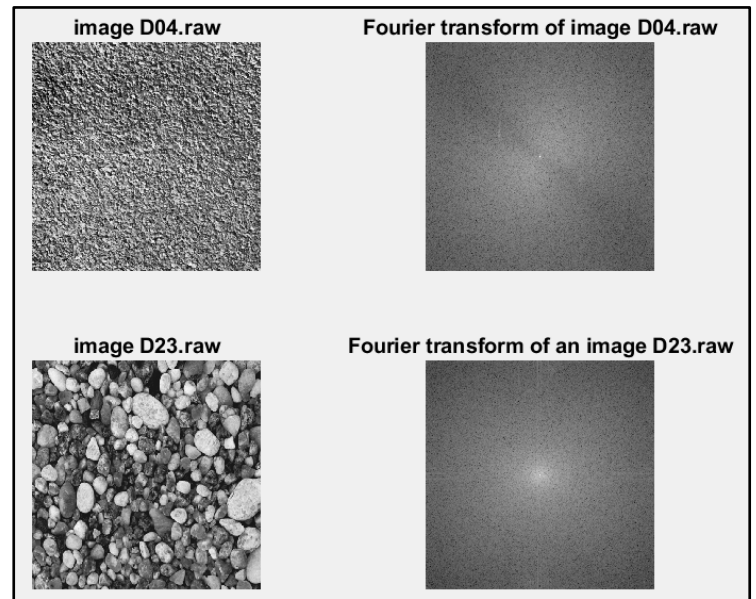


Problem 1

```
row=512; col=512;
fin_D04=fopen('D04.raw','r');
I_D04 = fread(fin_D04, [col row], 'uint8=>uint8');
I_D04 = reshape(I_D04, row, col);
subplot(2,2,1)
imshow(I_D04);title('image D04.raw');
F_D04 = fftshift(fft2(I_D04));
Sc_D04 = abs(F_D04);
Sc_D04 = 18*log(Sc_D04); %利用18*log去讓值落在0~255之間
subplot(2,2,2)
imshow(Sc_D04,[]);title('Fourier transform of image D04.raw');
fclose(fin_D04);
```

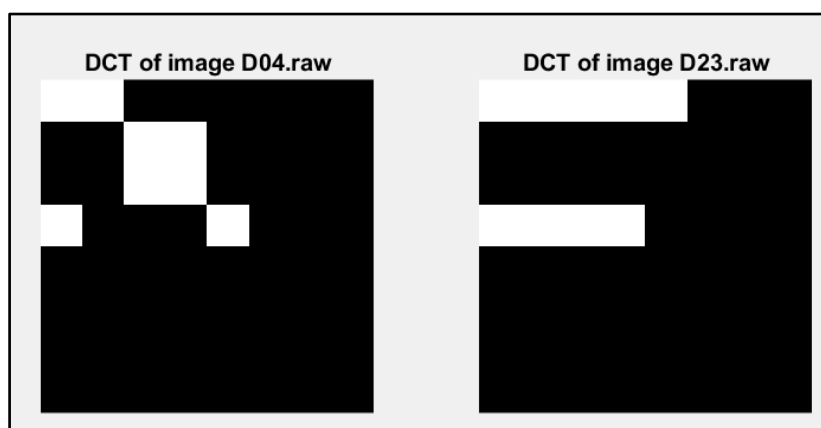
```
fin_D23=fopen('D23.raw','r');
I_D23 = fread(fin_D23, [col row], 'uint8=>uint8');
I_D23 = reshape(I_D23, row, col);
subplot(2,2,3)
imshow(I_D23);title('image D23.raw');
F_D23 = fftshift(fft2(I_D23));
Sc_D23 = abs(F_D23);
Sc_D23 = 18*log(Sc_D23); %利用18*log去讓值落在0~255之間
subplot(2,2,4)
imshow(Sc_D23,[]);title('Fourier transform of an image D23.raw');
fclose(fin_D23);
```



Problem 2

```
Q=xlsread('Qtable.xls','A2:H9');
row=512; col=512;
fin_D04=fopen('D04.raw','r');
I_D04 = fread(fin_D04, [col row], 'uint8=>uint8');
I_D04 = reshape(I_D04, row, col);
S04 = zeros(8,8);
for i=1:8:256
    for j=1:8:256
        tmp = I_D04(i:i+7, j:j+7);
        tmp = dct2(tmp-128);
        Y = round(tmp./Q);
        S04(1:8,1:8) = Y;
    end
end
subplot(1,2,1)
imshow(S04);title('DCT of image D04.raw');
```

