PART I

COMPUTER TERMINOLOGIES

·Bit – binary digit (1/0)
·Byte – group of 8 bits
·OS – Operating System
·USB – Universal Serial Bus
·IT – Information Technology
·ICT – Information and Communication Technology
·DOS – Disk Operating System
·NOS – Network Operating System
·AGP – advanced/accelerated graphics port
·WORM – write once read many
·Hardcopy – print out on paper
·Softcopy – print out on screen / file saved on disk
·CPU – Central Processing Unit
·GUI – Graphics User Interface / enables the clicking of icons
·ASCII – American Standard Code for Information Interchange
·PCI – Peripheral Component Interconnect
·ISA – Industry Standard Architecture
·OOP – Object Oriented Programming
·RAD – Rapid Application Design/Development
·MHz – MegaHertz
·GIGO – garbage in garbage out
·CRT – Cathode Ray Tube
·DTP – Desk Top Publishing
·CAD – Computer Aided Design
·CAM – Computer Aided Manufacturing
·CAI – Computer Aided Instruction
·SOHO – Small Office Home Office
·VGA – Video Graphics Array
·SVGA – Super Video Graphics Array

TYPES OF PRIMARY MEMORY

·ROM – Read Only Memory (permanent and non-volatile)
·RAM – Random Access Memory

TYPES OF PRIMARY MEMORY

·CD-ROM – Compact Disk-Read Only Memory
·Stiffy
·DVD – Digital Versatile/Video Disk
·HDD – Hard Disk Drive
·MB – MegaBytes
·HD – High Density (1.44MB)
·DD – Double Density (720KB or 0.720MB)
·IDE – Integrated/Intelligent Drive Electronics
·SCSI – Small Computer Systems Interface

INTERNET or NETWORKS

·MODEM – Modulator Demulator
·URL – Uniform Resource Locator (the unique address of each webpage)
·IRC – Internet Relay Chat
·ISP – Internet Service Provider
·WWW – World Wide Web
·LAN – Land Area Network (a single building or campus)
·MAN – Metropolitan Area Network (an entire city)
·WAN – Wide Area Network (over provinces or within a whole country)
·GAN – Global Area Network (several countries/continents like Internet)
·NODE – describes any device connected to a network (a computer or printer)
·NIC – Network Interface Card
·Email – electronic mail
·E-commerce – electronic business
·Netiquette – refers to the use of good manners when using the net
·Protocol – means the rules pertaining to something
·IP – Internet Protocol
·HTTP – Hyper Text Transfer Protocol
·FTP – File Transfer Protocol
·HTML – Hyper Text Markup Language (an authoring language used to create documents on the web)

FILE TYPES

· Executable Files:
  - exe (executable)
  - com (command)
· Examples of Graphic Files
  - jpg (Joint Photographic Experts Group)
  - bmp (bit mapped)
  - gif (Graphical Interchange Format)
  - mpg (Motion Picture Group)
· Word Processing Package: MS Word (.doc)
· Spreadsheet Package: MS Excel (.xls)
· Database: MS Access (.mdb)

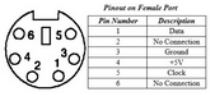
PART II

COMPUTER PORTS

·A Computer Port is an interface or a point of connection between the computer and its peripheral devices.
·The main function of a computer port is to act as a point of attachment, where the cable from the peripheral can be plugged in and allows data to flow from and to the device.
·A computer port is also called as a Communication Port as it is responsible for communication between the computer and its peripheral device. This can be divided into two types based on the type or protocol used for communication. They are Serial Ports and Parallel Ports.
·A **serial port** is an interface through which peripherals can be connected using a serial protocol which involves the transmission of data one bit at a time over a single communication line. The most common type of serial port is a D-Subminiature or a D-sub connector that carry RS-232 signals.
·A **parallel port** is an interface through which the communication between a computer and its peripheral device is in a parallel manner i.e. data is transferred in or out in parallel using more than one communication line or wire. Printer port is an example of parallel port.

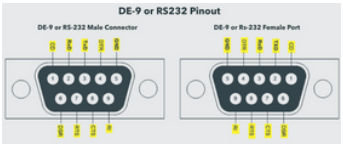
TYPES OF PORTS

1) **PS/2** - (6 pin DIN connector) is developed by IBM for connecting mouse and keyboard. It was introduced with IBM's Personal Systems/2 series of computers and hence the name PS/2 connector. PS/2 connectors are color coded as purple for keyboard and green for mouse.



2) **Serial Port** - is used to refer the interface that is compliant to RS-232 standard. There are two types of serial ports that are commonly found on a computer: DB-25 and DE-9.
·DB-25 - is a variant of D-sub connector and is the original port for RS-232 serial communication. They were developed as the main port for serial connections using RS-232 protocol but most of the applications did not require all the pins.
·DE-9 - is the main port for RS-232 serial communication. It is a D-sub connector with E shell and is often miscalled as DB-9. A DE-9 port is also called as a COM port and allows full duplex serial communication between the computer and it's peripheral. Some of the applications of DE-9 port are serial interface with mouse, keyboard, modem, uninterruptible power supplies (UPS) and other external RS-232 compatible devices.

PINOUT DIAGRAM:

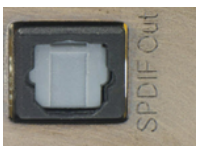


3) **Parallel Port or Centronics 36 Pin Port** - is an interface between computer and peripheral devices like printers with parallel communication. The Centronics port is a 36 pin port that was developed as an interface for printers and scanners and hence a parallel port is also called as a Centronics port.

4) **Audio Port** - are used to connect speakers or other audio output devices with the computer. The audio signals can be either analogue or digital and depending on that the port and its corresponding connector differ.
·Surround Sound Connectors or 3.5 mm TRS Connector - is the most commonly found audio port that can be used to connect stereo headphones or surround sound channels. A 6-connector system is included on majority of computers for audio out as well as a microphone connection. The 6 connectors are color coded as blue, lime, pink, orange, black and gray.

Port	2-Channel	4-Channel	6-Channel	8-Channel
Blue	Line In	Line In	Line In	Line In
Lime	Line Out	Front Speakers	Front Speakers	Front Speakers
Pink	Mic In	Mic In	Mic In	Mic In
Orange			Center/Subwoofer	Center/Subwoofer
Black		Rear Speakers	Rear Speakers	Rear Speakers
Grey				Side Speakers

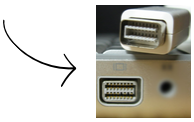
·The Sony/Phillips Digital Interface Format (S/PDIF) is an audio interconnect used in home media. It supports digital audio and can be transmitted using a coaxial RCA Audio cable or an optical fiber TOSLINK connector. Most computers home entertainment systems are equipped with S/PDIF over TOSLINK.



5) **VGA Port** - is found in many computers, projectors, video cards and High-Definition TVs. It is a D-sub connector consisting of 15 pins in 3 rows. The connector is called as DE-15. VGA port is the main interface between computers and older CRT monitors. Even the modern LCD and LED monitors support VGA ports but the picture quality is reduced. VGA carries analogue video signals up to a resolution of 648X480.

6) **Digital Video Interface** - is a high speed digital interface between a display controller like a computer and a display device like a monitor. It was developed with an aim of transmitting lossless digital video signals and replace the analogue VGA technology. There are three types of DVI connectors based on the signals it can carry: DVI-I, DVI-D and DVI-A. DVI-I is a DVI port with integrated analogue and digital signals. DVI-D supports only digital signals and DVI-A supports only analogue signals.

·Mini DVI - is developed by Apple as an alternative to Mini-VGA port and is physically similar to one. It is smaller than a regular DVI port. It is a 32-pin port and is capable of transmitting DVI, composite, S-Video and VGA signals with respective adapters.



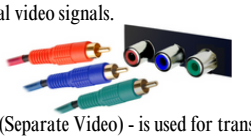
·Micro DVI - is physically smaller than Mini-DVI and is capable of transmitting only digital signals. This port can be connected to external devices with DVI and VGA interfaces and respective adapters are required.

7) **Display Port** - (has 20 pin connector) is a digital display interface with optional multiple channel audio and other forms of data. Display Port is developed with an aim of replacing VGA and DVI ports as the main interface between a computer and monitor. The latest version DisplayPort 1.3 can handle a resolution up to 7680 X 4320.

·Mini Display Port - Apple introduced a miniature version of DisplayPort and called it Mini DisplayPort (mDP or Mini DP). Even though Mini DisplayPort has 20 pins, the physical size of the connector is smaller than a regular DisplayPort and the pin out is also different. Most laptops provide Mini DisplayPort as an additional video out option in addition to HDMI.

8) **RCA Connector** - can carry composite video and stereo audio signals over three cables. Composite video transmits analogue video signals and the connector is as yellow colored RCA connector. The red and white connectors are used for stereo audio signals (red for right channel and white for left channel).

·Component Video - is an interface where the video signals are split into more than two channels and the quality of the video signal is better that Composite video. It transmits only video signals and two separate connectors must be used for stereo audio. Component video port can transmit both analogue and digital video signals.



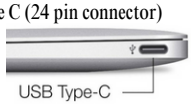
·S-Video (Separate Video) - is used for transmitting only video signals. The picture quality is better than that of Composite video but has a lesser resolution than Component video.

9) **HDMI (High Definition Media Interface)** - (19 pins) is a digital interface to connect High Definition and Ultra High Definition devices like Computer monitors, HDTVs, Blu-Ray players, gaming consoles, High Definition Cameras etc.

10) USB (Universal Serial Bus) - replaced serial ports, parallel ports, PS/2 connectors, game ports and power chargers for portable devices. USB port can be used to transfer data, act as an interface for peripherals and even act as power supply for devices connected to it. There are three kinds of USB ports: Type A, Type B or mini USB and Micro USB.

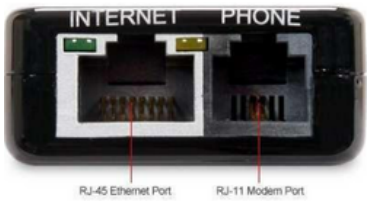
USB Type A (4 pin connector)

USB Type C (24 pin connector)



11) **RJ-45** - the interface that is used for computer networking and telecommunications is known as Registered Jack (RJ) and RJ – 45 port in particular is used for Ethernet over cable. RJ-45 connector is an 8 pin – 8 contact (8P – 8C) type modular connector.

12) **RJ-11** - is another type of Registered Jack that is used as an interface for telephone, modem or ADSL connections. Even though computers are almost never equipped with an RJ-11 port, they are the main interface in all telecommunication networks.

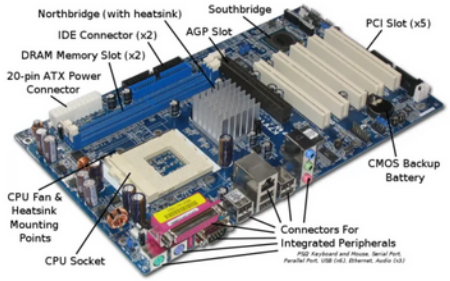


12) **e-SATA** - is an external Serial AT Attachment connector that is used as an interface for connecting external mass storage devices. Modern e-SATA connector are called e-SATAp and stands for Power e-SATA ports.

PART III

MOTHERBOARD

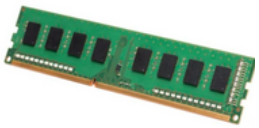
·The main printed circuit board in a computer is known as the motherboard (MOBO). Other names for this central computer unit are system board, mainboard, or printed wired board (PWB).
·Numerous major components crucial for the functioning of the computer are attached to the motherboard. These include the processor, memory, and expansion slots. The motherboard connects directly or indirectly to every part of the PC.



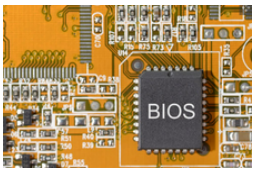
PARTS OF THE MOBO AND THEIR FUNCTIONS

1) **Central Processing Unit (CPU)** - Also known as the microprocessor or the processor, the CPU is the computer's brain. It is responsible for fetching, decoding, and executing program instructions. It also performs mathematical and logical calculations.

2) **Random Access Memory (RAM)** - usually refers to computer chips that temporarily store dynamic data to enhance computer performance while you are working. RAM is volatile, meaning it loses its contents once power is turned off. This is different from non-volatile memory, such as hard disks and flash memory, which do not require a power source to retain data.



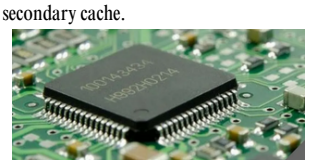
3) **Basic Input/Output System (BIOS)** - is a "read-only" memory, which consists of low-level software that controls the system hardware and acts as an interface between the operating system and the hardware. Most people know the term BIOS by another name—device drivers or drivers. BIOS is essentially the link between computer hardware and software in a system. All motherboards include a small block of read-only memory (ROM) separate from the main system memory used for loading and running software. The BIOS contains all the code required to control the keyboard, display screen, disk drives, serial communications, and several miscellaneous functions.



