

# LAB ACTIVITY

## PENGOLAHAN CITRA DIGITAL

### Pertemuan 9 – Perbaikan Kualitas Citra (Part 2)

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Kelas: 5 CA

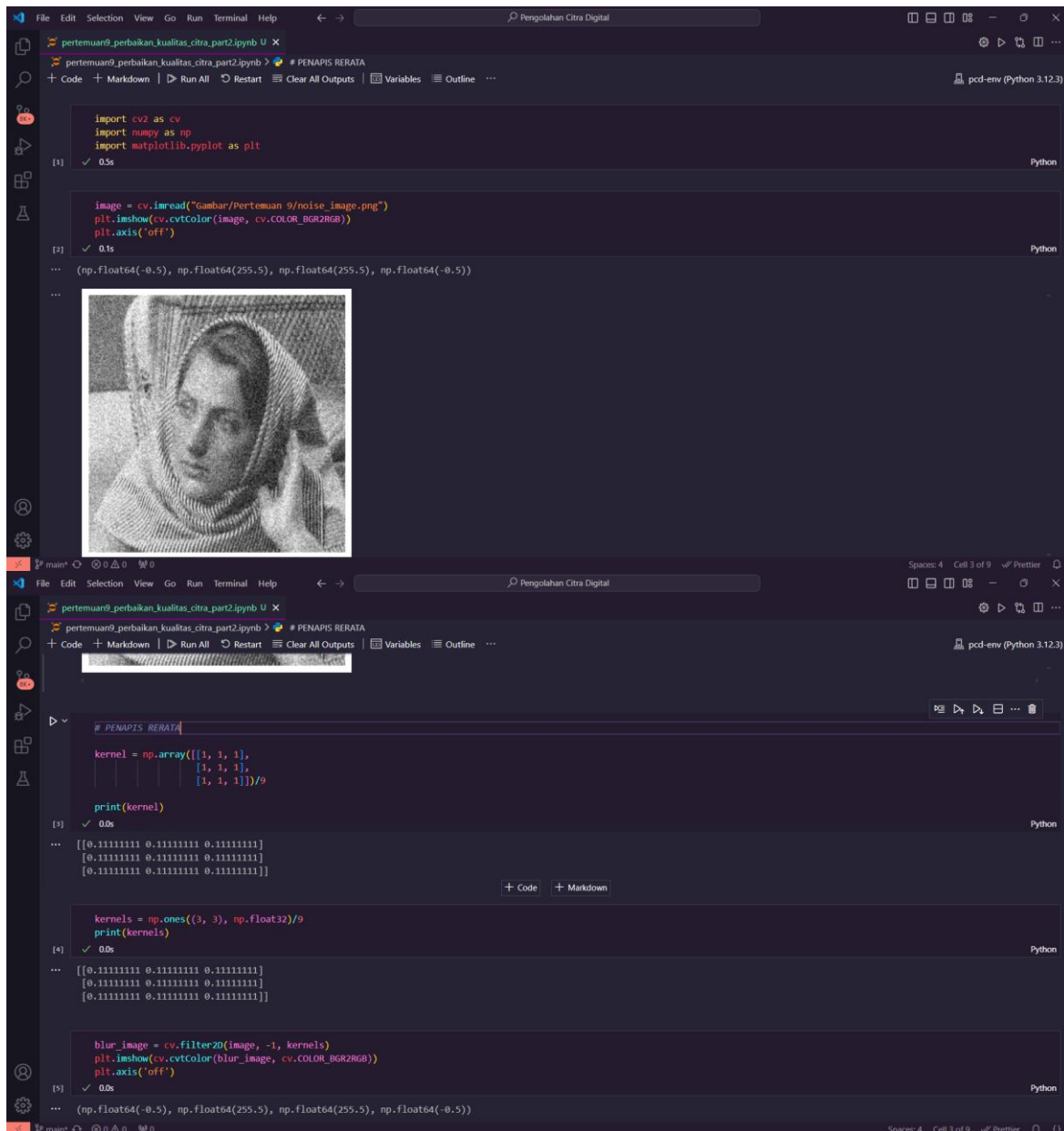
NPM: 062230701416  
Mata Kuliah: Pengolahan Citra Digital

#### Alat dan Bahan:

1. Text Editor
2. Python
3. Library Python numpy, opencv, matplotlib
4. Google Colab (Opsional)

### 1. Perbaikan Kualitas Citra Menggunakan Python

#### a) Penapis Rerata



```
import cv2 as cv
import numpy as np
import matplotlib.pyplot as plt

image = cv.imread("Gambar/Pertemuan 9/noise_image.png")
plt.imshow(cv.cvtColor(image, cv.COLOR_BGR2RGB))
plt.axis('off')

(np.float64(-0.5), np.float64(255.5), np.float64(255.5), np.float64(-0.5))

# PENAPIS RERATA

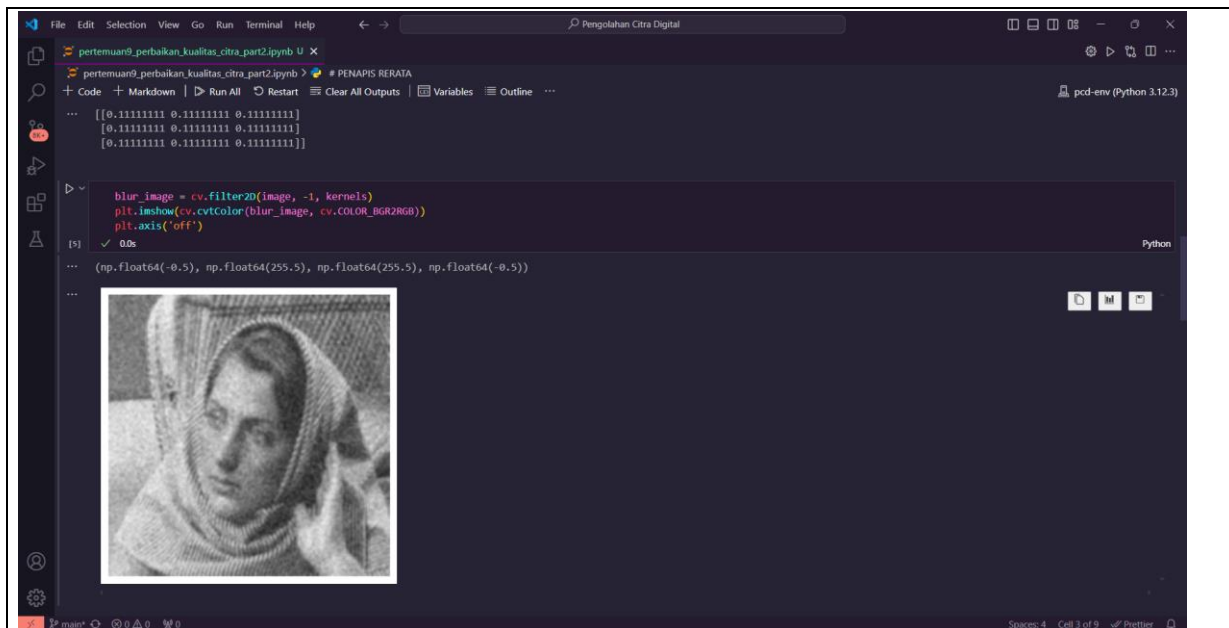
kernel = np.array([[1, 1, 1],
                    [1, 1, 1],
                    [1, 1, 1]])/9

print(kernel)

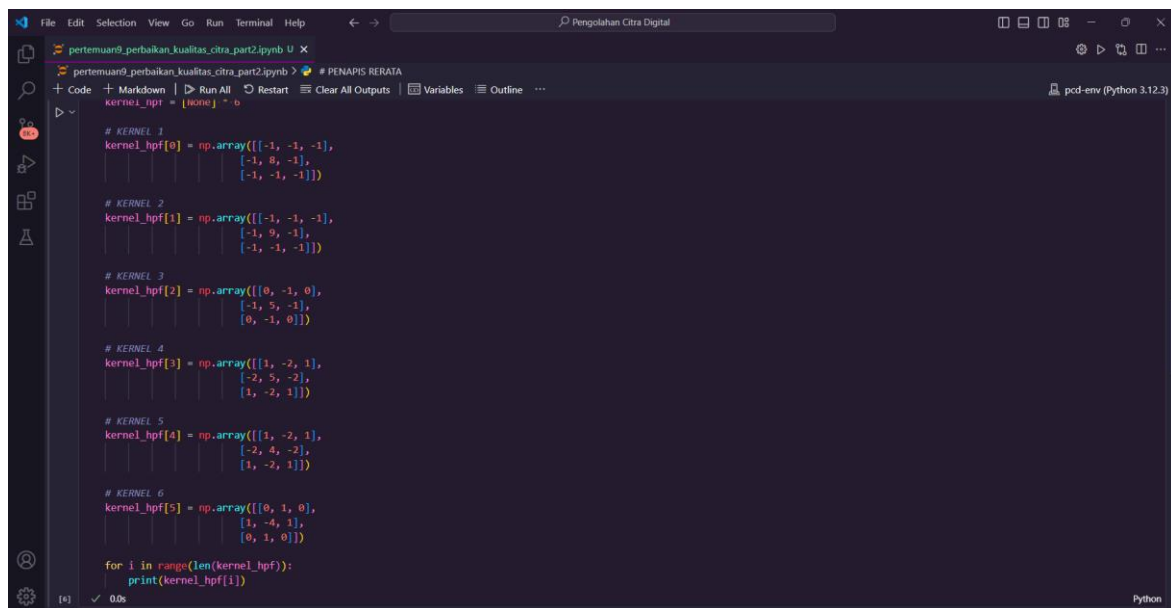
kernels = np.ones((3, 3), np.float32)/9
print(kernels)

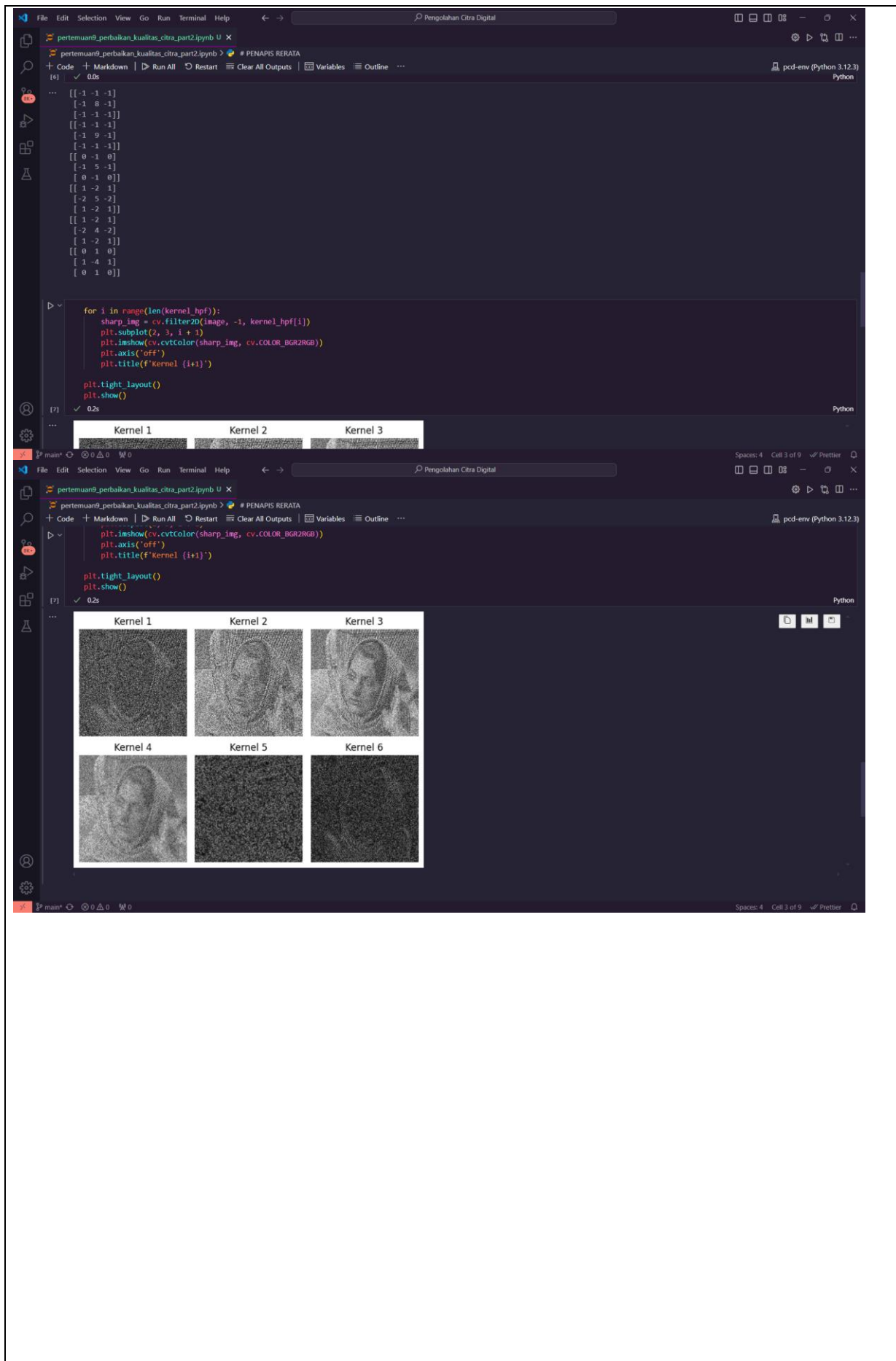
blur_image = cv.filter2D(image, -1, kernels)
plt.imshow(cv.cvtColor(blur_image, cv.COLOR_BGR2RGB))
plt.axis('off')

(np.float64(-0.5), np.float64(255.5), np.float64(255.5), np.float64(-0.5))
```



