Student: Elad Sofer - 312124662

Reading the image as RGB and convert it into gray-scale since we need to perform Fourier transform only upon one dimension

```
% he image
RGB_x = imread('2.png');
% Turn to gray-scale
x = rgb2gray(RGB_x);

% Turn the picture to NxN
N = min(size(x))
```

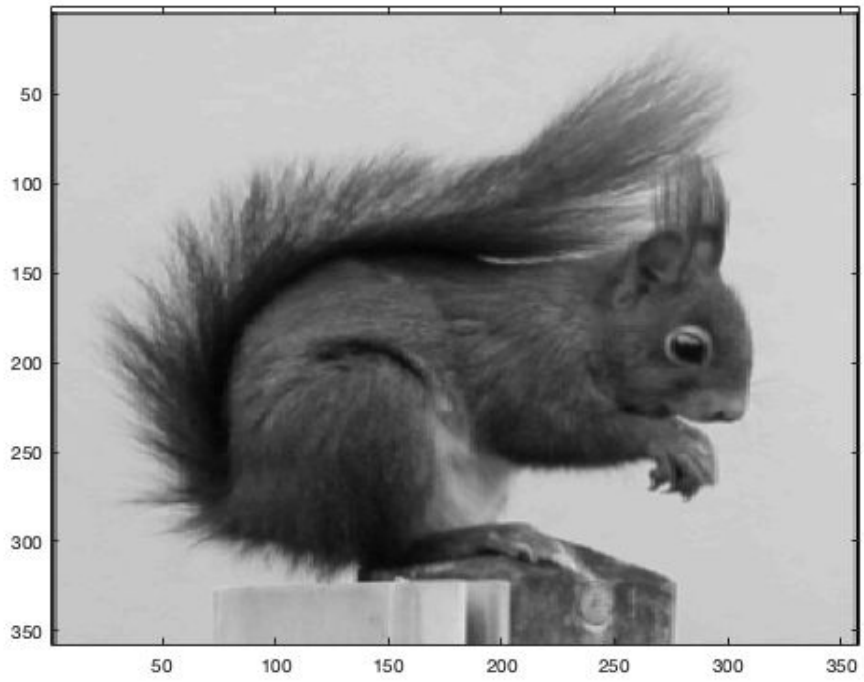
```
N = 358
```

1) Cropping the image dimensions to NxN for further sections.

2) NxN cropping is required for the section of averaging the Fourier transform

3) Displaying the NxN cropped image.

```
x = x(1:N, 1:N);
colormap('Gray')
figure(1);
imagesc(x);
```



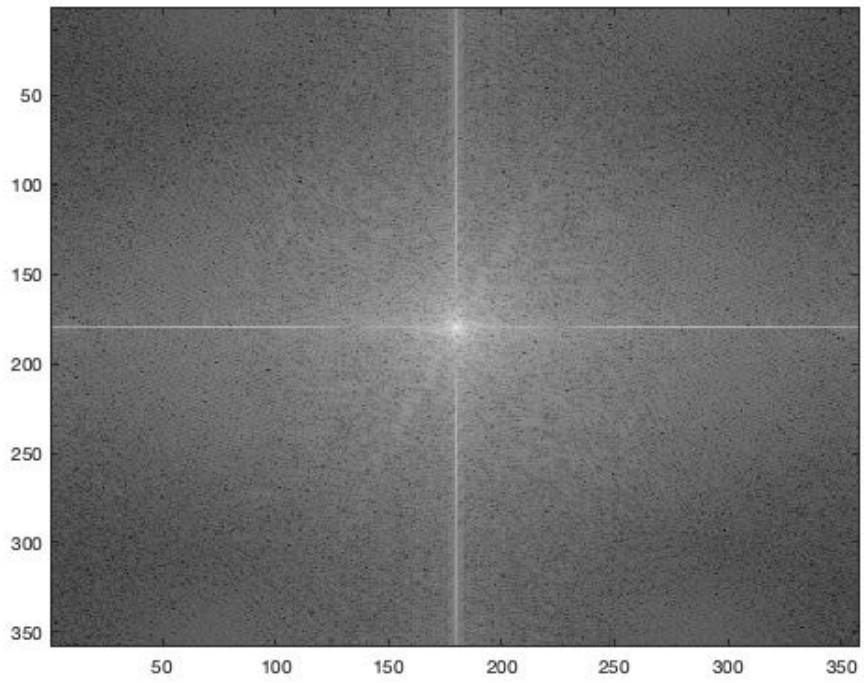
1) Perform Fourier transform and perform a shift since I don't want the fourier transform to be centered around pixel (0,0)

2) The reason is that I want the transform to be centered upon the (mid/2,mid/2) pixel.

3) I want to take the abs which is the amplitude of the signal as required.

4) To view the changes I performed a log10 operation since the fourier transform isn't visible in a normal-scale.

```
Fx = abs(fftshift(fft2(x)));
imagesc(log10(Fx));
```

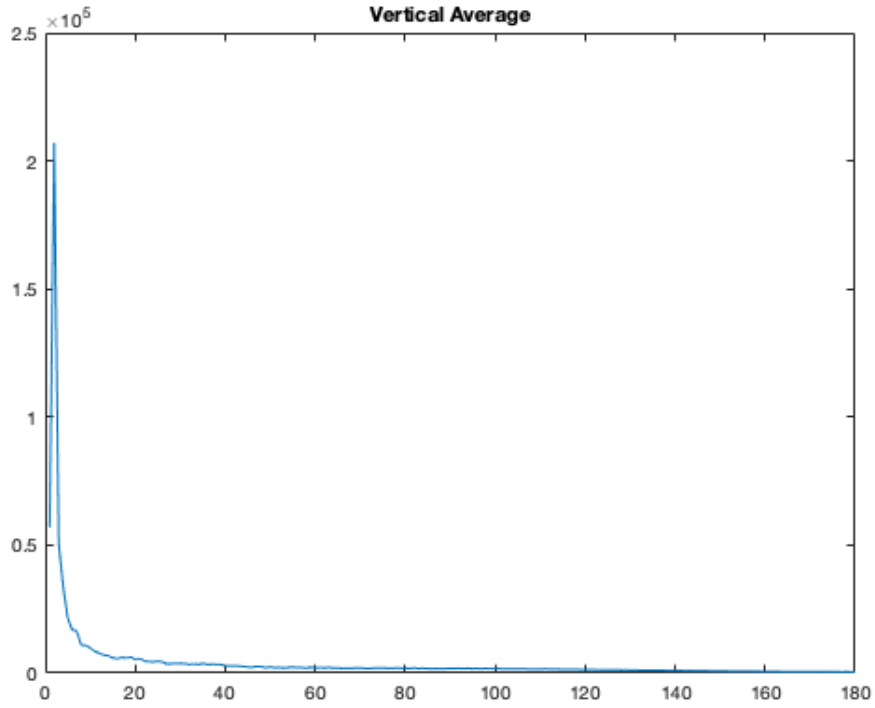


1) To take only the positive side of the transform I slice the shifted transform from the middle onwards.

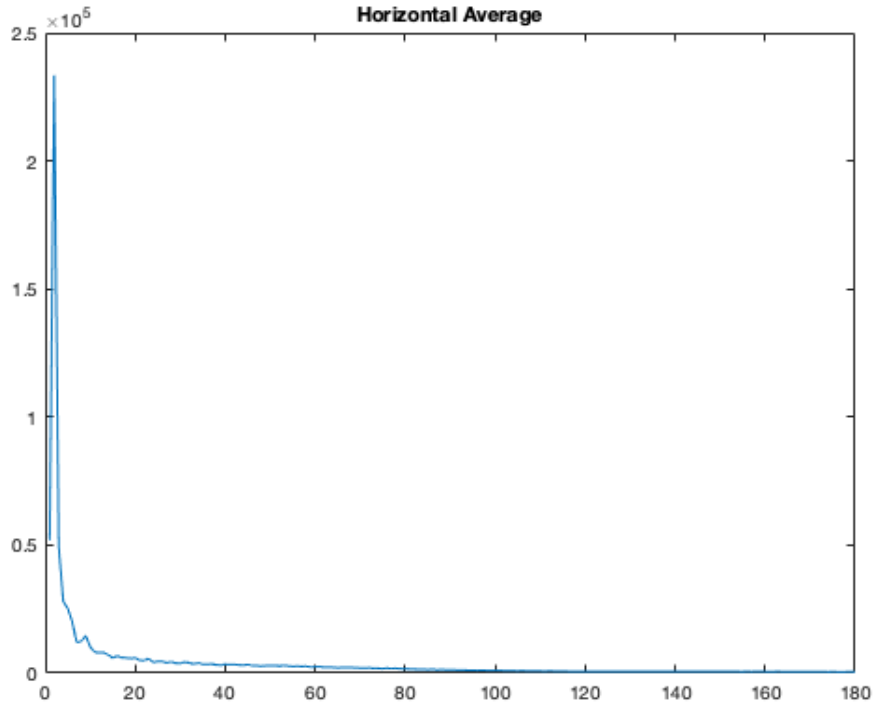
```
l = length(Fx);
mid = l/2;
pos_Fx = Fx(mid:end, mid:end);
```

Plotting the Verical & Horizontal mean of the positive side of the fourier transform

```
% Plot vertical average

V_avg = mean(pos_Fx,1);

figure(3)
plot(V_avg);
title('Vertical Average');
```




```
% Plot horizontal average

H_avg = mean(pos_Fx,2);

figure(4);
plot(H_avg);
title('Horizontal Average');
```


Horizontal Average
×10^5
2.5
2
1.5
1
0.5
0
0
20
40
60
80
100
120
140
160
180