

Computer software, or just software, is a collection of computer programs and related data that provide the instructions for telling a computer what to do and how to do it. In other words, software is a conceptual entity which is a set of computer programs, procedures, and associated documentation concerned with the operation of a data processing system. We can also say software refers to one or more computer programs and data held in the storage of the computer for some purposes. In other words software is a set of programs, procedures, algorithms and its documentation. Program software performs the function of the program it implements, either by directly providing instructions to the computer hardware or by serving as input to another piece of software. In contrast to hardware, software "cannot be touched".

Computer software is classified in two parts:

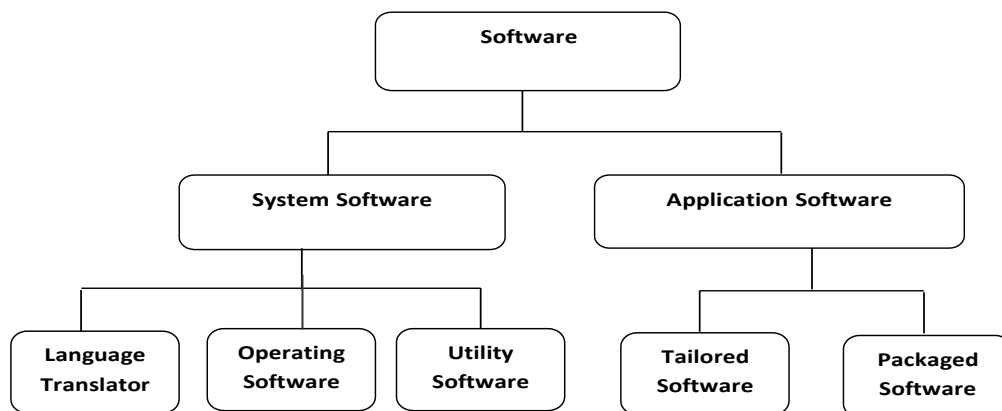


Figure: Software Classification

System software:

System software provides the basic functions that are performed by the computer. It is necessary for the functioning of a computer. Application software is used by the users to perform specific tasks. The user may choose the appropriate application software, for performing a specific task, which provides the desired functionality. The system software interacts with hardware at one end and with application software at the other end. The application software interacts with the system software and the users of the computer. Beside fig shows the hierarchy of software, hardware and users.



System software consists of many programs for controlling much Input/output operation. An operating system is example of system software. System software is further classified in three parts

- 1 **Language Translator:** A program that convert programming source code to machine readable codes are known as language translator. There are three types of language translator.
 - **Interpreter:** This is a program that converts high level language to machine level language i.e. Machine level language. The basic property of Interpreter is that it first scan one line of a program or source code, if this is error free then it executes either it will stop the execution. So a interpreter will check a program line by line and execute it, if it is error free. This process takes more time in execution of any program.
 - **Compiler:** A compiler is a program used to covert high-level language into machine level.

The basic property of compiler is that it first scan all file at a time and check for any error, if no error found then change the program to machine level either show all the errors present in the program. So it takes very less time for execution.

- Assembler: An assembler is a program written to convert assembly level language to machine level language.
- 2. **Operating system:** An operating system is the system software which is used to operate the computer. An operating system manages computer resources very efficiently, takes care of scheduling of multiple jobs for execution and manages the flow of data, instructions between input/output unit and the main memory. Windows, UNIX, Linux, Macintosh etc. are few widely used operating systems.
- 3. **Utilities:** Utility program are the programs which are often used by application program. These utility programs are created by the manufacturer. Ex. Text Editors, Sorting, Formatting etc.

Examples of system software:

- Close to the system
- Fast in speed
- Difficult to design
- Difficult to understand
- Less interactive
- Smaller in size
- Difficult to manipulate
- Generally written in low-level language

Application Software:

Application software is written to enable the computer to solve a specific data processing task. It is used for solving our various works. A program written for specific purpose could be termed as Application software. Example- Word processor, Database management systems software, accounting software's etc.

Application software can be sub-divided into:

- i. **Packaged Software:** Packaged software is that software which is generalized set of programs designed and developed for general purpose. Example: MS office package, Database, Web development Tools etc.
- ii. **Tailored software:** It is software designed to meet the specific requirements of an organization or individuals. Example: e-payment software, Hotel reservation software, Airline Reservation system etc. **It is also called Customized Software.**

Examples of application software:

- Payroll Software
- Student Record Software
- Inventory Management Software
- Income Tax Software
- Railways Reservation Software
- Microsoft Office Suite Software
- Microsoft Word
- Microsoft Excel

PROGRAM VS. SOFTWARE

S.N	Program	Software
1	A program is a set of instructions written in a programming language to perform a particular function. Many programs combine together to form software.	1 A software refers to a collection of several programs and other procedures and documentation.
2	A program is a set of instructions for performing a task	A software is made up of several computer programs.
3	A program is written for self-use and convenience	A software is developed for a third party for the sake of money
4	A program is only consisted of coding.	A software consisted of not of coding, but also program, documentation and manuals
5	A program is a set of instructions written by an individual in a programming language to perform a particular task	Software is a set of program that is basically known as coding of software, for a group of user and written by a group to execute a big task in a less time.
6	A program is simply a list of instructions for the computer to execute	Software is a program or set of programs that reside in main memory
7	A program is an instance of an algorithm written in some programming language such java, C++	A software is a collection of individual programs well packaged to run on a computer.
8	A program is a finite set of instructions, which must produce the output that is expected of it.	A software is a set of programs which interact with each other, in order to accomplish a common goal.

Difference between System Software and Application Software

SN	Application software	System Software
1	Application software is computer software designed to help the user to perform specific tasks.	System software is computer software designed to operate the computer hardware and to provide a platform for running application software.
2	It is specific purpose software.	It is general-purpose software.
3	Application Software performs in a environment which created by System/ Operating System	System Software Create his own environment to run itself and run other application.
4	It executes as and when required.	It executes all the time in computer.
5	Application is not essential for a computer.	System software is essential for a computer
6	The number of application software is much more than system software.	The number of system software is less than application software.
7	Example: MS office package, Banking software, Google chrome etc.	Example: device driver, compiler, interpreter, OS etc.

VIRUS AND ANTI-VIRUS:

V: Vital

I: Information

R: Resources

U: Under

S: Seize

Creepier was one of the first programs that resembled an internet worm. It was the first virus that get spread in Network.

ALK CLONER was the first virus that get spread in PC.

MALWARE: Malicious Software

Malware is any software intentionally designed to cause damage to a computer, server, client, or computer network. A wide variety of types of malware exist, common categories include: computer viruses, worms, Trojan horses, ransomware, spyware, adware, and scareware.

Computer Virus

A computer virus is a computer program that can replicate itself and spread from one computer to another. The term "virus" is also commonly but erroneously used to refer to other types of malware, including but not limited to adware and spyware programs that do not have the reproductive ability. A true virus can spread from one computer to another (in some form of executable code) when its host is taken to the target computer; for instance because a user sent it over a network or the Internet, or carried it on a removable medium such as a floppy disk, CD, DVD, or USB drive.

Viruses can increase their chances of spreading to other computers by infecting files on a network file system or a file system that is accessed by another computer.

Types of Viruses

Not all computer viruses behave, replicate, or infect the same way. There are several different categories of viruses and malware. Below I list and discuss some of the most common types of computer viruses.

Trojan horse:

A Trojan horse program has the appearance of having a useful and desired function. While it may advertise its activity after launching, this information is not apparent to the user beforehand. Secretly the program performs other, undesired functions. A Trojan horse neither replicates nor copies itself, but causes damage or compromises the security of the computer. A Trojan horse must be sent by someone or carried by another program and may arrive in the form of a joke program or software of some sort. The malicious functionality of a Trojan Horse may be anything undesirable for a computer user, including data destruction or compromising a system by providing a means for another computer to gain access, thus bypassing normal access controls.

Worms:

A worm is a program that makes and facilitates the distribution of copies of itself; for example, from one disk drive to another, or by copying itself using email or another transport mechanism. The worm may do damage and compromise the security of the computer. It may arrive via exploitation of system vulnerability or by clicking on an infected e-mail.

Boot sector Virus:

A virus which attaches itself to the first part of the hard disk that is read by the computer upon boot up. These are normally spread by pen drive.

Macro Virus: Macro viruses are viruses that use another application's macro programming language to distribute themselves. They infect documents such as MS Word or MS Excel and are typically spread to other similar documents.

Memory Resident Viruses:

Memory Resident Viruses reside in a computer's volatile memory (RAM). They are initiated from a virus which runs on the computer and they stay in memory after its initiating program closes.

Root kit Virus:

A root kit virus is an undetectable virus which attempts to allow someone to gain control of a computer system. The term root kit comes from the Linux administrator root user. These viruses are usually installed by Trojans and are normally disguised as operating system files.

Ransomware Virus: Ransomware is a type of malware from crypto-virology that threatens to publish the victim's data or perpetually block access to it unless a ransom is paid. It encrypts the victim's files, making them inaccessible, and demands a ransom payment to decrypt them. Ransomware attacks are typically carried out using a Trojan that is disguised as a legitimate file that the user is tricked into downloading or opening when it arrives as an email attachment. However, one high-profile example, the "WannaCry worm", travelled automatically between computers without user interaction.

Polymorphic Viruses:

A polymorphic virus not only replicates itself by creating multiple files of itself, but it also changes its digital signature every time it replicates. This makes it difficult for less sophisticated antivirus software to detect.

Logic Bombs/Time Bombs:

These are viruses which are programmed to initiate at a specific date or when a specific event occurs. Some examples are a virus which deletes your photos on Halloween, or a virus which deletes a database table if a certain employee gets fired.

Anti -virus

Anti-virus software is a software utility that detects, prevents, and removes viruses, worms, and other malware from a computer. Most anti-virus programs include an auto-update feature that permits the program to download profiles for new viruses, enabling the system to check for new threats. Antivirus programs are essential utilities for any computer but the choice of which one is very important. One AV program might find a certain virus or worm while another cannot, or vice-versa. Anti-virus software is also known as an anti-virus program or a vaccine.

Antivirus or **anti-virus** software, sometimes known as **anti-malware** software, is computer software used to prevent, detect and remove malicious software.

Some commonly used Anti Virus software's are: Bit Defender, kaspersky, NOD32, Avira, panda; McAfee, etc..

FUNCTIONS OF ANTI-VIRUS:

Some essentials function of antivirus are:

1. Scans specific files or directories for any malware or unknown malicious patterns
2. Allows to schedule scans to automatically run for you.
3. Allows initiating a scan of a particular file of your entire computer, or of a CD or flash drive at anytime.
4. Removes any malicious code detected - sometimes user will be notified of an infection and asked if users want to clean the file, other programs will automatically do this behind the scenes.
5. Shows the health of your computer.

TYPES OF ANTIVIRUS:

1. Windows Antivirus
2. MacOS Antivirus
3. Android Antivirus
4. Linux Antivirus

How do Viruses Spread?

1. Email Attachments:
2. File Sharing and Network Sharing
3. Downloading Pirated Files or software
4. Instant Messaging, IRC-(Internet Relay Chat), ICQ-(I Seek You), etc
5. Infected Floppy Disks and CD/DVD
6. Web Pages: visiting unknown and malicious links
7. No Antivirus or spyware scanner
8. Running old and outdated updates: Not running latest updates