Denoising microscope images in python

**→ Gaussian filter in denoising:**

from skimage import io

from scipy import ndimage as nd

from matplotlib import pyplot as plt

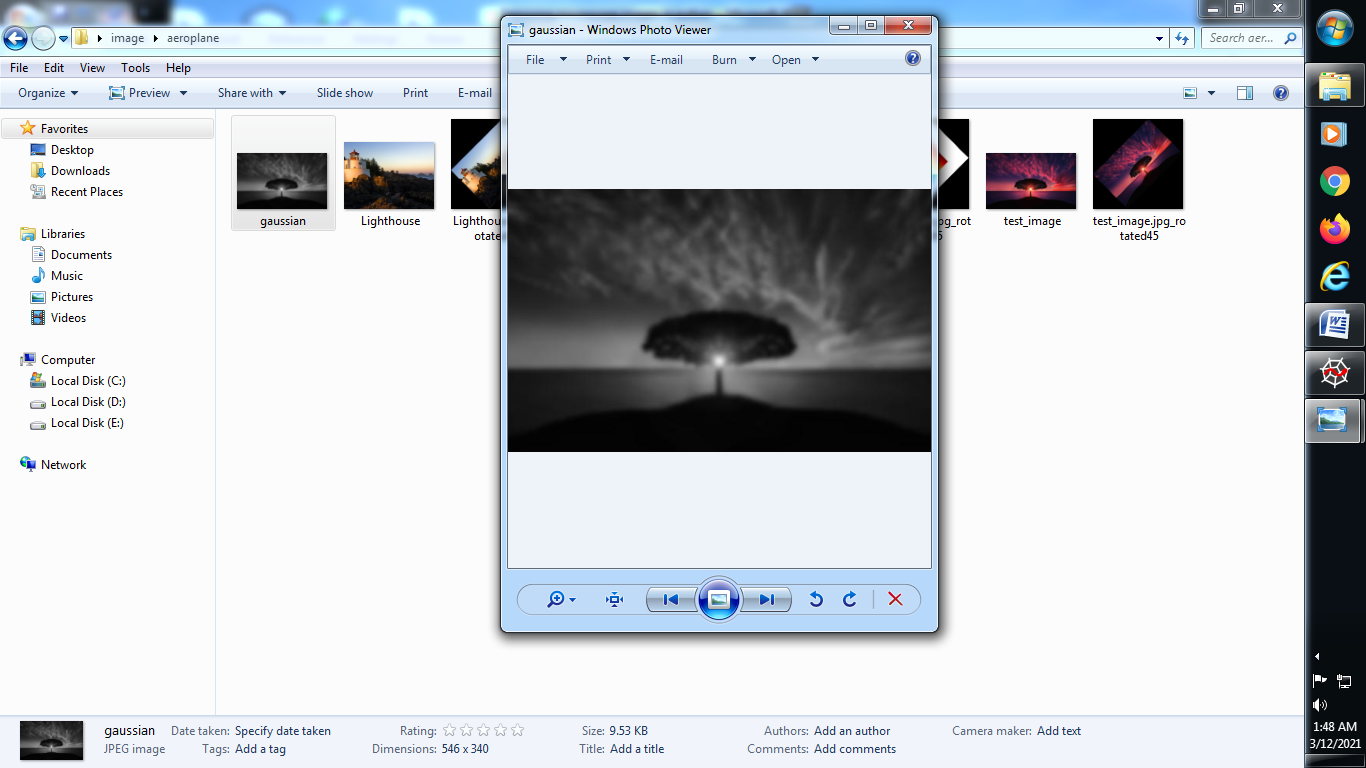
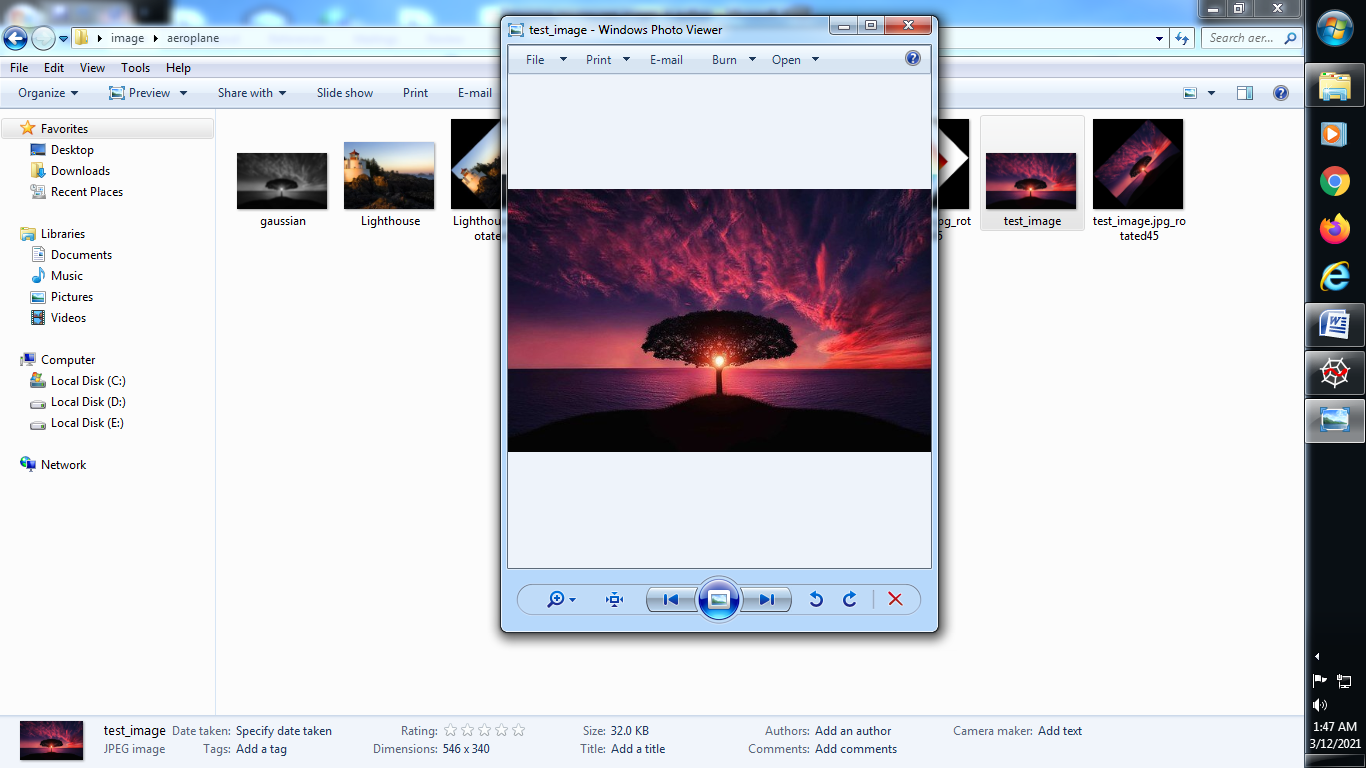
img = io.imread("C:\\Users\\abc\\Desktop\\image\\aeroplane\\test\_image.jpg")

gaussian\_img = nd.gaussian\_filter(img, sigma=3)

plt.imsave("C:\\Users\\abc\\Desktop\\image\\aeroplane\\gaussian.jpg",gaussian\_img)

**Output :**

**Original Image : Gaussian Image :**

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**→ Median filter in denosing :**

from skimage import io

from scipy import ndimage as nd

from matplotlib import pyplot as plt

img = io.imread("C:\\Users\\abc\\Desktop\\image\\aeroplane\\test\_image.jpg")

gaussian\_img = nd.gaussian\_filter(img, sigma=3)

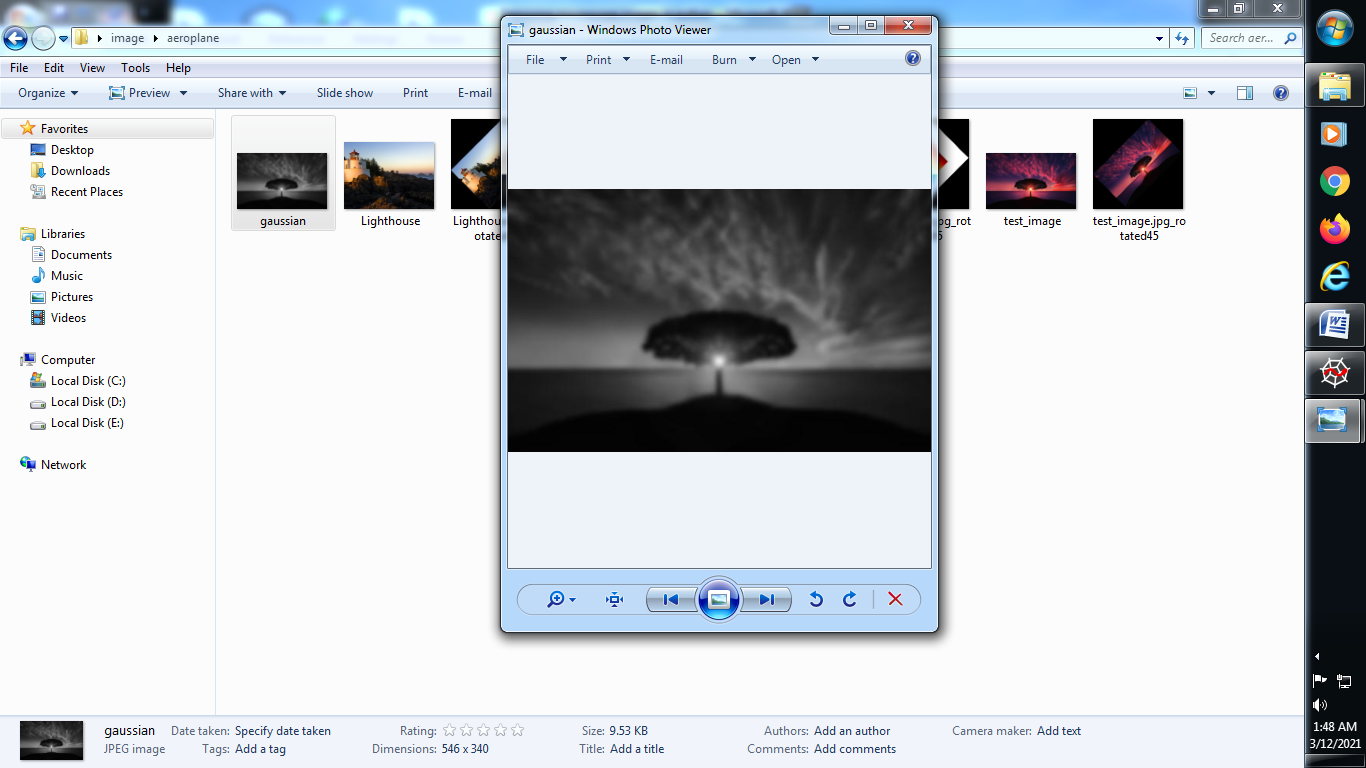
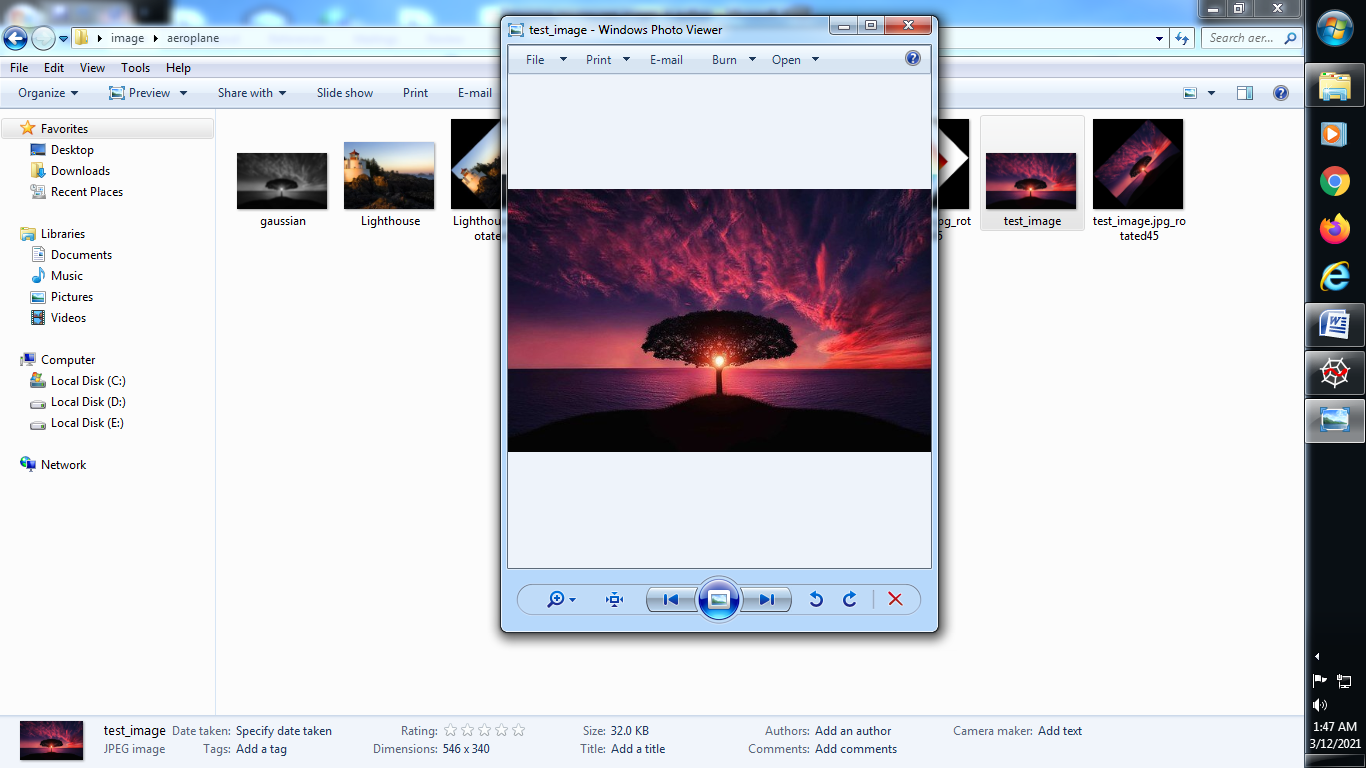
plt.imsave("C:\\Users\\abc\\Desktop\\image\\aeroplane\\gaussian.jpg",gaussian\_img)

