

<b>Generati on</b>	<b>Duration</b>	<b>Memory Device</b>	<b>Features</b>	<b>Example</b>
<b>First</b>	<b>Vacuum Tubes or Valves</b>		<ul style="list-style-type: none"> <li><input type="checkbox"/> used vacuum tubes as electronic circuit</li> <li><input type="checkbox"/> magnetic drum for primary storage</li> <li><input type="checkbox"/> mercury delay lined for memory</li> <li><input type="checkbox"/> punch-card used as secondary storage</li> <li><input type="checkbox"/> machine level programming used</li> <li><input type="checkbox"/> operating speed was used in terms of millisecond</li> </ul>	<b>Mark-I, UNIVAC, ENIAC etc.</b>
<b>Second</b>	<b>1955-1964</b>	<b>Transistor</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> magnet core memory used as internal storage</li> <li><input type="checkbox"/> magnet tapes used as secondary storage</li> <li><input type="checkbox"/> little bit faster I/O devices</li> <li><input type="checkbox"/> high level language used as programming</li> <li><input type="checkbox"/> processing speed measured in microsecond</li> </ul>	<b>IMB 1401, ICL 2950/10 etc.</b>
<b>Third</b>	<b>1964-1975</b>	<b>IC(Integrated circuits)</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> semi conductor memory used as primary storage</li> <li><input type="checkbox"/> magnetic discs were used as secondary storage</li> <li><input type="checkbox"/> massive use of high level language</li> <li><input type="checkbox"/> processing speed increased to nanosecond and even faster</li> </ul>	<b>IBM 360 series, UNIVAC 9000 etc.</b>
<b>Fourth</b>	<b>1975-1990</b>	<b>VLSI or Microprocessor</b>	<ul style="list-style-type: none"> <li><input type="checkbox"/> massive use of magnetic and optical storage devices with capacity more than 100 GB</li> <li><input type="checkbox"/> advancement in software and high level language</li> <li><input type="checkbox"/> use of 4<sup>th</sup> generation language(4GL)</li> <li><input type="checkbox"/> operation speed increased beyond picoseconds and MIPS (Millions of Instructions Per Second)</li> </ul>	<b>IBM PC, Pentium PC, Apple/Macintosh etc.</b>
				-

<b>Fifth</b>	<b>1990+</b>	<b>Bio-Chips</b>	<input type="checkbox"/> <b>AI will make computer Intelligent and knowledge based</b> <input type="checkbox"/> <b>very high speed, PROLOG (programming language)</b>	
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**Q: what is ASCII ?**

**ASCII** : Short for **American Standard Code for Information Interexchange**, **ASCII** is an standard that assigns letters, numbers, and other characters within the 256 slots available in the 8-bit code. The ASCII decimal (Dec) number is created from binary, which is the language of all computers. As shown in the table below, the lower case "h" character (Char) has a decimal value of 104, which is "01101000" in binary.

**EBCDIC** :Extended Binary Coded Decimal Interchange Code is a binary code for alphabetic and numeric characters that IBM developed for its larger operating systems.

**Q :Explain different types of computer.**

### **Supercomputers**

A supercomputer is pretty much exactly what it sounds like. It's a term used to describe computers that have the most capable processing power of its time. Early supercomputers in the 60s and 70s used just a couple processors, while the 90s saw supercomputers with thousands of processors at a time. Today, modern supercomputers run *hundreds* of thousands of processors, capable of computing quadrillions of calculations in just a few nanoseconds. You probably won't be needing that kind of power to access Facebook... Actually, supercomputers are used in computational science to calculate and carry out a plethora of complex tasks. Modeling molecular structures, weather forecasting, and the field of quantum mechanics, among others, rely on supercomputers and their intense processing power to solve their equations.

### **Mainframe Computers**

Like supercomputers, mainframe computers are huge, towering machines with lots of processing power. Mainframe computers are mostly used by corporations, government agencies, and banks – organizations that need a way to store large quantities of information. They are not the same as supercomputers. The processing capabilities of mainframe computers are measured in MIPS, or millions of instructions per second. Supercomputers, on the other hand, are measured in FLOPS, or floating point operations per seconds.

### **Minicomputers**

A minicomputer is a multiprocessing machine that can support up to about 200 users at the same time. It's like a less powerful mainframe computer, and is about the size of a refrigerator. A server can be an example of a minicomputer, but not all servers are minicomputers. Despite their name, a minicomputer is *not* a personal computer like the desktop machine you might have at home or work. They are much larger than that. Because of the ways microcomputers – which we'll cover next – have excelled in processing power even beyond minicomputers, and at a much smaller size, minicomputers have become pretty much obsolete.

### **Microcomputers**

Microcomputers are the ones people are most familiar with on a daily, non-professional basis, but of course that doesn't mean they're exclusive to the home. Microcomputers are smaller computers that run on

microprocessors in their central processing units. They are much, *much* cheaper than supercomputers, mainframe computers and even minicomputers, because they're meant for everyday uses that are more practical than professional. The range of capabilities for microcomputers are still vast, though. A film editor might use a microcomputer to run many intensive editing programs at once, while a student might use a microcomputer for Facebook and word processing.

## Cache Memory

Cache memory is a very high speed semiconductor memory which can speed up CPU. It acts as a buffer between the CPU and main memory. It is used to hold those parts of data and program which are most frequently used by CPU. The parts of data and programs, are transferred from disk to cache memory by operating system, from where CPU can access them.

## Advantages

- Cache memory is faster than main memory.
- It consumes less access time as compared to main memory.
- It stores the program that can be executed within a short period of time.
- It stores data for temporary use.

## Disadvantages

- Cache memory has limited capacity.
- It is very expensive.

