Question one: Solve the following problems

1. Obtain the run length Encoding (RLE) for the following segment of a binary image: 11111110000000001111110000.
2. Given the frequency of occurrence of each symbol, deduce the Huffman codewords for the symbols and calculate the average code length.

Symbol	Frequency
A	21
B	7
C	6
D	4
E	2

3. Consider the dictionary-based LZW compression algorithm. Suppose the alphabet is the set of symbols {0,1}. Show the dictionary (symbol sets plus associated codes) and output for LZW compression of the input:
   0110011
4. Consider the dictionary-based LZW compression algorithm. Suppose the alphabet is the set of symbols {A,B,C}. Show the dictionary (symbol sets plus associated codes) and output for LZW compression of the input:
   ABABBABCABABBA