Image to pencil sketch

import reqired library

```
import numpy as np
import cv2
import matplotlib.pyplot as plt
import matplotlib.image as matim
import ipywidgets as widgets
```

Define gamma function for image lookup table

```
def adjust_gamma(image, gamma = 1):
    invGamma = 1.0/gamma
    table = np.array([((i/255)**invGamma)*255 for i in np.arange(0, 256)]) #lookup table
    lut_img = cv2.LUT(image.astype(np.uint8), table.astype(np.uint8))
    return lut_img
```

Load the image

```
#path = './images/dolphin.jpg'
path = 'g2.jpg'
img = matim.imread(path)
```

Perform required operations

```
@widgets.interact_manual(ksize = (3, 25, 2), sigmaX = (1, 15, 2), gamma = (0, 1, 0.1))
def pencil_art_image(ksize = 21, sigmaX = 9, gamma = 0.1):
    gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
    gray_blur = cv2.GaussianBlur(gray, (ksize, ksize), sigmaX) # ksize =3, to 25 and sigmax 1
    gray_blur_divide = cv2.divide(gray, gray_blur, scale=256)
    pencil_sketch = adjust_gamma(gray_blur_divide, gamma=gamma)

    #display output
    plt.figure(figsize = (15, 8))
    plt.subplot(2,2,1)
    plt.imshow(gray, cmap = 'gray')
    plt.title("Gray Scale Image")
    plt.subplot(2,2,2)
    plt.imshow(gray_blur, cmap = 'gray')
    plt.title("Gaussian Blur")
```

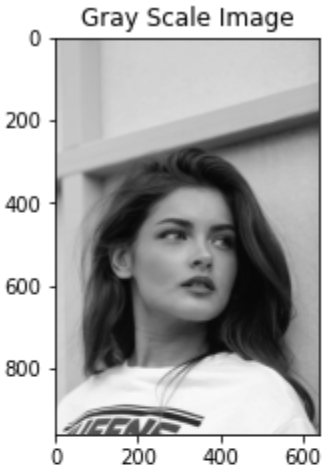
```
plt.title("Gaussian Blur")
plt.subplot(2,2,3)
plt.imshow(gray_blur_divide, cmap = 'gray')
plt.title("Division Image")
plt.subplot(2,2,4)
plt.imshow(pencil_sketch, cmap = 'gray')
plt.title("Pencil Sketch Image")
```

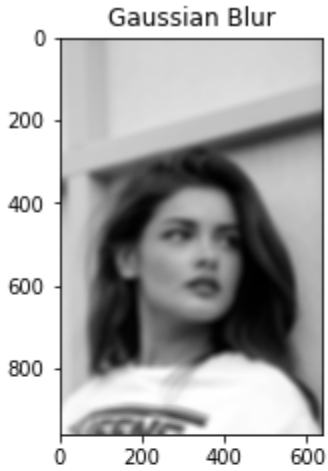
ksize 21

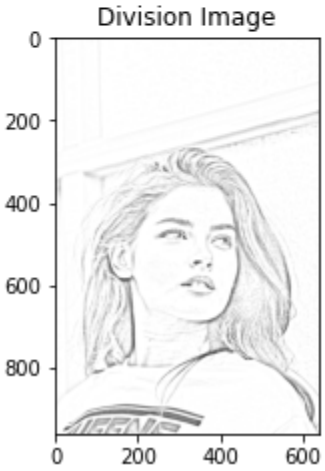
sigmaX 9

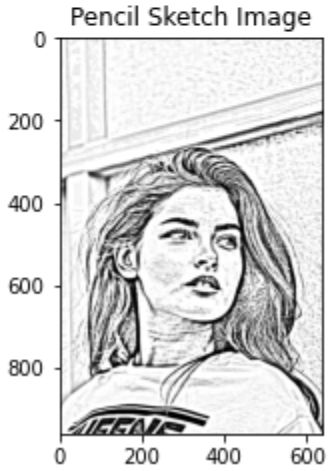
gamma 0.10

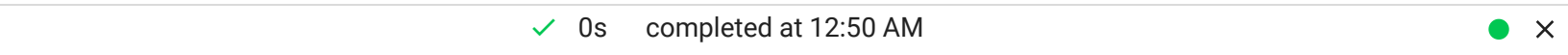
Run Interact







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