NIELIT Gorakhpur

Course Name: O Level (2nd Sem) **Subject: ICT**
Topic Backup & Restore **Date: 15-04-2020**

Chapter 2nd [Utilities]

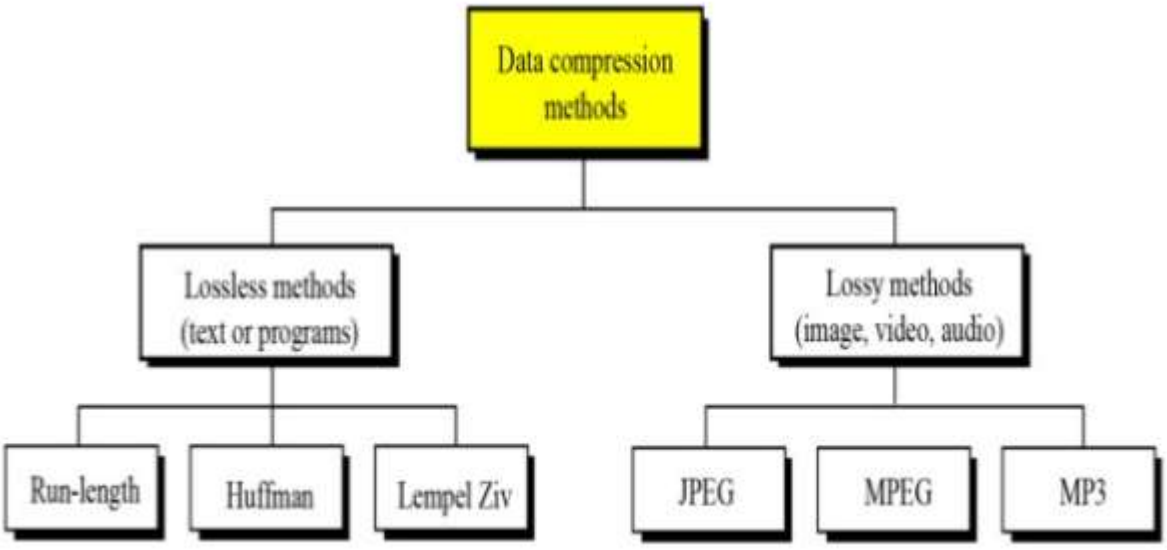
Data Compression:-.Data compression is the process of modifying, encoding or converting the bits structure of data in such a way that it consumes less space on disk. It enables reducing the storage size of one or more data instances or elements. In effect of smaller size of file is generated in order to achive faters transmission of electronic files and a smaller space required for its downloading. Data compression is also known as source coding or bit-rate reduction.

The concept of data compression is based on the fact that most types of files actually have redundant data and in order to compress a file, the data bits of the file are rearranged to make it smaller and more compact. There are many different algorithms and procedures are used to rearrange the data bits that are known as compression algorithms.

How Does Compression Works:-Compression is performed by a program that uses a formula or algorithm to determine how to shrink the size of the data. For instance, an algorithm may represent a string of bits -- or 0s and 1s -- with a smaller string of 0s and 1s by using a dictionary for the conversion between them, or the formula may insert a reference or pointer to a string of 0s and 1s.

Text compression can be as simple as removing all unneeded characters, inserting a single repeat character to indicate a string of repeated characters and substituting a smaller bit string for a frequently occurring bit string. Data compression can reduce a text file to 50% or a significantly higher percentage of its original size.

Types of Compression:-



Lossless Method:- This allows the potential for a file to return to its original size, without the loss of a single bit of data, when the file is uncompressed. Lossless compression is the usual approach taken with executables, as well as with text and spreadsheet files, where the loss of words or numbers would change the information. Lossless compression can compress the data whenever redundancy is present. Therefore, lossless compression takes advantage of data redundancy.

Lossy Method :- Lossy compression permanently eliminates bits of data that are redundant, unimportant or imperceptible. Lossy compression is useful with graphics, audio, video and images, where the removal of some data bits has little or no discernible effect on the representation of the content.
Graphics image compression can be lossy or lossless. Graphic image file formats are typically designed to compress information since the files tend to be large. JPEG is an image file format that supports lossy image compression. Formats such as GIF and PNG use lossless compression.

Difference between Lossless & Lossy Compression Method

Lossless	Lossy
While in Lossless Compression, A file can be restored in its original form.	In Lossy compression, A file does not restore or rebuilt in its original form.
But Lossless Compression does not compromise the data's quality.	In Lossy compression, Data's quality is compromised.

Lossless Compression is used in Text, images, sound.	Lossy compression is used in Images, audio, video.
But Lossless Compression does not reduce the size of data.	Lossy compression reduces the size of data.
Lossless Compression has less data-holding capacity than Lossy compression technique.	Lossy compression has more data-holding capacity.
Algorithms used in Lossless compression are: Run Length Encoding, Lempel-Ziv-Welch, Huffman Coding, Arithmetic encoding etc.	Algorithms used in Lossy compression are: Transform coding, Discrete Cosine Transform, Discrete Wavelet Transform, fractal compression etc.

Assignment:-

1- Why Data compression is needed?
2- Write difference between Lossless and lossy data compression method