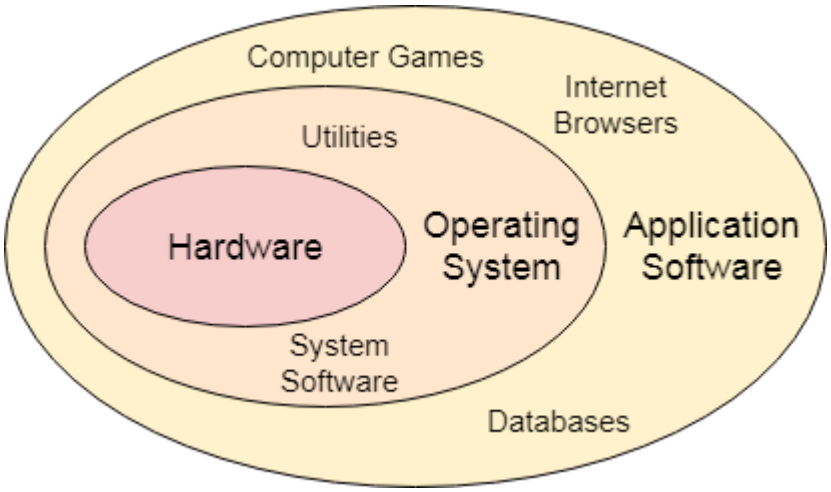
UNIT-IV

Operating System and Software Installations

- # Introduction to operating system

Operating System can be defined as an interface between user and the hardware. It provides an environment to the user so that, the user can perform its task in convenient and efficient way.

Operating System Definition and Function
In the Computer System (comprises of Hardware and software), Hardware can only understand machine code (in the form of 0 and 1) which doesn't make any sense to a naive user.
We need a system which can act as an intermediary and manage all the processes and resources present in the system.



An **Operating System** can be defined as an **interface between user and hardware**. It is responsible for the execution of all the processes, Resource Allocation, CPU management, File Management and many other tasks.
The purpose of an operating system is to provide an environment in which a user can execute programs in convenient and efficient manner.

- # Types of operating system (Windows and Linux):-

1. Windows:-

Windows is a **graphical operating system** developed by Microsoft. It allows users to view and store files, run the software, play games, watch videos, and provides a way to connect to the internet. It was released for both home computing and professional works.

Microsoft introduced the first version as 1.0

It was released for both home computing and professional functions of Windows on **10 November 1983**. Later, it was released on many versions of Windows as well as the current version, Windows 10.

2. Linux:-

   Just like Windows, iOS, and Mac OS, Linux is an operating system. It is a popular version of UNIX operating system. It is open source as its source code is freely available. Open source software is software that is distributed with its source code, making it available for use, modification, and distribution with its original rights. Anyone can use it in free. Its source code is available for all users. Linux is one such open source software whose source code is freely available on the internet.

- # Window - Evolution of operating system:-

Windows 1

Windows 1 was introduced by Microsoft on November 20 1985.It was a 16 bit operating system that need only less than 1 MB memory.

Windows 2

Windows 2 was launched on December 9 1987. This OS also a 16 bit Operating System.

Windows 3

Windows 3 was launched on May 22 1990.It was a major upgrade of windows history.

Windows 95

After Windows 3.1 version Microsoft began to develop a new operating system that's code name was Chicago. This operating system was introduced on August 24 1995.

Windows 98

This was launched on June 25 1998. This version supports for reading DVD and USB drives.

Windows 2000

Windows 2000 Professional version was designed with an intention to replace all the previous versions on all business desktops because of this edition was a business oriented operating system.

Windows XP

This edition of windows was launched on October 25 2001. This is a One of the bestselling product in Microsoft history.

Windows Vista

This was launched on 30 January 2007. Vista updated the look and feel of Windows with more focus on transparent elements, search and security.

Windows 7

Windows 7 was released on 22 October 2009. Microsoft named this edition as Blackcomb.

Windows 8

This was released on October 26 2012. This OS introduced major changes to operating system platform and user experience by introducing its tile type start menu and they design their start menu without start button.

Windows 10

This was released on July 29 2015.

Windows 11

This was released in 2021.

- # Linux - Evolution of operating system:-

LINUX was initially released by Linus Torvalds on September 17, 1991. The developers of the Free Open Source Foundation also helped Linus Torvalds in making Linux. When Torvalds developed Linux, he was a student at the University of Helsinki. At that time Torvalds developed Linux for his computer, in fact he wanted to buy Unix 386 Intel computer, but his financial condition was not so good that he could buy this computer. The License of Linux is open source, so Linux is freely available for anyone. But still the trademark of the name "Linux" goes to its creator, Linus Torvalds. The source code of the Linux OS is copyrighted by many individual authors, so it is collectively placed under the GPLv2 license, which includes everyone's consent.

- # Types of Software(Open Office and Web Browser):-

A. Open Office:-

Apache OpenOffice is the leading **open-source office software suite** for **word processing**, **spreadsheets**, **presentations**, **graphics**, **databases** and more. It is available in **many languages** and works on all **common computers**. It stores all your data in an **international open standard format** and can also read and write files from other common office software packages. It can be downloaded and used completely **free of charge** for **any purpose**.

Great software

Easy to use

and it’s free

B. Web Browser:-

A **web browser** is an application for accessing websites and the Internet. When a user requests a web page from a particular website, the browser retrieves its files from a web server and then displays the page on the user's screen. Browsers are used on a range of devices, including desktops, laptops, tablets, and smartphones.

- ## Case study of Installations Step for operating system and application software:-

The following is an overview of the procedures that are needed to install a new operating system (OS).

Step 1: Insert windows 7 CD or portable USB.

Step 2: You can see a black screen on your laptop or computer with message like press any key to boot from CD or DVD.

Step 3: Press space key or space bar from keyboard.

Step 4: Then “windows is loading files” will appear on your computer.

Step 5: You need to click on this next button.

Step 6: After that click on this install now button.

Step 7: You will get message like “setup is starting”.

Step 8: Now click on this “I accept the license terms” and then click on next button.

Step 9: Then you will get two option, you need to click on the second option i.e. Custom advanced so the partition window will appear.

Step 10: You need to select the partition i.e. drive in which you want to install the windows so select it and click on this next button.

Step 11: So windows is being installed now.

- ## Formatting of Hard disk:-

Disk formatting is the process of preparing a data storage device such as a hard disk drive, solid-state drive, floppy disk, memory card or USB flash drive for initial use.

Steps:

a) Go to This PC, Right Click on it and go to Manage.
b) Click on Disk management, you’ll get Details about Hard disk.
c) Then Go to Command Prompt.
d) In CMD, type Diskpart command.
e) After that type List Disk command.
f) Then you need to select Disk which you want to format with Select Disk_name Command (ex: select disk 0).

g) After selecting Type Clean command it will format that particular Disk which you had selected.

- # Partitioning of Hard disk in different logical drives:

A logical drive is a group of physical disk drives that appears to your operating system as a single drive that can be used to store data. The group of physical drives containing the logical drive is called a drive array, or just array.

A logical partition is a volume that is created inside an extended partition on a basic master boot record (MBR)-based disk.

