ALJABAR LINEAR

KELOMPOK 7

ANGGOTA KELOMPOK

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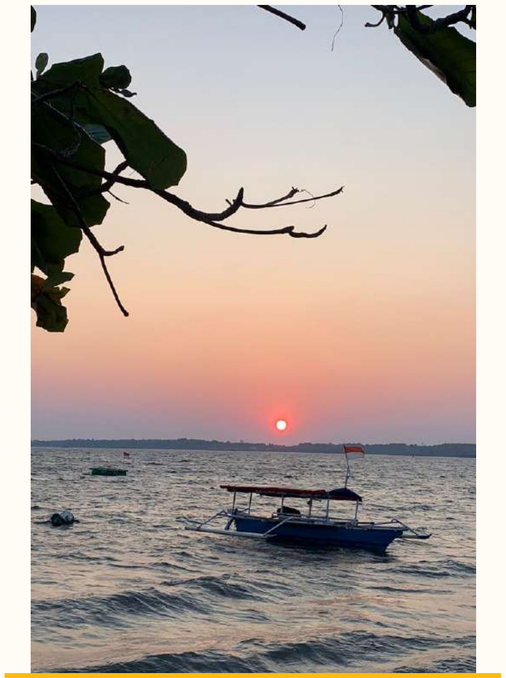
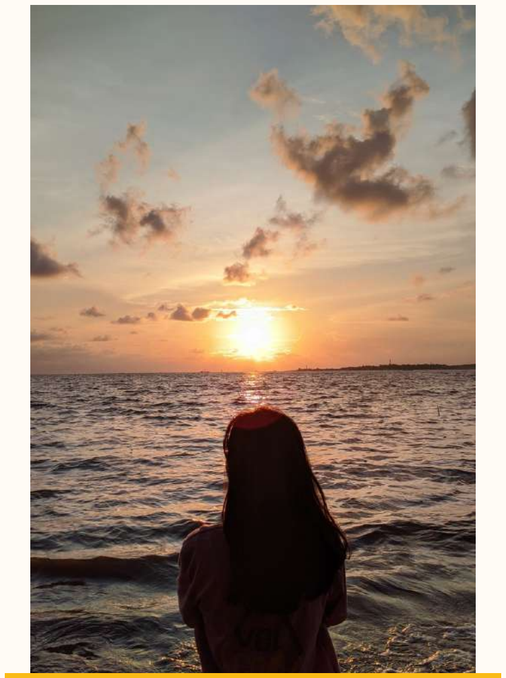


DILLA.JPG



ANTI.JPG

RHERE.JPG

KONVERSI CITRA RGB KE GRAYSCALE

```python
import cv2
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline

img_path = 'dilla.jpg'
img = cv2.imread(img_path)
print(img.shape)

fix_img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
plt.imshow(fix_img)

R, G, B = fix_img[:,:,0],  fix_img[:,:,1],  fix_img[:,:,2]
print(np.array(fix_img))
```

