CAESAR NOOR S.A.

1207070025

PCD

Praktikum 6

HISTOGRAM

Praktikum6 Histogram.ipynb

RAM
Disk

Caesar Noor 1207070025

Histogram

```
[17] # meng import library
     import numpy  as  np
     import imageio
     import matplotlib.pyplot  as  plt
```

```
[18] # memasukkan dan membaca variable gamb
     img = imageio.imread("Arlon.png")
```

```
<ipython-input-18-223d2301bbf6>:2:
  img = imageio.imread("Arlon.png")
```

```
[4] # menetepkan bentuk gambar
    img_height = img.shape[0]
    img_width = img.shape[1]
    img_channel = img.shape[2]
```

```
[19] # rumus merubah gambar menjadi graysca
     img_grayscale = np.zeros(img.shape, dt

     for y in range(0, img_height):
         for x in range(0, img_width):
             red = img[y][x][0]
             green = img[y][x][1]
             blue = img[y][x][2]
             gray = (int(red) + int(green)
             img_grayscale[y][x] = (gray, g

     # menampilkan gambar grayscale
```

Praktikum6 Histogram.ipynb

RAM
Disk

```
[19] # rumus merubah gambar menjadi graysca
     img_grayscale = np.zeros(img.shape, dt

     for y in range(0, img_height):
         for x in range(0, img_width):
             red = img[y][x][0]
             green = img[y][x][1]
             blue = img[y][x][2]
             gray = (int(red) + int(green)
             img_grayscale[y][x] = (gray, g

     # menampilkan gambar grayscale
     plt.imshow(img_grayscale)
     plt.title("Grayscale")
     plt.show()
```

```
---------------------------------
---------------------------------
-----
ValueError
Traceback (most recent call last)
<ipython-input-19-754c8f7dafa7> in
<cell line: 4>()
      8             blue = img[y][x][2]
      9             gray = (int(red) +
int(green) + int(blue)) / 3
---> 10             img_grayscale[y][x]
= (gray, gray, gray)
     11
     12 plt.imshow(img_grayscale)

ValueError: could not broadcast
input array from shape (3,) into
shape (4,)
```

SEARCH STACK OVERFLOW

Praktikum6 Histogram.ipynb

RAM Disk

Menampilkan Histogram Gambar Grayscale

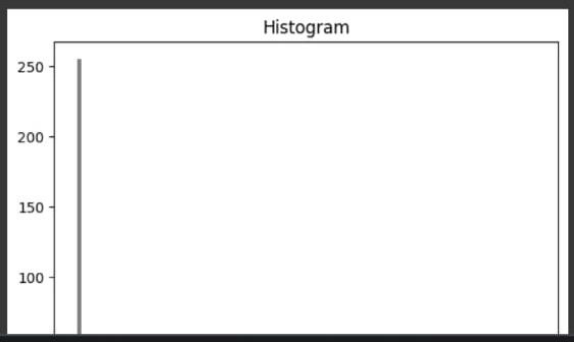
```
[22] # membuat histogram gambar grayscale
     hg = np.zeros((256))
```

```
[24] # nilai array hg diisi dengan nilai 0
     for x in range(0, 256):
         hg[x] = 0
```

```
[26] # menghitung nilai dari gambar graysca
     for y in range(0, img_height):
         for x in range(0, img_width):
             gray = img_grayscale[y][x][0]
             hg[gray] += 1
```

```
[32] # plt.figure(figsize=(20, 6))
     # plt.plot(hg, color="black", linewidt
     # plt.show()

     # menampilkan histogram yg dibuat warr
     bins = np.linspace(0, 256, 100)
     plt.hist(hg, bins, color="black", alpl
     plt.title("Histogram")
     plt.show()
```

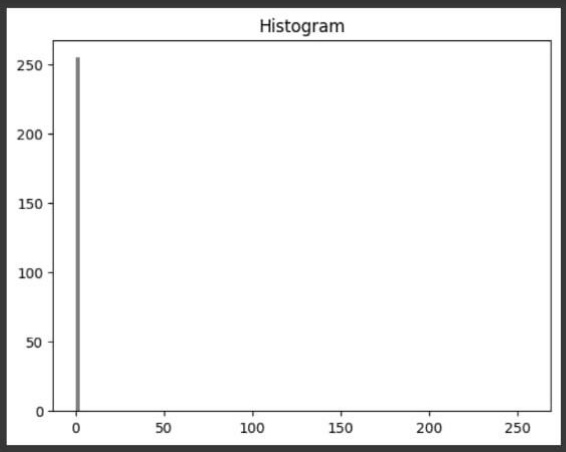
0 d



Praktikum6 Histogram.ipynb

RAM Disk

[32] 0 d



Menampilkan Histogram Gambar RGB

```
[30] # variable untuk menyimpan gambar
     hgr = np.zeros((256))
     hgg = np.zeros((256))
     hgb = np.zeros((256))
     hgrgb = np.zeros((768))
```

```
[33] # mengisi nilai hg dengan nilai 0
     for x in range(0, 256):
         hgr[x] = 0 # hg red
         hgg[x] = 0 # hg green
         hgb[x] = 0 # hg bkue

     for x in range(0, 768):
         hgrgb[x] = 0 #hg red, green, blue
```

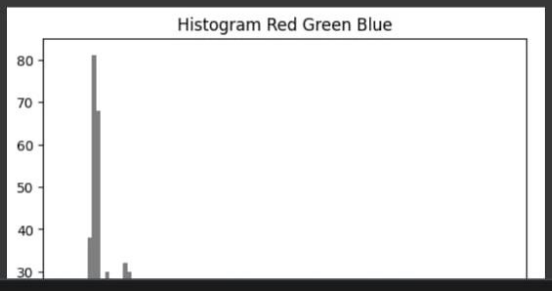
```
[34] # menghitung nilai dari gambar
     for x in range(0, 256):
         hgr[x] = 0
```

