

Name - Bolonghe B.P.M

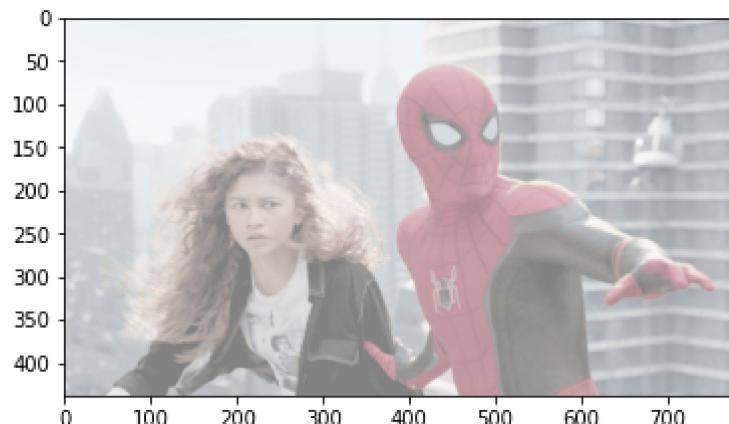
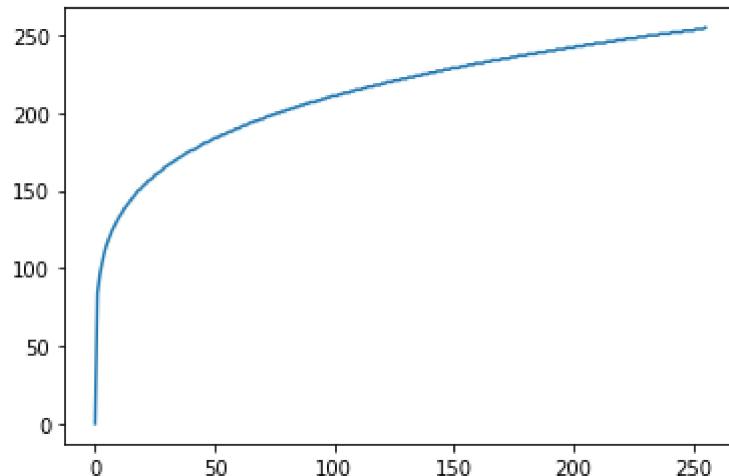
Index No - 190095C

