

**Thresholding:**      **التعتيب**

```

I = imread('nature.jpg');
g = rgb2gray(I);
[r, c] = size(g);
th = 128;
z = zeros(r, c);
for i=1:r
    for j=1:c
        if g(i, j) >th
            z(i, j) = 255;
        end
    end
end
tit = strcat( 'th = ', num2str(th) );
figure,title (tit);
hold on
imshow(z, []);

```

**Gray level decreasing :**      **تقليل السويات الرمادية**

```

I1 = imread('mountain.jpg');
g = rgb2gray(I1);
L = 256;
M = 5;
N = (L-1)/ M;
I2 = floor(g/ N);      % I2 values range from 0 to 4
I3 = mat2gray(I2);
figure, imshow(I1);
figure, imshow(g);
figure, imshow(I3);

```

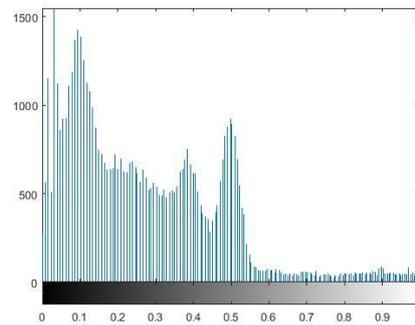
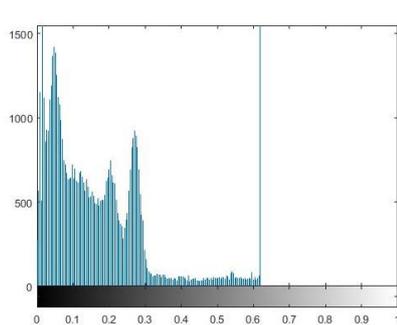


### التحويل اللوغاريتمي : Logarithmic conversion :

```

I1 = imread('man8.jpg');
d = im2double(I1);
c = 1/ log( 1+ max( max(d) ) );
I2 = c* log(1+ d);
figure, imhist(d);
figure, imhist(I2);
figure, imshow(I1);
figure, imshow(I2);

```

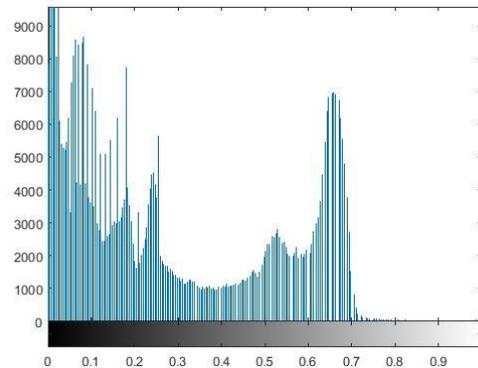
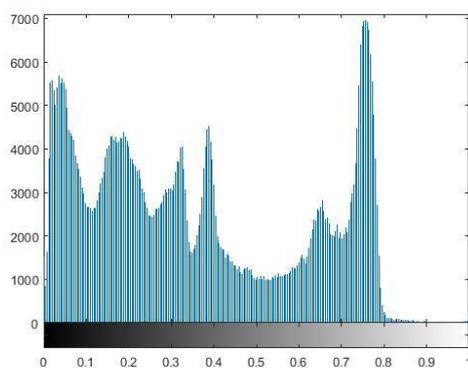
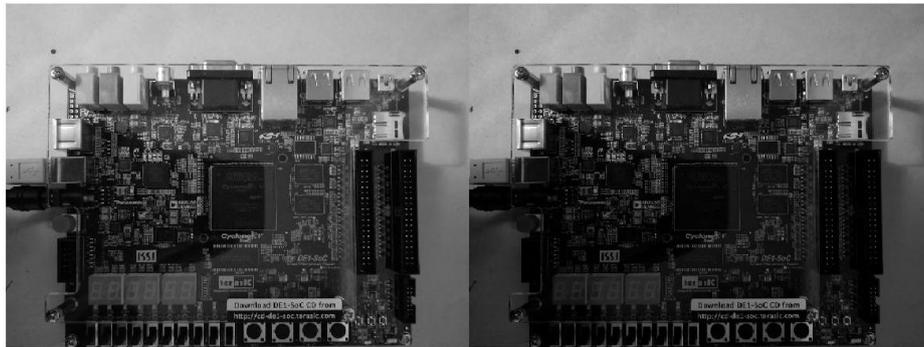


**Gamma conversion : تحويل غاما**

```

% gamma < 1: log_op.
% gamma > 1: exp_op.
I1 = imread('circiut1.jpg');
%I1 = rgb2gray(I1);
I1 = im2double(I1);
gamma = 0.5;
I2 = I1 .^ gamma;
figure, imshow([I1 I2], []);
figure, imhist(I1);
figure, imhist(I2);

```

**Bit plane Slicing : التقطيع بحسب مستويات البتات**

```

clear;
close all;
clc;

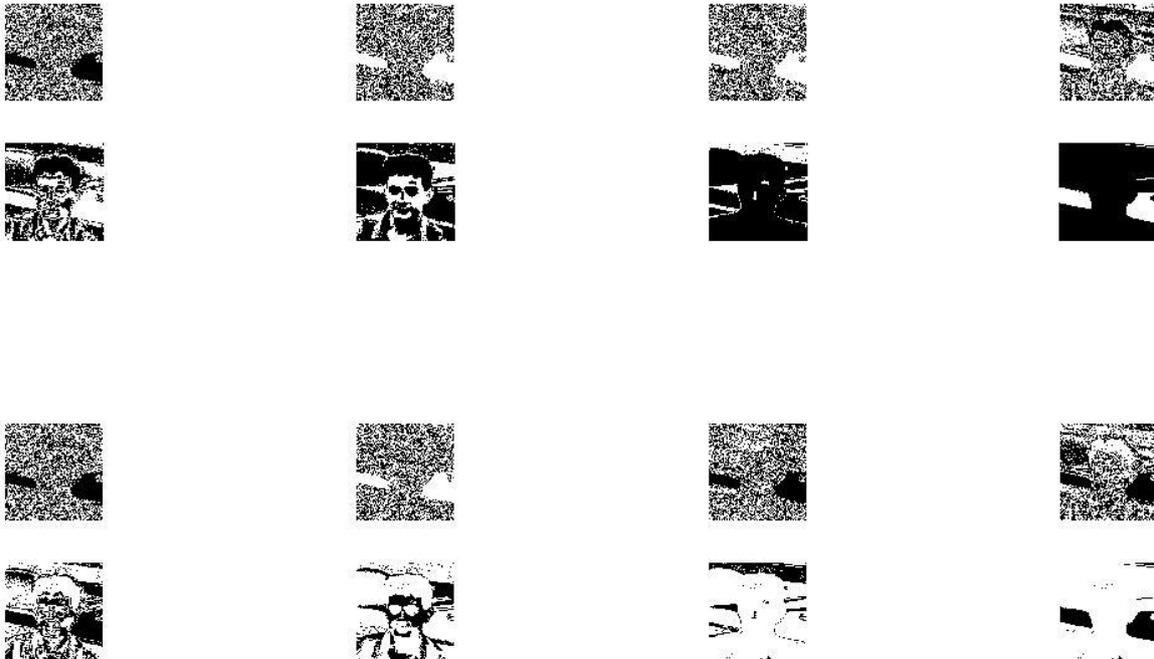
I1 = imread('man8.jpg');
c1 = cell(8);
c2 = c1;
temp = I1;
for i=1:8
    c1{i} = bitget(temp, i); % way1
end

```

```

c2{i} = mod(temp, 2);      % way2
temp = floor(temp / 2);
subplot(5,4,i), imshow(c1{i}, []);
subplot(5,4,i+12), imshow(c2{i}, []);
end

```



### Histogram Stretching : شد الهيستوغرام

```

I1 = imread('baby.jpg');
g = rgb2gray(I1);
g = im2double(g);

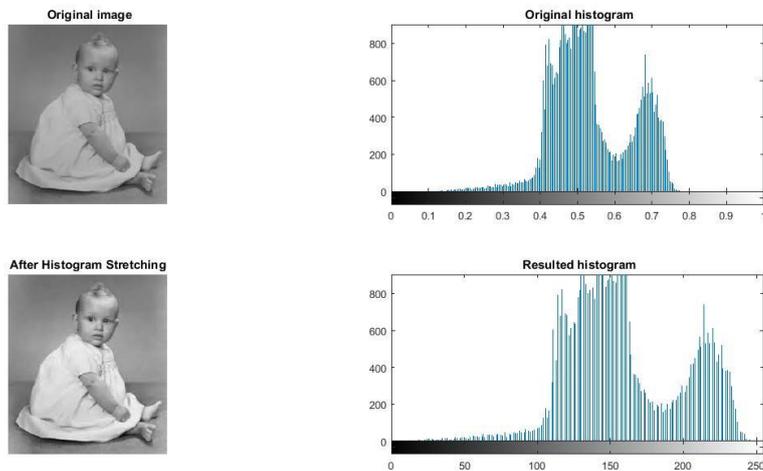
figure, subplot(2,2,1), imshow(g), title(' Original
image');
subplot(2,2,2), imhist(g), title(' Original histogram');

mn = min(g(:));
mx = max(g(:));

if mx == mn
    I2 = g;
    disp('Image is a homogeneous , can not be
stretchable');
else
    I2 = (g - mn) / (mx - mn);
    I2 = uint8(I2 * 255);
end