8 d

Praktikum6 Histogram.ipynb

RAM
Disk

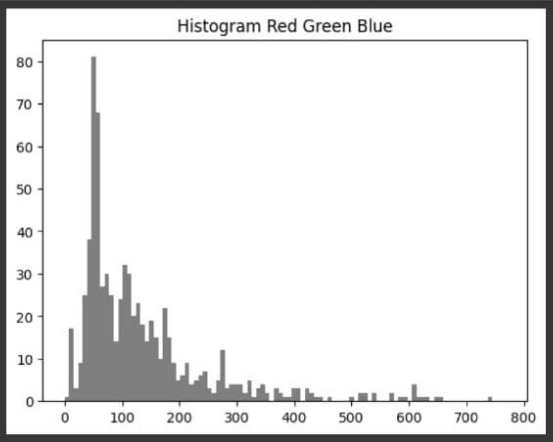
```
[34] # menghitung nilai dari gambar
     for x in range(0, 256):
         hgr[x] = 0
         hgg[x] = 0
         hgb[x] = 0

     for x in range(0, 768):
         hgrgb[x] = 0

     # th = int(256/64)
     temp = [0]
     for y in range(0, img.shape[0]):
         for x in range(0, img.shape[1]):
             red = int(img[y][x][0])
             green = int(img[y][x][1])
             blue = int(img[y][x][2])
             green = green + 256
             blue = blue + 512
     #         temp.append(green)
             hgrgb[red] += 1
             hgrgb[green] += 1
             hgrgb[blue] += 1

     # menampilkan histogram gambar rgb der
     binsrgb = np.linspace(0, 768, 100)
     plt.hist(hgrgb, binsrgb, color="black'
     # plt.plot(hgrgb)
     plt.title("Histogram Red Green Blue")
     plt.show()
```



Praktikum6 Histogram.ipynb

RAM
Disk

[34]



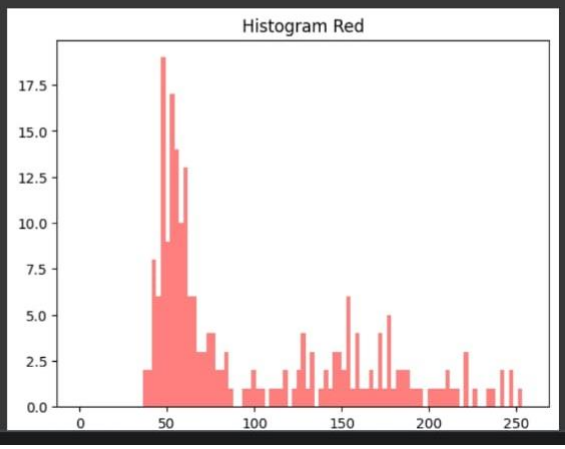

```
[35] # menampilkan histogram gambar rgb
     for y in range(0, img_height):
         for x in range(0, img_width):
             red = img[y][x][0]
             green = img[y][x][1]
             blue = img[y][x][2]
             hgr[red] += 1
             hgg[green] += 1
             hgb[blue] += 1
     # menampilkan histogram bagian warna m
     bins = np.linspace(0, 256, 100)
     plt.hist(hgr, bins, color="red", alpha
     plt.title("Histogram Red")
     plt.show()

     # menampilkan histogram bagian warna h
     plt.hist(hgg, bins, color="green", alp
     plt.title("Histogram Green")
     plt.show()

     # menampilkan histogram bagian warna b
     plt.hist(hgb, bins, color="blue", alph
     plt.title("Histogram Blue")
```

Praktikum6 Histogram.ipynb

RAM
Disk

[35]
8 d

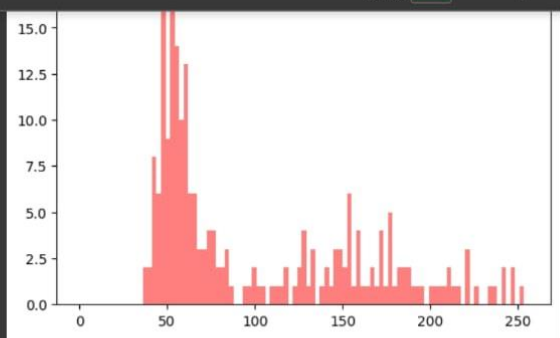
```
# menampilkan histogram gambar rgb
for y in range(0, img_height):
    for x in range(0, img_width):
        red = img[y][x][0]
        green = img[y][x][1]
        blue = img[y][x][2]
        hgr[red] += 1
        hgg[green] += 1
        hgb[blue] += 1
# menampilkan histogram bagian warna m
bins = np.linspace(0, 256, 100)
plt.hist(hgr, bins, color="red", alpha
plt.title("Histogram Red")
plt.show()

# menampilkan histogram bagian warna h
plt.hist(hgg, bins, color="green", alp
plt.title("Histogram Green")
plt.show()

# menampilkan histogram bagian warna b
plt.hist(hgb, bins, color="blue", alph
plt.title("Histogram Blue")
plt.show()
```

