M.Sc. IV Sem. (Mathematics)

Paper 2nd - Fundamentals of Computer Science - II

Unit V

Reference Book : **C. Ritchie,** *Operating Systems incorporating UNIX and Windows,* **BPB Publications, New Delhi.**

Topic : Users Interface

The users interface is the users' gateway into the computer, enabling the required human-computer interaction to take place. In the modern world, virtually every one is a computer user.

The computer users are classified into three categories namely **programmers, operational** and **end users.**

1. Programmers :

Programmers produce software for the use of themselves or others. The software can be broadly classified as *system* and *application*. The former case refers to the software such as operating system, compilers etc. while the later refers to the spreadsheets, database management, Information system etc.

The system programmer requires very low level access to machine facilities while an application programmer will usually work using a high level language such as C, C++ or even a high level tool such as a database language and so on.

2. Operational :

An operational user is concerned with the provision, operation and management of computing facilities for others. This include system engineer concerned with system efficiency, software installation etc.

3. End Users :

An end user is someone who applies the software to some problem area. We can identify within this group varying levels of expertise. These include persons or users who are unaware of interaction with a computer, person having little understanding of computer, the clerical staff etc.

Question : Identify the user class of the following :

    a) An engineer installing a C language.

    b) A university lecturer sending electronic mails.

    c) An accountant constructing a spreadsheet.

Types of Interface :

There are four different types of user interface :

1) **System Calls**
2) **Command Language**
3) **Job Control Language**
4) **Graphical User Interface (GUI)**

1. System Calls :

All interaction with the hardware has to be implemented by system calls. A low level language programmer may use system calls directly. In general, operating system will provide an additional layer of subroutines (functions) called an **Application Programming Interface (API)** between the programmer and the system call interface. There may be more than one API available for use on the same operating system.

2. Command Langauage :

Most operating systems provide the users with the facility of entering commands directly via an interactive terminal. Such systems are used to initiate programs and to perform house-keeping control routines on the system. Hence, it is a facility for online users rather than a batch.

3. Job Control Language :

Job Control Languages (JCLs) are used to define the requirements and parameter of works submitted to a batch system and would generally be used by computer operational staff in mainframe environment. Batch operation implies that jobs are initiated by a user and subsequently run with no (or minimal) interaction.

The principal characteristics of this mode of working are :

➢ The execution is intensive in the sense that there are no delays caused by human interaction.

➢ The resources required by job are generally more predictable and hence can be used in resource scheduling.

➢ Since the job runs on its own, responses to possible abnormal events must be planned.

➢ The work being done is often costed and charged to some cost centre within the organization.

➢

4. Graphical User Interface (GUI) :

A Graphical User Interface is an increasingly common and significant feature in modern computing. It provides a means of interacting with the system using a windows and mouse driven environment. It also provides additional opportunities to enhance the interface of application systems.

GUI systems have a number of common features which include :

❖ On-screen overlapping windows.

❖ Pointing device, usually a mouse, by which the user can move a screen cursor, serving as an input device.

❖ Various graphical features such as buttons, icons, slide bars etc.

❖ Higher level devices such as menus, dialogue boxes, selection lists, buttons etc.

Questions :

1. What are the main features of a graphical user interface ?

2. What form of user is used

   a) by programmers writing an application ?

   b) for controlling a batch mode system ?