Lab9

April 24, 2022

0.1 Lab 9

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0.2 Importing Necessary modules

[1]:
```
import numpy as np
import matplotlib.pyplot as plt
from PIL import Image
import cv2
```

0.3 Objective:

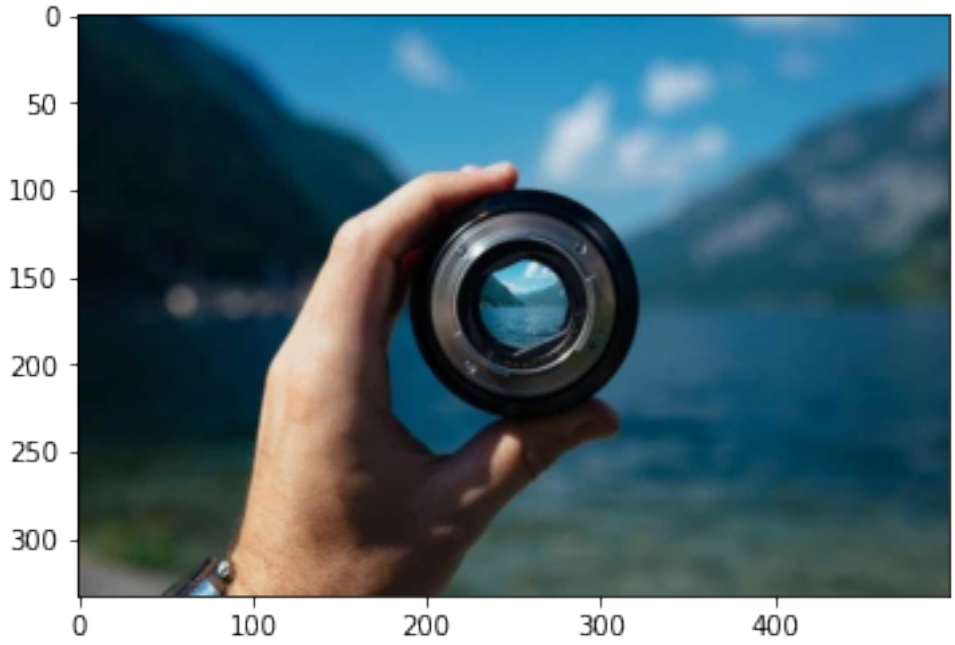
0.3.1 Implement Guassian Filter on a given image

[2]:
```
img = cv2.imread("testImage.jpg")
mask = [[1,2,1],
        [2,4,2],
        [1,2,1]]
rows = img.shape[0]
cols = img.shape[1]
```

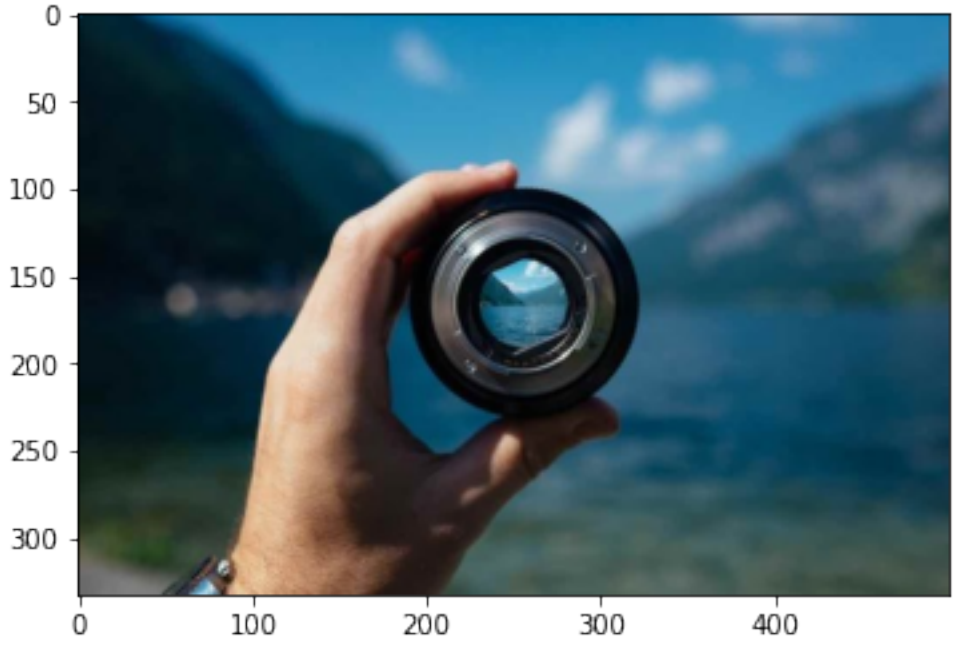
[3]:
```
print("Original Image")
plt.imshow(cv2.cvtColor(img, cv2.COLOR_BGR2RGB))
plt.show()
for i in range(rows):
    for j in range(cols):
        a=int(img[i][j][0])*mask[1][1]
        b=int(img[i][j][1])*mask[1][1]
        c=int(img[i][j][2])*mask[1][1]
        if i>0 and j>0:
            a+=mask[0][0]*int(img[i-1][j-1][0])
            b+=mask[0][0]*int(img[i-1][j-1][1])
            c+=mask[0][0]*int(img[i-1][j-1][2])
        if i>0:
            a+=mask[0][1]*int(img[i-1][j][0])
            b+=mask[0][1]*int(img[i-1][j][1])
            c+=mask[0][1]*int(img[i-1][j][2])
```

```
        if i>0 and j<cols-1:
            a+=mask[0][2]*(img[i-1][j+1][0])
            b+=mask[0][2]*(img[i-1][j+1][1])
            c+=mask[0][2]*(img[i-1][j+1][2])
        if j>0:
            a+=mask[1][0]*int(img[i][j-1][0])
            b+=mask[1][0]*int(img[i][j-1][1])
            c+=mask[1][0]*int(img[i][j-1][2])
        if j<cols-1:
            a+=mask[1][2]*int(img[i][j+1][0])
            b+=mask[1][2]*int(img[i][j+1][1])
            c+=mask[1][2]*int(img[i][j+1][2])
        if i<rows-1 and j>0:
            a+=mask[2][0]*(img[i+1][j-1][0])
            b+=mask[2][0]*(img[i+1][j-1][1])
            c+=mask[2][0]*(img[i+1][j-1][2])
        if i<rows-1:
            a+=mask[2][1]*int(img[i+1][j][0])
            b+=mask[2][1]*int(img[i+1][j][1])
            c+=mask[2][1]*int(img[i+1][j][2])
        if i<rows-1 and j<cols-1:
            a+=mask[2][2]*(img[i+1][j+1][0])
            b+=mask[2][2]*(img[i+1][j+1][1])
            c+=mask[2][2]*(img[i+1][j+1][2])
        sum = 0
        for i in range(3):
            for j in range(3):
                sum+=mask[i][j]
        a = a // sum
        b = b // sum
        c = c // sum
        img[i][j] = [a,b,c]
print("Transformed Image")
plt.imshow(cv2.cvtColor(img, cv2.COLOR_BGR2RGB))
plt.show()
```

```
Original Image
```



Transformed Image



[ ]: