**Sheet4**

**Question 1**

Perform the histogram equalization given the following histogram such that:

r = gray level

n=number of occurrences



**Question 2**

Sketch the histogram of the following gray scale image

|  |  |  |  |
| --- | --- | --- | --- |
| 20 | 20 | 25 | 30 |
| 50 | 30 | 10 | 15 |
| 20 | 250 | 10 | 10 |
| 25 | 30 | 15 | 15 |

1. From the histogram; what is your impression about this image?
2. Find the negative of the previous image if you know that the intensity values are in the range [0 - 255].
3. Convert the previous image to binary image using the threshold T= 25.

**Question 3**

Consider the 8x8 image below.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **1** | **2** | **5** | **5** | **6** | **7** | **7** | **6** |
| **1** | **2** | **6** | **4** | **0** | **5** | **7** | **7** |
| **1** | **1** | **6** | **0** | **0** | **7** | **7** | **6** |
| **6** | **0** | **6** | **4** | **3** | **3** | **3** | **3** |
| **6** | **0** | **0** | **0** | **4** | **3** | **0** | **3** |
| **6** | **7** | **7** | **7** | **4** | **3** | **0** | **3** |
| **6** | **7** | **7** | **7** | **0** | **0** | **3** | **3** |
| **6** | **7** | **7** | **7** | **0** | **0** | **3** | **3** |

a. Calculate the histogram equalization for the image above.

b. Calculate the size of the image

C. The output of a 3x3 mean filter at (2,2).

D. The output of a 3x3 median filter at (2,2)

E. City-block distance from (2,2) to (4,3)

F. The Euclidean distance from (2,2) to (4,3)

G. Power law transformation at (5,4)

H. Log transformation at (4,5)

**Question 4**

In each part you are given a filter. Explain how you expect applying the filter to an image would change the original image. Explain







C)



**Question 5**

##### Consider the image shown and let V={3,4}, compute the lengths of the shortest 4-, 8 path between y and x.



**Question 6**

**For the following image( 3 bit/pixel):**

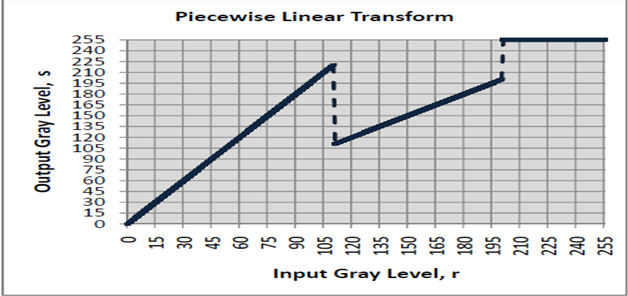
|  |  |  |  |
| --- | --- | --- | --- |
| 4 | 3 | 2 | 3 |
| 4 | 3 | 2 | 1 |
| 1 | 1 | 3 | 3 |
| 3 | 3 | 3 | 3 |
| 5 | 5 | 5 | 5 |

**Find:**

1. Find the image Negative for image A
2. Convert the image B to binary image using the threshold T= 4
3. zooming by 2x

**Question 7:**

1. **Given the following Piecewise linear chart write the pseudo code of the corresponding gray level transform**

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