
1.0 INTRODUCTION

The Graphical User Interface (GUI) is one of the most revolutionary changes to occur in the evolution of modern computing system. In less than 10 years, the expectation of what the interaction between human and computer would be like was changed from a terse, character-oriented system to the now more graphics-oriented system. This revolution has increased the accessibility and usability of computer systems to the general public.

In this unit, we will look at another type of software, which helps users to interact with the system easily and to perform a complex task with little knowledge of operating system or memorised commands. The software providing such features supports Modern User Interface concept such as desktop metaphor, which makes computer available to the majority of people who are either novice or non-programmers. The personal computer was invented for these users.

In this unit, we will look at several aspects of GUI, starting from common GUI terms, major components of GUI, its history and finally a popular package supporting GUI - MS-Windows.

1.1 OBJECTIVES

After going through this unit, you will be able to:

define what is GUI and how it is different from character oriented system,
define all the terms related with GUI, and
identify important features of GUIs
identify resources available in MS-Windows
identify various dialog-box options.

1.2 WHAT IS GRAPHICAL USER INTERFACE?

The terms “user interface” originated in the engineering environment in the late 1970s. Virtually every one who interacted directly with computers had been engineers and programmers, but a new kind of users was emerging: the non-programming user. These users often reacted more negatively to difficulties in dealing with a machine. New forms of interaction was needed, new interfaces were required and attention flowed to “the user interface”.

With the introduction of the Macintosh in 1984, Apple Computer popularised the user interface as it is known today. Apple’s use interface is now commonly referred to as a Graphical User Interface or GUI. The GUI has become associated with a common feature set available in a number of product offerings. Common features include:

secondary user-input devices. Usually a pointing device and typically a **mouse**.

point and shoot functionality with **screen menus** that **appear** or **disappear** under pointing-device-control.

windows that graphically display what the computer is doing.

icons that represent files, directories and other application and system entities.

dialog boxes, button, sliders, check boxes and many other **graphical metaphors** that let the programmer and user tell the computer what to do and how to do it.

Today’s GUIs have expanded basic functionality to support not only graphics but also **dimensions, colour, height, video** and highly dynamic interaction. Modern user interfaces can simulate a very realistic view of a real, three-dimensional world.

1.3 EVOLUTION OF THE HUMAN AND MACHINE INTERACTION

A Graphical User Interface

The primary means of communication with computer until recently has been through command-based interfaces. In command interfaces, users have to learn a large set of commands to get their job(s) done. In early computer systems paper tapes, cards and batch jobs were the primary means of communicating these commands to the computers. Later, time-sharing systems allowed the use of CRT terminals to interact/communicate with the computer. Users trying to share precious computer resources such as CPU and peripherals heavily burdened these early systems.

The batch system and time sharing led to command-driven user interfaces. Users had to memorise commands and options or consult a large set of user manuals. The early mainframe and minicomputer systems required a large set of instruction manuals on how to use the system. In some systems, meaningful terms were used for command names to help the end-user. But in other systems the end-user had to memorise several sequences of keystrokes to accomplish certain tasks.

Early users of computers were engineers and what we now call expert users; users that had a lot of interest in knowing more about the computer systems and the technology. Command line interfaces were acceptable by the majority of these users. In the 1970s, computers were introduced to a new class of users: secretaries, managers and non-technical people. These new users were less interested in learning computer technology and more interested in getting their jobs done through the machine. The command based interfaces caused many of these new users to develop computer phobia. Imagine the thought of memorising commands made up of “Control-Alt-Del” to boot the system.

To make life easier for the end-user, a large collection of devices have been invented to control, monitor and display information. The early (and still widely used) peripherals are the keyboard and the video terminal. But, it was not until the late 70s, research projects at some universities led to the invention of pointing devices and windowing systems. The mouse and joystick were among some of the few pointing devices that were invented in this period. Also, research pioneers invented the notion of splitting the screen to allow multiple windows and direct manipulation of objects.

In the 70s, researchers designed powerful new workstations armed with graphical user-interfaces. The basic assumption of these new workstations was that one user could have a powerful desktop computer totally dedicated to that user's task. Thus, the computer is not only used to perform the task, but can also provide a much more intuitive and easy-to-use environment.

Instead of memorising commands to each stage, the user selects a command from a menu bar displaying a list of available commands. For example, Figure 1 displays the menu bar. This menu bar displays a list of commands available such as File, Edit and view. When the mouse is clicked on any one of these menu commands the appropriate action is taken.

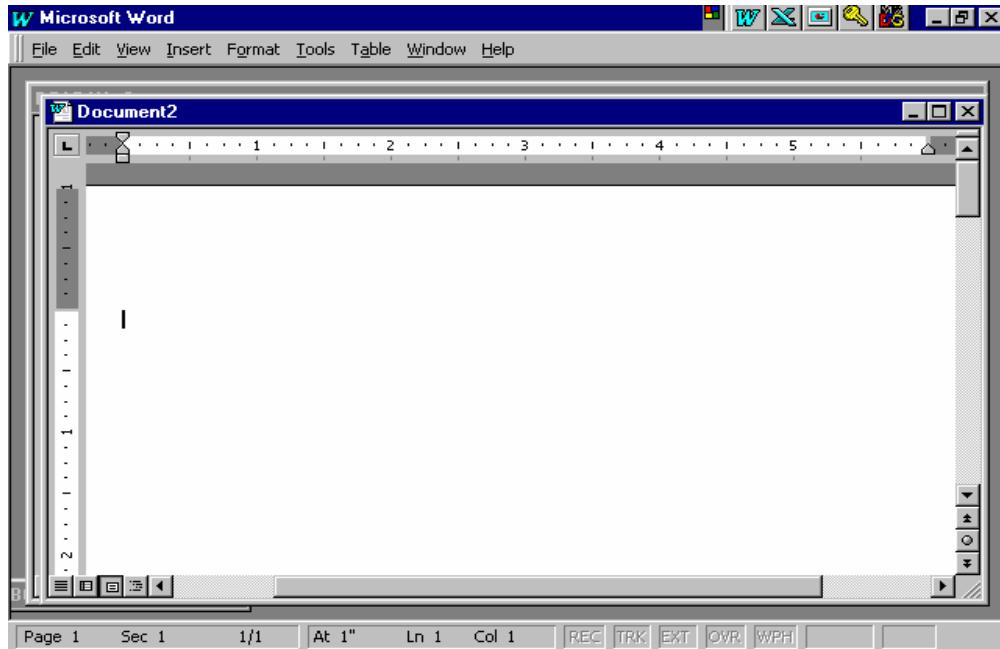


Figure 1: Menu Bar

Pull-down and **pop-up** menus display option commands available for each selection. Figure 2 shows the pull-down menu displayed when the file menu item is selected. The user can then select from different file related activities.

