

**TUGAS III**  
**PENGOLAHAN CITRA DIGITAL**



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**KELAS B**

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**JURUSAN TEKNOLOGI INFORMASI**  
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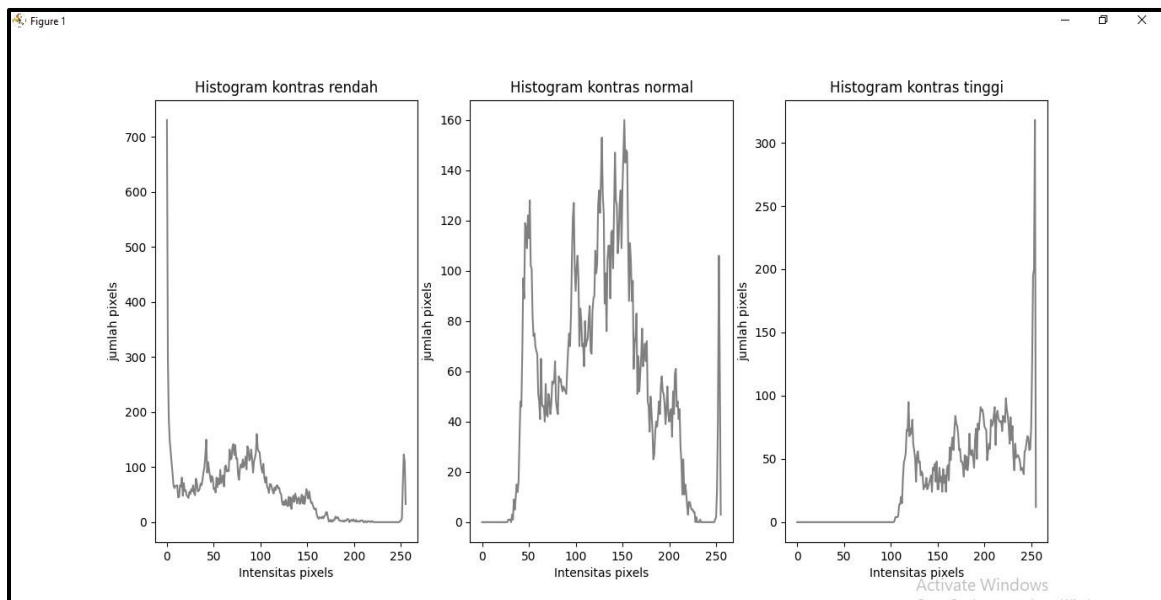
**2023**

## 1. HISTOGRAM

- Kode Program

```
histogram.py x
1 #Nama : Agym Mahaputra Romy Barlianta
2 #NIM : F55121076
3 import cv2
4 import matplotlib.pyplot as plt
5 #Low Contrast Picture
6 img_low_contrast = cv2.imread('low.png', 0)
7 histogram_low = cv2.calcHist([img_low_contrast], [0], None, [256], [0, 256])
8 plt.subplot(1, 3, 1)
9 plt.plot(histogram_low, color='gray')
10 plt.title("Histogram kontras rendah")
11 plt.xlabel('Intensitas pixels')
12 plt.ylabel('jumlah pixels')
13
14 #normal Contrast picture
15 img_normal_contrast = cv2.imread('normal.png', 0)
16 histogram_normal = cv2.calcHist([img_normal_contrast], [0], None, [256], [0, 256])
17 plt.subplot(1, 3, 2)
18 plt.plot(histogram_normal, color='gray')
19 plt.title("Histogram kontras normal")
20 plt.xlabel('Intensitas pixels')
21 plt.ylabel('jumlah pixels')
22
23 #high Contrast picture
24 img_high_contrast = cv2.imread('high.png', 0)
25 histogram_high = cv2.calcHist([img_high_contrast], [0], None, [256], [0, 256])
26 plt.subplot(1, 3, 3)
27 plt.plot(histogram_high, color='gray')
28 plt.title("Histogram kontras tinggi")
29 plt.xlabel('Intensitas pixels')
30 plt.ylabel('jumlah pixels')
31
32 plt.show()
```

- Hasil Running



## 2. HISTOGRAM EQUALIZATION

- Kode Program

```

1  #Nama : Agym Mahaputra Romy Barlianta
2  #NIM : F55121076
3  import cv2
4  import matplotlib.pyplot as plt
5
6  #picture low contrast equalization
7  img_low_contrast = cv2.imread('low.png', 0)
8  equalized_low_contrast = cv2.equalizeHist(img_low_contrast)
9  histogram_low = cv2.calcHist([img_low_contrast], [0], None, [256], [0, 256])
10 equalized_histogram_low = cv2.calcHist([equalized_low_contrast], [0], None, [256], [0, 256])
11 plt.subplot(2, 2, 1)
12 plt.imshow(img_low_contrast, cmap='gray')
13 plt.title('Gambar Asli')
14 plt.subplot(2, 2, 2)
15 plt.imshow(equalized_low_contrast, cmap='gray')
16 plt.title('Gambar Equalization')
17 plt.subplot(2, 2, 3)
18 plt.plot(histogram_low, color='gray')
19 plt.title("Histogram Gambar Asli")
20 plt.xlabel('Intensitas Pixels')
21 plt.ylabel('Jumlah pixels')
22 plt.subplot(2, 2, 4)
23 plt.plot(equalized_histogram_low, color='gray')
24 plt.title('Histogram Gambar Equalization')
25 plt.xlabel('Intensitas Pixels')
26 plt.ylabel('Jumlah Pixels')

```

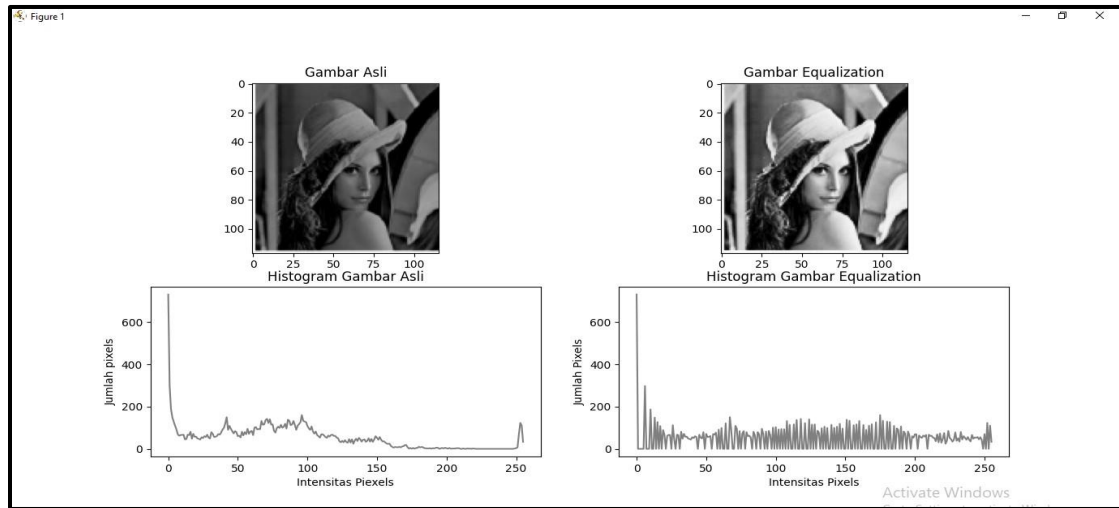
```

27
28 #picture normal contrast equalization
29 img_normal_contrast = cv2.imread('normal.png', 0)
30 equalized_normal_contrast = cv2.equalizeHist(img_normal_contrast)
31 histogram_normal = cv2.calcHist([img_normal_contrast], [0], None, [256], [0, 256])
32 equalized_histogram_normal = cv2.calcHist([equalized_normal_contrast], [0], None, [256], [0, 256])
33 plt.figure()
34 plt.subplot(2, 2, 1)
35 plt.imshow(img_normal_contrast, cmap='gray')
36 plt.title('Gambar Asli')
37 plt.subplot(2, 2, 2)
38 plt.imshow(equalized_normal_contrast, cmap='gray')
39 plt.title('Gambar Equalization')
40 plt.subplot(2, 2, 3)
41 plt.plot(histogram_normal, color='gray')
42 plt.title("Histogram Gambar Asli")
43 plt.xlabel('Intensitas Pixels')
44 plt.ylabel('Jumlah pixels')
45 plt.subplot(2, 2, 4)
46 plt.plot(equalized_histogram_normal, color='gray')
47 plt.title('Histogram Gambar Equalization')
48 plt.xlabel('Intensitas Pixels')
49 plt.ylabel('Jumlah Pixels')
50
51 #picture high contrast equalization
52 img_high_contrast = cv2.imread('high.png', 0)
53 equalized_high_contrast = cv2.equalizeHist(img_high_contrast)
54 histogram_high = cv2.calcHist([img_high_contrast], [0], None, [256], [0, 256])
55 equalized_histogram_high = cv2.calcHist([equalized_high_contrast], [0], None, [256], [0, 256])
56 plt.figure()
57 plt.subplot(2, 2, 1)
58 plt.imshow(img_high_contrast, cmap='gray')
59 plt.title('Gambar Asli')
60 plt.subplot(2, 2, 2)
61 plt.imshow(equalized_high_contrast, cmap='gray')
62 plt.title('Gambar Equalization')
63 plt.subplot(2, 2, 3)
64 plt.plot(histogram_high, color='gray')
65 plt.title("Histogram Gambar Asli")
66 plt.xlabel('Intensitas Pixels')
67 plt.ylabel('Jumlah pixels')
68 plt.subplot(2, 2, 4)
69 plt.plot(equalized_histogram_high, color='gray')
70 plt.title('Histogram Gambar Equalization')
71 plt.xlabel('Intensitas Pixels')
72 plt.ylabel('Jumlah Pixels')
73
74
75 plt.show()

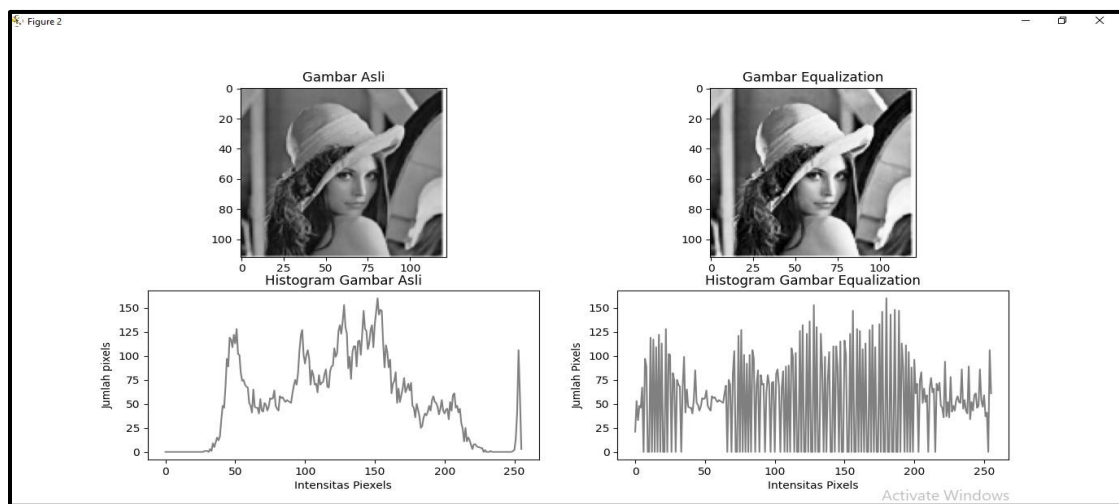
```

- Hasil Running

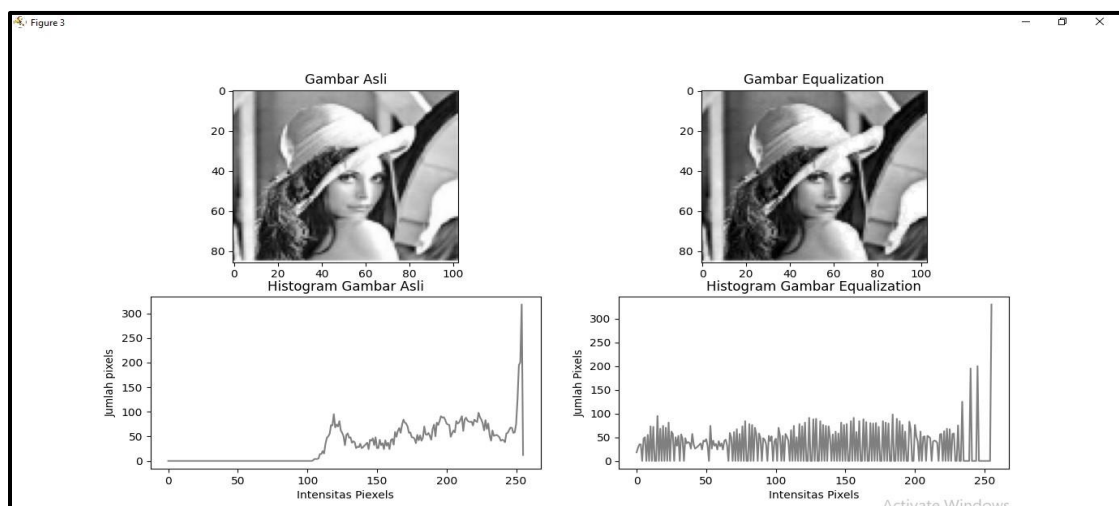
- a. Gambar dengan kontras Rendah



- b. Gambar dengan kontras Normal



- c. Gambar dengan kontras Tinggi





### 3. DIFFERENCE IMAGE

- Kode Program

```
difference_img.py x
1  #Nama : Agym Mahaputra Romy Barlianta
2  #NIM : F55121076
3  import cv2
4  import numpy as np
5
6  pic1 = cv2.imread('11.jpg')
7  pic2 = cv2.imread('12.jpg')
8
9  gray_pic1 = cv2.cvtColor(pic1, cv2.COLOR_BGR2GRAY)
10 gray_pic2 = cv2.cvtColor(pic2, cv2.COLOR_BGR2GRAY)
11
12 diff = cv2.absdiff(gray_pic1, gray_pic2)
13
14 eq_diff_pic = cv2.equalizeHist(diff)
15
16 cv2.imshow('Difference Picture', diff)
17 cv2.imshow('Histogram Equalization Difference Image', eq_diff_pic)
18 cv2.waitKey(0)
19 cv2.destroyAllWindows()
```

- Hasil Running



#### 4. IMAGE AVERAGING

- Kode Program

```
averaged_img.py x
1  #Nama : Agym Mahaputra Romy Barlianta
2  #NIM : F55121076
3  import cv2
4  import numpy as np
5
6  img1 = cv2.imread('musim1.jpg')
7  img2 = cv2.imread('musim2.jpg')
8  img3 = cv2.imread('musim3.jpg')
9
10 gray_img1 = cv2.cvtColor(img1, cv2.COLOR_BGR2GRAY)
11 gray_img2 = cv2.cvtColor(img2, cv2.COLOR_BGR2GRAY)
12 gray_img3 = cv2.cvtColor(img3, cv2.COLOR_BGR2GRAY)
13
14 img = np.array([gray_img1, gray_img2, gray_img3])
15 avg_img = np.average (img, axis=0)
16 avg_imgs = avg_img.astype(np.uint8)
17
18 cv2.imshow('Avegared Image', avg_imgs)
19 cv2.waitKey(0)
20 cv2.destroyAllWindows()
```

- Hasil Running

