

Computer Fundamentals



Lecture 5

Input/Output Devices



Input Devices

Introduction

- Input is the process of entering data into a computer.
- An **input device** is any hardware component that allows you to enter data and instructions into a computer.
- Traditional input devices include the **keyboard** and **mouse**, but there are also many other types of input devices in use today.

List of common Input Devices

- ❑ Keyboard
- ❑ Pointing Devices
 - ❑ Mouse
 - ❑ Trackball
 - ❑ Touchpad
 - ❑ Touch Screens
 - ❑ Pen Input
- ❑ Optical scanners
- ❑ Optical readers
- ❑ Bar code readers
- ❑ QR Code Reader

Keyboards

- A **keyboard** is an input device that contains keys you press to enter data and instructions into a computer or mobile device.
- Nearly all keyboards have a **typing area**, **function keys**, **Modifier keys**, and **navigation keys**.
- Many also include **media control buttons**, **Internet control buttons**, and other **special keys**.
- Others may include a **fingerprint reader** or a **pointing device**.

A typical QWERTY keyboard



Character Keys



Function Keys



Enter & Editing Keys



Lock Keys



Modifier Keys



System and GUI keys



Navigation keys



Numeric keypad

Types of Keyboards

- ❑ **Standard keyboards:** typically have from 101 to 105 keys, which include function keys along the top and a numeric keypad on the right.
- ❑ **Compact keyboard:** which is smaller than a standard keyboard and usually does not include the numeric keypad or navigation keys.



Compact keyboard

Types of Keyboards

- ❑ **Gaming keyboard** is a keyboard designed specifically for users who **enjoy playing** games on the computer. Gaming keyboards typically include **programmable keys** so that **gamers can customize the keyboard** to the game being played.



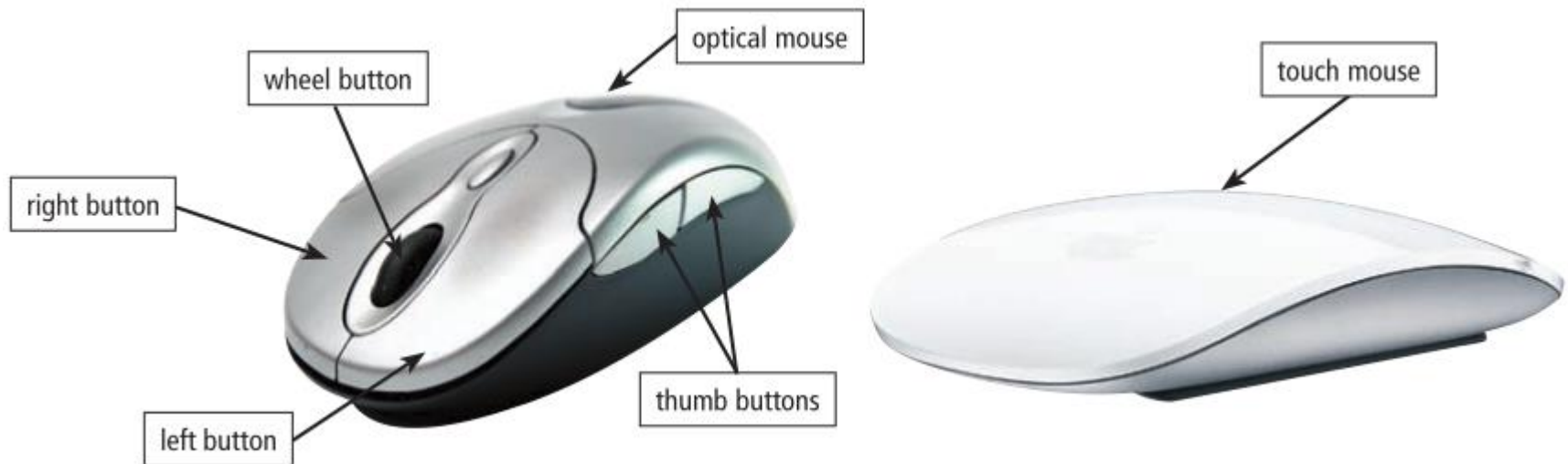
Pointing Devices

- A **pointing device** can enable you to select text, graphics, and other objects, such as buttons, icons, links, and menu commands.
- There are many **pointing device** such:
 - Mouse
 - Trackball
 - Touchpad
 - Touch Screens
 - Pen Input
 - ▶ Stylus Pen
 - ▶ Digital Pen

Pointing Devices

□ Mouse

- A mouse is a pointing device that fits under the palm of your hand comfortably.
- Desktop users have an optical mouse or a touch mouse



An optical mouse has buttons. A touch mouse often has no buttons.

Pointing Devices

□ Mouse

□ The common mouse operations

- ▶ Point
- ▶ Click
- ▶ Right-click
- ▶ Double-click
- ▶ Drag
- ▶ Rotate wheel
- ▶ Press wheel

Pointing Devices

□ Trackball

A trackball is a stationary pointing device with a ball on its top or side.

ball on
its top →



ball on
its side →



Pointing Devices

لوحة اللمس

□ Touchpad:

A touchpad is a small, flat, rectangular pointing device that is sensitive to pressure and motion



Pointing Devices

□ Touch Screens

- A touch screen is a touch-sensitive display.
- Touch screens that recognize multiple points of contact at the same time are known as *multi-touch*
- Example : Touch Screens in Smartphones and laptops



Pointing Devices

□ Pen Input :

- Some displays devices support pen input. It used for write, draw, or make selections.



Bluetooth Digital Pen



USB Digital Pen



Stylus

Scanners and Reading devices

Input Devices that can capture data directly from a source document include :

- 1) **Optical scanners**
- 2) **Optical readers**
- 3) **Bar code readers**
- 4) **QR Code Reader**

Scanners and Reading devices

- 1) **Optical Scanners** : is a light-sensing input device that reads printed text and graphics and then translates the results into a form the computer can process.
- The quality of scanned images is indicated by resolution, which is usually measured in the number of **dots per inch (dpi)** and can be specified when an item is scanned.



Scanner



2) Optical Readers

Optical Readers : is a device that uses a light source to read characters, marks, and codes and then converts them into digital data that a computer can process.



Scanners and Reading devices

3) Bar code readers

- A bar code reader, also called a bar code scanner, is an optical reader that **uses laser beams to read bar codes.**
- Linear barcodes can hold **anywhere between 8-25 characters**



Scanners and Reading devices

4) QR code reader is an optical scanning device able to read QR codes.

- **QR code** can hold a modest amount of information e.g. website address, contact details, product details, etc.



QR code reader



Other Input Devices

- Microphone

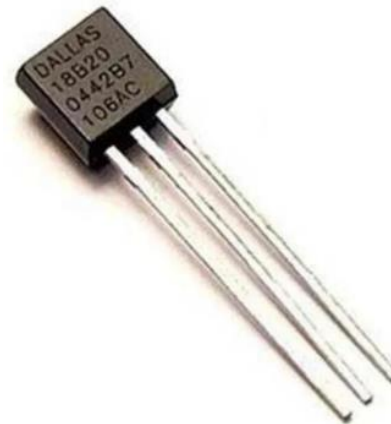


- Digital Camera



- Sensors

- Temperature Sensor
- Humidity Sensor
- Light Sensor
- Pressure Sensor
- pH Sensor
- ... etc



Sensors

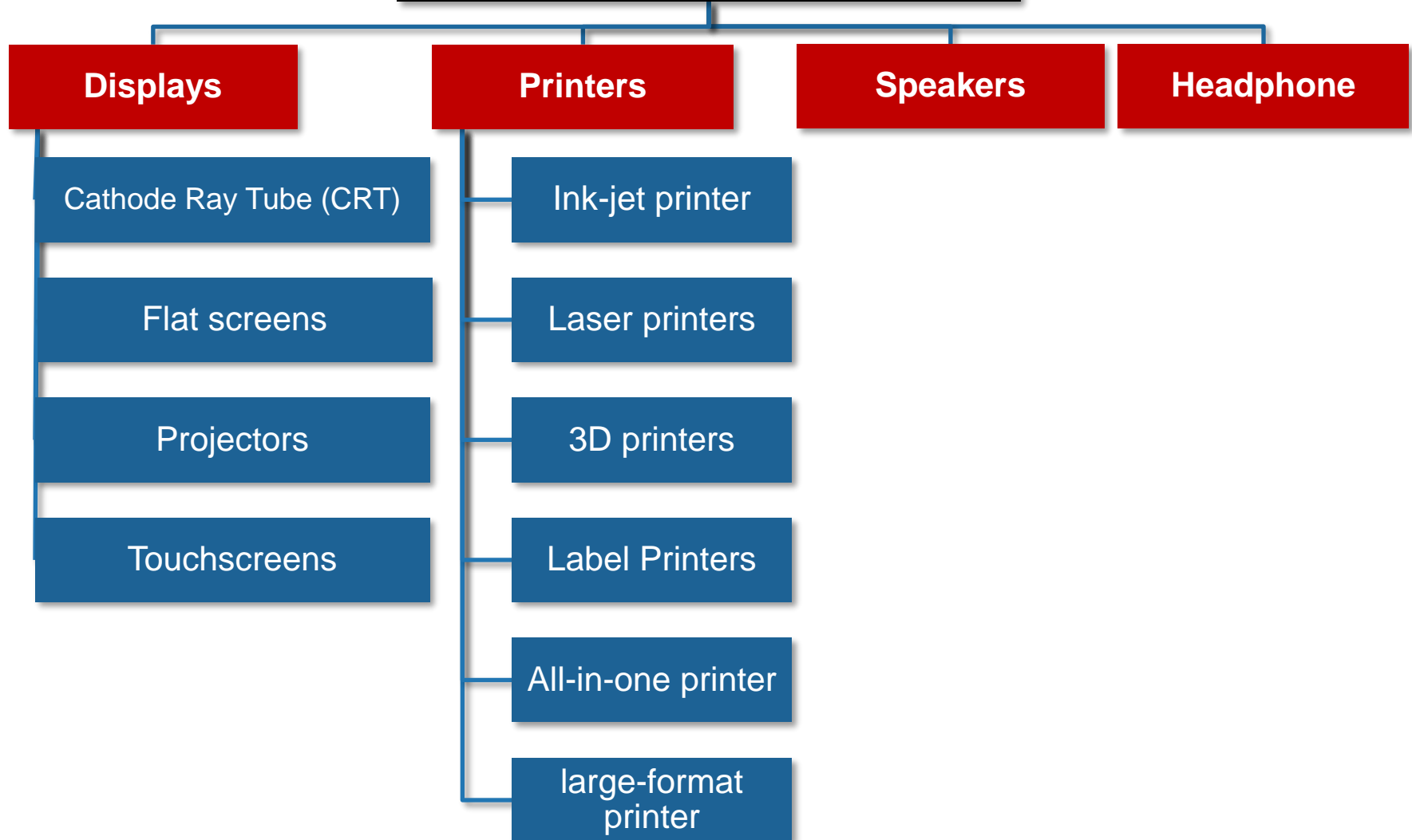


Output Devices

Output Devices

- ❑ An **output device** is any hardware component that conveys information to one or more people.
- ❑ Three commonly used output devices are a printer, a monitor, and speakers.
- ❑ working with a computer or mobile device, a user encounters four basic types of output: text, graphics, audio, and video

Output Devices



Output Devices

Displays:

- display, is an output device that visually conveys text, graphics, and video information.
- Display devices can be grouped into four broad categories:

1) Cathode Ray Tube (CRT)

2) Flat screens

3) Projectors

4) Touchscreens



Flat screen



CRT
monitor



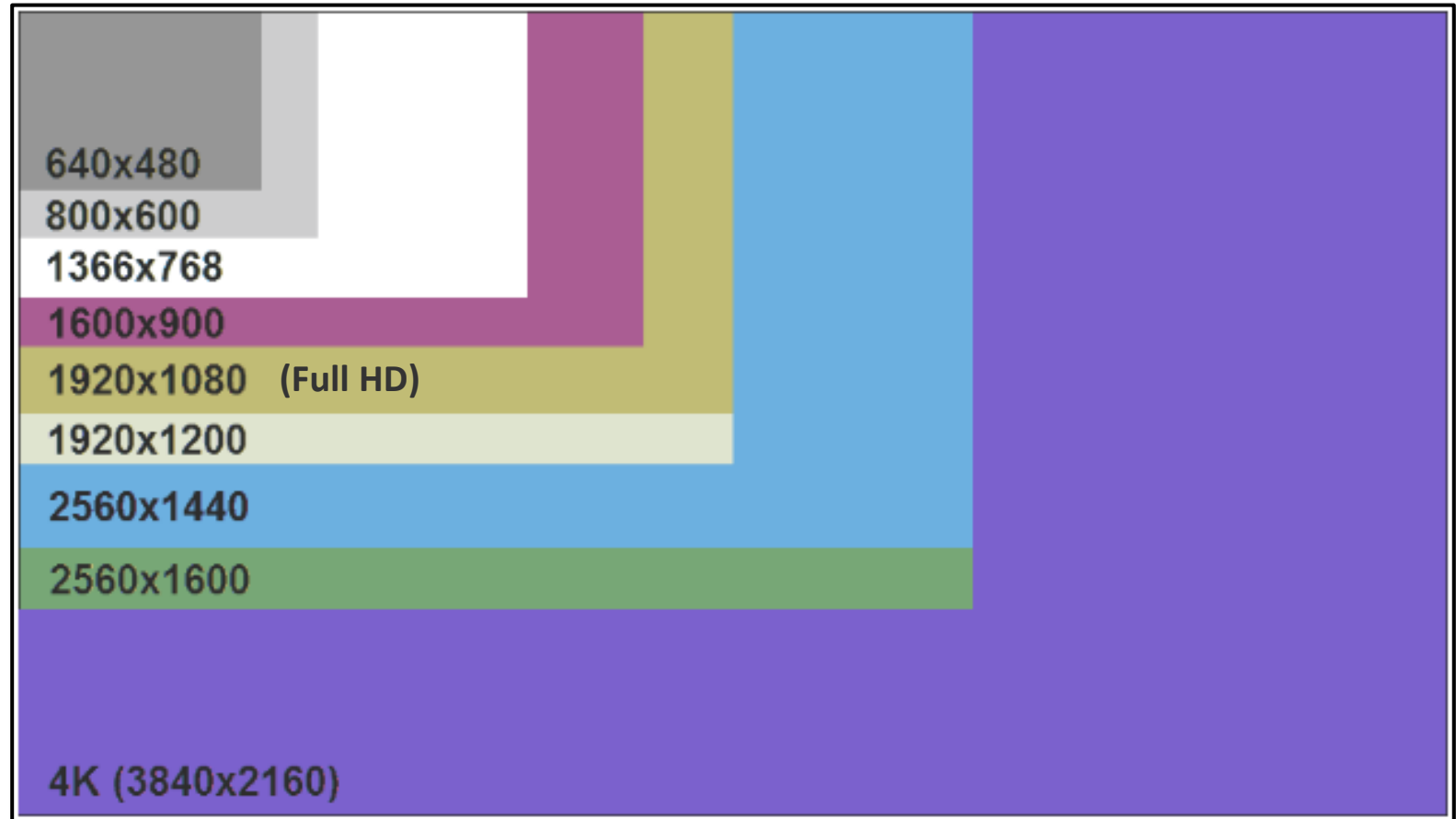
Projector

Screen Resolutions

Resolution is defined by how many **pixels** are used to draw the screen.