## Q: What are the difference between Structured Programming and Object Oriented Programming ?

Structured Programming	Object Oriented Programming
Structured Programming is designed which focuses on <b>process</b> / logical structure and then data required for that process.	Object Oriented Programming is designed which focuses on <b>data</b> .
Structured programming follows <b>top-down approach</b> .	Object oriented programming follows <b>bottom-up approach</b> .
Structured Programming is also known as <b>Modular Programming</b> and a subset of <b>procedural programming language</b> .	Object Oriented Programming supports <b>inheritance, encapsulation, abstraction, polymorphism</b> , etc.
In Structured Programming, Programs are divided into small self contained <b>functions</b> .	In Object Oriented Programming, Programs are divided into small entities called <b>objects</b> .
Structured Programming is <b>less</b> secure as there is no way of <b>data hiding</b> .	Object Oriented Programming is more secure as having data hiding feature.
Structured Programming can solve <b>moderately</b> complex programs.	Object Oriented Programming can solve any <b>complex</b> programs.
Structured Programming provides <b>less reusability</b> , more function dependency.	Object Oriented Programming provides more reusability, less function <b>dependency</b> .
Less abstraction and less flexibility.	More abstraction and more <b>flexibility</b> .

**Q :What are the difference between Virtual Memory and Cache Memory ?**

**Comparison between Virtual Memory and Cache Memory:**

	<b>Virtual Memory</b>	<b>Cache Memory</b>
Definition	Virtual memory is an abstraction of the main memory. It extends the available memory of the computer by storing the inactive parts of the content RAM on a disk. It fetches it back to the RAM when the content is required.	Cache memory is used to store frequently accessed data in order to quickly access the data whenever it is required. They both are conceptually the same; however they mainly differ in the matter of implementation.
Purpose	It extends the memory capacity of a computer beyond the one that is installed.	It reduces the amount of time needed to access the data.
Speed	It operates in the millisecond range.	It operates in the nanosecond range.
Control mechanism	Managed by the operating system	Managed automatically by the hardware
Component	It is a part of the hard drive (secondary storage).	Located on the processor itself

**Q: What are the difference between class and object ?**

	<b>Class</b>	<b>Object</b>
<b>Definition</b>	Class is mechanism of binding data members and associated methods in a single unit.	Instance of class or variable of class.
<b>Existence</b>	It is logical existence	It is physical existence
<b>Memory Allocation</b>	Memory space is not allocated , when it is created.	Memory space is allocated, when it is created.
<b>Declaration/definition</b>	Definition is created once.	it is created many time as you require.

## **Q : WHAT IS LOCALITY OF REFERENCE IN CACHE MEMORY?**

**Locality of Reference in Cache Memory** : The locality of reference is implemented to utilize the full benefit of cache memory in computer organization. It indicates that all the instructions referred by the processor are localized in nature. If the processor searches an instruction 'i', the probability is very high that after execution of instruction 'i', it will search for 'i+1'. That is a processor request instructions from memory which are residing in memory in nearby locations.

## **Q :How can you erase data from an Eprom?**

To **erase** the **data** stored in the array of transistors, ultraviolet light is directed onto the die. Photons of the UV light cause ionization within the silicon oxide, which allow the stored charge on the floating gate to dissipate. Since the whole memory array is exposed, all the memory is **erased** at the same time.

## **Q: what is micr device? write down application area of micr device.**

**MICR** (magnetic ink character recognition) is a technology used to verify the legitimacy or originality of paper documents, especially checks. Special ink, which is sensitive to magnetic fields, is used in the printing of certain characters on the original documents.

MICR is used extensively in banking because magnetic-ink characters are difficult to forge and are therefore ideal for marking and identifying cheques.

## **Q : What are the differences BETWEEN THE HIGH AND THE LOW LEVEL LANGUAGE?**

### **DIFFERENCE BETWEEN THE HIGH AND THE LOW LEVEL LANGUAGE:**

1. Low level language is machine readable form of program. Whereas the high level language will be in human readable form..
2. Low level language are difficult to write and compile but high level languages are easy to write as well as compile..
3. Low level language are compact and require less memory space.. High level language uses compilers and interpreters which requires large memory space.
4. In high level language debugging (troubleshooting) .I.e. Finding and correcting errors are easier whereas debugging in the low level language is quite difficult.
5. low level language coding and compiling is time consuming process whereas high level language coding and compiling is much easy and takes very less time to compile.

## **Q :What do you mean by Data and Information ?**

What are the difference between data and information?

**what is data:** Data are plain facts. The word "data" is plural for "datum." When data are processed, organized, structured or presented in a given context so as to make them useful, they are called Information.

It is not enough to have data (such as statistics on the economy). Data themselves are fairly useless, but when these data are interpreted and processed to determine its true meaning, they becomes useful and can be named as Information.

**Information** is data that has been processed in such a way as to be meaningful to the person who receives it. it is any thing that is communicated.

BASIS FOR COMPARISON	DATA	INFORMATION
Meaning	Data is unrefined facts and figures and utilized as input for the computer system.	Information is the output of processed data.
Characteristics	Data is a individual unit which contains raw material and doesn't carry any meaning.	Information is the product and group of data which collectively carry a logical meaning.
Dependence	It doesn't depend on Information.	It relies on Data.
Peculiarity	Vague	Specific.
Measuring Unit	Measured in bits and bytes.	Measured in meaningful units like time, quantity, etc.

### Q: What is multimedia ?

Multimedia:

Any visual representation that has a combination of audio, video, animation, or graphics. **Multimedia** is usually a more enjoyable and informative experience than text. For example, a Thesaurus that is in multimedia format could have audio of famous speeches instead of only the transcription.

### Q: What is a multimedia software?

A **multimedia program**, **multimedia application**, or any **multimedia software** is software that is capable of playing or recording audio files or playing or recording video files. For example, in our earlier example of a multimedia thesaurus that plays audio of famous speeches, it is considered multimedia software.

### Q :What is the difference between Source program & Object program?

**Source program:**

1. Source program is typically a program which is human readable instructions written by a programmer.
2. Source program is written in higher level languages such as Java or C.
3. Source program are easily readable by humans.

### **Object program:**

1. Object program is typically a machine executable program created by compiling a source program.
2. Object programs usually contain lower level languages such as Assembly language or machine code.
3. Object programs aren't easily readable by humans.

### **Q :What is compiler ?**

A compiler is a special program that processes statements written in a particular programming language and turns them into machine language or "code" that a computer's processor uses. Typically, a programmer writes language statements in a language such as Pascal or C one line at a time using an *editor*. The file that is created contains what are called the *source statements*. The programmer then runs the appropriate language compiler, specifying the name of the file that contains the source statements.

