

Q1. Answer the following:

(8 marks)

- A. What is the benefit of histogram equalization?
- B. Write a Matlab function to extract a histogram of a gray-scale image (6 bit/pixel).
- C. Write a Matlab program to run the histogram equalization of a gray-scale image (6bit/pixel), then show the histogram before and after equalization with their images.

Q2. In spatial filtering grayscale image $f(x,y)$, Write the code of spatial median filter function (function only). Note: mask size [7x7] only.

(4 marks)

Q3. Choose the correct answers for the following questions.

(3 Marks)

A. In the formula $s = c \cdot \log(1+r)$, r ranges

1. $r \geq 0$
2. $r \geq 1$
3. $0 \geq r$
4. $1 \geq r$

B. How is the negative of an image obtained with intensity levels $[0, L-1]$ with "r" and "s" being pixel values?

1. $s = L - 1 + r.$
2. $s = L - 1 - r.$
3. $s = L + 1 + r.$
4. $s = L + 1 - r.$

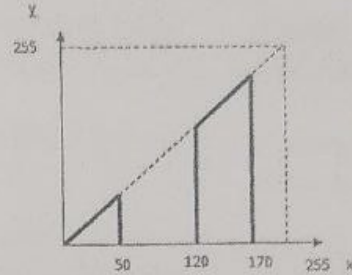
C. Which of the following expressions denote spatial domain process?

1. $g(x,y) = T[f(x,y)].$
2. $f(x+y) = T[g(x+y)].$
3. $g(xy) = T[f(xy)].$
4. $g(x-y) = T[f(x-y)].$

Q1. A grayscale image $f(x,y)$, apply the Function shown below, and answer the following:

- 1- What is the name of this function? (1 mark)
- 2- Show the output of this function by using Matlab code. (6 marks)

Note: Read image and convert it to a grayscale then show the images before and after applying this function in one figure.



Q2. Write MATLAB code to produce and display the histogram equalization of the original image.

(5 marks)

Q3: Choose the correct answers for the following questions.

(3 marks)

1. How is the negative of an image obtained with intensity levels $[0, L-1]$ with "r" and "s" being pixel values?

- a. $s = L - 1 + r$.
- b. $s = L - 1 - r$.
- c. $s = L + 1 + r$.
- d. $s = L + 1 - r$.

2. Which of the following involves reversing the intensity levels of an image?

- a. Log Transformations.
- b. Piecewise Linear Transformations.
- c. Image Negatives.
- d. None of the Mentioned.

3. Which of the following requires to specify the information at the time of input?

- a. Power transformation
- b. Log transformation
- c. Linear transformation
- d. Piece-wise transformation

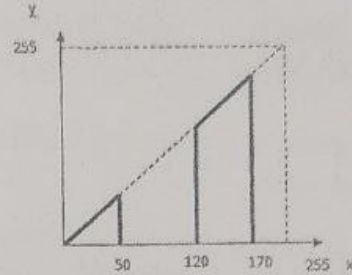
مدرس المادة

Dr. Majid D. Younis

Q1. A grayscale image $f(x,y)$, apply the Function shown below, and answer the following:

- 1- What is the name of this function? (1 mark)
- 2- Show the output of this function by using Matlab code. (6 marks)

Note: Read image and convert it to a grayscale then show the images before and after applying this function in one figure.



Q2. Write MATLAB code to produce and display the histogram equalization of the original image.

(5 marks)

Q3: Choose the correct answers for the following questions.

(3 marks)

1. How is the negative of an image obtained with intensity levels $[0, L-1]$ with "r" and "s" being pixel values?

- a. $s = L - 1 + r$.
- b. $s = L - 1 - r$.
- c. $s = L + 1 + r$.
- d. $s = L + 1 - r$.

2. Which of the following involves reversing the intensity levels of an image?

- a. Log Transformations.
- b. Piecewise Linear Transformations.
- c. Image Negatives.
- d. None of the Mentioned.

3. Which of the following requires to specify the information at the time of input?

- a. Power transformation
- b. Log transformation
- c. Linear transformation
- d. Piece-wise transformation

مدرس المادة

Dr. Majid D. Younis

Q1) Write MATLAB code to produce and display the histogram equalization of the original image. Display the original image and plots its gray-level histogram side by side. Provide brief and appropriate captions. **[6 Marks]**

[3 Marks]

Q3) Choose the correct answers for the following questions.

- 1) Approaches to image processing that work directly on the pixels of incoming image work in _____.
- a) Spatial domain.
 - b) Inverse transformation.
 - c) Transform domain.
 - d) None of the Mentioned.
- 2) Which of the following expression is used to denote spatial domain process?
- a) $g(x,y) = T[f(x,y)]$.
 - b) $f(x+y) = T[g(x+y)]$.
 - c) $g(xy) = T[f(xy)]$.
 - d) $g(x-y) = T[f(x-y)]$.
- 3) While performing the median filtering, suppose a 3×3 neighborhood has value (10, 20, 20, 20, 15, 20, 20, 25, 100), then what is the median value to be given to the pixel under filter?
- a) 15.
 - b) 100.
 - c) 20.
 - d) 25