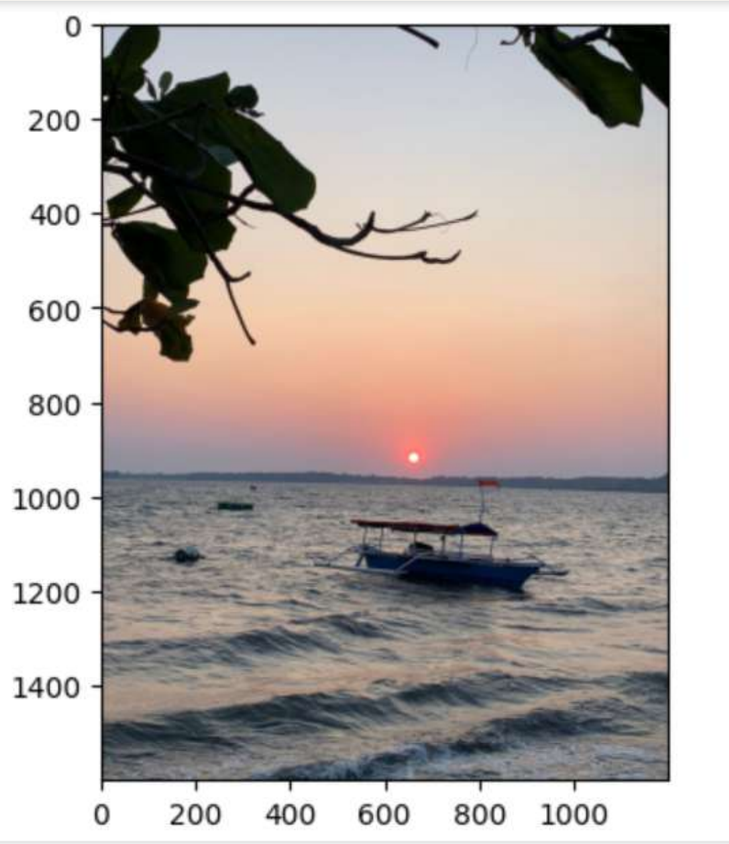
```python
import cv2
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline

img_path = 'Anti.jpg'
img = cv2.imread(img_path)
print(img.shape)

fix_img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
plt.imshow(fix_img)

R, G, B = fix_img[:,:,0],  fix_img[:,:,1],  fix_img[:,:,2]
print(np.array(fix_img))
```

```python
import cv2
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline

img_path ='Rhere.jpeg'
img = cv2.imread(img_path)
print(img.shape)

fix_img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
plt.imshow(fix_img)

R, G, B = fix_img[:,:,0], fix_img[:,:,1], fix_img[:,:,2]
print(np.array(fix_img))
```

MATRIKS AWAL DILLA.JPG

```
(1600, 1200, 3)
[[[ 10  18  29]
  [ 22  30  41]
  [ 25  32  42]
  ...
  [  1   3   0]
  [  2   5   0]
  [  2   5   0]]

 [[ 12  18  30]
  [ 16  23  33]
  [ 19  23  34]
  ...
  [  1   3   0]
  [  2   5   0]
  [  2   5   0]]

 [[ 21  25  36]
  [ 15  19  28]
  [ 17  20  29]
  ...
  [  1   3   0]
  [  2   5   0]
  [  2   5   0]]]
```

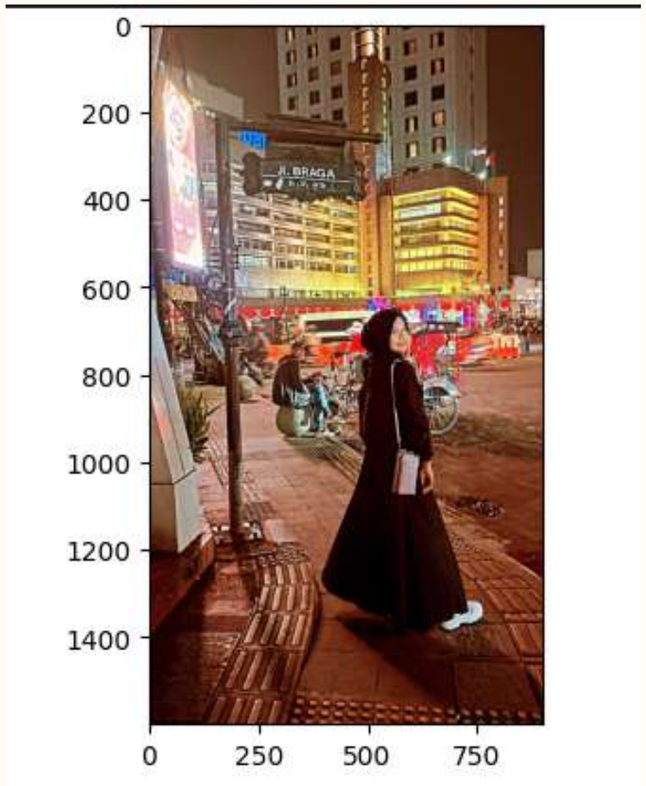
```
[[127 125 130]
 [128 127 132]
 [111 112 116]
 ...
 [141 140 146]
 [130 129 135]
 [118 117 123]]

[[103 102 108]
 [100  99 105]
 [ 83  84  89]
 ...
 [128 125 132]
 [123 120 127]
 [113 110 117]]

[[115 114 120]
 [102 103 108]
 [ 90  91  96]
 ...
 [129 126 133]
 [131 128 135]
 [133 130 137]]]
```



