



CHAPTER 7: MICROSOFT WINDOWS OPERATING SYSTEM: STRUCTURE, FEATURES, AND SYSTEM UTILITIES

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Abstract

This chapter provides a comprehensive understanding of the Microsoft Windows operating system, focusing on its structure, features, and essential utilities. It begins with an introduction to Windows as a graphical user interface (GUI)-based operating system that enables users to interact with computer systems through point-and-click operations. The chapter explains the organization of Windows, including different types of windows such as program, document, and folder windows, along with their key components like title bars, menu bars, and scroll bars. The chapter further explores the concept of the desktop environment, including icons, taskbar, start menu, and system tray, which collectively enhance user interaction and system navigation. It also explains fundamental file management operations such as copying, moving, renaming, and deleting files and folders. Additionally, the chapter provides detailed insights into various Windows accessories and system tools, including Calculator, Notepad, Paint, Snipping Tool, Disk Cleanup, Disk Defragmenter, and System Restore. Accessibility tools such as Magnifier, Narrator, and On-Screen Keyboard are also discussed, highlighting their role in supporting users with special needs. The chapter concludes with an overview of Control Panel and Windows Explorer, emphasizing their importance in system configuration and file management. Overall, this chapter equips learners with practical knowledge for efficient use of the Windows operating system.

Keywords: Windows Operating System, GUI, Desktop, Taskbar, Start Menu, File Management, Icons, Control Panel, Windows Explorer, System Tools, Disk Cleanup, Disk Defragmenter, System Restore, Windows Accessories, Accessibility Tools

What is Windows?

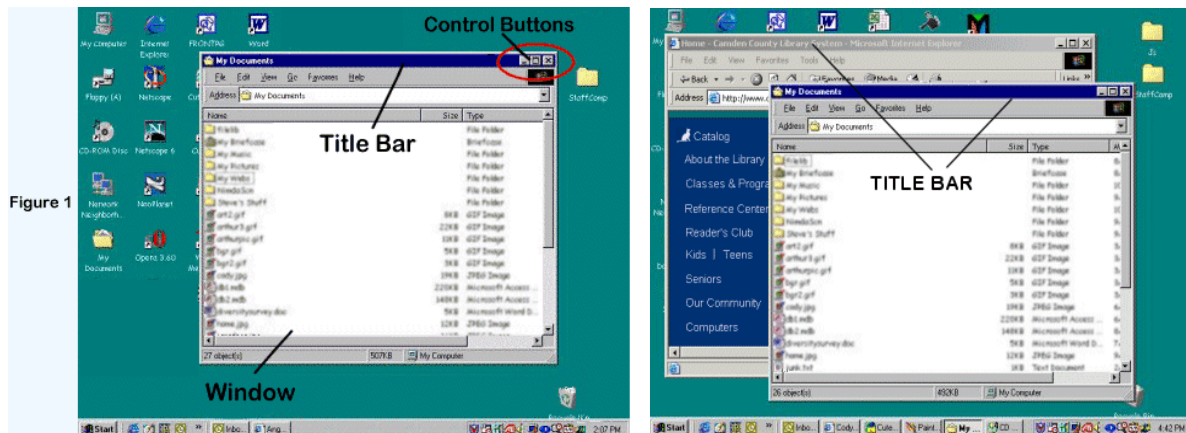
Window is an operating system and Graphical User Interface (GUI) created by Microsoft and found on most computer systems.

- It allows for easy “point and click” operations between the user and the different files and programs with which they wish to work.
 - While there are many different versions of Windows, the fundamentals are the same.
- An understanding of the below tools and features will make it easier to use windows.

Windows structure:

The “window” refers a program or document or other object that is open. We can have multiple windows open

at once and easily switch back and forth between them. We can move windows around, resize them or have a particular window expand onto the entire screen.



Types of Windows:-

1. Program Windows –Applications like Word, Internet Explorer are comes under the program windows.
2. Document Windows–these windows are Opens to a specific document within the applicable program window.
3. Folder Windows –A folder, like “My Documents” that may contain other folders, documents, programs, etc. are comes under this category.

Parts of a Window:-

1. **Title Bar** –it appears at the top of the window. It has mainly contained these buttons:-

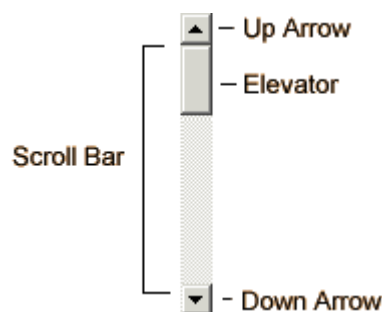


1. Minimize
2. Maximize
3. Restore
4. Close

To adjust the size and position of a window, we can click and drag on the title bar. When window is smaller we can also move our window to another position by dragging it by toolbar. Also we can resize our window by clicking on the “resize” button.

2. **Menu bar:** - every window has a menu bar, which allows to access features within that particular program. For example office 2010 programs also have a menu bar and is called “the ribbon”.

3. **Scroll Bars:** - Scroll bars often appear at the bottom and even more often on the right hand side of a window, if there is a lot of content. Scroll bars are disabled when the content displayed is limited enough to fit within the dimensions of the window.



4. Cut/Copy/Paste:-

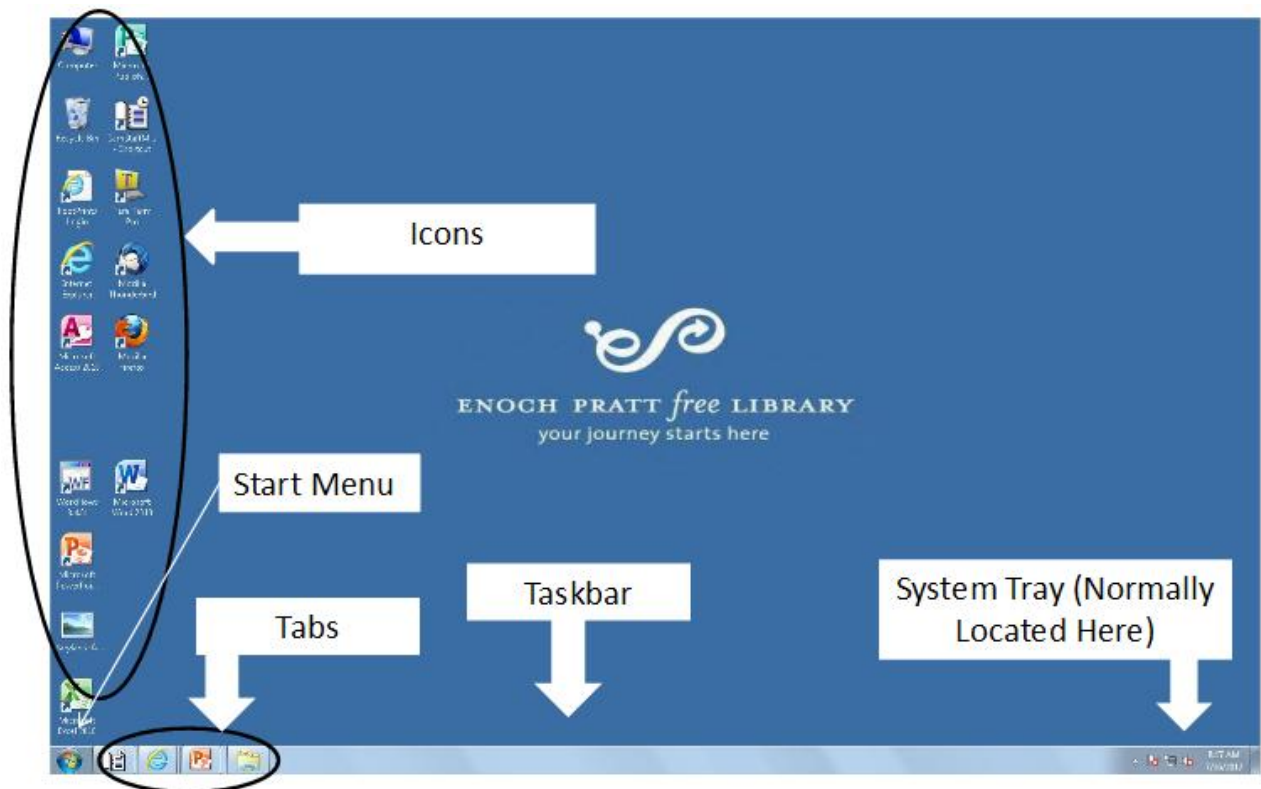
Cut, copy, and paste commands can be used with to move text, graphics and other items from one application to the next (Internet Explorer to Microsoft Word, for instance). Copied or cut items are placed in temporary storage (the Clipboard) and can be retrieved as long as the computer is on or if the item hasn't been replaced by another that you select. An item on the Clipboard can be pasted multiple times.