### **Advantages:**

1. The entire program is verified so there are no syntax or semantic errors;
2. The executable file is optimized by the compiler so it executes faster;
3. User does not have to execute the program on the same machine it was built;

### **Q : what is a normalized floating point number and what is the purpose of normalization.**

The advantages of normalizing floating-point numbers are:

- 1) The representation is unique, there is exactly one way to write a real number in such a form.
- 2) It's easy to compare two normalized numbers, you separately test the sign, exponent and mantissa.
- 3) In a normalized form, a fixed size mantissa will use all the 'digit cells' to store significant digits.
- 4) The IEEE and DEC normalization conditions make the representation always start with a 1-bit, this bit can be omitted, and its place used for data. The omitted bit is called the "hidden bit".

### **Q :What does *Line Editor* mean?**

A line editor is a basic type of computer-based text editor whereby one line of a file can be edited at a time. Line editors were the precursor to document editing software that is commonly used today. Line editors were used before interactive video graphic screens were commonly available in computers.

## **Q :What are the Advantages and Disadvantages of low level languages ?**

### **Advantages of low level languages**

1. Programs developed using low level languages are fast and memory efficient.
2. Programmers can utilize processor and memory in better way using a low level language.
3. There is no need of any compiler or interpreters to translate the source to machine code. Thus, cuts the compilation and interpretation time.
4. Low level languages provide direct manipulation of computer registers and storage.
5. It can directly communicate with hardware devices.

### **Disadvantages of low level languages**

1. Programs developed using low level languages are machine dependent and are not portable.
2. It is difficult to develop, debug and maintain.
3. Low level programs are more error prone.
4. Low level programming usually results in poor programming productivity.
5. Programmer must have additional knowledge of the computer architecture of particular machine, for programming in low level language.

## **Q :What does *Assembler* mean?**

An assembler is a type of computer program that interprets software programs written in assembly language into machine language, code and instructions that can be executed by a computer.

An assembler enables software and application developers to access, operate and manage a computer's hardware architecture and components.

An assembler is sometimes referred to as the compiler of assembly language. It also provides the services of an interpreter.

## **Q :What is Macro Assembler ?**

An assembler that can perform macro substitution and expansion. The programmer can define a macro that consists of several statements and then use the macro name later in the program, thus avoiding having to rewrite the statements. For example, a macro called swap exchanges the values of two variables: After defining swap, the programmer can then insert an instruction such as "swap a, b" in the assembly language program. While assembling, the assembler replaces the instruction with the statements within the macro that swap the values of the variables a and b.

## **Q :What is cache memory ? What are differences between internal and external cache memory.**

**Cache Memory** : Cache memory is used to increase the performance of the PC. It holds data and instructions retrieved from RAM to provide faster access to the CPU.



As a computer system is built using components from different suppliers, there are no standards on the speeds and transfer rates of these components. The CPU (processor) and main memory (RAM) overcome these differences by using cache memory.

Cache memory is an extremely fast memory type that acts as a buffer between RAM and the CPU. It holds frequently requested data and instructions so that they are immediately available to the CPU when needed.

Cache memory is located in two general locations: inside the processor (internal cache) and on the motherboard (external cache):

Internal cache: also known as primary cache, internal cache is located inside the CPU chip.

External cache: also known as secondary cache, external cache is located on the motherboard outside the CPU. This is the cache referred to

### **Q :What are the Differences Between SRAM and DRAM ?**

Comparison Chart

<b>BASIS FOR COMPARISON</b>	<b>SRAM</b>	<b>DRAM</b>
Speed	Faster	Slower
Size	Small	Large
Cost	Expensive	Cheap
Used in	Cache memory	Main memory
Density	Less dense	Highly dense
Construction	Complex and uses transistors and latches.	Simple and uses capacitors and very few transistors.
Charge leakage property	Not present	Present hence require power refresh circuitry
Power consumption	Low	High

**Q : Definition of output device.**

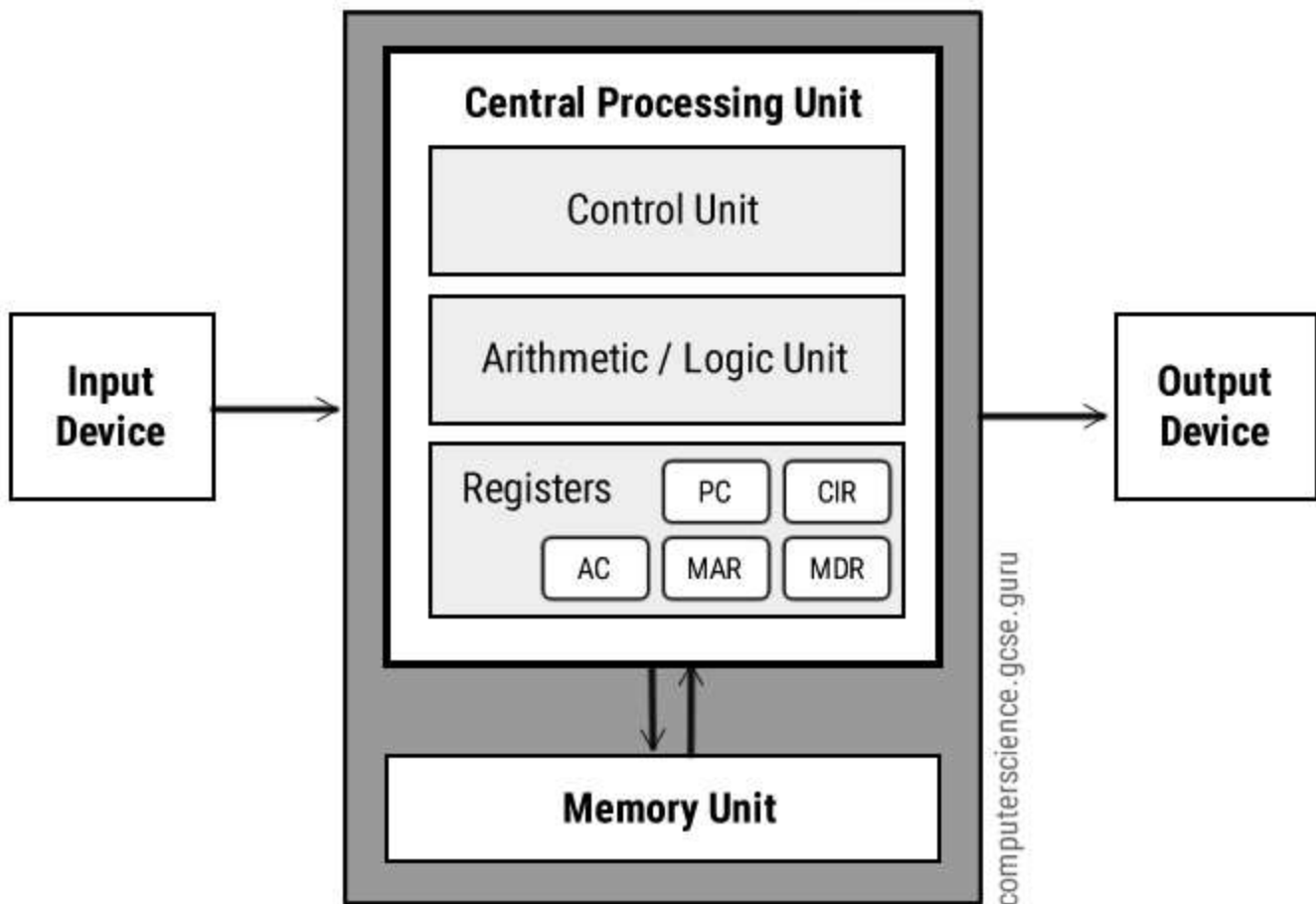
An **output device** is any **device** used to send data from a computer to another **device** or user. Most computer data **output** that is meant for humans is in the form of audio or video. Thus, most **output devices** used by humans are in these categories. Examples include monitors, projectors, speakers, headphones and printers.

**Q: Describe Von Neumann Architecture .**

Von Neumann architecture was first published by John von Neumann in 1945.

His computer architecture design consists of a Control Unit, Arithmetic and Logic Unit (ALU), Memory Unit, Registers and Inputs/Outputs.

Von Neumann architecture is based on the stored-program computer concept, where instruction data and program data are stored in the same memory. This design is still used in most computers produced today.



**Central Processing Unit (CPU)**

The Central Processing Unit (CPU) is the electronic circuit responsible for executing the instructions of a computer program.

It is sometimes referred to as the microprocessor or processor.

The CPU contains the ALU, CU and a variety of registers.

### Registers

Registers are high speed storage areas in the CPU. All data must be stored in a register before it can be processed.

<b><u>MAR</u></b>	Memory Address Register	Holds the memory location of data that needs to be accessed
<b><u>MDR</u></b>	Memory Data Register	Holds data that is being transferred to or from memory
<b><u>AC</u></b>	Accumulator	Where intermediate arithmetic and logic results are stored
<b><u>PC</u></b>	Program Counter	Contains the address of the next instruction to be executed
<b><u>CIR</u></b>	Current Instruction Register	Contains the current instruction during processing

### Arithmetic and Logic Unit (ALU)

The ALU allows arithmetic (add, subtract etc) and logic (AND, OR, NOT etc) operations to be carried out.

**Control Unit (CU) :** The control unit controls the operation of the computer's ALU, memory and input/output devices, telling them how to respond to the program instructions it has just read and interpreted from the memory unit. The control unit also provides the timing and control signals required by other computer components.

**Memory Unit :** The memory unit consists of **RAM**, sometimes referred to as primary or main memory. Unlike a hard drive (secondary memory), this memory is fast and also directly accessible by the CPU.

RAM is split into partitions. Each partition consists of an address and its contents (both in binary form).

The address will uniquely identify every location in the memory.

### Q :What is the Difference Between Machine Language and Assembly language?

Machine Language	Assembly language
Machine language is the lowest level programming language where the instructions execute directly by the CPU.	Assembly language is a low-level programming language which requires an assembler to convert to machine code/object code.
Machine language is comprehensible only to the computers.	Assembly language is comprehensible to humans.
A machine language consists of binary digits.	Assembly language follows a syntax similar to the English language.
Machine language varies depending on the platform.	Assembly language consists of a standard set of instructions.
Machine language is machine code.	Assembly language is using for microprocessor-based, real-time systems.

### Q : What are the advantages and disadvantages of magnetic disk storage

#### Advantages and Disadvantages of Magnetic storage devices

##### Advantages of Magnetic Storage Devices

1. Very fast access to data.
2. Data can be read directly from any part of the hard disc.
3. In most of the magnetic storage devices the access speed is about 1000kb/s
4. Some of the magnetic storage devices are very cheap for example floppy disks.
5. Most of the magnetic storage devices store very large amounts of data.

##### Disadvantages of Magnetic storage devices

- 1) Data can be altered by magnetic fields, dust, mechanical problems
- 2) Gradually lose their charge over time - data lost
- 3) Hard disks eventually fail which stops the computer from working.
- 4) Regular crashes can damage the surface of the disk, leading to loss of data in that sector.
- 5) The disk is fixed inside the computer and cannot easily be transferred to another computer.

### Q: what is auxiliary memory ?

**Auxiliary memory**, also known as **auxiliary storage**, secondary **storage**, secondary **memory** or external**memory**, is a non-volatile **memory** (does not lose stored data when the device is powered down) that is

not directly accessible by the CPU, because it is not accessed via the input/output channels (it is an external device).

### **What are the characteristics of Object Oriented programming language?**

The characteristics of OOP are:

Class definitions – Basic building blocks OOP and a single entity which has data and operations on data together

Objects – The instances of a class which are used in real functionality – its variables and operations

Abstraction – Specifying what to do but not how to do ; a flexible feature for having a overall view of an object's functionality.

Encapsulation – Binding data and operations of data together in a single unit – A class adhere this feature

Inheritance and class hierarchy – Reusability and extension of existing classes

Polymorphism – Multiple definitions for a single name - functions with same name with different functionality; saves time in investing many function names Operator and Function overloading

Generic classes – Class definitions for unspecified data. They are known as container classes. They are flexible and reusable.

Class libraries – Built-in language specific classes

Message passing – Objects communicates through invoking methods and sending data to them. This feature of sending and receiving information among objects through function parameters is known as Message Passing.

### **What does Procedural Language mean?**

Procedural language is a type of computer programming language that specifies a series of well-structured steps and procedures within its programming context to compose a program. It contains a systematic order of statements, functions and commands to complete a computational task or program.

Procedural language is also known as imperative language.

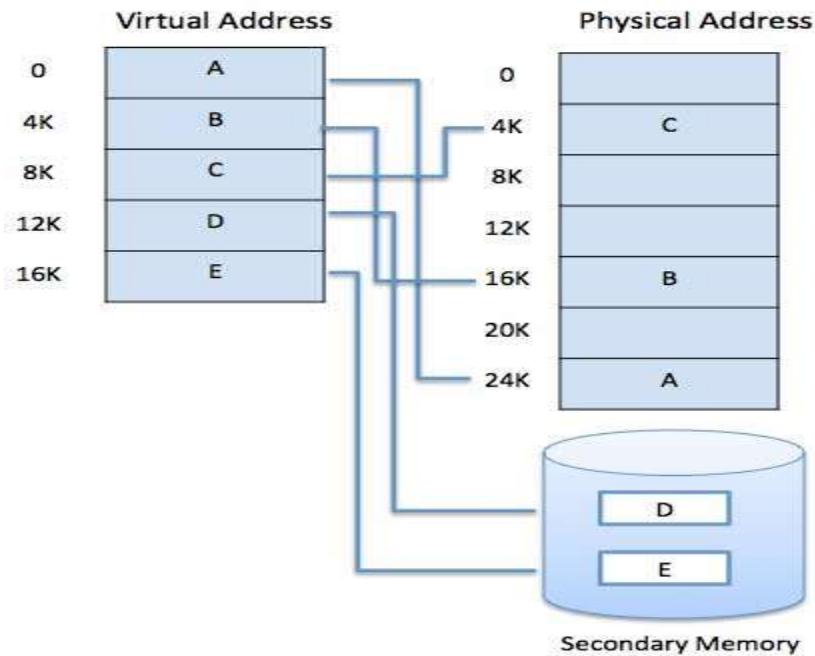
### **What is Virtual memory ? Briefly explain it .**

**virtual memory** : A computer can address more memory than the amount physically installed on the system. This extra memory is actually called **virtual memory** and it is a section of a hard disk that's set up to emulate the computer's RAM.

The main visible advantage of this scheme is that programs can be larger than physical memory. Virtual memory serves two purposes. First, it allows us to extend the use of physical memory by using disk. Second, it allows us to have memory protection, because each virtual address is translated to a physical address.

Following are the situations, when entire program is not required to be loaded fully in main memory.

- User written error handling routines are used only when an error occurred in the data or computation.
- Certain options and features of a program may be used rarely.
- Many tables are assigned a fixed amount of address space even though only a small amount of the table is actually used.
- The ability to execute a program that is only partially in memory would counter many benefits.
- Less number of I/O would be needed to load or swap each user program into memory.
- A program would no longer be constrained by the amount of physical memory that is available.
- Each user program could take less physical memory, more programs could be run the same time, with a corresponding increase in CPU utilization and throughput.



**Q: write some names of Secondary Memory:**

- A. Hard Disk (Local Disk)
- B. Optical Disks: CD-R, CD-RW, DVD-R, DVD-RW
- C. Pen Drive
- D. Floppy Disks
- F. Memory Cards
- G. External Hard Disk

**Q: explain the memory unit.**

**Units of Memory:**

The smallest unit is bit, which mean either 0 or 1.

1 bit	= 0 or 1
1 Byte	= 8 bit
1 Nibble	= 4 bit
1 Kilo Byte	= 1024 Byte= $2^{10}$ Byte
1 Mega Byte	= 1024 KB= $2^{10}$ KB
1 Gega Byte	= 1024 MB= $2^{10}$ MB
1 Tera Byte	= 1024 GB= $2^{10}$ GB
1 Peta Byte	=1024 TB= $2^{10}$ TB
1 Exa Byte	=1024 PB= $2^{10}$ PB
1 Zetta Byte	= 1024 EB= $2^{10}$ EB
1 Yotta Byte	= 1024 ZB= $2^{10}$ ZB

**Q: explain booting .**

### **Booting**

The process of loading the system files of the operating system from the disk into the computer memory to complete the circuitry requirement of the computer system is called booting.

Types of Booting:

There are two types of booting:

- **Cold Booting:** If the computer is in off state and we boot the computer by pressing the power switch 'ON' from the CPU box then it is called as cold booting.
- **Warm Booting:** If the computer is already 'ON' and we restart it by pressing the 'RESET' button from the CPU box or CTRL, ALT and DEL key simultaneously from the keyboard then it is called warm booting.

**Q :Explain different Types of Computer on the basis of working principle.**

**a) Analog Computer :**An analog computer is a form of computer that uses *continuous* physical phenomena such as electrical, mechanical, or hydraulic quantities to model the problem being solved. Eg: Thermometer, Speedometer, Petrol pump indicator, Multimeter

### **b) Digital Computer**

A computer that performs calculations and logical operations with quantities represented as digits, usually in the binary number system.

### **c) Hybrid Computer (Analog + Digital)**

A combination of computers those are capable of inputting and outputting in both digital and analog signals. A hybrid computer system setup offers a cost effective method of performing complex simulations. The instruments used in medical science lies in this category.

### **Q: Briefly describe Software**

#### **Software**

Software, simply are the computer programs. The instructions given to the computer in the form of a program is called Software. Software is the set of programs, which are used for different purposes. All the programs used in computer to perform specific task is called Software.

Types of software

#### **1. System software:**

##### **a) Operating System Software**

DOS, Windows XP, Windows Vista, Unix/Linux, MAC/OS X etc.

##### **b) Utility Software**

Windows Explorer (File/Folder Management), Compression Tool, Anti-Virus Utilities, Disk Defragmentation, Disk Clean, BackUp, WinZip, WinRAR etc...

##### **c) Language Processors**

Compiler, Interpreter and Assembler

#### **2. Application software:**

##### **a) Package Software**

Ms. Office 2003, Ms. Office 2007, Macromedia (Dreamweaver, Flash, Freehand), Adobe (PageMaker, PhotoShop)

##### **b) Tailored or Custom Software**

School Management system, Inventory Management System, Payroll system, financial system etc.

### **What is OS? Explain different types of OS.**

#### **Operating system**

Operating system is a platform between hardware and user which is responsible for the management and coordination of activities and the sharing of the resources of a computer. It hosts the several applications that run on a computer and handles the operations of computer hardware.



## Functions of operating System:

- Processor Management
- Memory Management
- File Management
- Device Management

## Types of Operating System:

- **Real-time Operating System:** It is a multitasking operating system that aims at executing real-time applications. Example of Use: e.g. control of nuclear power plants, oil refining, chemical processing and traffic control systems, air
- **Single User Systems:** Provides a platform for only one user at a time. They are popularly associated with Desk Top operating system which run on standalone systems where no user accounts are required. Example: DOS.
- **Multi User Systems:** Provides regulated access for a number of users by maintaining a database of known users. Refers to computer systems that support two or more simultaneous users. Another term for multi-user is time sharing. Ex: All mainframes are multi-user systems. Example: Unix
- **Multi-tasking and Single-tasking Operating Systems:** When a single program is allowed to run at a time, the system is grouped under the single-tasking system category, while in case the operating system allows for execution of multiple tasks at a time, it is classified as a multi-tasking operating system.
- **Distributed Operating System:** An operating system that manages a group of independent computers and makes them appear to be a single computer is known as a distributed operating system. Distributed computations are carried out on more than one machine. When computers in a group work in cooperation, they make a distributed system.

## What is ISCII and Unicode?

**ISCII(American standard code for information interchange) :** To use the Indian language on computers, ISCII codes are used. It is an 8-bit code capable of coding 256 characters. ISCII code retains all ASCII characters and offers coding for Indian scripts also.

**Unicode:** It is a universal coding standard which provides a unique number for every character, no matter what the platform, no matter what the program, no matter what the language. Unicode version 3.1 represented 94,140 characters.

## Difference between mainframe and desktop computer:

A mainframe is a large, powerful computer that can process requests from millions of users at the same time, whereas a microcomputer is a small computer designed to be used by one person at a time. Large organizations such as banks and government agencies use mainframe computers. Single users work with microcomputers to perform personal and work-related tasks.

A personal computer is usually known as a "micro computer". It is designed to handle 1 user at a time, with semi-limited multi-tasking. These are relatively inexpensive nowadays.

A mainframe is designed to handle multiple processes (and users) simultaneously (true multitasking) at a fairly decent speed. There can vary in cost from inexpensive to very expensive, depending on specifications.

### **What is Radix ?**

**Radix** is a term used to describe the number of digits utilized in a positional number system before "rolling over" to the next digit's place. For example in the base-10 number system, there is a total of 10 digits used (zero through nine), therefore, its radix is 10. In the base-2 number system, there are two numbers used (zero and one), so its radix is two. Other words that are synonymous with radix are base and root, in an arithmetic sense.

### **What is the difference between software and firmware?**

1. Software generally refers to high level programs while firmware is used to microcode embedded in most hardware
2. Software can be very big while firmware are usually very small
3. Software can be replaced without much hassle while replacing firmware is often difficult
4. Software is often stored in user accessible memory while firmware is located in an inaccessible storage embedded in the hardware
5. Software is changed constantly while firmware is very rarely changed.

### **Q : Why does 2's complement is preferred to represent negative numbers over 1's complement?**

Actually, I didn't know that 1's complement is in a position to be compared with 2's complement. 2's complement makes sense to be used for negative integers. 1's complement is just a computation technique which might be helpful to evaluate 2's complement. The real (defeated) rival of 2's complement was the sign-magnitude representation for negative integers.

1's complement has no special usage for negative integers. 2's complement makes sense because it can be used in natural addition and subtraction arithmetic without any need to change the bits. Providing that no overflow occurs, the sign bit of the result is just the right value. The bit number promotion in this notation is straight forward, for example, to promote an 8-bit signed integer to 16, we could simply repeat the sign bit of integer value in the high byte of it.

On the contrary, the sign-magnitude notation is just the way that human uses to represent negative integers. The bit number promotion and addition subtraction arithmetic is a bit mess with this notation.

### **Q : How Integer Representation in computer :**

Integers are *whole numbers* or *fixed-point numbers* with the radix point *fixed* after the least-significant bit. They are contrast to *real numbers* or *floating-point numbers*, where the position of the radix point varies. It is important to take note that integers and floating-point numbers are treated differently in computers. They have different representation and are processed differently (e.g., floating-point numbers are processed in a so-called floating-point processor). Floating-point numbers will be discussed later.

Computers use *a fixed number of bits* to represent an integer. The commonly-used bit-lengths for integers are 8-bit, 16-bit, 32-bit or 64-bit. Besides bit-lengths, there are two representation schemes for integers:

1. *Unsigned Integers*: can represent zero and positive integers.
2. *Signed Integers*: can represent zero, positive and negative integers. Three representation schemes had been proposed for signed integers:
  1. Sign-Magnitude representation
  2. 1's Complement representation
  3. 2's Complement representation

You, as the programmer, need to decide on the bit-length and representation scheme for your integers, depending on your application's requirements. Suppose that you need a counter for counting a small quantity from 0 up to 200, you might choose the 8-bit unsigned integer scheme as there is no negative numbers involved.

### Q : What is ROM? Explain Different Types of ROM.

#### Types of ROM :

Following are the types of ROM

- **PROM**: PROM stands for Programmable Read Only Memory. Instructions can be stored in PROM only once. Then it becomes ROM and we cannot change instructions in it. Initially PROM is a blank chip. Once instructions are written on it, then it become ROM. Now we cannot change or delete the instructions. If there is any error in writing instructions then PROM chip becomes unusable.
- **EPROM** :EPROM stands for Erasable Programmable Read Only Memory. Program instructions written on EPROM can be erased and changed with the help of ultra violet rays. So if once we write instruction on this chip with errors, we can erase wrong instructions and rewrite new instructions.
- **EEPROM** :EPROM stands for Electrically Erasable Programmable Read Only Memory. Program instructions written on EEPROM can be erased with the help of electricity and rewritten.

