P6 Analysis

1. fileB has some characters that are more common than characters in fileA. Thus, the compression of fileB will have a smaller compression ratio than fileA. This is because, when compressing fileB, a higher frequency of characters will allow the compression algorithm to decrease the total number of bits as it won't have to traverse the tree in as many different paths.

2.

COMPRESSION:

oak-ridge.jpg

Compression Ratio: 4027336/4018768 = 1.002
Runtime: 65 ms

Mtblanc.jpg

Compression Ratio: 2624056/2616920 = 1.002
Runtime: 50 ms

Hawthorne.txt

Compression Ratio: 3974152/2229704 = 1.782
Runtime: 58 ms

Conclusions:
Runtime has a correlation to the total number of bits in the uncompressed file. This makes sense intuitively because if the program has to read/write more bits then It should take longer to do so. Compression ratio is uniform for images at approximately 1.00. It can be inferred then that images have very little compression. A possible explanation for this is because colors have a much greater gradient than the 256 character options in a text file. A text file has compression ratio greater than 1 which makes sense as there should be fewer bits in the compressed file than the original file.

3.

DECOMPRESSION:

oak-ridge.jpg

Runtime: 56 ms

Mtblanc.jpg

Runtime: 44 ms

Hawthorne.txt

Runtime: 40 ms

Conclusions:
Text files have lower runtime then image files when decompressing. A possible explanation for this behavior is that text files have a clearly defined list of unique characters whereas images have a more complex gradient of colors that corresponds to more computations in order to accurately decompress the file.