Practical 5 Fourier Analysis - Part 1

Q1. Add the code for the modified filter creation part

I think a cutoff frequency value between 5-8 gives the best results. If we increase the cut off frequency more than this, the image starts becoming unclear.

```
[m,n]=size(im);
w = zeros(m, n);
x = [40 53 90 77];
y = [108 44 22 86];
cf = 6;
 for h = 1 : 4
   for i = 1 : m
      for j = 1 : n
                  if (sqrt((i - x(h))^2 + (j - y(h))^2) < cf)
                      w(i, j) = 1;
            end
      end
   end
```

Q2. In what part of the code do we create a high pass filter? Add the resulting print screens for both low and high pass filters and also images of the filters in frequency domain.

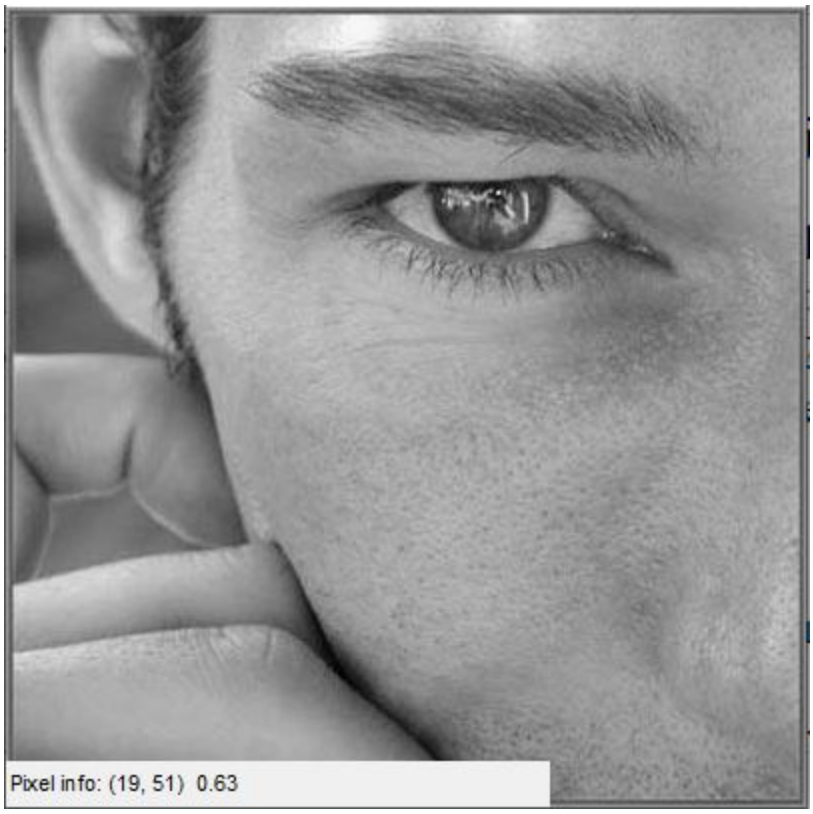
We create high pass filter in below code

```
hp=fftim.*(1-w);
```