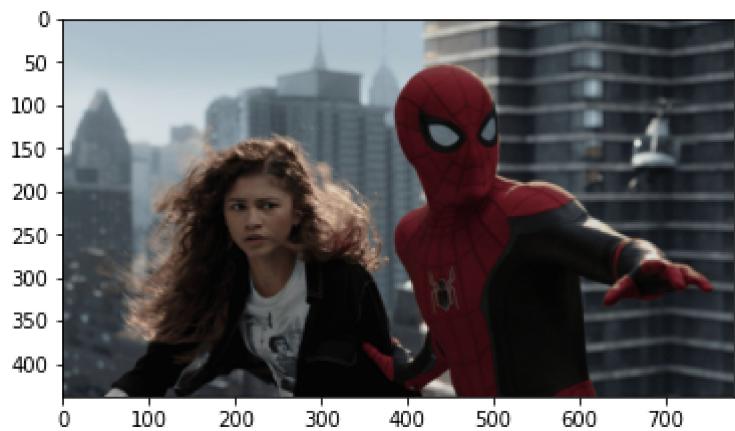
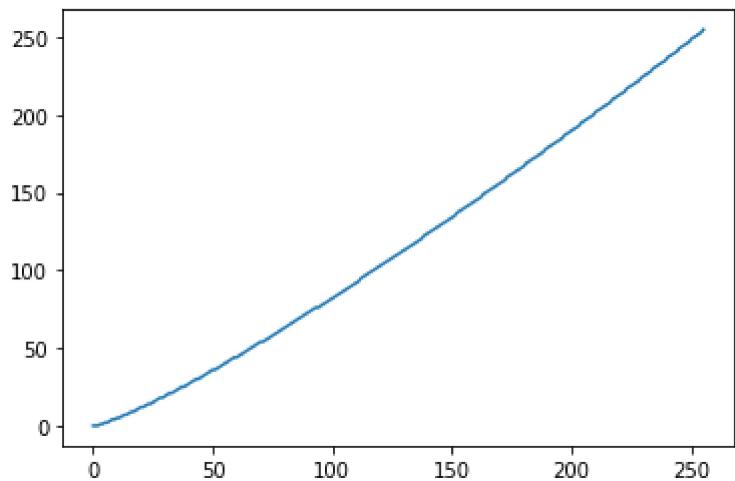
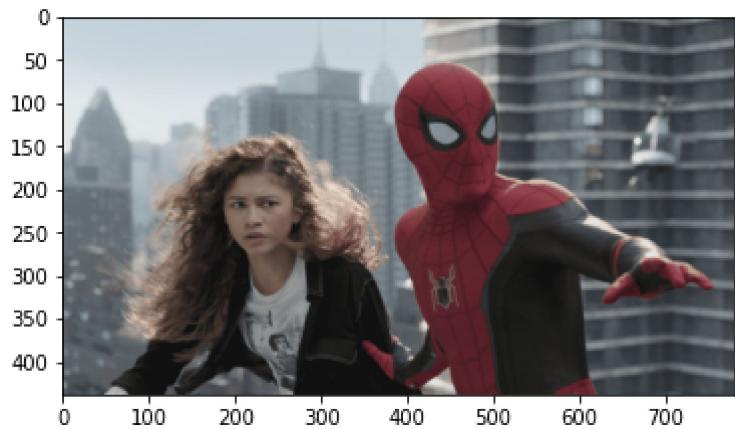
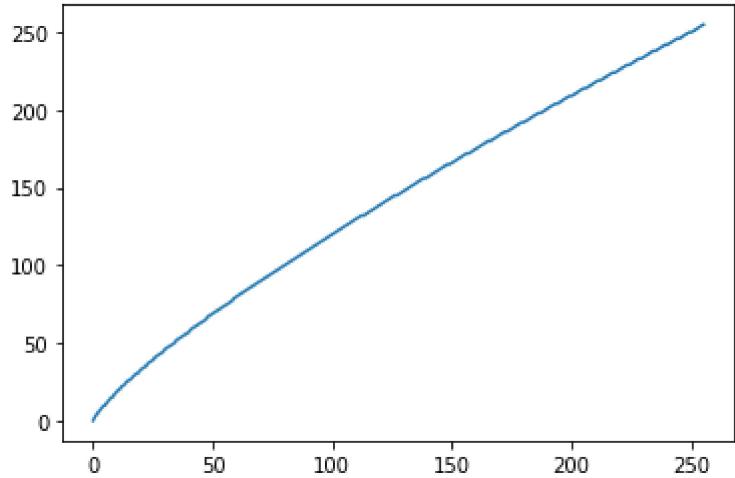
```
In [47]: import numpy as np
import matplotlib.pyplot as plt
import cv2 as cv
```

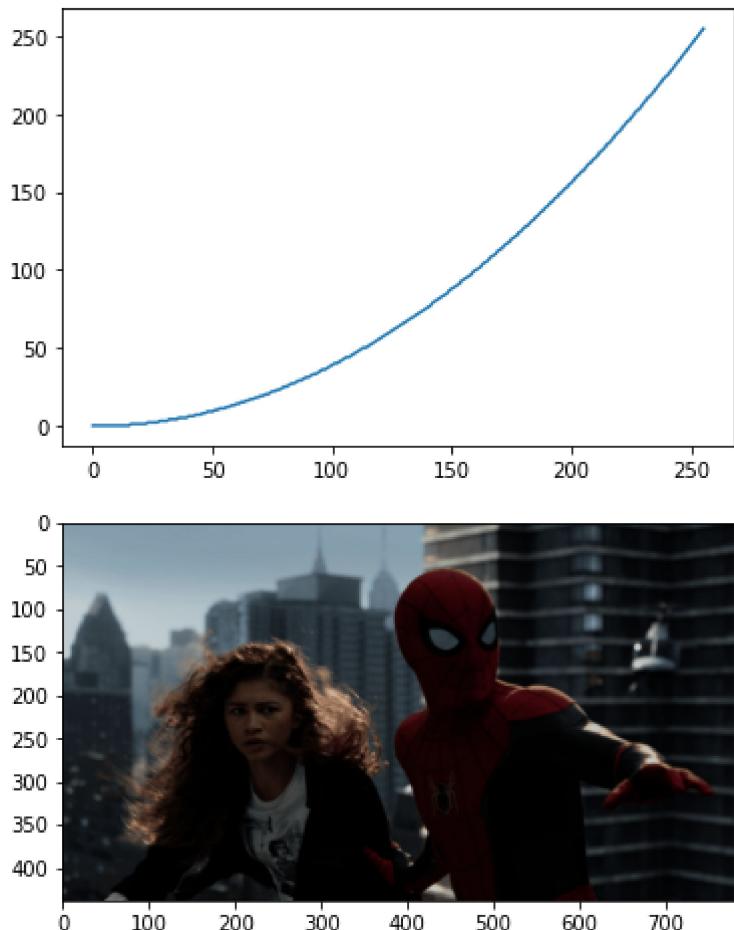
```
In [48]: f = cv.imread(r'spider.png')
assert f is not None
gamma = [0.2,0.8,1.2,2]
for item in gamma:
    t = np.array([(p/255)**item*255 for p in range(0,256)]).astype(np.uint8)
    g = cv.LUT(f, t)

    fig, ax = plt.subplots()
    ax.plot(t)

#cv.namedWindow('Image',cv.WINDOW_AUTOSIZE)
fig, ax = plt.subplots(1,1)
#cv.waitKey(0)
plt.imshow(cv.cvtColor(g, cv.COLOR_BGR2RGB,2))
#cv.waitKey(0)
#cv.destroyAllWindows()
```

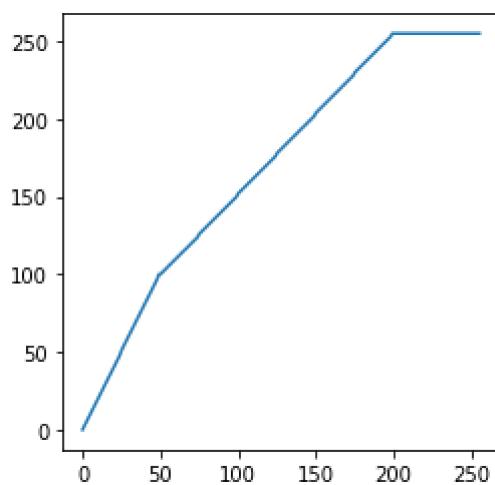






```
In [49]: t1 = np.linspace(0,100,50, endpoint = True)
t2 = np.linspace(100,255,150, endpoint = True)
t3 = np.array([255 for p in range(200,256)])

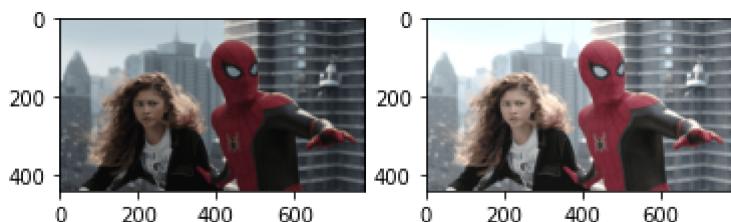
t = np.concatenate((t1, t2, t3), axis = 0).astype(np.uint8)
fig, ax = plt.subplots()
ax.plot(t)
ax.set_aspect('equal')
assert len(t) == 256
```



```
In [50]: g = cv.LUT(f, t)
plt.subplot(1,2,1)
plt.imshow(cv.cvtColor(f, cv.COLOR_BGR2RGB))

plt.subplot(1,2,2)
plt.imshow(cv.cvtColor(g, cv.COLOR_BGR2RGB))
```

Out[50]: <matplotlib.image.AxesImage at 0x2a71afb6b90>



In [51]:

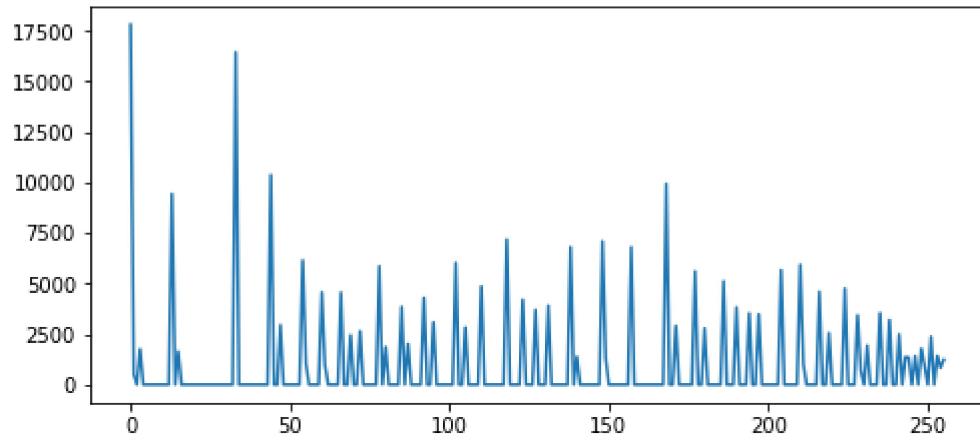
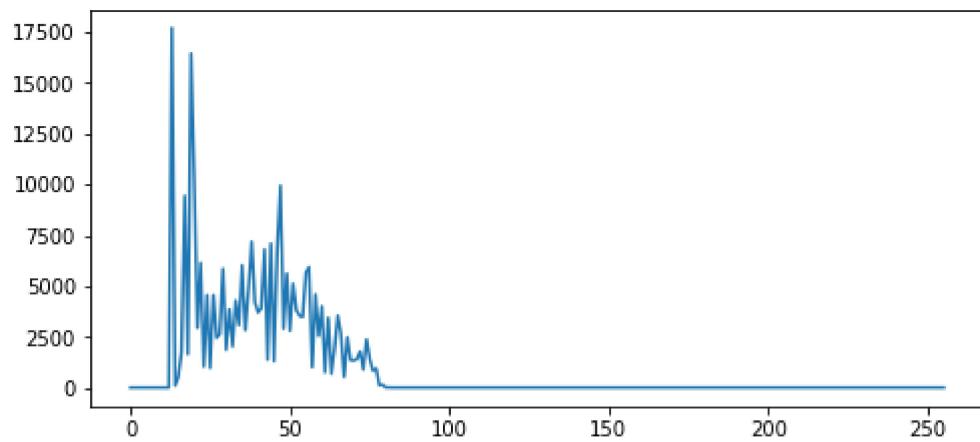
```
f = cv.imread(r'shells.tif',cv.IMREAD_GRAYSCALE)
assert f is not None
```

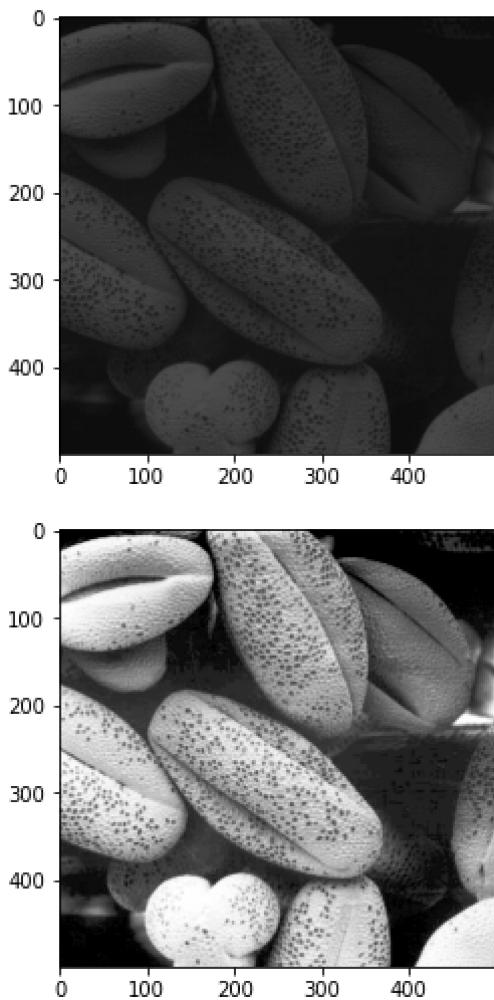
```
hist_f = cv.calcHist([f],[0],None,[256],[0,256])
g = cv.equalizeHist(f)
hist_g= cv.calcHist([g],[0],None,[256],[0,256])

fig, ax = plt.subplots(2,1,figsize=(8,8))
ax[0].plot(hist_f)
ax[1].plot(hist_g)

fig, ax = plt.subplots(1,1)
plt.imshow(cv.cvtColor(f, cv.COLOR_BGR2RGB))
fig, ax = plt.subplots(1,1)
plt.imshow(cv.cvtColor(g, cv.COLOR_BGR2RGB))
```

Out[51]: <matplotlib.image.AxesImage at 0x2a71a8dcb20>





```
In [52]: im = cv.imread(r"zion_pass.jpg")
assert im is not None

hsv = cv.cvtColor(im, cv.COLOR_BGR2HSV)
sat = hsv.copy()
value = 70
sat[:, :, 1] = hsv[:, :, 1] + value
sat = np.clip(sat, 0, 255)

im = cv.cvtColor(im, cv.COLOR_BGR2RGB)
sat_im = cv.cvtColor(sat, cv.COLOR_HSV2RGB)

fig, axe = plt.subplots(1,2, figsize=(12,12))
axe[0].imshow(im)
axe[0].set_title("Original")
axe[1].imshow(sat_im)
axe[1].set_title("Saturated")

hue_im = hsv.copy()
value = 30
hue_im[:, :, 0] = hue_im[:, :, 0] + value
hue_im = np.clip(hue_im, 0, 255)

hue_im = cv.cvtColor(hue_im, cv.COLOR_HSV2RGB)

fig, axe = plt.subplots(1,2, figsize=(12,12))
axe[0].imshow(im)
axe[0].set_title("Original")
axe[1].imshow(hue_im)
axe[1].set_title("Increased Hue")
```

Out[52]: Text(0.5, 1.0, 'Increased Hue')