MATRIKS AWAL RHERE.JPG

```
(1599, 899, 3)
[[[148 107  89]
  [153 112  94]
  [171 130 112]
  ...
  [ 66  27  10]
  [ 66  28   9]
  [ 66  28   9]]

 [[140  99  81]
  [137  96  78]
  [150 109  91]
  ...
  [ 65  28  12]
  [ 65  28  10]
  [ 65  28  10]]

 [[148 107  89]
  [142 101  83]
  [153 112  94]
  ...
  [ 55  19   7]
  [ 55  19   7]
  [ 55  19   7]]]
```

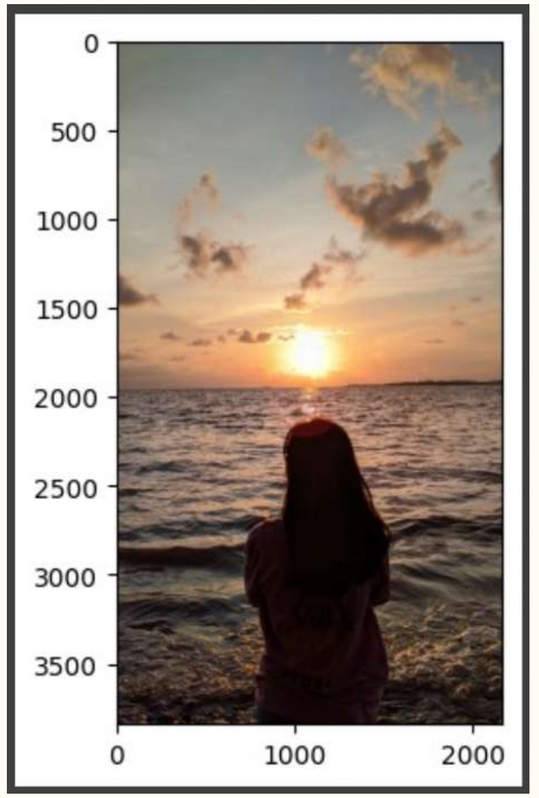
```
[[ 29   4   8]
 [ 28   3   7]
 [ 27   2   6]
 ...
 [ 47   7   5]
 [ 48   9   4]
 [ 50   9   5]]

[[ 29   2   7]
 [ 28   1   6]
 [ 27   0   5]
 ...
 [ 47   8   3]
 [ 47  10   4]
 [ 49  10   5]]

[[ 28   2   5]
 [ 27   1   4]
 [ 24   0   2]
 ...
 [ 45   8   0]
 [ 43  10   3]
 [ 45  10   4]]]
```



MATRIKS AWAL ANTI.JPG

```
(3840, 2160, 3)
[[[117 117 105]
  [113 113 101]
  [111 111  99]
  ...
  [ 86  96  97]
  [ 87  97  98]
  [ 86  96  97]]

 [[115 115 103]
  [114 114 102]
  [113 113 101]
  ...
  [ 87  97  98]
  [ 86  96  97]
  [ 85  95  96]]

 [[112 112 100]
  [114 114 102]
  [115 115 103]
  ...
  [ 88  98  99]
  [ 86  96  97]
  [ 83  93  94]]
```

```
[[ 13   0  12]
 [ 32  20  32]
 [ 33  23  32]
 ...
 [ 65  24  28]
 [ 70  30  30]
 [ 78  41  35]]

[[ 19   7  19]
 [ 28  16  28]
 [ 25  15  26]
 ...
 [ 64  29  36]
 [ 59  27  30]
 [ 67  35  36]]

[[ 27  15  27]
 [ 28  18  29]
 [ 22  14  25]
 ...
 [ 68  37  45]
 [ 72  43  47]
 [ 70  41  43]]]
```

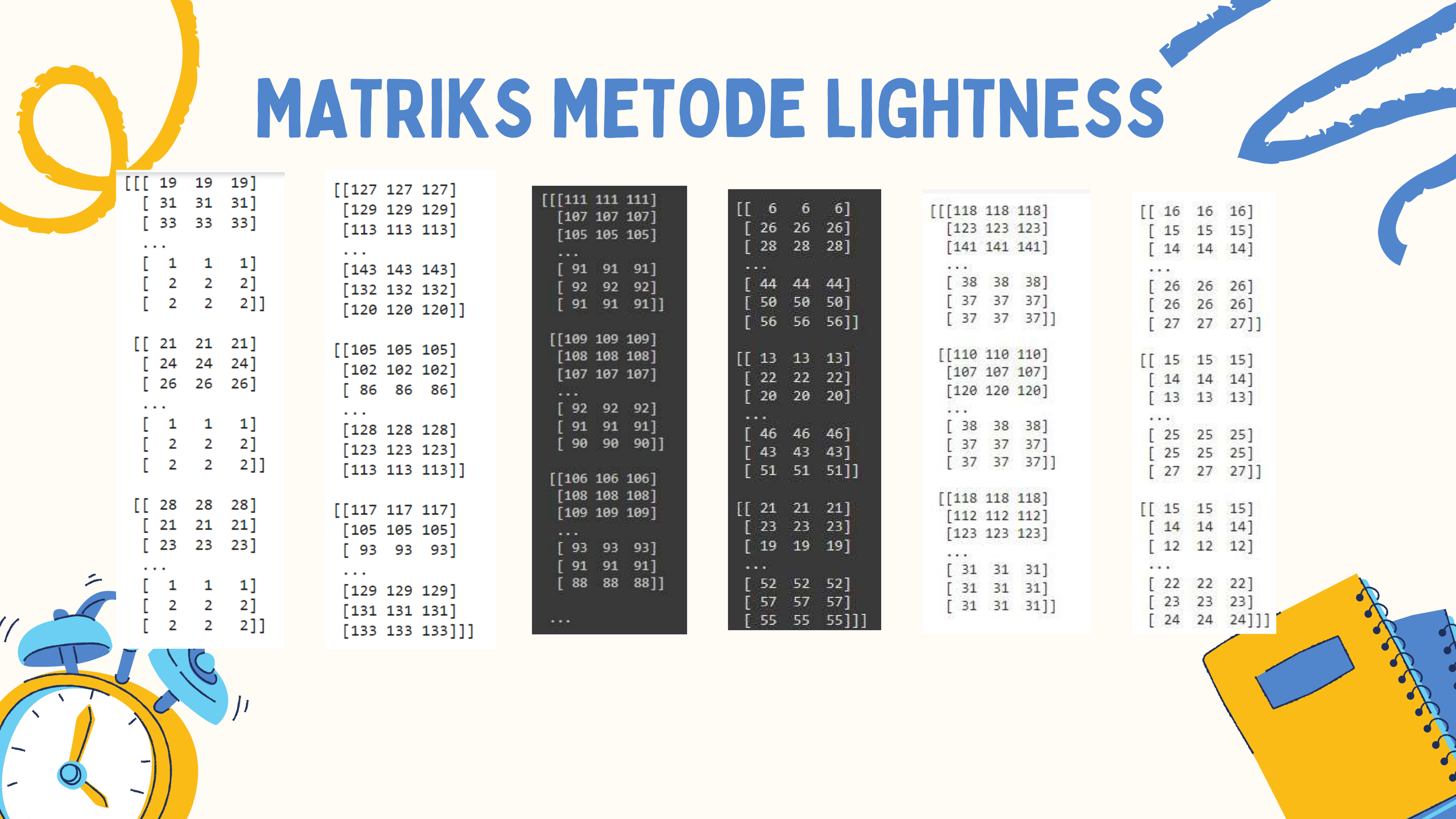


METODE LIGHTNESS

```
fix_img[:] = np.max(fix_img, axis = -1, keepdims = 1)/2 + np.min(fix_img, axis = -1, keepdims = 1)/2

print(np.array(fix_img[:]))
plt.axis('off')
plt.imshow(fix_img[:])
plt.savefig('metode lightness.jpg', bbox_inches = 'tight')
```

Lightness, mencari nilai tertinggi dan terendah dari nilai R, G, dan B, kemudian hasil penjumlahan nilai tertinggi dan terendah tersebut dikalikan dengan 0,5. Secara matematis dapat dirumuskan: Grayscale = {max{R, G, B}} + {min{R, G, B}} * 0.5

MATRIKS METODE LIGHTNESS



HASIL METODE LIGHTNESS

METODE AVERAGE

```
gray_img = np.mean(fix_img, axis = 2)
print(np.array(gray_img))

plt.axis('off')
plt.imshow(gray_img, cmap = 'gray')
plt.savefig('Metode Average.jpg', bbox_inches = 'tight')
```

Average, mencari nilai rata-rata dari R, G, dan B. Nilai rata rata itulah yang dapat dikatakan sebagai grayscale. Rumus matematisnya adalah: Grayscale = (R + G + B) / 3

MATRIKS METODE AVERAGE

```
[[ 19.  31.  33. ...   1.   2.   2.]
 [ 21.  24.  26. ...   1.   2.   2.]
 [ 28.  21.  23. ...   1.   2.   2.]
 ...
 [127. 129. 113. ... 143. 132. 120.]
 [105. 102.  86. ... 128. 123. 113.]
 [117. 105.  93. ... 129. 131. 133.]]
```

```
[[111. 107. 105. ...  91.  92.  91.]
 [109. 108. 107. ...  92.  91.  90.]
 [106. 108. 109. ...  93.  91.  88.]
 ...
 [  6.  26.  28. ...  44.  50.  56.]
 [ 13.  22.  20. ...  46.  43.  51.]
 [ 21.  23.  19. ...  52.  57.  55.]]
```

```
[[118. 123. 141. ...  38.  37.  37.]
 [110. 107. 120. ...  38.  37.  37.]
 [118. 112. 123. ...  31.  31.  31.]
 ...
 [ 16.  15.  14. ...  26.  26.  27.]
 [ 15.  14.  13. ...  25.  25.  27.]
 [ 15.  14.  12. ...  22.  23.  24.]]
```

HASIL METODE AVERAGE

METODE LUMINOSITY

```
lumi_img = (0.2126*R)+(0.7152*G)+(0.0722*B)
print(np.array(lumi_img))

plt.axis('off')
plt.imshow(lumi_img, cmap = 'gray')
plt.savefig('Metode Luminosity', bbox_inches = 'tight')
```

Luminosity, mengalikan setiap nilai R, G, dan B dengan konstanta tertentu yang sudah ditetapkan nilainya, kemudian hasil perkalian seluruh nilai R, G, B dijumlahkan satu sama lain. Rumus matematisnya adalah: Grayscale = {0.2126 x R} + {0.7152 x G} + {0.0722 x B} Grayscale = {0.299 x R} + {0.587 x G} + {0.114 x B}

MATRIKS METODE LUMINOSITY

```
[[ 19.  31.  33. ...   1.   2.   2.]
 [ 21.  24.  26. ...   1.   2.   2.]
 [ 28.  21.  23. ...   1.   2.   2.]
 ...
 [127. 129. 113. ... 143. 132. 120.]
 [105. 102.  86. ... 128. 123. 113.]
 [117. 105.  93. ... 129. 131. 133.]]
```

```
[[111. 107. 105. ...  91.  92.  91.]
 [109. 108. 107. ...  92.  91.  90.]
 [106. 108. 109. ...  93.  91.  88.]
 ...
 [  6.  26.  28. ...  44.  50.  56.]
 [ 13.  22.  20. ...  46.  43.  51.]
 [ 21.  23.  19. ...  52.  57.  55.]]
```

```
[[114.417  119.417  137.417  ...  34.064   34.707   34.707 ]
 [106.417  103.417  116.417  ...  34.711   34.5666  34.5666]
 [114.417  108.417  119.417  ...  25.7872  25.7872  25.7872]
 ...
 [  9.6038   8.6038   7.6038 ...  15.3596  16.9304  17.4278]
 [  8.1012   7.1012   6.1012 ...  15.9304  17.433   17.9304]
 [  7.7442   6.7442   5.2468 ...  15.2886  16.5104  17.0078]]
```

HASIL METODE LUMINOSITY

METODE WEIGHT AVERAGE

```
wav_img = (0.299*R) + (0.587*G) + (0.114*B)
# print(lumi_img)
print(np.array(wav_img))
plt.axis('off')
plt.imshow(wav_img, cmap = 'gray')
plt.savefig('Metode Weighted Average', bbox_inches='tight')
```

MATRIKS METODE WEIGHT AVERAGE

```
[[ 19.  31.  33. ...   1.   2.   2.]
 [ 21.  24.  26. ...   1.   2.   2.]
 [ 28.  21.  23. ...   1.   2.   2.]
 ...
 [127. 129. 113. ... 143. 132. 120.]
 [105. 102.  86. ... 128. 123. 113.]
 [117. 105.  93. ... 129. 131. 133.]]
```

```
[[144.3 139.1 136.5 ... 118.3 119.6 118.3]
 [141.7 140.4 139.1 ... 119.6 118.3 117. ]
 [137.8 140.4 141.7 ... 120.9 118.3 114.4]
 ...
 [  7.8  33.8  36.4 ...  57.2  65.   72.8]
 [ 16.9  28.6  26.  ...  59.8  55.9  66.3]
 [ 27.3  29.9  24.7 ...  67.6  74.1  71.5]]
```

```
[[118. 123. 141. ...  38.  37.  37.]
 [110. 107. 120. ...  38.  37.  37.]
 [118. 112. 123. ...  31.  31.  31.]
 ...
 [ 16.  15.  14. ...  26.  26.  27.]
 [ 15.  14.  13. ...  25.  25.  27.]
 [ 15.  14.  12. ...  22.  23.  24.]]
```

HASIL METODE WEIGHT AVERAGE

KESIMPULAN

DARI HASIL DISKUSI KELOMPOK KAMI, METODE LIGHTNESS MERUPAKAN METODE YANG PALING BAGUS UNTUK DIGUNAKAN DIKARENAKAN METODE LIGHTNESS PADA MATRIKS SEPERTI DALAM MODEL WARNA LAB, DIPILIH KARENA DAPAT MEMBERIKAN REPRESENTASI YANG LEBIH KONSISTEN TERHADAP PERSEPSI MATA MANUSIA TERHADAP PERUBAHAN WARNA SERTA METODE LIGHTNESS RELATIF MUDAH UNTUK DIIMPLEMENTASIKAN DAN DIPAHAMI. INI MEMBUATNYA MENJADI PILIHAN YANG BAIK UNTUK APLIKASI PENGOLAHAN CITRA YANG MEMBUTUHKAN SOLUSI YANG EFISIEN DAN CEPAT.

TERIMA KASIH!