Jaydeep Mahajan-CE066-IP-LAB3

Aim: Implement following Image Enhancement Techniques using Octave.

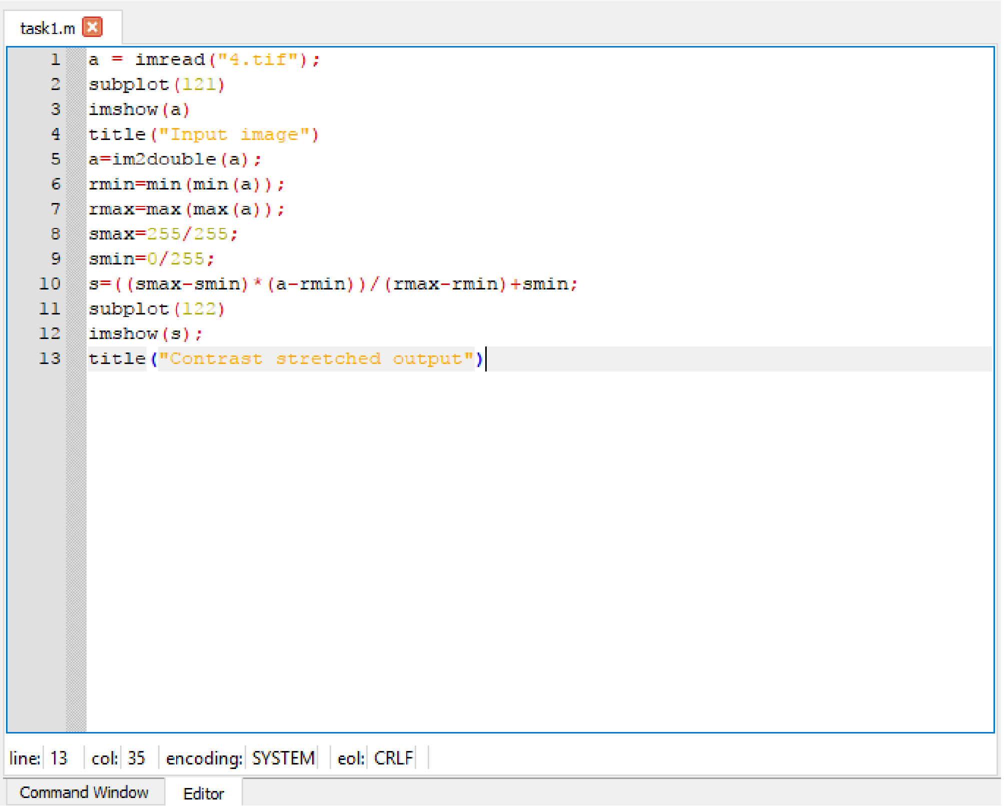
1. Contrast Stretching
2. Intensity Level Slicing
3. Bit Plane Slicing Functions

1) round (X): This function rounds the value of X to the nearest integer. Example: variable = round (0.75); % variable becomes 1 since 0.75 > 0.50.

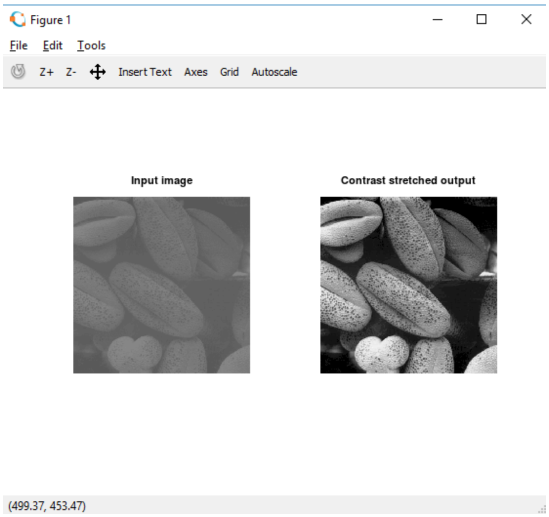
2) bitget (image, i): This function returns the status of bit(s) 'I' of the unsigned integers in "image". Example: bitplane_i = bitset(orig_img , bit);

GENERAL EQUATION OF CONTRAST STRETCHING: Slope of the Line: m=(y2–y1)/(x2– x1) = (smax-smin)/(rmax-rmin) Putting the above values in the equation of line Y = (m * X) + c we get s = (((smax-smin) / (rmax-rmin)) * (r- rmin)) + smin