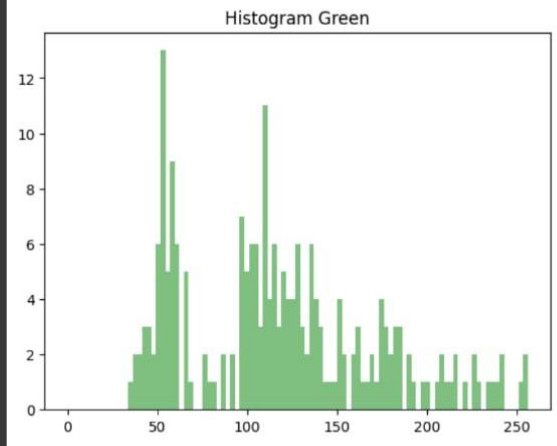


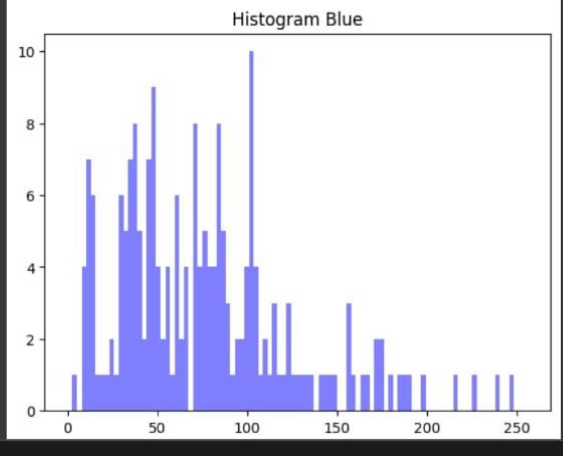
Praktikum6 Histogram.ipynb

RAM
Disk

[35]
8 d





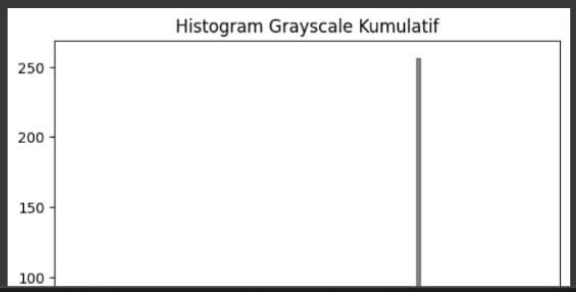


Praktikum6 Histogram.ipynb

RAM Disk

Menampilkan Histogram Kumulatif

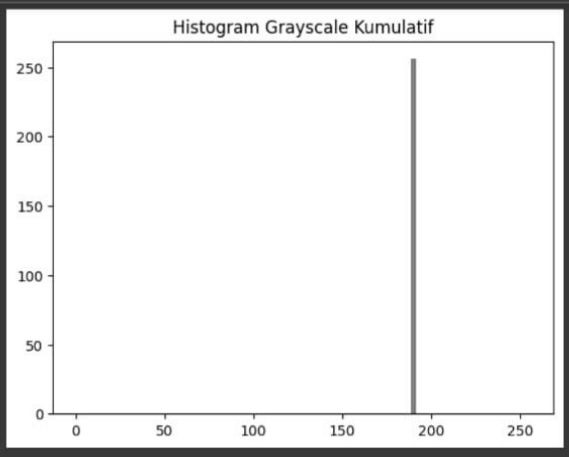
```
[36]# menghitung nilai kumulatif
    hgk = np.zeros((256))
    c = np.zeros((256))

    for x in range(0, 256):
        hgk[x] = 0
        c[x] = 0

    for y in range(0, img_height):
        for x in range(0, img_width):
            gray = img_grayscale[y][x][0]
            hgk[gray] += 1

    c[0] = hgk[0]
    for x in range(1, 256):
         c[x] = c[x-1] + hgk[x]

    hmaxk = c[255]

    for x in range(0, 256):
        c[x] = 190 * c[x] / hmaxk

    # menampilkan Histogram dengan warna h
    plt.hist(c, bins, color="black", alpha
    plt.title("Histogram Grayscale Kumulat
    plt.show()
```



Praktikum6 Histogram.ipynb

RAM Disk

[36]



Menampilkan Histogram Hequalisasi

2 d

```
# menghitung nilai hequalisasi
hgh = np.zeros((256))
h = np.zeros((256))
c = np.zeros((256))

for x in range(0, 256):
    hgh[x] = 0
    h[x] = 0
    c[x] = 0

for y in range(0, img_height):
    for x in range(0, img_width):
        gray = img_grayscale[y][x][0]
        hgh[gray] += 1

h[0] = hgh[0]
for x in range(1, 256):
     h[x] = h[x-1] + hgh[x]

for x in range(0, 256):
```

Praktikum6 Histogram.ipynb

RAM
Disk

Menampilkan Histogram Hequalisasi

2 d

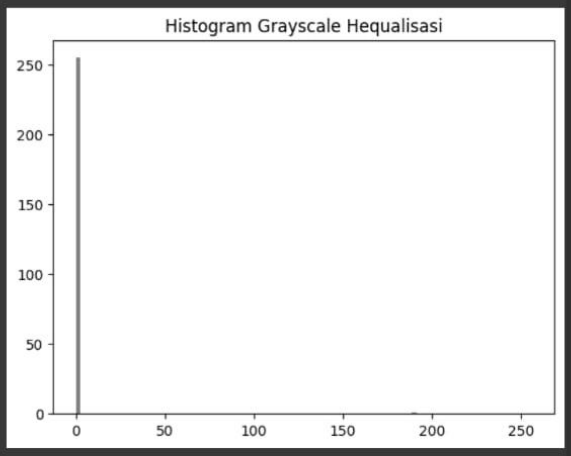
```
# menghitung nilai hequalisasi
hgh = np.zeros((256))
h = np.zeros((256))
c = np.zeros((256))

for x in range(0, 256):
    hgh[x] = 0
    h[x] = 0
    c[x] = 0

for y in range(0, img_height):
    for x in range(0, img_width):
        gray = img_grayscale[y][x][0]
        hgh[gray] += 1

h[0] = hgh[0]
for x in range(1, 256):
     h[x] = h[x-1] + hgh[x]

for x in range(0, 256):
     h[x] = h[x] / img_height / img_wi

for x in range(0, 256):
    hgh[x] = 0

for y in range(0, img_height):
    for x in range(0, img_width):
        gray = img_grayscale[y][x][0]
        gray = h[gray] * 255
        hgh[int(gray)] += 1

c[0] = hgh[0]
for x in range(1, 256):
     c[x] = c[x-1] + hgh[x]

hmaxk = c[255]
```

Praktikum6 Histogram.ipynb

RAM
Disk

2 d

```
for x in rang
    hgh[x] = 0

for y in range(0, img_height):
    for x in range(0, img_width):
        gray = img_grayscale[y][x][0]
        gray = h[gray] * 255
        hgh[int(gray)] += 1

c[0] = hgh[0]
for x in range(1, 256):
     c[x] = c[x-1] + hgh[x]

hmaxk = c[255]

for x in range(0, 256):
    c[x] = 190 * c[x] / hmaxk

# menampilkan Histogram hequalisasi de
plt.hist(c, bins, color="black", alpha
plt.title("Histogram Grayscale Hequali
plt.show()
```



FLIP GAMBAR

Praktikum6 Flip Gambar.ipy...

RAM
Disk

Caesar Noor 1207070025

0 d
```
[11] # import library
     import numpy as np
     import imageio
     import matplotlib.pyplot as plt
```

0 d
```
[10] # memasukkan dan membaca gambar yg dip
     img = imageio.imread("Tf.png")
```

```
<ipython-input-10-c73bb538e940>:2:
  img = imageio.imread("Tf.png")
```

0 d
```
[9] # memberikan bentuk, resolusi, dan typ
    img_height = img.shape[0]
    img_width = img.shape[1]
    img_channel = img.shape[2]
    img_type = img.dtype
```

0 d
```
[12] # memberikan fungsi variable untuk fli
     img_flip_horizontal = np.zeros(img.sha
     img_flip_vertical = np.zeros(img.shape
```

25 d
```
[14] # perhitungan flip gambar horizontal
     for y in range(0, img_height):
         for x in range(0, img_width):
             for c in range(0, img_channel)
                 img_flip_horizontal[y][x][
```

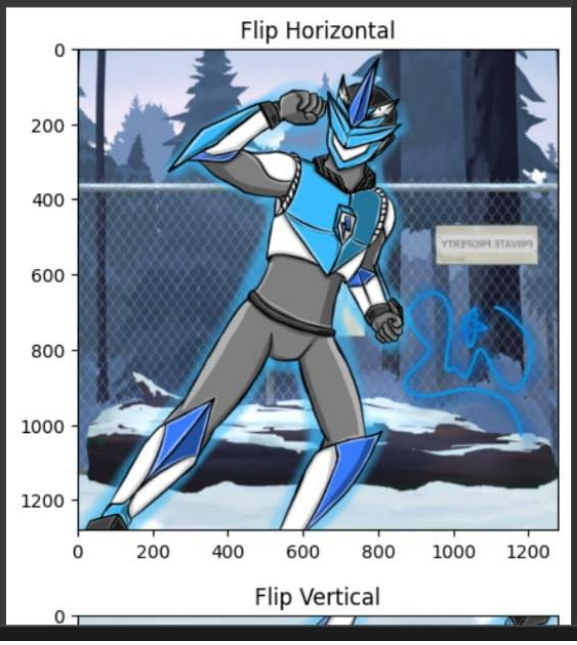
29 d
```
[15] # perhitungan flip gambar vertikal
     for y in range(0, img_height):
         for x in range(0, img_width):
```

Praktikum6 Flip Gambar.ipy...

RAM
Disk

29 d
```
[15] # perhitungan flip gambar vertikal
     for y in range(0, img_height):
         for x in range(0, img_width):
             for c in range(0, img_channel)
                 img_flip_vertical[y][x][c]
```

6 d
```
# menampilkan hasil gambar yg telah di

# flip horizontal
plt.imshow(img_flip_horizontal)
plt.title("Flip Horizontal")
plt.show()

# flip vertical
plt.imshow(img_flip_vertical)
plt.title("Flip Vertical")
plt.show()
```