Performing Cut/Copy/Paste:-

1. Select the item (text or graphic) to be copied by either highlighting the text or right clicking on the graphic.

2. Once we have made your selection, in the case of text, notice that it remains highlighted
3. We can now right click on your selection and select
Copy OR Press [Ctrl] + [C]
4. Now we have copied the material and we can use it to paste into another application.
5. Once we have copied the item, go to the application where we would like to paste it.
6. Place your cursor where you want to paste the item in the document (a word file, email, etc.)
7. Right Click and then select
Paste OR Press [Ctrl] + [V].
5. Moving/copying files and folders: - Similar to cutting and pasting text/graphics.
6. Renaming files/folders.
7. Creating new folders and shortcuts

The Desktop: - The “Desktop” is the general work area of your computer. It gives you access to programs, folders and documents that you use frequently. This area is customizable on your own computer, though it is not something that can be changed on a public computer at the library.



1. Icons: - An icon is a symbol/picture that acts as a button to open up a folder, document, application or other object. All icons need to be double clicked in order to open.

Different Types of Icons

1. Application Icons open up a program (an executable file), like Internet Explorer, Microsoft Word, etc.
2. Folder Icons store and organize documents and applications. Often you will find folders within folders.
3. Document icons represent a specific file, like a word document, picture, etc. These files typically have an association with the program that is used to open them.



Windows operating system uses different icons to represent files, folders and applications. Icons found on the desktop are normally left aligned. The desktop icons basically provided by windows are:

1. My Documents
2. My Computer
3. My Network Places
4. Recycle Bin
5. Internet Explorer

Recycle Bin:- Recycle bin makes it easy to delete and undelete files and folders. When a file or folder is deleted from any location, Windows stores it in the recycle bin. If a file is deleted accidentally, you can move it back from the recycle bin. We can also empty recycle bin to save disk space.

Steps to move back the file or folder from the recycle bin:-

1. Open Recycle bin by double clicking on its icon.
2. Select the file or folder you want to move back.
3. Click the right mouse.
4. A menu will appear, choose restore from it.
5. Windows will move the file or folder back to the location from where it was deleted.

My Computer: - My computer lets you browse the contents of your computer. The common tasks that we can perform through my computer are:

1. Access information stored as different storage devices connected with the computer, such as hard disk, floppy disk or CD ROM.
2. Create, move, copy, delete or rename files, folders and programs from one disk to another disk.
3. Execute or run programs from the disks.
4. Configure devices of the computer.
5. Add or remove a printer.

Icons vs. Programs

1. You double click on the icon to execute the program.
2. When inside of the program, you single click on the commands or icons for that program. (Examples: MS Office, Internet Explorer, Firefox, Windows Media Player, etc.)

2. The Taskbar: - The task bar is at the bottom of the desktop but you can move it to the top or either side of the screen by clicking and dragging it to the new location. Buttons representing programs currently running on your computer appears on the task bar. At the very left of the task bar is the start button, which allows access to other Windows programs and features that are not on the desktop. At the right side is an area called the system tray. System tray shows programs running in the background, the clock, volume control, etc.



3. Start Button:- Start button is found at the lower left corner of the screen. Click once on the start button to open a menu of choices. Through this button we can open the programs, installed on your computer and access all the utilities available in the windows environment. We can shutdown, restart and/or standby the computer by using the start button.

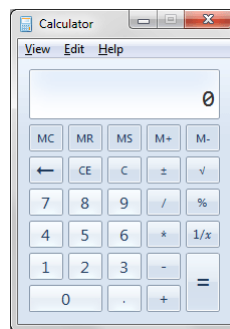
Start menu displays a menu of choices:

- 1. Default Programs:** - choose default programs for web browsing, e-mail, playing music and other activities. Place the mouse pointer to the programs entry and a sub menu will open, showing all programs or applications currently installed. To open a program, which has been installed on your computer, click on it and the program will open.
- 2. Favorites:** - Favorites menu present a list of the Internet addresses that you have added to your Internet Explorer Favorite List.
- 3. Documents:** - Access letter, reports, notes and other kind of documents. The Documents menu lists the files you have recently worked on. You can open the most recently used document directly from here. To open a document from this list, simply click on it and the document will open.
- 4. Control Panel:** - one can change setting and customize the functionality of the computer by using this button. This menu provides the facility to change or configure the hardware or software settings of the computer. This menu leads to several choices. The individual icons in the Control Panel refer to a variety of tools to control the way of your computer, its components presents information, as well as the tools to control the behavior and appearance of the Windows interface.
- 5. Find and search:** - This option of the start menu helps in locating files or folders stored on the hard disk or network. This command is very helpful in case we forget the exact location of a file or folder that we want to access. The search option presents different ways for finding a file or folder. These options include search based on name, type, size, and date and storage location of the file or folder. It opens a dialog box, where the user can type a name of the file or folder to search for. The procedure of using this command is given below:
 1. Click on Find option of the start menu, the Find dialog box will appear.
 2. Enter the name of the file or folder in the Named text box.
 3. From the Look in drop down list box choose the location where you imagine that your desired file or folder may be present.
 4. Click on the Find now button to start search.
 5. If find dialog box successfully searches the location of the desired file or folder, it will display it in the window below this dialog box.
- 6. Help and support:** - Find help topics, tutorials, troubleshooting and support services. To access the Help system of windows, you can select Help from the start menu. Help option helps us how to use the commands and menus and in case of problems how to trouble shoot the windows operating system.
- 7. Run:** - This command is used to execute a command or program directly instead of using the icon or program menu. Press the "Browse" button to locate the program you want to open through Run command.
- 8. Shutdown:-** Shutdown is a process in which computer closes all programs currently running and disconnects the devices connected with it and turns itself off. Following steps are followed to shutdown the computer:-
 1. Click on the start button to open the Start Menu.
 2. Click on the Shut Down.
 3. Shut down dialog box will appear.
 4. Choose the shut down option from the list and click the "OK" button.
- 9. Devices and Printers:-**view and manages devices, printers and printers job.
- 10. Computer:** - see the disk drive and other hardware connected the computer
- 11. Music:** - Play music and other audio files
- 12. Pictures:** - view and organize digital pictures.



Windows Accessories :- Windows operating system ships with some handy applications known as Windows accessories. Calculator, Notepad, Paint, Explorer, WordPad are some of the most frequently used accessories. Apart from above mentioned applications, Windows has a few tools for Ease of Access and some System Tools. We'll be briefly talking about them here.

1. Calculator:-



Windows Calculator is a calculating application included in all the versions of Windows. It can be used to perform simple calculation, scientific calculation and Programming calculation.

