Lab 9

Binary Compression

1. java **BinaryDump** 40 < 4runs.bin

Num bits: 40 bits

1. java RunLength - < 4runs.bin | java BinaryDump

Num bits: 32

Compression ratio = 32 / 40 = 0.8

1. java **BinaryDump** 40 < 4runsrle.bin

num bits: 32

ASCII Compression

1. java BinaryDump 8 < abra.txt

96 bits

1. java RunLength - < abra.txt | java BinaryDump 8

416

Compression ratio = 418 /96 = 4.4

I believe this occurs because RunLength compression isn’t suitable for ASCII compression. It is more suitable for bitmap graphics as its data is stored as a series of 1s and 0s.

1. I created my own text file called “random.txt” – containing a random sequence of chars

* Java BinaryDump 8 < random.txt
  + 808 bits
* Java RunLength -< random.txt | java BinaryDump 8
  + 3656 bits
* Compression Ratio = 3656 / 808 = 4.5

Bitmap Compression

**Step 1: Use BinaryDump to find out how many bits the bitmap file q32x48.bin has**

* 1536 bits

**Step 2: Use Run Length function to compress the bitmap file q32x48.bin**

* Java RunLength - < q32x48.bin > q32x48rle.bin
* Java BinaryDump < q32x48rle.bin
  + 1144 bits

**Step 3: Calculate the compression ratio**

* Compression ratio = 1144 / 1536
  + 0.7

**Step 4: Perform the Steps 1 and 2 on the higher resolution bitmap file q64x96.bin**

* Java BinaryDump < q64x96.bin
  + 6144 bits
* Java RunLength -< q64x96.bin > q64x96rle.bin
* Java BinaryDump < q64x96rle.bin
  + 2296 bits
* Compression ratio = 2296 / 6144 = 0.37

**Step 4: Compare the compression ratio of the first bitmap image to this second compressed bitmap image. What do you think is the reason for this difference?**

I believe this to be because, the larger file has more data to compress. It will have a larger initial size because it has more uncompressed data and this explains why the compression ratio is much less for the larger file.