

## Utilities

### Utilities

Utility programs, commonly referred to as just "utilities," are software programs that add functionality to your computer or help your computer perform better. Following are a few examples

### Antivirus software

An antivirus program is a software utility designed to protect your computer or network against computer viruses.

- A computer **virus** is a program designed to cause damage,
  - delete files
  - prevent access to files
  - send spam
  - spy on you,
  - steal personal information
  - modify data
  - send e-mail
  - display messages
  - etc.
- When the virus is executed, it spreads by copying itself into or over data files, programs, or boot sector of a computer's hard drive, or potentially anything else writable.
- Almost all computer viruses only damage the data contained on the computer and do not physically harm the computer or its hardware.



There are various antiviruses

Once installed on a computer an antivirus monitors, detects, and cleans any computer viruses by looking for virus signatures (a **virus signature** is the fingerprint of a virus. It is a set of unique data, or bits of code, that allow it to be identified).

After installing an antivirus program on your computer, it should automatically start each time you boot your computer.

### *Backup software*

Backup software helps a user organize his/her backup. Some (possible) features of backup software are the following:

- User friendly – the process of backup does not have to be a complicated one
- Fast – backup should, preferably, not take much of the computer's time
- Performs automatically – it saves and backs up work every few seconds. Better than this, a whole system can be built to save on two or more secondary storage devices in parallel.
- Offers full system backup including operating system, programs, settings etc.
- Ransomware protection. Ransomware is a type of malware that prevents you from using your computer or accessing certain files unless you pay a ransom.
- Offers cloud integration.
- Restore option.

It can however be heavy on resources i.e. utilizes processor time and requires a large memory. It can also be expensive.

### *Disk repair software*

Features of such software can contain:

- Fixing corrupted hard drives.
- Recover files.

### *Compression utility*

Used to compress and decompress files. Two advantages:

- Saves hard disk space
- Reduce file size thus making it easier to transfer programs from one place to another.

Most operating systems include tools for compressing and uncompressing files. For example, latest versions of Microsoft Windows include a compression utility for creating and extracting .zip files.

Example of compression utilities are WinZip, WinRAR, etc.

Compression can be lossless or lossy. With **lossless** compression, every single bit of data that was originally in the file remains after the file is uncompressed. This is used with, for example text files, spreadsheet files etc. GIF (image) format is also lossless.

**Lossy** compression reduces a file by permanently eliminating certain information, especially redundant information. When the file is uncompressed, only a part of the original information is still there (although the user may not notice it). It is used for example with video and sound. JPEG (image) format is lossy.

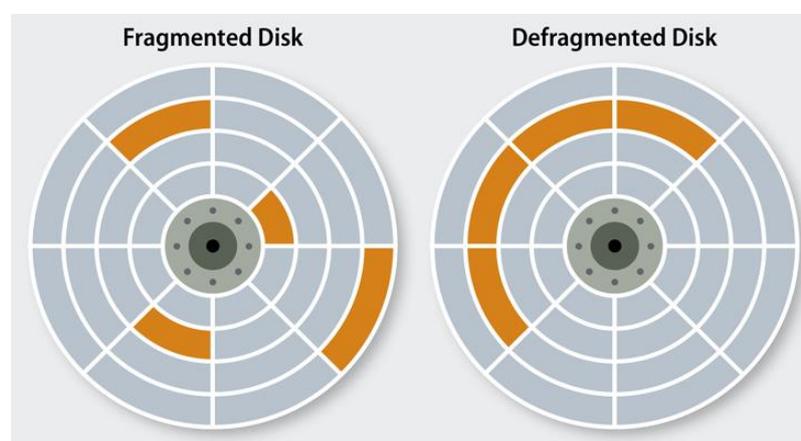
### *Encryption Utility*

Encryption software is software that uses **cryptology** (the study to find the best ways to encryption codes) to prevent unauthorized access to digital information. Cryptology is used to protect digital information on computers as well as the digital information that is sent to other computers over the Internet. Two obvious examples where encryption is needed are passwords and credit card numbers.

### *Defragmentation tool*

File **fragmentation** is a term that describes a group of files that are scattered throughout a hard drive platter instead of one continuous location. Fragmentation is caused when information is deleted from a hard drive and small gaps are left behind to be filled by new data. As new data is saved to the computer, it is placed in these gaps. If the gaps are too small, the remainder of what needs to be saved is stored in other available gaps.

Fragmentation causes slow access time because read/write head accessing the data must find all fragments of a file before it can be opened or executed.



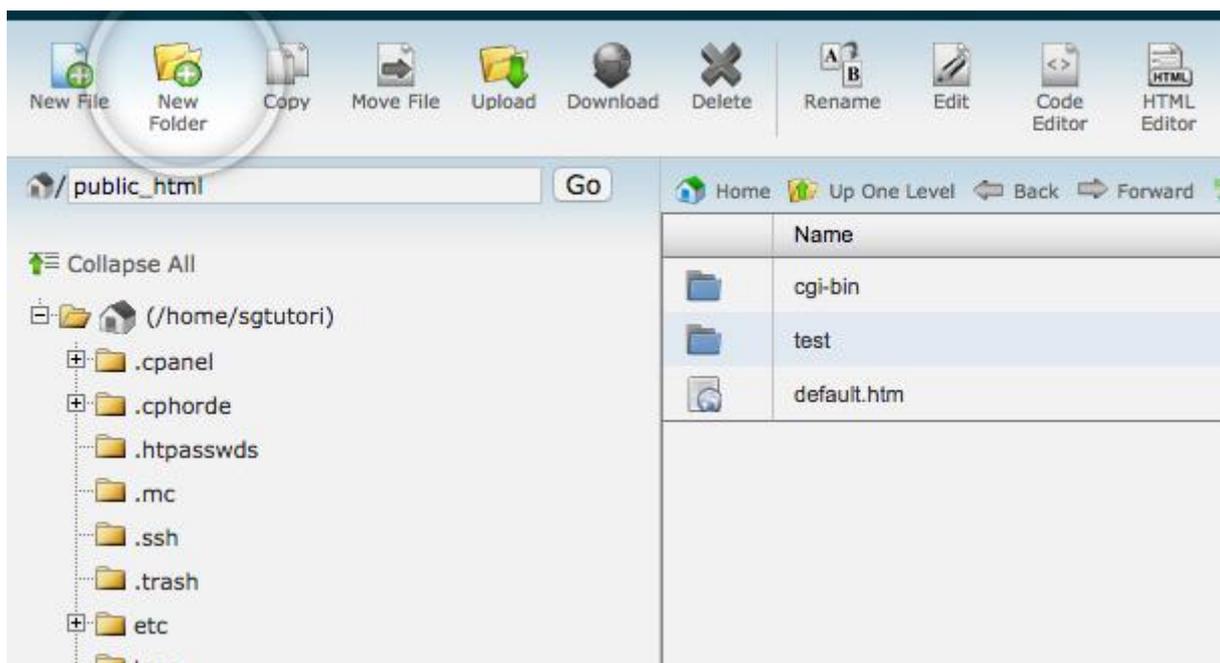
**Defragmentation** is a term used to describe the process of reorganizing a hard drive's data to help increase the proficiency of accessing the data and prevent file fragmentation. By organizing the data on the hard drive, it can decrease the time it takes to run a program and open files on a hard disk drive.

An example of a defragmentation utility included with Microsoft Windows is Microsoft's Defrag.

### *File manager*

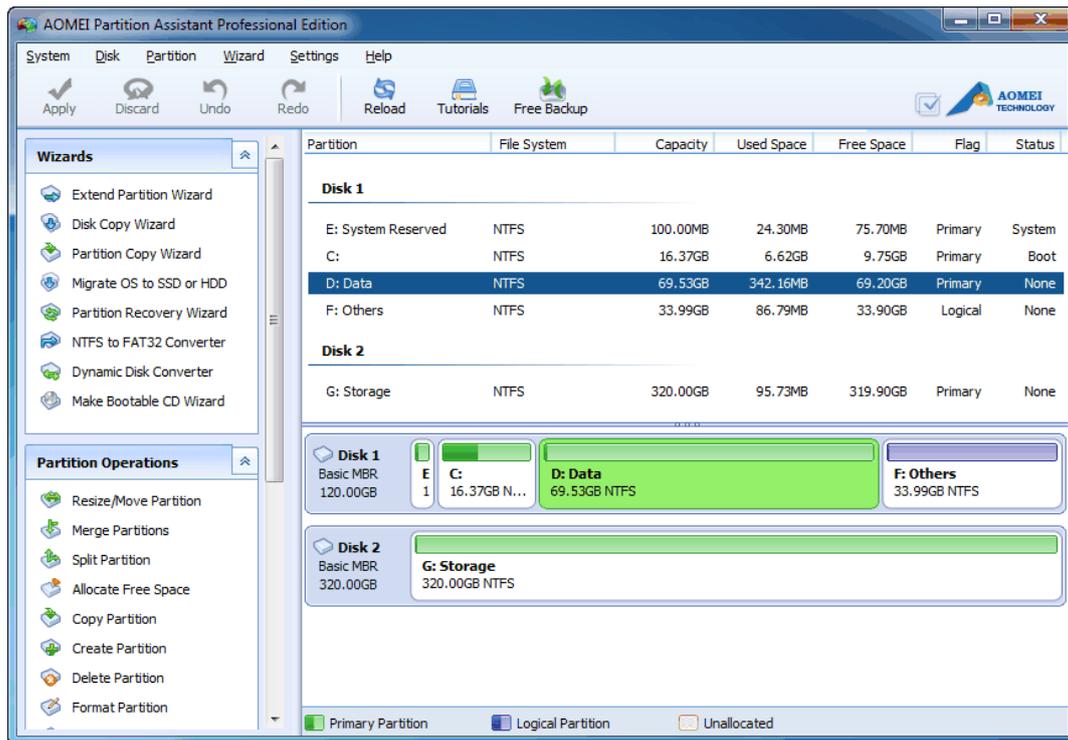
A file manager is a software program that helps a user manage all the files on their computer. For example, all file managers allow the user to view, edit, copy, and delete the files on their computer storage devices.

With recent versions of Microsoft Windows, Windows Explorer (Explorer) is considered the default file manager. With Apple computers, Finder is considered the default file manager.



### *Disk partition tool*

When referring to a computer hard drive, a disk partition or partition is a section of the hard drive that is separated from other segments. Partitions enable users to divide a physical disk into logical sections. For example, allowing multiple operating systems to run on the same device.



### Exercise

1. A virus (or malware) can cause different kinds damage. Mention three.
2. An antivirus looks for virus signatures. What is a virus signature?
3. Name three features that can be found in a backup utility.
4. What does a disk repair program do?
5.
  - a) Name two advantages of a compressed file.
  - b) What is the difference between lossy and lossless compression?
6. Why is encryption important?
7.
  - a) What is it that cause fragmentation?
  - b) What does a computer gain after defragmentation?
8. What does a file manager utility do?
9.
  - a) What is disk partitioning?
  - b) Name an advantage of disk partitioning?
10. Find two other utilities and describe the briefly.