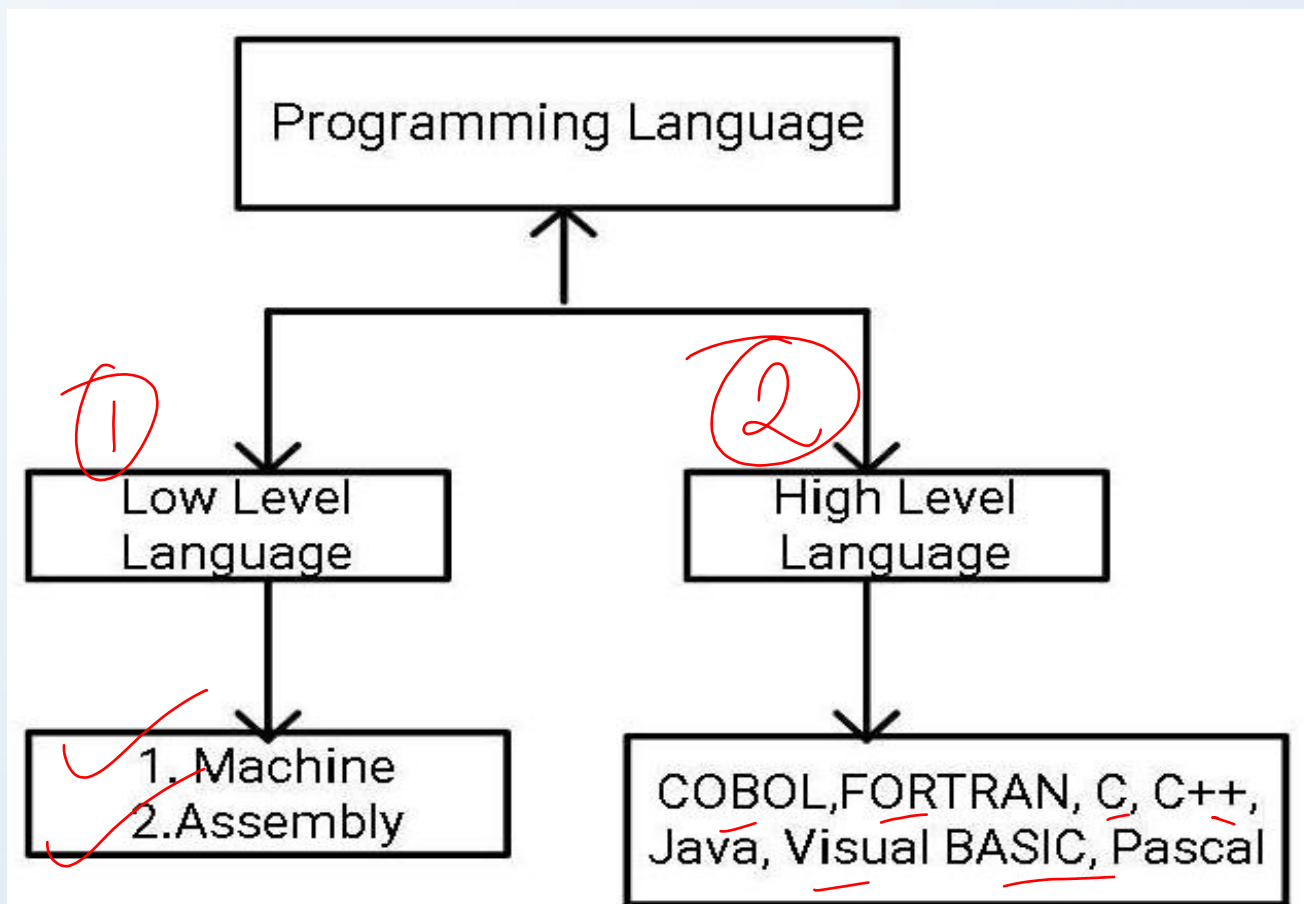


Computer Awareness Module - 4

Table of Content

- Types of computer Languages
- Types of Language Translators
- What is OS and its features
- Different Types of OS
- Booting process
- Wildcard characters



What Is Machine Language?

Machine language is the lowest level of programming language that a computer can understand. It's made up of binary code, which is a series of 1s and 0s. The computer's central processing unit (CPU) reads machine language.

