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SUBJECT DATA IMAGE
PROCESSING.

Q1:-

Grey Level slicing:

Grey level slicing is a equivalent bandpass filtering. It manipulates group of intensity level in an image upto a specific range by diminishing rest or by leaving them alone.

Gray level:

It indicate the brightness of a pixel.

In a grey scale you can take one pixel a one value between 0 and 255.

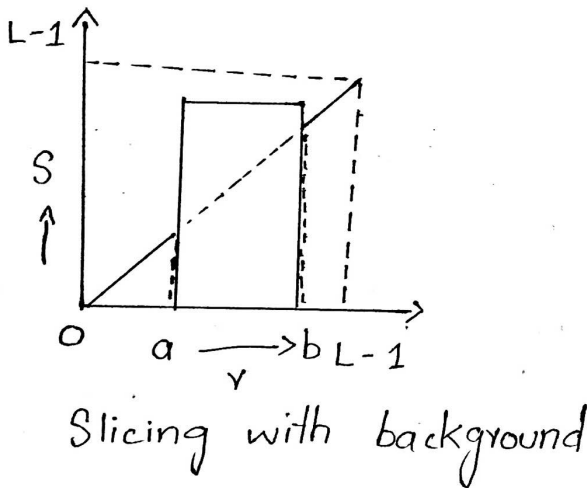
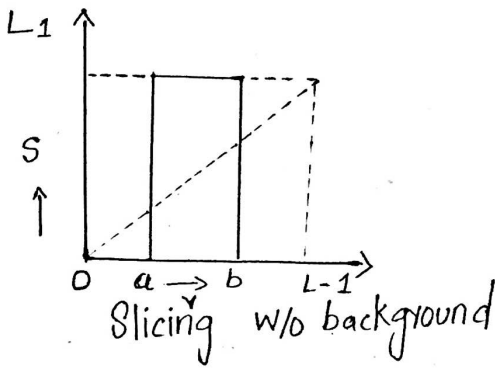
Gray level transformation:-

Gray level function can be written as

$$s = T(r)$$

Example

Grey level slicing (Point Processing)



Grey level slicing is very applicable in different departments such as

Medical images

Satellite images

x-rays

CT-Scan

Explanation:-

This technique is adopted when a specific range of gray is given prominence and is needed to be applied to enhance an image.

This technique is most preferred for analysing health & image.

Q1:- b part:

Negative image:

Negative image is total inversion of positive image where positive image is normal image. In negative image colors appear as other colors such as

Such as

Red appear as cyan, green

blue appear as yellow.

The transformation function used image negative is

$$s = T(r) = L - 1 - r$$

Achievements from Negative image:

This processing technique is particularly suited for improving white or grey element embedded in dark region of an image.

B. Gamma transform:-

Gamma transform is also called power law transform denoted by

$$f(x, y) = (c * f(x, y))^{\gamma}$$

Since gamma of different display are different it is the most primary technique to adopted to enhance image for several display devices.

Q2:-

The right side image is enhanced by applying different enhancement techniques. First we will discuss about Contrast stretching.

Contrast stretching:- This technique is also called (normalization) it attempt to improve the contrast in an image by stretching the range of intensity values it contain to span a desire range of values.

How it's work:- Before the stretching can be performed it is neccessary to specify the upper & lower pixel values limits over the image should be normalized.

Brightness enhancement:-

Brightness enhancement is shifting of intensity value to a higher value.

The darker and the lighter pixel both get their value shifted by some constant value.

Example:-

In X-ray images brightness can be enhanced to find the darker spot.

This two enhancement tools should be used gain a corresponding result.

Q3

Q2:- Data from the graph?

for P

$$x = 6$$

$$y = 1$$

for q

$$x' = 3$$

$$y' = 7$$

∴ Solution:

$$P(x, y) = (6, 1)$$

$$Q(x', y') = (3, 7)$$

$$D4(P, Q) = |x - x'| + |y - y'|$$

$$= |6 - 3| + |1 - 7|$$

$$= 3 + 6$$

$$= 9$$

$$\begin{aligned}\Rightarrow D_8(p, v) &= \text{Max}(|x-x'|, |y-y'|) \\ &= \text{Max}(|6-3|, |1-7|) \\ &= \text{Max}(3, 6) \\ &= \text{Max}(6) \\ &= 6\end{aligned}$$

$$\begin{aligned}\Rightarrow D_e(p, v) &= \sqrt{(x-x')^2 + (y-y')^2} \\ &= \sqrt{(6-3)^2 + (1-7)^2} \\ &= \sqrt{(3)^2 + (-6)^2} \\ &= \sqrt{9+36} \\ &= \sqrt{45}\end{aligned}$$

Q4 :- part A

Histogram:-

It is very useful tool which show all the available angle present in digital image.

It work as graphical representation of the tonal distribution in a digital image.

Work in an image:

Plot the number of pixels for each tonal value.

The histogram for a very dark image will have most of it's data point. on the left side and center of the graph.

⑥ Match each picture with
it's possible histogram.

Pic a : Hgm 2

Pic b : Hgm 1

Pic c : Hgm 4

Pic d : Hgm 3