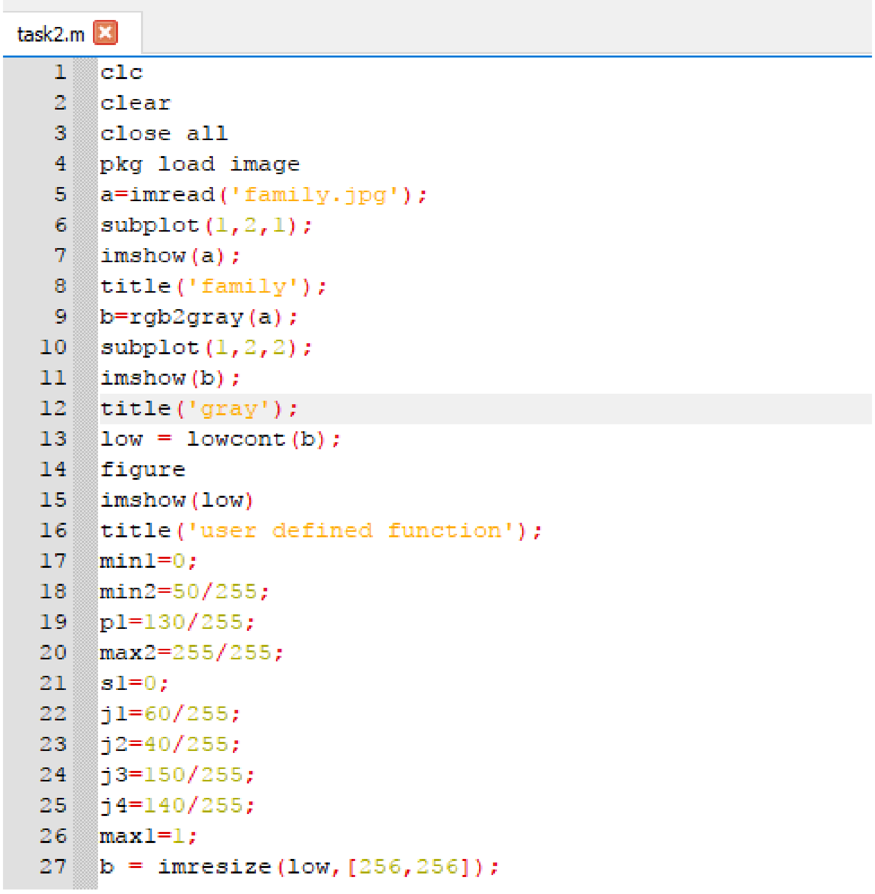
Task1: Do contrast stretching For the Image given in Figure 3.10 of the Textbook. Obtain Contrast stretched Image from Low contrast Image as given in Figure 3.10 (c).



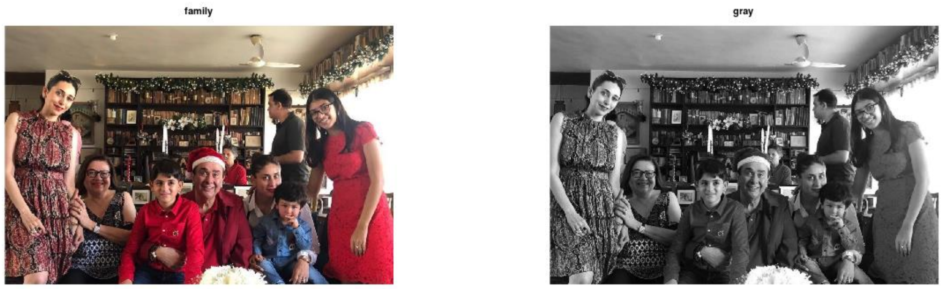
```
a = imread("4.tif");
subplot(121)
imshow(a)
title("Input image")
a=im2double(a);
rmin=min(min(a));
rmax=max(max(a));
smax=255/255;
smin=0/255;
s=((smax-smin)*(a-rmin))/(rmax-rmin)+smin;
subplot(122)
imshow(s);
title("Contrast stretched output")
```



Task 2: Take any family photo of yours – convert it into grayscale- reduce its contrast by using the function that was defined during lab session. Enhance the contrast of that image using piecewise linear operation for contrast stretching.



