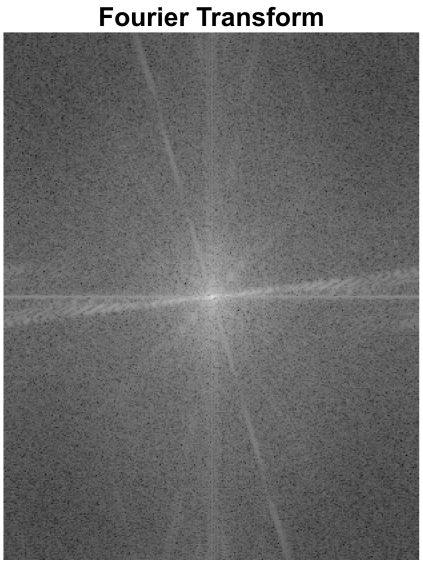
```
% Load the Image
image = imread("C:\Users\Pavan\Desktop\cat.2.jpg");
gray_image = rgb2gray(image);

% Apply Fourier Transform
fft_image = fftshift(fft2(double(gray_image)));
figure, imshow(log(1 + abs(fft_image)), []), title('Fourier Transform');
```




```
% (b) Apply Butterworth Low-Pass Filter
D0 = 30;
n = 2;
[rows, cols] = size(gray_image);
[u, v] = meshgrid(1:cols, 1:rows);
u = u - ceil(cols/2);
v = v - ceil(rows/2);
D = sqrt(u.^2 + v.^2);
butterworth_filter = 1 ./ (1 + (D / D0).^(2 * n));
butterworth_filtered = ifft2(ifftshift(fft_image .* butterworth_filter));
figure, imshow(abs(butterworth_filtered), []), title('Butterworth Filtered Image');
```

Butterworth Filtered Image

```
% Apply Gaussian Low-Pass Filter
sigma = 10;
gaussian_filter = fspecial('gaussian', size(gray_image), sigma);
gaussian_filtered = ifft2(ifftshift(fft_image .* gaussian_filter));
figure, imshow(abs(gaussian_filtered), []), title('Gaussian Filtered Image');
```

Gaussian Filtered Image