What Is A Computer?

A computer is an electronic device, operating under the control of instructions (software) stored in its own memory unit, that can accept data (input), manipulate data (process), and produce information (output) from the processing. Generally, the term is used to describe a collection of devices that function together as a system.

COMPUTER

From the Latin word "computare"

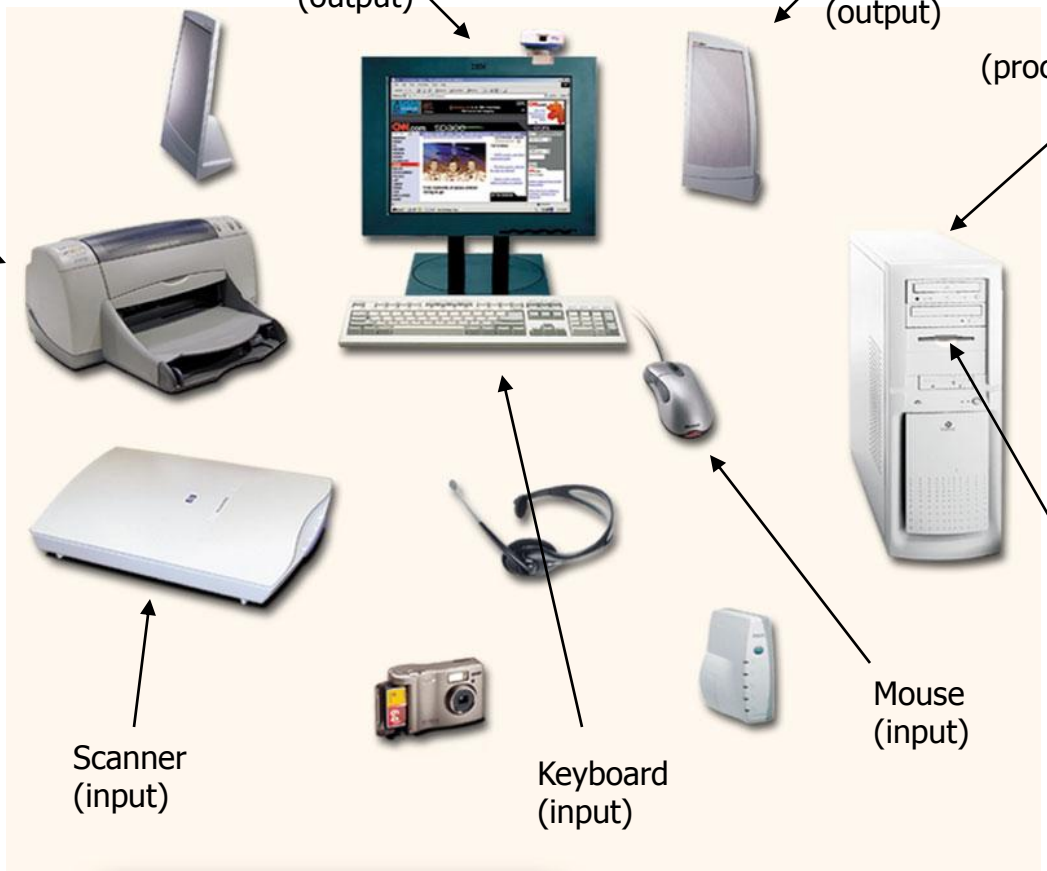
to reckon – to sum up

Webster's Dictionary defines "computer" as any programmable electronic device that can store, retrieve, and process data

The Old Oxford English dictionary describes a computer as a **person** employed to make calculations.

* *Before the machines, people were hired to do calculations.*

Devices that comprise a computer system



What Does A Computer Do?

Computers can perform four general operations, which comprise the information processing cycle.

- Input
- Process
- Output
- Storage

What Do Computers Do?

- Input, Process, Output, & Store data

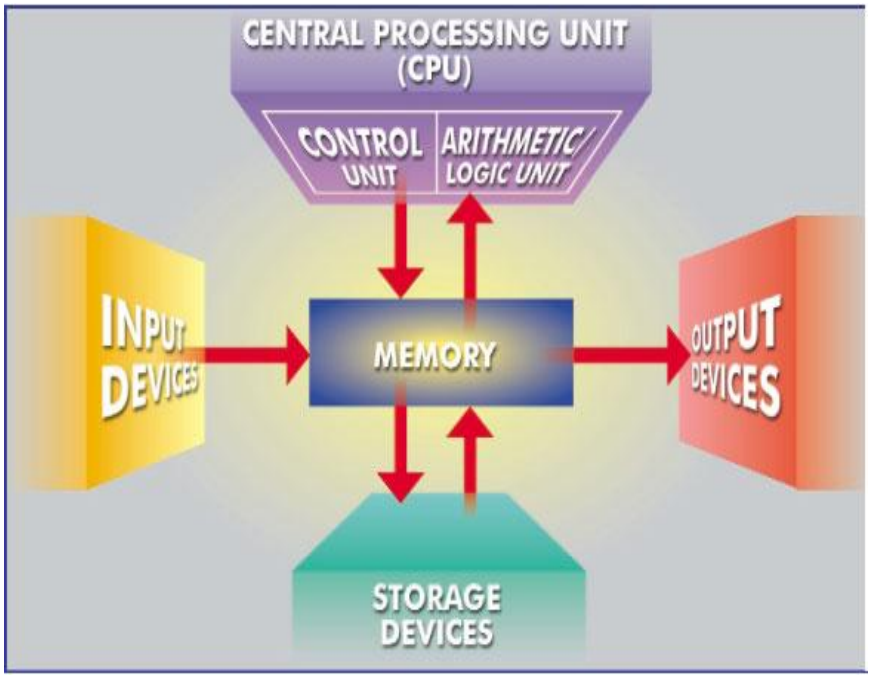
Input ⇒ **Process** ⇒ **Output**

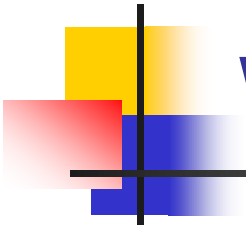
⇕

Store Data

What Are The Primary Components Of A Computer ?

- Input devices.
- Central Processing Unit (containing the control unit and the arithmetic/logic unit).
- Memory.
- Output devices.
- Storage devices.

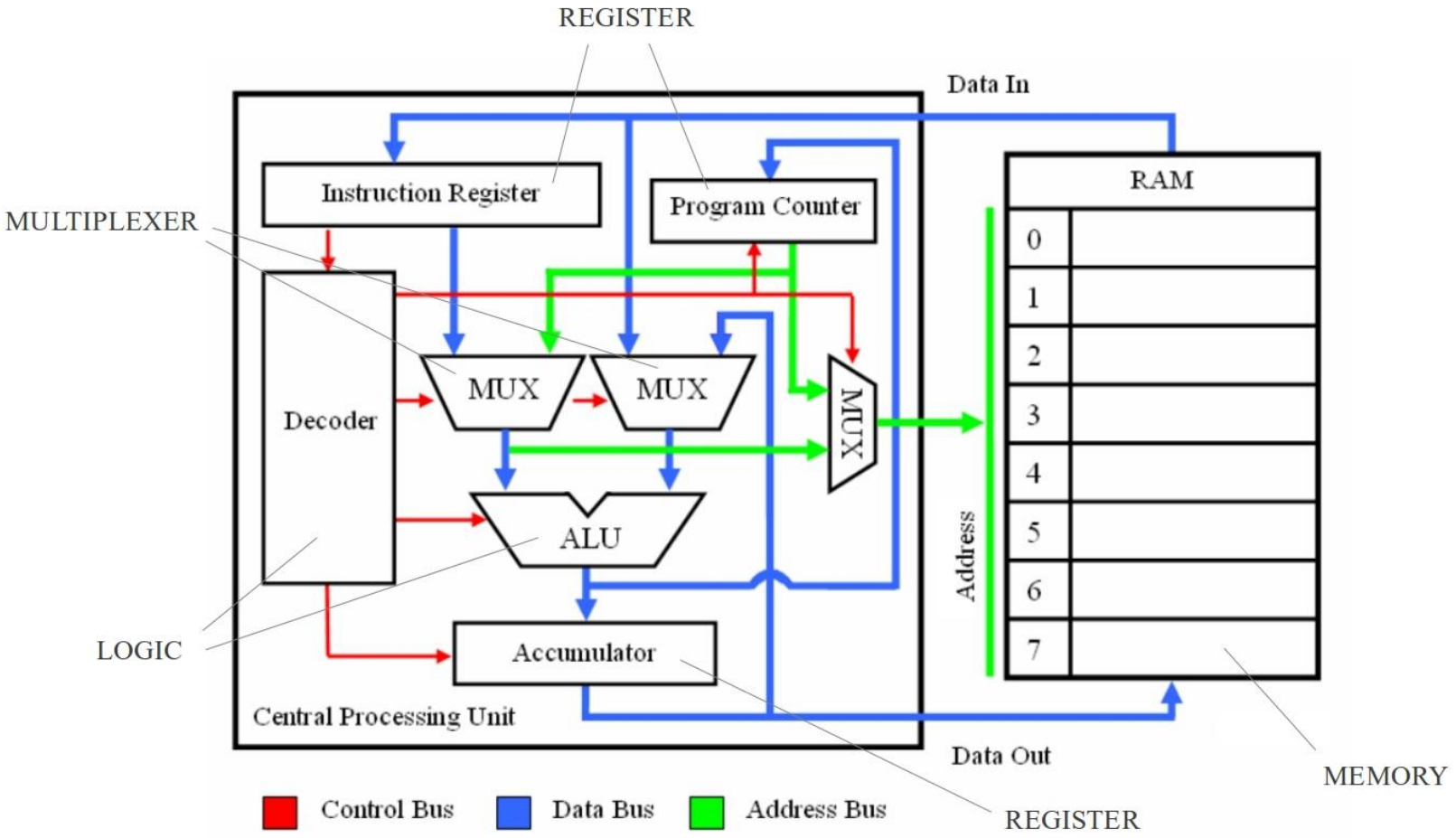




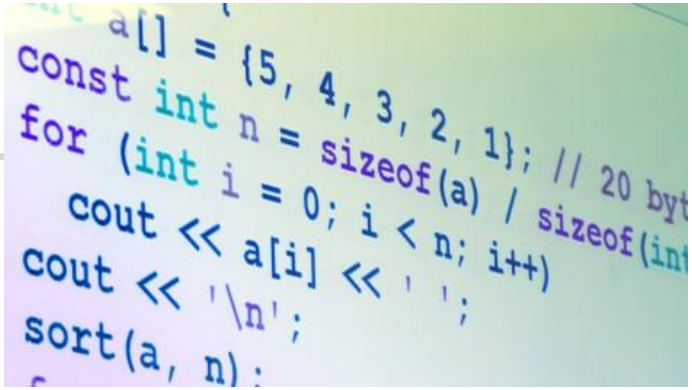
Why Is A Computer So Powerful?

- The ability to perform the information processing cycle with amazing speed.
- Reliability (low failure rate).
- Accuracy.
- Ability to store huge amounts of data and information.
- Ability to communicate with other computers.

Simple CPU


REGISTER
Data In
Instruction Register
Program Counter
RAM
MULTIPLEXER
0
1
2
3
4
5
6
7
Decoder
MUX
MUX
MUX
ALU
Address
LOGIC
Accumulator
Central Processing Unit
Data Out
MEMORY
Control Bus
Data Bus
Address Bus
REGISTER

How Does a Computer Know what to do?



- It must be given a detailed list of instructions, called a **compute program** or **software**, that tells it exactly what to do.
- Before processing a specific job, the computer program corresponding to that job must be stored in memory.
- Once the program is stored in memory the compute can start the operation by executing the program instructions one after the other.

Uses of Computer

PC at Home

Common uses for the computer within the home

- Computer games
- Working from Home
- Banking from Home
- Connecting to the Web

Uses of Computer

Office Applications

Stock Control

Stock control is ideal for automation and in many companies it is now completely computerized. The stock control system keeps track of the number of items in stock and can automatically order replacement items when required.

Accounts / Payroll

In most large organizations the accounts are maintained by a computerized system. Due to the repetitive nature of accounts a computer system is ideally suited to this task and accuracy is guaranteed.

Uses of Computer

Automated Production Systems

Many car factories are almost completely automated and the cars are assembled by computer-controlled robots. This automation is becoming increasingly common throughout industry.

Design Systems

Many products are designed using CAD (Computer Aided Design) programs to produce exact specifications and detailed drawings on the computer before producing models of new products.

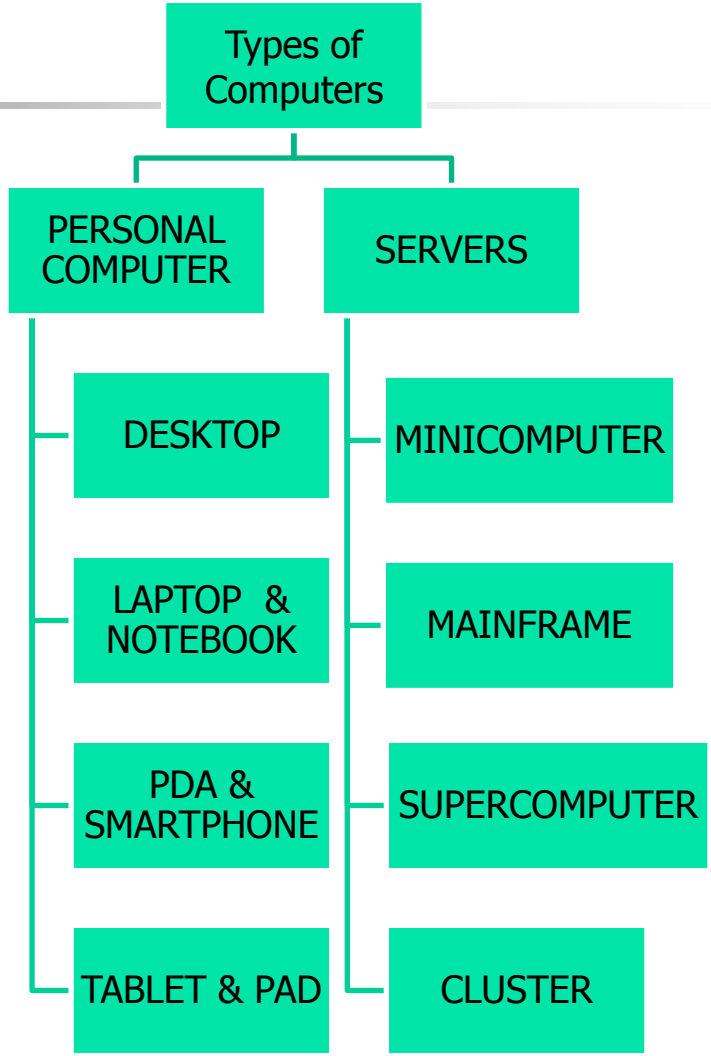
Uses of Computer

Computers in Daily Life

- Accounts
- Games
- Educational
- On-line banking
- Smart ID cards
- Supermarkets
- Working from home (Tele-working)
- Internet

Types of Computers

Types of Computers



Personal computers

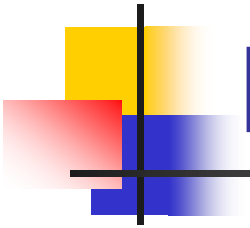
Desktop

Laptop

Notebook

Subnotebook

Palmtop



Personal computer

- Can be classified into:
  - Desktop PCs
    - sits on desks, rarely moved, large and bulky.
    - Memory capacity, graphics capacity and software availability vary from one computer to another Used both for business and home applications

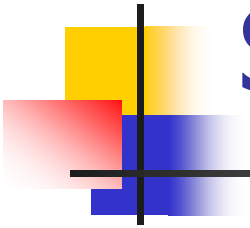
Personal computers

- Portable PCs
  - Can be moved easily from place to place
  - Weight may varies
  - Small PCs are popular known as laptop
  - Widely used by students, scientist, reporters, etc

LAPTOPS VIDEO

Personal computer

- **Advantages**
  - Small size
  - Low cost
  - Portability
  - Low Computing Power
  - Commonly used for personal applications
- **Disadvantages**
  - Low processing speed

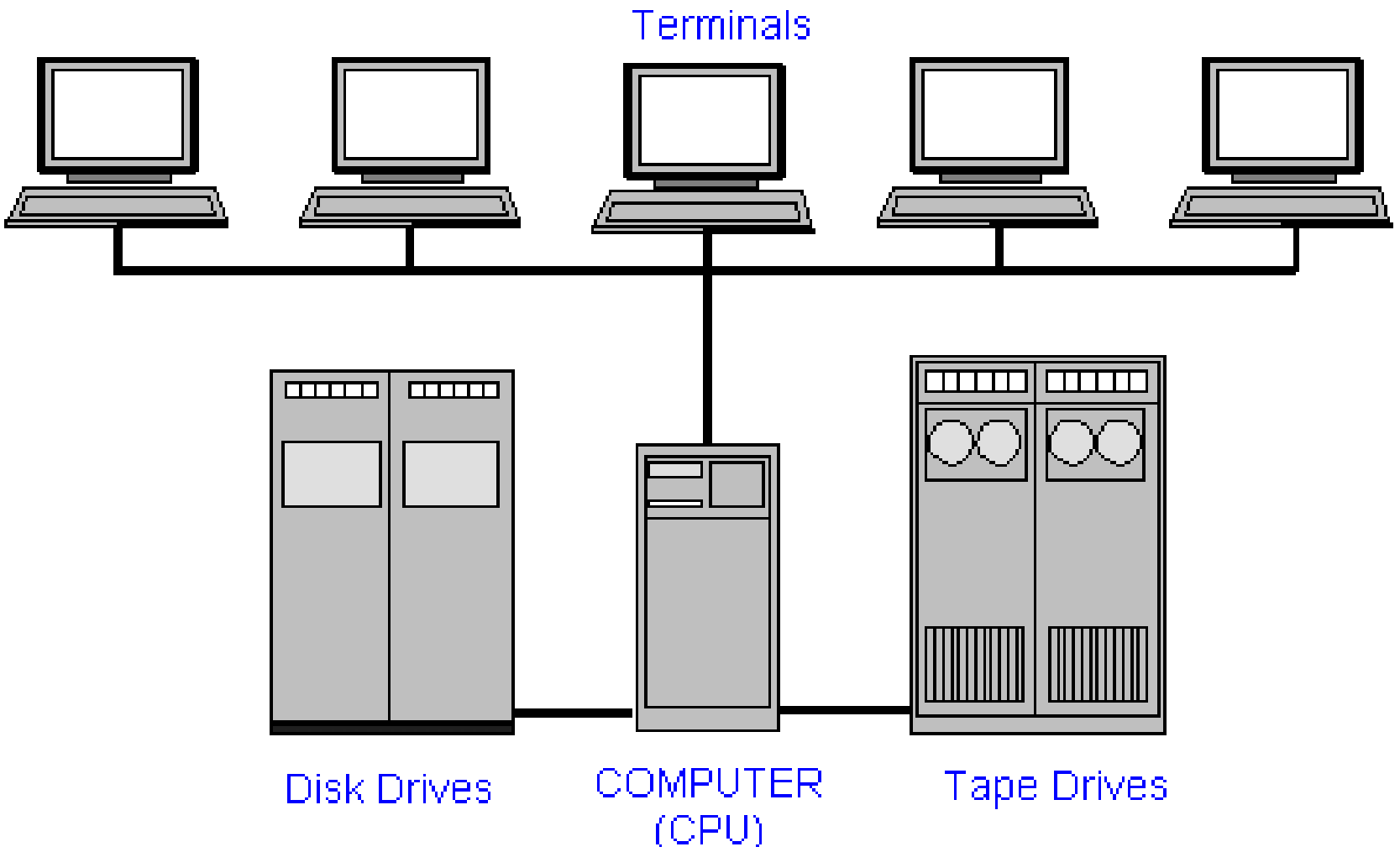


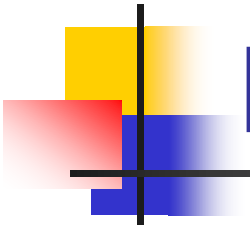
Servers

- Servers are enhanced computers dedicated to running programs that offer services to other computers.
- They have to be connected to networks to be able to offer their services and to share their resources with other computers.
- They need to be very powerful. In order to satisfy the demand of the *client computers, the hardware needs to be very sophisticated, resulting in the most* expensive type of computers.

Minicomputer

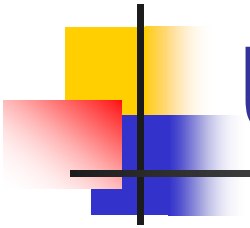
- Medium sized computer
- Also called the minis
  - e.g. IBM36, HP9000, etc
- Computing power lies between microcomputer and mainframe computer





MiniComputer

- Characteristics
  - Bigger size than PCs
  - Expensive than PCs
  - Multi-User
  - Difficult to use
  - More computing power than PCs
  - Used by medium sized business organizations, colleges, libraries and banks.



Uses of Minicomputer

- Payroll
- Hospital patients registration
- Inventory Control for supermarket
- Insurance claims processing
- Small bank accounting and customer details tracking

Minicomputer

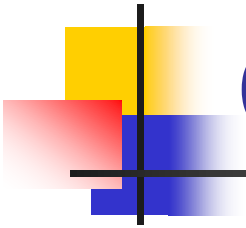
- **Advantage**
  - Cater to multiple users
  - Lower costs than mainframes
- **Disadvantage**
  - Large
  - Bulky

Mainframe

- Known as **enterprise servers**
- Occupies entire rooms or floors
- Used for centralized computing
- Serve distributed users and small servers in a computing network

Mainframe

- Large, fast and expensive computer
- it is very rare to find a mainframe because they have been replaced by less obsolete servers. A mainframe is a huge sized computer capable of serving many workstations.
- They were used by banks to store all the information related to customers, loans, etc.
- Characteristics:
  - Bigger in size
  - Very expensive
  - Support a few hundred users simultaneously (Multi-Users)
  - Difficult to use
  - More computing power than minicomputers
  - Need a special air-conditioned room
  - Used in big business organizations and government departments

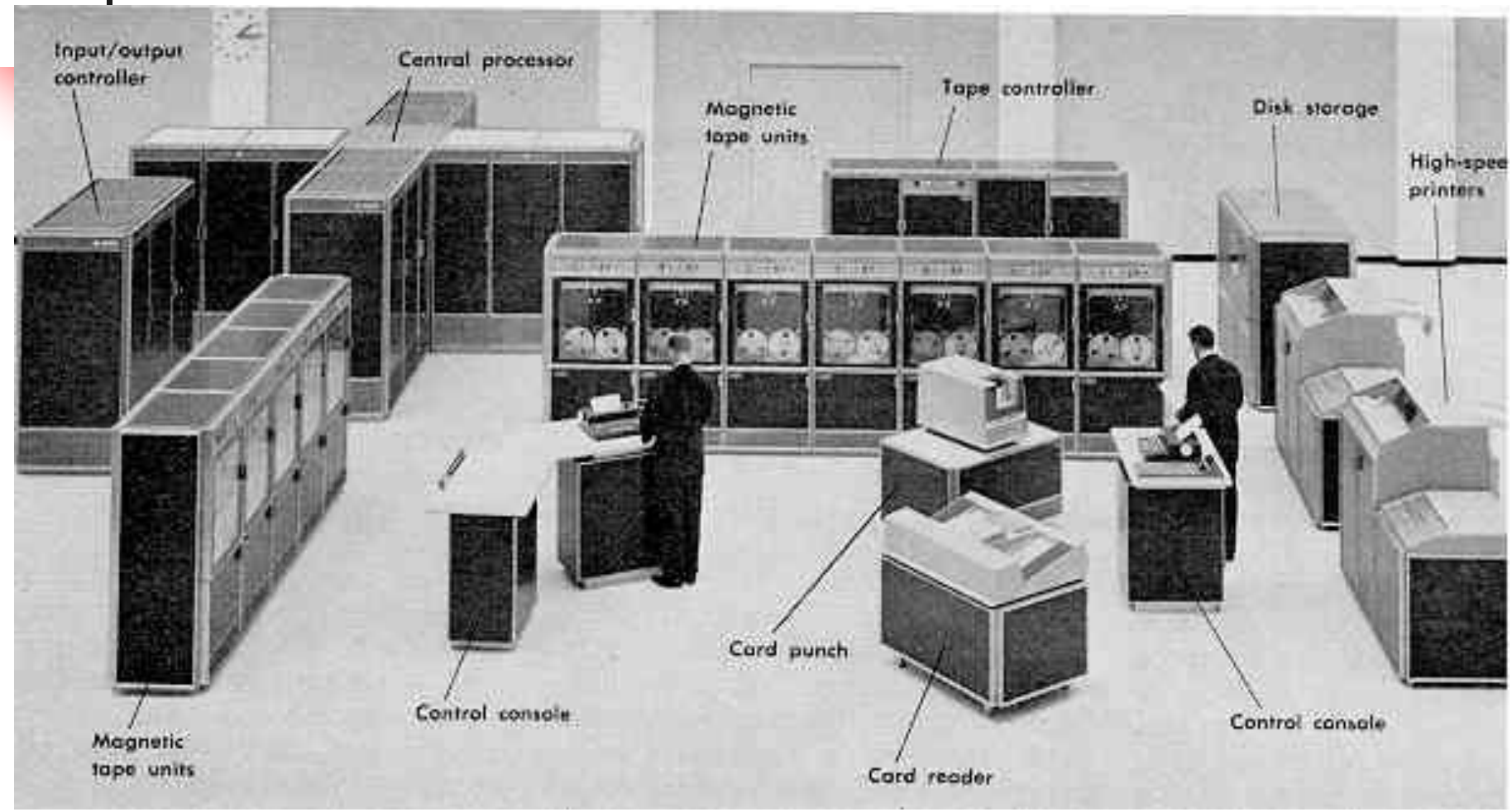


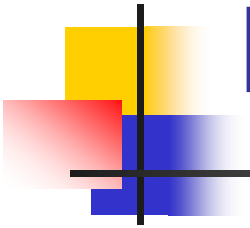
Cluster

- A cluster is a group of linked servers, typically mounted in racks. All these servers in the rack are connected through high speed fiber-optic networks to work as a single computer.
- Features:
  - Increase availability
  - Facilitating the scalability
  - Enable load balancing
  - Facilitate management of resources (CPU, RAM, hard disks, network bandwidth).

Areas where mainframes are used

- Airline reservation
- Big banks with hundreds of branches located all over the world
- Big universities with thousands of enrollment
- Natural gas and oil exploration companies
- Space Vehicle control
- Weather forecasting
- Animated Cartoon
- Some mainframes are designed to be extremely fast and called super computers. It is used for space launching, monitoring and controlling.


Input/output controller
Central processor
Magnetic tape units
Tape controller
Disk storage
High-spee printers
Magnetic tape units
Control console
Card punch
Card reader
Control console



Mainframe

- **Advantage**
  - Supports many users and instructions
  - Large memory
- **Disadvantage**
  - Huge size
  - Expensive

Supercomputer

- Fastest and expensive
- Used by applications for molecular chemistry, nuclear research, weather reports, and advanced physics
- Consists of several computers that work in parallel as a single system
- world-s-10-fastest-supercomputers

DATACENTERS

DATACENTERS

- are physical used by enterprises to house computer, server and networking systems and components for the company's information technology (IT) needs.
- Store, process and serve large amounts of data to clients in a client/server architecture.

- Requires backup power supply systems, cooling systems, redundant networking connections and policy-based security systems.

What computer is it?

- a) lt is handy-held computer.
- b) Banks used to work with these computers to store information.
- e) lt is a platform for audio visual media.
- d) They run a reduced operating system.
- e) They are smaller and less powerful than laptops.
- f) They are very powerful computers connected to networks.
- g) lt is a group of servers that work as a single computer.
- h) lts pointing device is usually a touchpad or a trackball.
- i) These are complex clusters.

COMPARISON	To a lower degree	**less + adj+ than**
	To the same degree	**as+ adj+ as**
	To a higher degree	Monosyllabic adj: **-er than*** Two- syllable adj: • Ending in –y: **-(i)er than** • Ending in –ow, -er,-le: optional → **–er than** / **more...than** • Other endings: **more+ adj+ than** Three or more syllables: **more+ adj+ than**
SUPERLATIVE	Nouns with a superlative adj. take **"the"** or a possessive.	Monosyllabic adj: **-est** Two- syllable adj: • Ending in –y: **-(i)est** • Ending in –ow, -er,-le: optional → **–est** / **most+adj.** • Other endings: **most+ adj.** Three or more syllables: **most+adj.** (prepositions "in" or "of" usually follow)

Adjective/Adv.	Comparative	Superlative
Good/well	Better	Best
Bad	Worse	Worst
Far	Farther/further*	Farthest/furthest*
Real	More real	Most real
Tired	More tired	Most tired

PRACTICE

1.-Fill in the blanks with the comparative or superlative form of the adjectives in brackets.

a) In . . . . …. (early) computers, programmers wrote programs in machine code.

b) A bit is . . . . ….(small) unit of data in a computer.

e) Graphene has . . . . …. . . …..(great) electron mobility than silicon.

d) This motherboard supports . . . . …. . . . . ….(late) technologies.

e) A multi-core processor develops . . . . . (efficient) simultaneous processing of multiple tasks.

f) Your virus protection has to be the …… . …… (good).

PRACTICE

2.- Compare the computers mentioned using the following adjectives. Desktops- PDAs – workstations – servers - Laptops – netbooks - pad computers

1. *(cheap) Netbooks are cheaper than laptops.*
2. (big) ……
3. *(*expensive) ……
4. (powerful) ……
5. (small) ……
6. (common)
7. (fast)
8. (trendy)
9. (modern)
10. (good)

PRACTICE

3.-Finish the sentences.

a) The more bandwidth the system bus has, … . …….. . …. . .. … . …. .
b) The less latency your RAM has, . …….. … …….. .. .. …….. . .
e) The more memory the graphic card has, …….. .. …… .. ……..
d) The more GHz the processor has, ……. ..
……..
e) The more time you spend testing the program,
……..