**CS 254- ANALYSIS OF ALGORITHMS**

**ANALYSIS OF STRING COMPRESSION ALGORITHM**

**INTRODUCTION**

Huffman coding is a lossless string compression algorithm designed by David A. Huffman while he was a Sc.D. student at MIT in 1951.

LZW is an improved implementation of the LZ78 algorithms, created by Terry Welch in 1984.

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**OBJECTIVE**

1. Study and analysis of RUN LENGTH , HUFFMAN and LZW compression algorithm.
2. Compression and decompression of a text file using HUFFMAN and LZW algorithm, thereby proving its correctness.
3. Attempt to discuss recent variants in the HUFFMAN and LZW algorithm.

**MOTIVATION**

Data compression finds its applications everywhere - easing data transfer, file encryption, and many more. Data compression is always useful for encoding information using fewer bits than the original representation than it would use. There are many applications where the size of information would be critical like in data communication, the size of data can affect the cost too much. Data compression involves encoding information using fewer bits than original representation. This may be lossless or lossy. Lossless compression reduces bits by eliminating statistical redundancy. Two such lossless compression algorithms are HUFFMAN and LZW algorithm. HUFFMAN algorithm is based on the method for the construction of minimum-redundancy codes while LZW algorithm is based on the concept of dictionary keys.

**COURTESY**

Source credits given to recent research papers, geeksforgeeks and Wikipedia.