Object Code


What it's used for

- Machine language is used to control a computer's operations precisely.
- It's used to develop embedded systems and IoT devices, especially for resource-constrained applications.

What Is Assembly Language?

Assembly language is a type of programming language that is designed to be used by developers to write programs that can run directly on a computer's central processing unit (CPU). It is a low-level language, which means it is closer to the machine code the CPU can execute. In an assembly language program, each instruction represents a single operation that the computer's CPU can perform.

mnemonic code

A handwritten red arrow pointing from the right towards the text "mnemonic code".

Highlevel Language

A high-level language (HLL) is a programming language that is designed to be similar to human language, making it easier for programmers to write code. HLLs are more abstract than machine language, and are used to develop programs that can run on multiple types of machines.

Source Code

HLL

- Procedural Language
Ex:- COBOL, FORTRAN, C, Basic
- Object Oriented programming Language
Ex:- C++, Java, Python, LISP, C#
- Scripting Language
Ex:- Java Script, PHP, VB script
- Markup Language
Ex:- HTML, XML, SGML



Dennis Ritchie

There are many high level languages

Some Examples:

✓ **COBOL**

✓ **FORTRAN**

PASCAL

C & C++

~~✗~~ **PROLOG**

✓ **JAVA**

.NET

Business applications

Engineering & Scientific Applications

General use and as a teaching tool

**General Purpose - currently
most popular.**

Artificial Intelligence

General all purpose programming

General or web applications.

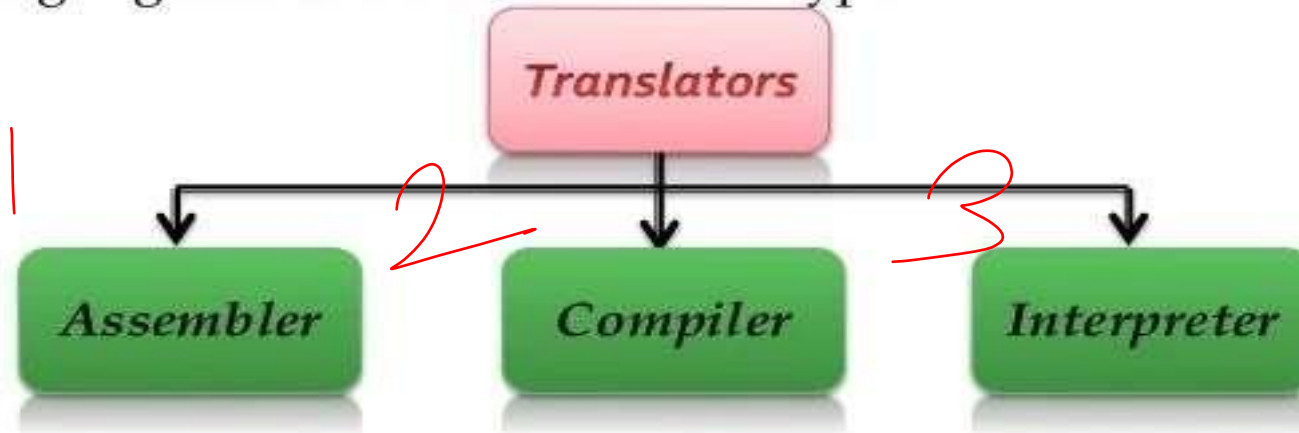
James Gosling
Vander Du Rossam

- Python:** Developed by Guido van Rossum in 1991, Python is a dynamic language with simple syntax and code that's popular for rapid application development.
- Java:** Developed by James Gosling in 1995, Java is a general-purpose language that's popular in both industry and academia.
- C++:** Developed by Bjarne Stroustrup in 1983.
- C** Developed by Dennis Ritchie in 1972.
- Visual Basic:** Developed by Alan Cooper and Bruce R. Martin in 1991.
- C#:** Created by Microsoft, C# is an object-oriented language that's popular for creating complex systems and large projects.
- Ruby:** Developed by Yukihiro Matsumoto in Japan, Ruby is a scripting language that's popular for full-stack web development.

Types of Language Translators

Language Processor

- Language translators convert programming source code into language that the computer processor understands.
- Programming source code has various structures and commands, but the computer processors understand only machine language.
- Language translators are of three types: -



What is a compiler?

- A compiler translates high-level languages into machine code .
- Compilers are generally used when **a program is finished** and has been checked for syntax errors
- Compiled code can be distributed (**creates an executable**) and run without the need for translation software
- If compiled code contains any errors, after fixing, it **will need re-compiling**

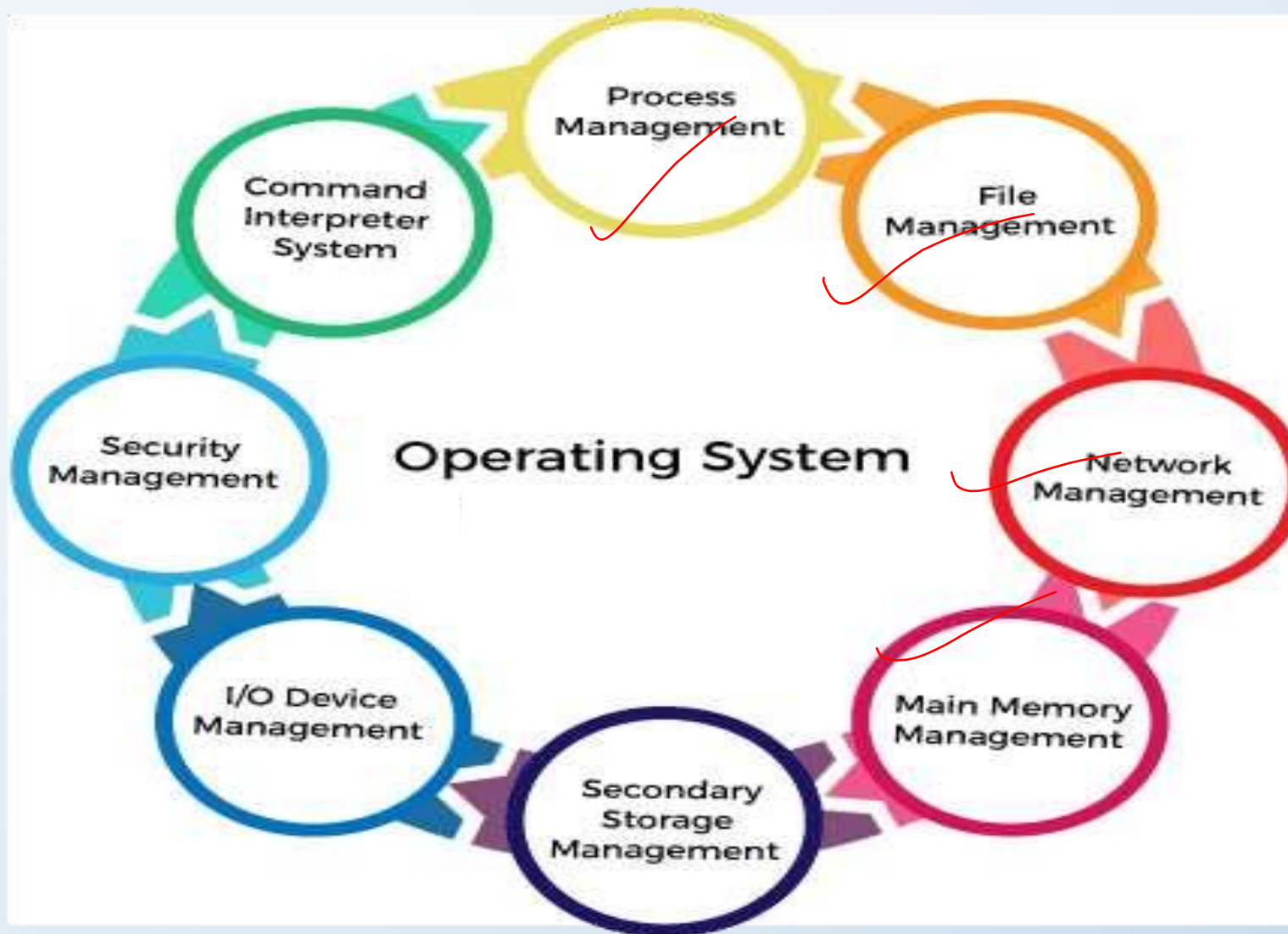
What is an interpreter?

- An interpreter translates high-level languages into machine code **one line at a time**.
- Each line is executed after translation and if **any errors are found**, the **process stops**.
- Interpreters are generally used when a program **is being written** in the development stage.

What is an OS ?

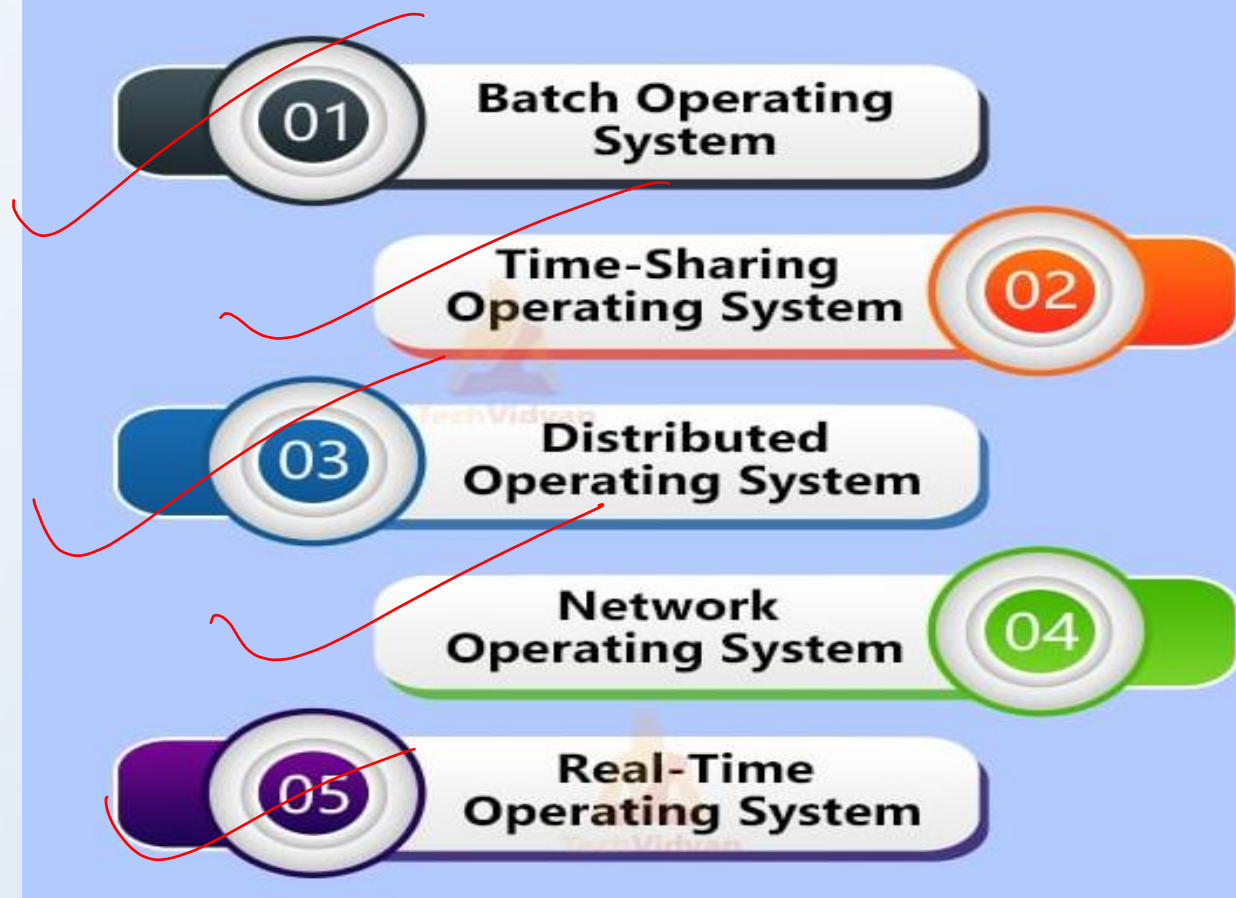
OS stands for operating system, which is the software that allows users to interact with their computers and smartphones. It manages the computer's hardware and software resources, and allows users to run applications and programs.

An operating system is the most important software that runs on a computer. It manages the computer's memory and processes, as well as all of its software and hardware. It also allows you to communicate with the computer without knowing how to speak the computer's language. Without an operating system, a computer is useless.





Types of Operating System



Types of OS



The batch operating system is a very lengthy and time-saving process. To speed up the same process, a job with the same type of requirements are combined and executed as a group. The user of a batch operating system doesn't have direct interaction with the computer.

Types of OS



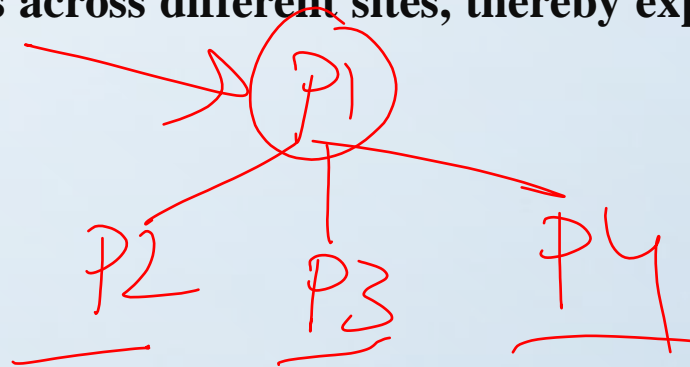
A time-sharing operating system (TSOS) is a type of operating system that allows multiple users to access and use a computer system at the same time. It's also known as a multitasking operating system. A multi-tasking operating system enables the people situated at a different terminal to access a single computer system simultaneously. The CPU's processor time is distributed among many users is called time-sharing.

Types of OS



↳ Multiprocessing

In a Distributed Operating System, multiple CPUs are utilized, but for end-users, it appears as a typical centralized operating system. It enables the sharing of various resources such as CPUs, disks, network interfaces, nodes, and computers across different sites, thereby expanding the available data within the entire system.



Types of OS



Networking operating system executes on a server that can serve and manages the data, groups, user, security, application and other networking functions. A network operating system (NOS) is a type of software that manages and controls a network's resources. It allows devices on a network to communicate with each other and share resources.



The military and Space software system is a real-time operating system that has minimum response time for fetching and executing the input commands.

Features of RTOS

- **Predictability:** RTOSs are predictable and deterministic, meaning that the time it takes to complete a task is known and the result is always the same.
- **Event-driven:** RTOSs monitor the priority of tasks and make changes to them.
- **Preemptive:** RTOSs switch between tasks based on their priorities.

What is Booting

Booting a computer is the process of starting a computer and loading its operating system (OS) into the computer's main memory. The term comes from the bootstrap tab on the back of a boot.

How it works

- The user turns on the computer by pressing the power button.
- The computer's bootloader in the cache memory receives power.
- The bootloader performs a Power On Self Test (POST).
- If the POST is successful, the Basic Input Output System (BIOS) is activated.
- The BIOS finds and loads the OS into the computer's main memory.
- The computer is now ready for users to run applications.

The two main types of booting are cold booting and warm booting:

- **Cold booting**

Also known as hard booting, this is when a computer is turned on after being completely off. It starts the boot sequence from scratch.

- **Warm booting**

Also known as soft booting or rebooting, this is when a computer is restarted while it's already on. It's used when the computer is unresponsive or hung up.

Wildcard characters :

Wildcard characters are special characters that can represent other characters in a search or pattern matching operation. They are used in computing and programming to search for or manipulate data, files, or text.

Examples of wildcard characters

- **Asterisk (*)**: Matches any number of characters
- **Question mark (?)**: Matches any single character
- **Hyphen (-)**: Matches a range of characters

a
abc
abc

a* ←

a? ←

Wildcard characters Use cases

- **File searches:** Wildcards can be used to find files without typing the full name
- **Search for similar items:** Wildcards can be used to find multiple items with similar data
- **Find and replace:** Wildcards can be used to find and replace multiple occurrences of a pattern
- **Conditional formatting:** Wildcards can be used in conditional formatting rules
- **Library databases:** Wildcards can be used to search for variable endings of a root word

When the computer is switched on, the booting process performs the _____.

- (a) Integrity Test**
- (b) Power-on self Test**
- (c) Correct functioning Test**
- (d) Reliability Test**

The operating system is the most common type of _____ software.

- (A) System
- (B) Communication
- (C) Application
- (D) None of the above

The following is not a programming language

- (A) C++**
- (B) JAVA**
- (C) Office Suite**
- (D) Fortran**



Thank You
See you next day