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DIGITAL IMAGE PROCESSING

EXP-08

AIM:-The primary objective of this project is to develop an image processing algorithm in MATLAB to improve the quality of night-time images captured under low-light conditions

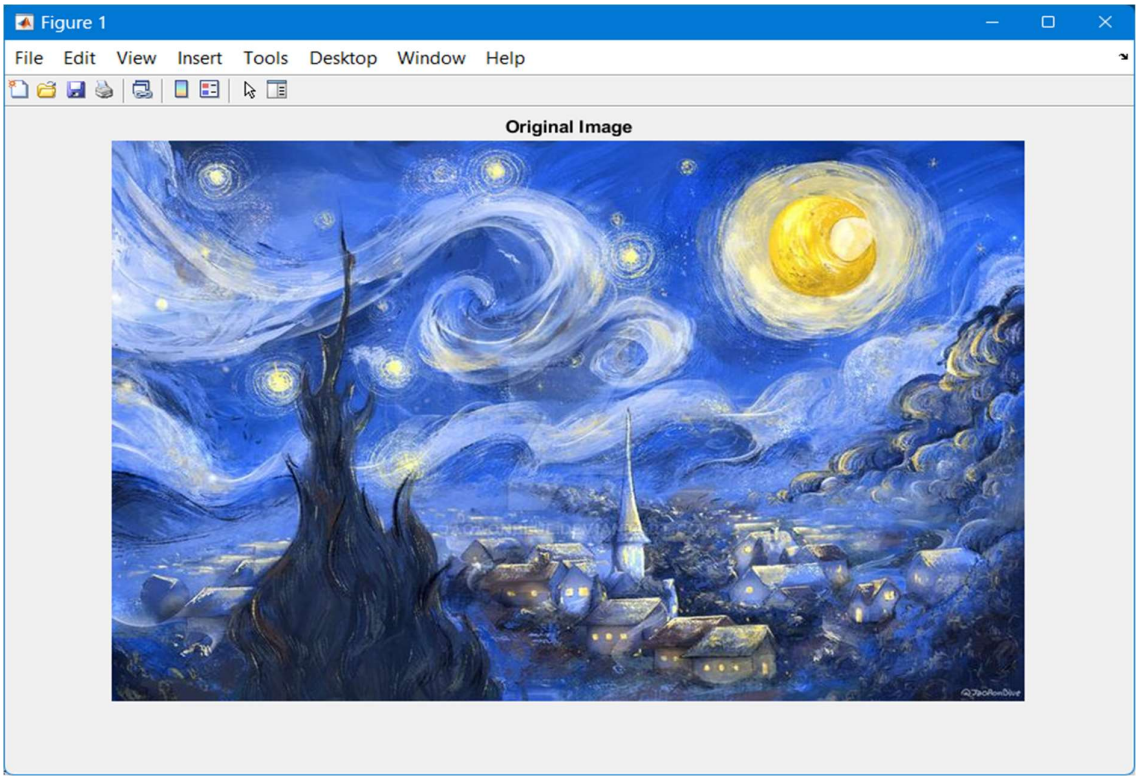
Code:-

```
image ="D:\21BEC1835\stary light.jpg";
img = imread(image);
% Display original image
figure(1);
imshow(img);
title('Original Image');
% Color image smoothing using mean filter
kernel_size = 5;
smoothed_img = imfilter(img, ones(kernel_size) / kernel_size^2,
'replicate');
% Display smoothed image
figure(2);
imshow(smoothed_img);
title('Smoothed Image');
% Measure PSNR and SSIM for smoothed image
psnr_smoothed = psnr(smoothed_img, img);
ssim_smoothed = ssim(smoothed_img, img);
% Display PSNR and SSIM values
fprintf('PSNR of smoothed image: %.2f dB\n', psnr_smoothed);
fprintf('SSIM of smoothed image: %.2f\n', ssim_smoothed);
% Color sharpening using Laplacian filtering
laplacian_kernel = [-1 -1 -1; -1 8 -1; -1 -1 -1];
sharpened_img = img - imfilter(img, laplacian_kernel, 'replicate');
% Display sharpened image
figure(3);
imshow(sharpened_img);
title('Sharpened Image');
% Measure PSNR and SSIM for sharpened image
psnr_sharpened = psnr(sharpened_img, img);
ssim_sharpened = ssim(sharpened_img, img);
% Display PSNR and SSIM values
fprintf('PSNR of sharpened image: %.2f dB\n', psnr_sharpened);
fprintf('SSIM of sharpened image: %.2f\n', ssim_sharpened);
% Sharpening on smoothed image
sharpened_smoothed = smoothed_img - imfilter(smoothed_img,
laplacian_kernel, 'replicate');
% Display sharpened smoothed image
figure(4);
imshow(sharpened_smoothed);
title('Sharpened Smoothed Image');
% Measure PSNR and SSIM for sharpened smoothed image
psnr_sharpened_smoothed = psnr(sharpened_smoothed, img);
ssim_sharpened_smoothed = ssim(sharpened_smoothed, img);
% Display PSNR and SSIM values
```