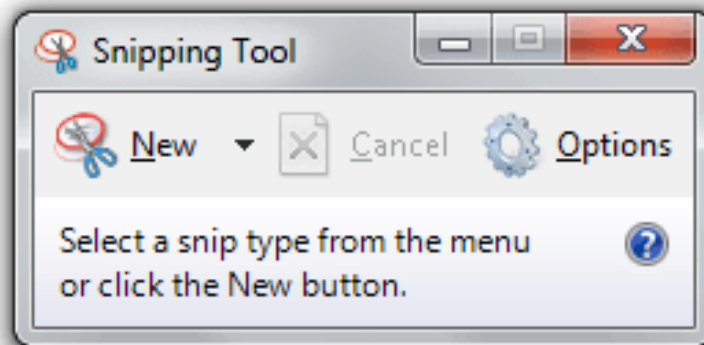
- Choose Start >> Programs >> Accessories >> Calculator to start Calculator application, or
- Alternately you can open Run dialog box (Start >> Run) dialog box then type calc and hit enter.
- From View menu choose the required type of calculator – Standard, Scientific, Programmer, Statistical
- Edit >> Copy and Paste commands can be used to input the numbers into calculator or paste the result to other applications

Calculator was first included with Windows 1.0 as a simple arithmetic calculator. In Windows 3.0, a Scientific mode was added, which included exponents and roots, logarithms, factorial-based functions, trigonometry (supports radian, degree and gradients angles), base conversions (2, 8, 10, 16), logic operations, Statistic functions such as single variable statistics and linear regression.

In Windows 7, separate Programmer, Statistics, Unit Conversion, Date Calculation, and Worksheets modes were added. Calculator's interface was revamped for the first time since its introduction.

On the right of the main Calculator, one can add a panel with Date Calculation, Unit Conversion, and Worksheets. The included Worksheets allow one to calculate a result of a chosen field based on the values of other fields. Pre-defined templates include calculating a car's fuel economy (mpg and L/100 km), a vehicle lease, and a mortgage. In pre-beta versions of Windows 7, Calculator also provided a Wages template.

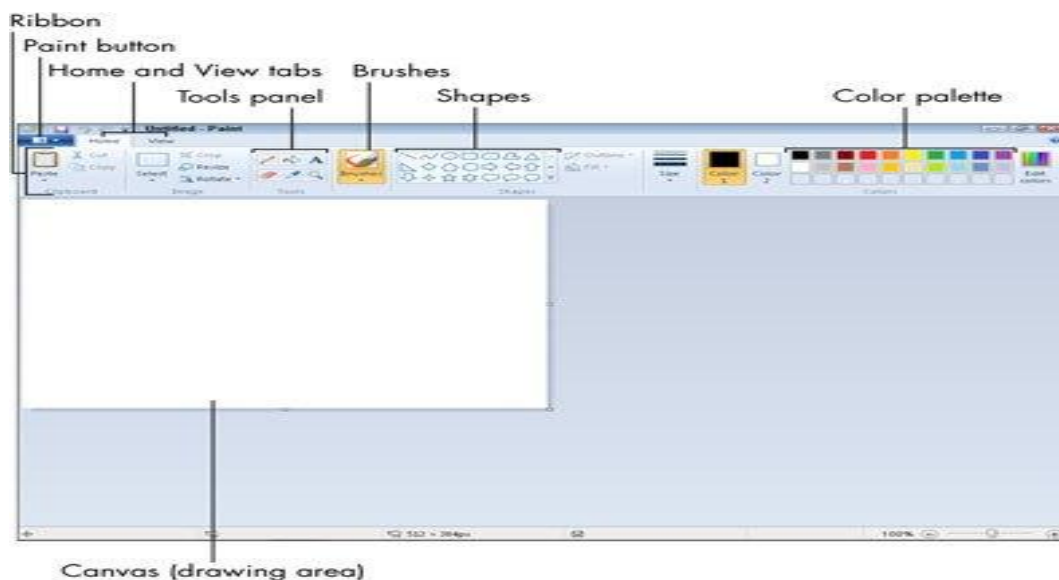
2.Snipping Tool:- Snipping Tool is another useful of Windows accessories included in Windows 7, Windows Vista, and Experience Pack for Windows XP Tablet PC Edition 2005. It was originally released as a powertoy for the Tablet PC. The program is a screen-capture tool that allows taking screenshots (called snips) of an open window, rectangular areas, a free-form area, or the entire screen. Snips can then be annotated using a mouse or a tablet, saved as an image file (PNG, GIF, or JPEG file) or an HTML page, or e-mailed.



The Snipping Tool captures all or part of the computer display screen as a picture. You can save the picture and attach it to an e-mail or paste the picture into a document. Click the Start button, type snip, and click the Snipping Tool from the search results. The screen fades slightly, and the Snipping Tool toolbar appears.

Snipping tool can be used to PrintScreen, annotate and use in other applications.

3. Paint:-



Paint (formerly Paintbrush for Windows) is a simple graphics painting program that has been included with all versions of Microsoft Windows. It is often referred to as MS Paint or Microsoft Paint. The program opens and saves files as Windows bitmap (24-bit, 256 colors, 16 color, and monochrome) .BMP, JPEG, GIF. Paintbrush supports GIF without animation or transparency. Since Windows 98 Paint supports GIF with transparency. It also supports PNG (without alpha channel), and TIFF (without multiple page support).

The program can be in color mode or two-color black-and-white, but there is no grayscale mode. For its

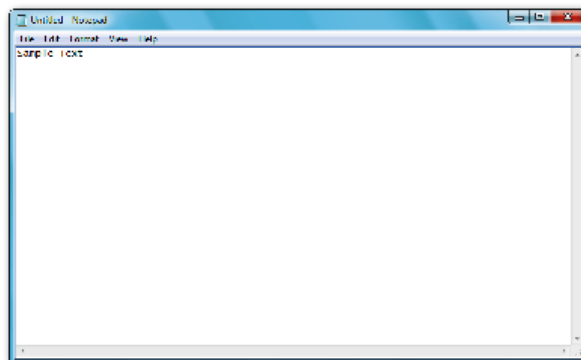
simplicity, it rapidly became one of the most used applications in the early versions of Windows—introducing many to painting on a computer for the first time—and still has strong associations with the immediate usability of the old Windows workspace.

4. Character Map:- Character Map is a utility included with Microsoft Windows operating systems and is used to view the characters in any installed font, to check what keyboard input (Alt code) is used to enter those characters, and to copy characters to the clipboard in lieu of typing them.



The tool is usually useful for entering special characters. It can be opened via the command line or Run Command dialog using the 'charmap' command.

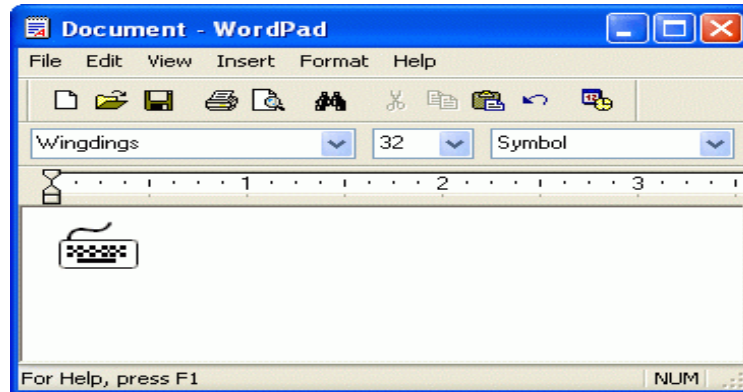
5. Notepad:-



Notepad is a common text-only (plain text) editor. The resulting files—typically saved with the .txt extension—have no format tags or styles, making the program suitable for editing system files that are to be used in a DOS environment.

Notepad supports both left-to-right and right-to-left based languages, and one can alternate between these viewing formats by using the right or left Ctrl+Shift keys to go to right-to-left format or left-to-right format, respectively.

6. WordPad:-



Microsoft WordPad is a free rich text editor included with Microsoft Windows 95 and the later. Earlier to Windows 95 there used to be an application called Write for the same task. Although capable of doing much more than Notepad, WordPad is not as advanced as Microsoft Word.

WordPad can format and print text, but lacks intermediate features such as a spell checker, thesaurus, and support for tables. As such, it is suitable for writing letters or short pieces, but underpowered for work that relies heavily on graphics or typesetting.

7. System Tools:-

For a smooth performance of a system, periodic maintenance is necessary. Tools like Disk Check, Disk Derangement, etc., helps in system maintenance. Windows includes some of the system utilities such as Disk Cleanup, Disk Defragment, System Restore, Control Panel and so on.

1. Disk Cleanup:- In Windows 7, Vista, and XP, Disk Cleanup frees disk space by cleaning areas that gather unneeded files. Using Disk Cleanup regularly, along with ScanDisk, DEFRAG, and up-to-date virus patterns, will help keep your computer running smoothly.



To run Disk Cleanup:

- From the Start menu, select Programs or All Programs, then Accessories, then System Tools, and then Disk Cleanup.
- Select the drive on which you would like to clear disk space (usually your C: drive), and click OK.
- Select from the four areas that Disk Cleanup will check and clean up:

Temporary Internet Files: Files stored on your local drive that allow web pages to load more quickly.

Downloaded Program Files: A storage location for programs downloaded when you visit specific web sites that use ActiveX and Java applets.

Recycle Bin: Files that have been marked as deleted.

Temporary Files: Items in the TEMP folder.

2.Disk Defragment:- Disk Defragmenter consolidates files so that each is saved in contiguous physical space on the hard drive. When your computer crashes or freezes, the drive becomes fragmented. This means the files may be broken up and stored in different locations in your computer. This causes programs and files to run more slowly.



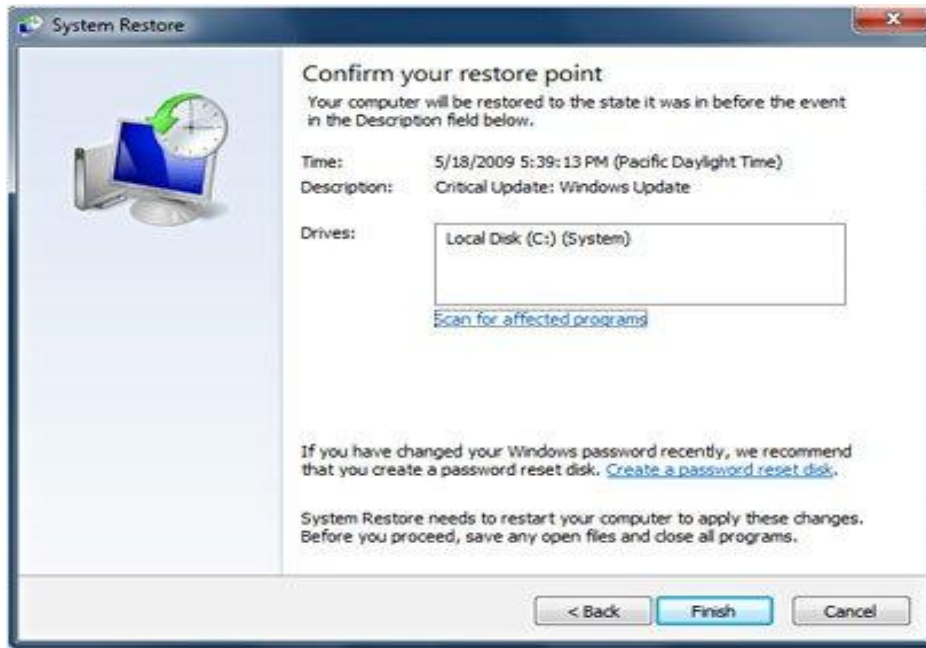
To run Disk Defragmenter:

- Close all programs.
- Choose Start menu | All Programs | Accessories | System Tools | Disk Defragmenter.
- Select the drive you want to clean and click OK.
- Click Analyze. This may take several minutes.
- Click Close or Defragment. If the drive needs defragmented and you choose Defragment, this may take several minutes to several hours, depending on the number of files to consolidate.

3.System Restore:- System restore is a feature of Windows that allows you to roll back the system to the same configuration it had at an earlier time. If this feature is turned on (which it is by default) Windows will take periodic snapshots (called restore points) of your installation. It can use the information gathered in these snapshots to restore your system to a previous configuration. It is a good idea to create a restore point before you make major changes to your system, such as before installing new hardware or doing any major updates.