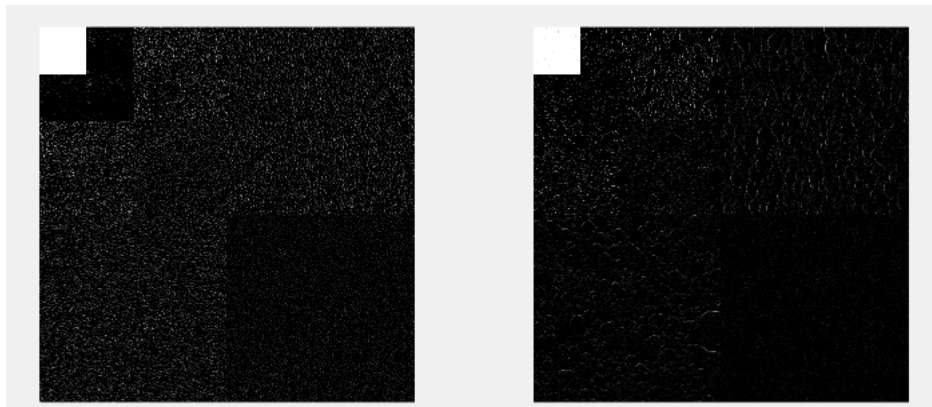
```
fin_D23=fopen('D23.raw','r');
I_D23 = fread(fin_D23, [col row], 'uint8=>uint8');
I_D23 = reshape(I_D23, row, col);
S23 = zeros(8,8);
for i=1:8:256
    for j=1:8:256
        tmp = I_D23(i:i+7, j:j+7);
        tmp = dct2(tmp-128);
        Y = round(tmp./Q);
        S23(1:8,1:8) = Y;
    end
end
subplot(1,2,2)
imshow(S23);title('DCT of image D23.raw');
```



Problem 3

```
N=512;row=512; col=512;
fin_D04=fopen('D04.raw','r');
I_D04 = fread(fin_D04, [col row], 'uint8=>uint8');
I_D04 = reshape(I_D04, row, col);
Y=I_D04;X=I_D04;
[A, D]=haart(X,1);
T=zeros(N,N);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
[A, D]=haart(T,1);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
Y(1:N,1:N)=T(1:N,1:N);
N=N/2;
X2=Y(1:N,1:N);
[A, D]=haart(X2,1);
T=zeros(N,N);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
[A, D]=haart(T,1);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
Y(1:N,1:N)=T(1:N,1:N);
N=N/2;
X3=Y(1:N,1:N);
[A, D]=haart(X3,1);
T=zeros(N,N);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
[A, D]=haart(T,1);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
Y(1:N,1:N)=T(1:N,1:N);
subplot(1,2,2)
imshow(Y);
```

```
N=512;row=512; col=512;
fin_D23=fopen('D23.raw','r');
I_D23 = fread(fin_D23, [col row], 'uint8=>uint8');
I_D23 = reshape(I_D23, row, col);
Y=I_D23;X=I_D23;
[A, D]=haart(X,1);
T=zeros(N,N);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
[A, D]=haart(T,1);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
Y(1:N,1:N)=T(1:N,1:N);
N=N/2;
X2=Y(1:N,1:N);
[A, D]=haart(X2,1);
T=zeros(N,N);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
[A, D]=haart(T,1);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
Y(1:N,1:N)=T(1:N,1:N);
N=N/2;
X3=Y(1:N,1:N);
[A, D]=haart(X3,1);
T=zeros(N,N);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
[A, D]=haart(T,1);
T(1:N,1:N/2)=A'; T(1:N,N/2+1:N)=D';
Y(1:N,1:N)=T(1:N,1:N);
subplot(1,2,1)
imshow(Y);
```

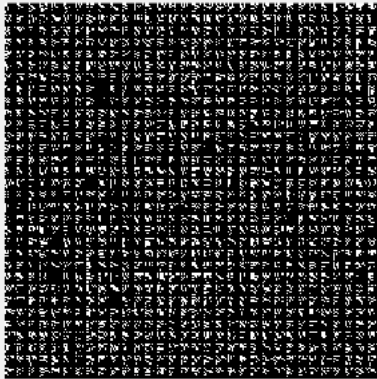


Problem 4

```
Q=xlsread('Qtable.xls','A2:H9');
row=512; col=512;
fin_D04=fopen('D04.raw','r');
I_D04 = fread(fin_D04, [col row], 'uint8=>uint8');
I_D04 = reshape(I_D04,row,col);
S04 = zeros(8,8);
for i=1:8:256
    for j=1:8:256
        tmp = I_D04(i:i+7, j:j+7);
        tmp = dct2(tmp-128);
        Y = round(tmp./Q);
        S04(i:i+7, j:j+7) = Y;
    end
end
subplot(1,2,1)
imshow(S04);title('DCT of image D04.raw');
```

```
fin_D23=fopen('D23.raw','r');
I_D23 = fread(fin_D23, [col row], 'uint8=>uint8');
I_D23 = reshape(I_D23,row,col);
S23 = zeros(8,8);
for i=1:8:256
    for j=1:8:256
        tmp = I_D23(i:i+7, j:j+7);
        tmp = dct2(tmp-128);
        Y = round(tmp./Q);
        S23(i:i+7, j:j+7) = Y;
    end
end
subplot(1,2,2)
imshow(S23);title('DCT of image D23.raw');
```

DCT of image D04.raw



DCT of image D23.raw

