

# UNIT 3:

# Computer Softwares

## Computer Software

- Computer software is also known as computer programs, is the non-tangible component of computers.
- Computer software contrasts with computer hardware, which is the physical component of computers.
- The information technology stands firmly on two legs, such as
  - Hardware
  - Software
- Computer hardware and software require each other and neither can be realistically used without the other.

## Hardware

- Hardware is formed as the physical components of computer system ➤ All of the hardware parts may do different tasks.
- Without the hardware, there is no computers.

## Software

- Software is basically a set of instructions grouped into programs that make the computer to function in the desired way.
- It is collection of programs to perform a particular task.
- There are so many different types of softwares available for different purposes.
- Without the software, we cannot do any task using the computer.
- Software is usually written in high-level programming languages that are easier and more efficient for humans to use than machine language.

## Types of Software

- The software is widely available and there may be vast and a variety of software.
- Software are categorized into,
  - System Software
  - Application Software

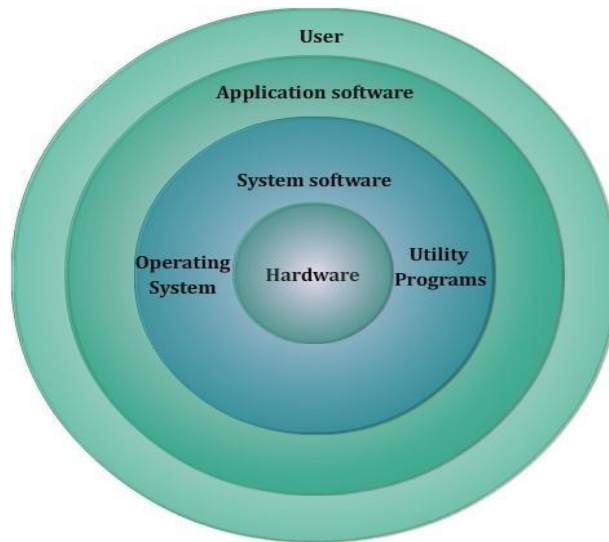


FIG : Computer Software

## System Software

- Systems software is a set of instructions that serves primarily as an intermediary between computer hardware and application programs, and may also be directly manipulated by knowledgeable users.
- It makes the operation of a computer system more effective and efficient.
- Systems software provides important self-regulatory functions for computer systems, such as
  - Loading itself when the computer is turned on.
  - Managing hardware resources such as secondary storage for all applications.
  - Providing commonly used sets of instructions for all applications to use.
- Without using the system software, there may be no computer program that can run on a computer system.

- So the system software is an important or indispensable part of the computer system.

## Types of System Software

- Operating System
- Utility Programs

### Operating System

- Operating System is an important system software found almost in all computers.
- Operating is defined as the program, that instructs the computer how to work with its various components.
- It helps to manage files and checks the various peripheral devices such as printers, monitors, etc.
- The operating system itself is a collection of programs, these programs translate our instructions to the computer's language.
- And then translate the computer's response from computer's language to the user understandable form.

### Utility Programs

- Utility software is a type of system software designed to help analyze, config, optimize and maintain the computer.
- A single piece of utility software is usually called a utility or tool.
- Utility software should not be confused with application software, which allows users to do things like creating text documents, playing games, listening to music or surfing the web.
- Rather than providing these kinds of user-oriented or output-oriented functionality, utility software usually focuses on how the computer infrastructure (including the computer hardware, operating system, application software and data storage) operates.
- Due to this focus, utilities are often rather technical and targeted at people with an advanced level of computer knowledge.
- Examples of utility software include,
  - Virus scanner - to protect the system from viruses.
  - Disk defragmenter - to speed up the hard disk.

- System monitor - to look at the current system resources.
- File managers - to add, delete, rename and move files and folders.

## Application Software

- Application software is computer software, designed to help the user to perform singular or multiple related specific tasks.
- They act as instructions which direct the hardware to perform specific functions.
- Application software cannot be operated unable to run without the operating system and system utilities.
- Application software can be used as a productivity/business tool; to assist with graphics and multimedia projects.
- Examples of Application Software
  - Microsoft Word
  - Microsoft PowerPoint
  - Macromedia Freehand
  - Adobe Photoshop
  - CorelDraw

**Note:** Above & below mentioned software/Logos are of respective vendors.



FIG : Application Software

### Types of Application software

- General purpose application software is designed to satisfy common needs of various businesses such as

- Application suite
- Enterprise software
- Enterprise infrastructure software
- Information worker software
- Content access software
- Educational software
- Simulation software
- Media development software
- Product engineering software

#### Features of application software

- Application software is close to users.
- Application software is slow in speed.
- This software is easy to understand and manipulate.
- Application software is easy to design

### Relationship between Hardware and Software

S.No.	SOFTWARE	HARDWARE
1.	It is a collection of program to bring the computer hardware system into operation.	It is the physical components of the computer system.
2.	It consists of numbers, alphabets, alphanumeric symbols, identifies keywords etc.	It consists of electronic components like IC's, diodes, resistors, crystals, boards, insulators etc.
3.	This should be prepared according to the type of software.	The design can be modified according to the capacity.
4.	It will vary as per the computer and its built-in function and programming language.	It is almost construct for all types of computer system.
5.	It is designed and developed by a programmer in a high level language, which is readable by human being.	The hardware can understand only low-level language or machine language.
6.	It is represented in any high level language such as BASIC, COBOL, C,C++, JAVA,..... etc.	The hardware works only on binary code as 1's and 0's.
7.	The software is categorized as operating systems, utilities, language processor, application softwares etc.	The hardware consists of Input, Output, Memory, ALU, Control Unit etc.

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## What is an Operating System?

An **Operating System (OS)** is a software that acts as an interface between computer hardware components and the user. Every computer system must have at least one operating system to run other programs. Applications like Browsers, MS Office, Notepad Games, etc., need some environment to run and perform its tasks. The OS helps you to communicate with the computer without knowing how to speak the computer's language. It is not possible for the user to use any computer or mobile device without having an operating system.

## History Of OS

- Operating systems were first developed in the late 1950s to manage tape storage
- The General Motors Research Lab implemented the first OS in the early 1950s for their IBM 701
- In the mid-1960s, operating systems started to use disks
- In the late 1960s, the first version of the Unix OS was developed
- The first OS built by Microsoft was DOS. It was built in 1981 by purchasing the 86-DOS software from a Seattle company
- The present-day popular OS Windows first came to existence in 1985 when a GUI was created and paired with MS-DOS.

## Types of Operating System (OS)

Following are the popular types of OS (Operating System):

- Batch Operating System
- Multitasking/Time Sharing OS
- Multiprocessing OS
- Real Time OS
- Distributed OS
- Network OS
- Mobile OS

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## **Batch Operating System**

Some computer processes are very lengthy and time-consuming. To speed the same process, a job with a similar type of needs are batched together and run as a group.

The user of a batch operating system never directly interacts with the computer. In this type of OS, every user prepares his or her job on an offline device like a punch card and submit it to the computer operator.

## **Multi-Tasking/Time-sharing Operating systems**

Time-sharing operating system enables people located at a different terminal(shell) to use a single computer system at the same time. The processor time (CPU) which is shared among multiple users is termed as time sharing.

## **Real time OS**

A real time operating system time interval to process and respond to inputs is very small. Examples: Military Software Systems, Space Software Systems are the Real time OS example.

## **Distributed Operating System**

Distributed systems use many processors located in different machines to provide very fast computation to its users.

## **Network Operating System**

Network Operating System runs on a server. It provides the capability to serve to manage data, user, groups, security, application, and other networking functions.

## **Mobile OS**

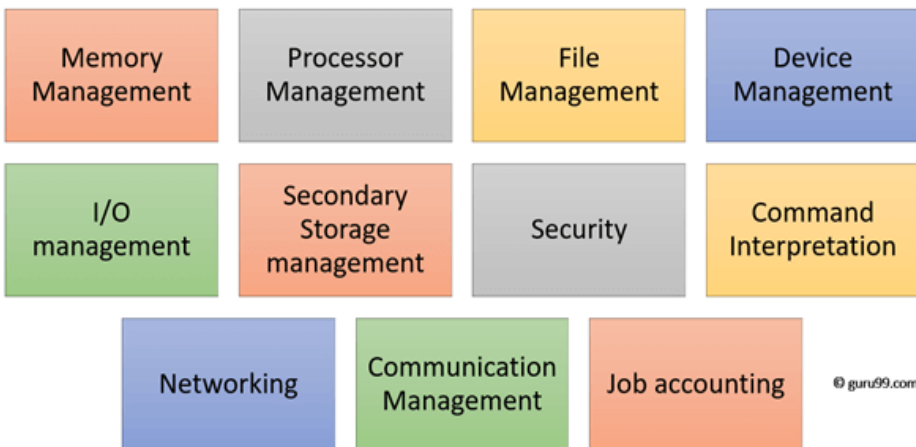
Mobile operating systems are those OS which is especially that are designed to power smartphones, tablets, and wearables devices. Some most famous mobile operating systems are Android and iOS, but others include BlackBerry, Web, and watchOS.

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# Functions of Operating System

Some typical operating system functions may include managing memory, files, processes, I/O system & devices, security, etc.

Below are the main functions of Operating System:



In an operating [system software](#) performs each of the function:

1. **Process management:** Process management helps OS to create and delete processes. It also provides mechanisms for synchronization and communication among processes.
2. **Memory management:** Memory management module performs the task of allocation and de-allocation of memory space to programs in need of this resources.
3. **File management:** It manages all the file-related activities such as organization storage, retrieval, naming, sharing, and protection of files.
4. **Device Management:** Device management keeps tracks of all devices. This module also responsible for this task is known as the I/O controller. It also performs the task of allocation and de-allocation of the devices.
5. **I/O System Management:** One of the main objects of any OS is to hide the peculiarities of that hardware devices from the user.



6. **Secondary-Storage Management:** Systems have several levels of storage which includes primary storage, secondary storage, and cache storage. Instructions and data must be stored in primary storage or cache so that a running program can reference it.
7. **Security:** Security module protects the [data and information](#) of a computer system against malware threat and authorized access.
8. **Command interpretation:** This module is interpreting commands given by the and acting system resources to process that commands.
9. **Networking:** A distributed system is a group of processors which do not share memory, hardware devices, or a clock. The processors communicate with one another through the network.
10. **Job accounting:** Keeping track of time & resource used by various job and users.
11. **Communication management:** Coordination and assignment of compilers, interpreters, and another software resource of the various users of the computer systems.

## Disk Operating System Commands



A **disk operating system** is an OS that operates on a hard drive. The operating system commands and regulates the computer's hardware and peripheral devices while also controlling the program and its operation. Microsoft created and released it as IBM PC DOS for the first time. In 1981, it also referred to the family of DOS known as MS-DOS.

The DOS is a 16-bit operating system, which implies that it may save and process 16 bits of data at once. It is a single-user, single-tasking OS. It is NON-GUI (**Graphical User Interface**), and it operates within a **CUI (Character User Interface)** environment.

The Dos operating system allows you to control the computer's behavior and functionality. It is a command-line operating system, which implies that you must use commands on the command line interface to achieve your desired results. The DOS has been improved from **1.00 to 1.1, 1.25, 6.0, 8.0**, and so on over the years.

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DOS Commands are instructions that allow Windows users to conduct tasks on files and folders. As you may know, a file is a container for a collection of information or data, and a directory is a collection of files. These are case insensitive.

The file name in MS-DOS is in 8dot format and broken into two parts - primary and secondary names. The primary name can be up to eight characters long, while the secondary name can be up to four characters with a dot. For example, in the filename Logo.jpg, the primary name is Logo, while the secondary name is .jpg. Secondary names are set for each type of file, so for system files, the secondary name is **.sys**, and for text files, it is **.txt**, etc. Special characters such as **>, ., /, \*, ?, |, &** Space are not permitted in file or directory names. Here is a list of the most common file types, along with their default secondary names:

File name	Extension
Text file	.txt
Program file	.prg
Library file	.lib
Command file	.com
Batch file	.bat
System file	.sys
Executable file	.exe
Database file	.dbm

## Types of DOS Commands

There are mainly two types of DOS Commands. These are as follows:

1. **Internal Commands**
2. **External Commands**

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# Operations on the File

A file is a collection of logically related data that is recorded on the secondary storage in the form of sequence of operations. The content of the files are defined by its creator who is creating the file. The various operations which can be implemented on a file such as read, write, open and close etc. are called file operations. These operations are performed by the user by using the commands provided by the operating system. Some common operations are as follows:

## **1.Create operation:**

This operation is used to create a file in the file system. It is the most widely used operation performed on the file system. To create a new file of a particular type the associated application program calls the file system. This file system allocates space to the file. As the file system knows the format of directory structure, so entry of this new file is made into the appropriate directory.

## **2. Open operation:**

This operation is the common operation performed on the file. Once the file is created, it must be opened before performing the file processing operations. When the user wants to open a file, it provides a file name to open the particular file in the file system. It tells the operating system to invoke the open system call and passes the file name to the file system.

## **3. Write operation:**

This operation is used to write the information into a file. A system call write is issued that specifies the name of the file and the length of the data has to be written to the file. Whenever the file length is increased by specified value and the file pointer is repositioned after the last byte written.

## **4. Read operation:**

This operation reads the contents from a file. A Read pointer is maintained by the OS, pointing to the position up to which the data has been read.

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## **5. Re-position or Seek operation:**

The seek system call re-positions the file pointers from the current position to a specific place in the file i.e. forward or backward depending upon the user's requirement. This operation is generally performed with those file management systems that support direct access files.

## **6. Delete operation:**

Deleting the file will not only delete all the data stored inside the file it is also used so that disk space occupied by it is freed. In order to delete the specified file the directory is searched. When the directory entry is located, all the associated file space and the directory entry is released.

## **7. Truncate operation:**

Truncating is simply deleting the file except deleting attributes. The file is not completely deleted although the information stored inside the file gets replaced.

## **8. Close operation:**

When the processing of the file is complete, it should be closed so that all the changes made permanent and all the resources occupied should be released. On closing it deallocates all the internal descriptors that were created when the file was opened.

## **9. Append operation:**

This operation adds data to the end of the file.

## **10. Rename operation:**

This operation is used to rename the existing file.

## Directory Commands

Directory Command	Description
<a href="#"><u>pwd</u></a>	The pwd command stands for (print working directory). It displays the current working location or directory of the user. It displays the whole working path starting with /. It is a built-in command.
<a href="#"><u>ls</u></a>	The ls command is used to show the list of a folder. It will list out all the files in the directed folder.
<a href="#"><u>cd</u></a>	The cd command stands for (change directory). It is used to change to the directory you want to work from the present directory.
<a href="#"><u>mkdir</u></a>	With mkdir command you can create your own directory.
<a href="#"><u>rmdir</u></a>	The rmdir command is used to remove a directory from your system.

## Introduction to Microsoft Windows

- Windows is developed by Microsoft Corporation.
- Microsoft Windows is a series of graphical interface Operating Systems.
- Microsoft Windows provides the environment necessary to start up and to operate a personal computer.
- It controls the overall activity of the computer.
- Windows also provides virtual memory management, supports multitasking platform and support many peripheral devices.
- More than 90 % of all the personal computers were dominated by Windows Operating System.

### An overview of different versions of Windows □

Versions of Microsoft Windows

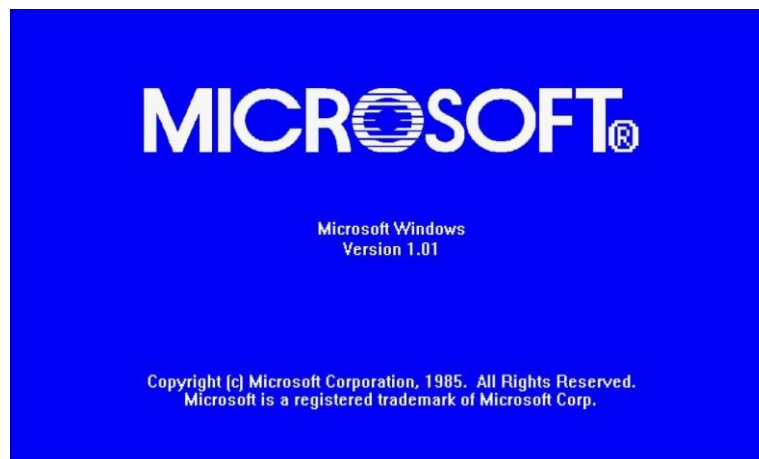
- Windows 1.0 - 2.0
- Windows 3.0 - 3.1
- Windows 95

- Windows 98
- Windows-2000
- Windows –XP
- Windows Vista
- Windows 7
- Windows 8



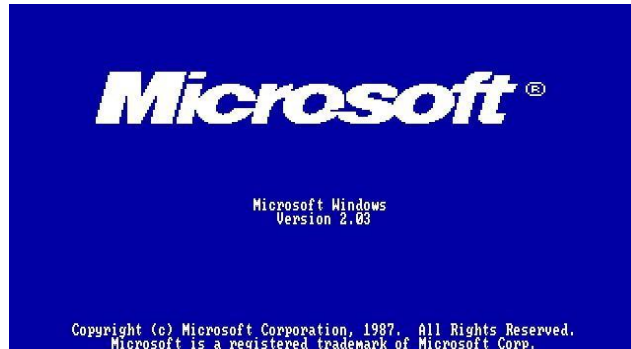
*FIG : Versions of Windows*

□ The first version of Microsoft Windows (**Microsoft Windows 1.0**) came out in November 1985.



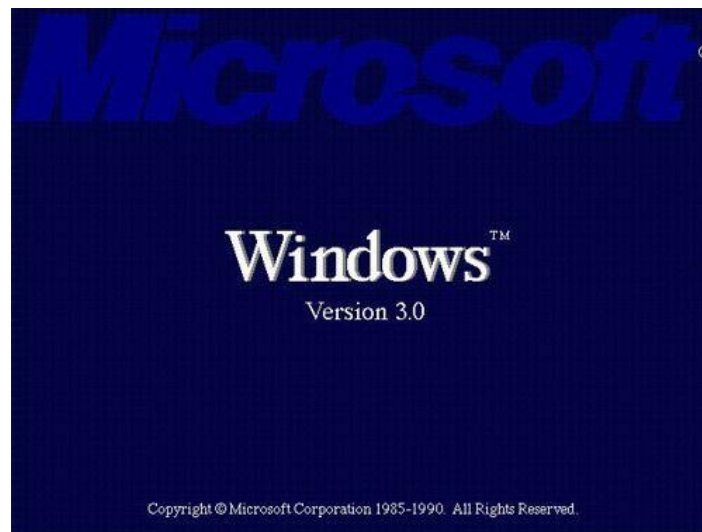
*FIG : Microsoft Windows 1.0*

- Rather than typing MS-DOS commands, you just move a mouse to point and user can click their way through screens in Windows1.0.
- On December 9, 1987 Microsoft releases **Windows 2.0** with desktop icons and expanded memory.



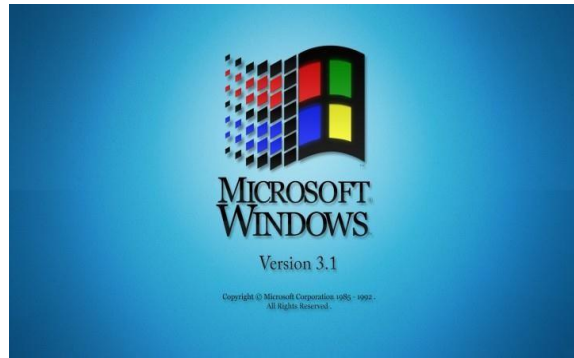
*FIG : Microsoft Windows 2.0*

- With improved graphics support, you can now overlap Windows, control the screen layout, and use keyboard shortcuts to speed up your work.
- Microsoft released **Windows 3.0** in May, 1990. Offering better icons, performance and advanced graphics with 16 colors designed for Intel 386 processors.
- This version is the first release that provides the standard "look and feel" of Microsoft Windows.



*FIG : Microsoft Windows 3.0*

- In the year 1992 Microsoft releases **Windows 3.1** and this is the most widely used Operating System yet.



*FIG : Microsoft Windows 3.1*

- Windows 3.1 contained necessary fixes and improved font functionality.
- Microsoft continued to develop a new release, Windows NT, hoping it could be released as a continuation of Windows 3.0 and 3.1.
- Unfortunately, issues with driver support and software meant that it was time for a new version altogether.
- Microsoft introduced Windows 95 in August 1995 to supersede Windows 3.X and significant enhancement were made for managing multimedia elements.

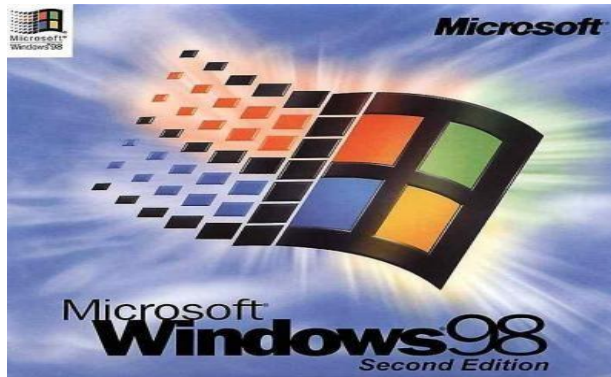


**FIG : Microsoft Windows 95** □

Window 95 is updated from 16-bit to 32-bit.

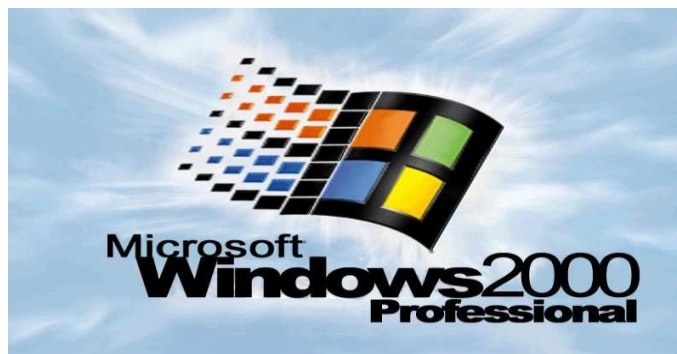
- Microsoft released the next version of Windows on June 25, 1998: **Windows 98**.





*FIG : Microsoft Windows 98*

- Windows 98 included improved hardware and hardware drivers, Internet Explorer, and eventually, Internet connection sharing.
- A second edition of Windows 98 came out on February 17, 2000; it was named Windows 98 SE (for "Second Edition").
- On September 14, 2000, Microsoft released **Windows Me** (for Millennium Edition), also called **Windows Millennium**.



*FIG : Microsoft Windows 2000*

- Windows 2000 made everyone's lives easier by increasing the number of plug and play devices compatible with the operating system.
- Windows XP was released in 2001.
- Windows XP is the new version of Windows. The letter XP stands for extra performance, Microsoft Windows XP brims with new features, improved programs and tools.
- Windows XP comes in two versions, Home and Professional.



*FIG : Microsoft Windows XP*

- Windows Vista is released in 2006 with the strongest security system.
- Windows Vista security features protect against the latest generation of threats, such as worms, viruses and spyware. If an attacker manages to compromise a computer, Windows Vista limits the damage.



*FIG : Microsoft Windows Vista*

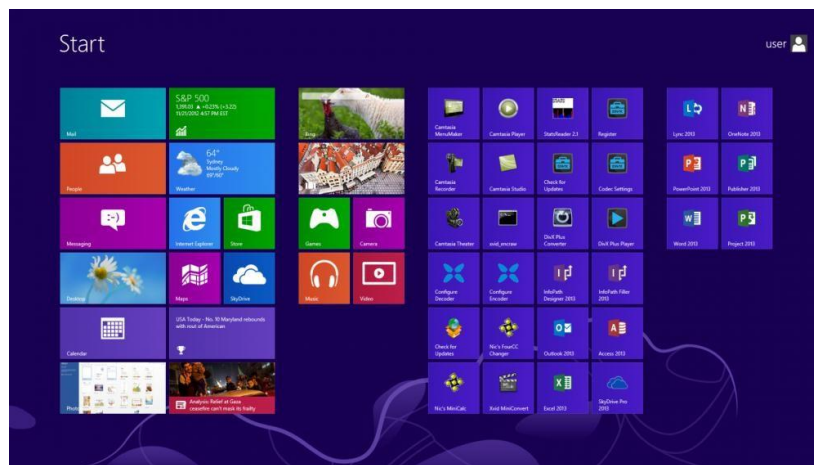
- Windows 7 is released in 2009 to fulfill requirements of Windows vista.
- Windows 7 include multi-touch support, Internet Explorer 8, improved performance and start-up time, Aero Snap, Aero Shake, support for virtual hard disks, a new and improved Windows Media Center, and improved security.



**FIG: Microsoft Windows 7** □

Windows 8 has been released in 2012.

- Windows 8 is a reimaged Operating System from the chipset to the user experience, and it introduces a totally new interface that works smoothly for both touch screens and input devices like mouse and keyboard.
- It functions as both a tablet for entertainment and a full-featured PC for getting things done.
- Windows 8 also includes enhancements of the familiar Windows desktop, with a new taskbar and streamlined file management.
- Windows 8 features a Start screen with tiles that connect to people, files, apps, and websites.
- Apps are easily accessed from the Windows Store built right into the Start screen.

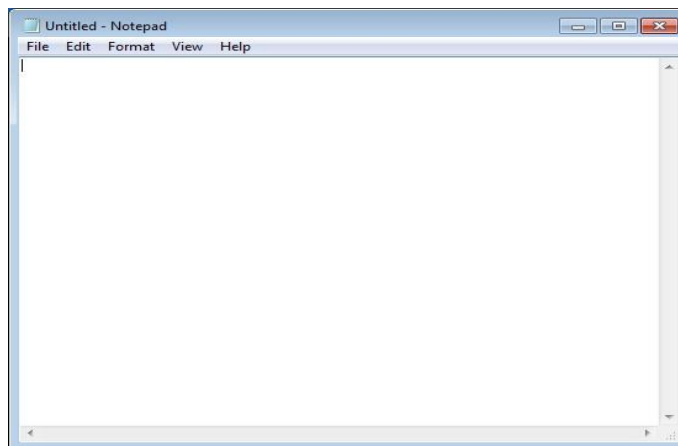


*FIG 3.12: Microsoft Windows 8*

## Basic Windows elements

### Window

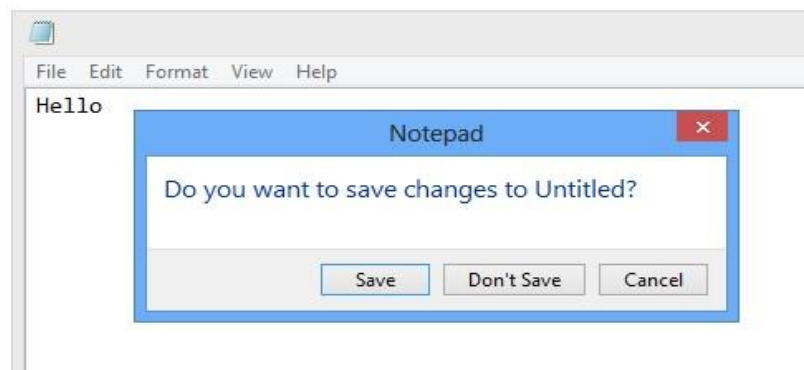
- A window is simply a rectangular unit that acts independently from other windows.
- In a graphical user interface (GUI), the boundaries of the window can be easily expanded or contracted.
- Windows come in two basic types: the application window, and the dialog box. **Application window**



*FIG : Application Window*

- Application windows are the main part of almost all programs.
- Common elements of application windows include the control menu, menu bar, and border.

### Dialog box



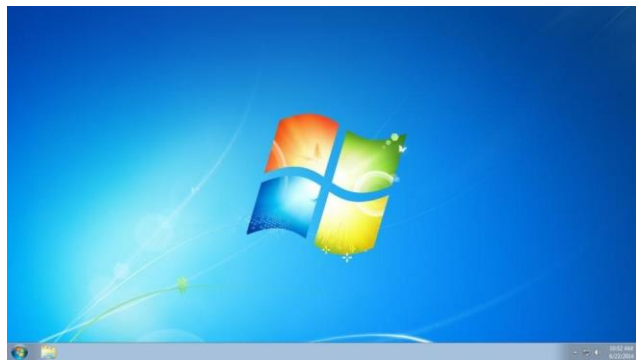
*FIG : Dialog box*

- Dialogs perform a specific task or give details for the application.

- Most dialog boxes lack several of the control buttons and a border, and will have other buttons inside the window to complete a request such as —OK and —CANCEL.

### Taskbar

- In GUI interfaces, the taskbar is a desktop toolbar application that lets the user to locate and perform tasks such as switching between open Windows and starting new applications.
- A bar at the bottom of the desktop is the Taskbar and it was first introduced with Microsoft Windows 95 and found in all versions of Windows after that.



*FIG: Taskbar*

- The notification area, at the far right of the taskbar, includes a clock and a group of icons.
- When clicked on a window title in the taskbar, that window will become active and show up in front of other Windows which are opened already.

### Icons

- An icon is a small graphic representation of a program.
- Icons allow the user to access the program with ease.
- Icons are used with Graphical User Interface (GUI).
- Operating Systems such as Microsoft Windows and the Apple Mac OS to help quickly identify a type of file or program associated with the icon.



FIG : Icons

## Start menu

- The Start menu is a feature of the Windows Operating System that provides quick access to programs, folders and system settings.
- By default, the Start menu is located in the lower-left corner of the Windows desktop.



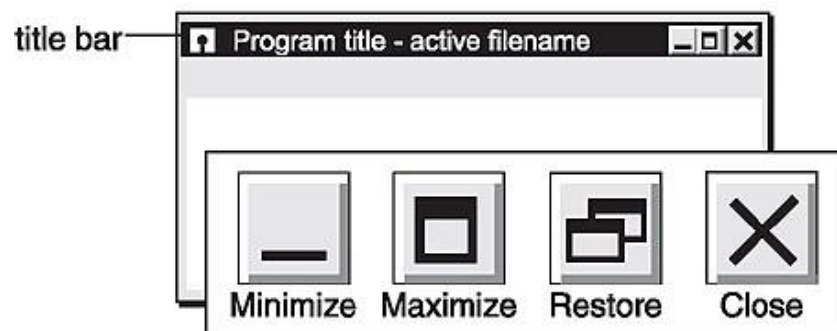
FIG : Start menu

## Border

- A border is —a part that forms the outer edge of something.
- The border not only defines where the window is on the desktop, but it can also be used to change the size of most windows.
- This type of border can be used to represent the outer edge of a document or to separate several sections within a document from each other.

## Title Bar

- The title bar is located along the top of a window or a dialog box that displays the name of the window or software program being used.
- In many graphical user interfaces, including the Macintosh and Microsoft Windows interfaces, user move (drag) a window by grabbing the title bar.
- Control buttons are the little buttons which are on the right side of title bar



*FIG : Title bar*

- These commands can be done with the mouse using other window elements; their primary usefulness is in when user have to do any of these functions with the keyboard.

## Minimize Button



*FIG: Minimize Button*

By pressing, it will remove the window and replace it with a program icon somewhere on the desktop.

## Maximize / Restore Button



*FIG : Maximize Button*

By pressing, it will make the window as large as it can possibly go – usually as large as the screen.



*FIG : Restore Button*

The button will then change to the Restore Button, which when pressed change the window back to its previous size.

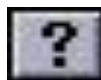
## Close Button



*FIG : Close Button*

- Pressing this button is just one way of closing the window. Other ways of closing the window include double-clicking the control menu or clicking on the File menu and then Exit if it's an application window, and clicking on the —OK|| button if it's a dialog box.
- Take caution on dialog boxes: When this button is active, it usually has the same effect as pressing the —CANCEL|| button, so be sure that, don't need to save any changes user made in the dialog box.

## Help Button



*FIG : Help Button*

- If user press it, a question mark will be attached to the mouse pointer.
- Then when user click on something else in that window, user will see a little box describing the purpose of what they clicked on and/or how to use it.



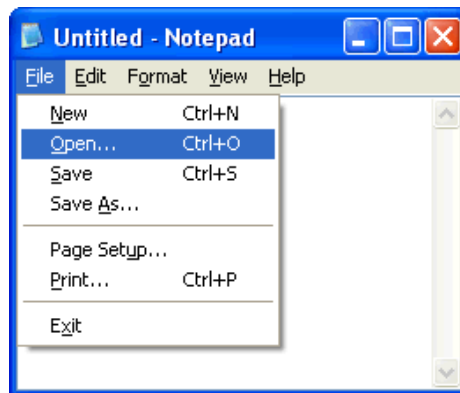
## Resize Handle



*FIG: Resize Handler*

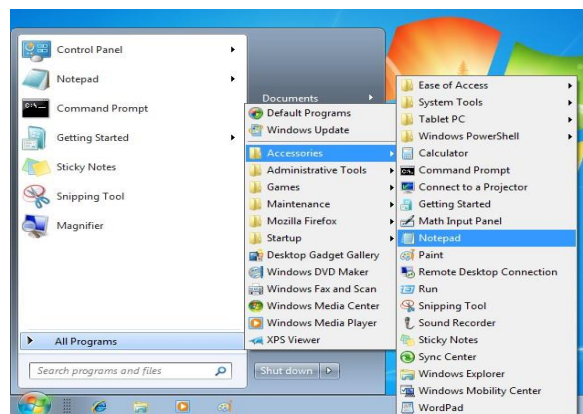
The resize handle is actually an extension to the border, found in the lower right corner of the window. It is especially useful when user want to change the size of the window but for some reason the border is too thin.

