



NUST

COLLEGE OF ELECTRICAL & MECHANICAL ENGINEERING



Digital Image Processing

Lab #4

Submitted by:

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Submitted to:

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Github: [Furqan3/Digital-Image-Processing \(github.com\)](https://github.com/Furqan3/Digital-Image-Processing)

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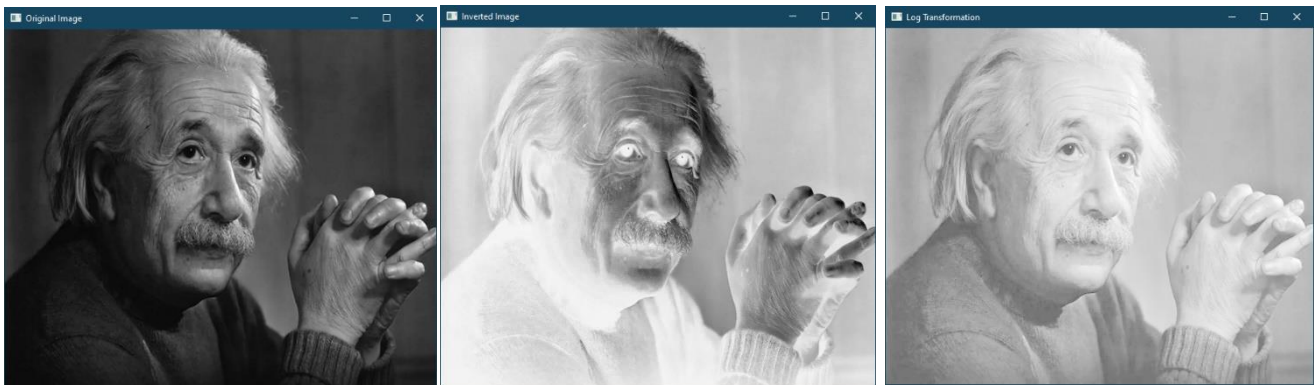
1 CODE:

```
import cv2 as cv
import numpy as np
image=cv.imread('sample.png',0)
image= cv.resize(image,(int(600),int(500)))
cv.imshow('Original Image',image)

image2=np.array(255-image)
cv.imshow('Inverted Image',image2)

c=255/(np.log(1+np.max(image)))
image3=np.array(c*np.log(image+1))
image3=np.array(image3,np.uint8)
cv.imshow('Log Transformation',image3)
cv.waitKey()
```

OUTPUT:



Original Image

Inverted Image

Log Transformation

2 CODE:

```
import cv2 as cv
import numpy as np
import copy

image=cv.imread('sample.png',0)
image= cv.resize(image,(int(600),int(500)))
cv.imshow('Original Image',image)
image1=copy.copy(image)
image2=copy.copy(image)
image3=copy.copy(image)
mean=np.mean(image)
image1[image>mean]=255
image1[image<mean]=0
cv.imshow('1',image1)
```

```

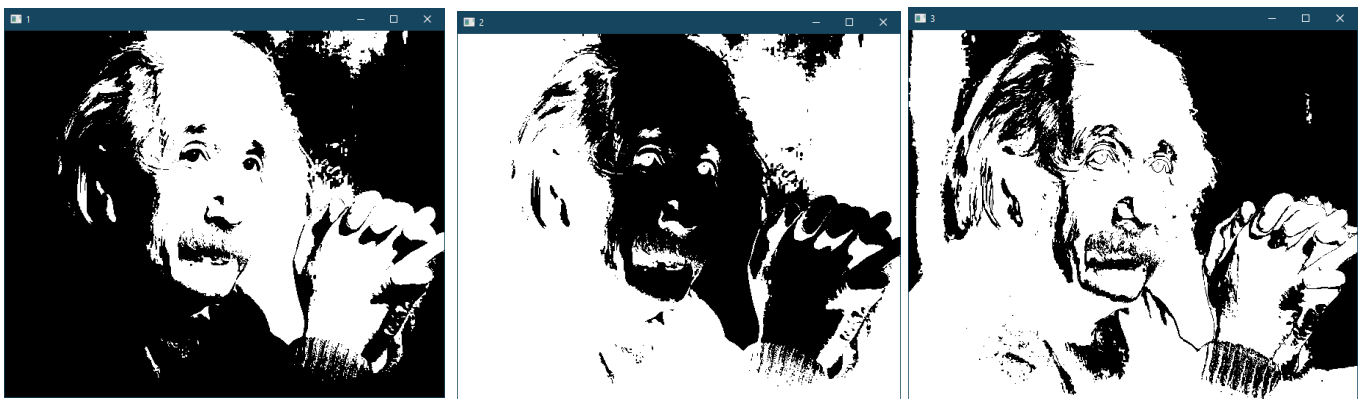
image2[image>mean]=0
image2[image<mean]=255
cv.imshow('2',image2)

for i in range(500):
    for j in range(600):
        if image[i][j]>(mean-20) and image[i][j]<(mean+20):
            image3[i][j]=0
        else:
            image3[i][j]=255

cv.imshow('3',image3)
cv.waitKey()

```

OUTPUT:



3 CODE:

```

import cv2 as cv
import numpy as np
import copy

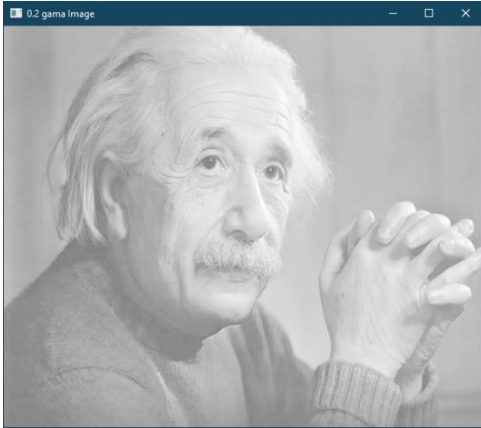
def gama(image,g):
    image=np.divide(image,255)
    gimage=255*(np.power(image,g))
    return np.array(gimage,np.uint8)

image=cv.imread('sample.png',0)
image= cv.resize(image,(int(600),int(500)))
cv.imshow('Original Image',image)
cv.imshow('0.2 gama Image',gama(image,.2))
cv.imshow('0.5 gama Image',gama(image,.5))
cv.imshow('1.2 gama Image',gama(image,1.2))

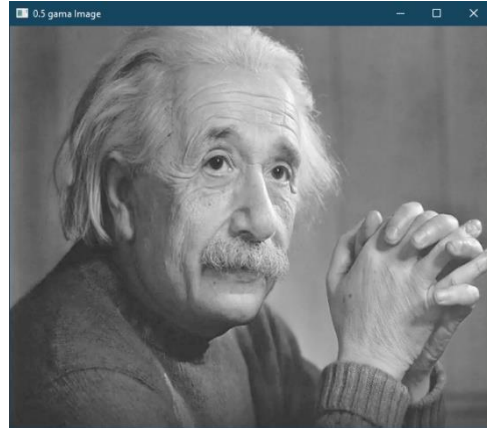
```

```
cv.imshow('1.8 gama Image',gama(image,1.8))
cv.waitKey()
```

OUTPUT:



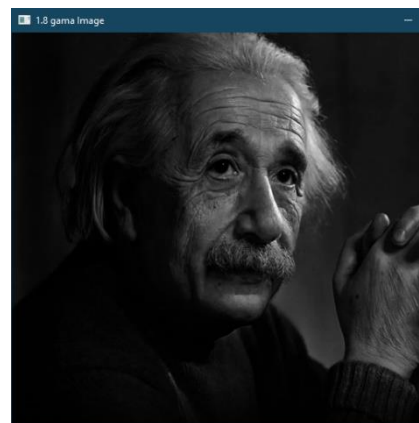
Gamma=0.2



Gamma=0.5



Gamma=1.2



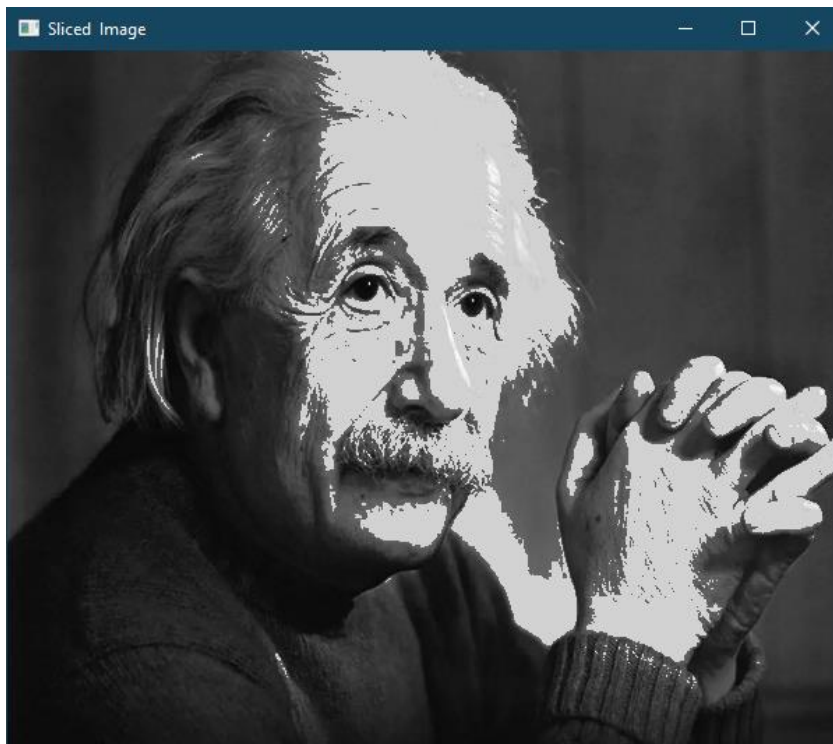
Gamma=1.8

4 CODE:

```
import cv2 as cv
import numpy as np
import copy

image=cv.imread('sample.png',0)
image= cv.resize(image,(int(600),int(500)))
cv.imshow('Original Image',image)
image2=copy.copy(image)
for i in range(500):
    for j in range(600):
        if image[i][j]>100 and image[i][j]<200:
            image2[i][j]=210
cv.imshow('Sliced Image',image2)
cv.waitKey()
```

OUTPUT:



5 CODE:

```
import cv2 as cv
import numpy as np
import copy
import matplotlib.pyplot as plt

image=cv.imread('sample.png',0)
image= cv.resize(image,(int(600),int(500)))
histogram=np.array(range(0,256),np.uint32)*0
for i in range(image.shape[0]):
    for j in range(image.shape[1]):
        histogram[image[i][j]]=histogram[image[i][j]]+1
x=np.array(range(0,256),np.uint8)
print(np.sum(histogram),' ',image.shape,' ',np.size(image))

plt.plot(x,histogram)
plt.show()
```

OUTPUT:

