Seth Pregler
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Lab 5 Pre-lab Submission

Questions
a) What is the purpose for using zigzag transformation in JPEG encoding?

After computing the Quantization matrix, lower frequency coefficients occupy the top left of the matrix and contain most of the energy, whereas the bottom right of the matrix, the high frequency coefficients, will mostly be null values. Zig-zag scanning through the Q-Matrix orders the DCT coefficients into an efficient sequence whereby its structure is leveraged by Run-length encoding (RLE). This benefits subsequent Huffman encoding by reducing redundant information, thus improving compression.

b) What is the purpose for using Huffman encoding in JPEG encoding?

The purpose of using Huffman encoding is to compress the data further. Huffman coding does this by encoding a sequence of data into variable length codes, whereby more frequent symbols in the input are assigned shorter codes. This aspect of variable length coding is beneficial because more frequent symbols require less bits, reducing the total bytes needed to represent the input data. Huffman encoding is also lossless as compared Quantization.