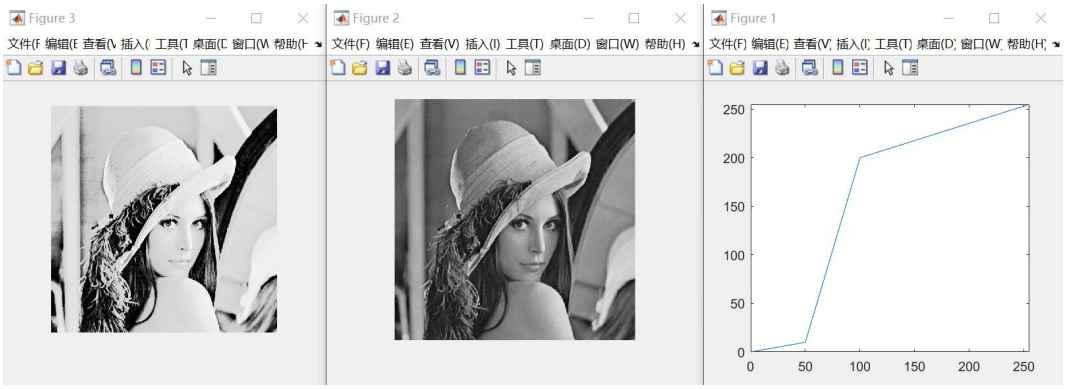
图像处理第二次作业

- 灰度分段线性变换
  - 代码

```
b=imread( 'logo.jpg' );

f0=0;g0=0;
f1=50;g1=10;
f2=100;g2=200;
f3=255;g3=255;

figure,plot([f0,f1,f2,f3],[g0,g1,g2,g3]);

r1=(g1-g0)/(f1-f0);
b1=-r1*f0+g0;

r2=(g2-g1)/(f2-f1);
b2=-r2*f1+g1;

r3=(g3-g2)/(f3-f2);
b3=-r3*f2+g2;

axis([0 255 0 255]);
[m,n]=size(b);
h=double(b);
g = zeros(m,n);
figure,imshow(mat2gray(h));

for i=1:m
  for j=1:n
    t=h(i,j);
    if ((t>=f0)&&(t<=f1))
        g(i,j)=r1*t+b1;
    else
        if ((t>=f1)&&(t<=f2))
            g(i,j)=r2*t+b2;
        else
        if ((t>=f2)&&(t<=f3))
            g(i,j)=r3*t+b3;
        end
        end
    end
  end
end
figure,imshow(mat2gray(g));
```

