Data compression is the process of reducing the size of the size of data so that it occupies less storage space and requires less transmission time.

→ Lossless compression

The orginal data can be perfectly reconstructed from the compressed data

a) Working principle

- Removes statistical redundancy
- uses encoding techniques like
  - → RLE
  - → Huffman coding

b) Characteristics

- → Exact reconstruction
- → Lower compression ratio
- → Suitable for text, exec files etc.

c) Examples

- → Win zip / 7-zip
- → PNG
- → FLAC

Advantage:

- No loss of info.
- Safe for sensitive data

disadvantage

- compression ratio is limited
- file size is smaller compared to lossy.

→ Lossy compression

Some information is permanently removed during compression. The reconstructed data is not exactly the same as the orginal

a) Working principle

- Removes less information
- Exploits human auditory & visual senses.
- Uses transformation
  - → DCT
  - → Quantization
  - → Transform coding.

b) Example

- → JPEG
- → MP3
- → MPEG.

c) Advantages

- High compression ratio
- Efficient for multimedia transmission
- Saves storage space

d) Disadvantages

- Quality degradation
- Not suitable for text
- Repeated compression worsens quality.