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1 Assignment 1

1.1 Negative of an image

```
1  a=imread('Lenna.png');
2  figure
3  [row,col,s]=size(a);
4  imshow(a);
5  for i=1:row
6      for j=1:col
7          for k=1:3
8              a(i,j,k)=255-a(i,j,k);
9          end
10     end
11 end
12
13 figure
14
15 imshow(a);
```

(a) Original Image

(b) Negative Image

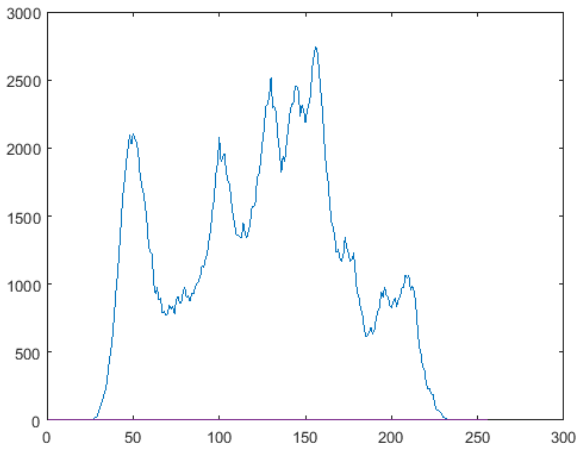
Figure 1: a normal and a negative image

2 Assignment 2

2.1 Plotting the histogram of an image

```
a=imread('Lenna.png');
b=rgb2gray(a);
[row,col]=size(b);
arr=zeros(256);
for i=1:row
    for j=1:col
        arr(b(i,j)+1)= arr(b(i,j)+1)+1;
    end
end
plot(arr);
```

(a) Original Image

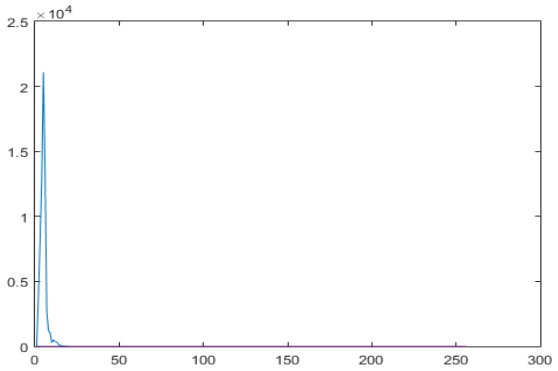


(b) Histogram of the Image

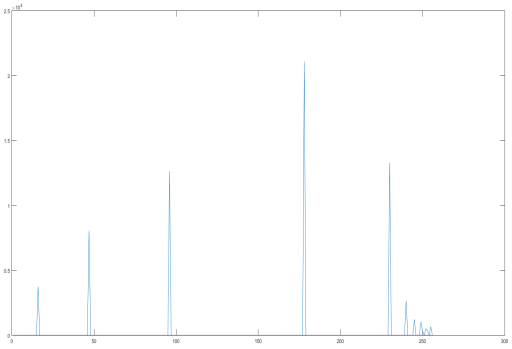
Figure 2: Image & histogram of the image

2.2 Histogram equalization

```
a=imread('Lenna.gif');
b=(a);
[row,col]=size(b);
arr=zeros(256);
for i=1:row
   for j=1:col
       arr(b(i,j)+1)= arr(b(i,j)+1)+1;
   end
end
plot(arr);
pr=zeros(256);
pr1=zeros(256);
for k=1:256
    pr(k) = arr(k)/(row*col);
end
k=0;
for l=1:256
     k=k+pr(l);
     pr1(l)= pr1(l)+k;
end
for i=1:row
    for j=1:col
        b(i,j)=pr1(b(i,j)+1)*255;
    end
end
arr1=zeros(256);
for i=1:row
   for j=1:col
       arr1(b(i,j)+1)= arr1(b(i,j)+1)+1;
   end
end
imwrite(b,'C:\Users\ratul\Desktop\myGray.png')
imtool(b);
```



(a) Original Histogram



(b) Histogram after equalization

Figure 3: Histograms of the images

(a) Original Image

(b) Equalized image

Figure 4: Image & histogram of the image

3 Assignment 3

3.1 Mean Filter

```
1  p = imread('Lenna.png');
2  b=rgb2gray(p);
3  imwrite(b,'C:\Users\ratul\Desktop\grayscale.png');
4  [row,col]=size(b);
5  c1=zeros(row,1);
6  imr1 =[c1,b,c1];
7  r1=zeros(1,col+2);
8  imr = [r1;imr1;r1];
9  p2=imr;
10 imr=double(imr);
```

```
[r,c]=size(imr);
mask=ones(3,3)/9;
for i=2:r-1
    for j=2:c-1
        sum=0;
        for k=-1:1
            for l=-1:1
                sum = sum + p2(i+k,j+l)*mask(k+2,l+2);
            end
        end
        imr(i,j)=sum;
    end
end
imtool(uint8(imr));
imwrite(imr,'C:\Users\ratul\Desktop\myGray.png')
```

(a) Original Image (b) Mean filtered image

Figure 5: Normal & Filtered Image

3.2 Median Filter

```
1  a=imread('C:\Users\Public\Pictures\Sample␣Pictures\
     LennaNoise.jpg');
2  b=rgb2gray(a);
3  imwrite(b,'C:\Users\ratul\Desktop\salt.png');
4  %m = imnoise(M,'salt & pepper',0.5);
5  [row,col]=size(b);
6  c1=zeros(1,col);
7  r1=zeros(row+2,1);
8  imr=[c1;b;c1];
9  imr2=[r1,imr,r1];
10 [r,c]=size(imr2);
11 imr3=imr2;
12 for i = 2:r-1
13     for j = 2:c-1
14         M=imr3(i-1:i+1,j-1:j+1);
15         imr2(i,j)=median(median(M));
16     end
17 end
18 imwrite(imr2,'C:\Users\ratul\Desktop\medianfilt.png')
     ;
19 imshow(imr2);
```

(a) Original Image (b) Median filtered image

Figure 6: Noisy & Filtered Image

3.3 Min Filter

3.4 Max Filter