1. Suppose we have an image with 256 different gray levels. All the gray values appear an equal number of times. 1 point

Will variable-length coding lead to any compression in this image without additional processing?

- ○ Yes
- ◉ No

2. How can lossless image compression be achieved for the image in Question 1? 1 point

- ○ Lossless compression will never be achieved for such image.
- ◉ Via predictive coding.
- ○ Erasing pixels.
- ○ Performing a DCT.

3. How many unique sets of Huffman codes can you construct for an image with only 3 different pixel values (e.g., all the image is composed of 0s, 255s, and 128s)? 1 point

- ◉ 2
- ○ 3
- ○ Infinity
- ○ 5

4. For an image with intensities 21, 95, 169 and 243; and respective probabilities 3/8, 1/8, 1/8, and 3/8; the length of the corresponding variable-length code created by the Huffman coding procedure are 1 point

- ○ 1, 4, 4, 1
- ○ 2, 2, 2, 2
- ◉ 1, 3, 3, 2
- ○ 1, 2, 2, 1

5. The main source of error (lossy compression) in JPEG is 1 point

- ○ The division into 8x8 blocks.
- ◉ The quantization.
- ○ The DCT.
- ○ The variable-length (Huffman) coding.

6. In lossless image compression, prediction can be based on any pixel in the image. 1 point

- ◉ False
- ○ True

7. A reason for using DCT (instead of Fourier, for example) in JPEG is 1 point

- ○ It is simpler to compute
- ○ No particular reason
- ◉ Its favorable periodicity property
- ○ It is real while Fourier is complex

8. Since we must encode all pixels in the image, JPEG needs at least a bit per pixel and therefore in a 256 levels image (8 bits), it can only achieve up to 8:1 compression. 1 point

- ○ True
- ◉ False

9. In JPEG, if we double the quantization step, then we double the compression ratio. 1 point

- ○ True
- ◉ False

10. Without JPEG or a similar compression technique, digital cameras will no be as popular as they are today. 1 point

- ◉ True
- ○ False

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