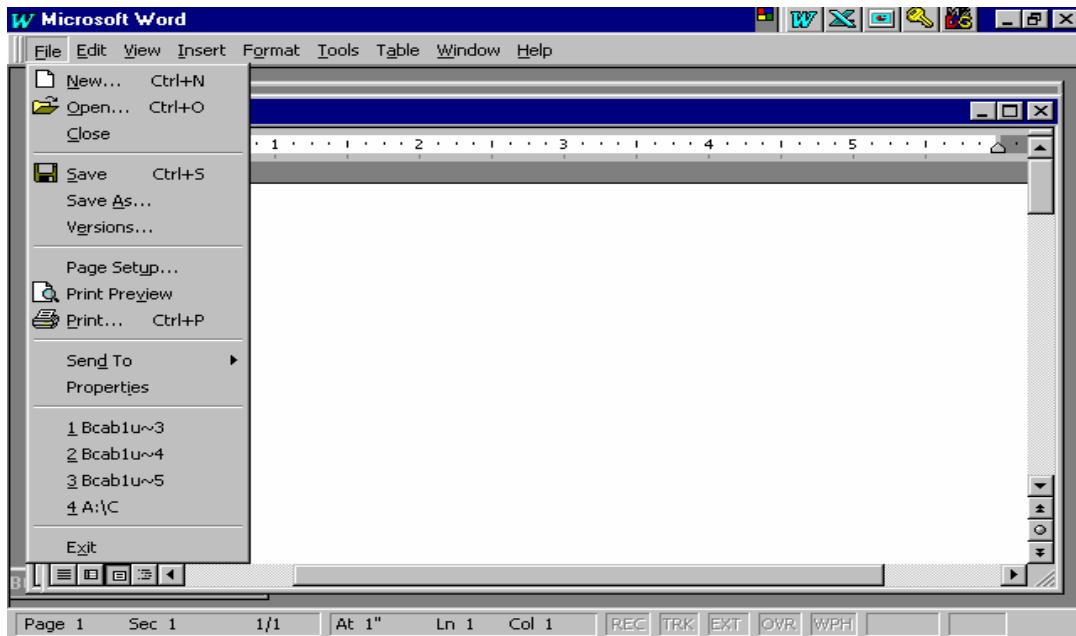


Figure 2: Pull-down Menu

Dialog boxes allow more complex interaction between the user and the computer. Dialog boxes employ a large collection of control objects such as dials buttons, scroll bars and editable boxes. For example, in figure 3, a dialog box is used to open a file. This dialog box is composed of two buttons called Open and Close and edit box that allows a file name to be entered and a scroll region that allows navigation through the list of files and directories available on the disk. Clicking on the open button causes the file to be viewed.

In graphical user-interfaces, textual data is not the only form of interaction. Icons represent concepts such as file **folders**, **waste baskets**, and **printers** etc. Icons symbolize words and concepts commonly applied in different situations. Figure 4 shows the **paint utility** with its palette composed of icons. Each one of these icons represents a certain type of painting behaviour. Once the pencil icon is clicked, for example, the cursor can behave as a pencil to draw lines.

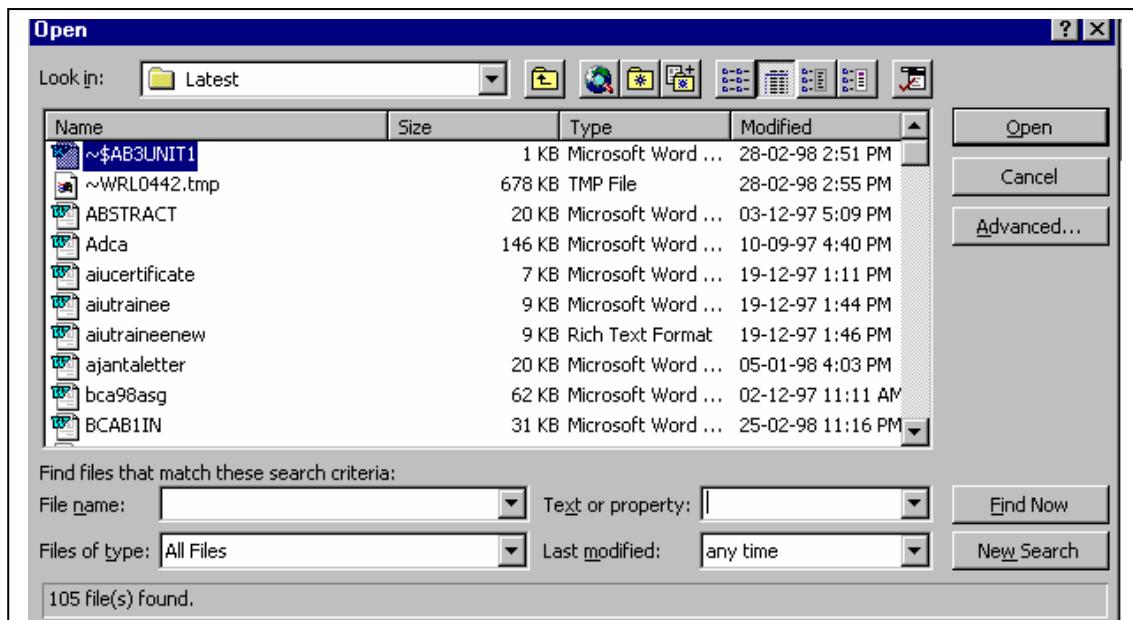


Figure 3: Dialog box

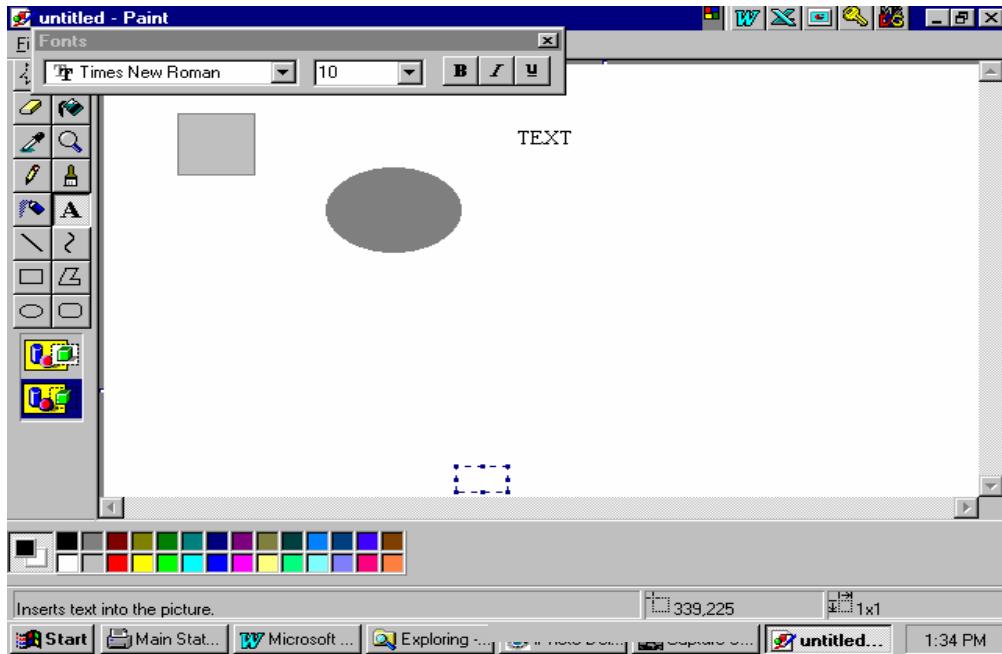


Figure 4: Paint Palette

The idea of metaphors has brought the computer closer to the natural environment of the end-user. The concept of physical metaphor paradigm developed by Alan Kay, initiated most of the research for graphic user interfaces based on new programming approach called **object oriented programming**. Discussion on this subject is beyond this unit. This will be covered in detail in **C++ and object oriented programming** course. The physical metaphor is a way of saying that the visual display of a computer system should present the images of real physical objects.

For example, the wastepaper basket icon can be used to discard objects from the system by simply dragging the unwanted objects into the wastepaper basket, as in real life. The desktop metaphor probably has been the most famous paradigm. Because of the large set of potential office users, this metaphor can have the most dramatic effect. In this paradigm, the computer presents information and objects as they would appear and behave in an office, using icons for folders, in-baskets, out-baskets and calenders.

1.4 COMMON GRAPHICAL USER INTERFACE TERMS

This section presents a list of terms commonly used with the graphical user interface (GUI).

1. Pointing devices

Pointing devices allow users to point at different parts of the screen. Pointing devices can be used to invoke a command from a list of commands presented in a menu. They can also be used to manipulate objects on the screen by:

- >Selecting objects on the screen
- Moving objects around the screen, or
- Merging several objects into another object

Since 1960s, a diverse set of tools have been used as pointing devices include the light pen, joystick, touch sensitive screen and the popularity of the mouse is due to optimal coordination of hand and easier tracking of the cursor on the screen.

2. Bit-mapped displays

As memory chips get denser and cheaper, bit displays are replacing character-based display screens. Bit-mapped displays made up of tiny dots (pixels) that are independently addressable and provide much finer resolution than character displays. Bit-mapped displays have advantages over character displays. One of the major advantages includes graphic manipulation capabilities, which present information in the final form on paper (also called WYSIWYG: What You See Is What You Get).

3. Windows

When a screen is split into several independent regions, each one is called a window. Several applications can display results simultaneously in different windows. Figure 5 presents a screen with two windows.

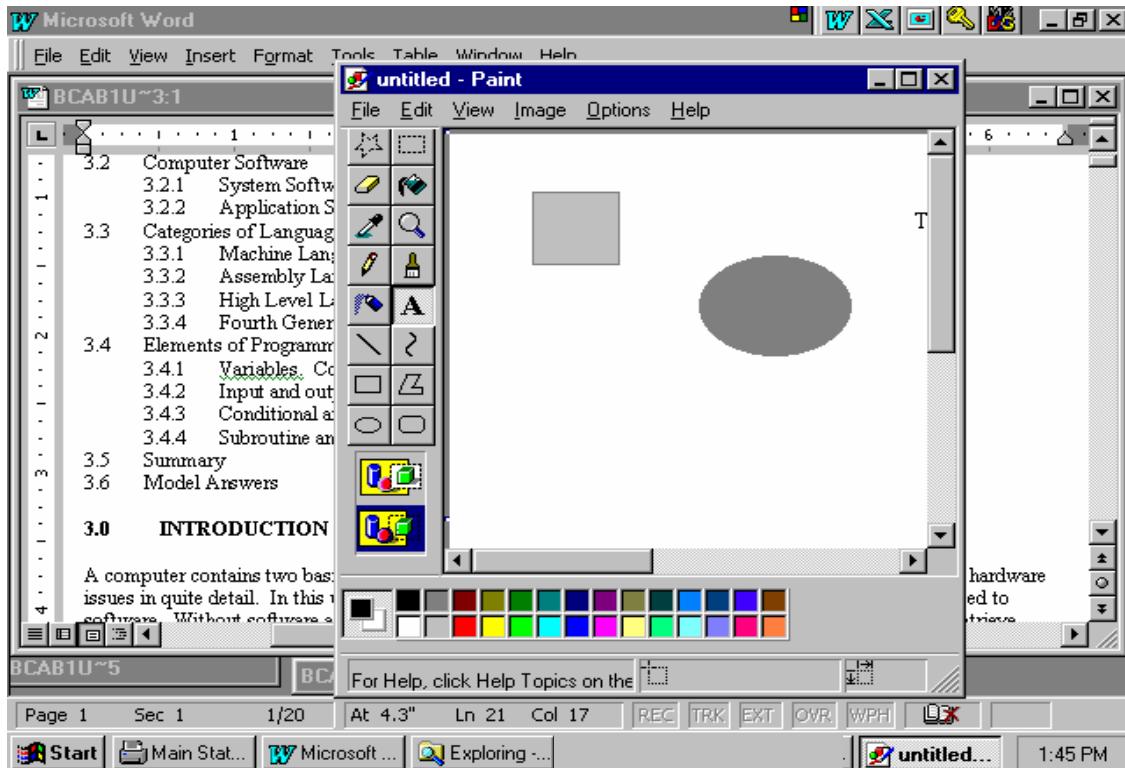


Figure 5: Screen with two windows

The end-user can switch from one application to another or share data between applications. Windowing systems have capabilities to display windows either tiled or over-lapped, Figure 6 and Figure 7. Users can organise the screen by resizing the window or moving related windows closer.

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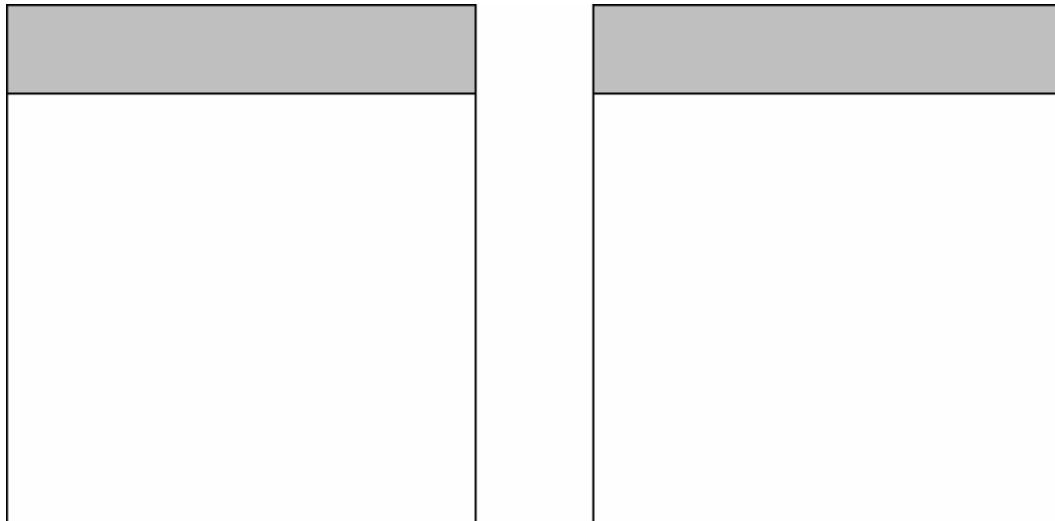


Figure 6 : Tiled Windows

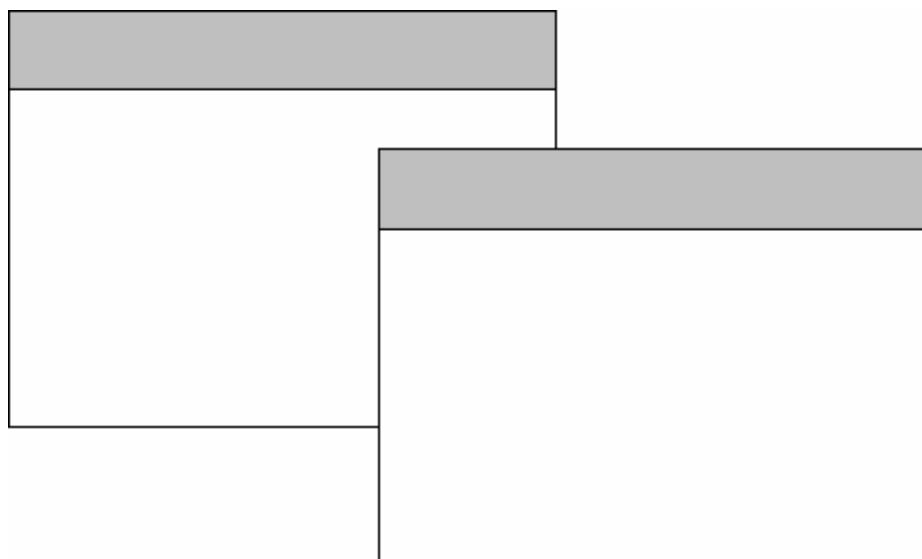


Figure 7: Overlapped Windows

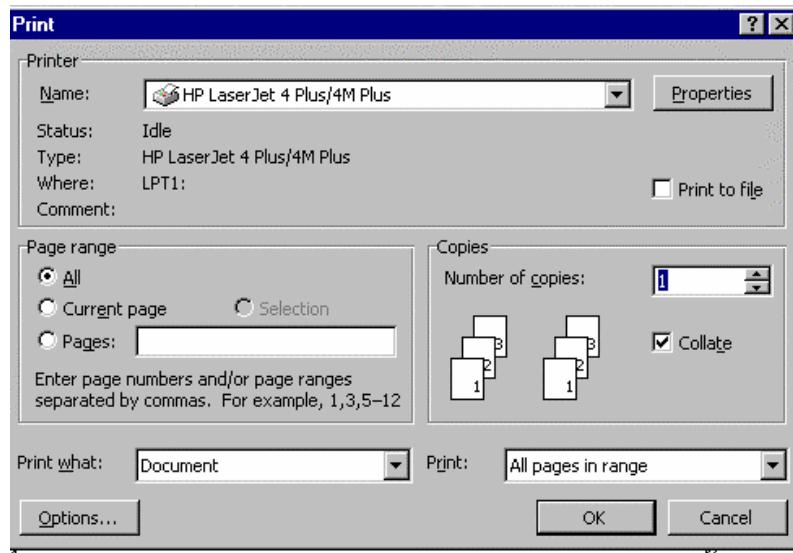
4. Menus

A menu displays a list of commands available within an application (figure 1). From the menu, the end-user can select operations such as File, Edit, view. Instead of remembering commands at each stage, a menu can be used to provide a list of items. Each menu item can be either a word or an icon representing a command or a function. Menu item can be invoked by moving the cursor on the menu item and selecting the item by clicking the mouse.

When a menu icon is invoked it could cause other menus, called **pull-down menus**, to appear. **Pull-down menus** (figure 2) are used to present a group of related commands or options for a menu item. Figure 2 presents the File pull-down menu.

5. Dialog boxes

Dialog boxes are used to collect information from the user or to present information to the user. For example, when printing a file, (figure 8) a dialog box is displayed to get additional information.

**Figure 8: Dialog box**

Some of the information obtained are the number of copies and page numbers to be printed. Dialog boxes are also used to indicate error messages in the form of alert boxes. Dialog boxes use a wide range of screen control elements to communicate with the user.

6. Icons

Icons are used to provide a symbolic representation of any system/user-defined object such as file, folder, address, book, applications and so on. A specific type of icon represents different types of objects. In some GUIs, documents representing folders are represented by a folder icon (figure 9). A folder icon contains a group of files or other folder icons. Double clicking on the folder icon causes a window to be opened displaying a list of icons and folder icons representing the folder's contents.

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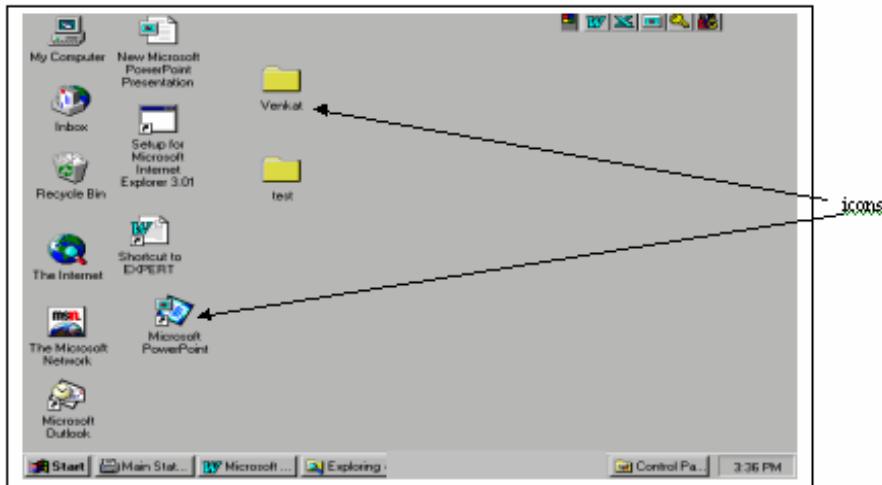


Figure 9: Icons

7. Desktop metaphor

In the desktop metaphor, users are not aware of applications. Users deal with files, folder, drawer, a clipboard and an out-box. Instead of starting the word processor and loading file, users merely open the report document, which implicitly invokes the word processor. Clicking the mouse on an icon representing the report cause word processor to get started and to load the report file implicitly. Today, several computing environments provide this capability.

8. Graphic User Interfaces

GUIs are systems that allow creation and manipulation of user interfaces employing windows, menus, icons, dialog boxes, mouse and keyboard. Macintosh toolbox, Microsoft windows and X-windows are some examples of GUIs.

Check Your Progress 1

1. What is GUI and what are its features?
-

2. Define the features of the followings:

- (a) Windows
 - (b) Pull-down menu
 - (c) Dialog Box
 - (d) Pointing devices
-

3. What is the difference between Bitmapped and character based displays?
-

1.5 MICROSOFT WINDOWS (MS-WINDOWS)

MS-Windows is the most popular GUI for personal computers. Windows provides an environment that enhances DOS in many ways. The major benefits of Windows are:

1. **Common Look and Feel :** All Windows applications have the same basic look and feel. Once you know one or two Windows applications, it is easy to learn another one.
2. **Device Independence :** Windows presents a device-independent interface to applications. Unlike most of today's DOS applications, a Windows application is not bound to the underlying hardware such as mouse, keyboard or display. Windows shields the applications from this responsibility. The application deals with the Windows API to manipulate any underlying devices.
3. **Multitasking:** Windows provides non-pre-emptive multitasking support, Users can have several applications in progress at the same time. Each application can be active in a separate window.
4. **Memory Management:** Windows also provides memory management to break the 640K limitation of MS-DOS. An application has the ability to use the extended memory, share data segments with other applications and swap unwanted segments to disk.
5. **Support for existing DOS applications :** Windows allow most standard DOS applications to run under it directly. Any application that does not control the PC's hardware, use the PC BIOS or MS-DOS software interrupts, can run in its own window.
6. **Data Sharing :** Windows allows data transfer between application Clipboard. Any type of data can be transferred from one window with the Clipboard. The Dynamic Data Exchange (DDE) protocol defines how two applications can share information. Information such as bitmap, metafile, character strings and other data formats can be shared.
7. **Support for Object Orientation :** In order to create screen objects such as windows, the application developer defines a class (similar to record) specifying the necessary properties. Instances of class can then be created. Several applications can share the same windows simultaneously. To communicate with instances of a window class, messages are sent and received by a special function called the window function. The windows handles all messages such as re-drawing the screen, displaying icons or pop-up menus and changing the contents of the client area (refer to figure 10). This facilitates the process of Application development. An application can choose to display the window, resize the window, display additional information in the client area, and so on.

1.5.1 Structure of a Window

For the sake of simplicity certain parts, such as title bar and menu bar, are common for most of the windows. Since the window parts of many of the window based application software are common, this makes a person to understand and memorise faster. You will see that the button to maximise or to minimise always appear on the right top corner in all the windows. Similarly the menu bar, the title bar, the control menu bar also appear at the same place for all the windows. This way if you get familiar to one window, you will get familiar with the other windows too as the meaning for each of the similar buttons remain the same. Depending upon the type of application all windows, however, may not have every element.

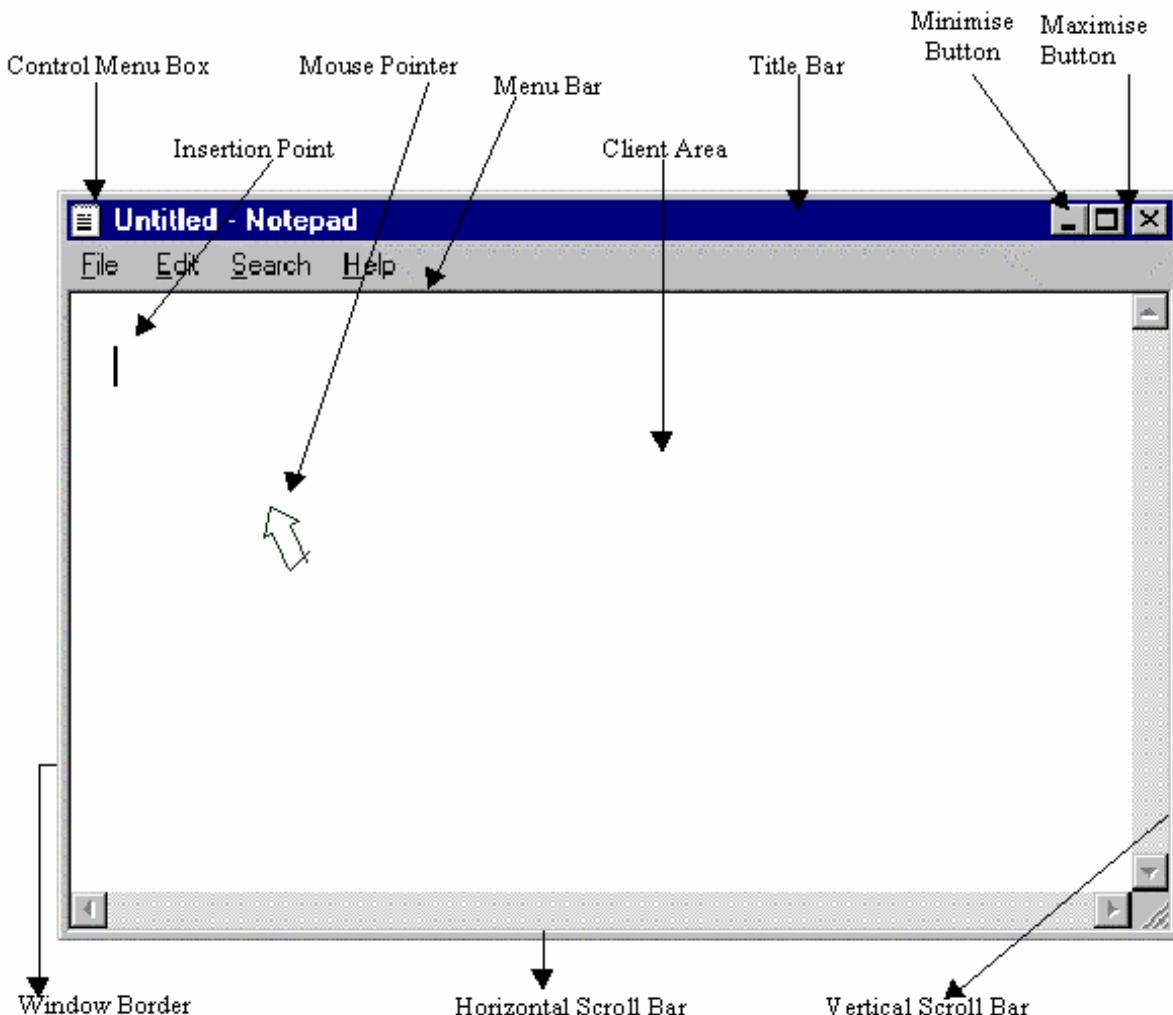


Figure 10: Parts of a Window

Control-menu box	It is in the upper-left corner of each window. Clicking on the Control-menu box opens the Control menu. The Control menu can be used to move, size, and close a window while working with the keyboard.
Title Bar	It shows the name of the application, document, or a folder name.
Menu Bar	It lists the available menus. A menu contains a list of actions or commands.
Scroll Bars	They are used to move through a document or a list when the entire document or list does not fit in the window.
Maximise Button	Clicking this button using the mouse enlarges the active window so that it fills the entire desktop.
Minimise Button	Clicking this button reduces the window to an icon and arranges it on the desktop. Minimising the application window does not quit the application.
Restore Button	The Maximise button is replaced by the Restore button after the window is enlarged. Clicking this button returns the window to its previous size.
Window Border	It is the outside edge of the window. The window can be resized by lengthening or shortening the border.
Insertion Point	It is a flashing vertical bar that marks the place where text or graphics are to appear on typing or drawing.
Mouse Pointer	An arrow used for pointing items. It appears if the mouse is installed on the system.
Client Area	Area inside the window which is under the application control.

Pop-up and Child Windows

Pop-Up and child windows are special types of windows, and are used to communicate information between the application and the end-user. They remain on the screen for a short period of time. Dialog boxes discussed in the next section, are more sophisticated form of pop-up windows. MS-Windows provides a collection of pre-defined child windows.

Resources

Resources are used to manage windows and user-defined objects., MS-Windows provides nine kinds of resources to application developers. These resources are : icons, cursors, menus dialog boxes, fonts, bitmaps, char strings, user-defined resources, and keyboard accelerators.

1. **Icons and cursors:** Windows defines a few types of icons and cursors. An icon or a cursor is essentially a bit-mapped region that is used to represent and symbolise a window or cursor. A developer can also define an original icon or cursor using the ICONEDIT utility.
2. **Menus :** Each window can have its own menu bar. A menu item can be a character string or a bitmap. Each item of a menu bar in turn can have a pop-up menu presenting a list of options. Currently, Windows does not support nesting of pop-up menus within other pop-up menus. (Windows 3.0 provides this functionality). But a pop-up menu can invoke a dialog box.
3. **Dialog boxes :** These provide another mechanism besides pop-up menu and menu bars to obtain information from the end-user. Dialog boxes are much more flexible than menu bars or pop-up menus. Dialog boxes usually contain a group of child windows such -as buttons, scroll bars, and editable fields. Just like windows, dialog boxes have a function that is used to process **messages** received from the user upon selection of options
4. **Fonts :** Windows provides a few families of fonts with different sizes and shapes : modem, roman, Swiss, Helvetica, and script. Application processors and desktop publishing can define additional fonts as needed.
5. **Bitmaps :** They are used to represent icons, cursors, or draw picture on the screen. Both mono and colour bitmaps can be defined.
6. **Character Strings :** Character strings are handled as resources mainly to provide a manageable solution to internationalisation of a window application.
7. **User-Defined Resources :** These can be used for any purpose and support any user-defined data type. Any arbitrary data can be managed as a user-defined resource.

1.5.2 Basic Techniques for Working in Windows

Windows offers an on-line Tutorial in which one can practice working with a mouse and performing basic Windows tasks. To run the Tutorial, choose the **Windows Tutorial** command from the **Help** menu.

Using a mouse is usually easier and faster than using the keyboard but one needs to know both mouse and keyboard techniques to work in Windows. Almost all the functions in Windows can be performed using either the keyboard or a mouse.

Basic Mouse Techniques

Generally the mouse has two buttons where one is the primary mouse button and the other is secondary. In Windows, the left mouse button is set as the primary button by default. The primary button is used to perform the majority of the tasks whereas the secondary button is used to display shortcut menu for the current window application.

Term	Meaning
Click	To quickly press and release the primary mouse button to select a single item.
Double-click	To click the primary mouse button twice in rapid succession to carry out an action after the item is selected.
Point	To move the mouse until the mouse pointer on the screen points to the item of choice.
Drag	To press and hold down the primary mouse button while moving the mouse.
Drag-and-Drop	Pointing to the item of choice, press and hold down the primary mouse button while moving the mouse. Release the mouse button on reaching the desired location to place the item.

The similar operations can be performed using keyboard also. For equivalent keyboard commands refer to your windows manual.

1.5.3 Using Menus

Each application window, and other windows as well, have *menu names* located on the *menu bar*. Commands, the actions that can be carried out in Windows, are listed on *menus*. Along with the menus on the menu bar, each window also has a control menu.

Menus on the Menu Bar

The menu on the menu bar can be selected and opened by pointing it and then clicking the primary mouse button. After opening the menu, a command or a menu item can be selected by dragging the selection cursor down or up the menu until the menu item is highlighted and release the mouse button to execute the command.

Clicking the menu name or anywhere outside the menu can close the menu. Pressing the ESC key on the keyboard can perform the same, but the control remains on the menu bar.

There are a number of menu conventions used in Windows, which are as follows:

Menu Convention	Meaning
Dimmed (or not visible) command	The command cannot be used with the application at the current time.
An ellipsis (...) following a command	A dialogue box appears on choosing the command. The dialogue box contains options need to be selected before carrying out the command.
A check mark (✓) to the left of a command	The command is in effect. By choosing the command again the check mark is removed and the command is no longer in effect.
A key combination to the right of a command	The key combination is a shortcut for choosing the command. Pressing the keys carry out the command without opening the menu.
A triangle (►) to the right of a command	On choosing this command, a cascading menu appears, listing additional commands.

Control Menu

Application windows, document windows and their icons; and some dialogue boxes have a Control menu. The commands on the Control menu allow one to work with a window. A window can be moved to a different location, or enlarged and even reduced to an icon using these commands. The commands that are on the Control menu and the way this menu is opened vary. The Control menu for windows and dialogue boxes can be opened by selecting the Control-

menu box in the upper-left corner of the window or dialogue box. The Control menu for an icon is opened on selecting the icon. Some commonly found Control menu commands are as follows:

Use	To
Restore	Restore the window to its former size after it is reduced to an icon or enlarged.
Move	Move the window to another position by using the keyboard.
Size	Change the size of the window by using the keyboard.
Minimise	Reduce the window to an icon
Maximise	Enlarge the window to its maximum size.
Close	Close the window or the dialogue box and even quit the application.

1.6 WORKING WITH A DIALOGUE BOX

A *dialogue box* supplies additional information to a command, required for the completion of a task. An ellipsis(...) after a menu command indicates that a dialogue box will appear on choosing this command.

Most dialogue boxes contain options that can be selected. After specifying the options, one can choose a command button to carry out the command. Some other dialogue boxes may display information, warnings, or error messages. Moving a dialogue box is just like moving a window - by dragging the title bar or using the Move command on the Control menu.

1.6.1 Types of Options

One may need to select one or more options within a dialogue box and for this one need to move from one option to another. To move within a dialogue box :

One can either click that option or press TAB to move to the next option and SHIFT+TAB to the previous option.

The currently selected option is marked by the selection cursor, which appears as a dotted rectangle, a highlight or both. The types of dialogue box options are as follows :

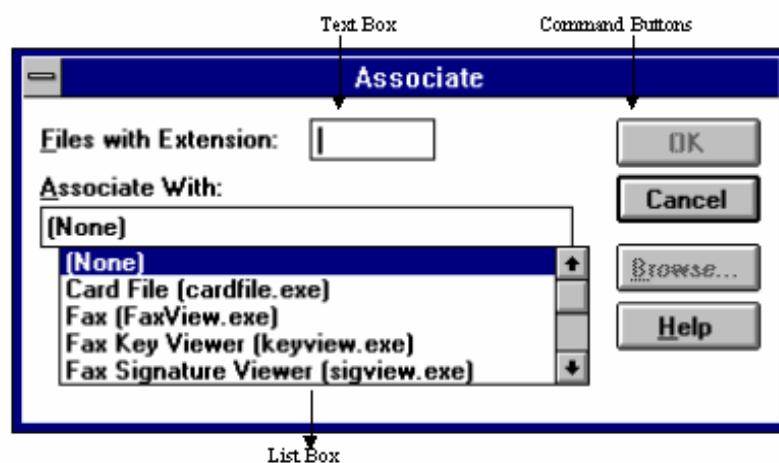


Figure 11: Dialog box options

Command Button

A Command Button initiates an immediate action, such as carrying out or canceling a command. The OK, Cancel and Help buttons are common command buttons. They are often located along the bottom or on the right side of the

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dialogue box. Some command buttons are marked with greater-than signs (>>) which expands the active dialogue box. A command button containing an ellipsis (...) opens another dialogue box.

Text Box

A text box is used to type information. On moving to an empty text box, an insertion point appears to its far left side.

List Box

A list box displays a list of choices. If there are more choices than can fit in the box, scroll bars are provided to move quickly through the list.

Usually only one item can be selected in a list box; and in some cases, more than one item can also be selected.

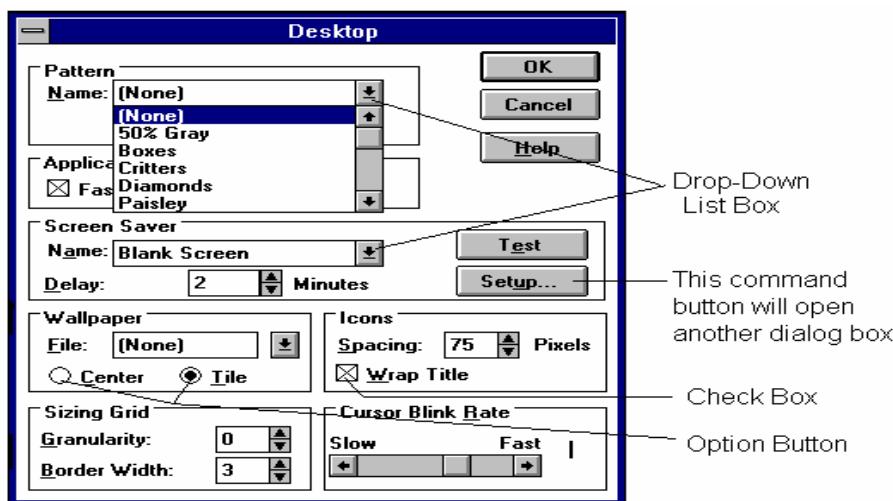


Figure 12: More Dialog box options

Drop-Down List Box

A drop-down list box appears initially as a rectangular box containing the current selection. On selecting the down arrow in the square box at the right, a list of available choices appears. If there are more choices than can fit in the box, scroll bars are provided.

Option Buttons

Option buttons represent a group of mutually exclusive options. Only one option can be selected at a time. The selected option button contains a black dot. If one option is already selected, then the current option replaces it.

Check Box

A check box presents non-exclusive options, that is, more than one option can be selected at a time. Selected check boxes contain an X.

Check Your Progress 2

- 1 . What are the four major components of GUI? Explain the functioning of any one component.

2. How does MS-Window enhance DOS environment?

1.7 STARTING WINDOWS 95

This section and onwards, we will be mainly discussing about the Windows 95 vision by Microsoft. For starting Windows 95, simply switch-on the computer and you will come directly to Windows 95 screen (as shown in the figure given below). This screen is called the desktop (metaphor), the settings of which can be changed as the user likes.

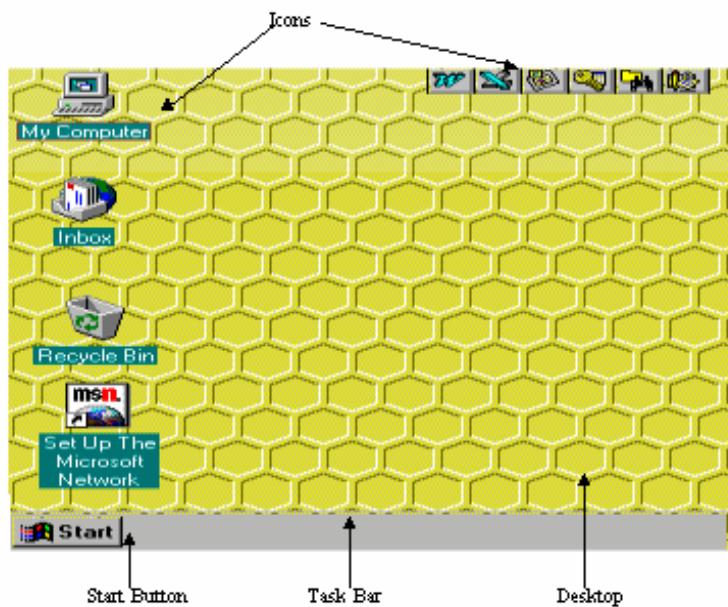


Figure 13: Start Window 95

To adjust settings such as desktop colour and background, use the right mouse button to click anywhere on the desktop, and then click **Properties**.

The icons on the left side represent some of the accessories and tools. They provide the short and easier access to the features that we will discuss in the later sessions. The bar that is at the bottom of the screen is called the taskbar.

1.7.1 Task Bar

The taskbar contains the **Start** button, which is used to quickly start a program or to find a file. It is also the fastest way to get Help. By default, the taskbar and the Start menu are always visible when Windows is running.

Also when you open a program, a document, or window, a button appears on the taskbar. You can use this button to quickly switch between the windows you have opened.

To customize the taskbar, right-click on it, and click on **Properties**.

1.7.2 Start Menu

Click on the **Start** button. The menu options (as shown in Figure) are popped-up above the taskbar. From here you can start your adventure with Windows 95.



Figure 14: Start Menu

When you click on the option that has a right pointed arrow, a cascading menu appears. Depending on your computer and the options you have chosen, you may see additional items in these cascading menus. An overview of each command is shown below :

COMMAND	DOES THIS
Programs	Displays a list of programs you can start.
Documents	Displays a list of documents that you have opened previously.
Settings	Displays a list of system components for which you can change settings.
Find	Enables you to find folder, file, shared computer, or mail message.
Help	Starts Help.
Run	Starts a program or opens a folder when you type an MS-DOS command.
Shut Down	Shuts down or restarts your computer, or logs you off.

The Start menu can be customised (add/remove programs) in the following way:

1. Click the **Start** button, and then point to **Settings**.

2. Click **Taskbar...**, and then click the **Start Menu Programs** tab.
3. Click **Add...**, and then click **Browse....**
4. Locate the program you want to add, and then double-click it.
5. Click **Next**, and then double-click the menu on which you want the program to appear.
6. Type the name that you want to see on the menu, and then click **Finish**.
7. If Windows prompts you to choose an icon, click one and then click **Finish**.

1.7.3 Shortcut Menus

Use the right mouse button to click any item and see a shortcut menu. This menu contains common commands that you can use on the item you clicked. For example, by clicking on the blank area on the taskbar with your right mouse button, you can choose to arrange windows and customize taskbar.

To work with files and folders, instead of using the standard menus to find the command you need, use the right mouse button to click a file or folder. The menu that appears shows the most frequently used commands for that file or folder.

1.7.4 Setup Screen Saver

The screen saver is set to save the wear and tear of the screen. The screen saver starts if your computer is idle for the number of minutes specified in the Wait box. To clear the screen saver after it has started, move your mouse or press any key.

By default, only a limited set of screen savers is installed during Windows Setup. If you assign a password to a screen saver, people who do not know the password cannot clear the screen saver, and therefore cannot easily gain access to your computer.

To set-up the screen saver, follow the steps given below

1. Right-click on the desktop and select **Properties OR** Choose **Settings** option from the **Start** menu, then select **Control Panel** and choose **Display** from the displayed items.
2. Click on the **Screen Saver** tab.
3. Click on the down-arrow under **Screen Saver** field and browse through the different screen savers.
4. Choose the one that you like.
5. Click on **Settings...** button to customize the way it works.
6. You can set the password by choosing the option **Password Protected**.
7. **Set Password...** button is activated. Click on it and specify the password.
8. Preview the screen saver and set the timings, so that after the specified time, the screen saver will be activated.
9. Press **OK**.

1.7.5 How To Get Help

If you do not know how to do something, you can look it up in Help. Just click the Start button, and then click Help.

A Graphical User Interface

You can get Help on each item in a dialog box by clicking the question-mark button in the title bar and then clicking the item.

To learn what any toolbar button is for, you can rest your mouse pointer on the button for a few seconds. Windows displays the button name.

To find a topic in Help, follow the tips given below:

1. Click the Contents tab to browse through topics by category. If your Help file does not have a Contents tab, click the Contents button to see a list of topics.
2. Click the Index tab to see a list of index entries: either type the word you are looking for or scroll through the list.
3. Click the Find tab to search for words or phrases that may be contained in a Help topic.

To search for words in a Help file, follow the steps given below:

1. In Help, click the Find tab. If this is the first time you have clicked the Find tab, follow the instructions on your screen to compile a word list.
2. In the first text box, type the word(s) you want to find. Matching words appear in the list below it.
3. In the list of matching words, click the word(s) you want to look for.
4. In the bottom list box, double-click a title to display the topic.

If you want to look for more than one word, separate them with spaces in the first text box. When you look for hyphenated words, be sure to type the hyphen. To set specific search criteria, click Options.

To get Help in a dialog box, follow the steps given below

1. Click  at the top of a dialog box, and then click the item you want information about. If the dialog box does not have the button, look for a Help button, or try pressing F1.
2. The pop-up window displays the related information. To close the pop-up window, click inside it.
3. If you want to print or copy the information in a pop-up window, use the right mouse button to click inside it, and then click Print Topic.

OR

Another way to get Help on an item on the screen is to use your right mouse button to click the area you want Help on, and then click the What's This? command.

1.7.6 Shut-Down Windows 95

To shut down your computer, click the **Start** button, click **Shut Down**, and then click **Shut Down The Computer**. Do not turn off your computer until the "You can now safely turn off your computer" message appears.

1.8 SUMMARY

In this unit, you learned:

1. What is a GUI?
 2. What are the basic components of it?
 3. What are the parts of Windows?
 4. What are the basic techniques for working with Windows?
 5. Icons are termed as objects in Windows 95 because of their properties.
 6. Windows 95 properties can be easily customised according to the needs of the user.
 7. Switch easily between windows through taskbar.
 8. Use Screen savers to save your screen and work.
 9. Always remember to shutdown the computer properly.
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1.9 MODEL ANSWERS

Check Your Progress 1

1. GUI is a system that allows creation and manipulation of user interfaces employing windows, menus, icons, dialog boxes, etc. The basic features of GUI are

Pointing device such as mouse which controls cursor.

Point and shoot functionality under control of device which cause screen menus appear or disappear.

Support of windows which graphically display the status of a computer program

Icons that represent files, directories and other application and system entities.

Support of graphical metaphors such as pull-down menus, dialog boxes, buttons, slides that let the programmer and user tell the computer what to do and how to do it.

2. When a screen is split into several independent regions each one is called a window. Several applications can display results simultaneously in different windows. The user can switch from one window to another window. Windowing systems have capabilities to display windows either tiled or overlapped. Users can organise the screen by resizing the window or moving related windows closer.
3. Bit-mapped display is made up of tiny dots (pixels) that is an independently addressable and has much finer resolution than character displays. Bit-mapped displays have the advantages over character displays. One of the major advantages is of graphic capability.

Check Your Progress 2

1. There are four major components of GUI.
 - (i) A windowing system
 - (ii) An emerging model
 - (iii) An application program interface
 - (iv) A set of tools and frameworks for creating interfaces and developing integrated application.

The API (Application Program Interface) is a set of programming language functions that allow the programmer to specify how the actual application will control the menus scroll bars and icons that appear on the screen. Like windowing models, APIs align with particular GUIs. Its features vary from package to package.

2. There are several ways MS-Window enhances DOS environment.

A Graphical User Interface

- (i) Device independence. It presents a device independent interface to applications. Unlike most of today's DOS applications, a window application is not bound to the underlying hardware such as mouse, keyboard or display windows.
- ii) Multitasking. Users can have several applications in progress at the same time. Each application can be active in a separate window.
- (iii) Memory management. Windows also provide memory management the 640K limitation of MS-DOS. An application has the ability to extend memory and share data segments with other applications.
- (iv) Data sharing. Clipboard allow data transfer between application clipboard. Any type of data can be transferred from one window to another through the clipboard.