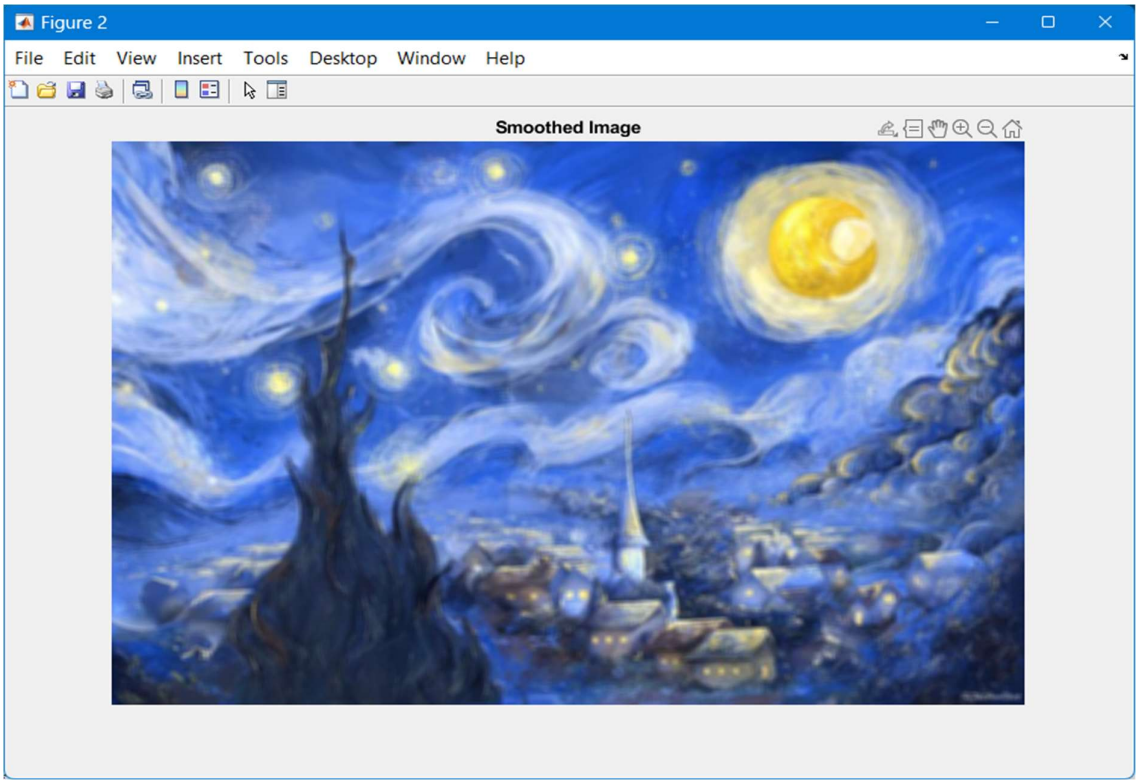
```
fprintf('PSNR of sharpened smoothed image: %.2f dB\n',
psnr_sharpened_smoothed);
fprintf('SSIM of sharpened smoothed image: %.2f\n',
ssim_sharpened_smoothed);
% Smoothing on sharpened image
smoothed_sharpened = imfilter(sharpened_img, ones(kernel_size) /
kernel_size^2, 'replicate');
% Display smoothed sharpened image
figure(5);
imshow(smoothed_sharpened);
title('Smoothed Sharpened Image');
% Measure PSNR and SSIM for smoothed sharpened image
psnr_smoothed_sharpened = psnr(smoothed_sharpened, img);
ssim_smoothed_sharpened = ssim(smoothed_sharpened, img);
% Display PSNR and SSIM values
fprintf('PSNR of smoothed sharpened image: %.2f dB\n',
psnr_smoothed_sharpened);
fprintf('SSIM of smoothed sharpened image: %.2f\n',
ssim_smoothed_sharpened);
```

