- Processors' time is shared among multiple users.
- Multiple users simultaneously access the system through terminals.

## * Process:

A process is sequential program in execution. A process defines the fundamental unit of computation for the computer. Components of process are:

1. Object Program
2. Data
3. Resources
4. Status of the program execution

Object program i.e code to be executed. Data is used for executing the program. While executing the program, it may require some resources. Last component is used for verifying the status of the process execution.

| * Processes | Programs |
|---|---|
| 1) It is a dynamic entity, that is a program in execution | 1) Program is a static entity made up of program statements |
| 2) A process is a sequence of information executions. | 2) Program contains the instructions. |
| 3) Process exists in a limited span of time. | A program exists at single place in space and continues to exist. |
| 4) Two or more processes could be executing the same program, each using their own data & resources. | 4) A program does not perform the action by itself. |

# Files Concept

A file is a collection of similar records. The file is treated as a single entity by users and applications & may be referred by name.

A file is a container for a collection of information. The file manager provides a protection mechanism to allow users admin how processes executing on behalf of different users can access the information in a file.

File protection is a fundamental property of files because it allows different people to store their information on a shared computer.

Files represents programs & data. It has a certain defined structure according to its type.

→ Text, Source, Executable & Object file.

* **Shell**: is a user interface for access to an OS services

Shell is a command interpreter which is not a part of the OS but makes heavy use of many OS features. Shell is a primary interface between the user and the OS. When the user logs in, a shell is started up.

→ Shells can fall into two categories:
- Command line which provides the Command line interface
- Graphical which provides the GUI

* **System calls**: (generate interrupt CPU ctrl interrupt handler) Is how a program requests a service from an OS kernel.

- System calls provides the interface between a process and the OS (switching b/w modes)
- These calls are generally available as assembly language instructions and they are usually listed in the various manuals used by the assembly language programmers.

## * Kernel: System call (HLL)

- OS is a complicated piece of software.
- The size of OS is very large and it is not very wise to keep the full OS in the memory in the memory all the time because very little space would be left for other appl^n programs, due to limited size of memory.
- Therefore, the OS is divided into 2 parts. One consists of the very essential routines which are required very often & almost all the time & the other consists of routines which are required sometimes, but not always. In this sense, they are not vital.
- The vital portion is called the kernel of the OS.