EXPERINMENT 3

Aim : To study Contrast stretching, Intensity level slicing and Bit plane slicing.

❖ Exercises :

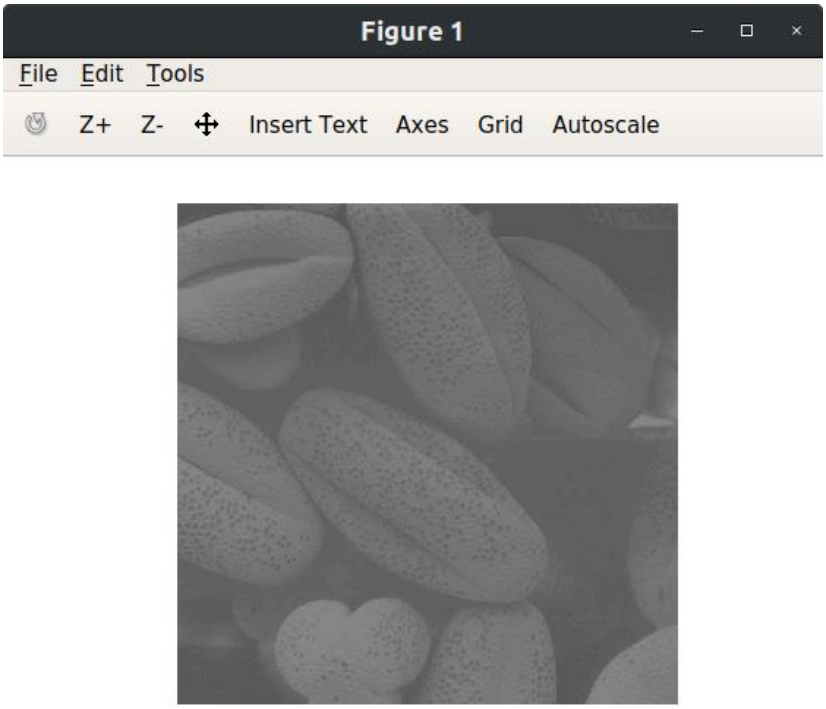
1. **Do contrast stretching For the Image given in Figure 3.10 of the Textbook. Obtain Contrast stretched Image from Low contrast Image as given in Figure 3.10 (c).**

→ Solution :-

Code :

```
close all
clear
clc

% Read Image
a = imread('/home/nihar/Desktop/SEM 7/IP/DIP3E_Original_Images_CH03/1.tif');
a = im2double(a);
imshow(a)

rmin = min(min(a))
rmax = max(max(a))
smin = 0/255;
smax = 255/255;
s = (smax-smin)/(rmax-rmin)*(a-rmin)+smin;
figure
imshow(s)
```

Input Image :



Output Image :

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

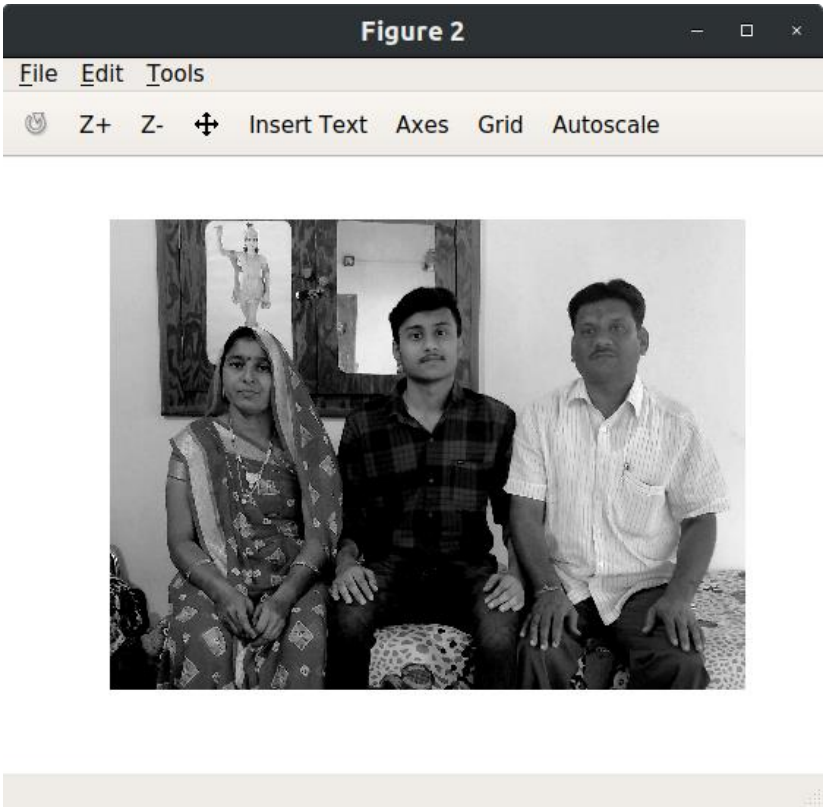
→ **Solution :-**

Code :

```
close all
clear
clc

% Read Image
a = imread('/home/nihar/Desktop/SEM 7/IP/Lab/Lab3/lab3images/IMG_2018.jpg');

% Gray scale image
b=rgb2gray(a);
b=b-70;
b = im2double(b);
figure
imshow(b)

rmin = min(min(b))
rmax = max(max(b))
smin = 0/255;
smax = 255/255;
s = (smax-smin)/(rmax-rmin)*(b-rmin)+smin;
figure
imshow(s)
```

Input Image :

Output Image :



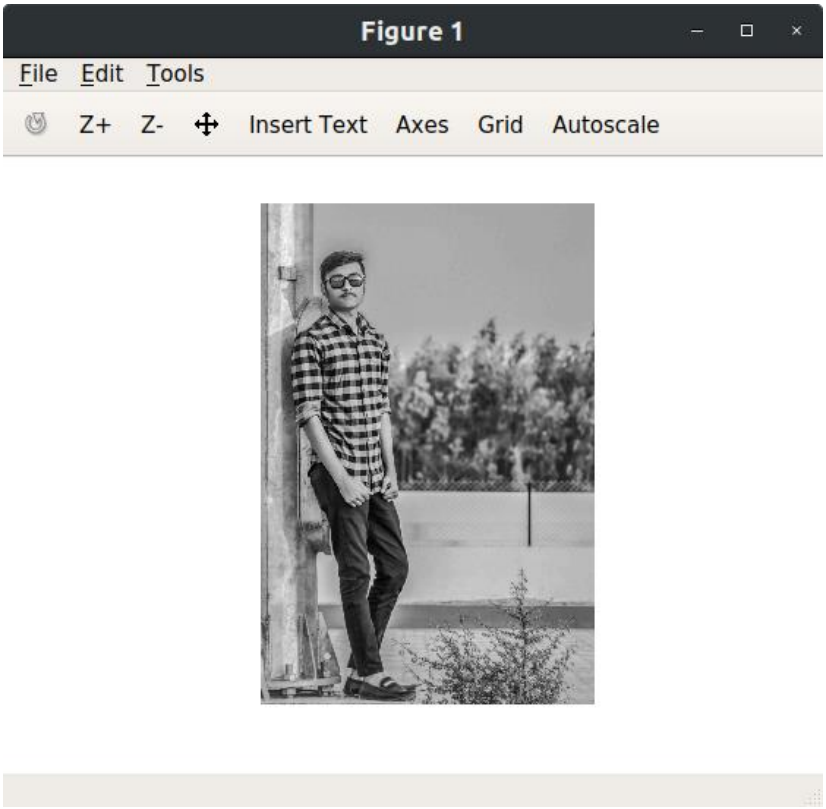
3. Apply thresholding to any of your gray scale photo.

→ Solution :-

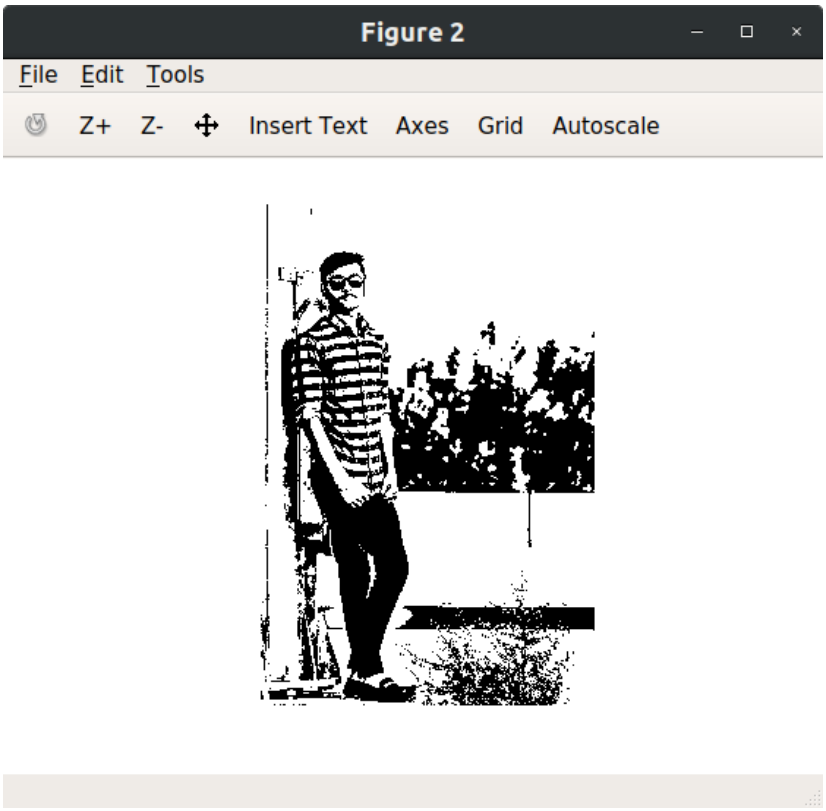
Code :

```
close all
clear
clc

% Read Image
a = imread('/home/nihar/Desktop/SEM 7/IP/Lab/Lab3/lab3images/my.jpg');
figure
imshow(a)
[m,n] = size(a);

for i=1:m
  for j=1:n
    if(a(i,j)>128)
      b(i,j)=1;
    else
      b(i,j)=0;
    endif
  endfor
endfor
figure
imshow(b)
```

Input Image :



Output Image :



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.**

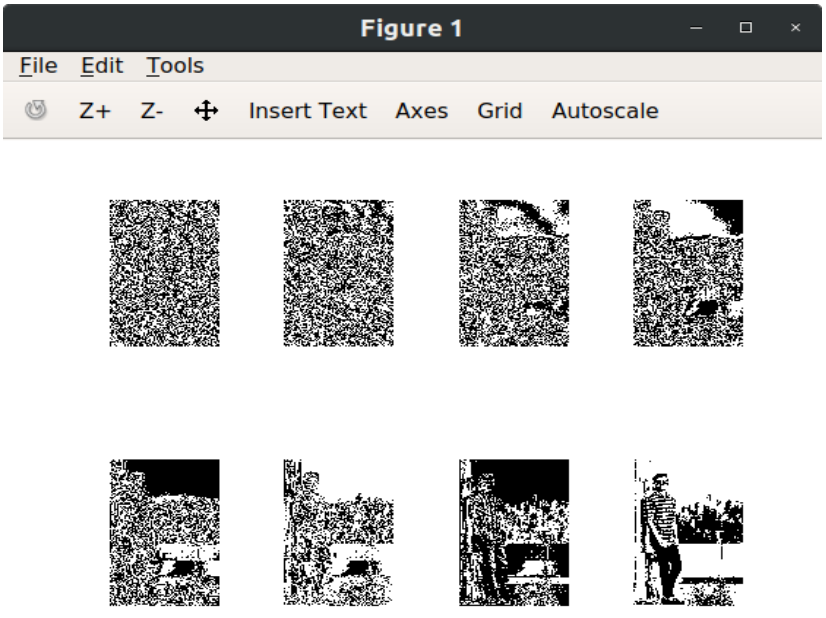
→ **Solution :-**

Code :

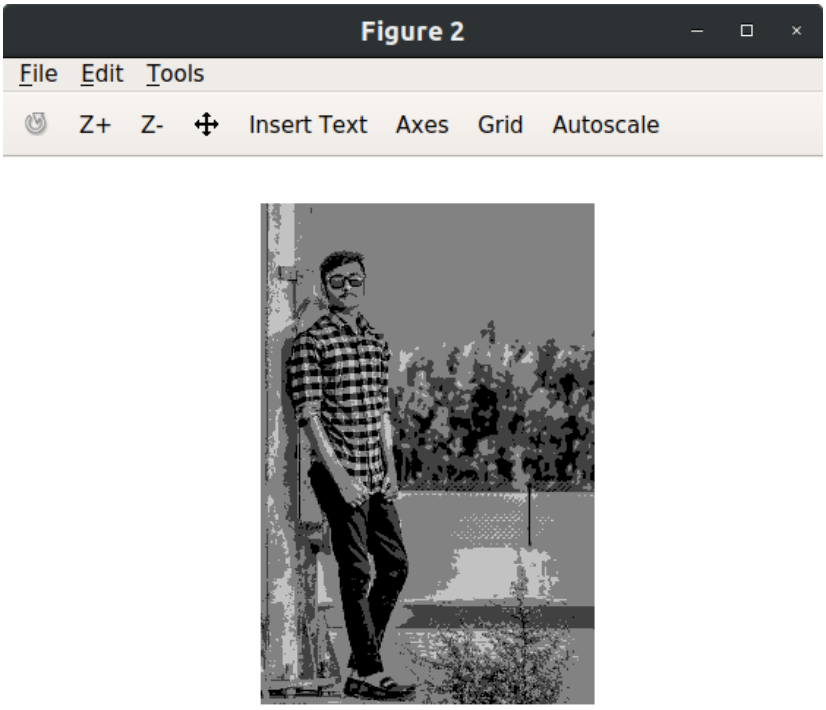
```
close all
clear
clc

% Read Image
a = imread('/home/nihar/Desktop/SEM 7/IP/Lab/Lab3/lab3images/my.jpg');

for i=1:8;
  bp(:,:,i) = bitget(a,i);
  subplot(2,4,i)
  imshow(bp(:,:,i))
endfor

sum = bp(:,:,8)*2^(7) + bp(:,:,7)*2^(6);
figure
imshow(uint8(sum))

sum = bp(:,:,8)*2^(7) + bp(:,:,7)*2^(6) + bp(:,:,6)*2^(5) + bp(:,:,5)*2^(4);
figure
imshow(uint8(sum))
```

Output Images :

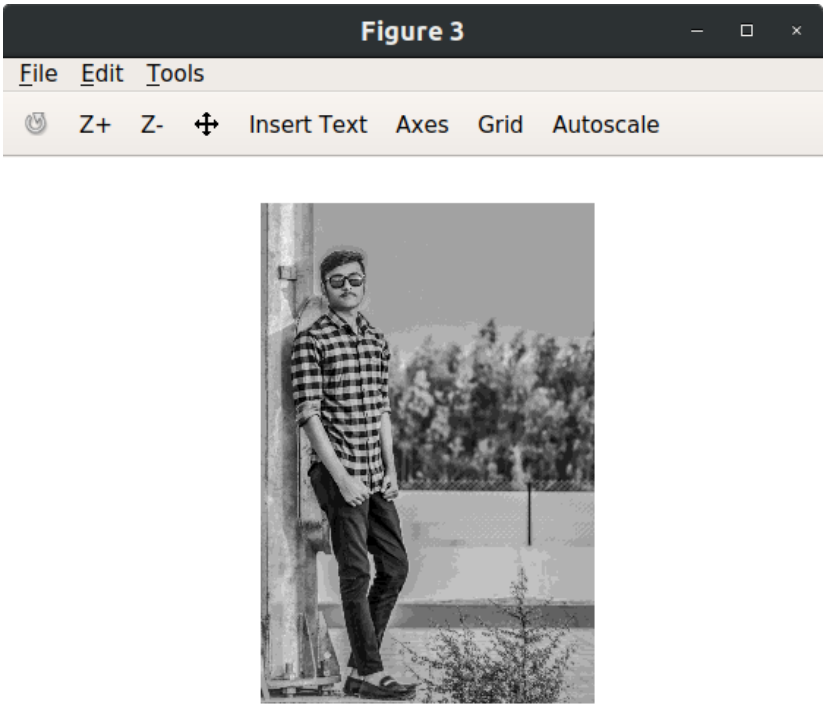
8 bit planes



Reconstructed image using higher order 2 bit planes



Reconstructed image using higher order 4 bit planes



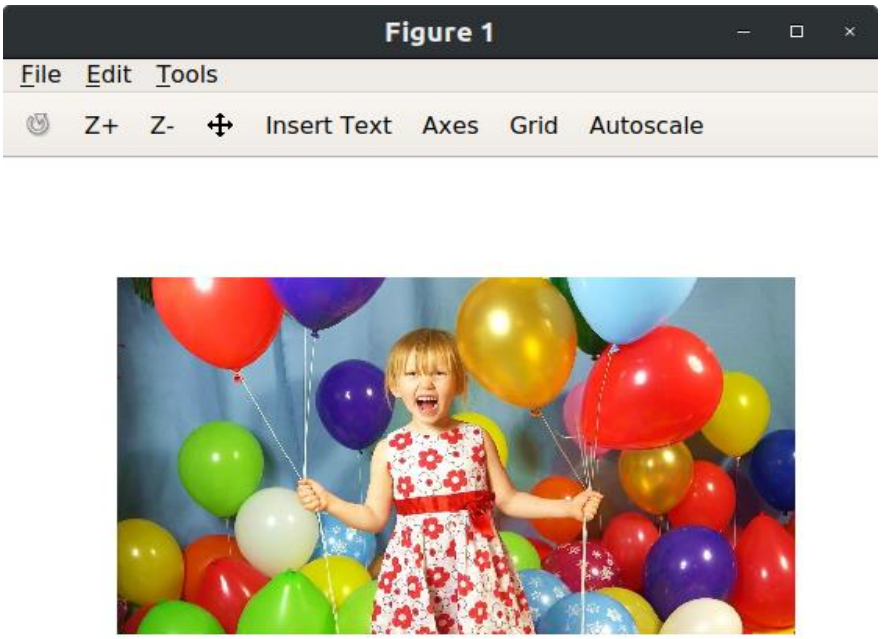
5. **Perform intensity slicing to separate out red green baloons form the image given.**