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### Q : What are the difference between Analog and Digital Computers ?

Analog Computers		Digital Computers
1	Analog Computers Work on continuous values.	Digital computers Work on discrete values.

2	Analog Computers have low memory.	Digital computers have a very large memory
3	Analog computers have Slow speed.	Digital computers have fast speed.
4	Analog computers are less reliable.	Digital computers are more reliable.
5	Analog computers used in engineering and science and medical fields.	Digital computers are used in all fields of life.
6	Analog computers are used to calculate / measure analog quantities like speed and temperature.	Digital computers are used to calculate mathematical and logical operations. It can solve addition, subtraction, division, multiplication and other mathematical and statistical operations.
7	Analog computers provide less accurate results.	Digital computers provide 100% accurate results.
8	Normally Analog Computers are specific purpose	Digital Computers are general purpose
9	Analog computers are difficult to use	Digital computers are easy to use
10	Examples of Analog computers are: thermometer, analog clock, speedometer etc.	Examples of digital computers are: Personal Computer, laptops, smart phones etc.

**Q : Discuss Differences Between RAM and ROM.**

Sr #	RAM	ROM
1	RAM stands for Random Access Memory	ROM stands for Read Only Memory.

2	RAM is a temporary memory.	ROM is a permanent memory.
3	RAM is a volatile memory.	ROM is a non volatile memory.
4	When computer is turned off, all data and programs are erased from RAM.	When computer is turned off, all data and programs are retained in ROM.
5	RAM is a Read / Write memory. Data can be read and written to RAM.	ROM is a read only memory. Data from ROM only can be read and not written.
6	Data and programs in RAM can be changed.	The contents of ROM cannot be changed.
7	Data or programs in RAM can be deleted.	Contents of ROM cannot be deleted.
8	The instructions and data are written (loaded) in RAM at execution time, when computer is working.	The instructions in ROM are written at the time of manufacturing.
9	RAM is used to load data and programs currently running.	ROM contains the instructions that help the computer to start-up and make it ready for work.
10	RAM is much faster than ROM.	ROM is slower than RAM.
11	RAM has two main types: Static RAM and Dynamic RAM	ROM has three types: PROM, EPROM and EEPROM
12	Physically RAM chip is larger than ROM chip.	Physically ROM chip is smaller than RAM chip.

### Q What does **System Bus** mean?

The system bus is a pathway composed of cables and connectors used to carry data between a computer microprocessor and the main memory. The bus provides a communication path for the data and control signals moving between the major components of the computer system. The system bus works by combining the

functions of the three main buses: namely, the data, address and control buses. Each of the three buses has its separate characteristics and responsibilities.

The system bus connects the CPU with the main memory and, in some systems, with the level 2 (L2) cache. Other buses, such as the IO buses, branch off from the system bus to provide a communication channel between the CPU and the other peripherals.

The system bus combines the functions of the three main buses, which are as follows:

1. The control bus carries the control, timing and coordination signals to manage the various functions across the system.
2. The address bus is used to specify memory locations for the data being transferred.
3. The data bus, which is a bidirectional path, carries the actual data between the processor, the memory and the peripherals.

The design of the system bus varies from system to system and can be specific to a particular computer design or may be based on an industry standard. One advantage of using the industry standard is the ease of upgrading the computer using standard components such as the memory and IO devices from independent manufacturers.

#### **Q : What is loader ?**

In a computer operating system , a loader is a component that locates a given program (which can be an application or, in some cases, part of the operating system itself) in offline storage (such as a hard disk ), loads it into main storage (in a personal computer, it's called random access memory ), and gives that program control of the computer (allows it to execute its instructions).

A program that is loaded may itself contain components that are not initially loaded into main storage, but can be loaded if and when their logic is needed. In a multitasking operating system, a program that is sometimes called a *dispatcher* juggles the computer processor's time among different tasks and calls the loader when a program associated with a task is not already in main storage. (By program here, we mean a binary file that is the result of a programming language compilation, linkage editing, or some other program preparation process.)

#### **What is linker ?**

In computer science, a **linker** is a computer program that takes one or more **object files** generated by a **compiler** and combines them into one, **executable** program.

**Dynamic linking** is a similar process, available on many operating systems, which postpones the resolution of some symbols until the program is executed.

#### **Q:What is decision table ?**

A decision table is used to represent conditional logic by creating a list of tasks depicting business level rules. Decision tables can be used when there is a consistent number of conditions that must be evaluated and assigned a specific set of actions to be used when the conditions are finally met.

Decision tables are fairly similar to decision trees except for the fact that decision tables will always have the same number of conditions that need to be evaluated and actions that must be performed even if the set of branches being analyzed is resolved to true. A decision tree, on the other hand, can have one branch with more conditions that need to be evaluated than other branches on the tree.

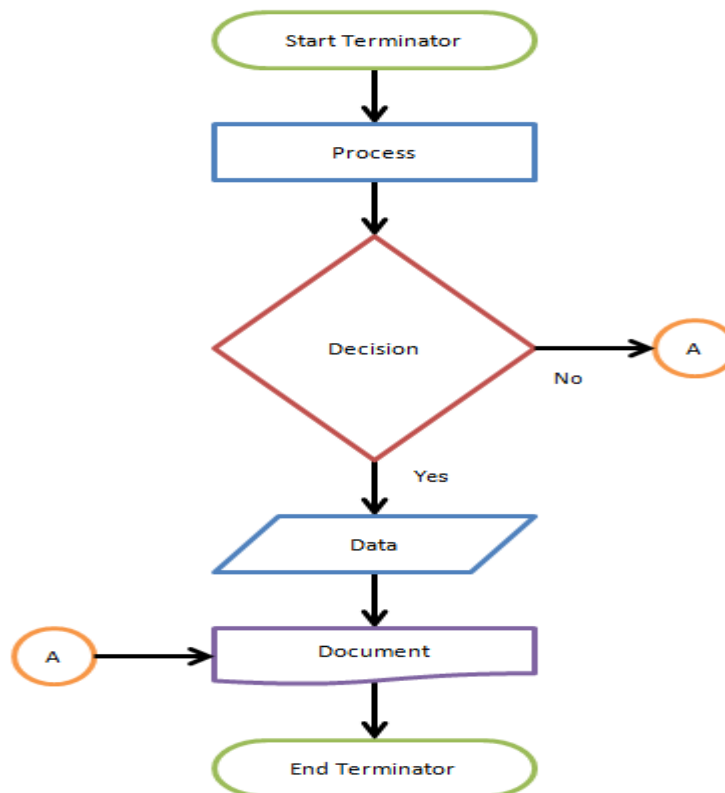
### Q: What is flowchart ?