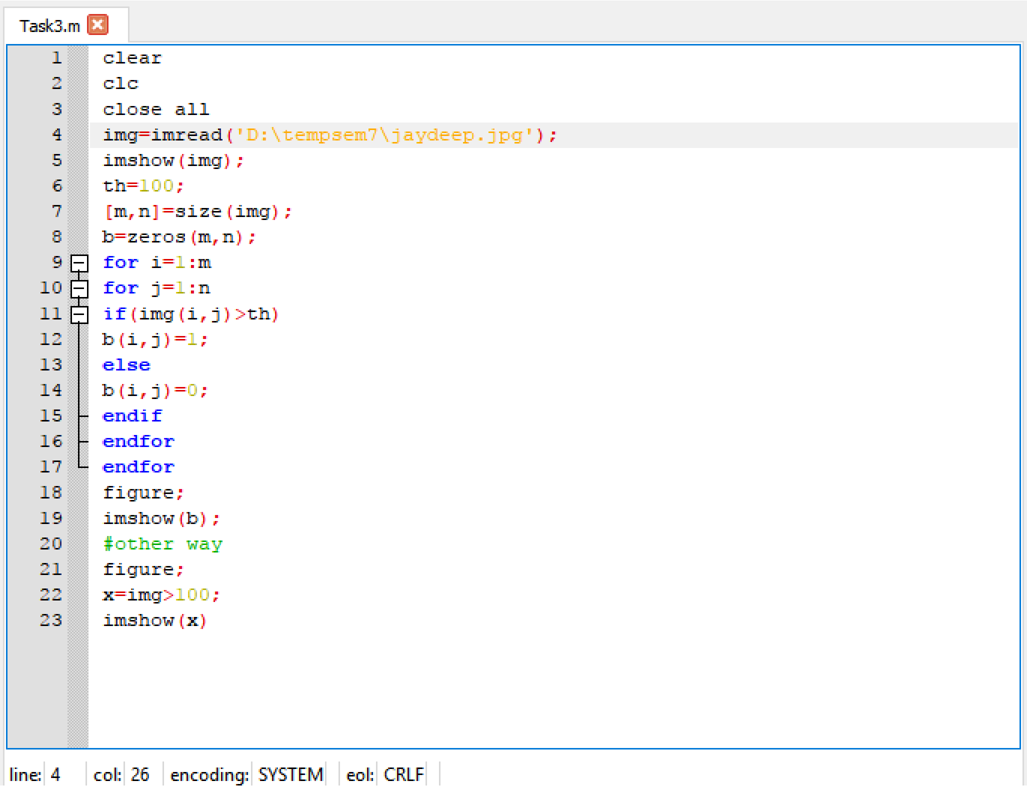
```
clc
clear
close all
pkg load image
a=imread('family.jpg');
subplot(1,2,1);
imshow(a);
title('family');
b=rgb2gray(a);
subplot(1,2,2);
imshow(b);
title('gray');
low = lowcont(b);
figure
imshow(low)
title('user defined function');
min1=0;
min2=50/255;
p1=130/255;
max2=255/255;
s1=0;
j1=60/255;
j2=40/255;
j3=150/255;
j4=140/255;
max1=1;
b = imresize(low,[256,256]);
```



family

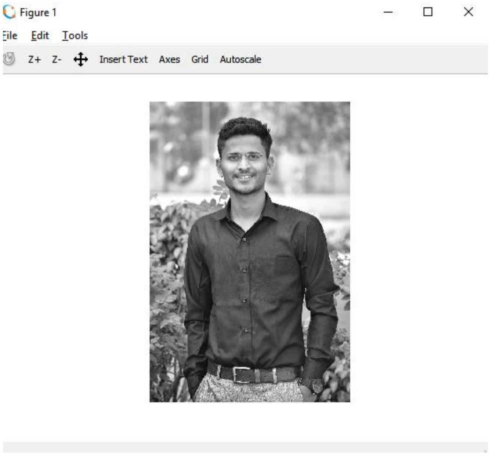
gray

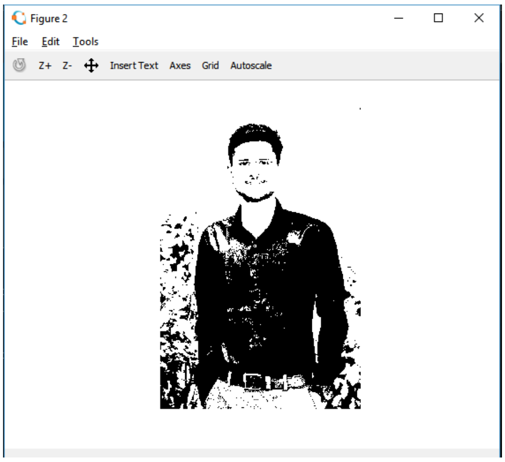
Task 3: Apply thresholding to any of your grey scale photo.



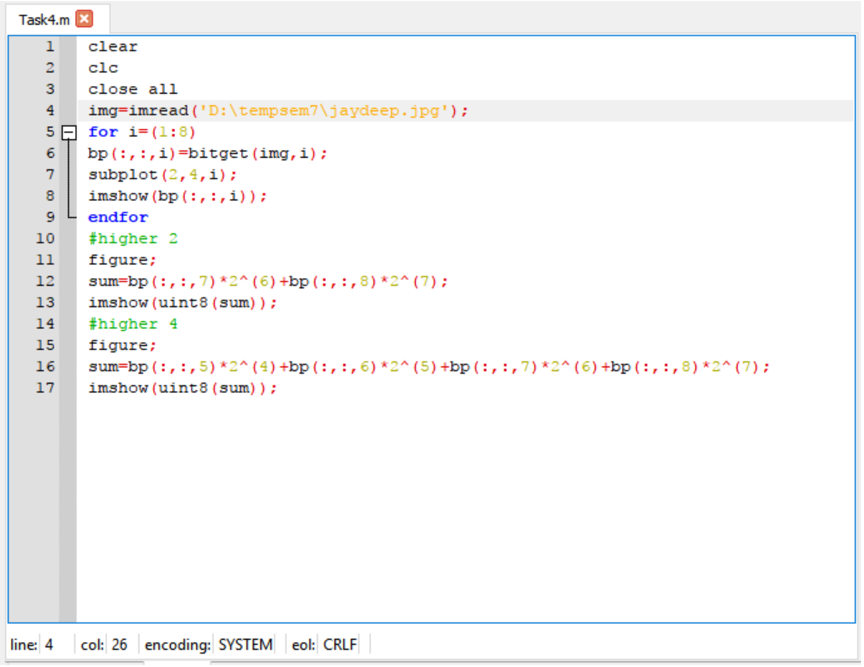
```
clear
clc
close all
img=imread('D:\tempsem7\jaydeep.jpg');
imshow(img);
th=100;
[m,n]=size(img);
b=zeros(m,n);
for i=1:m
for j=1:n
if(img(i,j)>th)
b(i,j)=1;
else
b(i,j)=0;
endif
endfor
endfor
figure;
imshow(b);
#other way
figure;
x=img>100;
imshow(x)
```

