Computers

2) Computer, it's characteristics

What Is a Computer and What Does It Do?

- Computer: A programmable, electronic device that accepts data, performs operations on that data, display data or results and stores the data or results as needed
  - Computers follow instructions, called programs, which determine the tasks the computer will perform

What Is a Computer and What Does It Do?

- A computer is an information-processing machine. It may also be defined as a device that works under the control of stored programs automatically accepting, storing and processing data to produce information that is the result of that processing.

- The forms of information processed include:
  - Data – invoices, sales, and purchase ledger, payroll, stock controls etc.
  - Text – widely available in many offices with microcomputers
  - Graphics – business graphs, symbols
  - Images – pictures
  - Voice – telephone

- Processing includes creating, manipulating, storing, accessing, and transmitting.

What Is a Computer and What Does It Do?

$2+5 = 7$

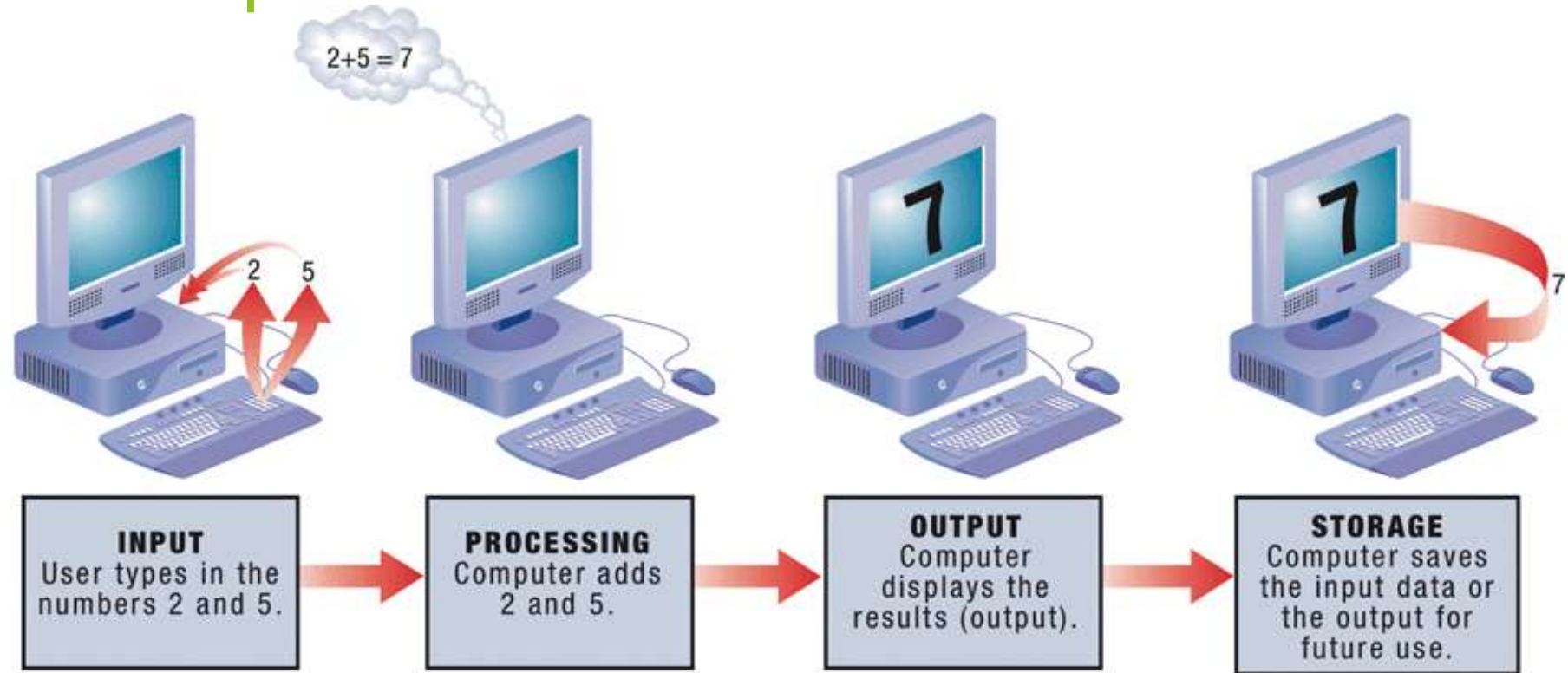| INPUT	PROCESSING	OUTPUT	STORAGE
User types in the numbers 2 and 5.	Computer adds 2 and 5.	Computer displays the results (output).	Computer saves the input data or the output for future use.