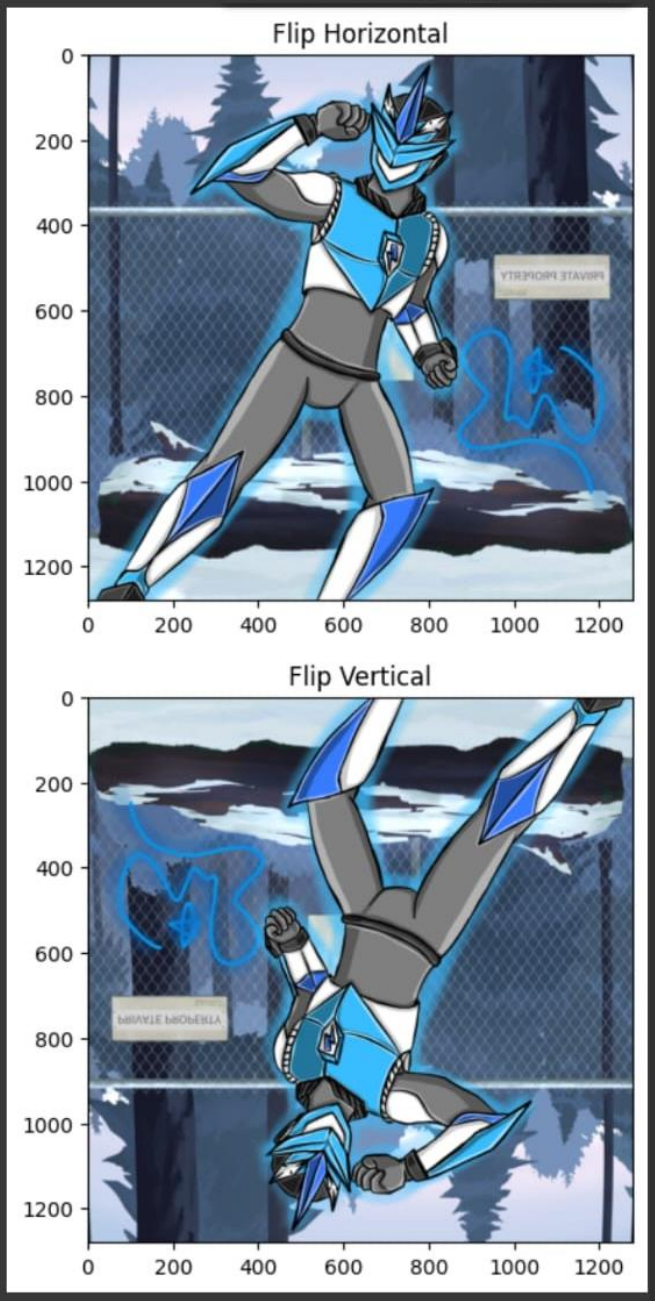


Praktikum6 Flip Gambar.ipy...

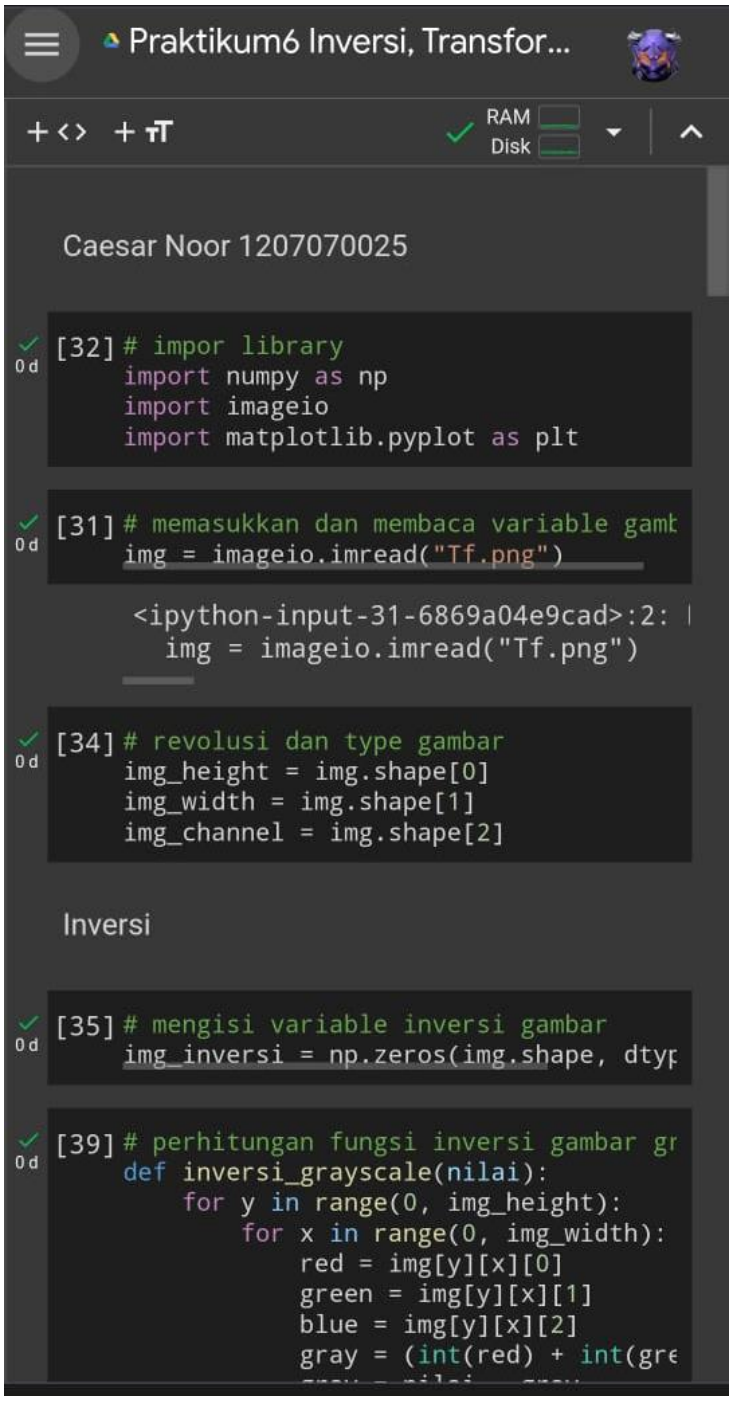
RAM
Disk

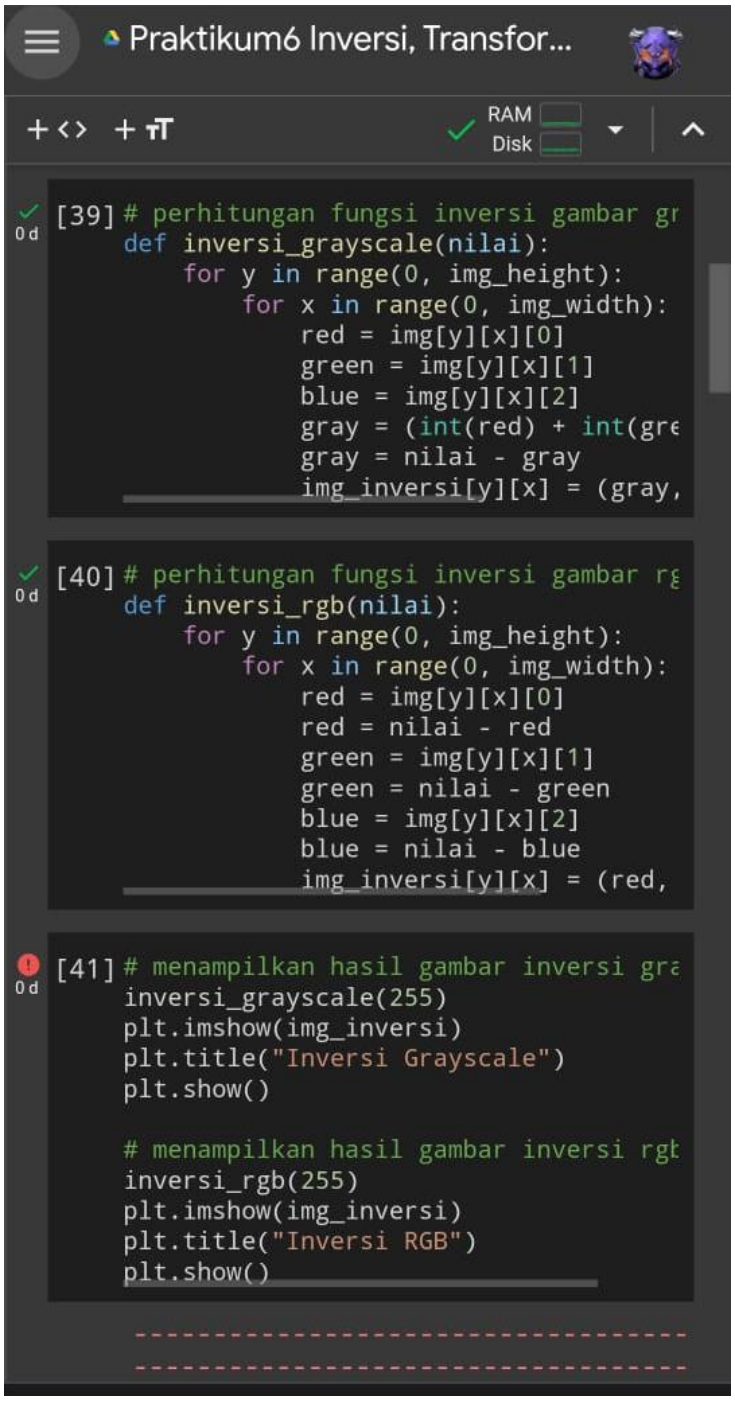
```
plt.show()
```

6 d



INVERSI


Praktikum6 Inversi, Transfor...
RAM
Disk
Caesar Noor 1207070025
[32] # impor library
import numpy as np
import imageio
import matplotlib.pyplot as plt
[31] # memasukkan dan membaca variable gamb
img = imageio.imread("Tf.png")
<ipython-input-31-6869a04e9cad>:2:
img = imageio.imread("Tf.png")
[34] # revolusi dan type gambar
img_height = img.shape[0]
img_width = img.shape[1]
img_channel = img.shape[2]
Inversi
[35] # mengisi variable inversi gambar
img_inversi = np.zeros(img.shape, dtyp
[39] # perhitungan fungsi inversi gambar gr
def inversi_grayscale(nilai):
for y in range(0, img_height):
for x in range(0, img_width):
red = img[y][x][0]
green = img[y][x][1]
blue = img[y][x][2]
gray = (int(red) + int(gre


Praktikum6 Inversi, Transfor...
RAM
Disk
[39] # perhitungan fungsi inversi gambar gr
def inversi_grayscale(nilai):
for y in range(0, img_height):
for x in range(0, img_width):
red = img[y][x][0]
green = img[y][x][1]
blue = img[y][x][2]
gray = (int(red) + int(gre
gray = nilai - gray
img_inversi[y][x] = (gray,
[40] # perhitungan fungsi inversi gambar rg
def inversi_rgb(nilai):
for y in range(0, img_height):
for x in range(0, img_width):
red = img[y][x][0]
red = nilai - red
green = img[y][x][1]
green = nilai - green
blue = img[y][x][2]
blue = nilai - blue
img_inversi[y][x] = (red,
[41] # menampilkan hasil gambar inversi gra
inversi_grayscale(255)
plt.imshow(img_inversi)
plt.title("Inversi Grayscale")
plt.show()
# menampilkan hasil gambar inversi rgb
inversi_rgb(255)
plt.imshow(img_inversi)
plt.title("Inversi RGB")
plt.show()

Praktikum6 Inversi, Transfor...

RAM
Disk

```
[41] # menampilkan hasil gambar inversi gra
     inversi_grayscale(255)
     plt.imshow(img_inversi)
     plt.title("Inversi Grayscale")
     plt.show()

     # menampilkan hasil gambar inversi rgb
     inversi_rgb(255)
     plt.imshow(img_inversi)
     plt.title("Inversi RGB")
     plt.show()
```

```
---------------------------------------------------------------------
ValueError
Traceback (most recent call last)
<ipython-input-41-4473ad828b45> in <cell line: 2>()
      1 # menampilkan hasil gambar inversi grayscale
----> 2 inversi_grayscale(255)
      3 plt.imshow(img_inversi)
      4 plt.title("Inversi Grayscale")
      5 plt.show()

<ipython-input-39-21c6c96f4317> in inversi_grayscale(nilai)
      8             gray = (int(red) + int(green) + int(blue)) / 3
      9             gray = nilai - gray
---> 10             img_inversi[y][x] = (gray, gray, gray)
```

Praktikum6 Inversi, Transfor...

RAM
Disk

```
[41]          8             gray = (int(red) + int(green) + int(blue)) / 3
              9             gray = nilai - gray
---> 10             img_inversi[y][x] = (gray, gray, gray)

ValueError: could not broadcast input array from shape (3,) into shape (4,)
```

SEARCH STACK OVERFLOW

Log

```
[43] # mengisi variable Log gambar
     img_log = np.zeros(img.shape, dtype=np
```

```
[44] # perhitungan fungsi log gambar graysc
     def log(c):
         for y in range(0, img_height):
             for x in range(0, img_width):
                 red = img[y][x][0]
                 green = img[y][x][1]
                 blue = img[y][x][2]
                 gray = (int(red) + int(gre
                 gray = int(c * np.log(gray
                 if gray > 255:
                     gray = 255
                 if gray < 0:
                     gray = 0
                 img_log[y][x] = (gray, gra
```

Praktikum6 Inversi, Transfor...

RAM
Disk

```
[45] enampilkan hasil gambar log grayscale
     (30)
     .imshow(img_log)
     .title("Log")
     .show()
```

```
---------------------------------
---------------------------------
-----
ValueError
Traceback (most recent call last)
<ipython-input-45-6c947b4de5b2> in
<cell line: 2>()
      1 # menampilkan hasil gambar
log grayscale
----> 2 log(30)
      3 plt.imshow(img_log)
      4 plt.title("Log")
      5 plt.show()

<ipython-input-44-94b2f48688da> in
log(c)
     12                 if gray < 0:
     13                     gray = 0
---> 14                 img_log[y][x] =
(gray, gray, gray)

ValueError: could not broadcast
input array from shape (3,) into
shape (4,)
```

SEARCH STACK OVERFLOW

Inversi & log

Praktikum6 Inversi, Transfor...

RAM
Disk

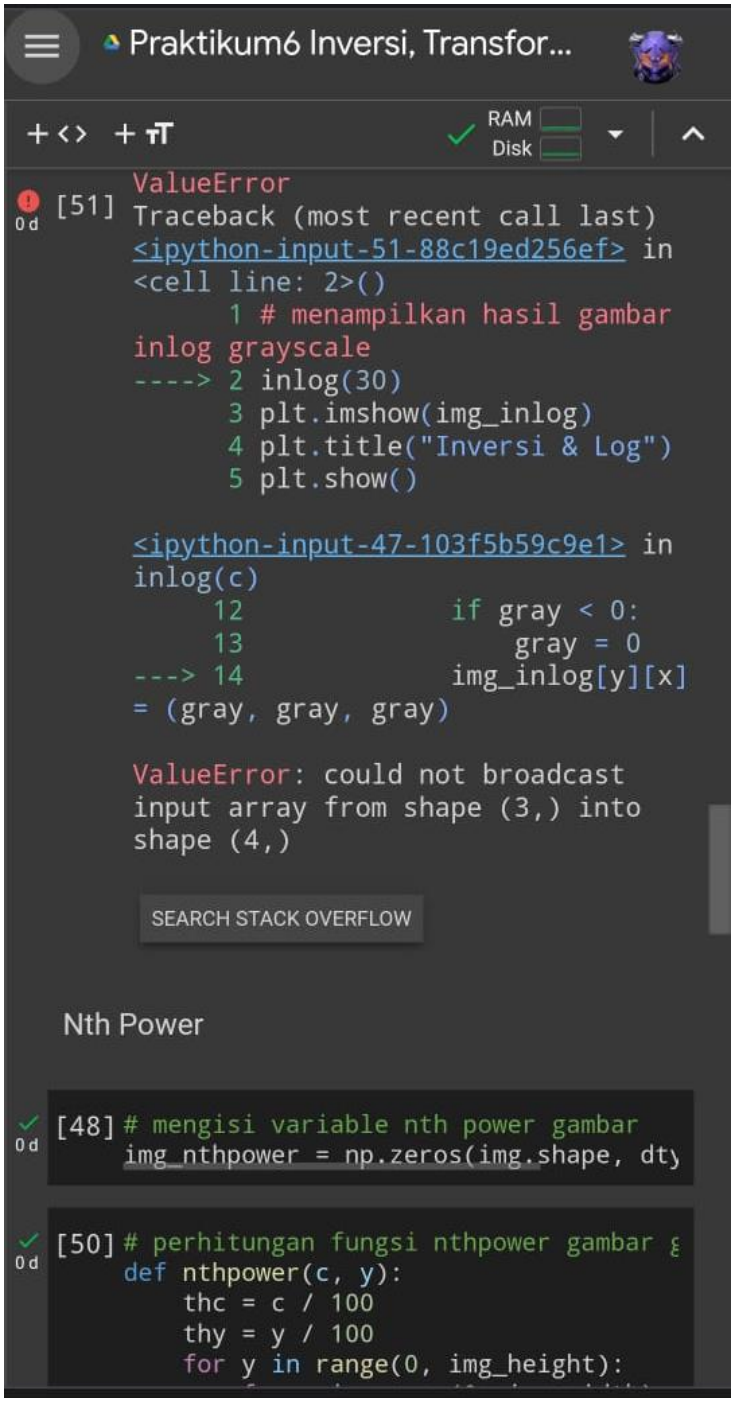
Inversi & log

```
[46] # mengisi variabel inlog gambar
     img_inlog = np.zeros(img.shape, dtype=
```

```
[47] # perhitungan fungsi inlog gambar gray
     def inlog(c):
         for y in range(0, img_height):
             for x in range(0, img_width):
                 red = img[y][x][0]
                 green = img[y][x][1]
                 blue = img[y][x][2]
                 gray = (int(red) + int(gre
                 gray = int(c * np.log(255
                 if gray > 255:
                     gray = 255
                 if gray < 0:
                     gray = 0
                 img_inlog[y][x] = (gray, g
```

```
[51] # menampilkan hasil gambar inlog grays
     inlog(30)
     plt.imshow(img_inlog)
     plt.title("Inversi & Log")
     plt.show()
```

```
---------------------------------
---------------------------------
-----
ValueError
Traceback (most recent call last)
<ipython-input-51-88c19ed256ef> in
<cell line: 2>()
      1 # menampilkan hasil gambar
inlog grayscale
----> 2 inlog(30)
```


Praktikum6 Inversi, Transfor...
RAM
Disk
[51]
ValueError
Traceback (most recent call last)
<ipython-input-51-88c19ed256ef> in
<cell line: 2>()
1 # menampilkan hasil gambar
inlog grayscale
----> 2 inlog(30)
3 plt.imshow(img_inlog)
4 plt.title("Inversi & Log")
5 plt.show()
<ipython-input-47-103f5b59c9e1> in
inlog(c)
12 if gray < 0:
13 gray = 0
---> 14 img_inlog[y][x]
= (gray, gray, gray)
ValueError: could not broadcast
input array from shape (3,) into
shape (4,)
SEARCH STACK OVERFLOW
Nth Power
[48] # mengisi variable nth power gambar
img_nthpower = np.zeros(img.shape, dty
[50] # perhitungan fungsi nthpower gambar g
def nthpower(c, y):
thc = c / 100
thy = y / 100
for y in range(0, img_height):


Praktikum6 Inversi, Transfor...
Melakukan inisialiasi
Nth Power
[ ] # mengisi variable nth power gambar
img_nthpower = np.zeros(img.shape, dty
[ ] # perhitungan fungsi nthpower gambar g
def nthpower(c, y):
thc = c / 100
thy = y / 100
for y in range(0, img_height):
for x in range(0, img_width):
red = img[y][x][0]
green = img[y][x][1]
blue = img[y][x][2]
gray = (int(red) + int(gre
gray = int(thc * pow(gray,
if gray > 255:
gray = 255
if gray < 0:
gray = 0
img_nthpower[y][x] = (gray
[ ] # menampilkan hasil gambar nthpower gr
nthpower(50, 100)
plt.imshow(img_nthpower)
plt.title("Nth Power")
plt.show()
ValueError
Traceback (most recent call last)
<ipython-input-49-7df077e97588> in
<cell line: 2>()

Praktikum6 Inversi, Transfor...

RAM
Disk

```
[49] # menampilkan hasil gambar nthpower gr
     nthpower(50, 100)
     plt.imshow(img_nthpower)
     plt.title("Nth Power")
     plt.show()
```

```
---------------------------------
---------------------------------
-----
ValueError
Traceback (most recent call last)
<ipython-input-49-7df077e97588> in
<cell line: 2>()
      1 # menampilkan hasil gambar
nthpower grayscale
----> 2 nthpower(50, 100)
      3 plt.imshow(img_nthpower)
      4 plt.title("Nth Power")
      5 plt.show()

<ipython-input-26-7bbdeed90c50> in
nthpower(c, y)
     13                 if gray < 0:
     14                     gray = 0
---> 15                 img_nthpower[y]
[x] = (gray, gray, gray)

ValueError: could not broadcast
input array from shape (3,) into
shape (4,)
```

SEARCH STACK OVERFLOW

Nth Root Power

Praktikum6 Inversi, Transfor...

RAM
Disk

Nth Root Power

```
[53] # mengisi variable gambar nthrootpower
     img_nthrootpower = np.zeros(img.shape,
```

```
[52] # perhitungan fungsi nthrootpower gamb
     def nthrootpower(c, y):
         thc = c / 100
         thy = y / 100
         for y in range(0, img_height):
             for x in range(0, img_width):
                 red = img[y][x][0]
                 green = img[y][x][1]
                 blue = img[y][x][2]
                 gray = (int(red) + int(gre
                 gray = int(thc * pow(gray,
                 if gray > 255:
                     gray = 255
                 if gray < 0:
                     gray = 0
                 img_nthpower[y][x] = (gray
```

```
[54] ı hasil gambar nthrootpower grayscale
     (50, 100)
     ng_nthrootpower)
     th Root Power")
```

```
---------------------------------
---------------------------------
-----
ValueError
Traceback (most recent call last)
<ipython-input-54-b8c2315458e5> in
<cell line: 2>()
      1 # menampilkan hasil gambar
```

Praktikum6 Inversi, Transfor...

RAM
Disk

```
[54] # menampilkan hasil gambar nthrootpower grayscale
     nthrootpower(50, 100)
     plt.imshow(img_nthrootpower)
     plt.title("Nth Root Power")
     plt.show()
```

0d

```
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-54-b8c2315458e5> in <cell line: 2>()
      1 # menampilkan hasil gambar nthrootpower grayscale
----> 2 nthrootpower(50, 100)
      3
      4 plt.imshow(img_nthrootpower)
      5 plt.title("Nth Root Power")
      6 plt.show()

<ipython-input-52-11f11a147b62> in nthrootpower(c, y)
     14                 if gray < 0:
     15                     gray = 0
---> 16                 img_nthpower[y][x] = (gray, gray, gray)

ValueError: could not broadcast input array from shape (3,) into shape (4,)
```

SEARCH STACK OVERFLOW