median\_img = nd.median\_filter(img,size = 3)

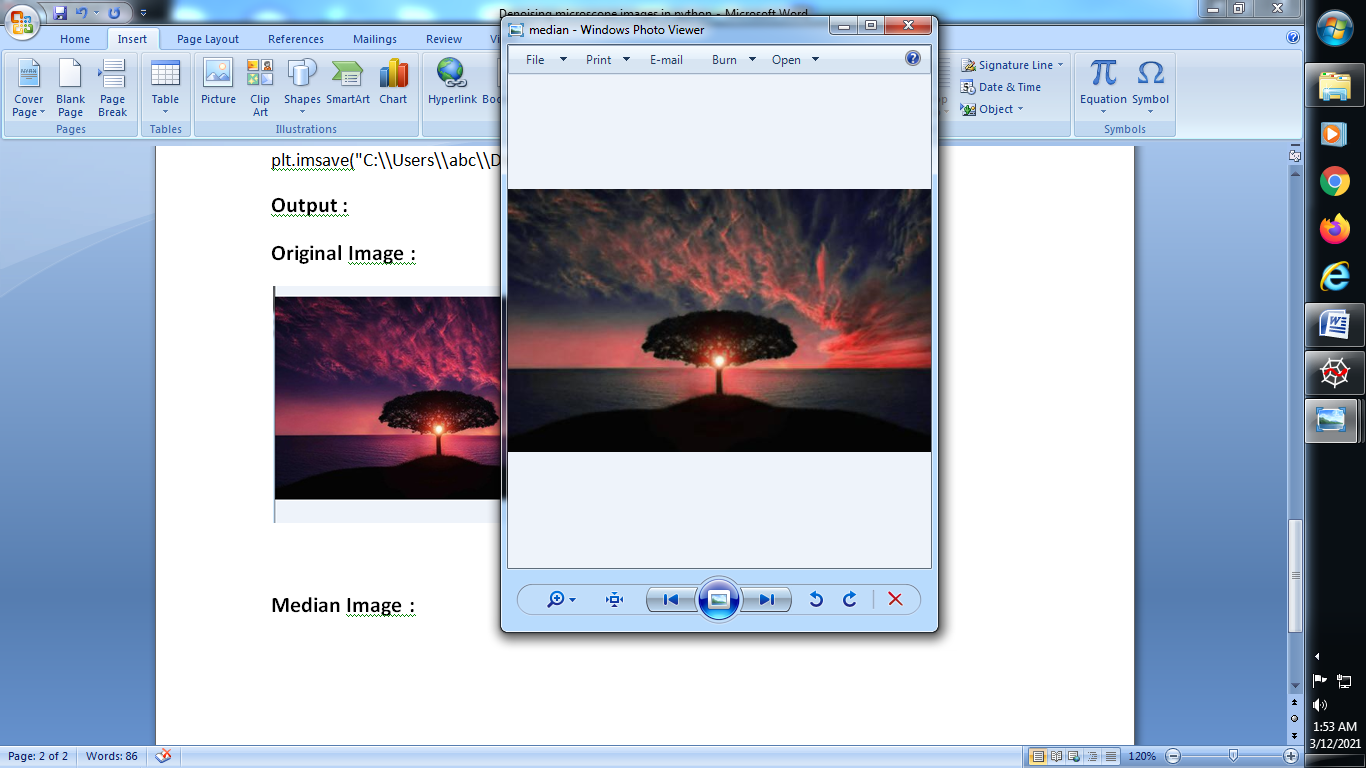
plt.imsave("C:\\Users\\abc\\Desktop\\image\\aeroplane\\median.jpg",median\_img)

**Output :**

**Original Image : Gaussian Image :**

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**Median Image :**

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**→ denoise filter image :**

from skimage import io,img\_as\_float

from scipy import ndimage as nd

from matplotlib import pyplot as plt

import numpy as np

img = img\_as\_float(io.imread("C:\\Users\\abc\\Desktop\\image\\aeroplane\\test\_image.jpg"))

gaussian\_img = nd.gaussian\_filter(img, sigma=3)

plt.imsave("C:\\Users\\abc\\Desktop\\image\\aeroplane\\gaussian.jpg",gaussian\_img)

median\_img = nd.median\_filter(img,size = 3)

plt.imsave("C:\\Users\\abc\\Desktop\\image\\aeroplane\\median.jpg",median\_img)

from skimage.restoration import denoise\_nl\_means, estimate\_sigma

sigma\_est = np.mean(estimate\_sigma(img, multichannel=True))

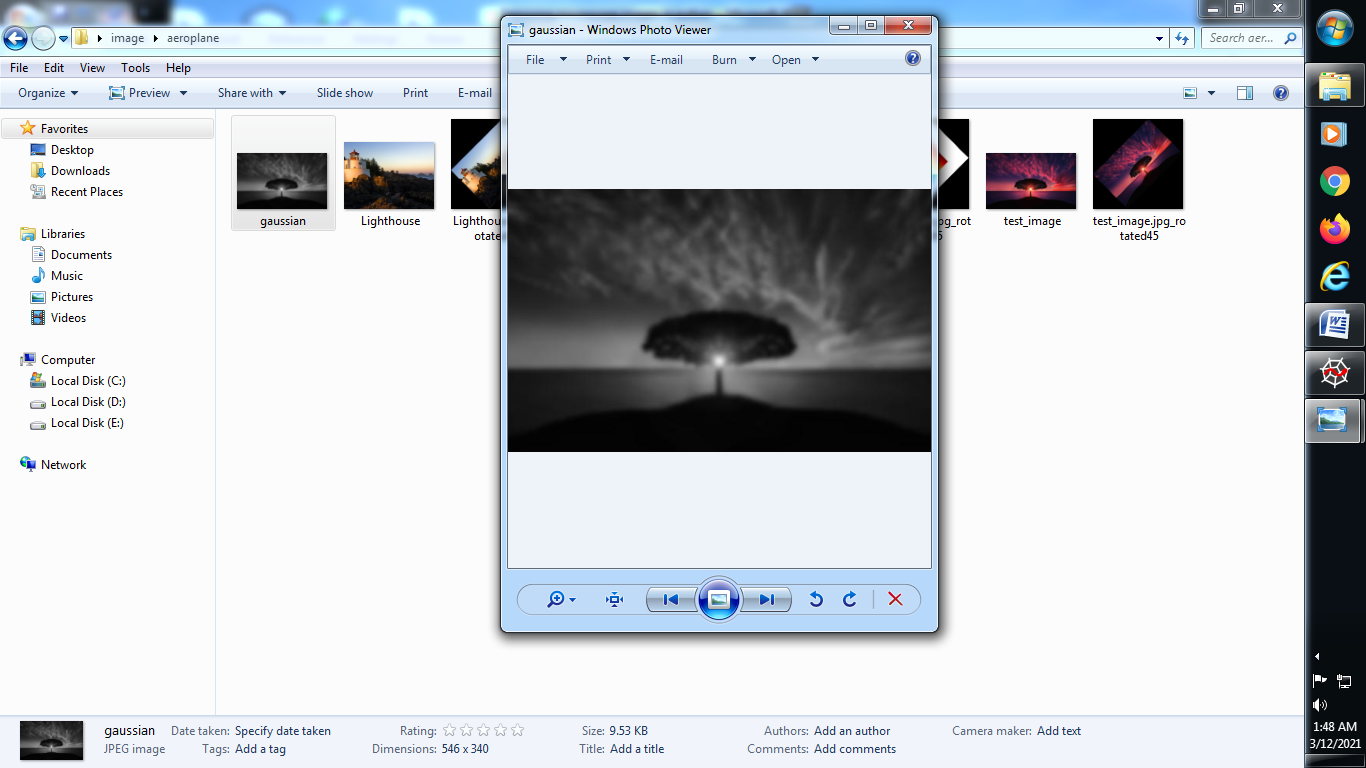
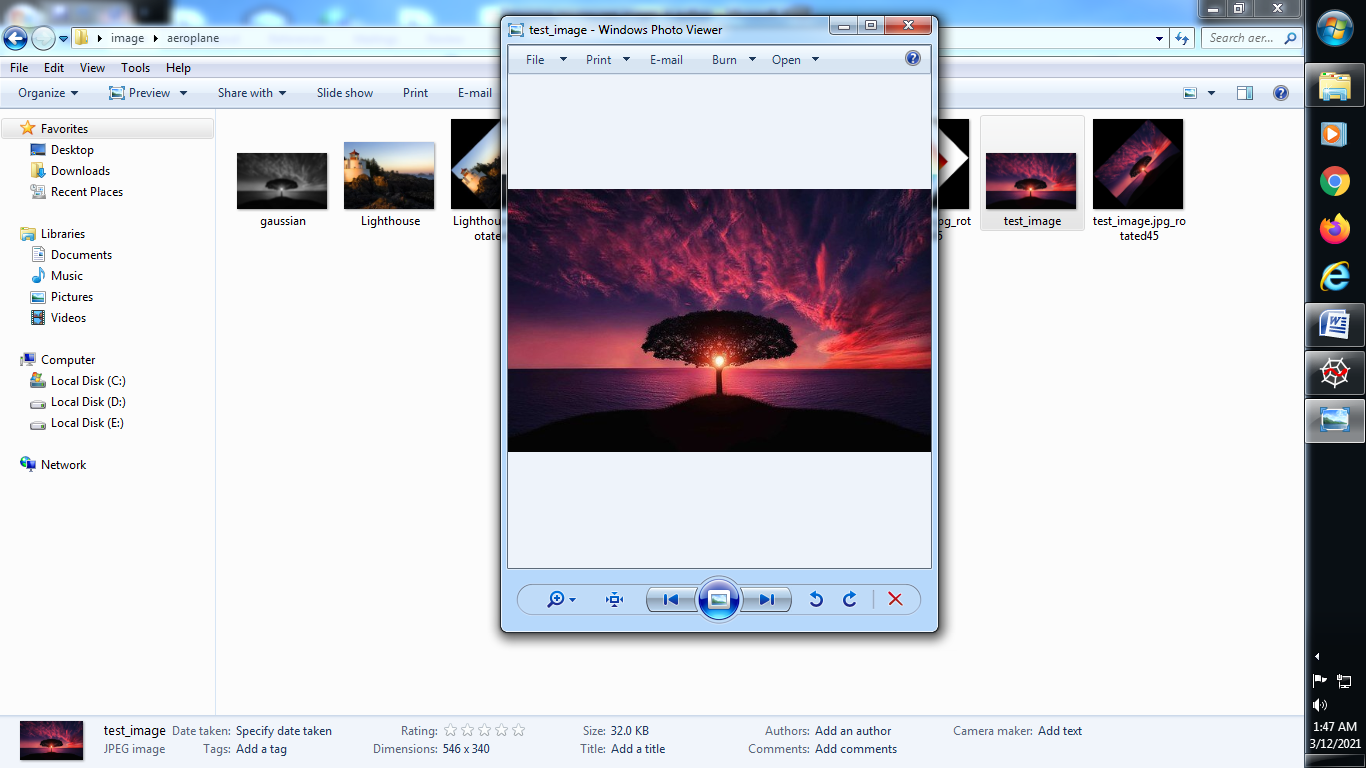
denoise = denoise\_nl\_means(img, h=1.15 \* sigma\_est, fast\_mode=False,

patch\_size=5,patch\_distance=6,multichannel=True)

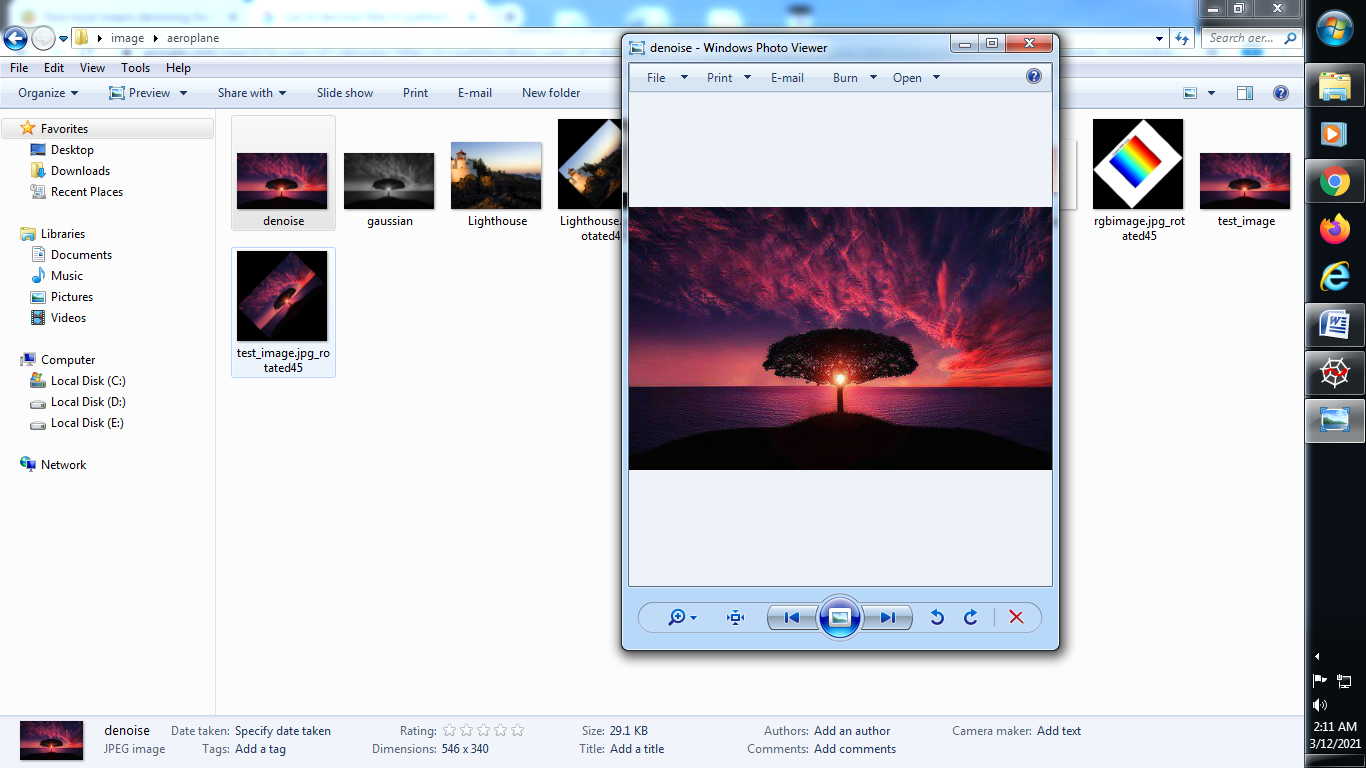
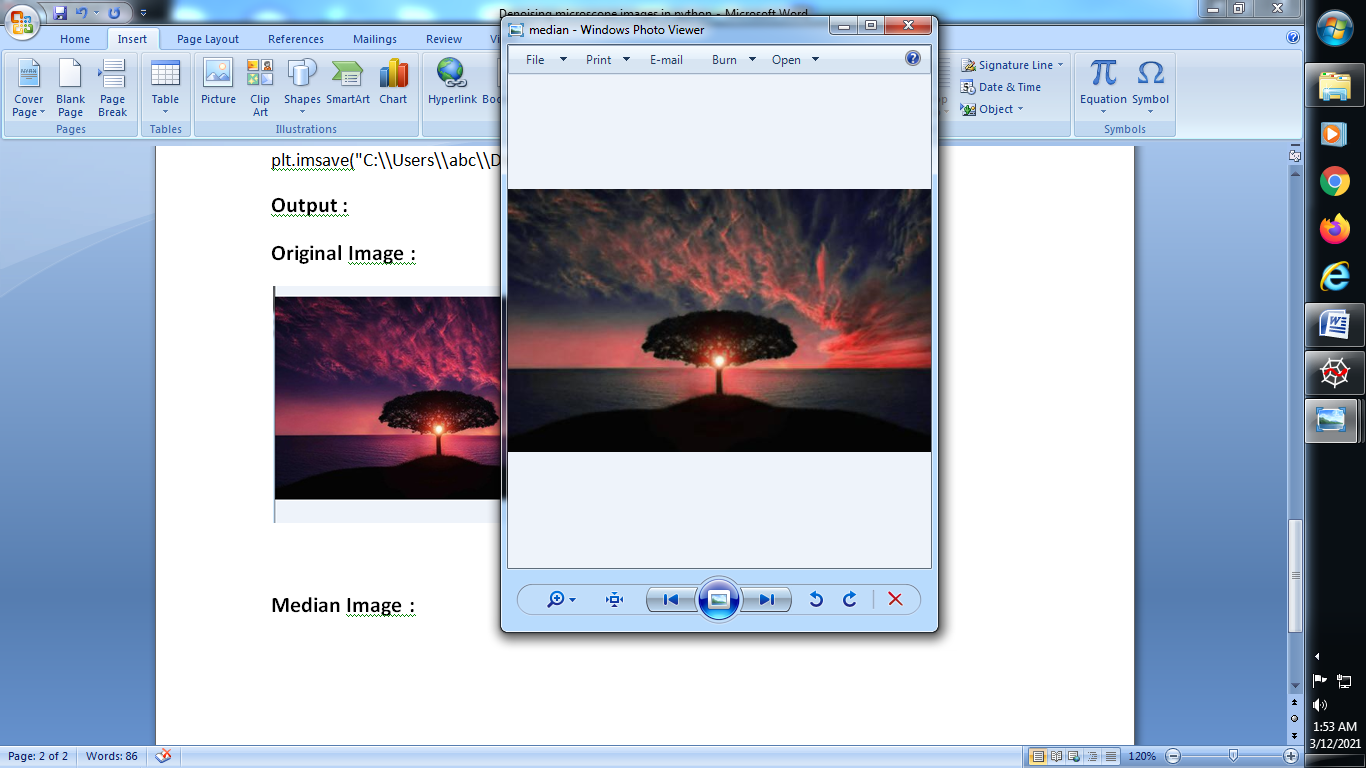
plt.imsave("C:\\Users\\abc\\Desktop\\image\\aeroplane\\denoise.jpg",denoise)

**→ Output :**

**Original Image : Gaussian Image :**

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**Median Image : Denoising Image :**

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