line: 4 col: 26 encoding: SYSTEM eol: CRLF

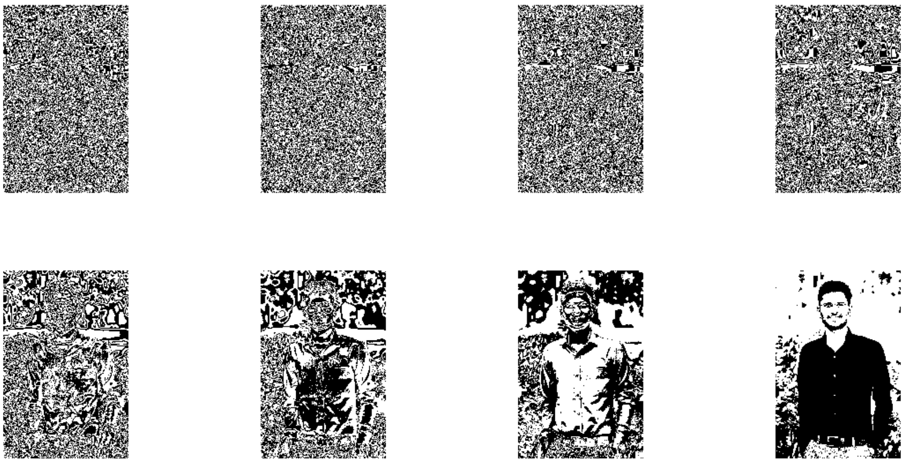




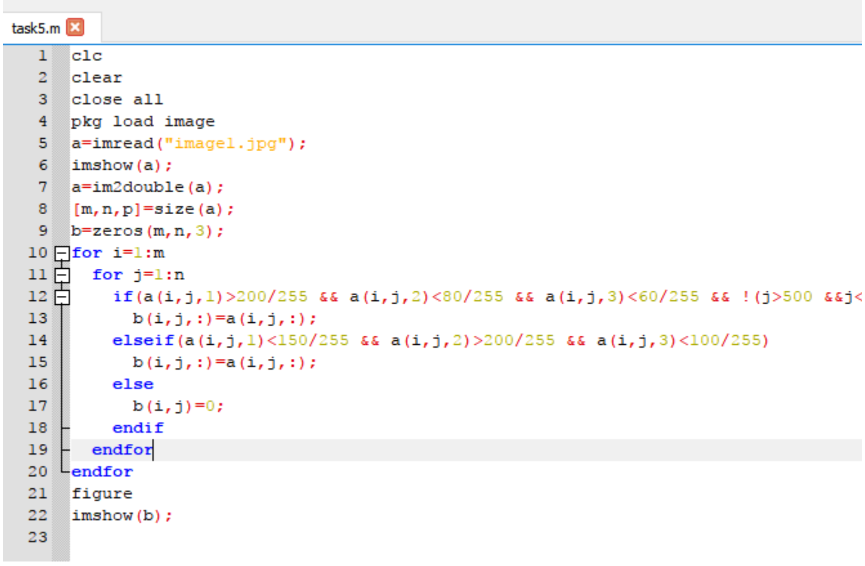
Task 4: Take your photo and separate out its bit plains. Reconstruct the given image using higher order 2-bit planes. Reconstruct the given image using higher order 4-bit planes. Experiment with the bit planes and derive your conclusions.



```
clear
clc
close all
img=imread('D:\tempsem7\jaydeep.jpg');
for i=(1:8)
bp(:,:,i)=bitget(img,i);
subplot(2,4,i);
imshow(bp(:,:,i));
endfor
#higher 2
figure;
sum=bp(:,:,7)*2^(6)+bp(:,:,8)*2^(7);
imshow(uint8(sum));
#higher 4
figure;
sum=bp(:,:,5)*2^(4)+bp(:,:,6)*2^(5)+bp(:,:,7)*2^(6)+bp(:,:,8)*2^(7);
imshow(uint8(sum));
```



Task 5: Perform intensity slicing to separate out red green balloons form the image 1(check: lab3images) given.



```
clc
clear
close all
pkg load image
a=imread("image1.jpg");
imshow(a);
a=im2double(a);
[m,n,p]=size(a);
b=zeros(m,n,3);
for i=1:m
  for j=1:n
    if(a(i,j,1)>200/255 && a(i,j,2)<80/255 && a(i,j,3)<60/255 && !(j>500 &&j<
      b(i,j,:)=a(i,j,:);
    elseif(a(i,j,1)<150/255 && a(i,j,2)>200/255 && a(i,j,3)<100/255)
      b(i,j,:)=a(i,j,:);
    else
      b(i,j)=0;
    endif
  endfor
endfor
figure
imshow(b);
```

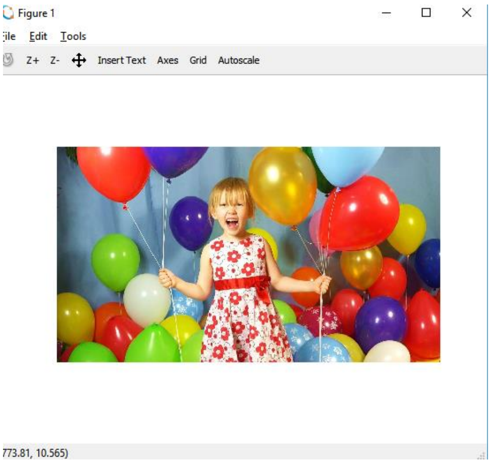


Figure 1
ile Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
773.81, 10.565)

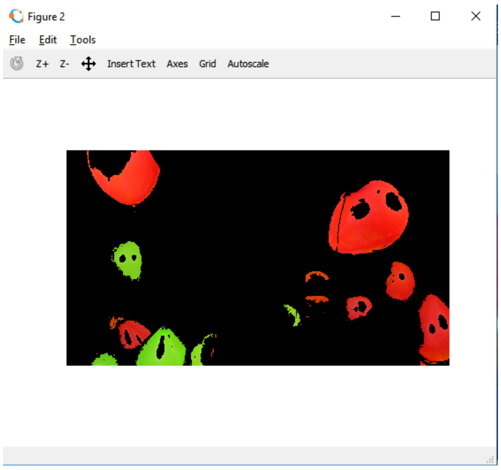


Figure 2
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale