Assignment 1

Huffman Compression & Decompression

You are required to write a program that can compress and decompress a file using Huffman encoding.

Input to this program is:
1. A file name.
2. Whether to compress or decompress the file.

Output of the program is:
1. The compressed/decompressed file.
2. The code used to code the bytes of the source file.
3. The compression ratio.
4. The execution time.

Part (A) – Compression

You must build the Huffman tree as described in class and assign a Huffman code for each character. Your output is the compressed file, compression ratio and the codes used to compress the file. To display the code, it must be in the following format:

Byte	Code	New Code
65	01000001	10001
66	01000010	101101
67	01000011	01000

Part (B) - Decompression

You must read the file header and then the file must then be decompressed (returned to its original format).

Deliveries & Notes:

- You should work in teams of **three**.

- Develop your program using any programming language you want.

- You should deliver a report, preferred to be hard copy that contains **description** of your implementation, **data structures** used for implementing the encoding techniques, the **algorithms** used and its **complexity** and the **header format** of the compressed file.

- Bonus:
  - Compression and decompression of binary files.
  - Compression and decompression of folders.

Good Luck