→ **Solution :-**

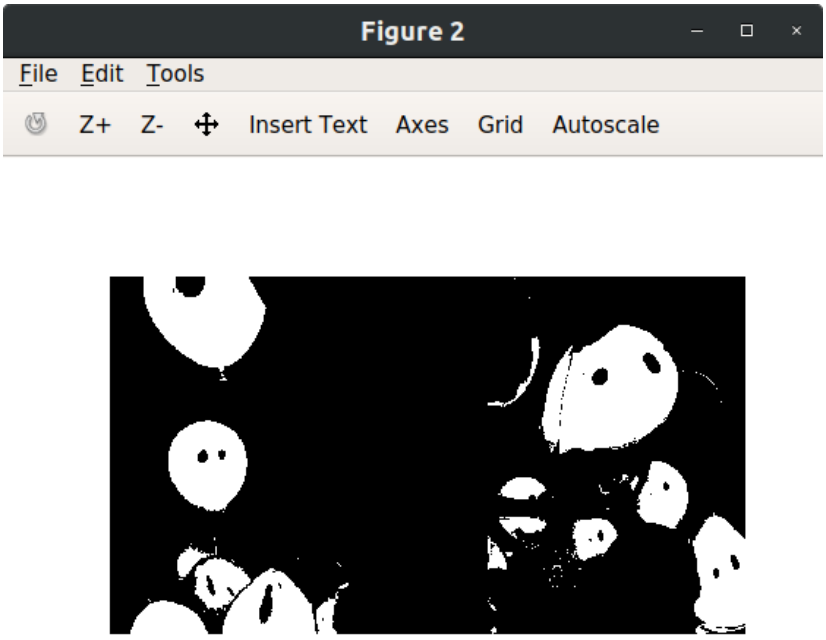
Code :

```
close all
clear
clc

% Read Image
a = imread('/home/nihar/Desktop/SEM 7/IP/Lab/Lab3/lab3images/image1.jpg');
figure
imshow(a)
[m,n,p] = size(a);

%b=zeros(m,n);
for i=1:m
  for j=1:n
    if(j<481 || j>762)
      if((a(i,j,1)<150 && a(i,j,2)>150 && a(i,j,3)<100)
        || (a(i,j,1)>195 && a(i,j,2)<125 && a(i,j,3)<110))
          b(i,j)=1;
      else
          b(i,j)=0;
      endif
    endif
  endfor
endfor

figure
imshow(b)

final = a .* b;
figure
imshow(final)
```

Input Image :



Output Images :



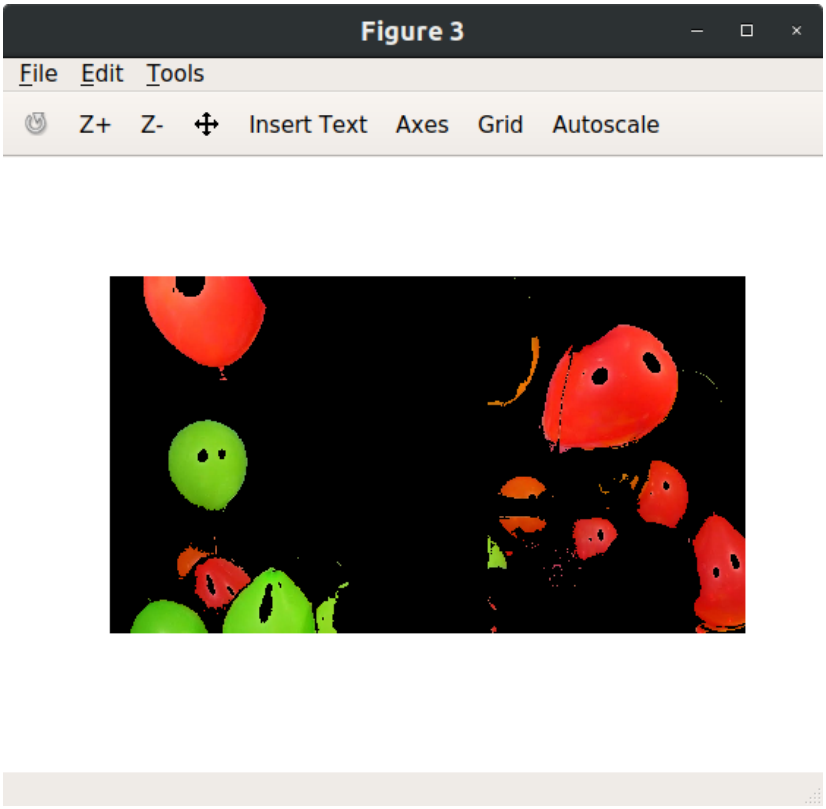


Figure 3
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale