תמונה שמכילה טקסט, צילום מסך, גופן, מספר

תוכן שנוצר על-ידי בינה מלאכותית עשוי להיות שגוי.  
 תמונה שמכילה טקסט, גופן, צילום מסך

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We will use equation 8-6:

Plugging these values into equation 8-6, we get that

Applying the encoding on our original image, we get that

Average compression-

Compression ratio-

And so, the compression is .

The minimal compression is

And so, the effectiveness of huffman compression is

Meaning that Huffman encoding achieves 96.6% effectiveness compared to the optimal compression.

The existing pairs in each line are- , , , and .  
Since the image is stored continuously, there are also the pairs between the last element of a line and the first element of the next line. And so, there’s also the pair .

So there are 6 possible pairs-

.

and there are a total of 32 pairs in the image.

Plugging these values into the entropy equation we get that-

(e)

Assuming we take the difference in every row separately

We shall calculate the entropy-

And so,

The entropy is lower than the original encoding, telling us that there’s a correlation between pixels and that this is a better compression method compared to compressing the original image directly.

(f)

As we can see, the image has correlation between pairs of pixels(at the very least).

In (a), the correlation between values is not taken into account.

In (d) we do take that correlation into account, resulting in lower entropy- indicating spatial redundancy.

In (d) we also take that correlation into account, but not as much as (d)- likely because it didn’t remove all of the correlation.



We will follow the process in the book. .

works for

The unary code is .

We want bits, and so we get .

We will now concatenate the results-

works for .

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works for and specifically for .

The unary code is .

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