TUGAS III

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KELAS B

PROGRAM STUDI TEKNIK INFORMATIKA

JURUSAN TEKNOLOGI INFORMASI

FAKULTAS TEKNIK

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1. HISTOGRAM

- Kode Program

histogram.py

```python
#Nama : Agym Mahaputra Romy Barlianta
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import cv2
import matplotlib.pyplot as plt
#low Contrast Picture
img_low_contrast = cv2.imread('low.png', 0)
histogram_low = cv2.calcHist ([img_low_contrast], [0], None, [256], [0, 256])
plt.subplot(1, 3, 1)
plt.plot(histogram_low, color='gray')
plt.title("Histogram kontras rendah")
plt.xlabel('Intensitas pixels')
plt.ylabel('jumlah pixels')

#normal Contrast picture
img_normal_contrast = cv2.imread('normal.png', 0)
histogram_normal = cv2.calcHist ([img_normal_contrast], [0], None, [256], [0, 256])
plt.subplot(1, 3, 2)
plt.plot(histogram_normal, color='gray')
plt.title("Histogram kontras normal")
plt.xlabel('Intensitas pixels')
plt.ylabel('jumlah pixels')

#high Contrast picture
img_high_contrast = cv2.imread('high.png', 0)
histogram_high = cv2.calcHist ([img_high_contrast], [0], None, [256], [0, 256])
plt.subplot(1, 3, 3)
plt.plot(histogram_high, color='gray')
plt.title("Histogram kontras tinggi")
plt.xlabel('Intensitas pixels')
plt.ylabel('jumlah pixels')

plt.show()
```
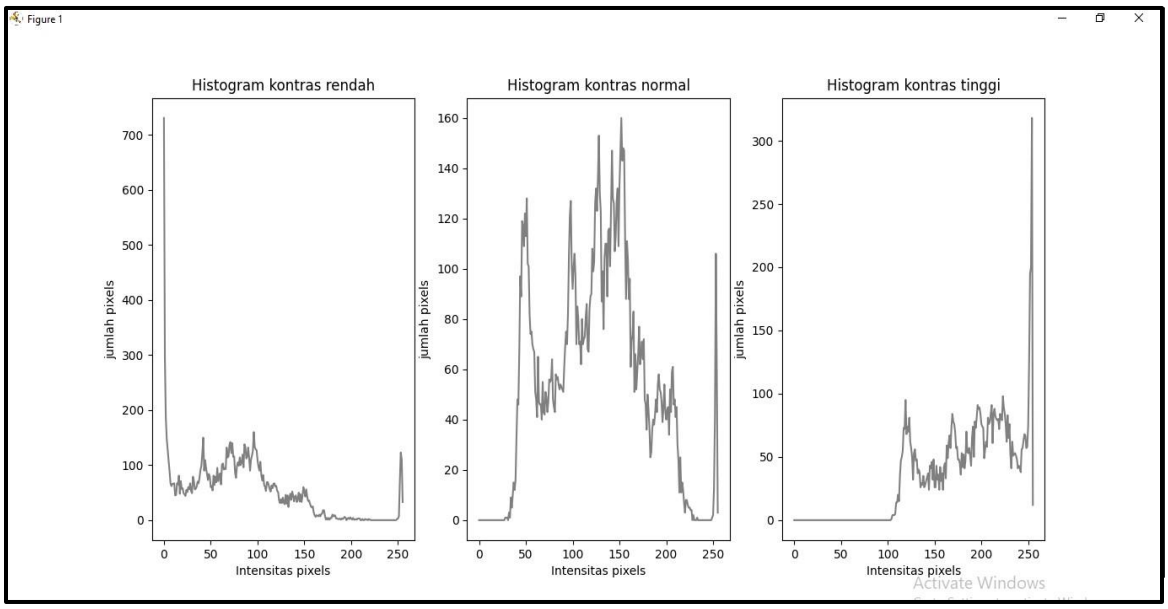

