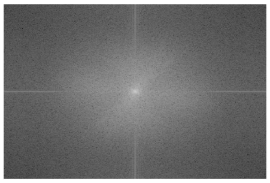
```
% Read Image
image = imread('https://www.pixelstalk.net/wp-content/uploads/images2/Cool-
Wild-Animal-Android-For-Desktop-Wallpapers.jpg');

% Step 2: Fourier Transform of the image
fft_image = fft2(double(gray_image));
fft_shifted = fftshift(fft_image);

% Step 3: Display the original and Fourier transform of the image
figure;
subplot(3,2,1), imshow(gray_image), title('Original Grayscale Image');
subplot(3,2,2), imshow(log(1+abs(fft_shifted)),[]), title('Fourier
Transform');

% Step 4: Create Butterworth Low-Pass Filter
D0 = 50;
n = 2;
[M, N] = size(gray_image);
u = 0:(M-1);
v = 0:(N-1);
idx = find(u > M/2); u(idx) = u(idx) - M;
idy = find(v > N/2); v(idy) = v(idy) - N;
[V, U] = meshgrid(v, u);
D = sqrt(U.^2 + V.^2);
butterworth_filter = 1 ./ (1 + (D./D0).^(2*n));

% Step 5: Apply Butterworth Filter in Frequency Domain
filtered_fft_butter = fft_shifted .* butterworth_filter;

% Step 6: Inverse Fourier Transform to get filtered image (Butterworth)
filtered_image_butter = ifft2(ifftshift(filtered_fft_butter));

% Step 7: Create Gaussian Low-Pass Filter
sigma = 25;
gaussian_filter = exp(-(D.^2)./(2*sigma^2));

% Step 8: Apply Gaussian Filter in Frequency Domain
filtered_fft_gaussian = fft_shifted .* gaussian_filter;

% Step 9: Inverse Fourier Transform to get filtered image (Gaussian)
filtered_image_gaussian = ifft2(ifftshift(filtered_fft_gaussian));

% Step 10: Display Results
subplot(3,2,3), imshow(log(1+abs(filtered_fft_butter)),[]),
title('Butterworth filter');
subplot(3,2,4), imshow(abs(filtered_image_butter),[]), title('Butterworth
Filtered Image');

subplot(3,2,5), imshow(log(1+abs(filtered_fft_gaussian)),[]),
title('Gaussian filter');
```

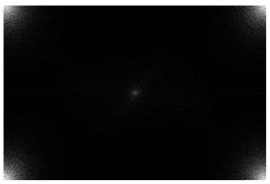
```
subplot(3,2,6), imshow(abs(filtered_image_gaussian),[]), title('Gaussian
Filtered Image');
```

Original Grayscale Image

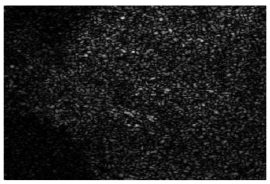
Fourier Transform



Butterworth filter



Butterworth Filtered Image



Gaussian filter

Gaussian Filtered Image