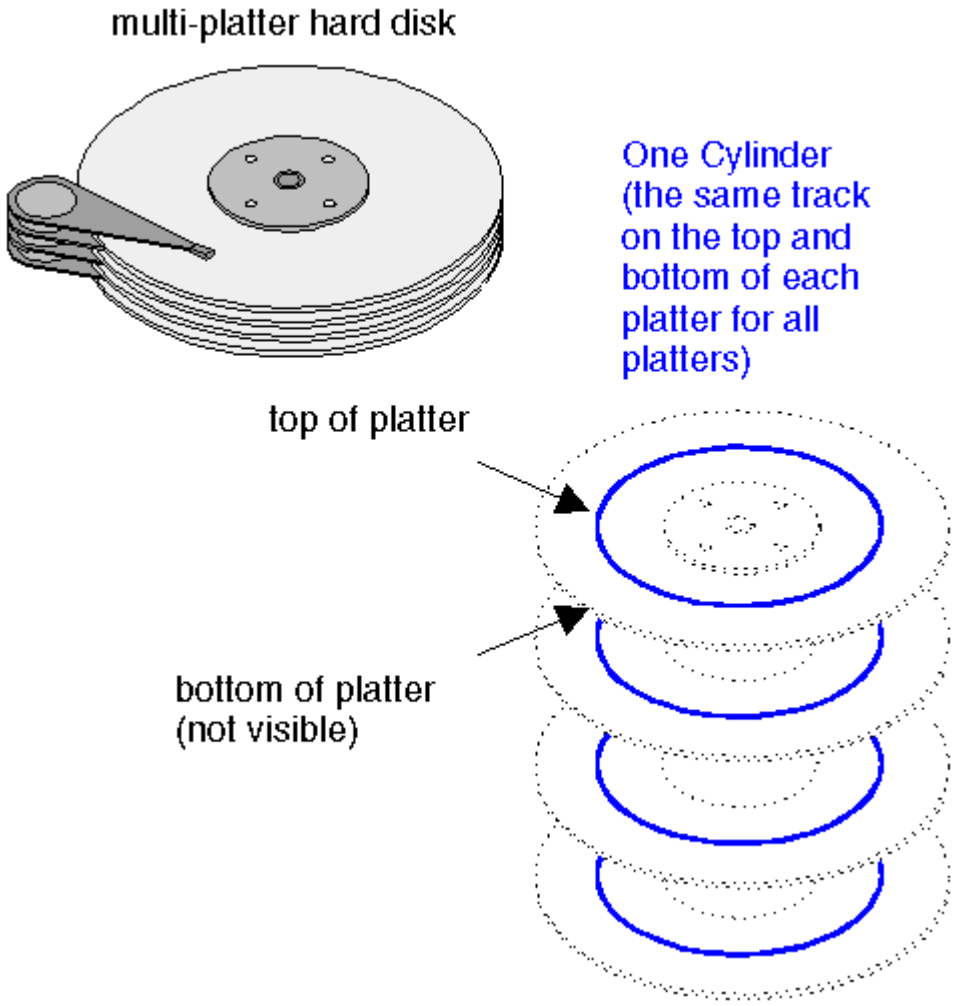
Logical partitions are similar to primary partitions. However, while only four primary partitions can exist on a single disk, the number of logical partitions that can exist on a disk is unlimited. A logical partition can be formatted and assigned a drive letter.

A logical partition must be created inside an extended partition. If an extended partition does not already exist on the disk or the specified size of the logical drive exceeds the extended partition, no partition is created.

- # Disk Structure: Cylinders

The aggregate of all tracks that reside in the same location on every disk surface. On multiple-platter disks, the cylinder is the sum total of every track with the same track number on every surface. On a floppy disk, a cylinder comprises the top and corresponding bottom track.

When storing data, the operating system fills an entire cylinder before moving to the next one. The access arm remains stationary until all the tracks in the cylinder have been read or written.



Cylinder: The cylinder is the aggregate of the same track number on every platter used for recording.

Head:

A read/write head is a specific physical part of a hard disk that is responsible for reading data from, and writing data to, the disk. Read/write heads are typically made up of a thin horizontal magnetic blade attached to an actuator arm.

Platters:

A **hard disk drive platter** or **hard disk** is the circular magnetic disk on which digital data is stored in a hard disk drive.The rigid nature of the platters is what gives them their name (as opposed to the flexible materials which are used to make floppy disks). Hard drives typically have several platters which are mounted on the same spindle. A platter can store information on both sides, typically requiring two recording heads per platter, one per surface.

Tracks: A disk drive track is a circular path on the surface of a disk or diskette on which information is magnetically recorded and from which recorded information is read. A track is a physical division of data in a disk drive, as used in the Cylinder-Head-Record (CCHHR) addressing mode of a CKD disk.

Sector:

A sector is the smallest physical storage unit on the disk, and on most file systems it is fixed at 512 bytes in size. A cluster can consist of one or more consecutive sectors – commonly, a cluster will have four or eight sectors.

Disk defragmentation:

Defragmentation, also known as *defragging* or *defrag*, is the process of rearranging the data on a storage medium, such as a hard disk drive (HDD), for efficient storage and access.

Defragmenting a hard drive can improve a computers or laptop's performance and speed. To reduce fragmentation, a disk optimization tool typically uses compaction to free up larger areas of space. Certain disk defragmentation tools might try to keep smaller files together, especially if they're often accessed sequentially.

Disk clean up:

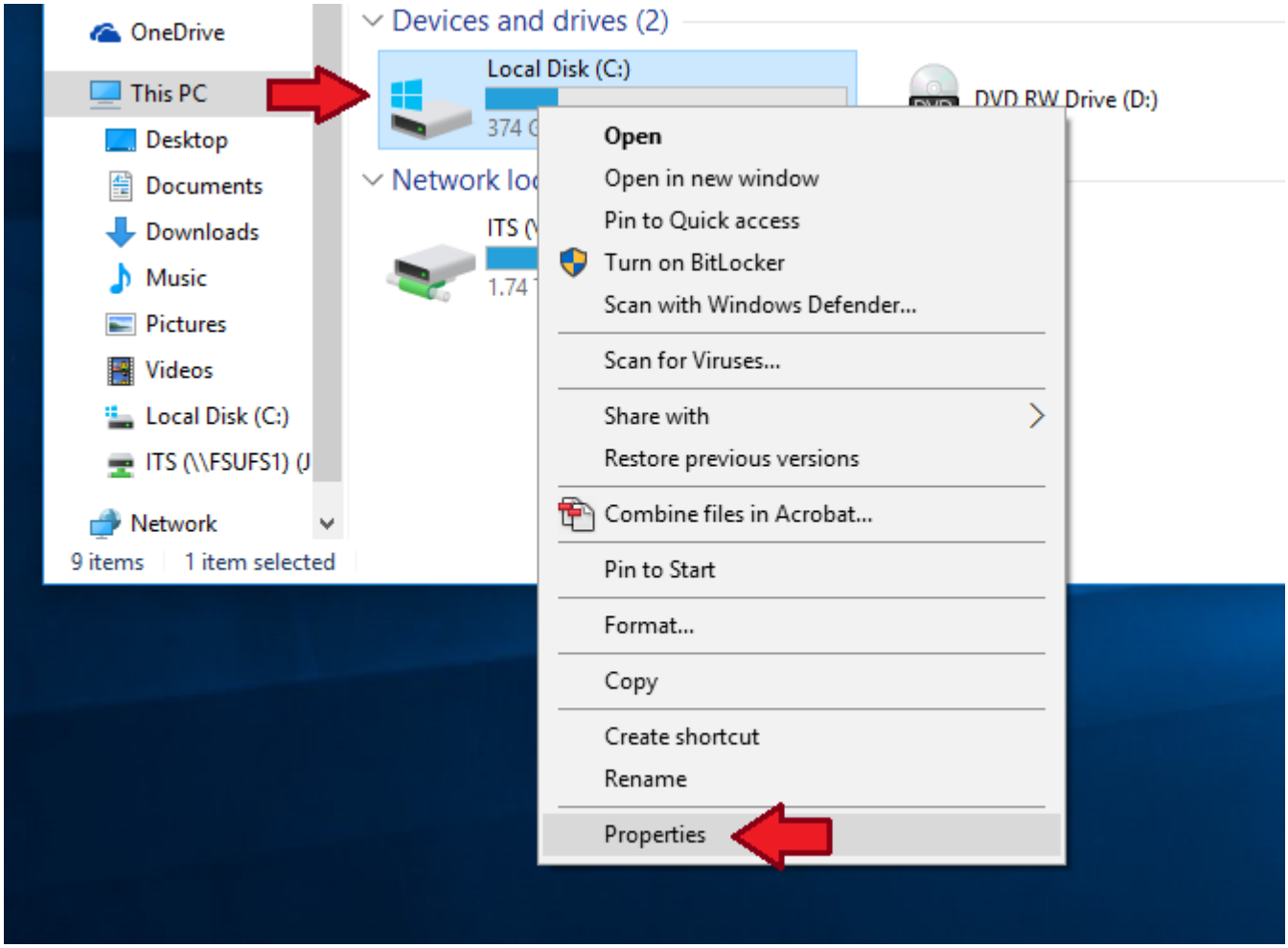
Disk Cleanup helps free up space on your hard disk, creating improved system performance.

