In order to function properly, **computers need maintenance**.

In fact, due to its importance and complexity, computer equipment maintenance requires special attention.

When approaching the different types of IT maintenance, two aspects must be considered:

* The maintenance includes both hardware and software of the computer. Both are very important and will decisively influence the operation of the system.
* The various types of maintenance can work simultaneously. In the case of corrective maintenance, it will act if the predictive maintenance or preventive maintenance are not able to anticipate the problem.

**Types of maintenance**

* Predictive Maintenance
* It is a type of maintenance that is carried out using diagnostic tools, in order to anticipate possible failures and to try to avoid them before they occur.
* One of the most important ways in which this type of maintenance is carried out is through the monitoring of computer systems. This way, one or several operators control the proper functioning of equipment and systems, using tools such as[monitoring software](https://pandorafms.com/), to control all different types of variables, such as temperature of the CPU, battery levels or many others.

### Preventive Maintenance

* This is a very frequent type of maintenance, which is carried out in order to prevent possible failures and improve the functioning of a system, but also to lengthen the useful life of the different components of the system.
* Preventive maintenance is useful in many aspects. For example, it decreases the number of system downtimes or it can reduce the number of repairs, and it can also detect weak points in the system that might affect its operation.
* When we talk about **preventive maintenance of software**, we include operations such as the creation of backup copies, the freeing-up of hard disk space, the freeing-up of RAM memory or the scanning and cleaning of computers through antivirus.
* When we talk about **preventive hardware** **maintenance**, we usually talk about two different types, which are tasks such as periodic cleaning of equipment and its components, or “active preventive maintenance”, which aims to ensure its durability by protecting the systems from possible environmental aggressions, for example, by separating the computers from areas with a direct impact of sunlight, this is known as “passive preventive maintenance”.

### Corrective maintenance

* This is the solution that must be applied when the predictive and preventive maintenance have not worked properly or when these have not been able to avoid the failure.
* There are times when a computer or system fails (for example due to a hardware failure) but we want it to be operational again and in optimal conditions. Then this will include repairing or replacement operations, depending on the needs of each case.
* One of the considerations to be made regarding this type of maintenance is that not only will it be important to solve the failure, but we must also determine what was the cause of it, in order to find the possible repercussions that might have affected other parts of the system and to prevent it from happening again in the future.
* Evolutionary maintenance
* This type of maintenance is not meant to correct or prevent possible failures, but to develop the computing resources that are available.
* With evolutionary maintenance, we want to ensure that computer systems do not become obsolete, but remain updated in order to offer the users the best technology options, depending on the possibilities of each company and organization.
* This type of maintenance will include everything from software update tasks to the complete replacement of equipment or systems, depending on the needs.
* Routine maintenance for a computer involves taking regular steps that make your computer faster, more secure and less cluttered.
* If your computer seems slow, displays an error message about low disk space or takes a long time to boot up, doing routine maintenance can fix the issue and help your computer last longer. While some routine computer maintenance tasks prevent future problems like viruses or data loss, others free up space and even fix software bugs. Whether you have a PC or Mac, you can install updates, check for viruses, maintain your hard drive, backup files and perform other simple tasks to keep your computer in good shape.

## 1) **Operating System and Software Updates**

* Installing operating system updates and keeping all your programs updated are important PC maintenance tasks that improve your computer's security and stability.

## 2) **Virus Protection**

* Your computer also benefits from having antivirus software, such as Windows Defender or Malwarebytes, that can perform real-time scans on files you download and open.
* This PC maintenance task helps protect you from malicious files that can slow your computer, destroy important system files or lead to theft of passwords and other personal information. When your antivirus program detects a threat, it will alert you to delete the file or move it to a self-contained location where it can't cause harm to your computer. For the strongest protection, set your antivirus software to download automatic updates to protect you from the latest viruses.

**3) Hard Drive Maintenance**

* As you use your computer, temporary internet files, downloaded files and cache files build up and leave you with less hard-drive space.
* Running utilities such as the built-in Disk Cleanup for Windows and third-party programs like CCleaner for Mac can locate and clear these files for you.
* Since visiting many websites collects files that can make your web browser sluggish, it also helps to check your browser's preferences or settings to find its option to clear the cache or temporary internet files.

## 4) **File Backups**

* Creating regular file backups prevents data loss and can even provide a copy of your entire system in case of a hard-drive crash or destructive virus.
* Backup and Restore for Windows and Time Machine for Mac are native backup and restore utilities that can create a full system image, back up selected files and let you set a frequency and time for future backups.
* You can use an external hard drive, flash drive or DVDs to save your backups and then use the utility to easily restore individual files or return your computer to a previous state.
* If you prefer storing important files online, you can use OneDrive, Dropbox or another cloud storage service to have more flexible access to your data on any device that can access the service's website.

**System utilities for maintaining PC**

Every functionality of your computer uses a [utility software](https://www.techjockey.com/category/utility-software); be it backing up your data, [antivirus software](https://www.techjockey.com/category/antivirus-software), data security or file management system. Utility software helps manage, maintain and control a computer and support its infrastructure. What you did the last time your PC went slow? You must have taken help of tools like Cleaner to resume its normal function. This is nothing else but a utility software!

## **What is Utility Software?**

System utility software improves the function of computer infrastructure to help users perform multiple tasks efficiently. Some of the functions performed by various utility software include data compression, data recovery, disk defragmentation, computer resources and files management, system diagnosis, and more.

All operating systems have basic inbuilt utility tools, but additional software further ensures improved functionality. Utility software focuses on computer components such as hardware, software, operating system, and storage parts.

## **Types of Utility Software**

There are majorly 4 types of utility software available in the market to fix your PC from all these problems. They are:

**1) System Utilities:**

Software applications like anti-virus, memory testers, package managers, network utilities, and registry cleaners are included in system utility software.

System utilities are the core software functions that allow you to manage your computer in ways that you would find it inconceivable to be without. System utilities may be already included in your computer or downloaded from the Internet. No matter where you look, you can always find plenty of system utility programs at little or no cost.

**Disk Cleanup**

Disk Cleanup is a function that comes with all versions of Windows Operating Systems. Disk Cleanup allows for you to scan your entire hard drive to search for extra room by deleting any unneccessary files such as temporary files from the Internet and cookies that are downloaded when you visit webpages. Not only does Disk Cleanup allow you to delete simple files from the Internet, but it also allows for you to delete Restore Points, uninstall programs, remove Windows components, and compress old files all in the click of a mouse. You can find Disk Cleanup in Windows XP by going to the Start menu –> All Programs –> Accessories –> System Tools –> Disk Cleanup.

**Disk Defragmenter**

The Disk Defragmenter is another tool that comes with Windows and is used for many different solutions. The main function of the Disk Defragmenter is to reassemble fragmented files. Whenever a file is modified in any way, the computer stores the file in broken pieces across the hard drive rather than putting the whole file in one spot. This can lead to system malfunction and poor performance because your computer must search for all the pieces of a specific file before it can display it. The Disk Defragmenter searches for all pieces of every file on your hard drive and reassembles the files into a specific location. This increases the speed at which files are displayed and results in less delays when opening files or programs.

**System Restore**

System Restore is a function that comes with Windows that allows you to return your computer to an earlier time in which you had not encountered an error. System Restore is great for fixing problems that a virus has caused after you use antivirus software to rid your computer of the malware. System Restore allows you to manually set Restore Points on a calendar and also automatically creates Restore Points on a regular basis as well as right before your computer goes through any major change such as installing a new program. System Restore can be found by going to Start –> All Programs –> Accessories –> System Tools –> System Restore.

**Registry Cleaners**

Registry cleaners are programs that allow for you to scan your computer for any errors in the registry, which is a collection of the core computer files that are essential to performance and functionality, and repairs them if needed. Registry cleaners are widely available on the Internet and give you a significant upperhand when cleaning up the mess that a virus or other malware has left on your computer. Likewise, some otherwise safe programs can cause errors in the registry without intending to. Registry files can also be corrupted if the user unknowingly deletes or modifies a file in the registry. This usually occurs when an inexperienced user tries to fix their computer and inevitably causes more damage than before.

**File Splitters**

File splitters are programs that allow you to break a file into smaller pieces in order to store or send files. File splitters often come in handy because many online storage services, including email attachments, limit you to a specific file size that can be transferred at one time even though files often exceed these limits. File splitters allow you to break the file into two or more pieces, send them simultaneously, and then piece them back together when you are ready to use the file again. A good file splitter is File Splitz. It allows for you to break a file of any size into multiple pieces and then rejoin the files together just as easily.

**2) Storage Device Management Utilities:** All the disk related software utilities fall into this type of utility. They can be disk checkers, disk partition editors, disk formatters, disk space analysers and so on.

* [**Backup software**](https://en.wikipedia.org/wiki/Backup_software)makes copies of all information stored on a disk and restores either the entire disk (aka [Disk cloning](https://en.wikipedia.org/wiki/Disk_cloning)) in an event of [disk failure](https://en.wikipedia.org/wiki/Hard_disk_failure) or selected files that are accidentally deleted or corrupted. [Undeletion](https://en.wikipedia.org/wiki/Undeletion" \o "Undeletion) utilities are sometimes more convenient.
* [**Disk checkers**](https://en.wikipedia.org/wiki/Disk_checker) scan an operating hard drive and check for logical (filesystem) or physical errors.
* [**Disk compression**](https://en.wikipedia.org/wiki/Disk_compression) utilities transparently [compress](https://en.wikipedia.org/wiki/Data_compression)/uncompress the contents of a disk, increasing the capacity of the disk.
* [**Disk defragmenters**](https://en.wikipedia.org/wiki/Disk_defragmenter) detect [computer files](https://en.wikipedia.org/wiki/Computer_file) whose contents are scattered across several locations on the [hard disk](https://en.wikipedia.org/wiki/Hard_disk) and collect the fragments into one contiguous area.
* [**Disk formatters**](https://en.wikipedia.org/wiki/Disk_formatting) prepare a data storage device such as a hard disk, solid-state drive, floppy disk or USB flash drive for initial use. These are often used to permanently erase an entire device.
* [**Disk partition** editors](https://en.wikipedia.org/wiki/Disk_partitioning) divide an individual drive into multiple logical drives, each with its own file system which can be mounted by the operating system and treated as an individual drive.
* [**Disk space analyzers**](https://en.wikipedia.org/wiki/Disk_space_analyzer) provide a visualization of disk space usage by getting the size for each folder (including sub folders) and files in folder or drive. showing the distribution of the used space.

3) **File Management Utilities:** Archivers, backup software, data compression utilities and file managers fall in the category of [file management utilities](https://www.techjockey.com/category/document-management-software).

* [**Archivers**](https://en.wikipedia.org/wiki/File_archiver) output a stream or a single file when provided with a directory or a set of files. Archive suites may include compression and encryption capabilities. Some archive utilities have a separate un-archive utility for the reverse operation. One nearly universal type of archive file format is the [zip file](https://en.wikipedia.org/wiki/Zip_(file_format)).
* [**Cryptographic**](https://en.wikipedia.org/wiki/Filesystem-level_encryption) utilities encrypt and decrypt streams and files.
* [**Data compression**](https://en.wikipedia.org/wiki/Data_compression) utilities output a shorter stream or a smaller file when provided with a stream or file.
* [**Data conversion**](https://en.wikipedia.org/wiki/Data_conversion)utilities transform data from a source file to some other format, such as from a text file to a [PDF](https://en.wikipedia.org/wiki/PDF) document.
* [**Data recovery**](https://en.wikipedia.org/wiki/Data_recovery) utilities are used to rescue good data from corrupted files.
* [**Disk cleaners**](https://en.wikipedia.org/wiki/Disk_cleaner) find files that are unnecessary to computer operation, or take up considerable amounts of space.
* [**File comparison**](https://en.wikipedia.org/wiki/File_comparison) utilities provide a standalone capability to detect differences between files.
* [**File managers**](https://en.wikipedia.org/wiki/File_manager) provide a convenient method of performing routine data management, email recovery and management tasks, such as deleting, renaming, cataloging, uncataloging, moving, copying, merging, setting write protection status, setting file access permissions, generating and modifying folders and data sets.

4) **Miscellaneous Utilities:** All the remaining utility software can be included in this type, for example, data generators, hex editors, HTML checkers and merge programs.

**Problems related to CpU,Motherboard,Keyboard,Input/output devices.**

1. **Keyboard**

There are several problems you can encounter with a [keyboard](https://www.thoughtco.com/computer-keyboards-abroad-4069727)

## **Some Letters Won't Type**

Sometimes a tiny piece of debris can get stuck under a few of your keys. If you find that a certain letter won’t type, you may be able to fix the problem by using a compressed air duster and gently blowing off your keys.

## **Buttons Are Sticking**

Keyboards get very dirty sometimes, especially if you have a tendency to snack and type. You can clean a keyboard yourself (laptop or desktop), but it may be safer to have it cleaned by a professional.

## **Numbers Won't Type**

There is a "numbers lock" button near your keypad that turns the pad on and off. If your numbers won’t type, you’ve probably pressed this button by mistake.

## **Letters Are Typing Numbers**

It can be scary to type words and see nothing but numbers appearing! This is probably an easy fix, but the solution is different for every type of laptop. The problem is you have "numlock" turned on, so you need to turn it off. This is sometimes done by pressing the FN key and the NUMLOCK key at the same time.

## **Typing Over Letters**

If you are editing a document and are surprised to find that you are suddenly typing over words instead of inserting between words, you have accidentally pressed the "Insert" button. Just press it again. That key is an either/or function, so depressing it once causes it to insert text, and pressing it again causes it to replace text.

## **Cursor Is Jumping**

This is one of the most frustrating problems of all, and it seems to be related to using a laptop with Vista or Windows XP. One possible solution is adjusting your touchpad settings. Secondly, you could "disable tapping during input." To find this option with XP, go to:

* Control panel
* Mouse
* Advanced
* Advanced feature settings
* Tapping and feature settings
* Tapping settings
* Disable tapping

1. **Cpu**

computers won’t load the operating system if an essential component like a CPU is not working.

In other words, the usual boot up process can’t be completed as POST or Power-On Self-Test will indicate that a critical component is missing in the system. Other components such as fans, hard drive, and the motherboard in general will continue to work but the boot up process will eventually end up in a blue screen of death error.

**a.Lock ups and overheating immediately before PC shuts down**.

* If you noticed that your computer had lock up instances before the final crash, one of the things that you should consider is a bad CPU. It may have overheated causing the system to shut down automatically to prevent further damage.
* A CPUhas a built-in fan to keep itself cool but if the fan fails for some reason, the CPU can temporarily overheat. This is one of the reasons why you should ensure that all fans in your computer are checked and cleaned once every year.
* Dust can sometimes choke fans so keeping it away regularly can make or break a system.

**b. Beeping**.

* Computer runs a self check (POST) to verify if all the essential peripherals are working or not.
* If the test will find out that the CPU is not working, the boot up process will then be interrupted and the motherboard will produce a beeping sound.
* The beeps are actually codes that helps a technician identify the problem so make sure that you take note how many beeps there are.

## **How To Recognize Computer Beep Errors?**

* A **very short beep** is indicative of a problem with your motherboard. It can also mean that you have a problem with your system memory (BIOS AWARD).
* A **long beep followed by three sequential short beeps** signals an issue linked to your graphics card configurations.
* A **short beep followed by three sequential long beeps** means that you have a problem with your system memory.
* If you are **hearing beep, pause, beep, pause, followed by two sequential beeps,** the error is linked to your CPU (central processing unit).
* **Three beeps, pause, three beeps, pause, followed by four beeps** indicates an issue with video memory.
* **One long beep and nine short beeps** means there is a problem with the ROM (BIOS AWARD).
* **Three beeps, pause, four beeps**, **pause, followed by a beep signals** an error with your graphics card.
* **Four beeps, pause, three beeps, pause, and then one beep** indicates a system memory problem.

**c. Charred motherboard or CPU.**

* Severe overheating can melt or leave charred appearance on both the motherboard or the CPU itself. Try to remove the motherboard from the tower and disconnect the CPU to see if this is the case (steps provided below).
* If overheating was bad, the CPU may be damaged permanently.

## **3. Motherboard**

Common symptoms of motherboarMotherboard failure is one of the most challenging issues any user or technician can face simply because there are a number of variables to consider. To get down to the bottom of the issue, a technician will usually have to eliminate several software and hardware causes. Usually, there are not many signs to come by to help you diagnose a motherboard failure. A motherboard either works or not, nothing in between. Other peripherals like fans and hard drives may still work even if the motherboard is dead but your computer may still not work at all.  If you think motherboard is to blame, make sure that you consider the items below.

**Physically damaged parts.**

* The first thing that you want to do, especially if you haven’t opened a computer yet, is to physically check the motherboard. This will allow you to examine if there is any bloated or damaged capacitor causing the issue like the ones identified in the figure below.
* Leaking or bloated capacitors are usually products of overheating, material defect, or plain old aging. If you can see a capacitor that’s about to blow, you can assume that the reason for your motherboard problem.

**Look out for unusual burning odor:**

* Another telltale sign of a motherboard problem is burning smell. Most of the time, a really strong burning smell is an indication that an overheated component. Sometimes, plugging in an incompatible component can lead to overheating or failure so if you’ve installed any component prior to noticing the problem, make sure to remove it right away.
* You cannot just install a component to any motherboard so make sure that you consider checking compatibility first. Plugging in an incompatible RAM or video card for example may lead to severe problems so as to damage the motherboard permanently.

**Random lock ups or freezing issues.**

* If you’ve noticed that your computer has been freezing up lately, the first thing that you should do to troubleshoot it is to see if software is to blame. However, if you’ve already ruled out all software factors, the next good thing to do is to consider other hardware variables, including the possibility that the motherboard may be failing.
* **Blue screen of death**. Getting a blue screen of death on your computer does not automatically means a motherboard issue. At lot of times, the main reason may be a bad driver or hardware failure. If you can, take note of the error message, especially the error code which looks like this one (0x000000(0x000000,0x000000,0x000000,0x000000).

## **Reasons why a motherboard fails**

below are some of the common reasons why a motherboard can stop working:

* **Overheating.**
* **Fan failure**. Dust can accumulate very fast in fans causing them to fail. Make sure that you clean the fans inside the tower at least once every year.
* **Too much dust in the system**. Dust, like heat, can shorten component lifespan and the motherboard in general. Try your best to clean the inside of your computer regularly.
* **Smoke.**
* **Accidental drop that subjects components to unnecessary shock.**
* **Aging.**
* **Power surges or unstable voltage.**

**How to troubleshoot a motherboard failure issue:**

* There are usually two troubleshooting categories that a user or a technician can follow in order to troubleshoot a bad motherboard. **The first one checks if the computer does POST and still boots, while the second checks if the system fails to do POST or no longer powers back on.**
* POST is basically a diagnostic test run by your motherboard’s BIOS to check if peripherals like hard drives, video card, RAM, keyboard, or mouse are all connected or not. If the essential peripherals are detected, BIOS then loads the operating system.