```

```
subplot(2,2,3), imshow(I2), title('After Histogram
Stretching');
subplot(2,2,4), imhist(I2), title(' Resulted histogram');
```



## Histogram Equalization      تسوية الهيستوغرام

```
I1 = imread('baby.jpg');
g = rgb2gray(I1);

h = imhist(g);
ah = cumsum(h);
figure, subplot(3, 3, 1), bar(ah);

% Normalization
levels0 = ( ah - min(ah) ) ./ ( max(ah) - min(ah) );   %
way 0
levels1 = ah ./ ah(end);                               %
way 1

I0 = zeros( size(g) );
I1 = I0;

for i=0:255
    Idx = find(g == i);
    I0(Idx) = levels0(i+1);
    I1(Idx) = levels1(i+1);
end

subplot(3, 3, 2), imshow(g);
```

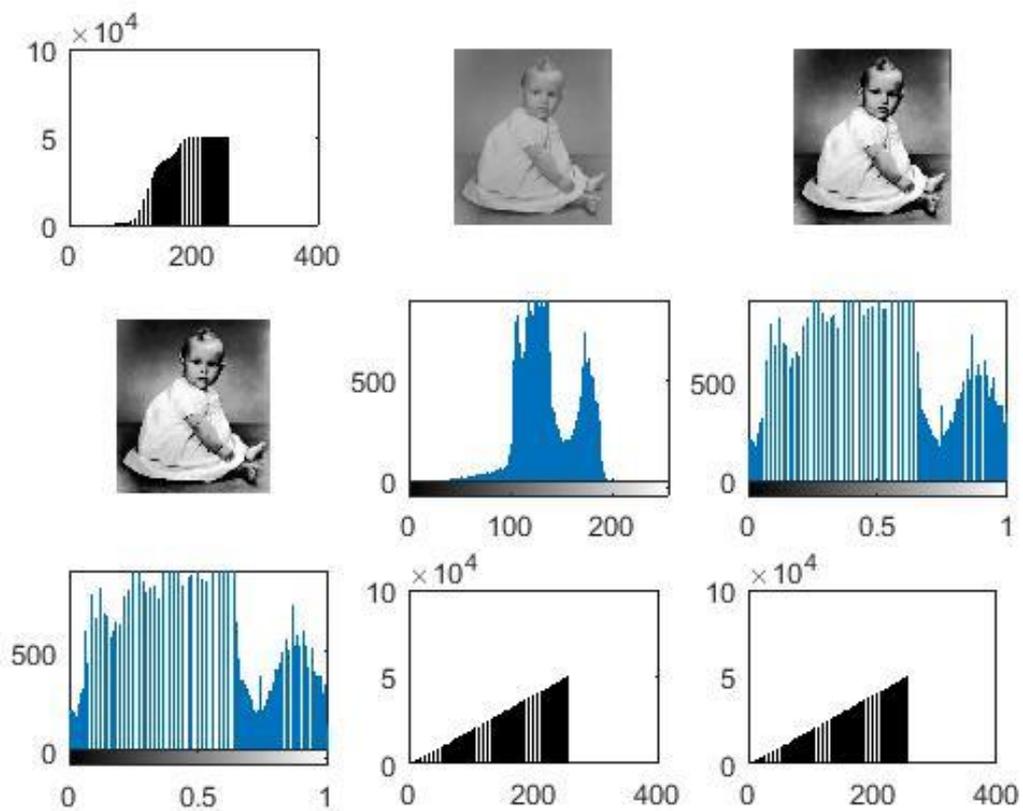
```

subplot(3, 3, 3), imshow(I0)
subplot(3, 3, 4), imshow(I1);

subplot(3, 3, 5), imhist(g);
h0 = imhist(I0);
h1 = imhist(I1);
subplot(3, 3, 6), imhist(I0);
subplot(3, 3, 7), imhist(I1);

levels0 = cumsum(h0);
levels1 = cumsum(h1);
subplot(3, 3, 8), bar(levels0);
subplot(3, 3, 9), bar(levels1);

```



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