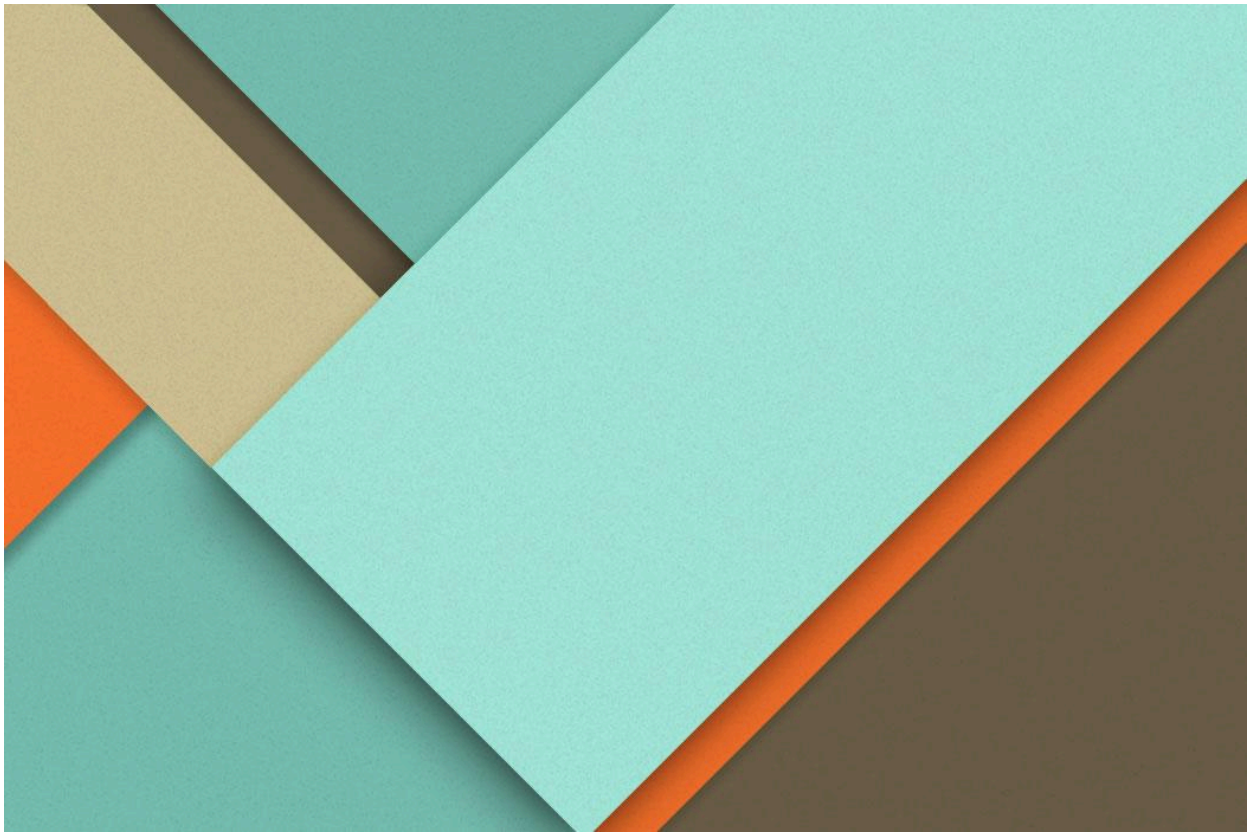

Experiment - 07

12-09-2024

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Experiment - 07

Homomorphic Filter

Challenging Experiment:

Design and Implement a homomorphic filtering technique using MATLAB to enhance the contrast of low light images. Evaluate the effectiveness of implementation by applying it to a variety of images with different lighting conditions.

Aim:

- To design a Homomorphic filter function.
- To implement the technique on 5 different images under varying lighting conditions.

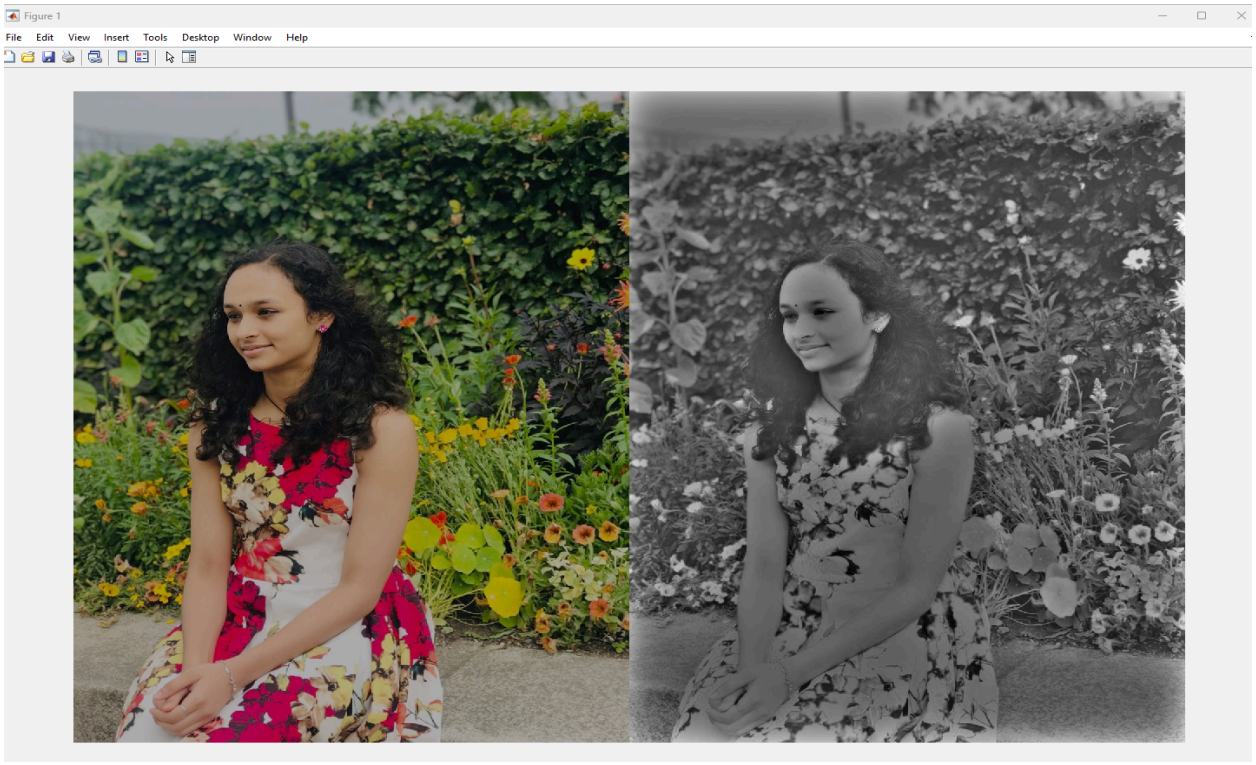
Software Required: MATLAB

Code:

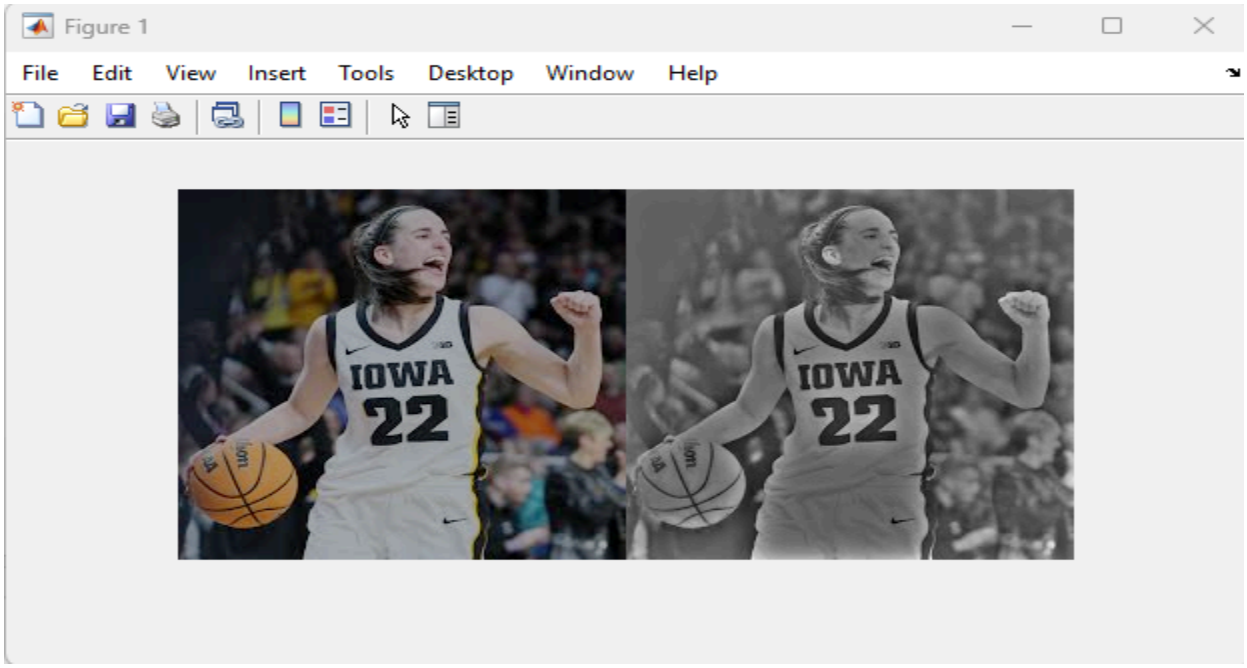
```
clc
clear
close all
I = imread("D:\21BEC1027\3964.jpeg");
I = im2double(I);

I = log(1 + I);

M = 2*size(I,1) + 1;
N = 2*size(I,2) + 1;

sigma = 10;
[X, Y] = meshgrid(1:N,1:M);
centerX = ceil(N/2);
centerY = ceil(M/2);
gaussianNumerator = (X - centerX).^2 + (Y - centerY).^2;
H = exp(-gaussianNumerator./(2*sigma.^2));
```

```
H = 1 - H;


H = fftshift(H);
If = fft2(I, M, N);


Iout = real(ifft2(H.*If));
Iout = Iout(1:size(I,1),1:size(I,2));
Ihmf = exp(Iout) - 1;
imshowpair(I, Ihmf,'montage')
```

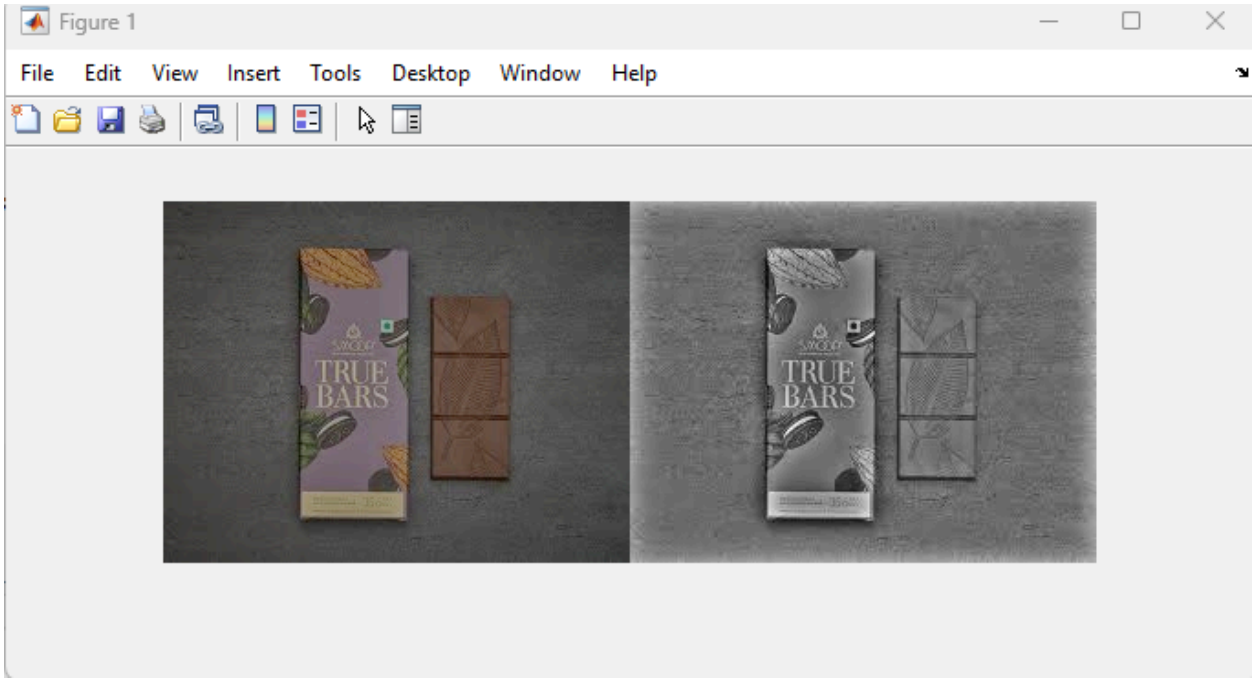
Output 1:



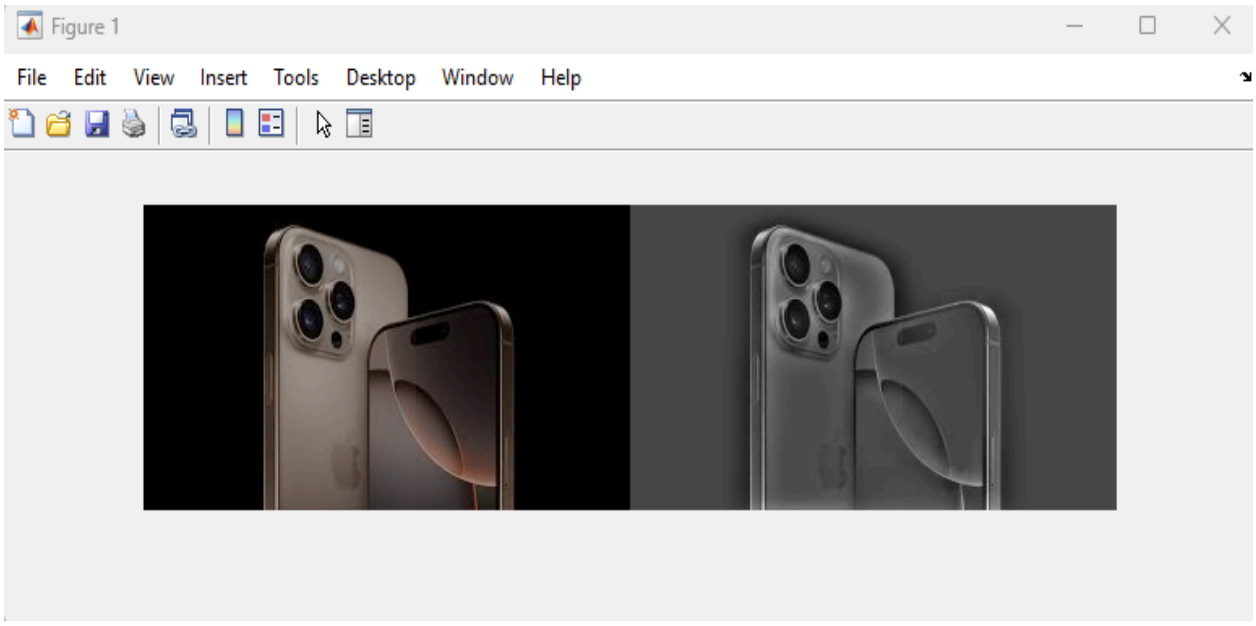
Output 2:



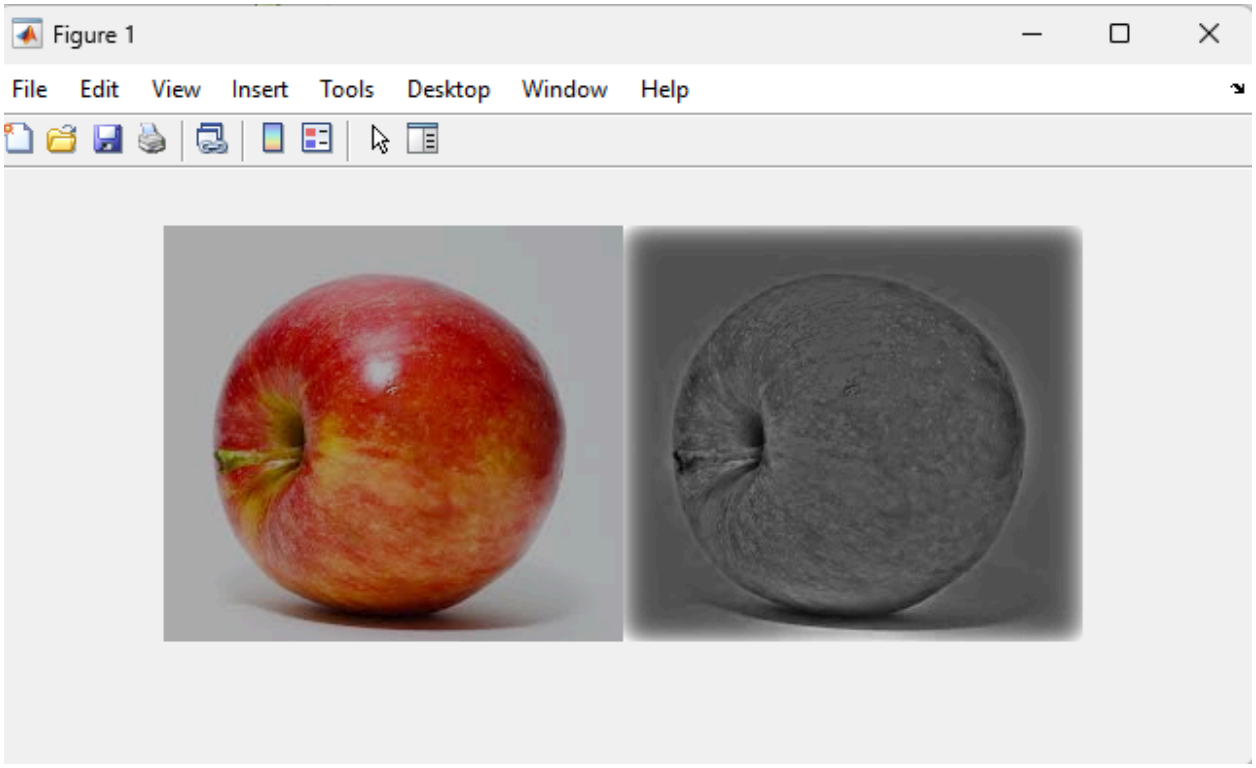
Output 3:



Output 4:



Output 5:



Result:

Hence we have performed the Homomorphic filtering technique on 5 images and obtained the results.