## b) Penajaman Citra (*Image Sharpening*)





### c) Perbandingan Metode (*Average, Gaussian Blur, Median Blur, Bilateral*)

The image shows a Jupyter Notebook interface with two cells of Python code. The first cell defines the denoising methods and applies them to an image. The second cell displays the results in a 2x2 grid.

**Cell 1 Code:**

```
averaging = cv.blur(image, (21, 21))
gaussian = cv.GaussianBlur(image, (21,21), 0)
median = cv.medianBlur(image, 5)
bilateral = cv.bilateralFilter(image, 9, 350, 350)

image_repair = [averaging, gaussian, median, bilateral]
metode_names = ['Averaging', 'Gaussian Blur', 'Median Blur', 'Bilateral']
```

**Cell 2 Code:**

```
for i in range(len(image_repair)):
    plt.subplot(2, 2, i + 1)
    plt.imshow(cv.cvtColor(image_repair[i], cv.COLOR_BGR2RGB))
    plt.title(f'{metode_names[i]}')
    plt.axis('off')

plt.tight_layout()
plt.show()
```

The output of the notebook shows four subplots of the same image, each with a different denoising effect:

- Averaging:** The image is significantly blurred, losing fine details.
- Gaussian Blur:** Similar to averaging, but with a smoother appearance.
- Median Blur:** The image is less blurred than the first two, but some noise remains.
- Bilateral:** The image is very sharp, with most noise removed while preserving edges.