

UNIT-6: Computer Software

Contents: *Introduction, Types of Software, System Software, Application Software, Software Acquisition, Operating System (Introduction, Objectives of Operating System, Types of OS, Functions of OS, Process Management, Memory Management, File Management, Device Management, Protection and Security, User Interface, Examples of Operating Systems).*

Hardware

Computer Hardware:

- Hardware refers to the physical components of a computer.
- Computer Hardware is any part of the computer that we can touch these parts.
- These are the primary electronic devices used to build up the computer. Examples of hardware in a computer are the Processor, Memory Devices, Monitor, Printer, Keyboard, Mouse, and the Central Processing Unit.

Software

Computer Software:

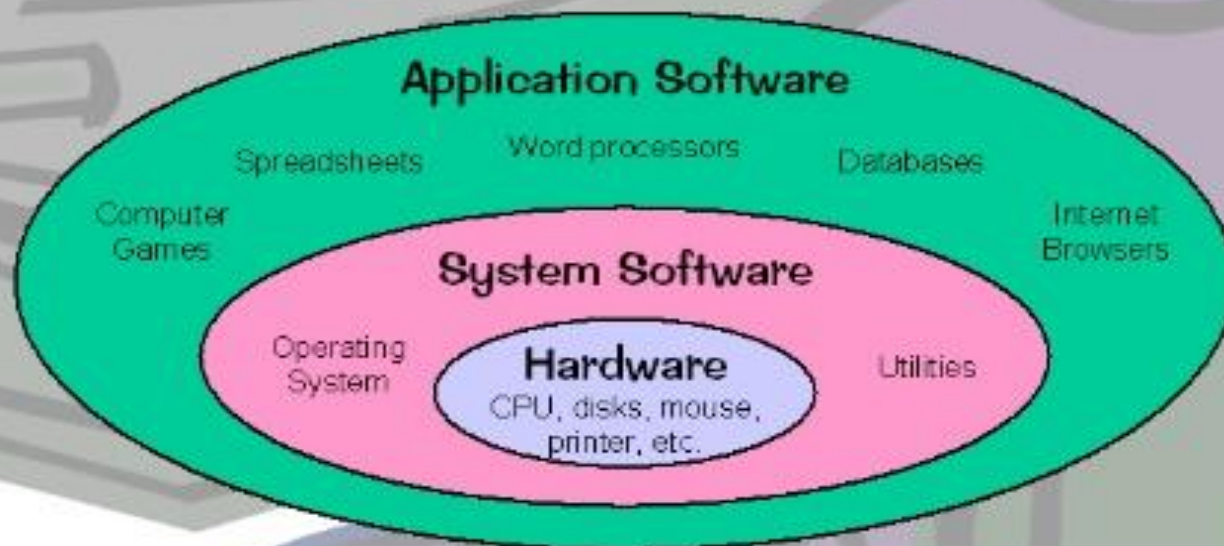
- Software is a collection of instructions, procedures, documentation that performs different tasks on a computer system.
- we can say also Computer Software is a programming code executed on a computer processor.
- The code can be machine-level code or the code written for an operating system. Examples of software are Ms Word, Excel, Power Point, Google Chrome, Photoshop, MySQL etc.

Hardware	Software
Hardware is a physical parts computer that cause processing of data.	Software is a set of instruction that tells a computer exactly what to do.
It is manufactured.	It is developed and engineered.
Hardware can not perform any task without software.	software can not be executed without hardware.
As Hardware are physical electronic devices, we can see and touch hardware.	We can see and also use the software but can't actually touch them.
It has four main categories: input device, output devices, storage, and internal components.	It is mainly divided into System software, Programming software and Application software.

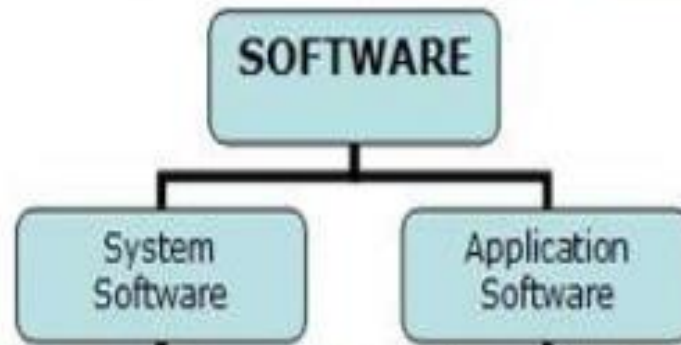
Hardware	Software
Hardware is not affected by computer viruses.	Software is affected by computer viruses.
It can not be transferred from one place to another electrically through network.	But, it can be transferred.
If hardware is damaged, it is replaced with new one.	If software is damaged, its backup copy can be reinstalled.
Ex: Keyboard, Mouse, Monitor, Printer, CPU, Hard disk, RAM, ROM etc.	Ex: Ms Word, Excel, Power Point, Photoshop, MySQL etc.

What is Software?

*The term Software refers to a set of Computer programmes, procedures and associated documents describing the programs , and how they are to be used .



TYPES OF SOFTWARE



- Although, the range of software available today is vast and varied, we classify most software into two categories:-
 1. System Software
 2. Application Software

A stylized illustration of a person with brown hair in a bun, wearing a purple long-sleeved shirt, sitting at a desk and using a computer. The computer monitor is light blue and displays vertical bars. The person's hands are on a keyboard. The background is white.

System Software

- * System Software includes the Operating System and all the utilities that enable the computer to function.
- * **System software** is a term referring to any computer software which manages and controls the hardware so that application software can perform a task.

*Example:

Operating Systems, Compiler, Loader, Linker, Interpreter.

Application Software

- * Application Software is a set of one or more programs, which solves a specific Task.
- * Application Software includes programs that do real work for a user.

***Example:**

Payroll systems, Inventory Control, Manage student database, Word Processor, Spreadsheet and Database Management System etc.,

Types of system software

- * Operating Software
- * Language Translators
- * Communication Software
- * Utility Software

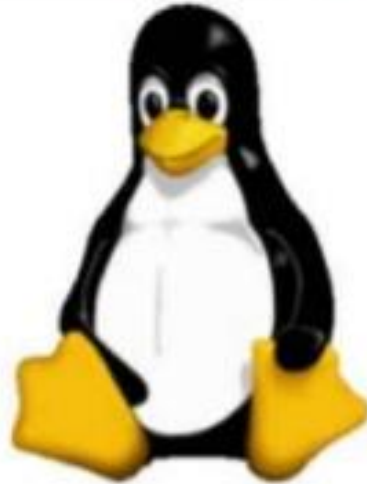


Operating System

A faint, stylized illustration of a person with brown hair tied in a bun, wearing a purple shirt, sitting at a desk and looking at a computer monitor. The monitor displays a blue screen with vertical bars. The person's hands are on a keyboard.

- * Operating System is a software, which makes a computer to actually work.
- * It is the software that enables all the programs we use.
- * The OS organizes and controls the hardware.
- * OS acts as an interface between the application programs and the machine hardware.
- * Examples: Windows, Linux, Unix and Mac OS, etc.,

Examples of Operating Software



Language translators

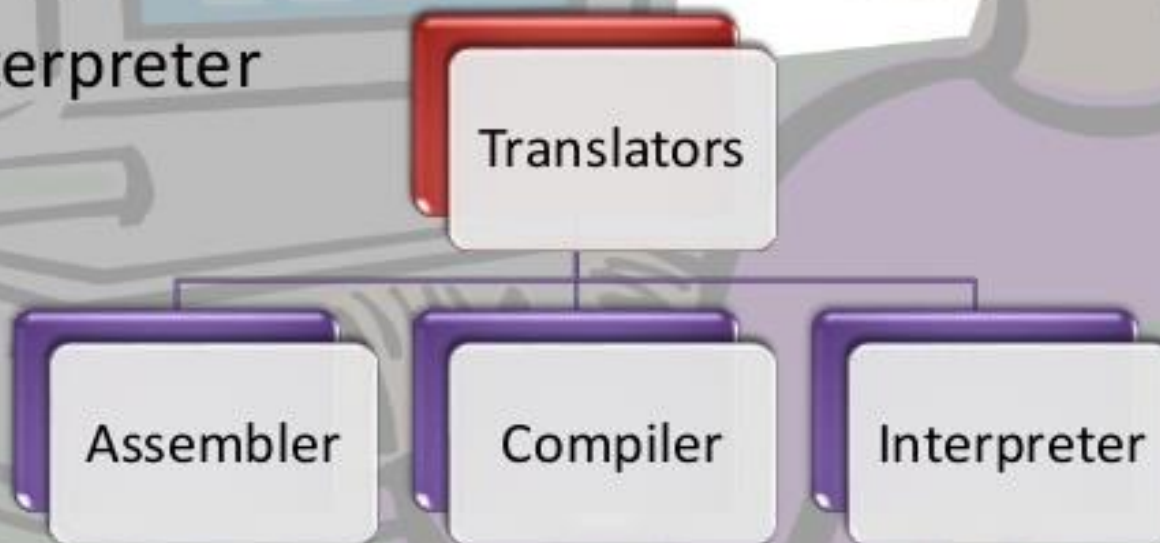
- * Language translators is a program that translates a set of instruction code to machine level language.



- * For a Machine, it is not possible to understand the natural language, so translators convert it into machine code.

Examples of Language Translators

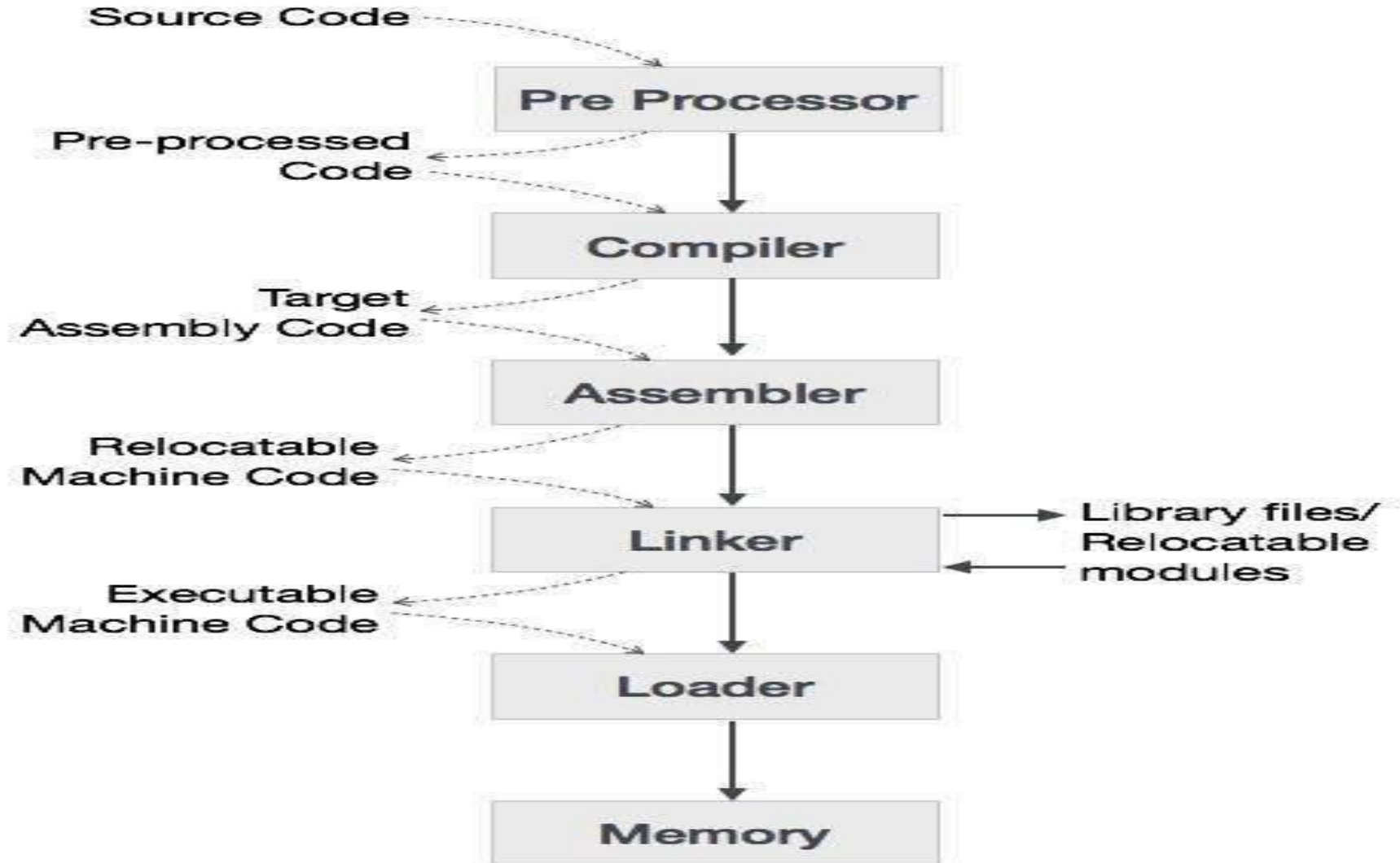
- There are 3 types of Language translators:-
 1. Assembler
 2. Compiler
 3. Interpreter



Language Translator

- A **translator** is a programming language processor that converts a **computer** program from one language to another.
- It takes a program written in source code and converts it into machine code.
- The hardware understands a language, which humans cannot understand. So we write programs in high-level language, which is easier for us to understand and remember.
- These programs are then fed into a series of tools and OS components to get the desired code that can be used by the machine.
- This is known as Language Processing System.

Language Processing System



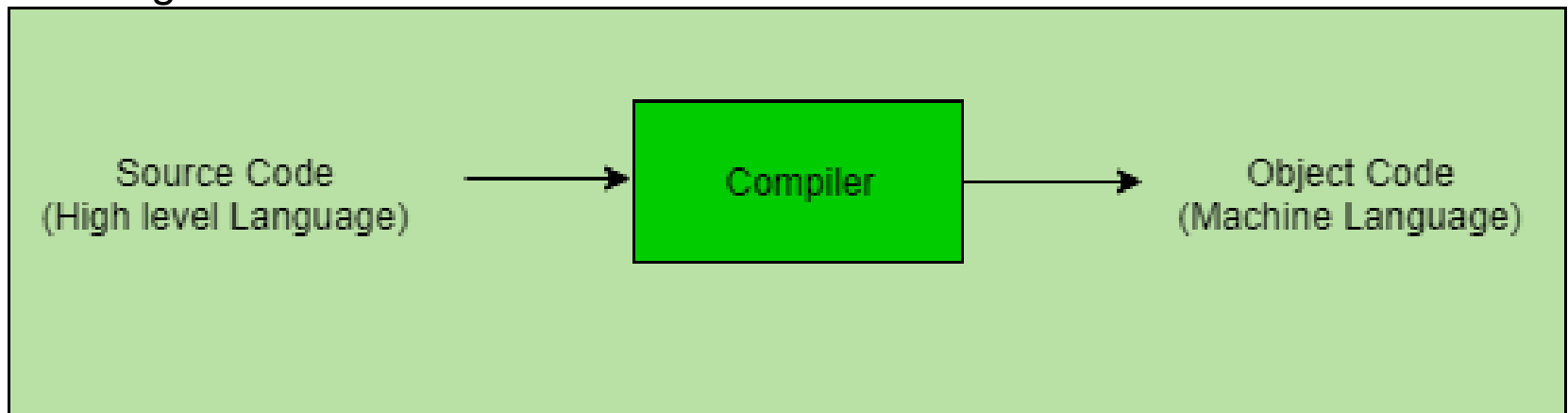
Language Translator Cont..

Compiler

The language processor that reads the complete source program written in high level language as a whole in one go and translates it into an equivalent program in machine language is called a Compiler.

Example: C, C++, C#, Java

- In a compiler, the source code is translated to object code successfully if it is free of errors. The compiler specifies the errors at the end of compilation with line numbers when there are any errors in the source code. The errors must be removed before the compiler can successfully recompile the source code again.>

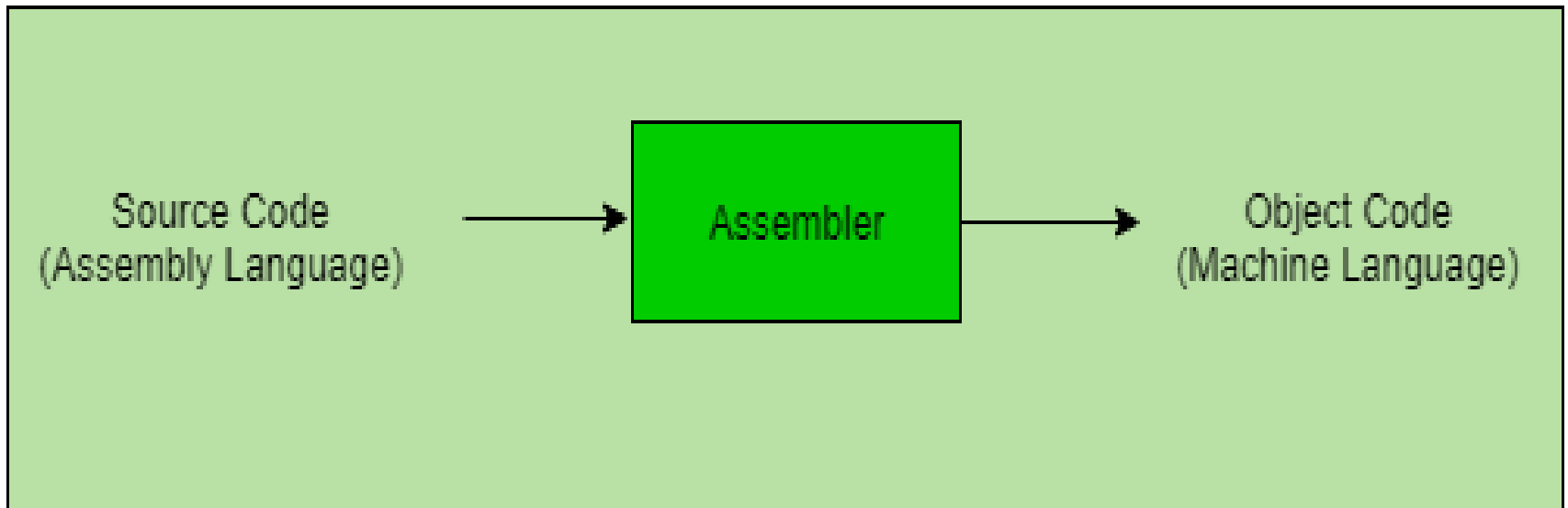


Language Translator Cont..

- **Assembler**

The Assembler is used to translate the program written in Assembly language into machine code.

- The source program is a input of assembler that contains assembly language instructions.
- The output generated by assembler is the object code or machine code understandable by the computer.



Language Translator Cont..

- **Interpreter**

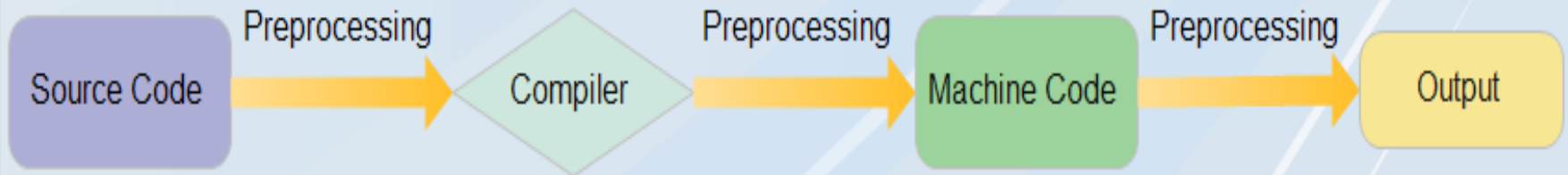
The translation of single statement of source program into machine code is done by language processor and executes it immediately before moving on to the next line is called an interpreter.

- If there is an error in the statement, the interpreter terminates its translating process at that statement and displays an error message.
- The interpreter moves on to the next line for execution only after removal of the error.
- An Interpreter directly executes instructions written in a programming or scripting language without previously converting them to an object code or machine code.

Example: Perl, Python and Mat lab.

Language Translator Cont..

How Compiler Works



How Interpreter Works



Difference between Compiler and Interpreter –

Compiler	Interpreter
A compiler is a program which converts the entire source code of a programming language into executable machine code for a CPU.	Interpreter takes a source program and runs it line by line, translating each line as it comes to it.
Compiler takes large amount of time to analyze the entire source code but the overall execution time of the program is comparatively faster.	Interpreter takes less amount of time to analyze the source code but the overall execution time of the program is slower.
Compiler generates the error message only after scanning the whole program, so debugging is comparatively hard as the error can be present any where in the program.	Its Debugging is easier as it continues translating the program until the error is met
Generates intermediate object code.	No intermediate object code is generated.
Examples: C, C++, Java	Examples: Python, Perl

Language Translator Cont..

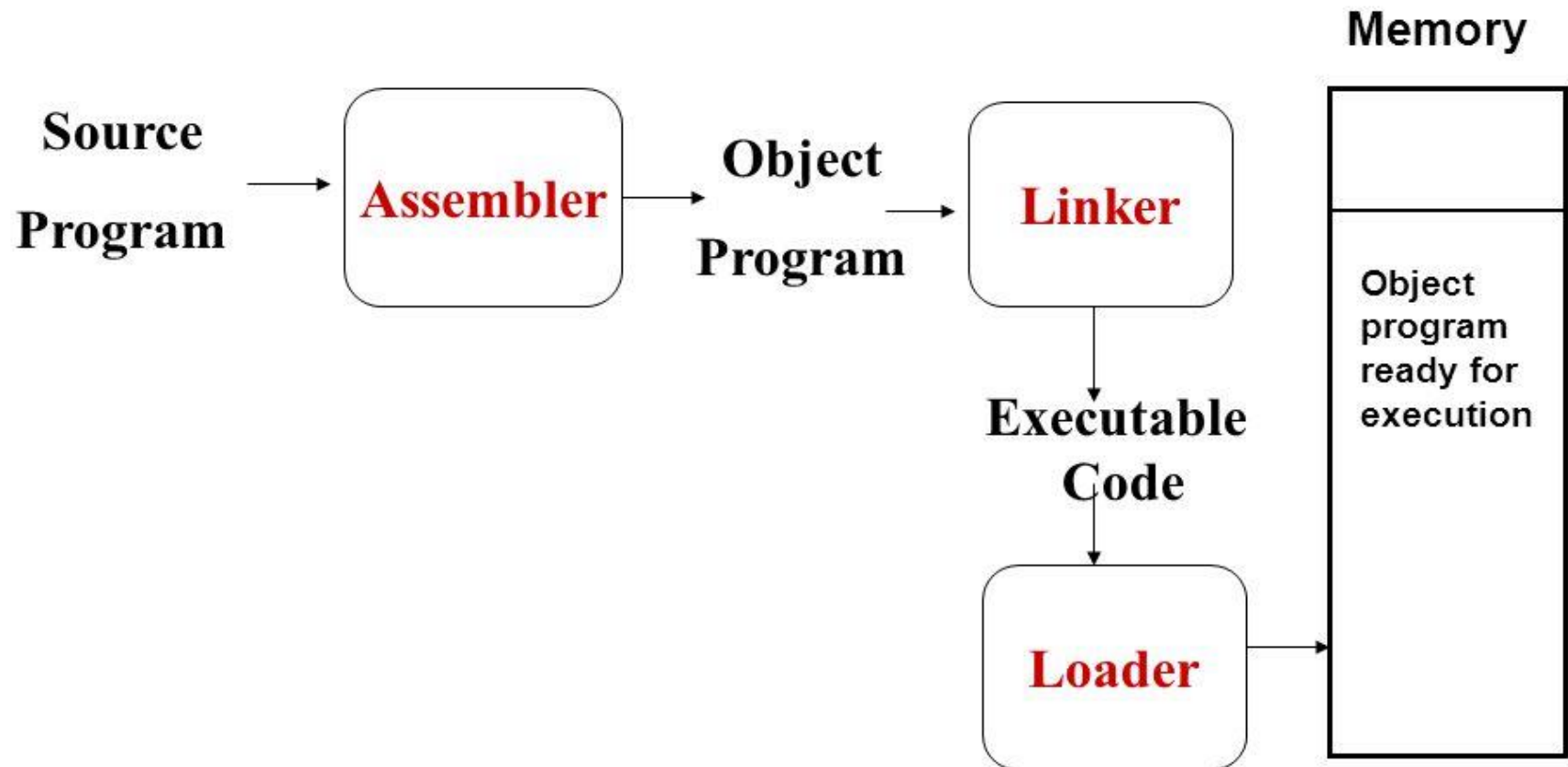
Linker

- Linker is a computer program that links and merges various object files together in order to make an executable file.
- All these files might have been compiled by separate assemblers.
- The major task of a linker is to search and locate referenced module/routines in a program and to determine the memory location where these codes will be loaded, making the program instruction to have absolute references.

Loader

- Loader is a part of operating system and is responsible for loading executable files into memory and execute them.
- It calculates the size of a program (instructions and data) and creates memory space for it.
- It initializes various registers to initiate execution.

Role of Loader and Linker



Programming Software

- **Programming software** is a **software** which helps the **programmer** in developing other **software**.
- It includes tools in form of programs or applications that software developers take in use to create, debug, maintain and support other programs and applications. Compiler, debugger, interpreter, linker and text editor are the parts programming software.
- Compilers, assemblers, debuggers, interpreters etc. ... Integrated development environments (IDEs) are combinations of all these **software**.
- **Programming software** is also known as **programming tool** or **software development tool**.

Programming Software Cont...

1. Compiler

- They convert high level language program into low level language program.

2. Assembler

- They convert assembly language program into low level language programs.

3. Interpreter

- It processes high level language line by line and simultaneously produce low level programs.

4. Linker

- Most low-level language allow the developer to develop large program containing multiple modules.
- Linker arranges the object code of all the modules that have been generated by the language translator into single program.

Programming Software Cont...

5. Debugger

- It is a software that is used to detect the errors and bugs in programs.
- It locates the position of errors in the program codes.

6. Text editor

- It is a program that allows user to work with texts in a computer system.
- It is used for documentation purpose and enables us to edit information present in existing document or file.
- Example: C, C++, C#, BASIC, Java, Python, etc.

Communication Software

- Communication Software is used to provide remote access to systems and exchange files and messages in text , audio or video formats b/w different computers.



COMMUNICATION SOFTWARE



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TEAM COMMUNICATION SOFTWARE IS USED FOR



**Instant
Messaging**



**Video
Conferencing**



**Document
Sharing**



**Online
Training**

Utility Software

- **Utility software** is software designed to help to analyze, configure, optimize or maintain a computer.
- Utility software usually focuses on how the computer infrastructure operates.
- It is used to support the computer [infrastructure](#) - in contrast to [application software](#), which is aimed at directly performing tasks that benefit ordinary users.

Utility Software Example



What are types of utility software?

- File Viewer.
- File Compressor.
- Diagnostic Utilities.
- Disk Scanner.
- Antivirus.
- **Disk Defragmenter.**
- Backup Utility.
- Data Recovery Utility.

Types of Application software

1. General Purpose Application Software
2. Specific Purpose Application Software



General purpose Application Software

- General Purpose software is intended to perform a broader class of functions.
- You can use these softwares for more purposes but limited capabilities for each purpose
- Ex:- Word processing, spreadsheet, Desktop publishing(DTP), Graphics packages etc.

Examples of General Purpose

Word Processors

- Word processors can handle every form of writing, aside from calligraphy.



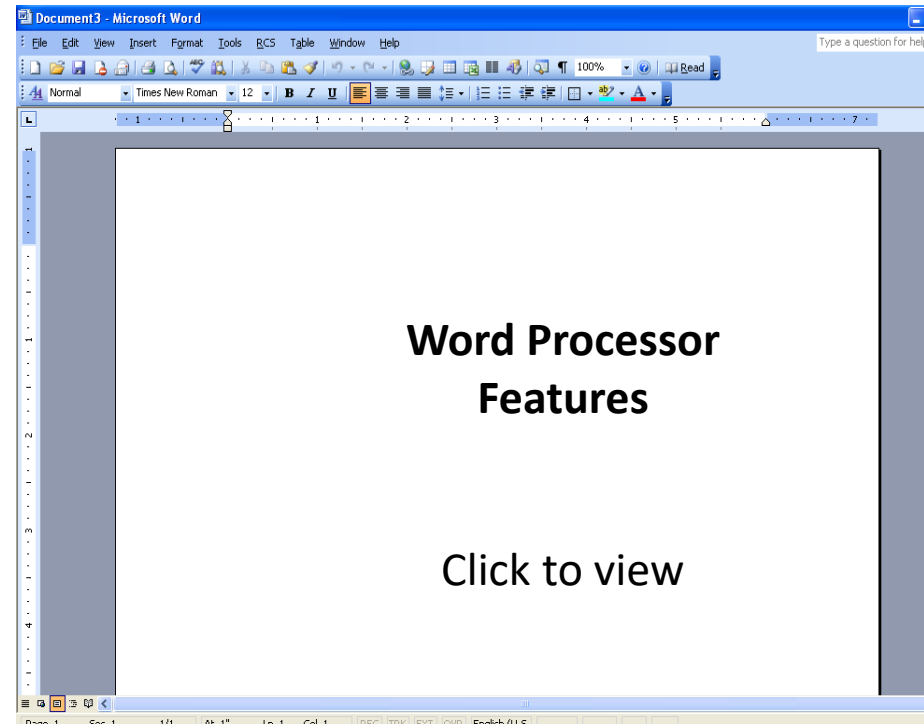
Spreadsheet Programs

- Spreadsheet Programs like Excel handle a significant portion of data processing problems.



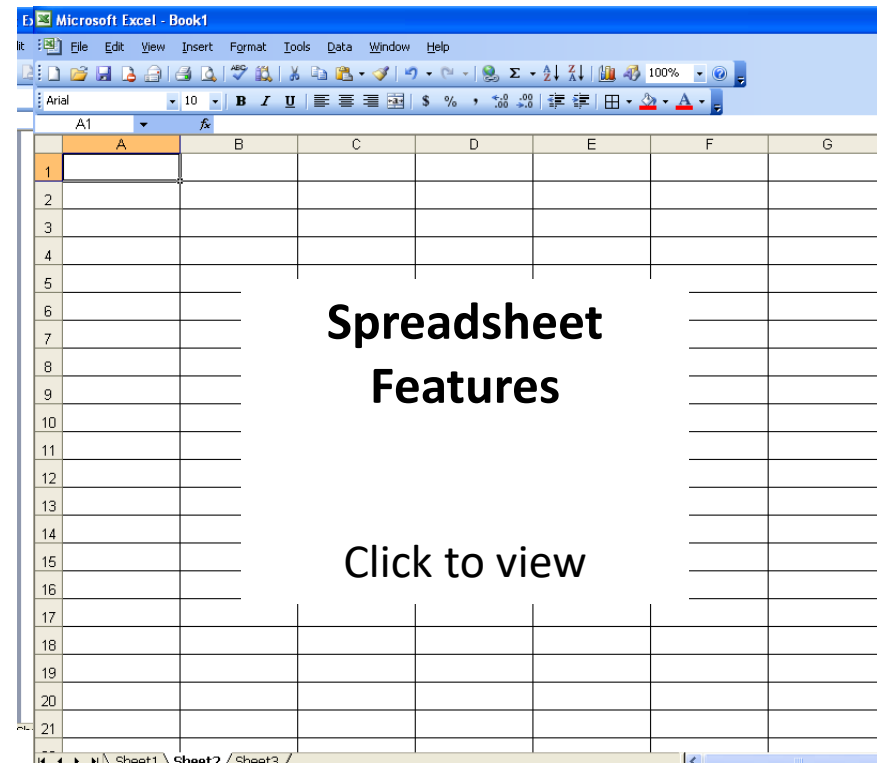
Word Processing Software

- Used to create and edit written documents
- Features include
 - Quick and easy editing
 - Variety of formatting options
 - Graphics
 - Templates
- Examples
 - Corel WordPerfect
 - Microsoft Word



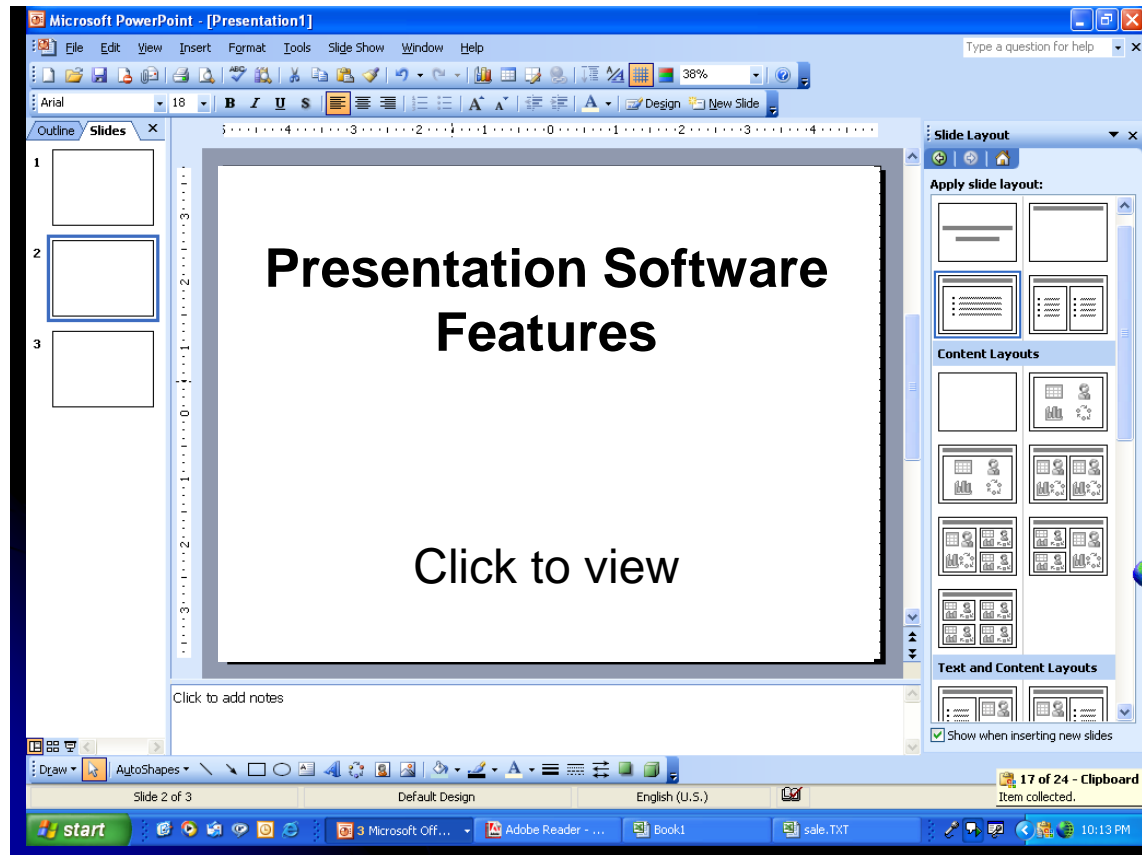
Spreadsheet Software

- Used to perform calculations and numerical analyses
- Features include
 - Worksheets with cells
 - Values, formulas, and functions
 - Automatic recalculation
- Examples
 - Lotus 1-2-3
 - Microsoft Excel



Presentation Software

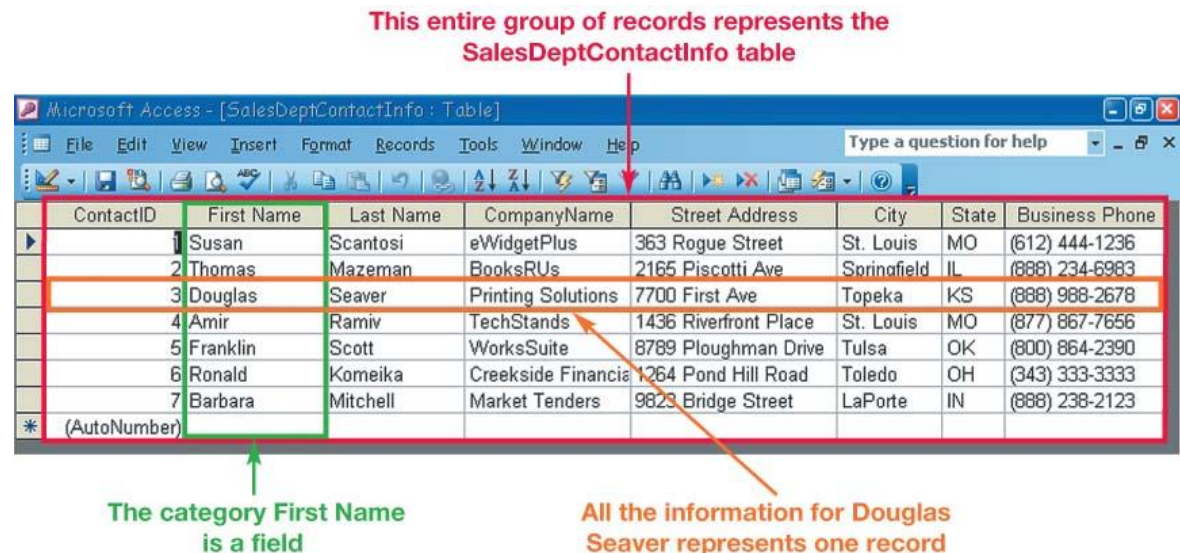
- Used to create slide shows
- Features include
 - Templates and layouts
 - Different views
- Examples
 - Corel Presentations
 - Microsoft PowerPoint



Database Software

- Used as a complex electronic filing system
- Features include
 - Ability to group, sort, and retrieve data and generate reports
 - Organized into fields, records, and tables
- Examples
 - Corel Paradox
 - Microsoft Access

This entire group of records represents the SalesDeptContactInfo table



ContactID	First Name	Last Name	CompanyName	Street Address	City	State	Business Phone
1	Susan	Scantosi	eWidgetPlus	363 Rogue Street	St. Louis	MO	(612) 444-1236
2	Thomas	Mazeman	BooksRUs	2165 Piscotti Ave	Springfield	IL	(888) 234-6983
3	Douglas	Seaver	Printing Solutions	7700 First Ave	Topeka	KS	(888) 988-2678
4	Amir	Ramiv	TechStands	1436 Riverfront Place	St. Louis	MO	(877) 867-7656
5	Franklin	Scott	WorksSuite	8789 Ploughman Drive	Tulsa	OK	(800) 864-2390
6	Ronald	Komeika	Creekside Financia	1264 Pond Hill Road	Toledo	OH	(343) 333-3333
7	Barbara	Mitchell	Market Tenders	9823 Bridge Street	LaPorte	IN	(888) 238-2123
*	(AutoNumber)						

The category First Name is a field

All the information for Douglas Seaver represents one record

Specific Purpose Application Software

- Software which is designed to carry out a specific set of tasks, usually in line with the requirements of a paying customer.
- You can use these softwares for less purposes but with greater capabilities for each purpose.
- Ex:-Web Browser, Media players, calender Programs etc.

Examples of specific Purpose

Web Browser

- A web browser is a specific purpose application software for retrieving , presenting ,an traversing informatio resources on the world wide web.



Media Player

- A media player is a specific Purpose application software for playing multimedia files like video movies and music.



Operating Systems

- Most important programs that run on a computer.
- It perform basic tasks,
 - such as recognizing input from the keyboard,
 - sending output to the display screen,
 - keeping tracks of files and directories on the disk
 - controlling peripheral devices such as disk drives and printers.
- Most commonly used operating systems :
 - Microsoft Windows, DOS, Xenix, Mac OS, OS/2, UNIX, MVS, etc

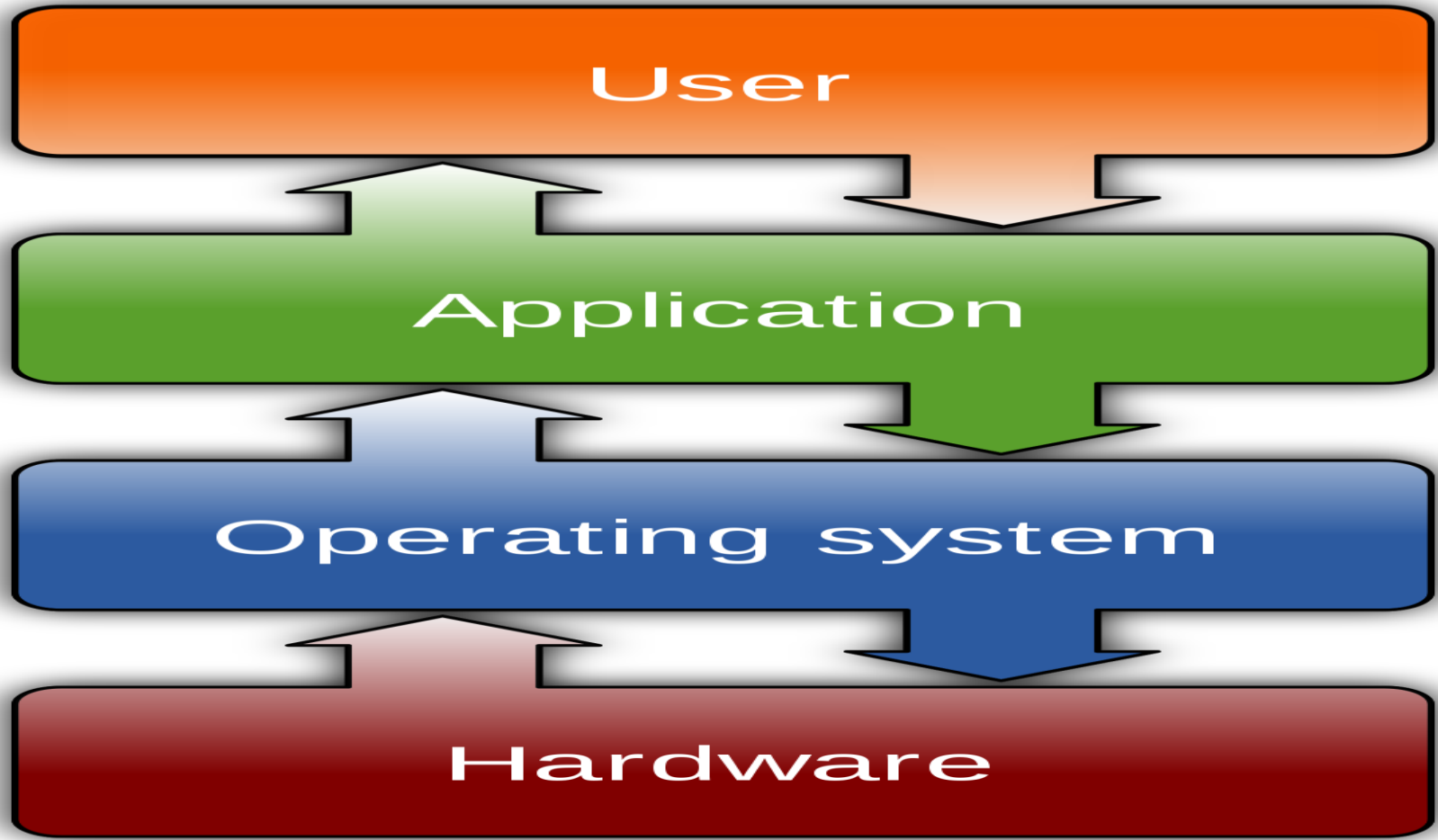
Operating system Cont...

- An operating system (OS) is a collection of software that manages computer hardware resources and provides common services for computer programs.
- The operating system is a vital component of the system software in a computer system.
- An operating system is a software that makes the computer hardware to work while the computer hardware provides 'raw computer power', the operating system is responsible for making computer more useful for users.
- The operating system provides an interface for users to communicate with computer.
- It also manages the use of hardware, resources and enables proper implementation of application programs.
- In short, the operating system is the master of control program of a computer.

Why to Learn Operating System?

- An Operating System (OS) is an interface between a computer user and computer hardware.
- An operating system is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
- Some popular Operating Systems include Linux Operating System, Windows Operating System, etc.

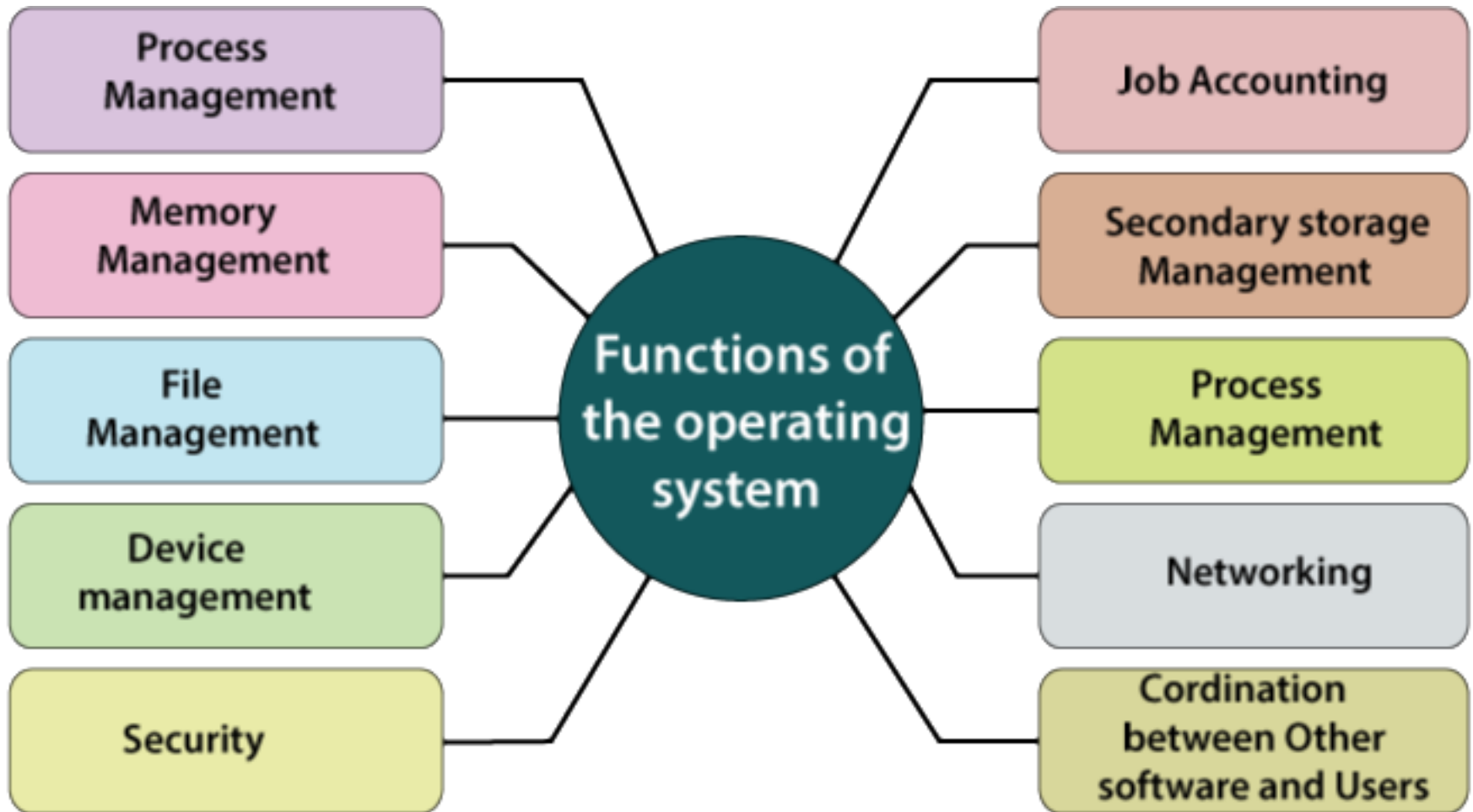
Operating System Cont.. How IS IT?



Functions of Operating System

- The main function of operating system is to manage the resources such as memory and files of the computer system.
- The operating system also resolved the conflicts that arises when two users or programs request the same resources at the same time.
- Therefore it is also called resource manager of computer.
- Some of the important functions of operating system are:

Function of operating system



Functions of Operating System

Following are some of important functions

- Memory Management
- Processor Management
- Device Management
- File Management
- Security
- Control over system performance
- Job accounting
- Error detecting aids
- Coordination between other software and users

Memory Management

- Memory management refers to management of Primary Memory or Main Memory.
- Main memory is a large array of words or bytes where each word or byte has its own address.
- Main memory provides a fast storage that can be accessed directly by the CPU. For a program to be executed, it must in the main memory.

Memory Management Cont..

- An Operating System does the following activities for memory management –
- Keeps tracks of primary memory, i.e., what part of it are in use by whom, what part are not in use.
- In multiprogramming, the OS decides which process will get memory when and how much.
- Allocates the memory when a process requests it to do so.
- De-allocates the memory when a process no longer needs it or has been terminated.

Processor Management

- In multiprogramming environment, the OS decides which process gets the processor when and for how much time.
- This function is called **process scheduling**.
- An Operating System does the following activities for processor management –
 - Keeps tracks of processor and status of process.
 - The program responsible for this task is known as **traffic controller**.
 - Allocates the processor (CPU) to a process.
 - De-allocates processor when a process is no longer required.

Device Management

- An Operating System manages device communication via their respective drivers.
- It does the following activities for device management :
 - Keeps tracks of all devices.
 - Program responsible for this task is known as the **I/O controller**.
 - Decides which process gets the device when and for how much time.
 - Allocates the device in the efficient way.
 - De-allocates devices.

File Management

- A file system is normally organized into directories for easy navigation and usage. These directories may contain files and other directions.
- An Operating System does the following activities for file management –
 - Keeps track of information, location, uses, status etc. The collective facilities are often known as **file system**.
 - Decides who gets the resources.
 - Allocates the resources.
 - De-allocates the resources.

Other Functions of OS cont...

- **Security** – By means of password and similar other techniques, it prevents unauthorized access to programs and data.
- **Control over system performance** – Recording delays between request for a service and response from the system.
- **Job accounting** – Keeping track of time and resources used by various jobs and users.
- **Error detecting aids** – Production of dumps, traces, error messages, and other debugging and error detecting aids.
- **Coordination between other software's and users** – Coordination and assignment of compilers, interpreters, assemblers and other software to the various users of the computer systems.

Other Functions of OS cont...

- **Job Management:**
 - OS manages the jobs waiting to be processed.
- **Batch Processing:**
 - Data are accumulated and processed in groups.
 - Most of the tasks of OS are grouped and performed one by one.
- **On-line Processing:**
 - Data are processed instantaneously.
 - Most on-line operating systems have multi-user and multitasking capabilities.
- **Data Management:**
 - OS manages the storage and retrieval of data.

Other Functions of an OS Cont...

- **Virtual Storage:**

- Using this method the capacity of main memory increases without actually increasing its size.
- This is done by breaking a job into sequences of instructions, called pages or segments, and keeping only a few of these in main memory at a time; the remaining are kept on secondary storage devices

- **Input/ Output Management:**

- OS manages the input to and output from a computer system. This applies to the flow of data among computers, terminals, and other devices such as printers.
- Application programs used the operating system extensively to handle input and output devices as needed.

Types of Operating System

- Based on the capabilities and the types of application supported, operating system can be divided into six major categories viz.

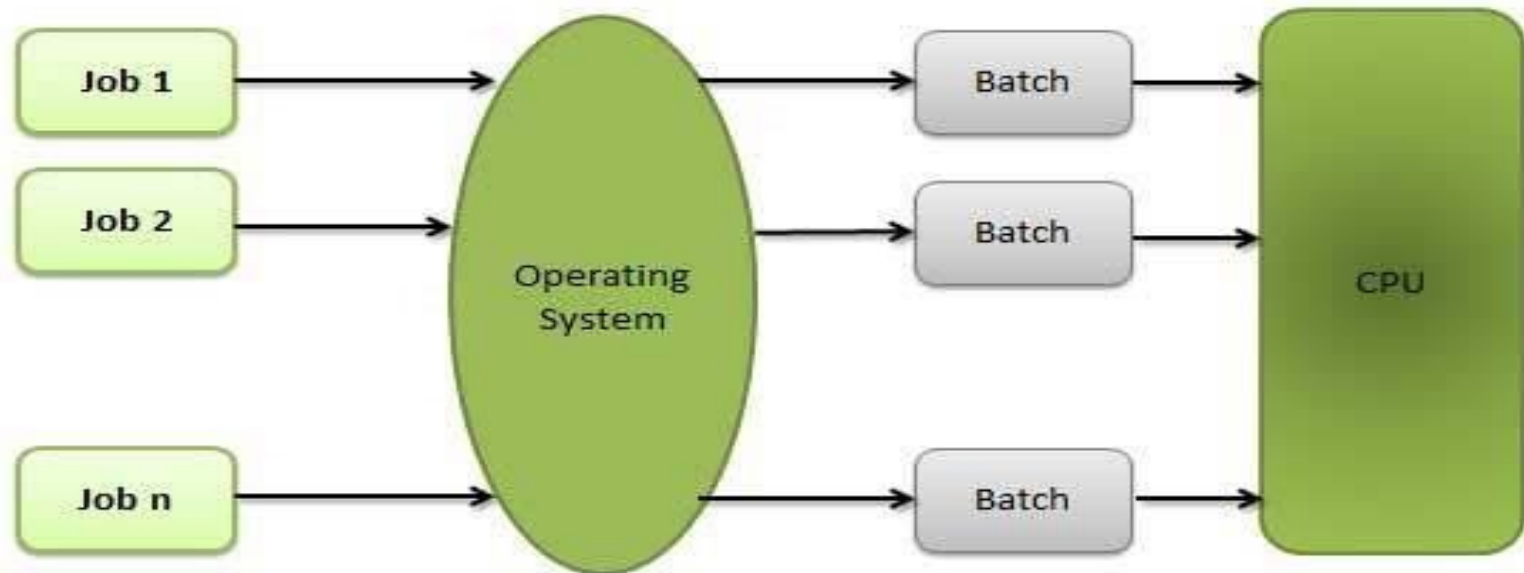
1. Batch Processing Operating System

- They are capable of executing only one job at a time.
- The jobs a program submitted by different users are grouped into batches and one batch of job is provides as input to the computer system at a time.
- The jobs in the batch are processed on first come first serve basis.
- After execution of one job is completed the operating system automatically fetches the next job from the batch without any human intervention.

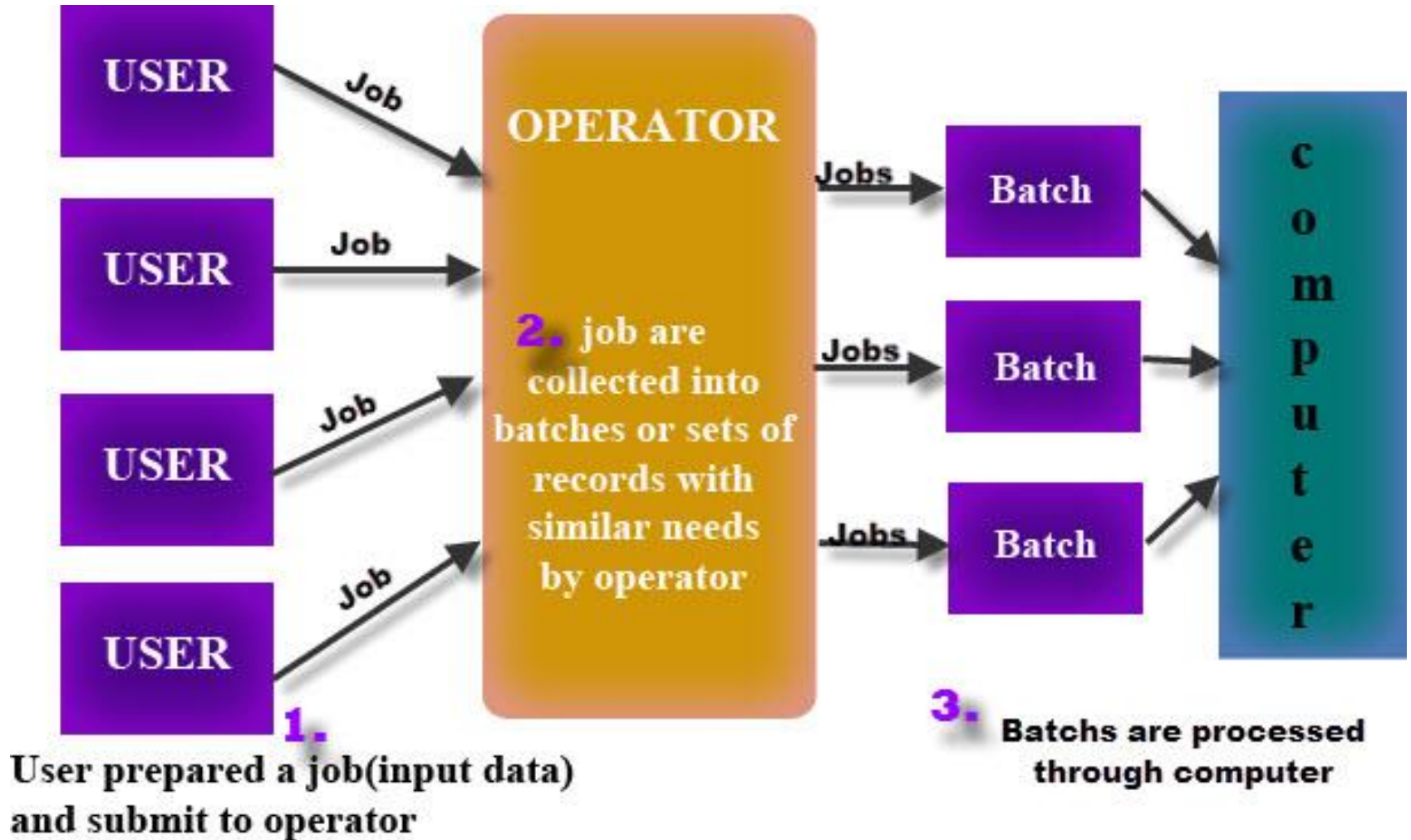
Types of Operating System

1. Batch Processing Operating System Cont...

Examples: Payroll **System**, Bank Statements, etc. Each task is given some time to execute so that all the tasks work smoothly. Each user gets the time of CPU as they use a single **system**.



Types of Operating System Cont..



Types of Operating System Cont..

1. Batch Processing Operating System Cont..

Advantages:

- a) They were very efficient in their time as idle time for these computers are very less.
- b) The OS facilitates execution of jobs in organized manner.

Disadvantages:

- a) Jobs are processed only in the order they are placed and not per user's priority.
- b) Debugging of a program at execution is not possible.
- c) Lack of interaction between the user and the job.
- d) CPU is often idle, because the speed of the mechanical I/O devices is slower than the CPU.
- e) Difficult to provide the desired priority.

Types of Operating System Cont..

2. Multi user Operating System

- The multi user operating system enables multiple users to use the resource of a computer system at the same time.
- It allows number of users to work simultaneously on the same computer.
- It is an **operating system** that permits several **users** to utilize the programs that are concurrently running on a single network server.
- The single network server is termed as "Terminal server". "Terminal client" is a software that supports **user** sessions.
- Examples include UNIX, MVS, etc.

Types of Operating System Cont..

2. Multi user Operating System Cont..

- It is usually implemented by following multi terminal configuration.
- In the configuration, a single powerful computer is connected to multiple terminals through serial ports.
- The computer system is responsible for processing different requests generated by various terminals at a time.
- Control computer is equipped with fast processor and a memory of large capacity for catering to multiple requests of end-users.
- Example : Linux, Unix, VM-386, etc.

Types of Operating System Cont..

2. Multi user Operating System Cont..

Advantages

- a) Allows resources of computer to be utilized in efficient manner.
- b) It enhances the overall productivity of various users by providing simultaneous access to various computer resources.

Disadvantages

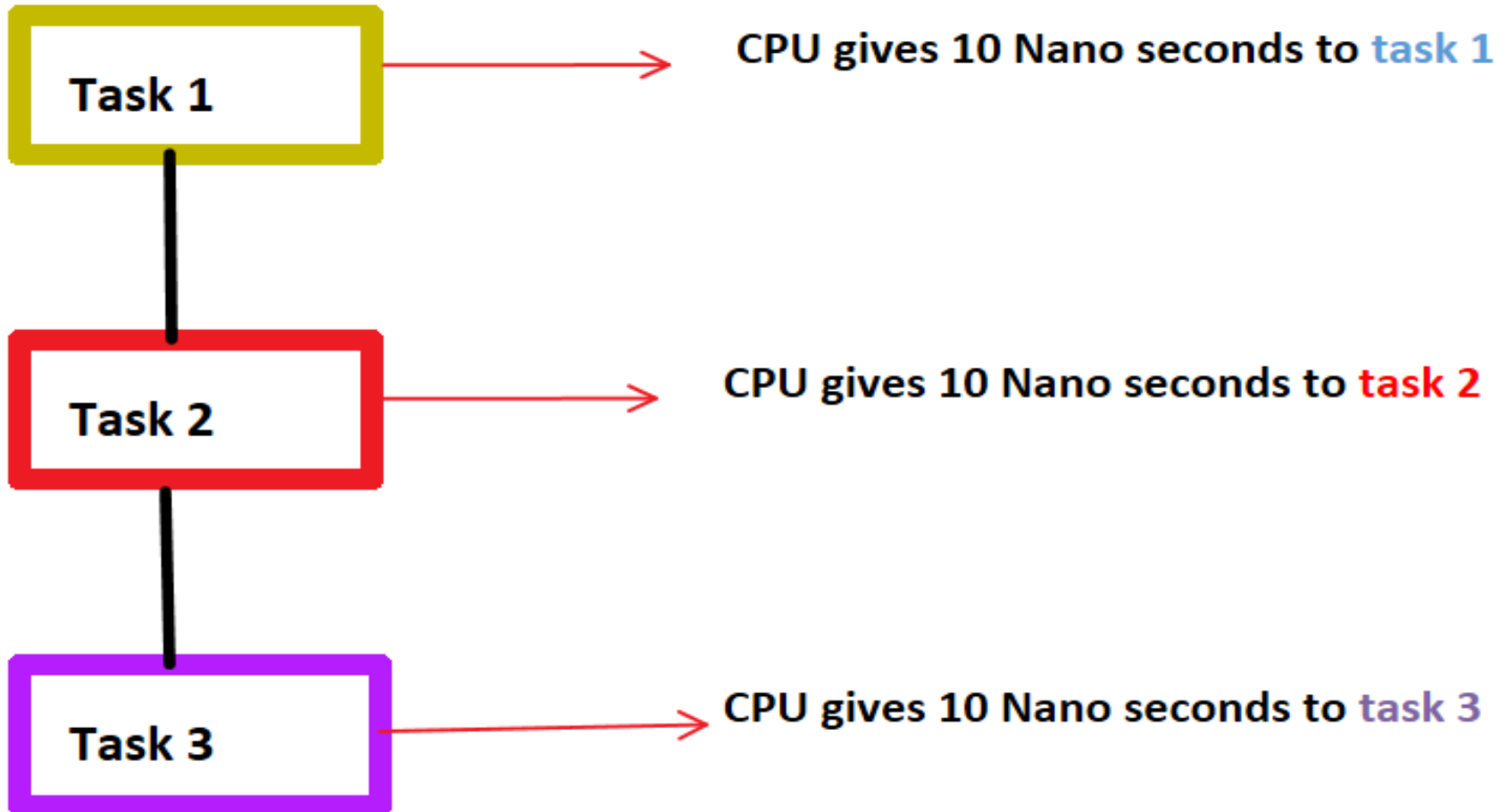
- a) It is complex and hence difficult to handle and maintain.
- b) It may result in inconsistent data if activities of a user aren't protected from other users.
- c) It is required to have robust security mechanism.

Types of Operating System Cont..

3. Multitasking Operating System

- Multitasking operating system allow user to carry out multiple tasks at the same time on a single computer system.
- The multitasking OS are also known as several other names such as multi-processing, multi-programming, concurrent, or process scheduling operating system.
- In this type of operating system, different processes are executed simultaneously by implementing the concept of time slicing.
- According to this concept, a regular slice of CPU time is provided to each of the processes running in the computer system.

Types of Operating System Cont..



Multi-Tasking In Operating System

Types of Operating System Cont..

3. Multitasking Operating System Cont..

- It can be of two types, viz.
 - a) Preemptive Multitasking Operating System
 - In this OS, slice of CPU time is allocated on some priority basis.
 - b) Co-operative Multitasking Operating System
 - In this OS, time slices of CPU are assigned to the process depending on whether or not to give up CPU control for other running processes.
 - Example: UNIX, Windows 2000, Linux, Windows XP.

Types of Operating System Cont..

3. Multitasking Operating System Cont..

Advantages:

- a) It helps in increasing the overall performance of the system.
- b) It helps in increasing overall productivity of user by performing number of tasks at the same time.

Disadvantages

- a) Large amount of memory is required to execute several programs at a time.
- b) Some mechanisms need to be implemented to ensure that the activity of one process do not interfere with the activities of other processes.

Types of Operating System Cont..

4. Real time Operating System

- A **real-time operating system (RTOS)** is an **operating system (OS)** intended to serve **real-time** applications that process data as it comes in, typically without buffer delays. Processing **time** requirements (including any **OS** delay) are measured in tenths of seconds or shorter increments of **time**.
- A **real-time operating system (RTOS)** is an **operating system** that guarantees a certain capability within a specified **time** constraint.
- For **example**, an **operating system** might be designed to ensure that a certain object was available for a robot on an assembly line.

Types of Operating System Cont..

4. Real- time Operating System Cont..

- The real-time operating system is similar to multi-tasking operating system in their functionality. However, these OS are specially designed and developed for handling real time applications or embedded applications.
- The real time applications are those critical application that are required to be executed within a specific period of time.
- Example of real time applications are; industrial robots, space-crafts, industrial control applications.
- It is of two types, viz.
 - a) Hard Real- time OS
 - It is a type of OS where it is necessary to perform a task in a specified amount of time.
 - b) Soft Real-time OS
 - In Soft Real-time OS, a task can be performed even after its allocated time has elapsed.

Types of Operating System Cont..

4. Real- time Operating System Cont...

Advantages:

- a) It is easy to design, develop and execute real-time application under real-time OS.
- b) It is usually more compact as compared to other operating system hence requires less memory.

Disadvantages:

- a) It is primarily focused on optimizing the execution time of an application and thus it sometimes overlooks some of other critical factor related to overall efficiency of the computer system.
- b) It is used only for providing some dedicated functionality and cannot be used as a general-purpose OS.

Types of Operating System Cont..

5. Multiprocessor Operating System

- Multiprocessor OS allow the use of multiple CPUs in a computer system for execution of multiple processes at the same time.
- The processes are executed faster compared to single processor.
- Example: Linux, UNIX, Windows 2000, etc.

Advantages

- a) It helps in improving the overall efficiency and through put of a computer system.
- b) It helps in increasing reliability of a computer. If one CPU fails, other CPU takes control and execute the currently running processes.

Disadvantages:

- a) Cost is very high.
- b) A large amount of memory is required for running and executing several users program.

Types of Operating System Cont..

6. Embedded Operating System

- It is somewhat similar to real-time OS.
- The embedded OS is installed on an embedded computer system which is used for performing computational task in electronic devices.
- This OS provides limited functionality that is required for corresponding embedded computer system.
- Example: Palm OS, Window CE.

Advantages:

- a) It allows implementation of embedded system in efficient manner.
- b) System with embedded OS is easy to use and maintain.

Disadvantages:

- a) It is possible to perform some specific operation with those OS.
- b) This OS cannot be used in frequently changing environment.

Types of Operating System Cont..

7. Distributed Operating System

- Distributed Operating System is one of the important type of operating system.
- Multiple central processors are used by Distributed systems to serve multiple real-time applications and multiple users. Accordingly, Data processing jobs are distributed among the processors.
- Processors communicate with each other through various communication lines (like high-speed buses or telephone lines).
- **Examples of Distributed Operating System** are- LOCUS, etc. These **systems** run on a server and provide the capability to manage data, users, groups, security, applications, and other networking functions. ... and that's why these computers are popularly known as tightly coupled **systems**

Types of Operating System Cont..

7. Distributed Operating System Cont..

Advantages:

- resource sharing facility, a user at one site may be able to use the resources available at another.
- Speedup the exchange of data with one another via electronic mail.
- Failure of one site in a distributed system doesn't affect the others, the remaining sites can potentially continue operating.
- Better service to the customers.
- Reduction of the load on the host computer.
- Reduction of delays in data processing.

Types of Operating System Cont..

Distributed Operating System Cont..

Disadvantages:

- It is difficult to provide adequate security in **distributed systems** because the nodes as well as the connections need to be secured.
- Some messages and data can be lost in the network while moving from one node to another.

Software Acquisition

- **Software acquisition** is generally a multi-organization endeavor concerned with the funding, management, engineering, system integration, deployment and long-term support of large **software** systems.
- Different kinds of software are made available for use to users in different ways.
- The user may have to purchase the software, can download for free from the Internet, or can get it bundled along with the hardware which is called system acquisition.
- Nowadays with the advent(development) of Cloud computing, many application software are also available on the cloud for use through the Internet, e.g. Google Docs.

Software Acquisition Cont..

The different ways in which the software are made available to users are:

- **Retail Software** is an off-the-shelf software sold in retail stores. It comes with printed manuals and installation instructions. For example, Microsoft Windows operating system.
- **OEM Software** stands for “Original Equipment Manufacturer” software.
- It refers to software that is sold, and bundled with hardware. Microsoft sells its operating system as OEM software to hardware dealers.
- OEM software is sold at a reduced price, without the manuals, packaging, and installation instructions. For example, Dell computers are sold with the “Windows 10” OS pre-loaded on them.
- **Demo-Software** is designed to demonstrate what a purchased version of the software is capable of doing and provides a restricted set of features. To use the software, the user must buy a fully- functional version.
- EG. Typing master, USB Flash Data Recovery Software, etc.
- **Shareware** is a program that the user is allowed to try for free, for a specified period of time, as defined in the license. It is downloadable from the Internet.
- When the trial period ends, the software must be purchased or uninstalled.
- Eg. Different Antivirus Software, IDM etc

Software Acquisition Cont..

- **Freeware** is software that is free for personal use. It is downloadable from the Internet.
- The commercial use of this software may require a paid license. The author of the freeware software is the owner of the software, though others may use it for free. The users abide by the license terms, where the user cannot make changes to it, or sell it to someone else.
- E.g. Linux, Debian, Apache, PostgreSQL, different Videogames, etc.
- **Public Domain Software** is free software. Unlike freeware, public domain software does not have a copyright owner or license restrictions.
- The source code is publicly available for anyone to use. Public domain software can be modified by the user.
- Eg. SHA3, Diamond Trust of London(video game), 7-Zip, etc.
- **Open-Source Software** is software whose source code is available and can be customized and altered within the specified guidelines laid down by the creator.
- Unlike public domain software, open-source software has restrictions on their use and modification, redistribution limitations, and copyrights.
- Eg. Linux, Apache, Firefox, OpenOffice.

Software Acquisition and Reuse Cont..

- Software **reuse** is the process of implementing or updating software **systems** using existing software assets.
- The systematic development of **reusable** components.
- The systematic **reuse** of these components as building blocks to create new **system**.
- **Software reuse** is the **process** of implementing or updating **software systems** using existing **software** components.
- A good **software reuse process** facilitates the increase of productivity, quality, and reliability, and the decrease of costs and implementation time.

THANK YOU!