FIGURE 1-6
The information processing cycle.

Basic Operations of Computer

- ▶ Input: entering data into the computer

- ▶ Processing: performing operations on the data

- ▶ Output: presenting the results

- ▶ Storage: saving data, programs, or output for future use

- ▶ Communications: sending or receiving data

Hardware

- Hardware: The physical parts of a computer
  - Internal hardware
    - Located inside the main box (system unit) of the computer
  - External hardware
    - Located outside the system unit and plug into ports located on the exterior of the system unit
  - Hardware associated with all five computer operations

FIGURE 1-8
Typical computer hardware.

DVD DRIVES
Read and write CD and DVD discs.

HARD DRIVE
Located inside the system unit; stores programs and most data.

SYSTEM UNIT
Case that contains the CPU, memory, power supply, disk drives, modem, and all other internal hardware.

MONITOR
Lets you see your work as you go; a primary output device.

PRINTER
Produces printed copies of computer output.

USB PORT
Connects external devices that use the USB interface.

MICROPHONE
Captures spoken input.

SPEAKERS
Produce audio output.

FLASH MEMORY CARD READER
Reads and writes flash memory cards.

FIREWIRE PORTS
Connect external devices that use the FireWire interface.

KEYBOARD
Used to type instructions into the computer; the principal input device.

CD AND DVD DISCS
Deliver programs and store large multimedia files.

MOUSE
Used to make on-screen selections; a primary pointing device.

FLASH MEMORY CARDS
Store digital photos, music files, and other content.

USB FLASH DRIVE
Used to store documents, digital photos, music files, and other content to be moved from one PC to another.

Hardware

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Hardware

- Input devices
    - Used to input data into the computer
    - Keyboards, mice, scanners, cameras, microphones, joysticks, etc.
- Processing devices
    - Perform calculations and control computer's operation
    - Central processing unit (CPU)
- Output devices
    - present results to the user on some device
    - Monitors, printers, speakers, projectors, etc.

Hardware

- Storage devices
- Used to store data on or access data from storage media
  - Primary Storage Devices
    - RAM (Random Access Memory)
    - ROM (Read Only Memory)
  - Secondary Storage Devices
    - Hard drives, DVD disks and drives, USB flash drives, etc.
- Communications devices
  - Allow users to communicate with others and to electronically access information
  - Modems, network adapters, etc.

Hardware

INPUT	OUTPUT
Keyboard	Monitor
Mouse	Printer
Microphone	Speakers
Scanner	Headphones and headsets
Digital camera	Data projector
Electronic pen	
Touch pad	**STORAGE**
Joystick	Hard drive
Fingerprint reader	Floppy disk
PROCESSING	Floppy disk drive
	CD/DVD disc
CPU	CD/DVD drive
COMMUNICATIONS	Flash memory card
	USB flash drive
Modem	Flash memory card reader
Network adapter	

FIGURE 1-9

Common hardware

1. For the following list of computer hardware devices, indicate the principal function of each device by writing the appropriate letter—I (input device), O (output device), S (storage device), P (processing device), or C (communications device)—in the space provided.

a. CPU _____
b. Monitor _____
c. Mouse _____

d. Keyboard _____
e. Hard drive _____
f. Modem _____

g. Speakers _____
h. DVD drive _____
i. Microphone _____

Self-Quiz

Software

Software: The programs or instructions used to tell the computer what to do

- System Software

- Application Software

- **System software:** allows a computer to operate i.e Operating system

- They are designed specifically to coordinate the functions of the hardware, make hardware accessible to one another and grant application software access to needed hardware.

  - Boots the computer and launches programs at the user's direction

  - Most use a GUI to interact with the user via windows, icons, menus, buttons, etc.

  - Windows, Mac OS, Linux, etc.

Operating systems

System Software: *Utilities*

- software that are designed specifically to give the computer user access to organize, customize and carry out maintenance functions in the computer.