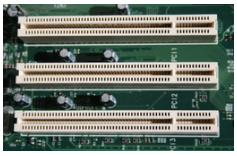
4) **Complimentary Metal Oxide Semiconductor Random Access Memory (CMOS RAM) -** motherboards also include a small separate block of memory made from CMOS RAM chips, which are kept alive by a battery (known as a CMOS battery) even when the PC's power is off. This prevents reconfiguration when the PC is powered on. CMOS devices require very little power to operate.
The CMOS RAM is used to store basic information about the PC's configuration, for instance:

- Floppy disk and hard disk drive types
- Information about CPU
- RAM size
- Date and time
- Serial and parallel port information
- Plug and Play information
- Power Saving settings

5) **Cache Memory** - is a small block of high-speed memory (RAM) that enhances PC performance by pre-loading information from the (relatively slow) main memory and passing it to the processor on demand. Most CPUs have an internal cache memory (built into the processor) known as Level 1 or primary cache memory. This can be supplemented by external cache memory fitted on the motherboard. This is the Level 2 or secondary cache.



6) **Expansion Buses** - is an input/output pathway from the CPU to peripheral devices. It is made up of a series of slots on the motherboard. Expansion boards (cards) plug into the bus. PCI is the most common expansion bus in a PC and other hardware platforms. Buses carry signals such as data, memory addresses, power, and control signals from component to component. Other types of buses include ISA and EISA. Expansion buses enhance the PC's capabilities by allowing users to add missing features to their computers by slotting adapter cards into expansion slots.



PCI slots

7) **Computer Chipsets** - is a group of small circuits that coordinate the flow of data to and from a PC's key components. These key components include the CPU itself, the main memory, the secondary cache, and any devices located on the buses. A chipset also controls data flow to and from hard disks and other devices connected to the IDE channels. A computer has two main chipsets:

- The NorthBridge (also called the memory controller) is in charge of controlling transfers between the processor and the RAM, which is why it is located physically near the processor. It is sometimes called the GMCH for Graphic and Memory Controller Hub.
- The SouthBridge (also called the input/output controller or expansion controller) handles communications between slower peripheral devices. It is also called the ICH (I/O Controller Hub). The term "bridge" is generally used to designate a component that connects two buses.

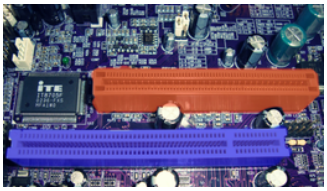
8) CPU Clock - synchronizes the operation of all parts of the PC and provides the basic timing signal for the CPU. Using a quartz crystal, the CPU clock breathes life into the microprocessor by feeding it a constant flow of pulses. A "real-time clock," also called the "system clock," keeps track of the time of day and makes this data available to the software. A "time-sharing clock" interrupts the CPU at regular intervals and allows the operating system to divide its time between active users and/or applications.

9) The Switches and Jumpers

- **DIP** (dual in-line package) switches - are small electronic switches found on the circuit board that can be turned on or off just like a normal switch. They are very small and so are usually flipped with a pointed object, such as the tip of a screwdriver, a bent paper clip, or a pen top. Take care when cleaning near DIP switches, as some solvents may destroy them. Dip switches are obsolete, and you will not find them in modern systems.
- **Jumper pins -** are small protruding pins on the motherboard. A jumper cap or bridge is used to connect or short a pair of jumper pins. When the bridge is connected to any two pins via a shorting link, it completes the circuit, and a certain configuration has been achieved.
- **Jumper caps -** are metal bridges that close an electrical circuit. Typically, a jumper consists of a plastic plug that fits over a pair of protruding pins. Jumpers are sometimes used to configure expansion boards. By placing a jumper plug over a different set of pins, you can change a board's parameters.

10) **PCI (Peripheral Component Interconnect)** - is a computer slot that allows you to insert expansion cards into your computer. These can come in the form of sound cards, RAID cards, SSDs, graphics cards, Coprocessors, and several other functional computer parts. It enables you to expand the capabilities of the PC by adding what you do not have.

11) **AGP Slot (Accelerated Graphics Port)** - is a point to point channel that is used for high-speed video output. This port is used to connect graphic cards to a computer's motherboard. It increases the speed at which machines can render graphics while using the system's resources more efficiently. The primary purpose of an AGP is to convey 3-D images much more smoothly than is possible on a regular PC.



PART IV

ASSEMBLY OF A COMPUTER

1) Open the case
2) Install the power supply
3) Attach the components to the motherboard
4) Install the motherboard
5) Install internal drives
6) Connect all internal cables
7) Connect front panel connectors
8) Install motherboard power connections (24pinATX)
9) Connect external cables to the computer to the port

DISASSEMBLY OF A COMPUTER

1) Unplugging the power cords
2) Open the case
3) Disconnect all the connectors
4) Remove the fan
5) Remove the HDD (hard disk drive) and ODD (optical disk drive)
6) Remove the RAM (random access memory)
7) Remove the expansion cards
8) Remove the motherboard
9) Remove the power supply