## Menu Bar



*FIG: Menu bar in Notepad*

- A menu bar is present in every application window directly below the title bar.
- Each word on the menu bar is a separate menu. If user click on the word, the corresponding menu will appear.
- Some programs have cascading menus, which means that an item inside the menu will bring user to another related menu.



*FIG : Cascading Menu bar*

# File management through Windows

- File management in windows can be done through Windows explorer or My Computer.

## Using Windows Explorer

- To open Windows Explorer,
  - Click on Start
  - Point to All Programs
  - Point to Accessories, and then click on Windows Explorer (Animation: Recording)
  - The left pane of the Explorer window shows a hierarchical list of files, folders, and storage drives (both fixed and removable) on computer. It also lists any network drives that have been mapped to as a drive letters on computer. (Animation: Recording)
- A drive or folder that contains other folders has an arrow to the left of the icon. Click the arrow to expand it and see the folders inside.
- Windows Explorer can be used to copy, move, rename, and search for files and folders.

## Opening drives and folders

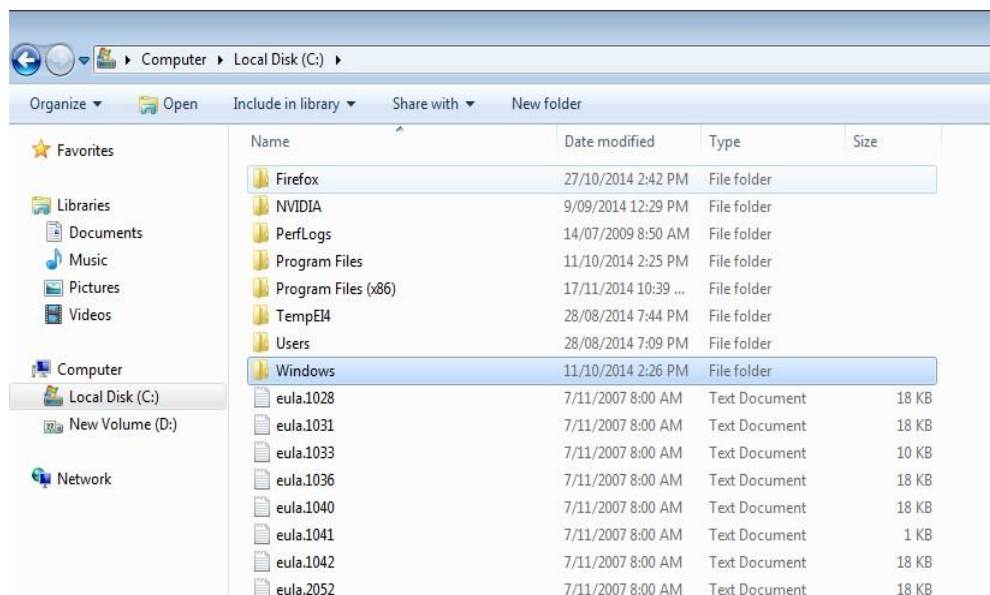


FIG : Opening drives and folders

- There are two basic formats for the interface used to open drives and folders in the computer.(text animation)
- The single-pane view used for most folders and in My Computer.

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- Two drives nearly all computers have a hard drive (drive C:). If user have more than one drive, then they are named E:, F: and so on. If user have a CD drive or a DVD drive, it also is named with a letter.
  - Opening a drive or folder is easy. Just double click the icon representing the drive user want to open. Files and folders contained in the drive are now shown in the opened window. Now for opening a folder, double click its icon.

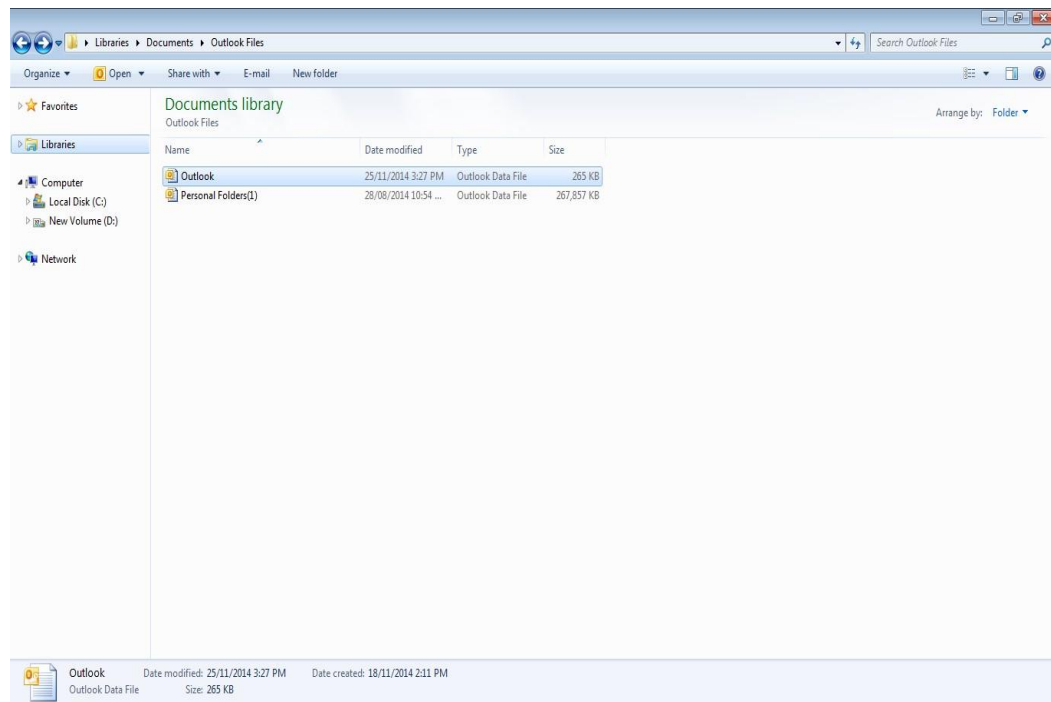
### **Copying or Moving a file or folder using My Document**

- Click on Start, and then click on My Documents.
- Click the file or folder to be copied. More than one file or folder can be copied at a time.
- To select more than one consecutive files or folders, click the first file or folder, press and hold down SHIFT key, and then click the last files or folders.
- Right click on the selected files or folders, then click Copy to copy the selected files and folders.
- Choose the desired location to paste the files of folders, then clicking the right mouse button, select Paste to paste the files or folders to the target drive.

### **View file details**

- Click on Start, and then click on My Documents.
- Double-click the folder that contains the files to be viewed.
- On the View menu, click Details.
- It will display all the details about the files such as Name, Type, size etc.

## Copying and moving files using Explorer



*FIG : Copying and moving files*

- Click Start, point to All Programs then Accessories, and then click Windows Explorer.
- Make sure the destination for the file or folder user want to move is visible.
- Drag the file or folder from the right pane and drop it on to the destination folder in the left pane to move the file or folder there.
- If user drag an item while pressing the right mouse button, they can move, copy, or create a shortcut to the file in its new location.
- To copy the item instead of moving it, press and hold CTRL while dragging.
- If user drag an item to another disk, it is copied, but not moved then press and hold down SHIFT while dragging.
- Dragging a program to a new location creates a shortcut to that program. To move a program, right-click and then drag the program to the new location.

### Create a new folder

- Folders help the user to organize their files.
- User can create a folder either by using My Computer window or through Windows Explorer. User can create a Folder in any existing disk drive or folder or on the windows desktop.

- The steps for creating a folder are
  - Click on Start, and then click on My Documents.
  - Under File menu click New and select Folder.
  - A new folder is displayed with the default name, New Folder.
  - Type a name for the new folder, and then press ENTER.
- A new folder can also be created directly on the desktop by right-clicking a blank area on the desktop, pointing to New, and then clicking Folder.

### Rename a file or folder

- The steps for renaming a folder are
  - Click on Start, and then click on My Documents.
  - Click on the file or folder user want to rename.
  - Under File menu click on Rename.
  - Type the new name, and then press ENTER key.
- Alternately file or folder can also be renamed by right-clicking it and then clicking on Rename.

### Delete a file or folder

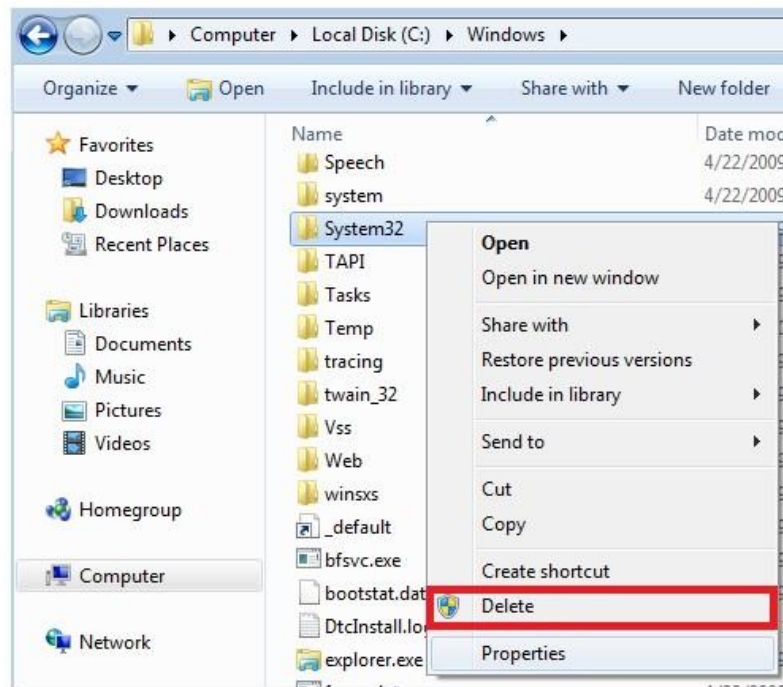


FIG : Delete a file or folder

- Steps for delete a folder
  - Click on Start, and then click on My Documents.

- Click on the file or folder user want to delete.
- Under File menu click on Delete.
- Files or folders can also be deleted by right-clicking the file or folder and then clicking Delete.
- Deleted files or folders are stored in the Recycle Bin, till they are permanently removed from the Recycle Bin.
- To retrieve a deleted file, double-click the Recycle Bin icon on the desktop. Right click on the file to be retrieved, and then click Restore.
- To permanently delete a file, press and hold down SHIFT key and drag it to the Recycle Bin.
- Files or folders deleted from a removable storage media such as network drive are permanently deleted and are not sent to the Recycle Bin.