MAT 343 MATLAB LAB 6 **NAME: _Hieu Pham____**

```
%Load picture file to MatLAB
A=imread('cauchybw.jpg');
B=double(A(:,:,1))+1;
B=B/256;
[U,S,V]=svd(B);

%Problem 1
sizeu=size(U)

sizeu =

  310   310

sizes=size(S)

sizes =

  310   338

sizev=size(V)

sizev =

  338   338


%Problem 2
rank1=S(1,1)*U(:,1)*V(:,1)';
C=zeros(size(A));
C(:,:,1)=rank1;
C(:,:,2)=rank1;
C(:,:,3)=rank1;
C=max(0,min(1,C));
figure(1)
image(C)
```

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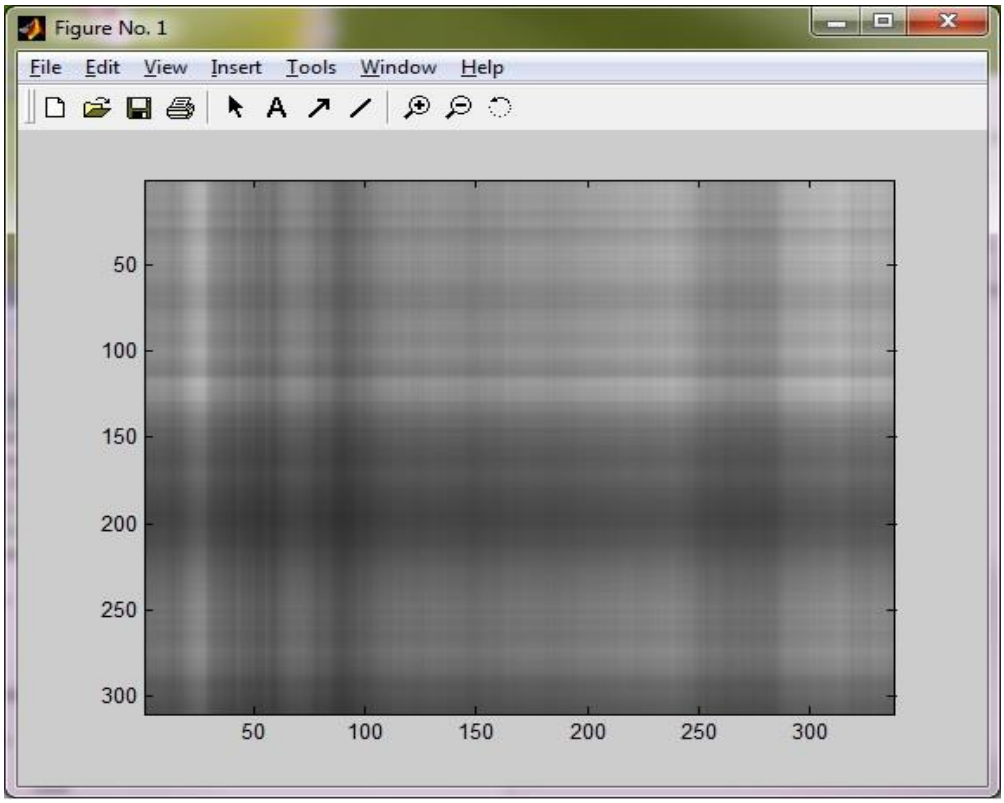


```
%Problem 3
for i=1:10
        rank10=rank10+S(i,i)*U(:,i)*V(:,i)';
end
C=zeros(size(A));
C(:,:,1)=rank10;
C(:,:,2)=rank10;
C(:,:,3)=rank10;
C=max(0,min(1,C));
figure(2)
image(C)
```

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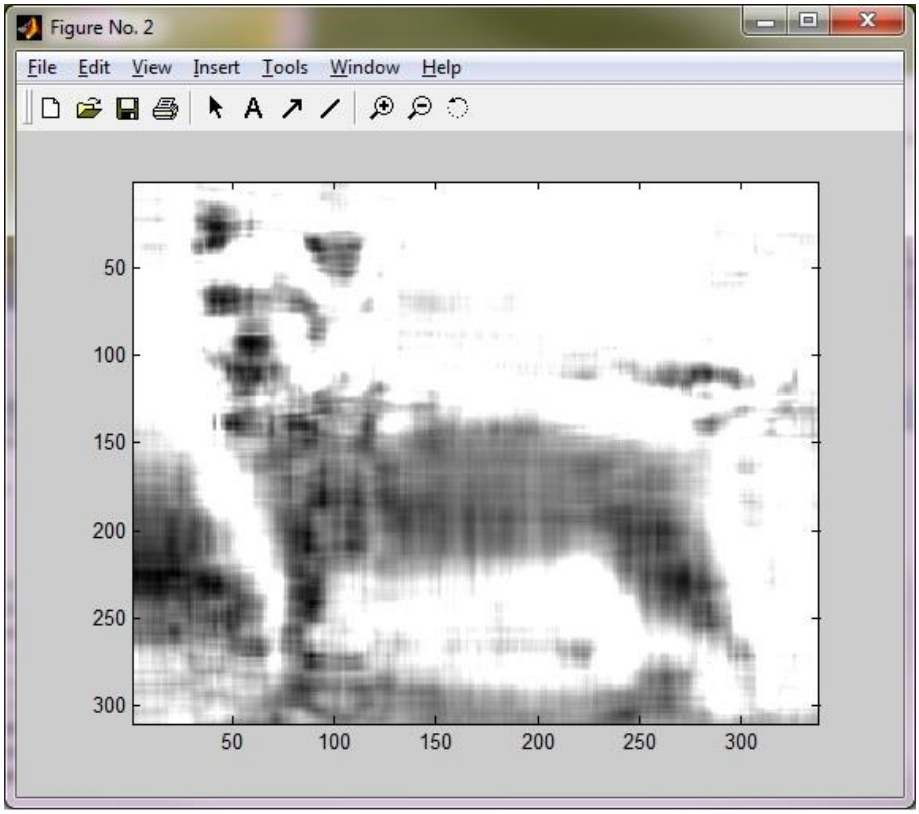


```
%Problem 4
rank50 = zeros(size(B));
for i = 1:50
        rank50 = rank50+S(i,i)*U(:,i)*V(:,i)';
end
C = zeros(size(A));
C(:,:,1) = rank50;
C(:,:,2) = rank50;
C(:,:,3) = rank50;
C = max(0,min(1,C));
figure(3)
image(C)
```

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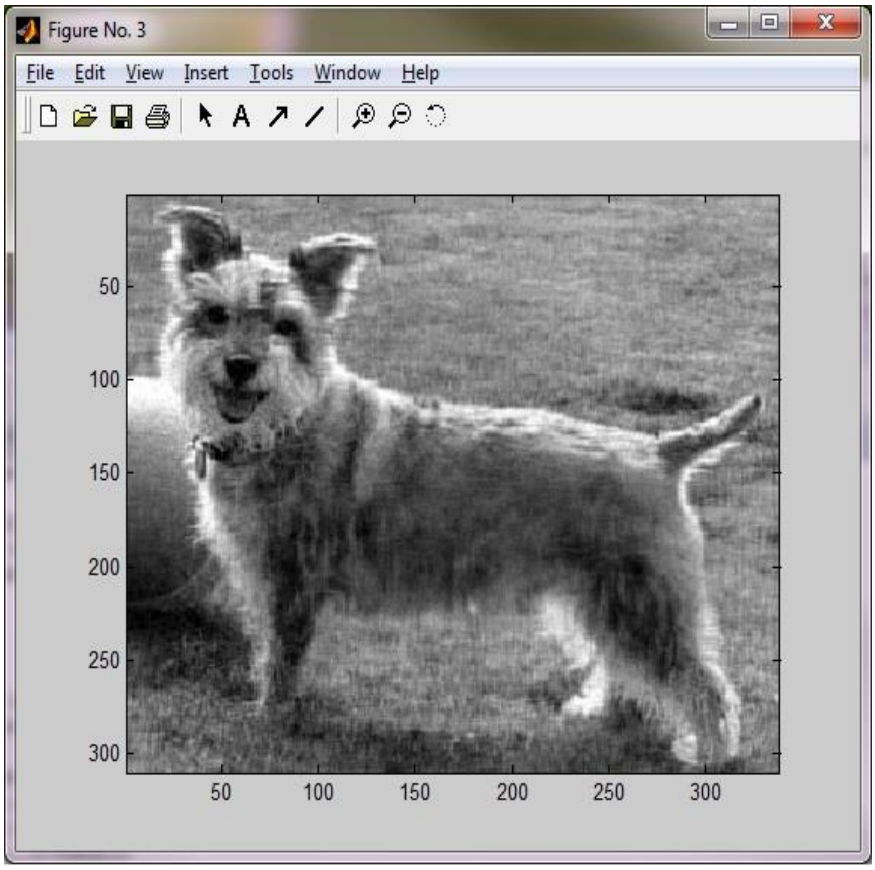


```
%I like the rank of 50 because it provided a good better approximation to the original
%picture.
%Problem 5
rank310 = zeros(size(B));
for i = 1:310
        rank310 = rank310+S(i,i)*U(:,i)*V(:,i)';
end
C = zeros(size(A));
C(:,:,1) = rank310;
C(:,:,2) = rank310;
C(:,:,3) = rank310;
C = max(0,min(1,C));
figure(3)
image(C)
```

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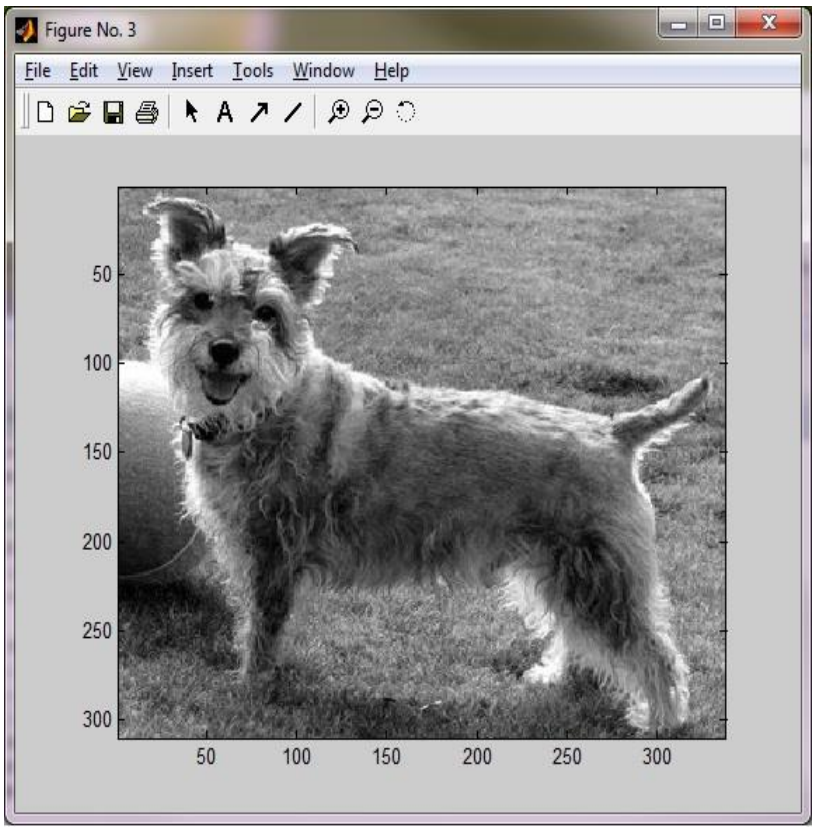

rank(B)

ans =

310

%Problem 6
a = 310;b = 338;c = 53;CR = (c*(a+b+1))/(a*b)

CR =

0.3283

% CR (Compression Rate) = 32.83%
% so 32.83% of the original picture was used
% as the approximation
a = 310;b = 338;CR = 1;c = ((CR*a*b)/(a+b+1))

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```
c =

  161.4484

% c=161.4484 will give me the same amount of data as the original picture.
% Rounding up is better. Otherwise I will have less data than the original picture.
% I only need the amount of data that is the same as the original picture.
```