What is input?

Input: is any data or instructions that are used by a computer.

Input devices: are hardware used to translate words, sounds, images, and actions that people understand into a form that the system can process.

Keyboard entry

❖ Keyboards: common way to input data. Keyboard converts numbers, letters, and special characters that people understand into electrical signals are sent to and processed by the system unit.

❖ QWERTY: an arrangement of keys is used by keyboard that reflects the first six alphabetic characters.

Most common types of Keyboards are:

1. Traditional keyboards:
   Full-sized, rigid, rectangular keyboards that include function, navigational, and numeric keys.

2. Ergonomic keyboards:
   Similar to traditional keyboard but is not rectangular and have a palm rest.

3. Wireless keyboards:
   Transmit input to the system unit through the air without using wires.

4. PDA keyboards:
   Miniature for PDAs and smart phones.

5. Virtual keyboards:
   Display image of a keyboard on a touch screen device/ common on tablet computers and mobile devices.

Feature:

❖ combines a typewriter keyboard with a numeric keypad used to enter numbers and arithmetic symbols.

❖ Toggle keys (CAPS LOCK key) turn a feature on or off.

❖ Combines action keys (CTRL key) perform an action when held down in combination with another key.


**Pointing devices**

- **Pointing devices**: accept pointing gestures and convert them to machine-readable input.

**Mice:**

- **A mouse** controls a mouse pointing appears an arrow/ have more buttons to select commands options and to control the mouse pointer.

- **A wheel buttons**: rotates to scroll through information.

**There are 3 basic designed of mice:**

1. **Optical mouse**: Has no moving parts/ it is emits and senses light to detect mouse movement/ used on surface with high precision.

2. **Mechanical mouse**: Has a ball on the bottom is attached with a cord to system unit/ move across a smooth surface.

3. **Cordless or wireless mouse**: Uses radio waves or infrared light waves to communicate with system unit.

**Similar to a mouse are:**

- **Track balls (roller ball)**: control by rotating a ball with your thumb.

- **Touch pads**: control by moving and tapping on the surface of a pad.

- **Pointing stick**: in a middle of keyboard control by directing the stick with on finger.

**Touch screens:**

- Operations are controlled by finger touching the screen.

- Widely used with tablet PC, netbook, and smart phones.

**Multi-touch screens:**

- can be touched with more than one finger.

- Commonly used on mobiles devices.

**Joystick:**

Operations are controlled by varying pressure, speed, and direction.
Stylus:
Is a pen like device used with tablet PCs and PDAs and used to draw images on screens.

Handwriting recognition software:
Translate hand written notes a form that the system unit can process.

Scanning devices
Scanners: move across text and graphics.
Scanning devices: convert scanned text and images into a form that can be processed by the system unit.

There are 4 types of scanning devices:
1. Optical scanners.
2. Card readers.

Optical scanners
Optical scanners (scanner): recognize light, dark, and colored area of scanned text or images.

There are 3 basic types of optical scanners:
- Flatbed scanner: like a cope machine image is placed on a glass surface and scanner records the image from below.
- Documents scanner: similar to a flatbed scanner but it quickly scan multipage documents.
- Portable scanner: handheld device that slides across the image/ making direct control.

Card readers
Card readers: Interpret encoded information.

There are 2 basic types of Card readers:
- Magnetic card readers: reads magnetic strip.
- Radio frequency card readers: reads RFID (radio frequency identification) microchip.

Bar code readers
Bar code readers: are used with electronic cash registers in supermarkets.

Wand readers or platform scanners: read UPC (universal product code) codes that are used to determined product descriptions and prices and to update inventor levels.
Character and mark recognition devices:

- Are scanners recognizing special characters and marks.

There are 3 types:

2. Optical-character recognition (OCR): read by a light source.
3. Optical-mark recognition (OMR): senses the presence or absence of mark.

Image capturing device

Create or capture original images.

Include:

- **Digital cameras**: images downloaded to system unit for further processing or printing.
- **Digital video cameras**: record motion digitally on disk or in the camera’s memory.
- **Webcams**: capture images and send them over the internet. Some webcams are attached or built-in.

Audio input devices

- **Audio input devices**: Convert sounds into a form that can be processed by the system unit.
- **Audio input**: take many forms include the human voice and music.
- **Voice recognition system**: use a microphone, a sound cord and special software.
What is output?

Output: is a data or information processed by a computer.

Output devices: translate processed text, graphics, audio, and video into a form humans can understand.

Monitors

Monitors (display screen): present visual images of text and graphics. Monitor outputs described as soft copy.

Features:

Clarity is a function of several monitors.

1. **Resolution**: expended as matrix of pixels or picture elements. The high a monitor's resolution (the more pixels), the clearer the image produced.

2. **Dot (pixel) pitch**: is distance between each pixels. The lower the dot pitch (the shorter the distance between pixels), the clearer the images produced.

3. **Refresh rate**: indicates how often a displayed image is updated or refreshed.

4. **Size or (active display areas)**: is measured by the diagonal length of a monitor's viewing area.

5. **Aspect ratio**: is determined by the width of a monitor divided by its height.

Flat-panel monitors

Flat-panel monitors: have become a standard for computer systems/ many are LCD (liquid crystal display).

There are 2 basic types:

1. **Passive matrix or dual-seen monitors**: create image by scanning the entire screen./ require very little power, clarity is not as sharp.

2. **Active**-matrix or thin film transistors (TFT) monitors: each pixel is independently activated. / more colors with better clarity, require more power.

3. **OLED (organic light-emitting diode)**: lower power consumption, longer battery life much thinner displays.

Cathode-ray tube

Cathode-ray tube (CRTs): common for office and home./ uses technology similar to older televisions./ compared to flat-panels. CRTs are bulky, require more electricity to run, and occupy considerable space on the desktop.
Other monitors

There are 3 specialized types of monitors are:


2. **Data projectors:** Similar to slide projectors. / Connect to microcomputers and project computer output appear on a monitor.

3. **High-definition television (HDTV):** Delivers a much clearer and more detailed wide-screen picture that regular television.

Printers

Printers (hard copy): Translate information that has been processed by the system unit and present the information on the paper.

**Feature**

**Regulation:** measure of clarity of images. / printer regulation is measured in dpi (dots per inch) / the higher the dpi, the better the quality of images produced.

**Color:** users have the option to print either with just black ink or with color.

**Speed:** is measured in the number of pages printed per minute.

**Memory:** more memory to store printing instructions, the faster to create large documents.

**Duplex printing:** allows automatic printing on both sides of a sheet of paper.

**Ink-jet printers**
Spray ink to produce high-quality output.

**Laser printers**
- Use technology similar to photocopying machine.
- Use a laser light beam to produce images with excellent letter and graphics quality.

**Two categorizes:**
1. Personal laser printer (by users)
2. Shared laser printers (by a group).
Other printers

• **Cloud printers**: are printers connected to the Internet and provide printing service to others on the Internet.

• **dot-matrix printers**: from characters and images using a series of small pins on a pins on a print head.

• **thermal printers**: use heat elements to produced images on heat-sensitive paper.

• **plotters**: for graphics tablets and other graphical input devices.

• **photo printer**: to print photo-quality images form digital cameras.

• **portable printers**: work with notebook computer, connect with USB.

Audio-output devices

- **Audio-output devices**: translate audio information from the computer into sounds that people can understand.

- Most widely used: are **speakers** and **headsets** (connect to a sound card in the system unit).

- **Digital music players (digital media players)**: for storing, transferring, and playing audio files. Many players also display video files.

Combination input and output devices

- Common devices include: fax machines, multifunctional devices, and Internet telephones.

  - **Fax machines**

    - **Fax machines**: send and receive images via standard telephone lines.

  - **Multifunctional devices**

    - **Multifunctional devices (MFD)**: typically combine the capacities of a scanner, printer, fax, and copy machine.

  - **Internet telephones**

    - **internet telephone**: receive and send voice communication.

    - **voice over IP (VoIP)** also known as (**telephony, Internet telephony, and IP telephony**).

      **VoIP**: use the Internet to transmit telephone calls.

      **Skype** and **vonage** are two examples of popular Internet telephony service providers.
There are 3 approaches to make Internet telephone are:

1. **Computer-to-computer:**
   Allows placing free long-distance calls.

2. **Computer-to-traditional telephone:**
   Allow a use to call almost any traditional telephone from computer.

3. **Traditional telephone-to-traditional telephone:**
   Communications do not require a computer.