VIT®

Vellore Institute of Technology

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DIGITAL IMAGE PROCESSING

LAB-7

E NITEESH KUMAR REDDY
21BEC1594

DESIGN AND IMPLEMENT A HOMOMORPHIC FILTERRING TECHNIQUE USING MATLAB

TO ENHANCE THE CONTRAST OF LOW LIGHT IMAGE:

EVALUATE THE EFFECTIVENESS OF IMPLEMENTATION BY APPLYING IT TO A VARIETY OF IMAGES WITH DIFFERENT LIGHTING.

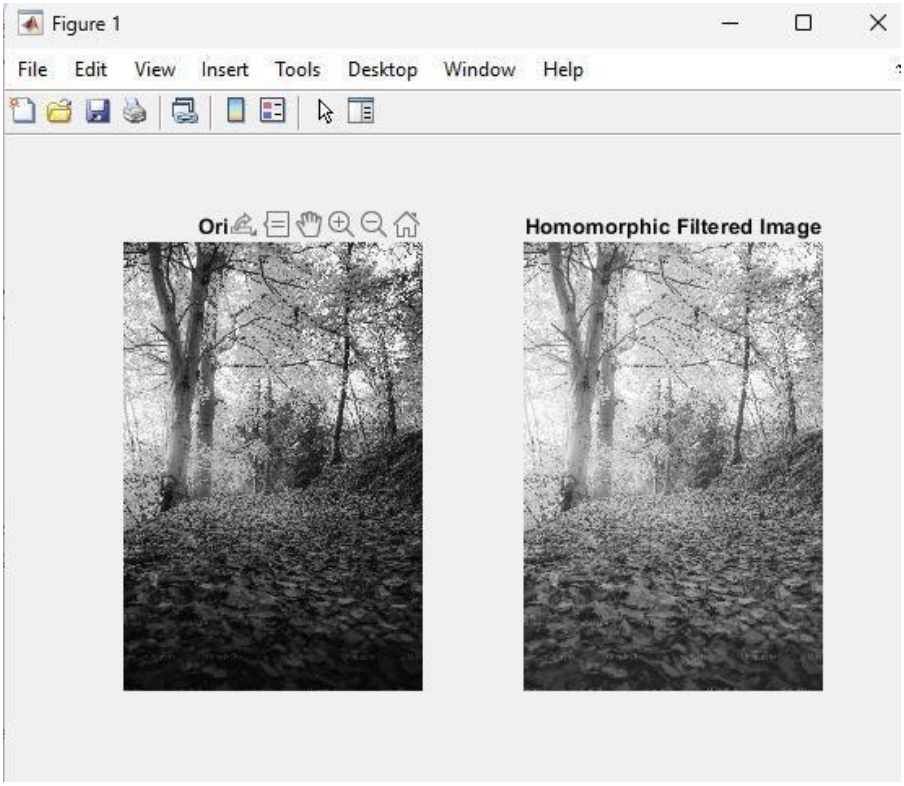
TOTAL 5 IMAGES WITH DIFFERENT IMAGES

CODE:

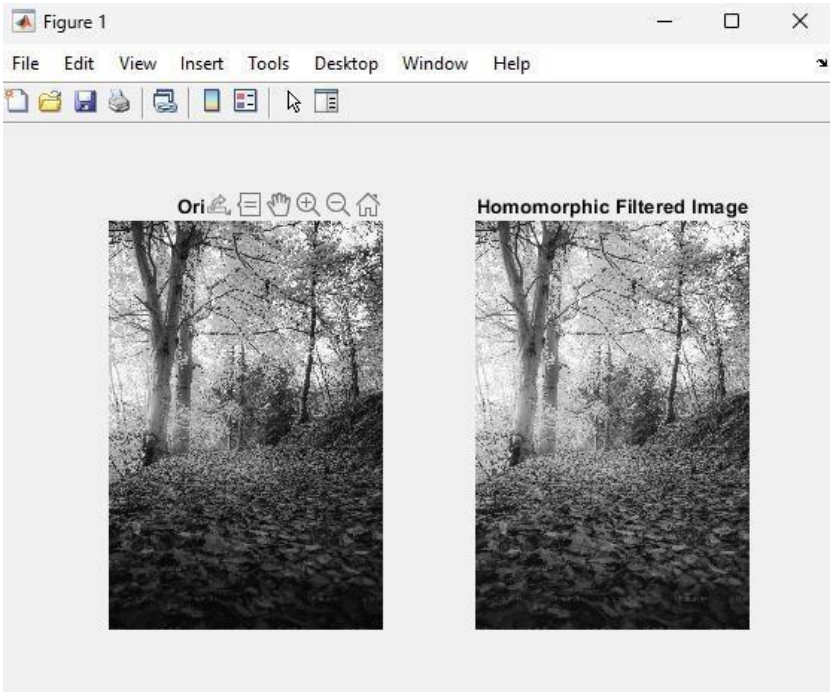
```
clc;
close all;
clear all;
d = 10;
% Cutofffrequency
d2 = d^2;
% Square of cutoff frequency
f = double(rgb2gray(imread("D:\21BEC1594\IMG_20221105_003550.jpg")));
l = log(1 + f);
% Logarithmic transformation
z = fft2(l);
[m, n] = size(f);
b = zeros(m, n);
h = zeros(m, n);
for i = 1:m
for j = 1:n
        b(i, j) = sqrt((i - m / 2)^2 + (j - n / 2)^2);
        %eucledian distance
h(i, j) = exp(-b(i, j)^2 / (2 * d2));
        %Gaussian filter
end
end
L = 0.5;
% Gamma low value
H = 1.5;
% Gamma high value
filter = L + (H - L) * h;
s = z .* filter;  g =
abs(ifft2(s));
%inverse fourier transformation
e = exp(g) - 1;
%inverse the logarithmic transformation
subplot(1, 2, 1);
imshow(f, []);
title('Original Image');
subplot(1, 2, 2);
imshow(e, []);
title('Homomorphic Filtered Image');
```

OUTPUT:

IMAGE: 1



50 % INCREASE BRIGHTNESS:



75 % INCREASE BRIGHTNESS:

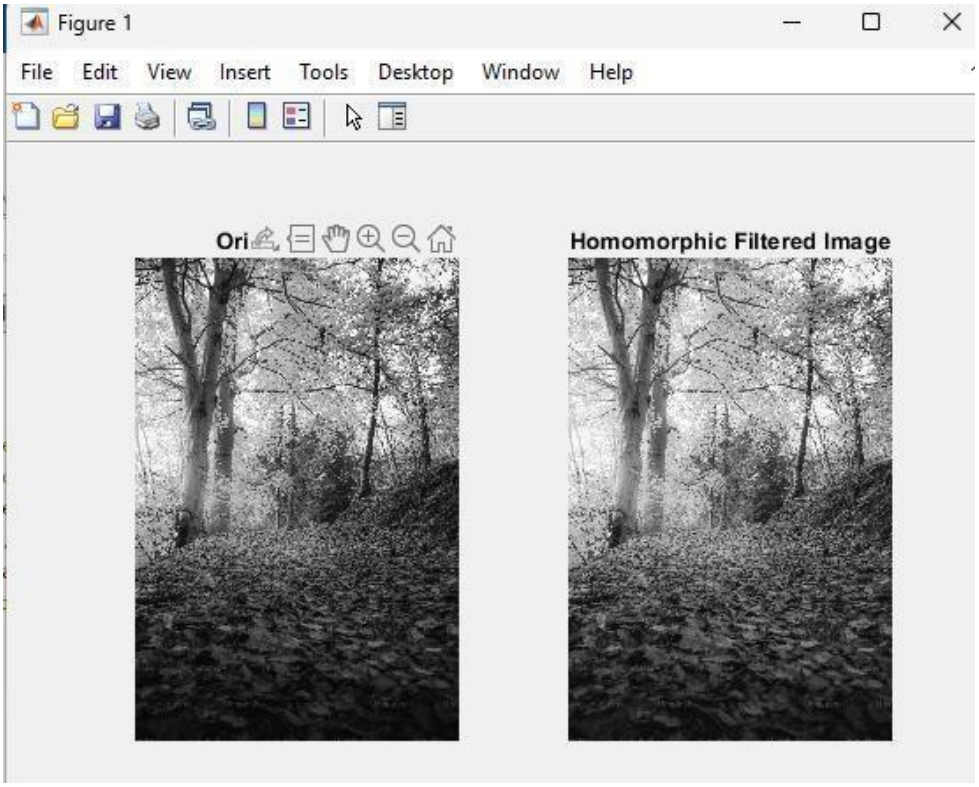
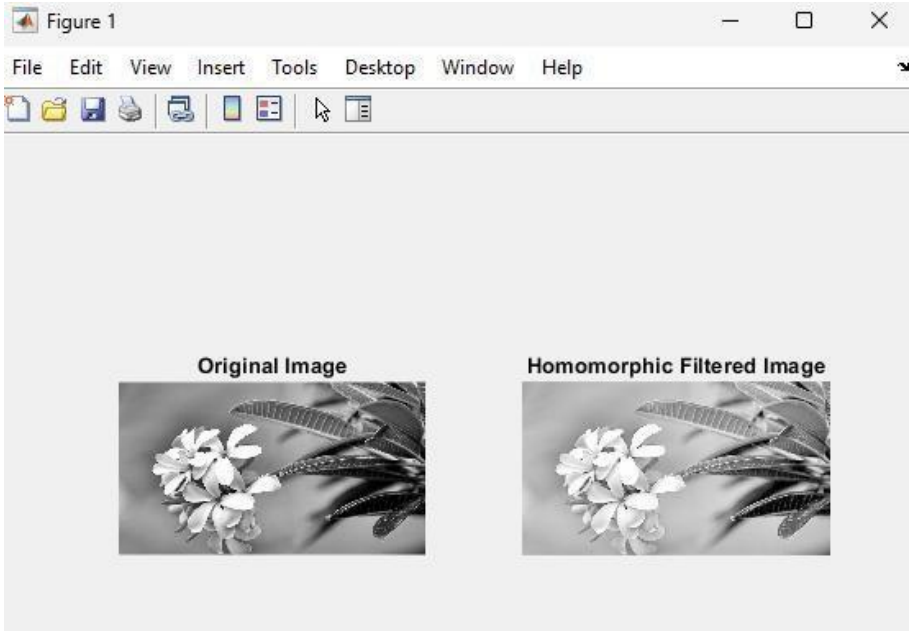
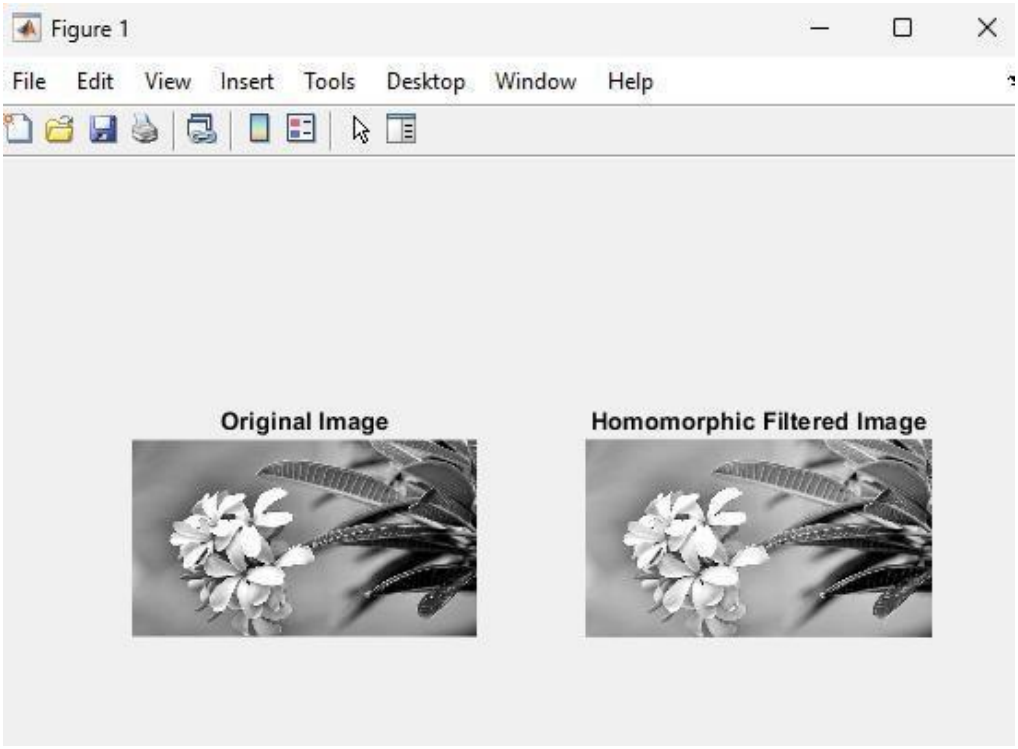


IMAGE: 2



50 % INCREASE BRIGHTNESS:



75 % INCREASE BRIGHTNESS:

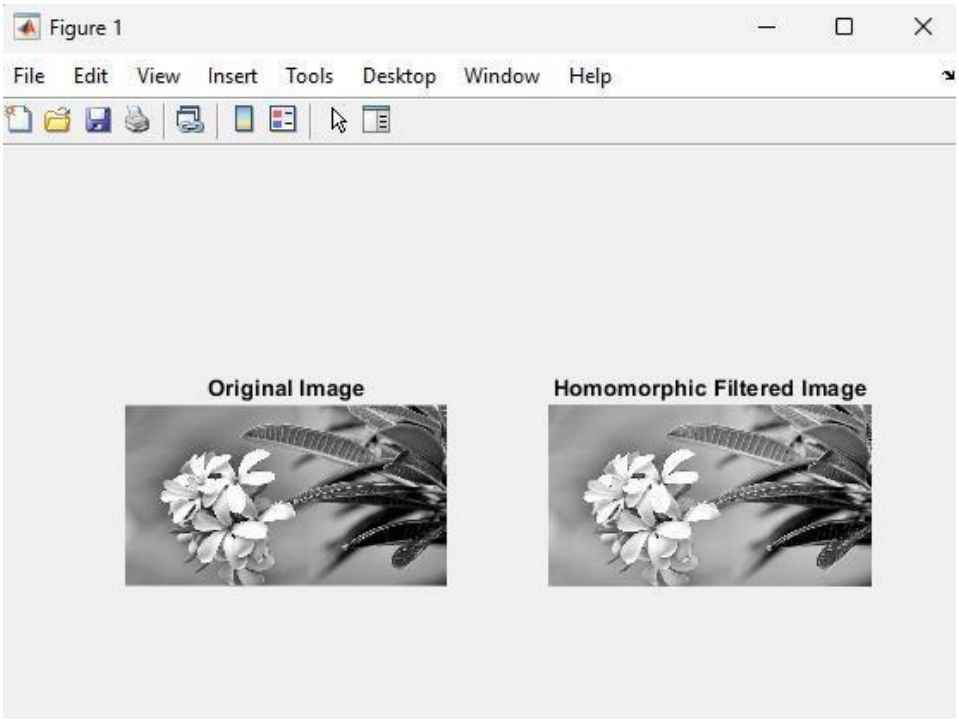
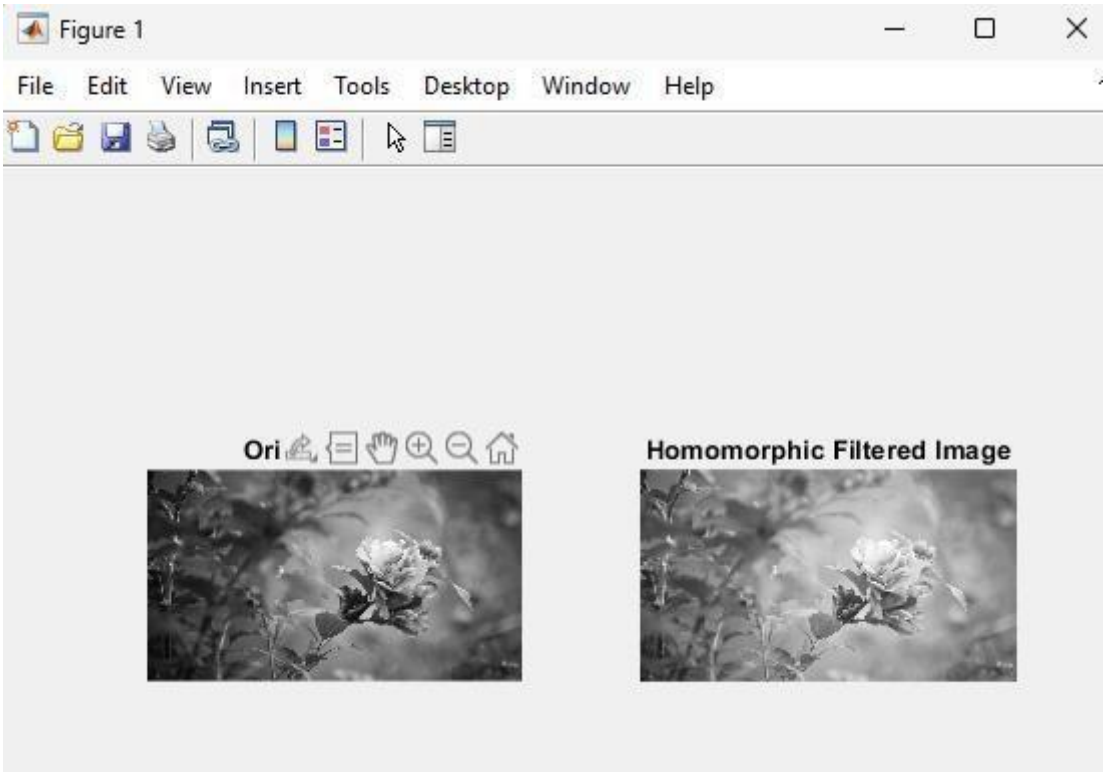
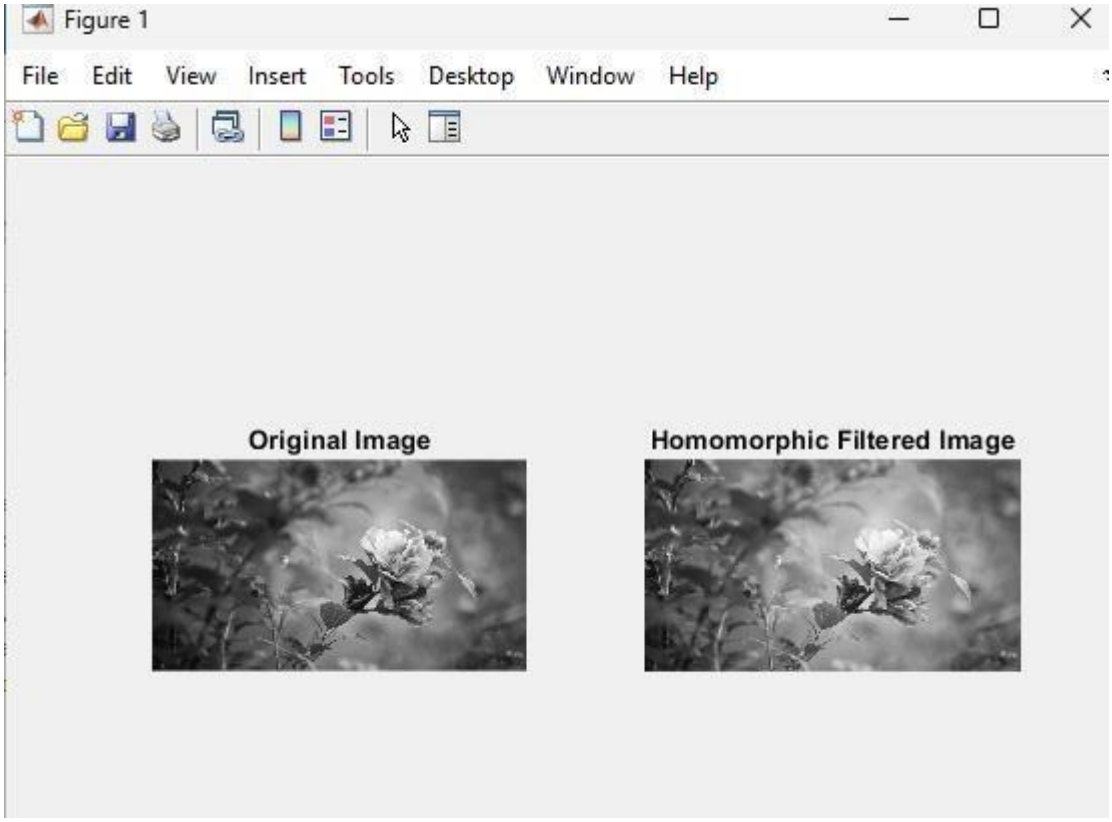


IMAGE: 3



50 % INCREASE BRIGHTNESS:



75 % INCREASE BRIGHTNESS:

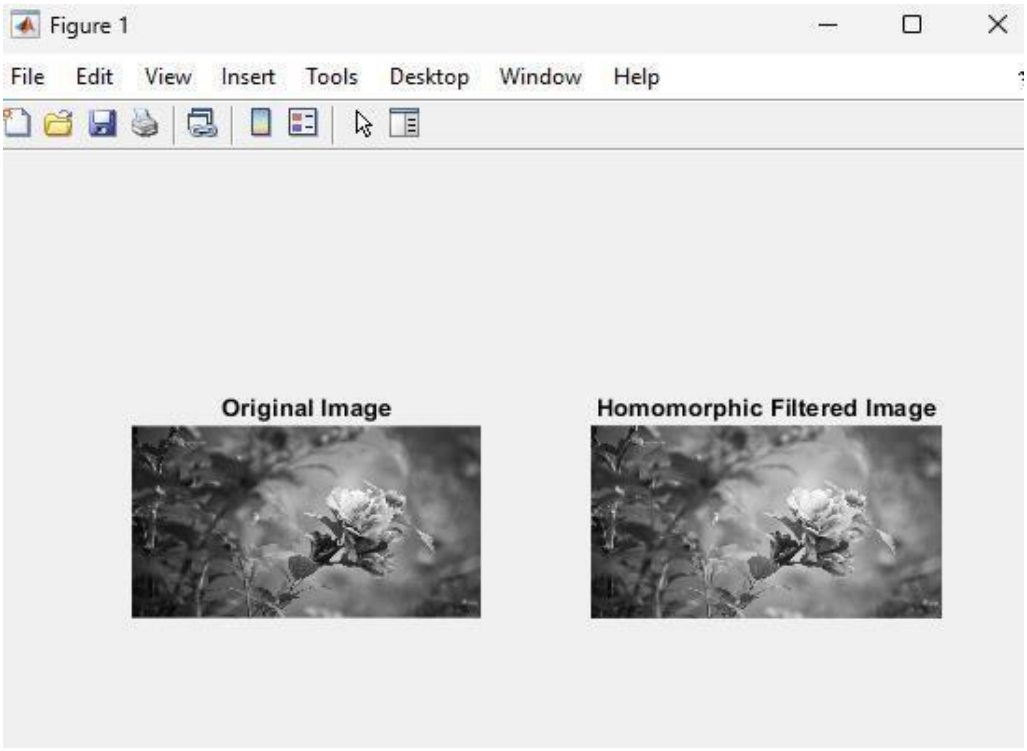
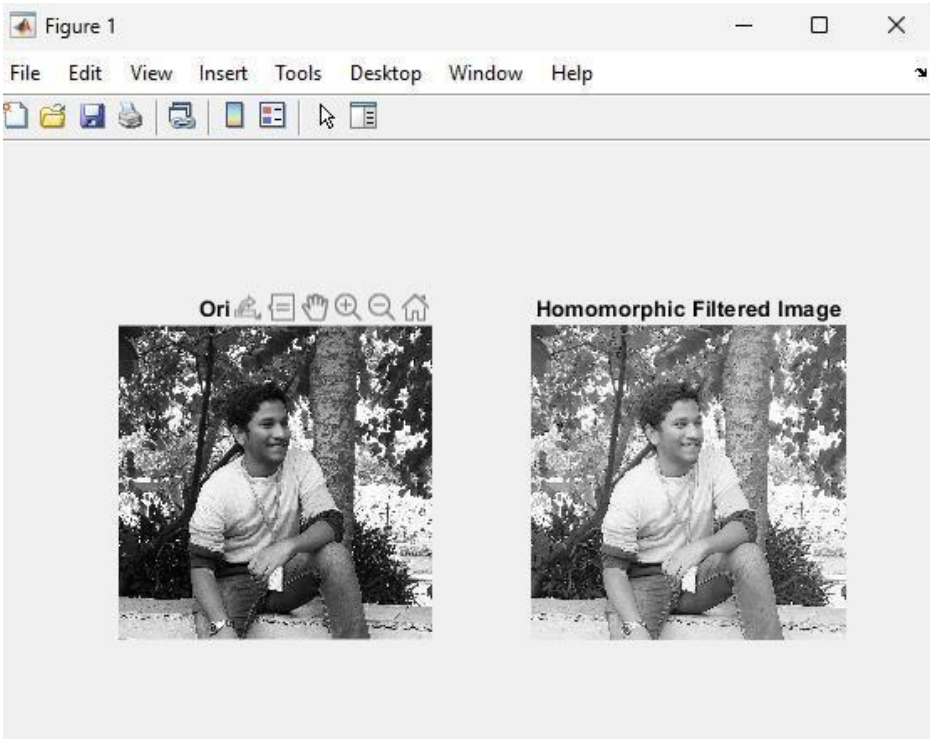
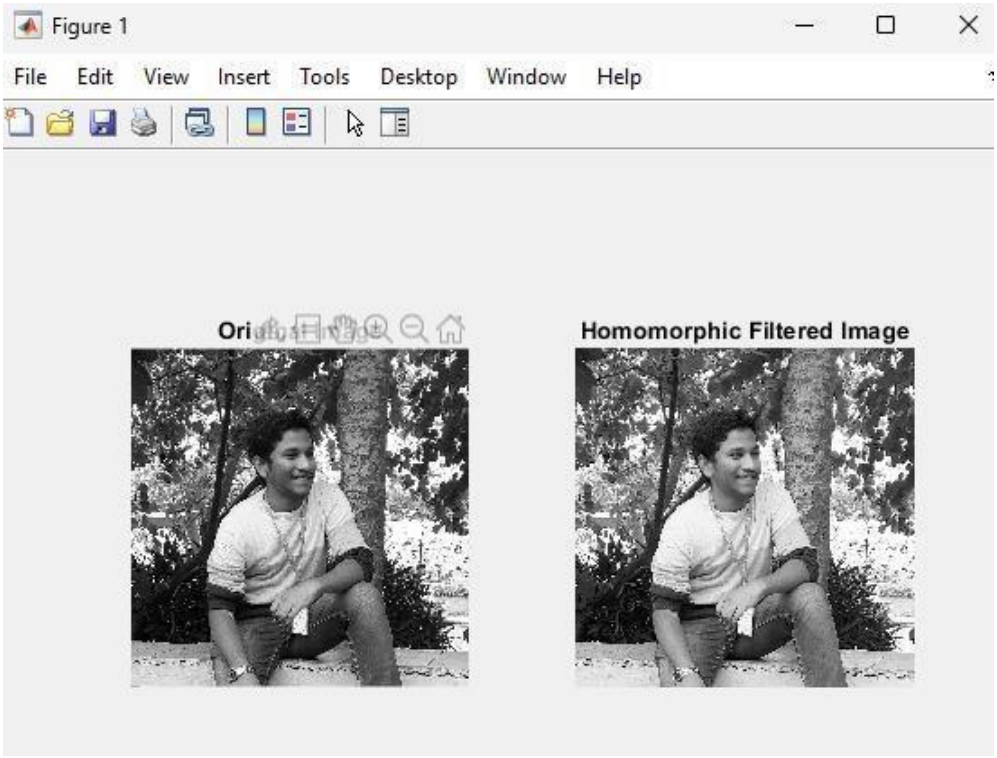


IMAGE: 4



50 % INCREASE BRIGHTNESS:



75 % INCREASE BRIGHTNESS:

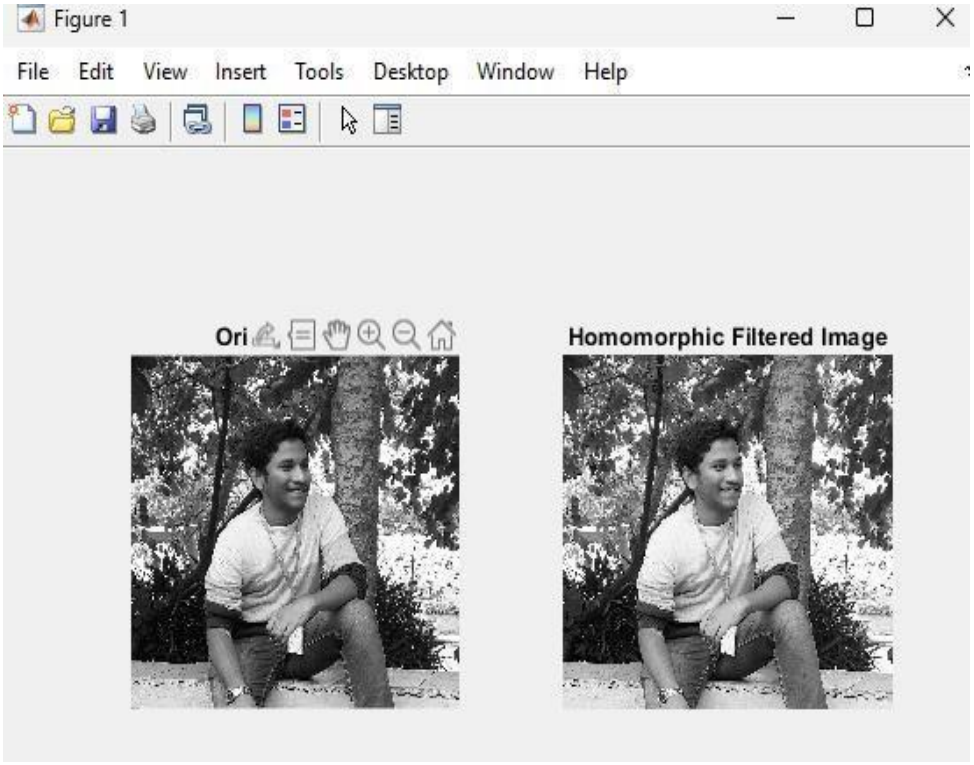
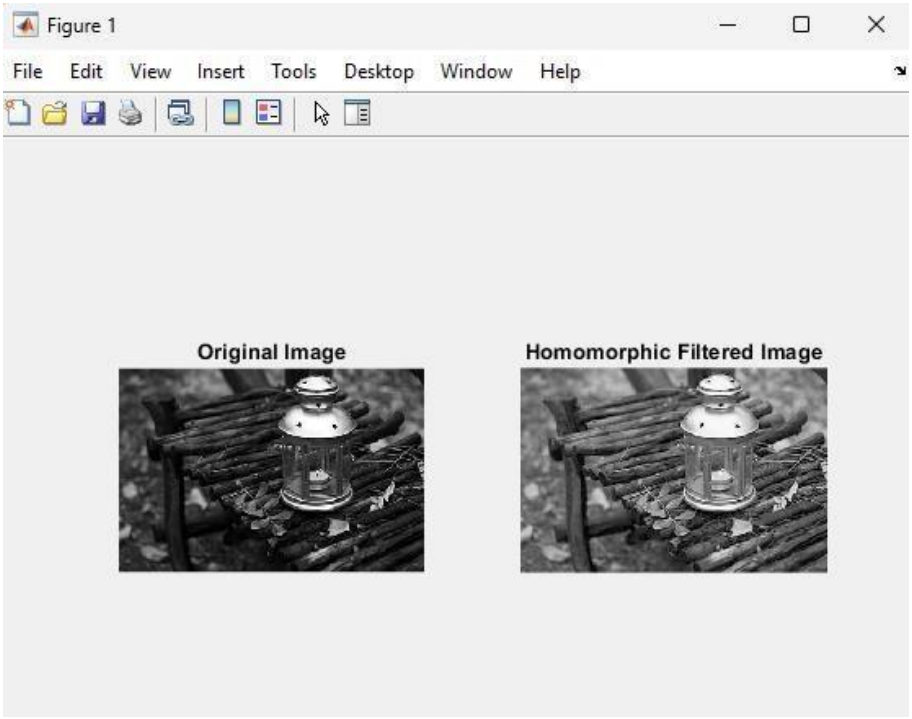
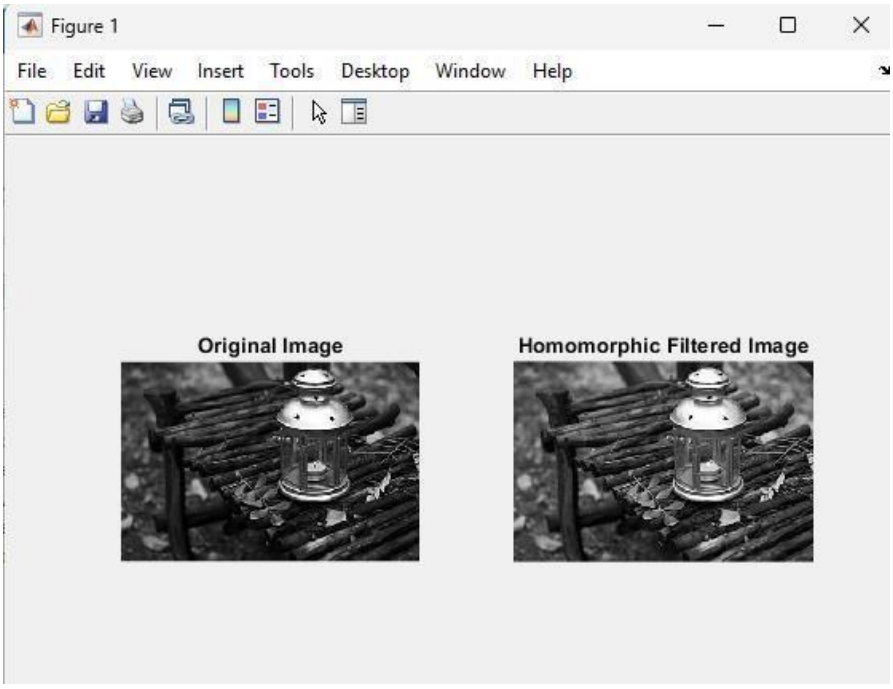


IMAGE: 5



50 % INCREASE BRIGHTNESS:



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