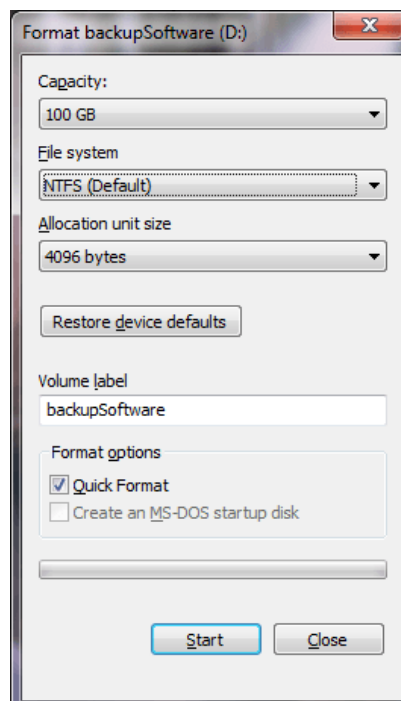
To run System Restore:

- Go to Start > Programs > Accessories > System Tools > System Restore.
- The System Restore screen will come up.
- Follow the on screen instructions



4.Format:- There are times when Windows becomes so damaged or so compromised by hackers and Trojan programs that the only thorough solution is to essentially start all over. This is accomplished by formatting your hard drive, which means erasing all of the programs and the data on your machine, and re-installing Windows.

The format creates a new root directory and file system for the disk. It can also check for bad areas on the disk, and it can delete all data on the disk. To be able to use a new disk, you must first use this command to format the disk.



8.Control Panel:- The Control Panel is a part of the Microsoft Windows graphical user interface. It allows users to view and manipulate basic system settings and controls via applets. You can use control panel for the tasks such as adding hardware, adding and removing software, controlling user accounts, and changing accessibility options. Additional applets can be provided by third party software.

In recent versions of Windows, the Control Panel has two views, Classic View and Category View, and it is possible to switch between these through an option that appears on either the left side or top of the window.

The classic view consists of shortcuts to the various control panel applets, usually without any description (other than the name). The categories are seen if the user use “Details” view.

The category view consists of categories, which when clicked on display the control panel applets related to the category. In Windows Vista, the category used applets below the name of the category.

9. Accessories also have few vision, hearing and ability tools. The first one is:

1.The Magnifier:- The Magnifier is a display utility that makes the computer screen more readable by people who have low vision by creating a separate window that displays a magnified portion of the screen. Magnifier provides a minimum level of functionality for people who have slight visual impairments.

Usually the Magnifier by default is set to show up at the top of the screen, but you can move it around by using your left mouse button: Click and hold down the left button and move the magnifier window to where you want it, then let go of the button.

When you open the Magnifier a new window appears: The Magnifier Settings window. From that window you can change the level of magnification, change the tracking and the presentation. To get out of the magnifier mode simply click Exit.

2.The Narrator:- It is available From Windows 2000 and newer. The Narrator is a text-to-speech utility for people who are blind or have low vision. Narrator reads what is displayed on the screen—the contents of the active window, menu options, or text that has been typed.

The Narrator is designed to work with Notepad, WordPad, Control Panel programs, Internet Explorer, the Windows desktop, and some parts of Windows Setup. Narrator may not read words aloud correctly in other programs. Narrator has a number of options that allow you to customize the way screen elements are read.

3.The On-screen Keyboard:- On-Screen Keyboard is a utility that displays a virtual keyboard on the computer screen. This tool allows people with mobility impairments to type data by using a pointing device or joystick. Besides providing a minimum level of functionality for some people with mobility impairments, On-Screen Keyboard can also be helpful for people who do not know how to type.

The program in which you want to type characters must be active while you are using On-Screen Keyboard. The accessibility tools in the Windows operating system are intended to provide a minimum level of functionality for users with special needs.



10.Windows explorer:- The tool's fundamental purpose is to let you view, open, copy, move, and otherwise manage your files and folders. So learning how to use it is key for tasks like importing photos from the aforementioned memory card, copying files to a flash drive, setting up folders to keep your data organized, and so on.

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