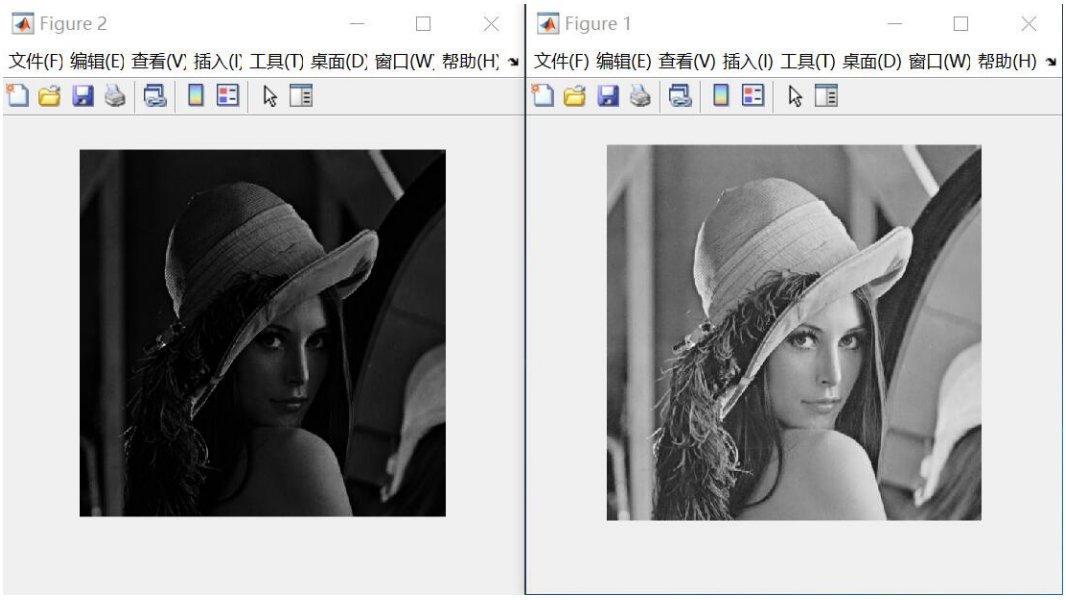
  - 运行结果



- 灰度指数变换
  - 代码

```
I=imread( 'logo.jpg' );
imshow(I);
Image= 1.5.^(double(I)*0.050)-1;
figure(2),imshow(Image,[]);
```

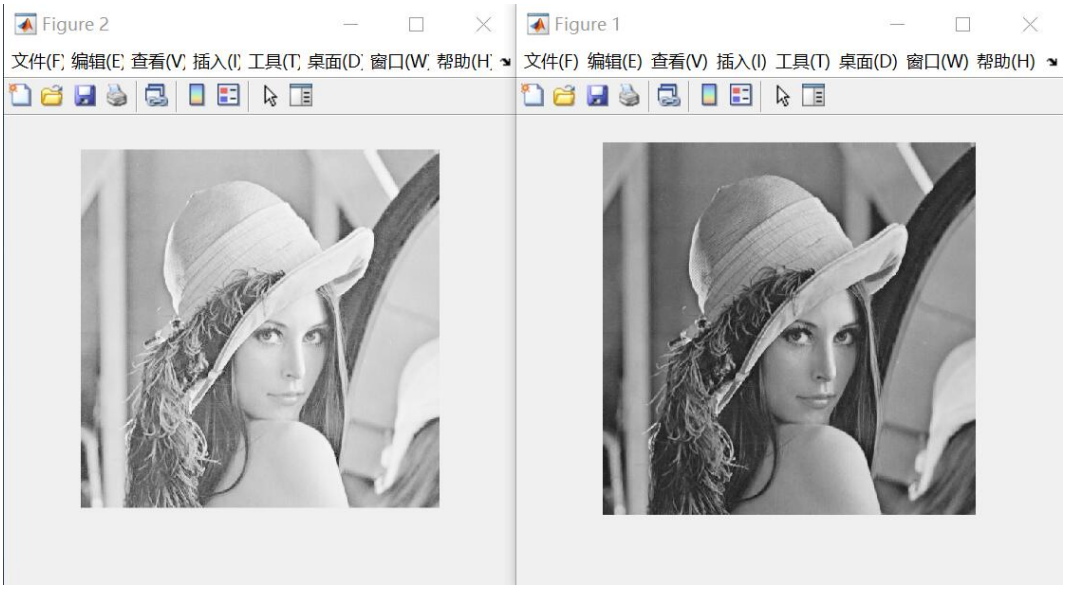
  - 运行结果



- 灰度对数变换
  - 代码

```
I=imread( 'logo.jpg' );
imshow(I);
Image=log(1+double(I));
figure(2),imshow(Image,[]);
```

  - 运行结果



- 直方图均衡化
  - 代码

```
img=imread('lena.jpg');
imshow(img);
title('均衡化前图像');

[m,n]=size(img);
GL=zeros(1,256);
GLPeq = zeros(1,256);

for k=0:255
    GL(k+1)=length(find(img==k))/(m*n);
end

figure,bar(0:255,GL,'g')
title('原图像直方图')
xlabel('灰度值')
ylabel('出现概率')

S1=zeros(1,256);
for i=1:256
    for j=1:i
        S1(i)=GL(j)+S1(i);
    end
end
S2=round((S1*256)+0.5);
for i=1:256
    GLPeq(i)=sum(GL(S2==i));
end
figure,bar(0:255,GLPeq,'b')
title('均衡化后的直方图')
xlabel('灰度值')
ylabel('出现概率')


img1=img;
for i=0:255
```

```
    img1(img==i)=S2(i+1);
end
figure,imshow(img1)
title('均衡化后图像')
```

- 运行结果