

Additional Questions

Question 1)

Given the following portion from a block (assumed to be 4x4 pixels to simplify the problem) from an image after the Discrete Cosine Transform stage of the compression pipeline has been applied:

| | | | |
|-----|----|----|-----|
| 118 | 42 | 54 | 150 |
| 42 | 32 | 30 | 34 |
| 100 | 60 | 43 | 98 |
| 44 | 39 | 40 | 31 |

- What is the result of the quantization step of the JPEG compression method assuming that a constant quantization value of 32 is used?
- What is the output of the following zig-zag step being applied to the resulting quantized block?
- What is the output of the RLC(Run length coding) step?
- Assume that the DC components of this image were as follows:
4 6 9 11 13 12 13 14 12 11
Show how you would code this sequence using Differential Pulse Code Modulation (DPCM)

Question 2)

Given the following portion from an image:

| | | | |
|----|----|----|----|
| 42 | 42 | 54 | 54 |
| 42 | 32 | 30 | 34 |
| 45 | 50 | 43 | 50 |
| 44 | 39 | 40 | 31 |

- Get the difference image assuming we are using the predictor P4 (A+B-C)
- Find the Entropy for both the original and the difference image
- Apply the Huffman coding on both the original and the difference image? compute the compression ratio and average message length in both cases.
- Discuss your results.