- Hasil Running



2. HISTOGRAM EQUALIZATION

- Kode Program

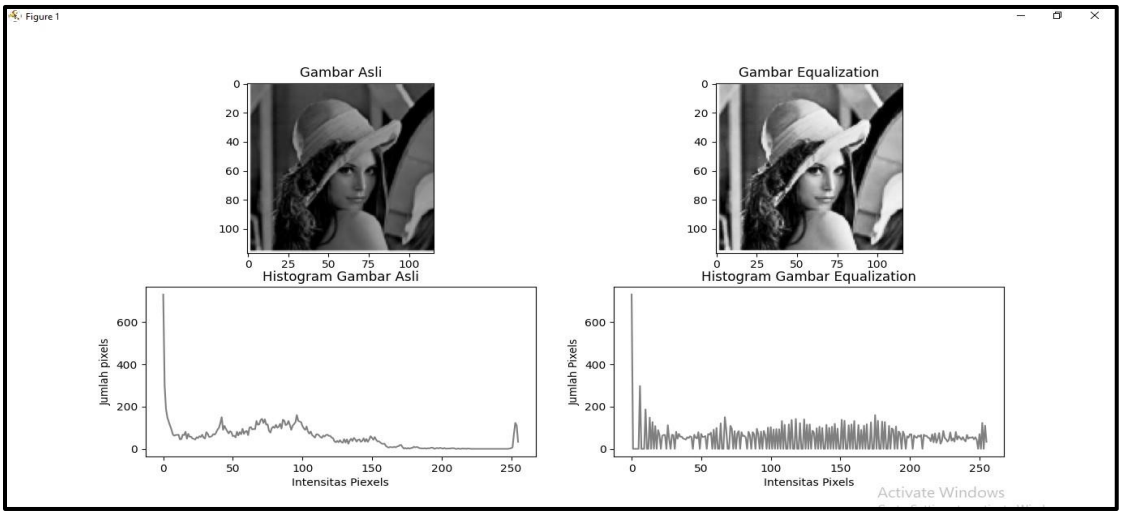
histogram_equalization.py

```python
#Nama : Agym Mahaputra Romy Barlianta
#NIM  : F55121076
import cv2
import matplotlib.pyplot as plt

#picture low contrast equalization
img_low_contrast = cv2.imread('low.png', 0)
equalized_low_contrast = cv2.equalizeHist(img_low_contrast)
histogram_low = cv2.calcHist([img_low_contrast], [0], None, [256], [0, 256])
equalized_histogram_low = cv2.calcHist([equalized_low_contrast], [0], None, [256], [0, 256])
plt.subplot(2, 2, 1)
plt.imshow(img_low_contrast, cmap='gray')
plt.title('Gambar Asli')
plt.subplot(2, 2, 2)
plt.imshow(equalized_low_contrast, cmap='gray')
plt.title('Gambar Equalization')
plt.subplot(2, 2, 3)
plt.plot(histogram_low, color='gray')
plt.title("Histogram Gambar Asli")
plt.xlabel('Intensitas Piexels')
plt.ylabel('Jumlah pixels')
plt.subplot(2, 2, 4)
plt.plot(equalized_histogram_low, color='gray')
plt.title('Histogram Gambar Equalization')
plt.xlabel('Intensitas Pixels')
plt.ylabel('Jumlah Pixels')
```

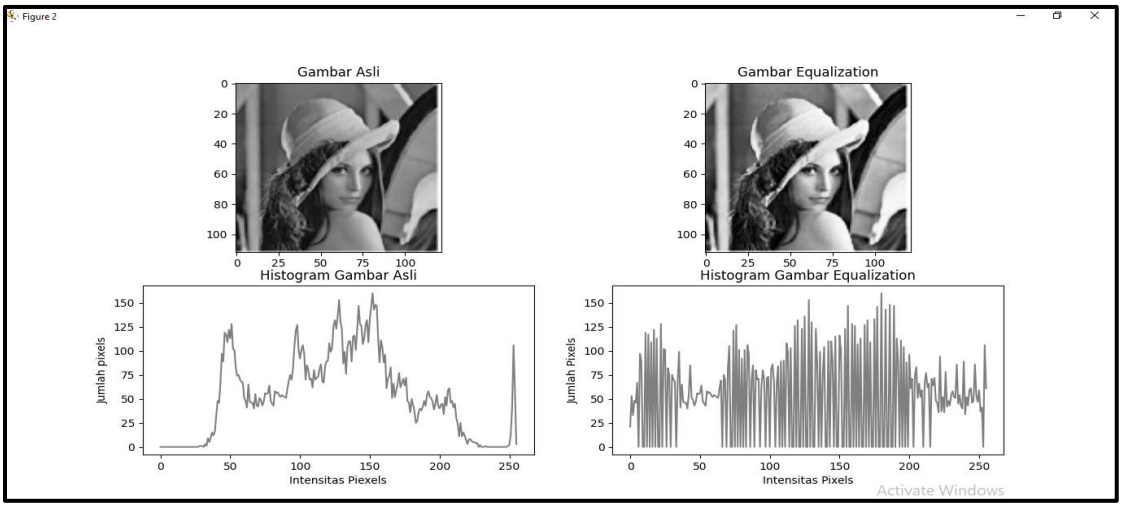
```
#picture normal contrast equalization
img_normal_contrast = cv2.imread('normal.png', 0)
equalized_normal_contrast = cv2.equalizeHist(img_normal_contrast)
histogram_normal = cv2.calcHist([img_normal_contrast], [0], None, [256], [0, 256])
equalized_histogram_normal = cv2.calcHist([equalized_normal_contrast], [0], None, [256], [0, 256])
plt.figure()
plt.subplot(2, 2, 1)
plt.imshow(img_normal_contrast, cmap='gray')
plt.title('Gambar Asli')
plt.subplot(2, 2, 2)
plt.imshow(equalized_normal_contrast, cmap='gray')
plt.title('Gambar Equalization')
plt.subplot(2, 2, 3)
plt.plot(histogram_normal, color='gray')
plt.title("Histogram Gambar Asli")
plt.xlabel('Intensitas Piexels')
plt.ylabel('Jumlah pixels')
plt.subplot(2, 2, 4)
plt.plot(equalized_histogram_normal, color='gray')
plt.title('Histogram Gambar Equalization')
plt.xlabel('Intensitas Pixels')
plt.ylabel('Jumlah Pixels')

#picture high contrast equalization
img_high_contrast = cv2.imread('high.png', 0)
equalized_high_contrast = cv2.equalizeHist(img_high_contrast)
histogram_high = cv2.calcHist([img_high_contrast], [0], None, [256], [0, 256])
equalized_histogram_high = cv2.calcHist([equalized_high_contrast], [0], None, [256], [0, 256])
plt.figure()
plt.subplot(2, 2, 1)
plt.imshow(img_high_contrast, cmap='gray')
plt.title('Gambar Asli')
plt.subplot(2, 2, 2)
plt.imshow(equalized_high_contrast, cmap='gray')
plt.title('Gambar Equalization')
plt.subplot(2, 2, 3)
plt.plot(histogram_high, color='gray')
plt.title("Histogram Gambar Asli")
plt.xlabel('Intensitas Piexels')
plt.ylabel('Jumlah pixels')
plt.subplot(2, 2, 4)
plt.plot(equalized_histogram_high, color='gray')
plt.title('Histogram Gambar Equalization')
plt.xlabel('Intensitas Pixels')
plt.ylabel('Jumlah Pixels')


plt.show()
```

