SOFTWARE’S AND OS

Software- is a collection of computer programs and related data that provide the instructions for telling a computer what to do and how to do it. In other words, software is a conceptual entity which is a set of computer programs, procedures, and associated documentation concerned with the operation of a data processing system.

- ***Hardware*** refers to the physical devices of a computer system.
- ***Software*** refers to a collection of programs
- ***Program*** is a sequence of instructions written in a language that can be understood by a computer

Types of Software

- System Software- is a set of one or more programs designed to control the operation and extend the processing capability of computer system.
- Application Software-is a set of one or more program designed to solve a specific problem or to do a specific task.

System Software

- Make the operation of a computer system more effective and efficient
- Help hardware components work together and provide support for the development and execution of application software
- Programs included in a system software package are called ***system programs*** and programmers who prepare them are called ***system programmers***
- Examples of system software are operating systems, programming language translators, utility programs, and communications software

Application Software

- Solve a specific problem or do a specific task
- Programs included in an application software package are called ***application programs*** and the programmers who prepare them are called ***application programmers***
- Examples of application software are word processing, inventory management, preparation of tax returns, banking, etc.

Operating System

- It acts as an interface between the user and the hardware.
- A user cannot run an application program on computer without OS.
- OS is essential s/w that is for computer to become operational.
- In the absence of OS neither i/p devices will be able to provide data to computer nor memory will be able to store anything nor will o/p devices be able to show the result.

What is OS?

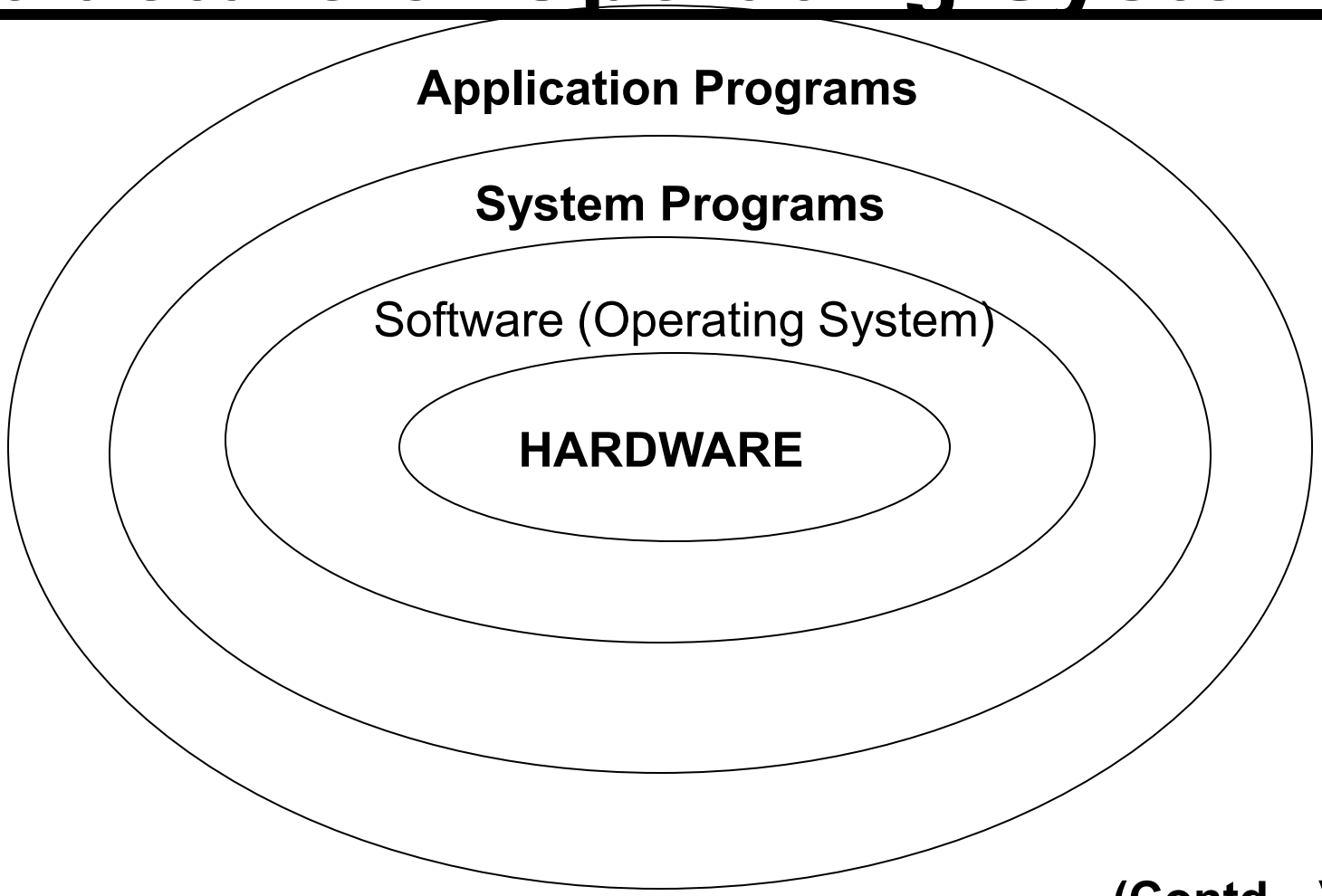
- Operating System is a software, which makes a computer to actually work.
- It is the software the enables all the programs we use.
- The OS organizes and controls the hardware.
- OS acts as an interface between the application programs and the machine hardware.
- Examples: Windows, Linux, Unix and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

