Memory

Memory refers to the physical devices used to store programs or data on a temporary or permanent basis for use in a computer or other digital electronic device.

There are two general categories of memory: primary and secondary.

1- **Primary memory**: *is the memory that is intimately associated with the actual working of the computer.*
This includes memory that holds the start-up routines as well as the current program and data it is working with.
For example : RAM, ROM

2- **Secondary memory:** *consists of the various devices that are able to store data and programs even when the power is off.*
For example : hard drives, floppy drives, tape drives, CD drives and DVD drives.

Kind Of Memory:

1- **Random Access Memory (RAM):** *is a memory that the microprocessor uses to store data during processing. This memory is volatile (loses its contents at power-down).*

When a software application is launched, the executable program is loaded from hard drive to the RAM. The microprocessor supplies address into the RAM to read instructions and data from it. RAM is needed because hard drives are too slow to operate with the speed of a microprocessor.

2- **Read Only Memory (ROM)** : *contains certain key routines (small programs). These take control of the computer when you switch on and ensure that the computer boots-up.*

Booting-up is the process of starting the computer up so that it is able to load and run computer programs.

3- Cache memory: *is very high speed memory that is used by the CPU in executing the individual instructions of the program.*

It is used to hold items such as instructions that are next in line to be executed and data that is likely to be needed by the CPU.

Computer Memory Units:

Bits

In all the components of a computer, data and instructions are stored as patters of ones and zeros. These individual ones and zeros are called bits.

Bytes

A set of eight bits is called a byte. Usually a byte represents a character (alphabet, digit or symbol). A key pressed from the keyboard sends one byte of data to CPU.

Because we use very large numbers of bytes for storage, the following table is showing you a list of computer memory units:

Memory Unit	Value
Bit	**0, 1**
Byte	**8 bits (alphabet, digits, or symbol)**
Kilobyte	**1024 bytes**
Megabyte	**1024 Kilobytes**
Gigabyte	**1024 Megabytes**
Terabyte	**1024 Gigabytes**

Storage Devices *(Secondary memory)*

Diskette

A diskette comprises a plastic flexible disk enclosed inside a tough plastic cover. At one end is a window. When the diskette is placed inside a diskette drive, the window is pushed to the side. The read-record head inside the drive makes contact with the magnetic disk.

Diskettes are slow and have a low capacity (1,44 Mb). Since they are cheap, they still tend to be commonly used for storing small amounts of data. Another advantage is that they can be used over and over again.

CD ROM

A CD ROM uses optical technology. When data is written, small pits are burned into the surface using a highly focussed laser beam. These are read by another laser beam.

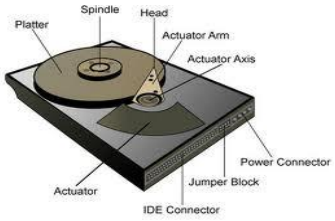
There are two types of CD ROM used for storage.

- ✓ **The CD-W disks** can only be written to once. Once data has been written to part of the surface, this part can no longer be used.
- ✓ **CD-RW disks** are designed so that one set of data can overwrite another. This allows the disks to be re-used many times.

CD ROM provides a reliable and storage medium for backing up and storing data. The speed is greater than that of a diskette but slower than that of a hard drive.Writing to a CD ROM is a much slower process than reading it. The capacity of a CD ROM is 640 Mb. It is sometimes possible to store about 700 Mb on a disk.

DVD

The Digital Versatile Disk is a development of the storage technology of the CD ROM. Using newer storage methods and higher quality media, a DVD can store about 8 Gb of data.



Hard disk drive

A hard drive consists of one or more magnetic platters or disks and a read arm with two electromagnetic coils for each disk. Each hard disk is divided into many sectors, each containing a certain amount of data. As of now, it is the cheapest and most common way to store a lot of data in a small space.

A hard disk drive can be **internal** or **external**. An internal drive is housed inside the main unit and is connected directly to the motherboard of the computer. An external drive is housed inside a special caddy which connects to the computer through one of its ports. Most now use the USB or firewire ports to achieve maximum performance.

Flash memory and memory sticks

A new type of external memory is the flash disk or memory stick. This is a solid state device (no moving parts) that connects to the computer via the USB port. It provides a very fast and reliable method of storing data externally.