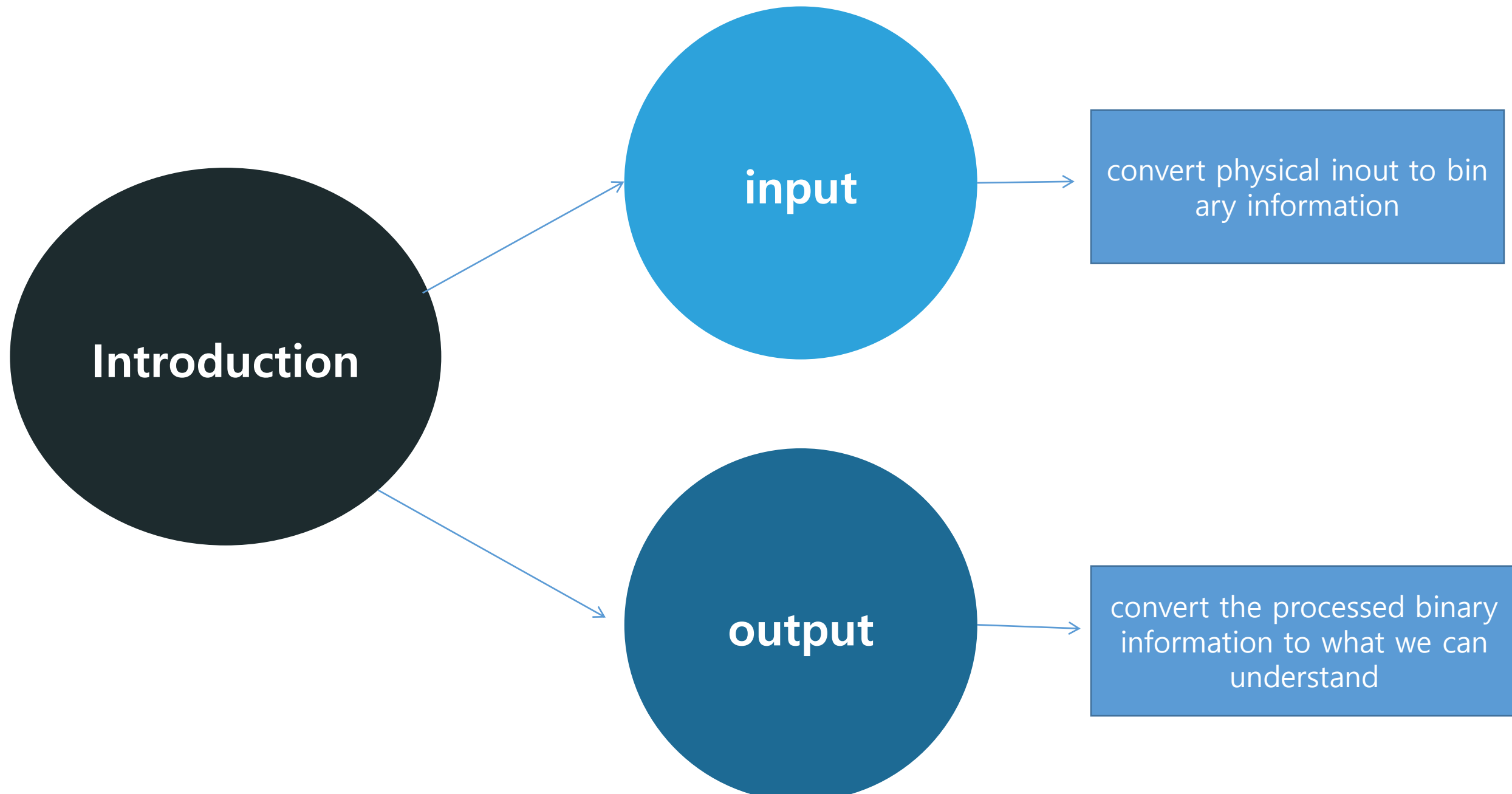# chapter 6 Input and Output

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INPUT

A19EC9046 SONG JI YOON

What is input?

: Any data or instructions used by a computer

Some hardware input devices include:
keyboards, mice, pointing, scanning, image capturing, audio-input

Traditional keyboards

Laptop keyboards

Virtual keyboards

Thumb keyboards

Ponting Devices

: Provide an intuitive interface by accepting pointing
gestures and converting them into machine-readable input.

Wide variety of devices such as:
mouse, touch screen, game controller, stylus

Mouse Types

Optical Mouse

Emits and senses light to detect mouse movement. And can be used on any surface.

Wireless Mouse

Battery operated. Uses radio waves (USB port) or infrared light waves.

Touch pads

Controls pointer by moving and tapping your fingers on the surface of the pad.
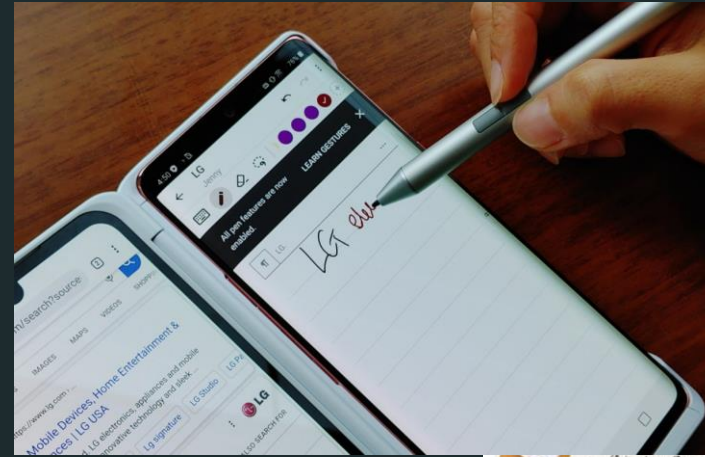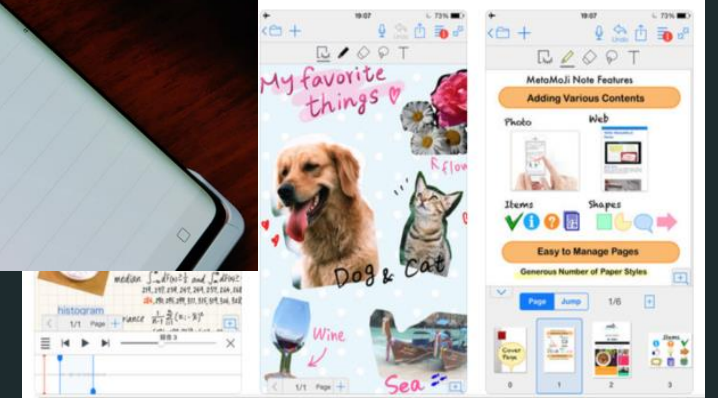
Touch Screen & Stylus

Touch Screen

: A display device that allows the user to interact (by touched) with a computer by using their finger or stylus

Common on mobile devices: Apple iPhone, notebook computers, desktop monitors

Stylus

: A pen-like device used on tablets. And uses handwriting recognition software

Gaming Controllers

: Provide input to computer games

- Joysticks use pressure and direction of the stick
- Gaming mice are similar to a mouse but high precision
- Game pads use both hands
- Motion sensing device control games by user movement

Scanning Devices

: Scanners convert scanned data into a form that system unit can process

Optical scanners :

Flatbed scanners   Document scanners   Portable scanners   3D scanners

Card Readers

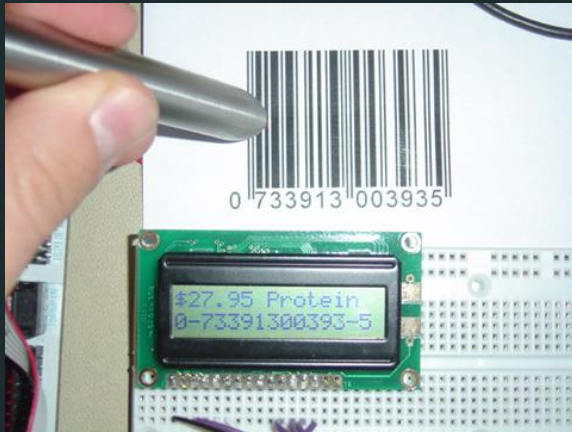: Interpret encoded information that is stored on debit, credit and identification cards

Magnetic card reader
- Information read from strip when swiped through reader
- Smart cards hold additional security information

Bar code Readers

: Contain photo-electric cells that scan or read bar codes or the zebra striped marks printed on product containers
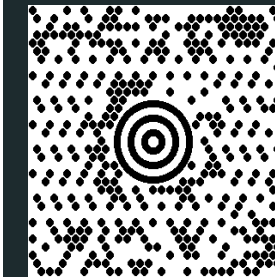

Wand readers

Hand-held readers

universal product code

maxicode

UPCs and MaxiCode readers

- UPC are heavily used in grocery stores for automated checkout and inventory control
- MaxiCode used by shipping companies for routing packages

RFID Readers

: Radio-frequency identification

Tiny chips embedded in most anything contain electronically stored information that can be read using an RFID reader located several yards away.

- Tracking pets
- Update and control inventories
- Read passports

Character and Mark Recognition Reader

: Recognize special characters and marks

Magnetic-ink character recognition (MICR)
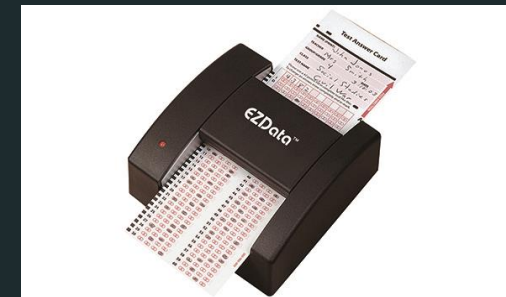: Used by banks to read encoded characters on checks

Optical-character recognition (OCR)
: Reads preprinted characters such as wand scanners

Optical-mark recognition (OMR)
: Sense the presence of absence of marks used for test scoring

Image Capturing Devices

: Create or capture original images

Digital Camera

Capture images digitally and store in memory

Web Cams

Capture images and send to a computer
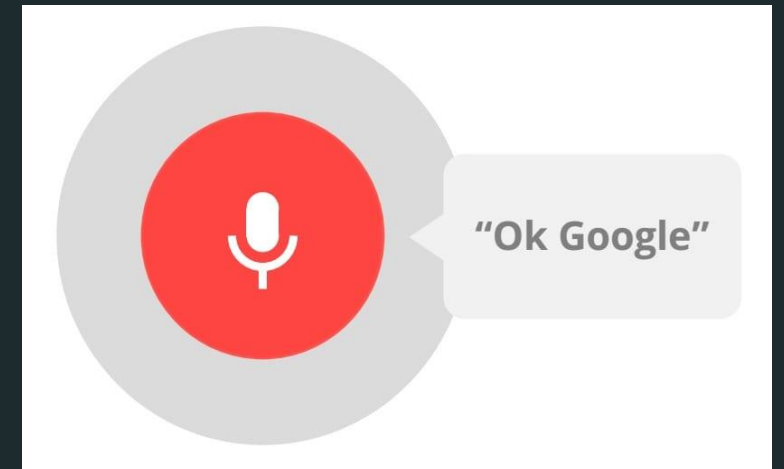
Voice recognition systems
- Use a microphone, sound card, and special software
- Users can operate computers and create documents using voice commands

Included in many smart phones:
- Siri in iPhones
- Cortana in Windows phones
- Google Now in Google phones

OUTPUT

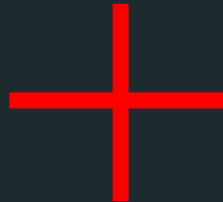Processed data converted into human readable form

Types of Output

- **Text**
- **Graphics /Photos**
- **Audio & Video**

Output Devices

- **Monitors**
- **Printers**
- **Audio-output devices**

MONITOR

MONITOR
as an
OUTPUT
DEVICE

FUNCTION
01

DISPLAY > SCREEN   IMAGES   TEXTS

02
FEATURES

MAIN
FEATURES

> SIZE   CLARITY   RESOLUTION / PIXEL   CONTRAST RATIO

DOT PITCH   ASPECT RATIO
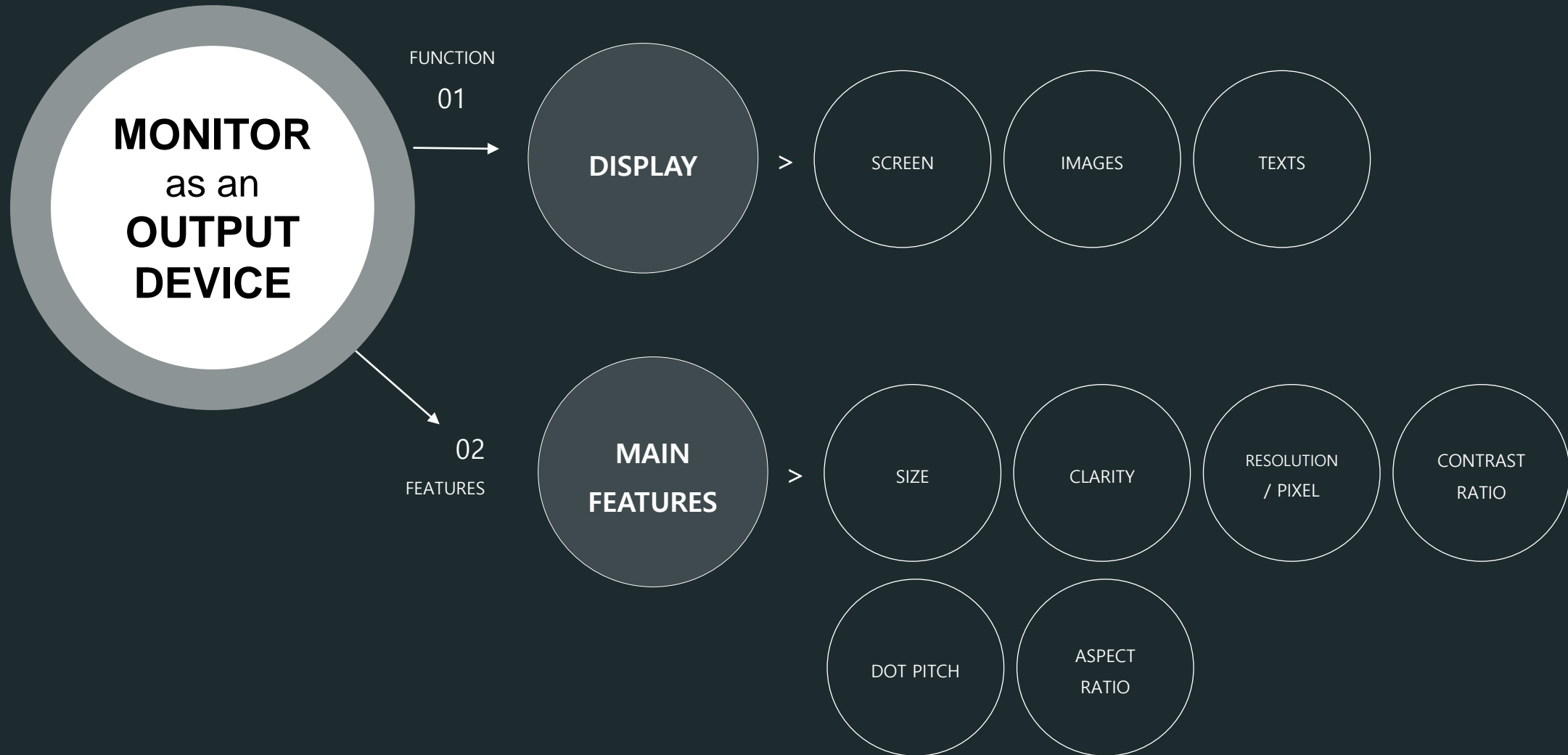
MONITOR TYPES

Curved Monitor	Flat Monitor

➤ Immersive

Not immersive

➤ Wider field of views
  - Must sit directly
    in the centre

➤ Less space efficient

Space efficient

➤ Expensive

Affordable

Curved display

Flat display with same wide

Flat display with same field of view
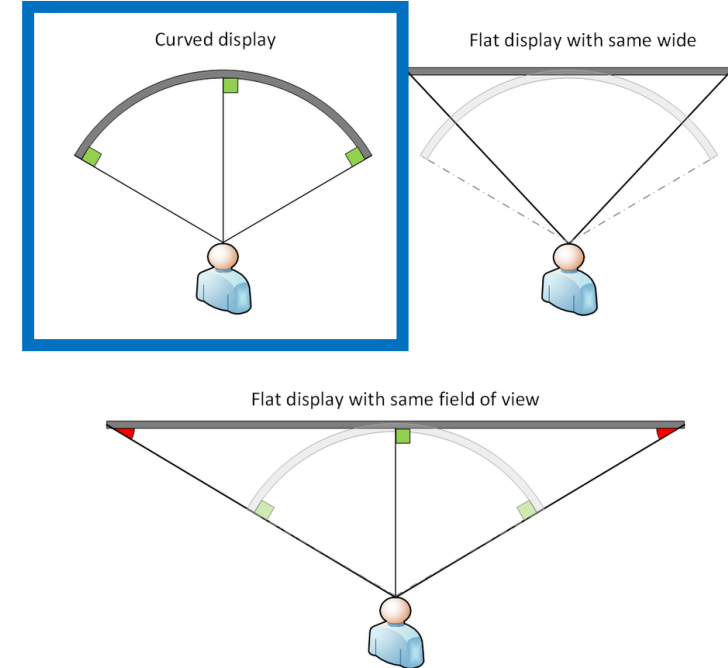
WHAT ARE THE DISPLAY TYPES ?

LCD
Light Crystal Display

LED
Light Emitting Diode

OLED
Organic Light Emitting Diode

LCD	LED	OLED
❖ Use fluorescent	Use LED	Use organic compound
❖ Brighter	Brighter	Bright
❖ Low contrast ratio - Low colour accuracy - Black is not black	Low contrast ratio - Average colour accuracy - Black is almost black	High contrast ratio - Better colour accuracy - Perfect black
❖ Thick	Thin	Very thin
❖ Cheap	Affordable	Expensive

OTHER MONITORS

➢ <u>**Interactive Whiteboard**</u>

- **Replace traditional blackboard/ whiteboard**
- **Connect to a computer**
- **Touch screen or use its special pen**
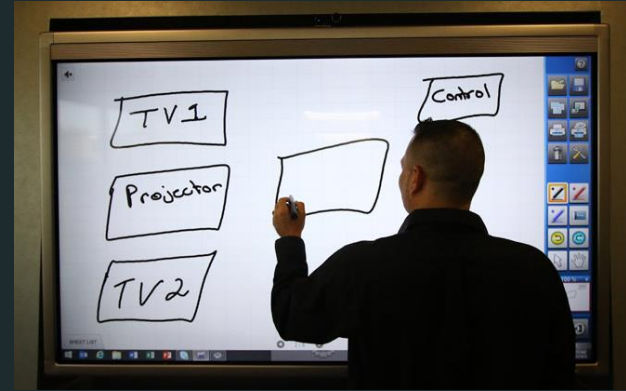
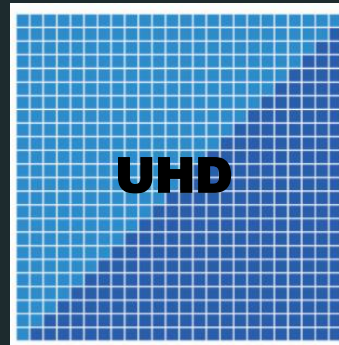➢ <u>**Ultra High Definition Television (UHDTV)**</u>

- **Resolution shows 4 times as many pixels as full HD images**

HD

UHD

OTHER MONITORS

➢ **Digital Projector**

- Project the images from a traditional monitor onto a screen or wall
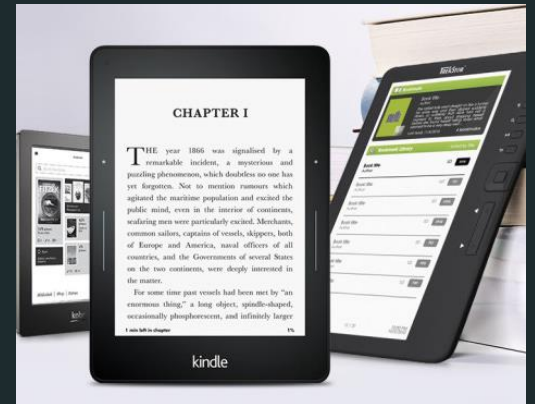
E-BOOK READER

Electronic Book (E-Book)

Traditional books printed in electronic form

Consisting of texts and images

Example:

Kindle

Kobo

Nook

PRINTERS

❑ Translates information that has been processed by the system unit

❑ Output referred to as hard copy

❑ Features :

- Resolution

- Color

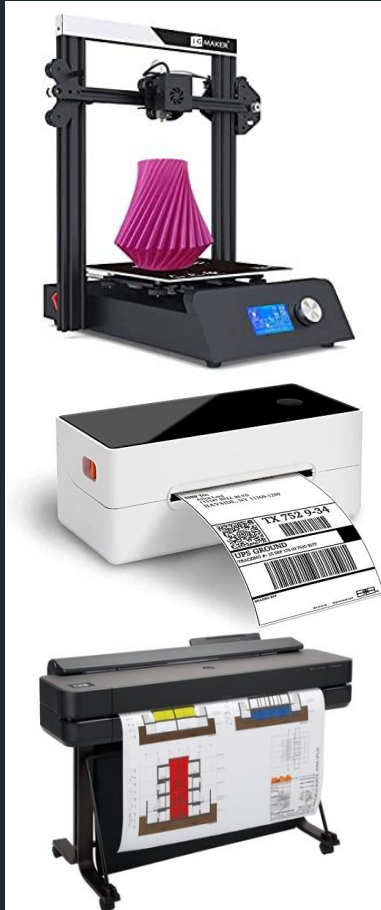- Speed

- Memory

- Duplex printing

PRINTERS

	LASER	INKJET
	Toner (powder)	Ink
Size	Bigger	Smaller
Best for	Document (Text)	Photos (Colour)
Quantity	Large	Small
Speed	Fast	Slower

❑ **3D Printers**

Create 3-D shapes with a thin layer of material repeatedly until created

❑ **Cloud printers**

- **Connected to the Internet to provide services to others on the Internet**
- **Send documents to printers from a variety of devices**

- **Thermal printers -> to create labels, safety signs, shipping labels and so on**

- **Plotters -> Businesses use plotter printers to draw charts. Architects and engineers use plotters to draw blue prints.**

AUDIO & VIDEO DEVICE

AUDIO

EXAMPLE →

Sound card, speakers and headphones

Translates audio information from the computer into sounds that people can understand

VIDEO

EXAMPLE →

Video card
– produces the image you see on a monitor

combination of input and output

01

headset

> mircophones

headphone

03

02

Multifunction Devices

Printers

can be use doto emailing and faxing

benifit: do not cost that much

but lower quality

telephone

> telephony and telephony

voice -over lp: hangouts and skype

other examples of combination of input and output

1. drones:
Take input from a controller and send back video and sound to the user
2. Robots:
it uses microphones, cameras and other sensors as input
- Output is dependent on the use for the robot
- can be seen in many different areas:
  be a sever in resturant
 it can help us to clean the house
 it even can be seen in a surgery room

3. Virtual Reality
- Created in 3D through computers for a virtual experience
- Headgear with gloves have sensors to collect data that work with software

Ergonomics

- a study of human factors related to things people use

- Devices has been challenged by this study

- this study guide developers to avoid eyestrains , headache, back and neck pain.

Making IT work for you

- communication via telephone and whatsapp
- uses robots to ease our daily life

A look into the future

- augumented reality displays
- data from our computer and the internet will be viewable
- Funding for development from the government has begun to assist soldiers and pilots.
- Google has developed a prototype, "Project Glass", that is being tested

Careers in IT

- communication via telephone and whatsapp
- uses robots to ease our daily life