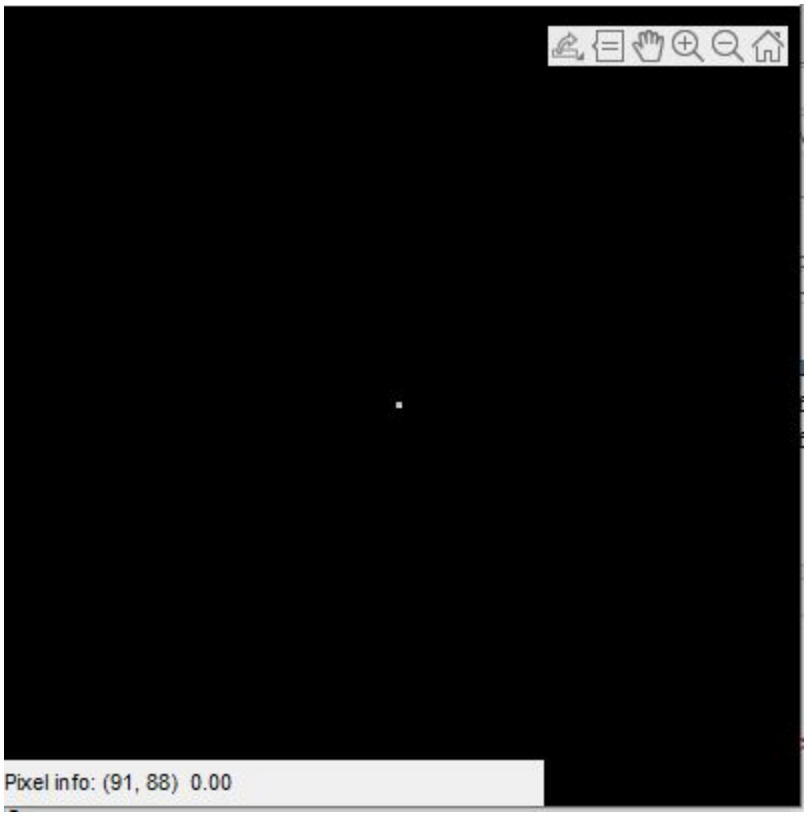
Resulting print screens for

Low pass filter

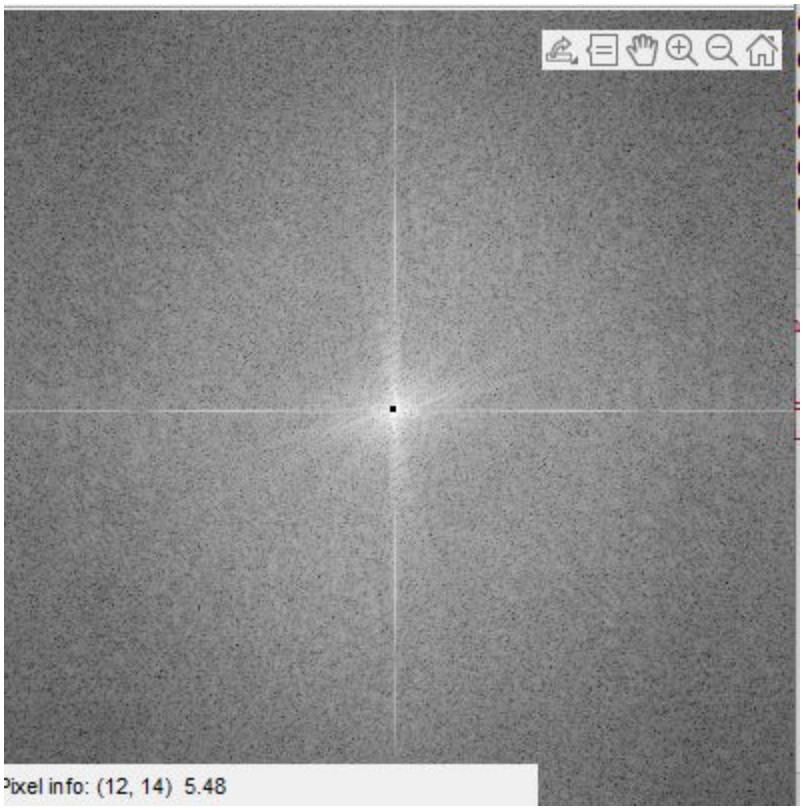
High Pass filter



Low pass image frequency domain



High pass image frequency domain



Q3. Provide the code of polygon building and the resulting print screen

Modified code of the polygon building below

```
i = double(imread('regn1.jpg'))/255;
ft = fft2(i);
ft = fftshift(ft);

c = [344 258 143 166 259 383]
r = [54 102 264 287 226 72]
BW = roipoly(i,c,r);

midpolyx = [258 280 259 239];
midpolyy = [148 172 193 169];

polymid = roipoly(i,midpolyx,midpolyy);
BW(polymid)=0;
BW=~BW;

norain = BW.*ft;

klar=real(ifft2(ifftshift(norain)));
```

```
klar=klar-min(klar(:));
klar=klar./max(klar(:));

figure(1),imshow(i),impixelinfo,
figure(2),imshow(log(1+abs(ft)),[]),impixelinfo,
figure(3),imshow(log(1+abs(klar)),[]),impixelinfo,
figure(4),imshow(log(1+abs(norain)),[]),impixelinfo;
```

Resulting print screen

Figure 3

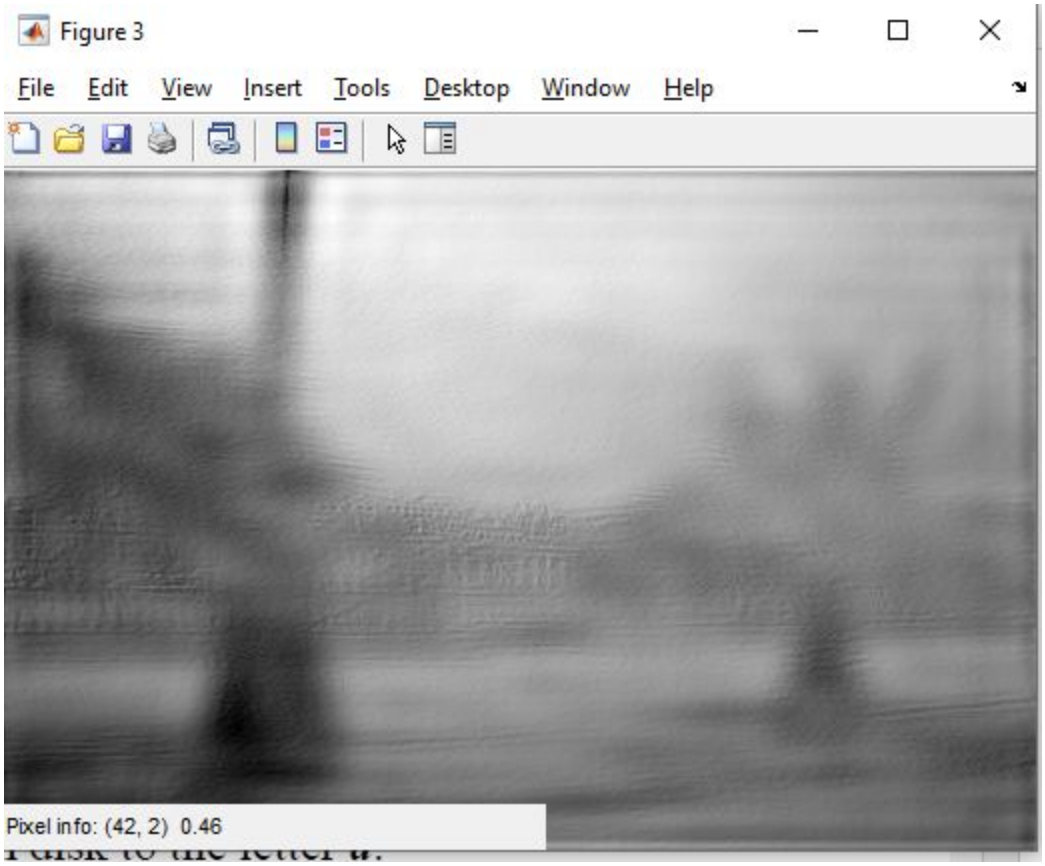
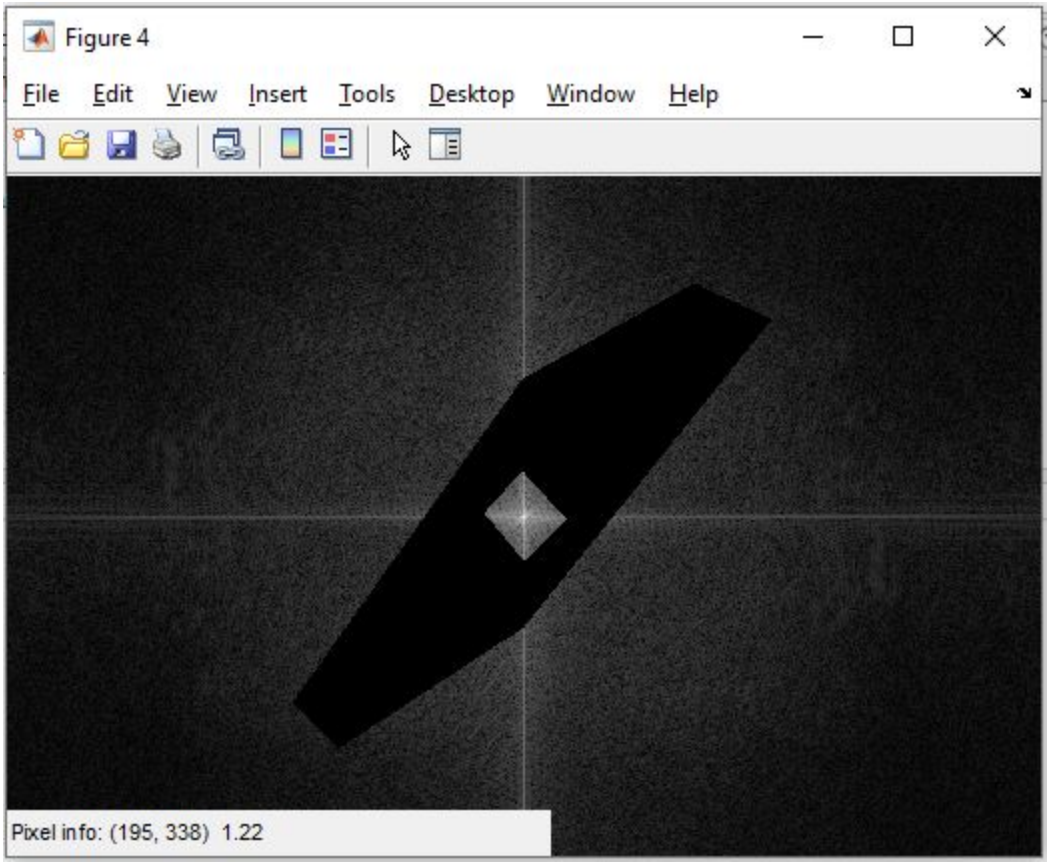


Figure 4



Q4. Show print screen of the result.

Print screen below