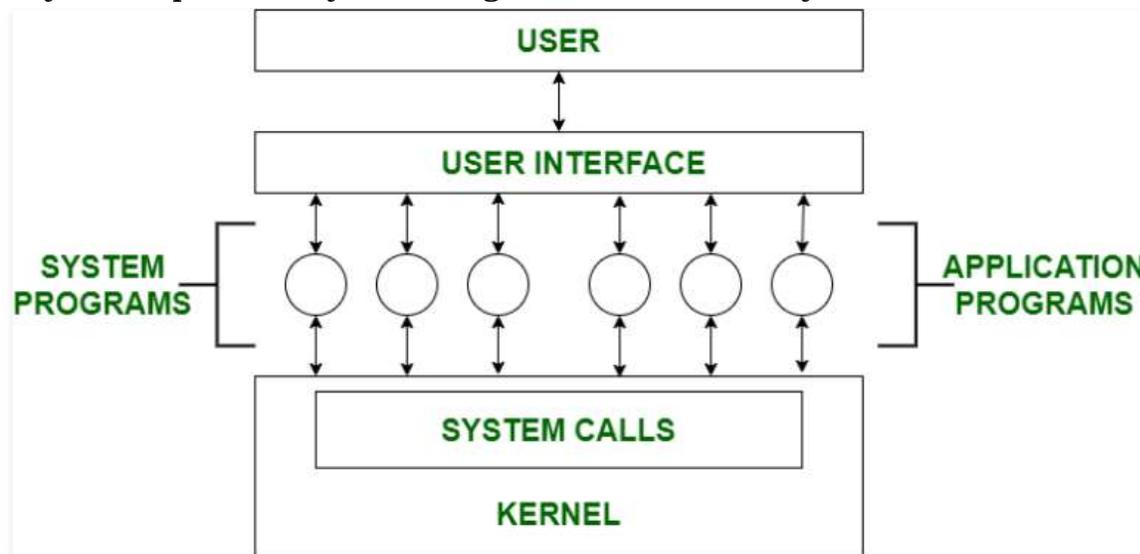


**Unit-II**  
**Lecture: 3**  
**(System Programs)**

System programs provide a convenient environment for program development and execution.

*Most users' view of the operating system is defined by system programs and not the actual system calls.*

According to computer hierarchy, one which comes at last is hardware. Then it is Operating System, System Programs and finally Application Programs. Some of the System Programs are simple user interfaces while others are complex. It traditionally lies between the user interface and system calls so users can only view up-to-the System Programs he can't see System Calls.



System Programs can be divided into these categories:

- **File Management:**

- Create, delete, copy, rename, print, dump and generally manipulate files and directories.
- A file is a collection of specific information stored in the memory of a computer system. File management is defined as the process of manipulating files in the computer system i.e. process of creating, modifying and deleting files.
- It helps to create new files in the computer system and placing them at specific locations.
- It helps in easily and quickly locating these files in the computer system.
- It helps to store files in separate folders known as directories.

- **Status Information:**
  - Information like **date, time, amount of available memory, disk space and number of users** etc are provided by such system programs.
  - Some also provide details like performance, logging and debugging information which is more complex.
  - All this information is formatted and displayed on output devices or printed.
  - Terminal or other devices or files or a window of GUI is used for showing the output of programs.
- **File Modification:**
  - e.g. **text editors to create and modify files.**
  - For searching contents of files or perform transformations of files we use special commands.
- **Programming Language Support:**
  - For common programming languages, we use **Compilers, Assemblers, Debuggers and interpreters which are already provided to users.**
  - It provides all support to users.
  - We can run any programming language. All languages of importance are already provided.
- **Program Loading and Execution:**
  - When the program is ready after Assembling and compilation, it must be loaded into memory execution.
  - **A loader is part of an operating system that is responsible for loading programs and libraries.**
  - It is one of the essential stages for starting a program.
  - Loaders, linkage editors and overlay loaders are provided by the system.
- **Communications:**
  - Virtual connections among processes, users and computer systems are provided by the programs.
  - Users **can send messages to another user on their screen, can send email, browse on web pages,** can transfer the files from one user to another etc.

Examples of system programs in OS are:

Windows 10, Ubuntu, Linux, Mac OS X, Android, Anti-virus, Disk formatting, Computer Language Translators etc.