**Flow Chart** :A flow chart is a graphical or symbolic representation of a process. Each step in the process is represented by a different symbol and contains a short description of the process step. The flow chart symbols are linked together with arrows showing the process flow direction.

#### Common Flowchart Symbols

Different flow chart symbols have different meanings. The most common flow chart symbols are:

- **Terminator**: An oval flow chart shape indicating the start or end of the process.
- **Process**: A rectangular flow chart shape indicating a normal process flow step.
- **Decision**: A diamond flow chart shape indicating a branch in the process flow.
- **Connector**: A small, labeled, circular flow chart shape used to indicate a jump in the process flow. (Shown as the circle with the letter "A", below.)



### **Q: What is Pseudocode?**

Pseudocode is an informal way of programming description that does not require any strict programming language syntax or underlying technology considerations. It is used for creating an outline or a rough draft of a program. Pseudocode summarizes a program's flow, but excludes underlying details. System designers write pseudocode to ensure that programmers understand a software project's requirements and align code accordingly. Pseudocode is not an actual programming language. So it cannot be compiled into an executable program. It uses short terms or simple English language syntaxes to write code for programs before it is actually converted into a specific programming language.

### **What is virus ?**

A computer virus is malicious code that replicates by copying itself to another program, computer boot sector or document and changes how a computer works. The virus requires someone to knowingly or unknowingly spread the infection without the knowledge or permission of a user or system administrator. In contrast, a computer worm is stand-alone programming that does not need to copy itself to a host program or require human interaction to spread. Viruses and worms may also be referred to as malware.

### **Q: How does a computer virus find me?**

Even if you're careful, you can pick up computer viruses through normal Web activities like:

- Sharing music, files, or photos with other users
- Visiting an infected website
- Opening [spam email](#) or an email attachment
- Downloading free games, toolbars, media players and other system utilities
- Installing mainstream software applications without thoroughly reading license agreements.

### **Q: What are the symptoms of a computer virus?**

Your computer may be infected if you recognize any of these [malware symptoms](#):

- Slow computer performance
- Erratic computer behavior
- Unexplained data loss
- Frequent computer crashes

### **Q : How to protect against computer viruses**

When you arm yourself with information and resources, you're wiser about computer security threats and less vulnerable to threat tactics. Take these steps to safeguard your PC with the best computer virus protection:

- Use antivirus protection and a firewall
- Get antispyware software



- Always keep your antivirus protection and antispyware software up-to-date
- Update your operating system regularly
- Increase your browser security settings
- Avoid questionable Web sites
- Only download software from sites you trust.
- Carefully evaluate free software and file-sharing applications before downloading them.
- Don't open messages from unknown senders
- Immediately delete messages you suspect to be spam

### **Q: What is Multimedia?**

Multimedia is defined as computer based interactive communication process that incorporates text, graphics, sound, video and animation.

The word multimedia refers to an integration of multiple media such as visual images, sound, text, video and animation which together can multiply the impact of the message on the other level. Interactive multimedia refers to that when a user becomes a regular viewer of the multimedia project and is allowed to control what and when the elements are delivered is termed as an interactive multimedia.

### **Q:What is Workstation ?**

**Workstation**, a high-performance [computer](#) system that is basically designed for a single user and has advanced graphics capabilities, large storage capacity, and a powerful [microprocessor](#)(central processing unit). A workstation is more capable than a [personal computer](#) (PC) but is less advanced than a midrange computer (which can manage a large network of [peripheral](#) PCs or workstations and handle immense data-processing and reporting tasks). The term workstation is also sometimes ascribed to dumb terminals (*i.e.*, without any processing capacity) that are connected to [mainframe](#) computers.

These four main operating systems for the workstations are

- **Windows OS**
- **Linux OS**
- **Mac OS**
- **Chrome OS**
- 

Q: What are the major types of interrupts?

There are mainly three types of interrupts:

1. External interrupts: It arises due to external call from I/O devices. For e.g. I/O devices requesting transfer of data, power failure, etc.
2. Internal interrupts: It arises due to illegal and erroneous use of an instruction or data. For e.g. stack overflow, division by zero, invalid opcode, etc. These are also called *traps*.
3. Software interrupts: It is initiated by executing an instruction. It can be used by the programmer to initiate an interrupt at the desired point in the program.

External and internal interrupts are initiated from signals that occur in the hardware of the CPU whereas Software interrupts occur from the instructions.

Q:What are the difference between Hardwired and Micro-programmed Control ?

<b>HARDWIRED CONTROL UNIT</b>	<b>MICROPROGRAMMED CONTROL UNIT</b>
Hardwired control unit generates the control signals needed for the processor using logic circuits	Micprogrammed control unit generates the control signals with the help of micro instructions stored in control memory
Hardwired control unit is faster when compared to microprogrammed control unit as the required control signals are generated with the help of hardwares	This is slower than the other as micro instructions are used for generating signals here
Difficult to modify as the control signals that need to be generated are hard wired	Easy to modify as the modification need to be done only at the instruction level
More costlier as everything has to be realized in terms of logic gates	Less costlier than hardwired control as only micro instructions are used for generating control signals
It cannot handle complex instructions as the circuit design for it becomes complex	It can handle complex instructions
Only limited number of instructions are used due to the hardware implementation	Control signals for many instructions can be generated
Used in computer that makes use of Reduced Instruction Set Computers(RISC)	Used in computer that makes use of Complex Instruction Set Computers(CISC)