Algorithms Practical 9

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Step 1. Implemented in RunLengthEncoding class

Step 2.

Binary Compression

1. Java BinaryDump < 4runs.bin: 40 bits

2. : java RunLength - < 4runs.bin | java BinaryDump: 32 bits
   Compression ratio = uncompressed size/ compressed size = 40/32 = 1.25

3. 32 bits, the compression ratio is the same = 1.25.

ASCII Compression

1. 96 bits
2. 416 bits, compression ratio = 0.23, Run length encoding works when there are sequences of four or more characters, as three are used to conduct run length encoding, lower than that can increase the size of the file. This is what is happening to our binary file as there isn't many four or more repeating characters in binary. Binary is not repeating like language (white space etc.) so this lossless algorithm doesn't work here.
3. Used wanda.txt, uncompressed = 104 bits compressed = 480 bits
   compression ratio = 0.22

Bitmap Compression

1. 1536 bits
2. 1144 bits
3. Compression ratio = 1536/1144 = 1.34

Q3. Uncompressed bits = 6144 bits
Compressed bits = 2296 bits
Compression ratio = 2.71

Step 4. The higher resolution bitmap file is better compressed by the run length encoding algorithm. In fact, for bitmaps, as resolution increase the usefulness increases too! This is because, when the resolution is higher more bits are in the image and this means that the algorithm will be even more effective. The more bits to compress the better for run length encoding for bitmaps, as higher resolution images have more repeating binary numbers, making the algorithm work better.