- Hasil Running

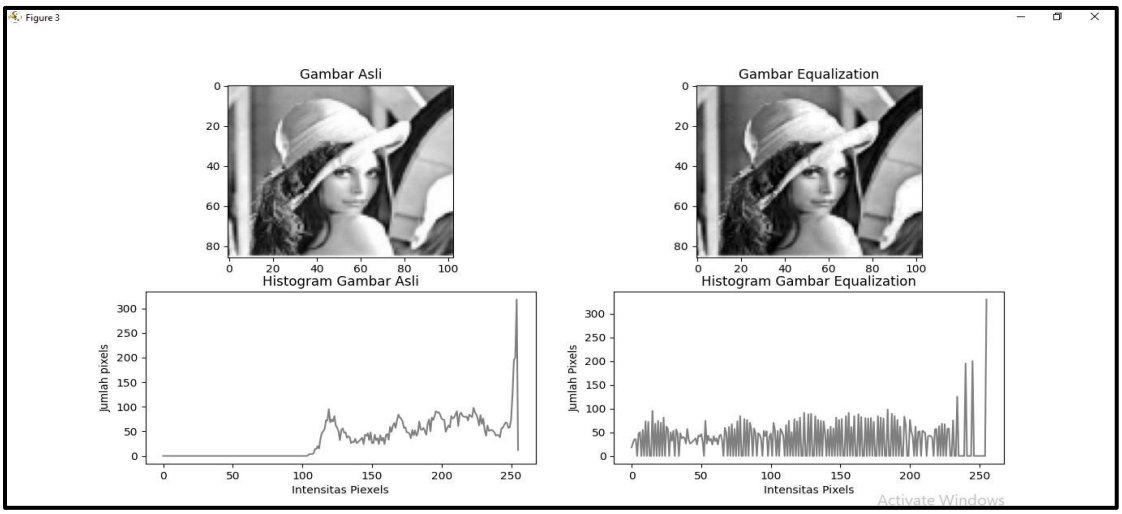
a. Gambar dengan kontras Rendah



b. Gambar dengan kontras Normal



c. Gambar dengan kontras Tinggi



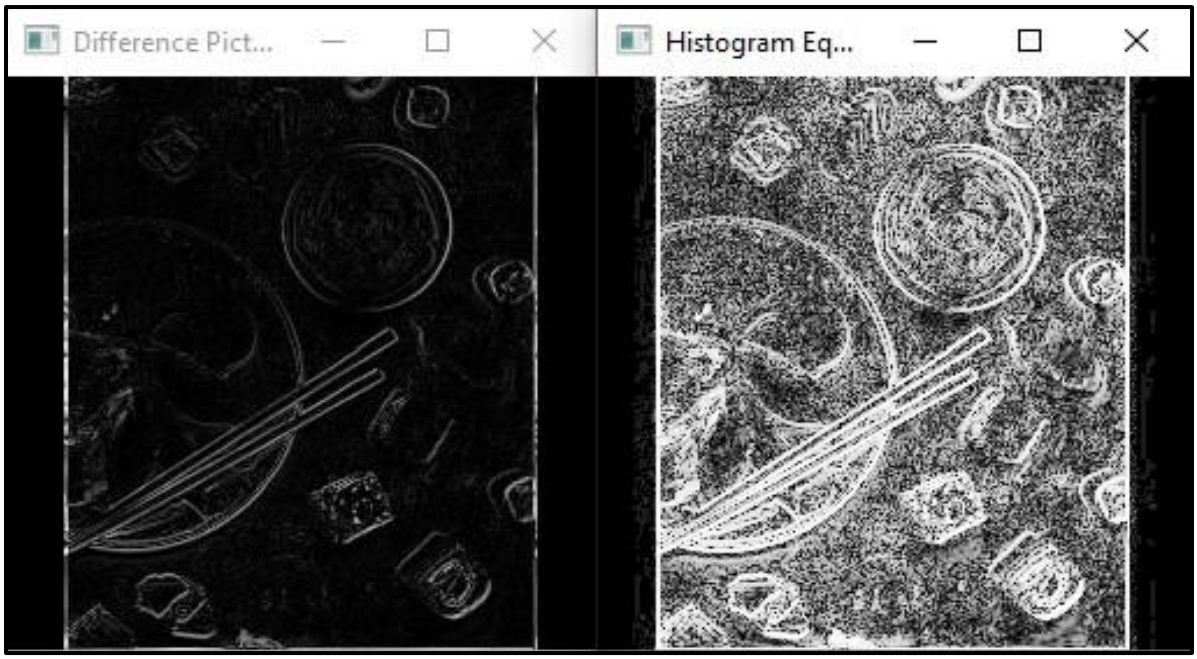
3. DIFFERENCE IMAGE

- Kode Program

difference_img.py

```python
#Nama : Agym Mahaputra Romy Barlianta
#NIM  : F55121076
import cv2
import numpy as np

pic1 = cv2.imread('11.jpg')
pic2 = cv2.imread('12.jpg')

gray_pic1 = cv2.cvtColor(pic1, cv2.COLOR_BGR2GRAY)
gray_pic2 = cv2.cvtColor(pic2, cv2.COLOR_BGR2GRAY)

diff = cv2.absdiff(gray_pic1, gray_pic2)

eq_diff_pic = cv2.equalizeHist(diff)

cv2.imshow('Difference Picture', diff)
cv2.imshow('Histogram Equalization Difference Image', eq_diff_pic)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

- Hasil Running



4. IMAGE AVERAGING

- Kode Program

averaged_img.py

```python
#Nama : Agym Mahaputra Romy Barlianta
#NIM  : F55121076
import cv2
import numpy as np

img1 = cv2.imread('musim1.jpg')
img2 = cv2.imread('musim2.jpg')
img3 = cv2.imread('musim3.jpg')

gray_img1 = cv2.cvtColor(img1, cv2.COLOR_BGR2GRAY)
gray_img2 = cv2.cvtColor(img2, cv2.COLOR_BGR2GRAY)
gray_img3 = cv2.cvtColor(img3, cv2.COLOR_BGR2GRAY)

img = np.array([gray_img1, gray_img2, gray_img3])
avg_img = np.average (img, axis=0)
avg_imgs = avg_img.astype(np.uint8)

cv2.imshow('Avegared Image', avg_imgs)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

- Hasil Running