What OS does?

An operating system performs basic tasks such as,

- controlling and allocating memory,
- prioritizing system requests,
- controlling input and output devices,
- facilitating networking and
- managing file systems.

Structure of Operating System:



(Contd…)

Structure of Operating System (Contd…):

- The structure of OS consists of 4 layers:
    1. **Hardware**

       Hardware consists of CPU, Main memory, I/O Devices, etc,

    2. **Software (Operating System)**

       Software includes process management routines, memory management routines, I/O control routines, file management routines.

(Contd…)

Structure of Operating System (Contd…):

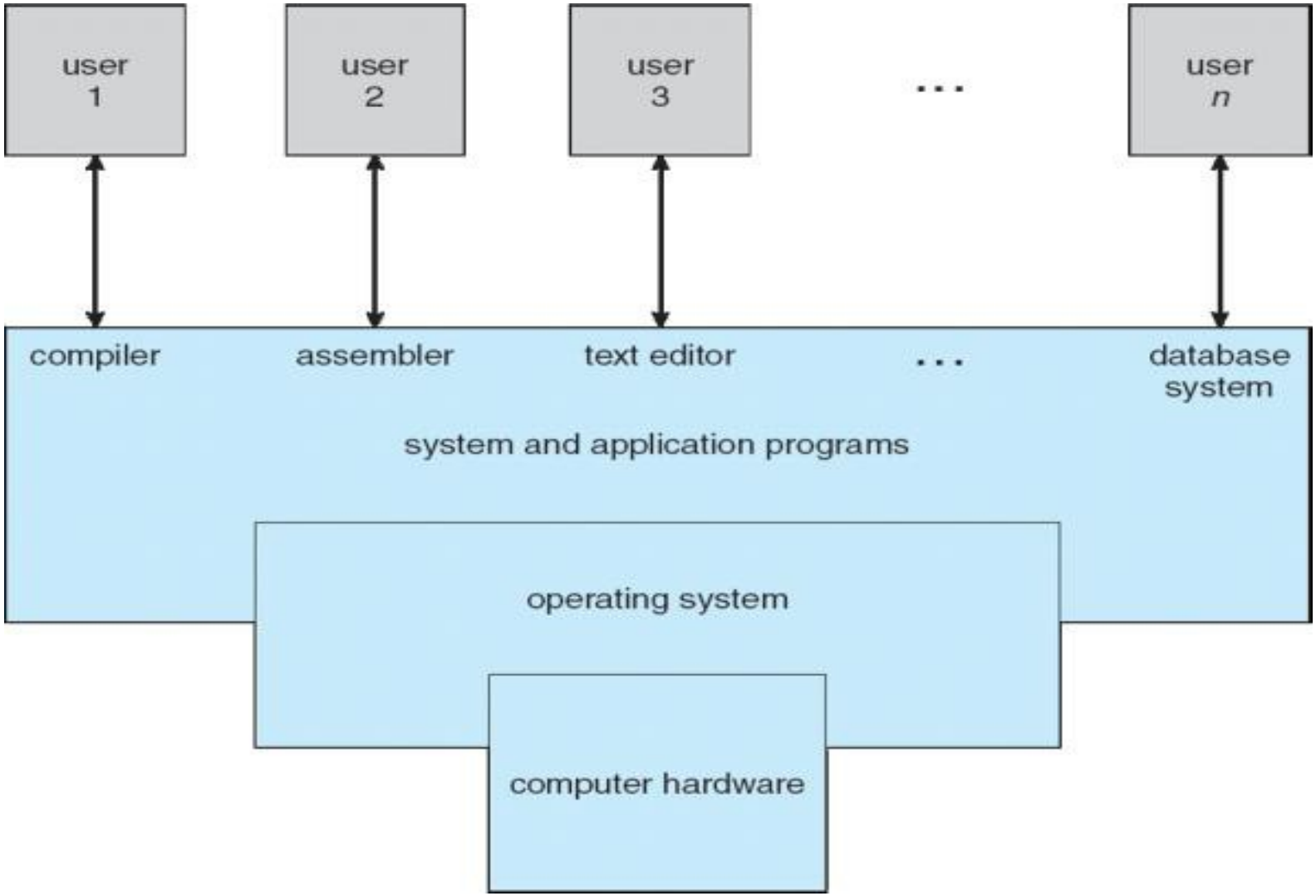
3. **System programs**

   This layer consists of compilers, Assemblers, linker etc.

4. **Application programs**

   This is dependent on users need. Ex. Railway reservation system, Bank database management etc.,

Architecture of OS



Operating Systems functions:

- The main functions of operating systems are:

1. Program creation
2. Program execution
3. Input/Output operations
4. Error detection
5. Resource allocation
6. Accounting
7. protection

Main Functions Of OS

- Process management functions: takes care of creation & deletion of processes, scheduling of system resources to different processes requesting them & providing mechanism for synchronization & communication among processes.
- Memory management processes: It takes care of allocation & deallocation of memory space to program in need of resources.
- File management : It takes care of file-related activities such as organization, storage , retrieval , naming ,sharing & protection of files.
- Security: It protects the resources & information of computer system against destruction & unauthorized access.
- Command Interpretation: It takes care of interpreting user commands & directing system resources to process the commands.

Classification of Operating System.

- **Multi user**. Multi user operating systems allow two or more users to run programs at the same time. Some operating systems permit hundreds or even thousands of concurrent users. The operating systems of mainframes and minicomputers are multi user system.
- **Multiprocessing.** Multiprocessing refers to a computer system ability to support more than one process at the same time. Multiprocessing operating systems enable several programs to run concurrently. MVS and UNIX are two of the most widely used multiprocessing systems, but there are many others, including OS/2 for high end PCs.

cont...

- **Multitasking.** Multitasking allows more than one program to run concurrently. Multitasking is the ability to execute more than one task at the same time, a task being a program. The terms multitasking and multiprocessing are often used interchangeably, although multiprocessing sometimes implies that more then one CPU is involved.
- **Multithreading.** Multithreading allows different parts of a single program to run concurrently. Multithreading is the ability of an operating system to execute different parts of a program called threads, simultaneously.
- **Real time.** Real time operating system is systems that respond to input immediately. This category includes operating systems designed substantially for the purpose of controlling and monitoring external activities with timing constraints. They are used for such tasks as navigation, in which the computer must react to a steady flow of new information without interruption.