- They include things like Disk Manager and Control Panel Items, Antivirus etc.
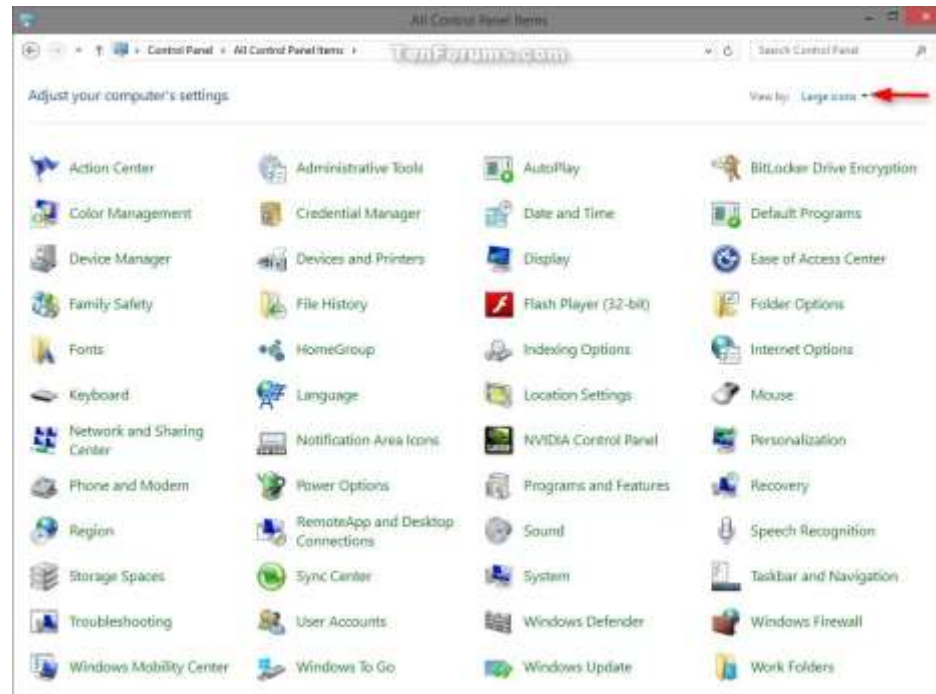
Utility software

System Software: *device drivers*

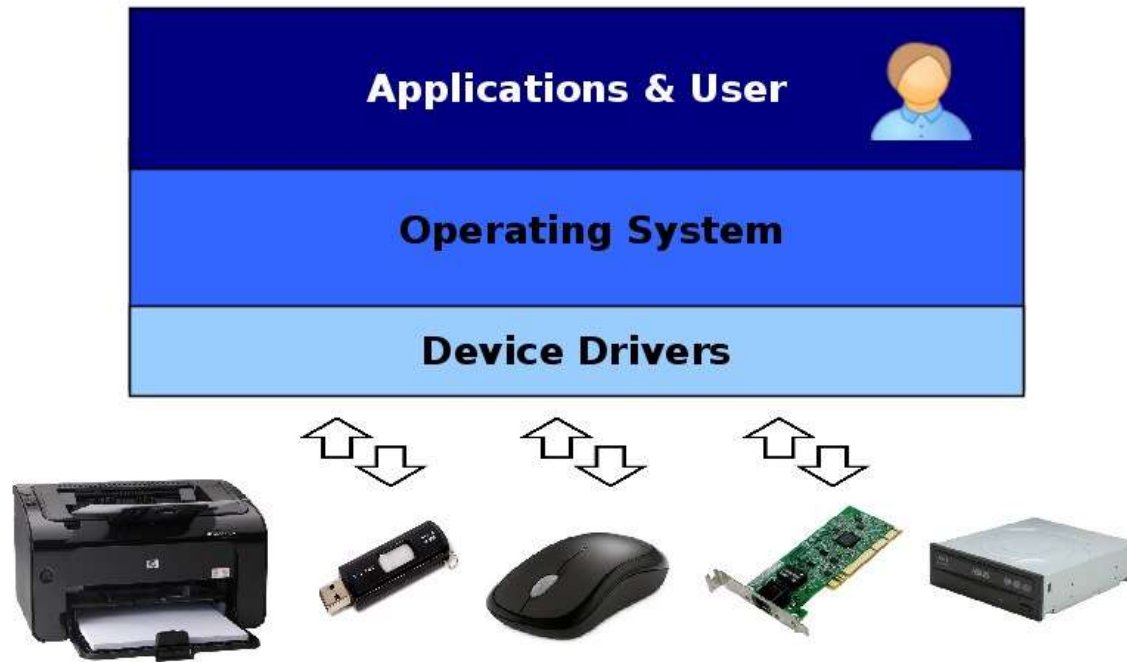used to establish linkage between a computer and connected hardware devices.

They assist in describing the device to the computer and provides information on its functions and available services which in turn define how the device can be used by the operating and other applications.

These include printer drivers and modem software.

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Device Drivers

how is it used to instruct the computer what to do?

FIGURE 1-10

The Windows desktop.

ICONS
Represent folders, documents, or other items that can be opened.

MENU BAR
Opens menus.

TOOLBAR
Contains buttons or icons that can be used to issue commands.

TOOLBAR BUTTON
Issues a command.

MENU
Contains commands.

START BUTTON
Opens the Start menu.

WINDOWS
Rectangular areas containing programs, documents, or other data.

DIALOG BOX
Displayed when needed to request information from the user.

WINDOWS DESKTOP
Provides the backdrop for icons, windows, and other objects, such as the Windows Sidebar shown here.

SIZING BUTTONS
Minimize, maximize, or close a window.

RIBBON
Replaces menus and toolbars in some programs.

HYPERLINK
Issues a command to the computer when clicked.

TASKBAR
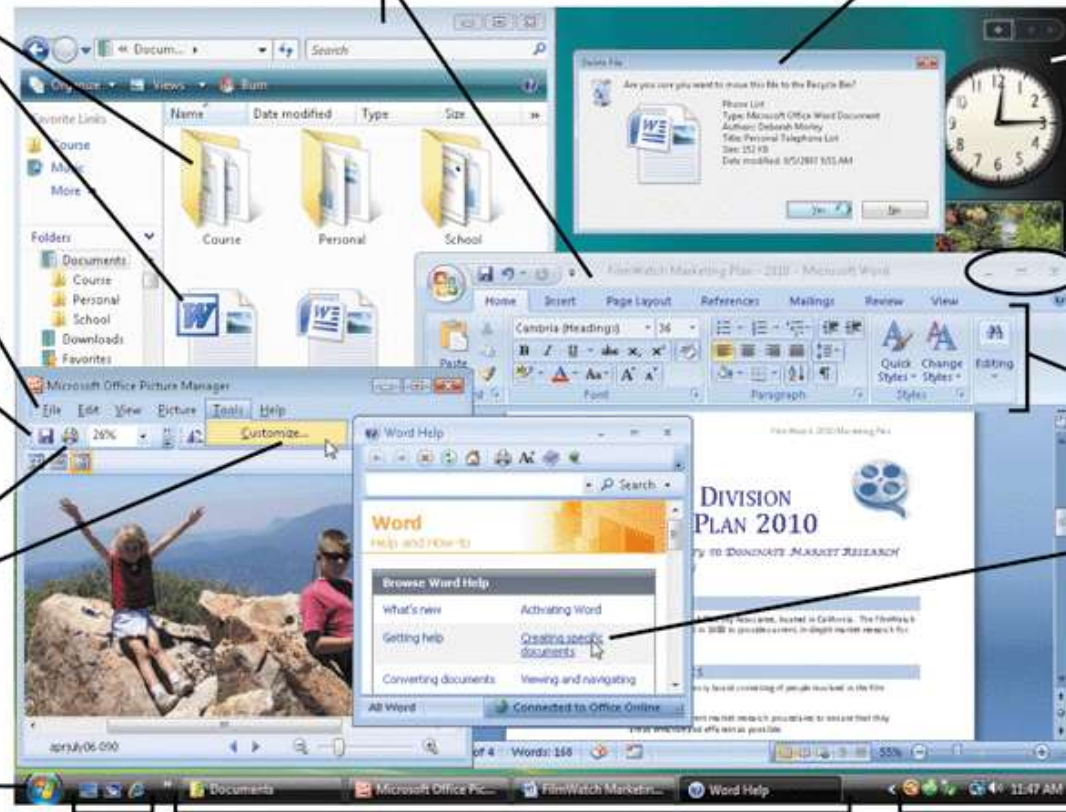Usually located at the bottom of the desktop.

TASKBAR TOOLBAR
Contains icons that can start programs.

TASKBAR BUTTONS
Correspond to open windows; can be used to change the active window.

SYSTEM TRAY
Shows the clock and other indicators.

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SHORTCUTS
Click to launch the program corresponding to these items.

ALL PROGRAMS
Click to view all programs installed on the PC.

SEARCH BOX
Used to search for documents or programs.

