Images and Graphics

Image processing:

There are specific algorithms possible to have a positive impact on images, each of which serves specific goals one of them is Background Image Subtraction

• use if you want to show a picture isolated from the background.

• enter two images; one representing the background and other background plus person is what is called image foreground and produces a new image and subtracting the first image of a second.

Example:

If we have these images:

The whole picture is:

125	125	125	125
214	125	214	125
214	125	214	214
214	214	214	214

The background is:

125	125	125	125
214	98	112	125
214	125	112	214
214	214	214	214

The result is

0	0	0	0
0	27	102	0
0	0	102	0
0	0	0	0

Image Filtering Techniques:

Regard to amending and purification of errors or imperfections in it and
Purification is defined as "the process of reducing the amount of color differences between the pixel and the surrounding pixels," and of these ways:

1- Mean Filter
2- Median Filter
3- Gauss Filter

Mean Filter:

• used to remove impurities bulky in the picture.
• adjusts the color value in each pixel calculates the arithmetic mean of these pixel plus the surrounding pixels in the form of a matrix.
• Shaded pixel value is calculated as follows:

206	125	98
216	**125**	98
212	214	101

Sol:

155=9/206+125+98+216+125+98+212+214+101

Disadvantages of using Mean Filter:

1. Replace all the pixels in the image in arithmetic ocean areas as adversely affect the value abnormal values surrounding pixels.
2. Make picture less clear, especially at the edges.

Median Filter:

• used to remove impurities any bitmap in small spaces such as pixels or These Pixels called impurities salt and pepper.
• replace value here is the arithmetic mean of the points mediator in the picture and arranging matrix values in ascending order and then collect (the number of digits +1) / 2 and this gives us the order or mediator.
Disadvantages of this method:
1. Reduce heterogeneities unit or contrast in the resulting image
2. Need more time to calculate.
If you have the following matrix, shaded refine the value of the pixel using median:

206	**204**	**200**
198	**25**	**205**
212	**211**	**207**

Arrange the numbers in ascending order becomes:

212 ,211 ,207 ,206 ,205 ,204 ,200 ,198 ,25

The order of the median=5 which equals to 205

206	**204**	**200**
198	**25**	**205**
212	**211**	**207**

The result is >>>>>>>>>>>>>>>

206	**204**	**200**
198	**205**	**205**
212	**211**	**207**

Modify image light:

there are two main methods to modify the image and lighting are:

1. linear Mapping
2. Logarithmic Mapping

linear Mapping:

• a way to modify the lighting of photos by reducing lighting or increase it.
• Grayscale images when adjusted linearly each pixel will increase by a fixed number leading to the approaching white pixel and thus lighten the image.
• White remains white pixel because the pixel value does not exceed 255 for grayscale.
• Graphical representation of the values is called Histogram where the X-axis values from zero to 255, while the focus of antibiotics shows repeat this value of the image.
• The following figure shows how the pixels with high values in the modified image accumulated when the value of 255 and is the value of the color white.

The original image

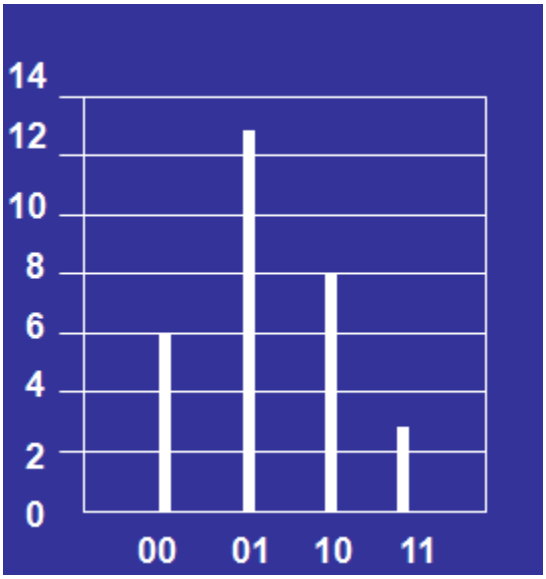
The linearly modified image

Example:

Write the histogram graph for the image with theses pixels if you knew the color depth is 2 bits:

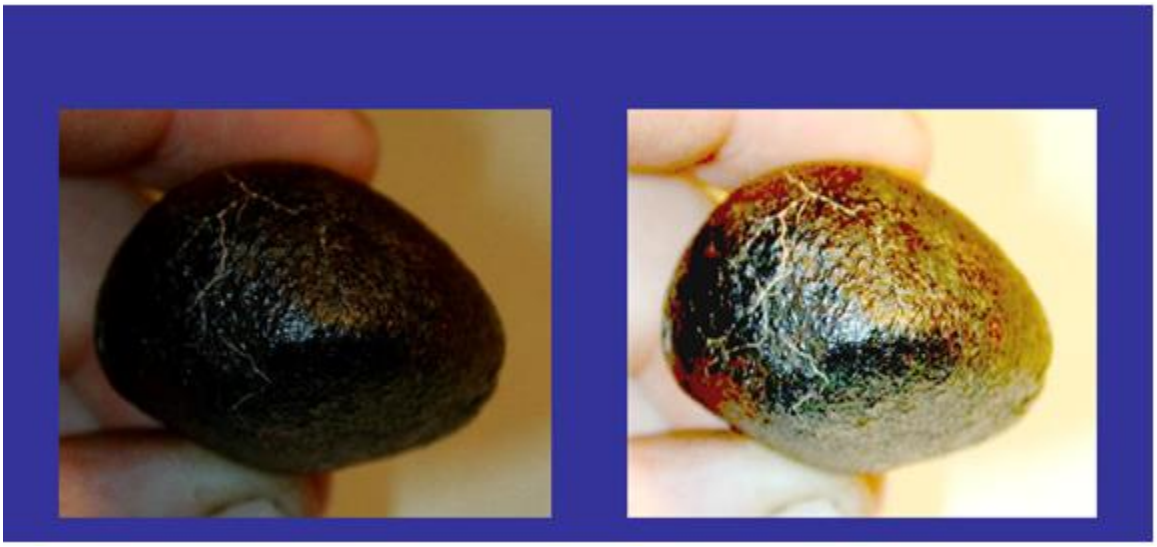
00	**11**	**10**	**01**	**01**
00	**00**	**10**	**10**	**10**
10	**00**	**01**	**10**	**10**
11	**00**	**01**	**01**	**10**
11	**01**	**01**	**01**	**01**
00	**01**	**01**	**01**	**01**

Answer:



Logarithmic Mapping

• The amendment does not benefit when the body we want to modify is dark on a white background in the picture because the white space will increase and this is not required.
• based on the increase the dark pixels with values larger than those differences between the white pixels, thus it does whiten dark picture objects without lightening the background.



Original image logarithmic mapped image

Edge Detection Technology:

• Edges of the picture are the areas where there is sudden change in the value of any pixel "sharp change in the intensity of the color or degree of it".
• used to determine the shapes in the picture to be defined later.
• This is an important technique to computer science sight Computer Vision.
• impurities and negative features of the lighting, which have a negative impact on the process of identifying the edges it is necessary before determining the edges to use the means of purification.
• There is an algorithm prepared by the scientist Sobel to determine the edges.
• based on calculating the difference longitudinally and transversally between pixel and its neighboring pixels to determine whether these pixel edge longitudinal or transverse.

Original Picture Picture Edges