- The number of horizontal and vertical pixels on a display screen
- For example, a resolution of 1024×768 means 1024 pixels across (columns) and 768 pixels down (rows) were used to draw the pixel matrix.

Common Screen Resolutions



Several Common Screen Resolutions

Output Devices - Printers

Printers

- A printer is an output device that produces text and graphics on a physical medium, such as paper or other material.
- Printed information (**hard copy**) exists physically.
- Information on a display device sometimes is called **soft copy**

Output Devices - Printers

- The most common printers available are:
 - 1) Ink-jet printer
 - 2) Laser printers
 - 3) 3D printers
 - 4) Label Printers
 - 5) All-in-one printer
 - 6) large-format printer

Output Devices - Printers

Ink-jet printers

- These printers spray ink on the page to form the image.
- one factor that determines the quality of an ink-jet printer is its resolution.
- Printer resolution is measured by the number of **dots per inch (DPI)** a printer can print.
- Most ink-jet printers can print from 300–720 dpi.



Output Devices - Printers

Laser Printer

- Laser Printer is a type of printer that utilizes a **laser beam** to produce an image.
- Most laser printers can print from 600 to 2,400 dpi



Output Devices - Printers

An all-in-one printer

- also called a **multifunction** printer (MFP), is a single device that looks like a printer or a copy machine but provides the functionality of a **printer**, **scanner**, **copy machine**, and perhaps a **fax machine**

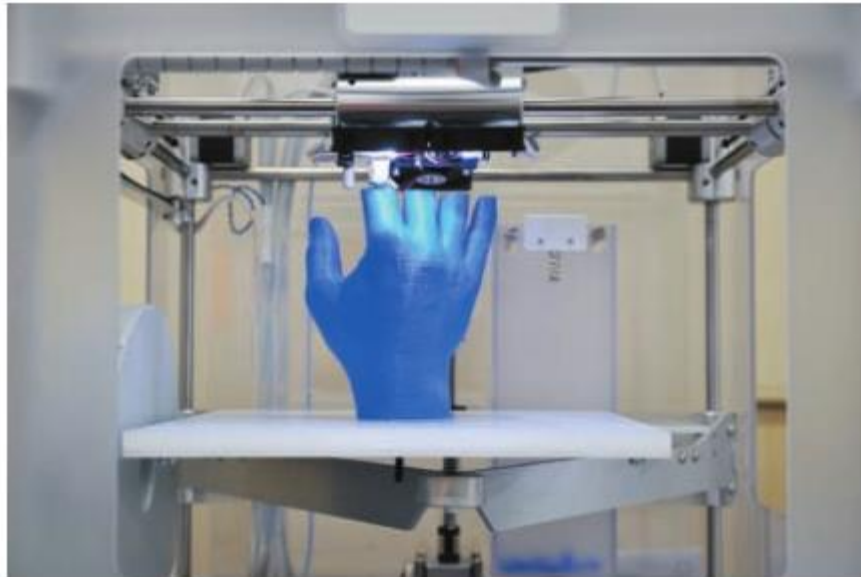


An all-in-one printer.

Output Devices - Printers

3-D printers

- A 3-D printer used to create an object by adding material to a three-dimensional object.



A 3-D printer.



Large-Format printers

it **used to** print banners, posters, trade show graphics, wallpaper ...etc



Other Output Devices

□ Speakers



□ Headphone



□ What about ...

- Sound Card?

- Video Card?

- GPS (Global Positioning System)?

Review Questions

- ❑ Define hard & soft copy?
- ❑ Name a device that allows users to show their output onto a large area, such as a wall.
- ❑ _____ is a device that gives us the hard copy as output.

Assignment

- What is the difference between a **laser printer** and an **inkjet printer** based on the following characteristics:
 - Functionality
 - Costs
 - Speed
 - Quality