

Question one: Solve the following problems

1. Calculate the size of a still image 800x600 with color depth 16 bits.

$$800 \times 600 \times 2 = 480000 \text{ B} = 468.75 \text{ KB}$$

2. Given the following 2-D array representing a 3-bit gray-level image:

3	1	3	6
3	4	7	5
2	1	4	3

- Apply the following operations separately:

- A. Perform 3*3 – noise filtering using the mean filter.

3	3	1	3	6	6
3	3	1	3	6	6
3	3	4	7	5	5
2	2	1	4	3	3
2	2	1	4	3	3

Convolve – apply – the following mean filter to the image:

1 1 1
1 1 1 x 1/9
1 1 1

The result is:

3	3	4	5
2	3	4	5
2	3	4	4

- B. Perform 3*3 – noise filtering using the median filter.

3	3	4	6
3	3	4	5
2	3	4	4

- C. Compare the histograms of the original image and the image filtered with mean filter.

Gray Levels	0	1	2	3	4	5	6	7
No. of bits for the Original Image	0	2	1	4	2	1	1	1
No. of bits for the Mean Filtered Image	0	0	2	4	4	2	0	0

D. Compare the histograms of the original image and the image filtered with median filter.

Gray Levels	0	1	2	3	4	5	6	7
No. of bits for the Original Image	0	2	1	4	2	1	1	1
No. of bits for the Mean Filtered Image	0	0	1	5	4	1	1	0