Output:-

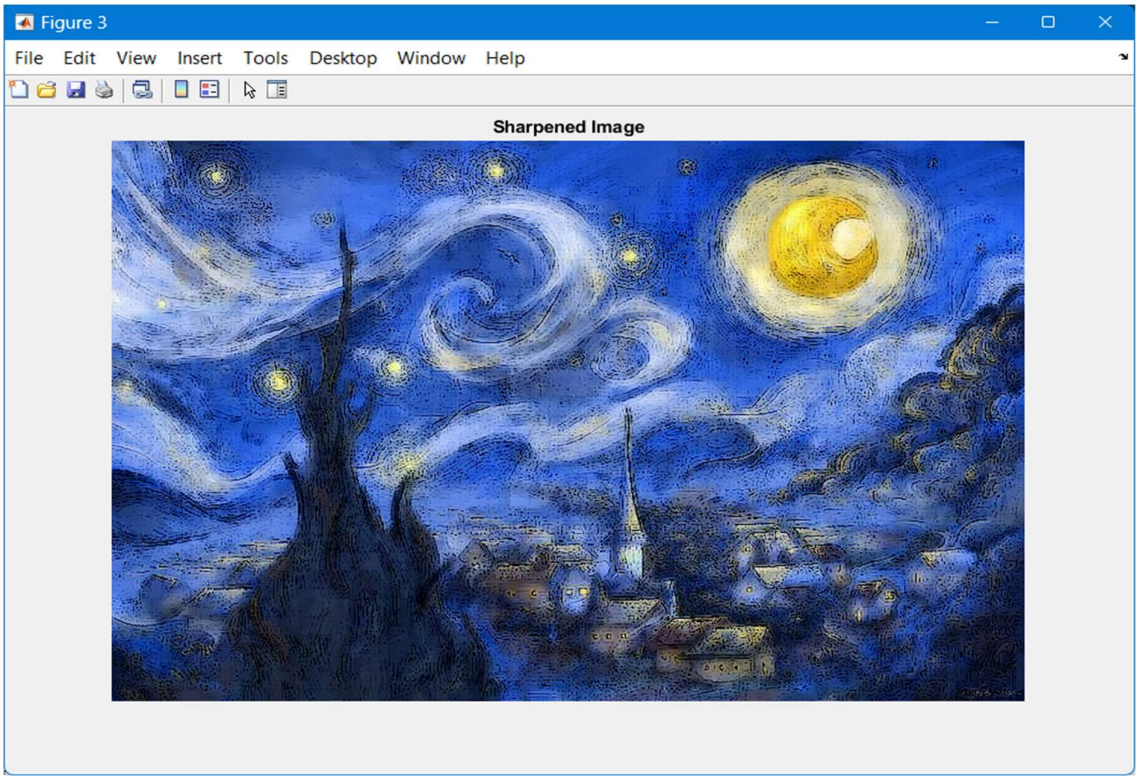
1.ORGINAL IMAGE:



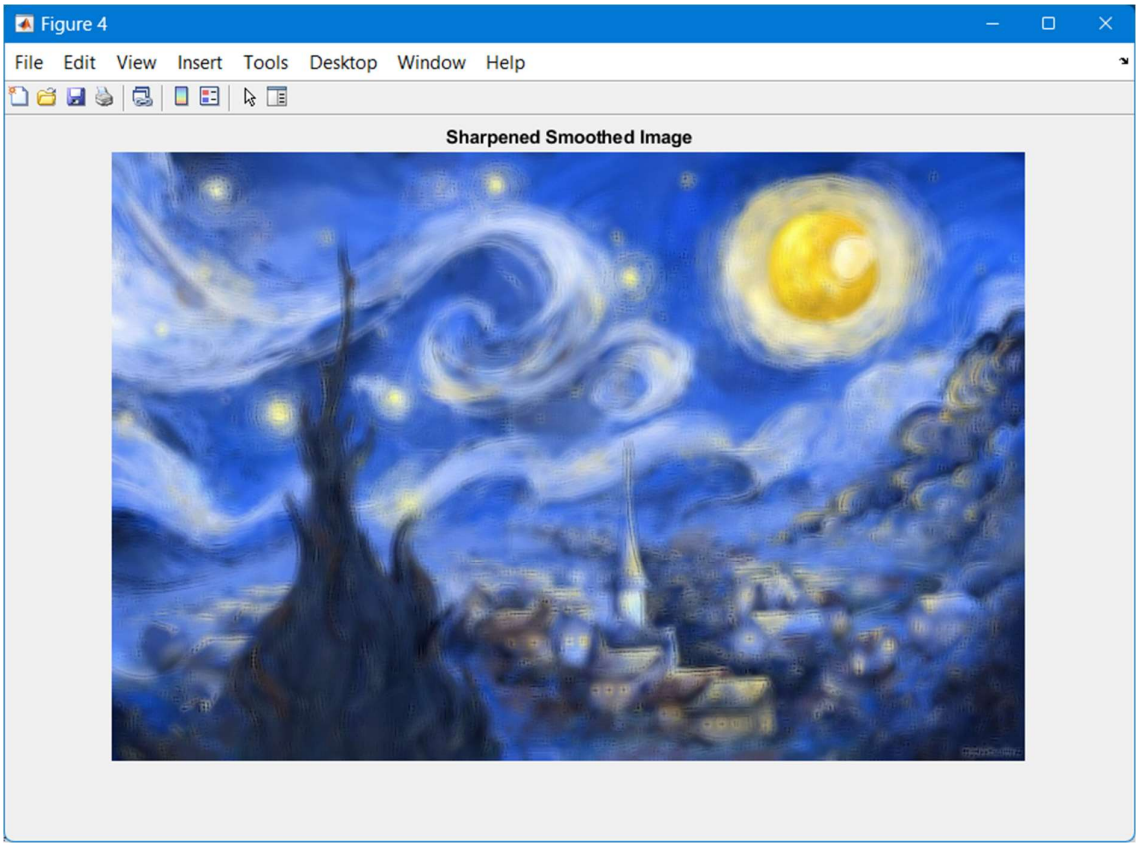
2.smoothed image:-



3.SHARPENED IMAGE



4.SHARPENED SMOOTHED IMAGE



5.SMOOTHED SHARPENED IMAGE

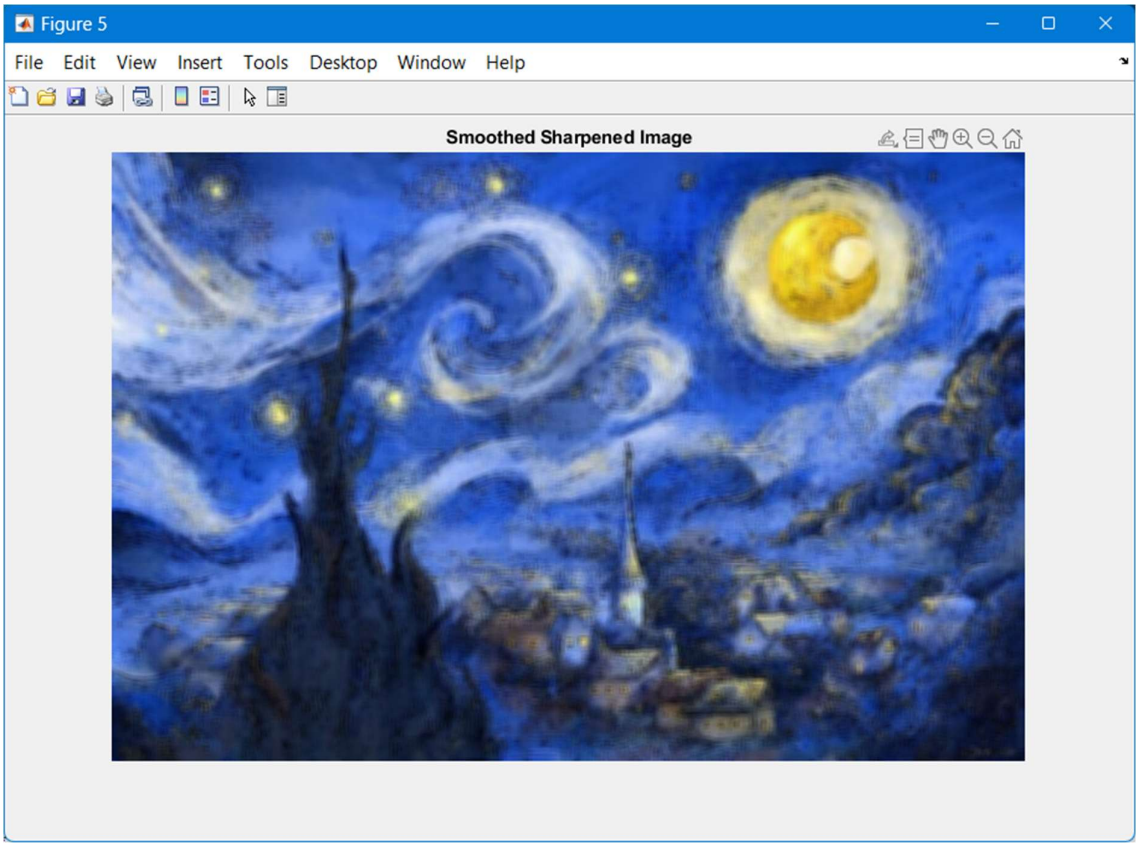


Figure 5
File Edit View Insert Tools Desktop Window Help
Smoothed Sharpened Image