Chapter : Operating System and Graphical User Interface - Role and Functions

Instruction : Parents please ensure that the student reads the content carefully to answer the questions below. They can also refer to any computer book (cl-8) for a detailed study of the chapter or they can refer to internet.

Link : https://youtu.be/GFAKuciQYTk

Computers are machines that perform specific tasks according to a set of instructions, or programs. Computers work with an interaction of hardware and software.

Hardware refers to the physical part of a computer that you can see and touch.

Software refers to the instructions,that tell the hardware what to do.Software enhances the capability of the hardware and direct the computer to perform specific type of activities.
Hardware and software are interdependent,Both are complementary to each other.

TYPES OF SOFTWARE:
Software is of two types:
1. **APPLICATION SOFTWARE**
   It is set of programs designed to perform some specific type of job,like MS-Word,MS-Paint,etc.
2. **SYSTEM SOFTWARE**
   It is a collection of one or more programs that controls and manages the overall operations and performance of a computer system. A system software can be classified into the following categories:
   - Operating System
   - Language Processor
   - Device Drivers
   - Utility Software

   TYPES OF OPERATING SYSTEM

In the past three decades,computers have taken a giant stride towards excellence and high performance.Similarly operating systems
have also been developed at a rapid pace to serve the needs of users.Following are the different types of Operating Systems:

SINGLE USER OPERATING SYSTEM

Single user operating system was the initial version of the operating system that allowed only one user to work with the computer at a time.   Eg...MS-DOS, MS-WINDOWS 3.1, WINDOWS 95 etc. Due to their limited features they're no longer in use nowadays.

MULTI-USER OPERATING SYSTEM

Multi-user operating system allows more than one user to use the same computer at the same time or at different times. Examples are
Windows 2000,WINDOWS NT, WINDOWS XP,WINDOWS Vista,WINDOWS 7 etc.

MULTI-PROCESSOR OPERATING SYSTEM

A Multi-Processor system consists of several processors that share a common physical memory. In this system, all processors operate under single operating system. Execution of several tasks by different processors at the same time, increase the system's performance.

MULTI-TASKING OPERATING SYSTEM

The ability to perform more than one task together at one time is called Multi-tasking. An operating system, which is capable of doing multiple tasks or processes while using common processing resource,   i.e using only one CPU is called a Multi-Tasking operating system.Examples are Windows XP, Unix
Windows 7,Windows 8 Windows 10,etc.

MULTI-THREADING OPERATING SYSTEM

These operating systems allow different parts of a software program to run simultaneously. The feature of Multi-Threading can delay the execution response of certain processes.For example WindowsXP,Windows7,Windows8 Unix,Linux etc.

RTOS (REAL TIME OPERATING SYSTEM)

RTOS is designed to handle real life scenarios and problems. Such operating systems have a capability to prioritise the processes, minimise execution time, and work independently with no interdependencies. Examples are
Air traffic control, Robots, Weapon systems, and Industrial control systems.
There are two types of Real Time Operating Systems :

Hard Real-time systems: These systems gurantee that critical tasks are completed in time.

Soft Real-time systems : These systems are less restrictive.Examples are
Undersea exploration,Planetary rovers, and virtual reality.

DISTRIBUTED OPERATING SYSTEM

Distributed operating system runs on a set of computers that are located in different geographical areas, interconnected by a network. It controls these interconnected systems and makes them appear as a single computer .

USER INTERFACE:

Interface is the point where two systems meet and interact with each other. Similarly in computing, user interface refers to the hardware-software mechanism by which a user interacts with the computer to pass
 instructions to it.The operating system of a
computer acts as an interface through which a user gives commands.

TYPES OF USER INTERFACE:

Various types of user interfaces have evolved With the advancement in technology.
Here we will discuss the two commonly used
interfaces**:**

CUI(CHARACTER USER INTERFACE):

This interface requires the user to type
commands in order to interact with the computer system. Character User Interface is
also known as Command Line Interface (CLI).A command line is a space on the display screen in which commands are typed in by the user. UNIX and DOS are the popular example of CUI.

GUI(GRAPHICAL USER INTERFACE):

This interface is graphics based and interactive in nature. Different devices,such as mouse ,keyboard,etc.are used to interact with the system. GUI is more user friendly as
unlike CUI,it does not require the user to memorize the commands,instead the user
uses different menus and options to communicate with the system.
Windows is the most popular GUI operating system.

ADVANTAGES OF GUI OVER CUI :

1.GUI interface is much attractive and appealing.
   CUI interface is relatively less appealing.

2.GUI is easier to learn and more user-friendly due to the presence of various graphical elements.

CUI is a text based interface and hence is not as user friendly as GUI.

3.With GUI,a user does not have to learn the
complicated commands.
 A user is required to memorize many commands to operate and control a CUI.

4.GUI users have windows that allow the users to work, view, control, and manipulate multiple programs and folders at the same time.
 CUI does not offer the same ease and ability to work with multiple programs at once on one screen.

5. GUI supports the use of both a mouse and keyboard to control and navigate through your system.
 CUI supports the use of a keyboard only.

6. In GUI the user mostly gets immediate visual feedback of the action he is doing. For example , the user can see immediately that the file is successfully   moved from one directory to another.
 In CUI, there is no obvious feedback. If we consider the same example, one or more additional commands will have to be issued to confirm the file transfer action.

7. In GUI multiple tasks can run simultaneously at a time.
 Only one task can be executed at the particular point of time in CUI.

DISADVANTAGES OF GUI OVER CUI :

1. GUI requires more system resources to load the various graphical elements, such as icons, fonts, etc.
  CUI uses less system resources as compared to GUI.

2. GUI is still a bit slower than CUI as it uses both mouse and keyboard to navigate and control.
 CUI uses only a keyboard for navigation and operation ,often resulting in faster performance.

3. GUI occupies much larger amount of hard disk space as compared to CUI.
   CUI takes up smaller hard disk space.

4.GUI requires more RAM to run.
    A character user interface does not need much RAM to run.

5.GUI based operating systems are more expensive as users have to pay the license fee.
 CUI based operating systems are less expensive.

EXERCISE

1.FILL IN THE BLANKS:

1.The ability to perform more than one task together at one time is called…………

2. ………… is graphics based and interactive in nature.

3. ………. is a space on the display screen in which commands are typed in by the user .

4………….. operating system runs on computers which are located in different geographical areas,interconnected through a network.

2.STATE TRUE OR FALSE:

1.Hard Real-time systems guarantee that critical tasks are completed in time.

2. CUI requires the user to type commands in order to interact with the computer system.

3.Multi-threading operating system allows more than one user to use the same computer at the same time or at different times.

4.Two commonly used user interfaces are:CUI and GUI.

3.MULTIPLE CHOICE QUESTIONS:

1.Character User Interface is also known as…………. Interface.
    a) Single user
    b) Command Line
    c) Multi user

2. ………. requires more RAM to run .
    a) CUI
    b) GUI
    c) CLI

3. ………. refers to the hardware-software mechanism by which a user interacts with the computer to pass instructions to it.
    a) Keywords
    b) User Interface
    c) Real-time

4.Which interface takes up smaller hard disk space?
    a) GUI
    b) CUI
    c) CBI

Q4. ANSWER THE FOLLOWING
   QUESTIONS:

1.Name the initial version of the operating system.

2.Define Multi processor operating system

3.What are the advantages of GUI over CUI?

4.Write any difference between Single user operating system and Multi user operating system.

5.Write any 4 disadvantages of GUI over CUI.

6.Write full forms:
    a) CUI
    b) RTOS
    c) CLI
    d) GUI

7.Write short notes on the following:
    1. Real-time operating system
    2. Multi-threading operating system.

8. Define hardware and software in brief.
                END

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