START BUTTON
Click to open the Start menu.

ARROW
Indicates a submenu will open when this item is pointed to.

POWER AND LOCK BUTTONS
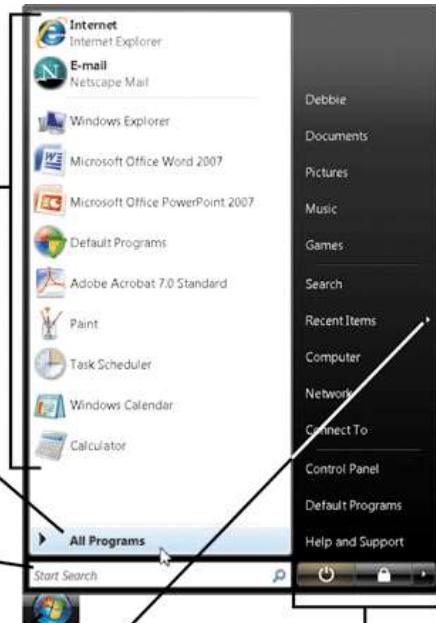Click to power down, shut down, restart, or lock the computer.

FIGURE 1-11
The Windows Vista Start menu.

Software

Allow users to create written documents, such as reports, letters, and memos.

SPREADSHEET PROGRAMS
Allow users to create documents containing numbers and computations, such as budgets, expense reports, and financial statements.

GAMES
Allow both children and adults to perform educational and/or entertainment activities.

MULTIMEDIA PROGRAMS
Allow users to perform tasks, such as playing music or video clips stored on a computer, CD, or Web page; creating audio CDs; and transferring home movies to DVD discs.

WEB BROWSERS
Allow users to view Web pages and other information located on the Internet.

FIGURE 1-12
Examples of application software.
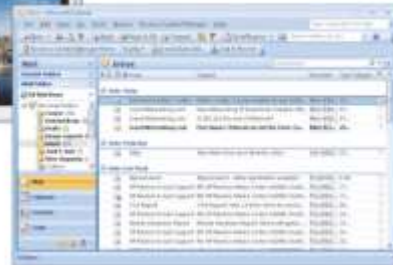
E-MAIL PROGRAMS
Allow users to compose, send, receive, and manage electronic messages sent over the Internet or a private network.

Application Software

Application Software

▶ Application software: Performs specific tasks or applications to solve specific problem

- ▶ Creating letters, budgets, etc.
- ▶ Managing inventory and customer databases
- ▶ Editing photographs
- ▶ Scheduling appointments
- ▶ Viewing Web pages
- ▶ Sending and receiving e-mail
- ▶ Recording / playing CDs
- ▶ Designing homes
- ▶ Playing games

Application Software

▶ Commercial Software

  ▶ **Commercial software** is software that is developed and sold for a profit. When you buy a commercial software program (such as *Microsoft Office*) comes with a *single-user license*

▶ Shareware

  ▶ Shareware is a type of proprietary software which is initially shared by the owner for trial use at little or no cost with usually limited functionality or incomplete documentation, but which can be upgraded upon payment.

▶ Freeware

  ▶ **Freeware** programs are software programs that are given away by the author for others to use free of charge.

▶ public domain software

  ▶ **Public domain software** is not copyrighted; instead, the ownership rights to the program have been donated to the public domain. Consequently, it is free and can be used, copied, modified, and distributed to others without restrictions.

1. **T F** A mouse is one common input device.

2. **T F** Software includes all the physical equipment in a computer system.

3. **T F** A computer can run without an operating system if it has good application software.

Self-Quiz

Characteristics of computer

▶ **Speed** - Computers have higher processing speeds than other means of processing, measured as number of instructions executed per second.

▶ **Accuracy** - Computers are not prone to errors. So long as the programs are correct, they will always give correct output. A computer is designed in such a way that many of the inaccuracies, which could arise due to the malfunctioning of the equipment, are detected and their consequences avoided in a way, which is completely transparent to the user.

▶ **Consistency** - Given the same data and the same instructions computers will produce exactly the same answer every time that particular process is repeated.

▶ **Reliability** - Computer systems are built with fault tolerance features, meaning that failure of one of the components does not necessarily lead to failure of the whole system.

▶ **Memory capability** - A computer has the ability to store and access large volumes of data.

▶ **Processing capability** - A computer has the ability to execute millions of instructions per second.

Any Question?