Disk Cleanup searches your disk and then shows you temporary files, Internet cache files, and unnecessary program files that you can safely delete. You can direct Disk Cleanup to delete some or all of those files.

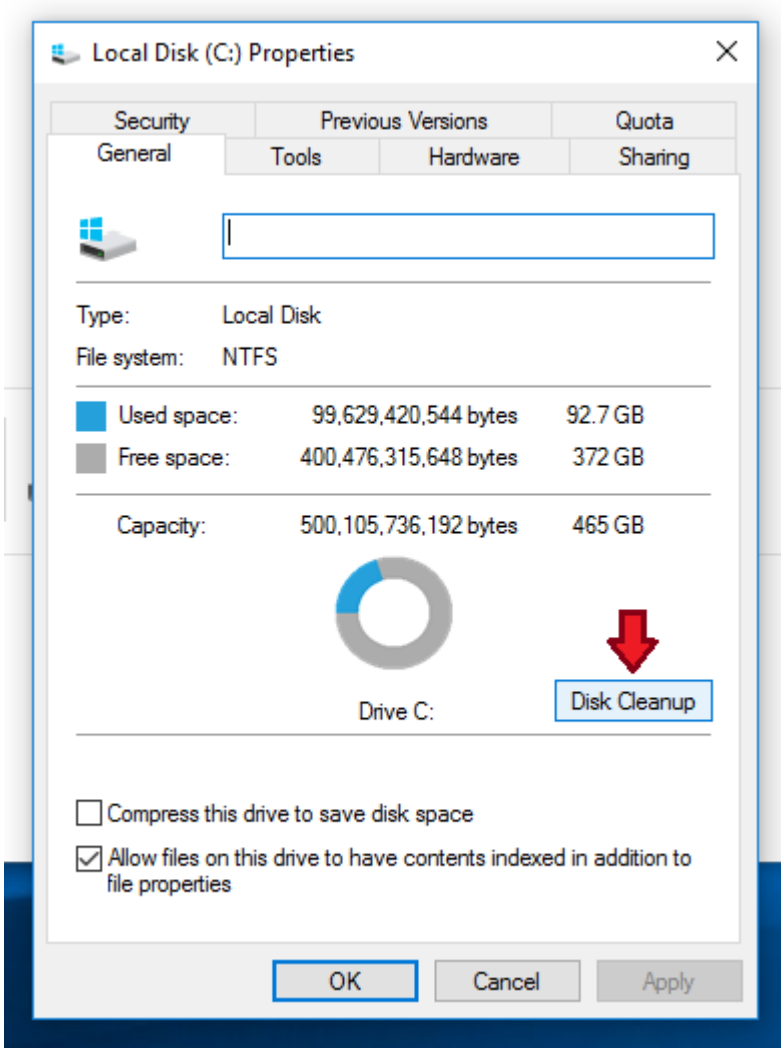
Steps:

1. Open File Explorer.

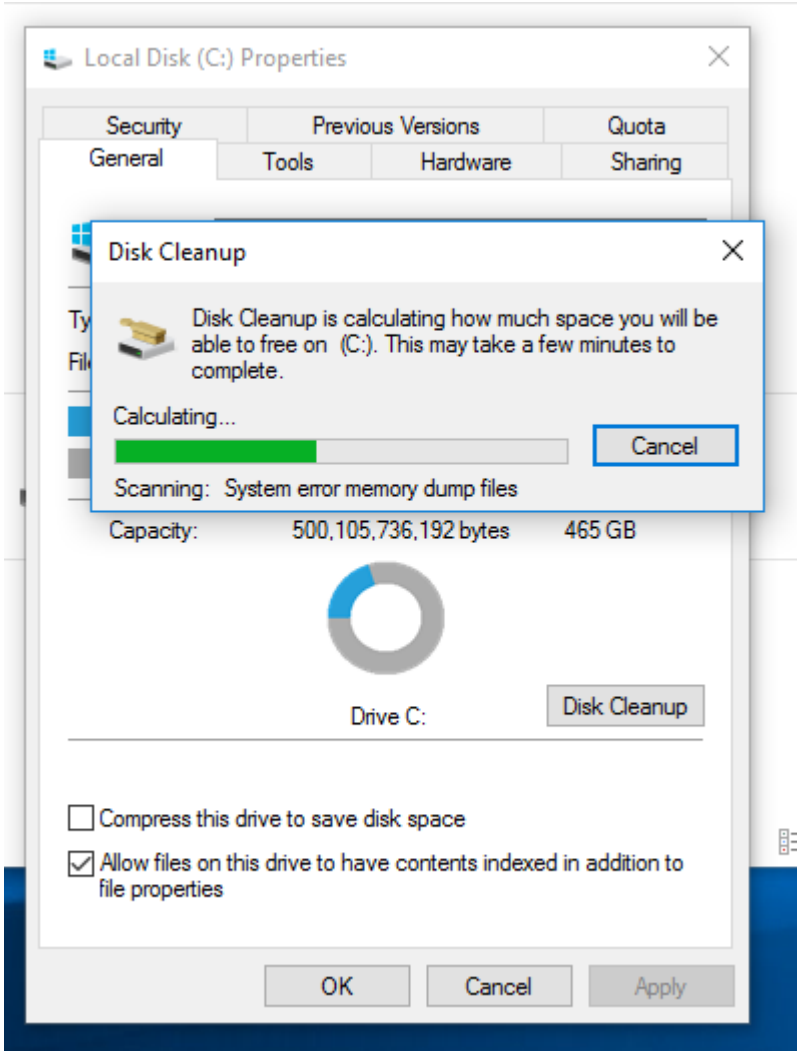
2. Right-click on the hard drive icon and select Properties.



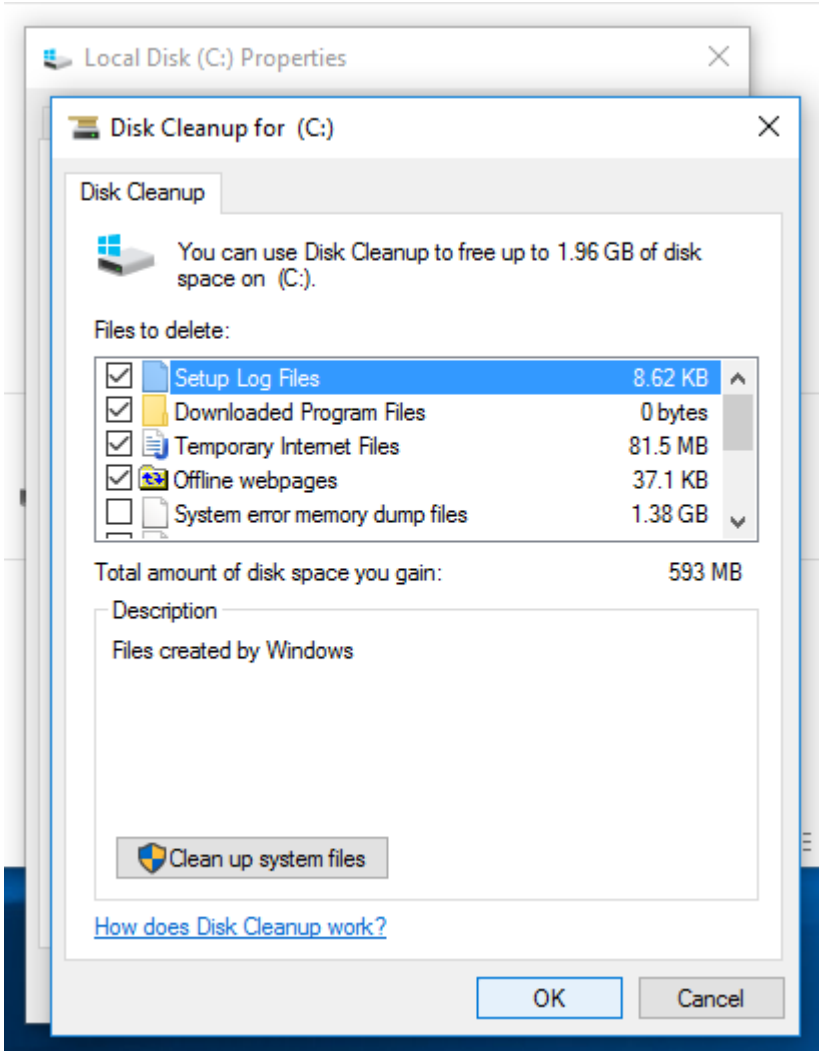
3. On the General tab, click Disk Cleanup.



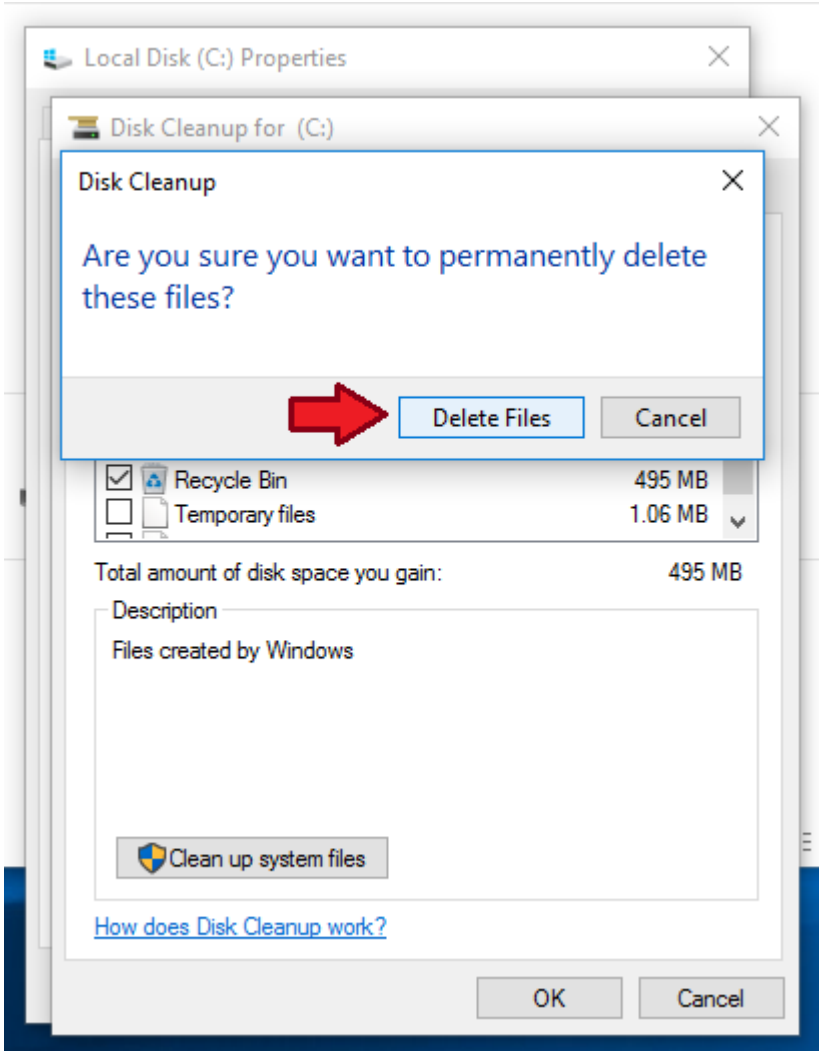
4. Disk Cleanup is going to take a few minutes calculating space to free up. Wait.



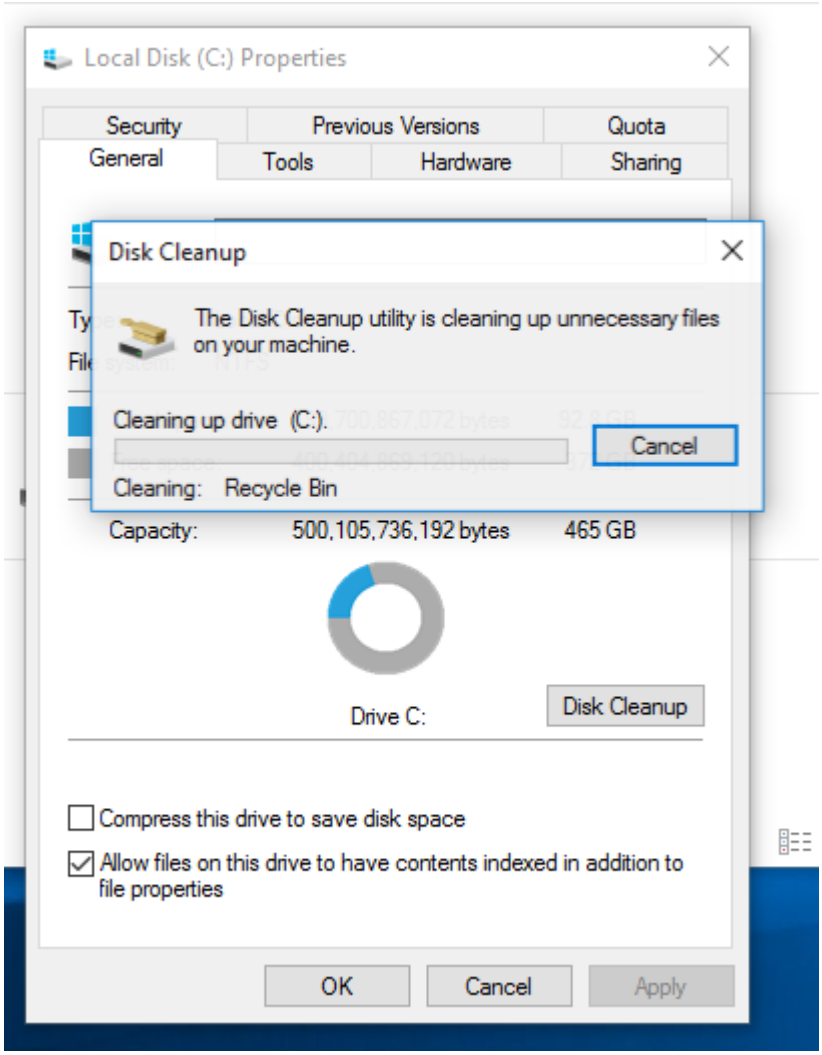
5. In the list of files you can remove, uncheck any you do not want removed. Click OK.



6. Click "Delete Files" to start the clean-up.



7. Wait for the Disk Cleanup to finish.



Scan Disk:

Microsoft Scan Disk (also called **Scan Disk**) is a diagnostic utility program included in MS-DOS and Windows 9x. It checks and repairs file systems errors on a disk drive, while the system starts.

Programs such as Scandisk, Chkdsk and Fsck are software utilities that are designed to correct file system errors on hard disks. If a computer is shutdown incorrectly (eg. it crashes or there is a power cut etc) then this disk checking software will often start automatically the next time the computer is switched on. It will scan the hard disk and detect any errors to the filesystem and then attempt to repair them. On older Windows systems such as Windows 98, you are given an option as to whether you want the repair utility to run. On more modern Windows systems such as Windows 2000 and Windows XP, the repair utility will run automatically.