# LAPORAN PRAKTIKUM

# GRAFIKA KOMPUTER

Dosen pengampu: Rio Priantama, S.T., M.T.I

## MODUL 6

| | | |
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| NIM | : | 20230810155 |
| Kelas | : | TINFC-2023-04 |

**TEKNIK INFORMATIKA**

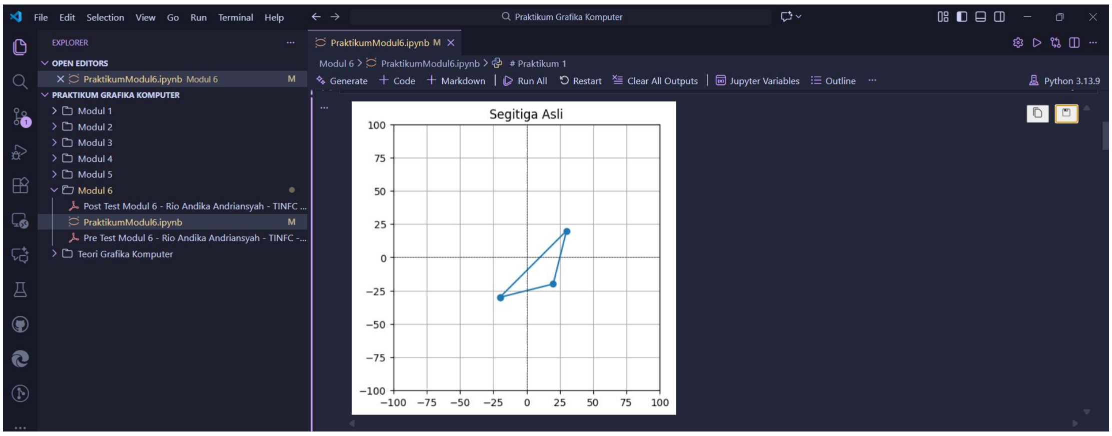
**FAKULTAS ILMU KOMPUTER**

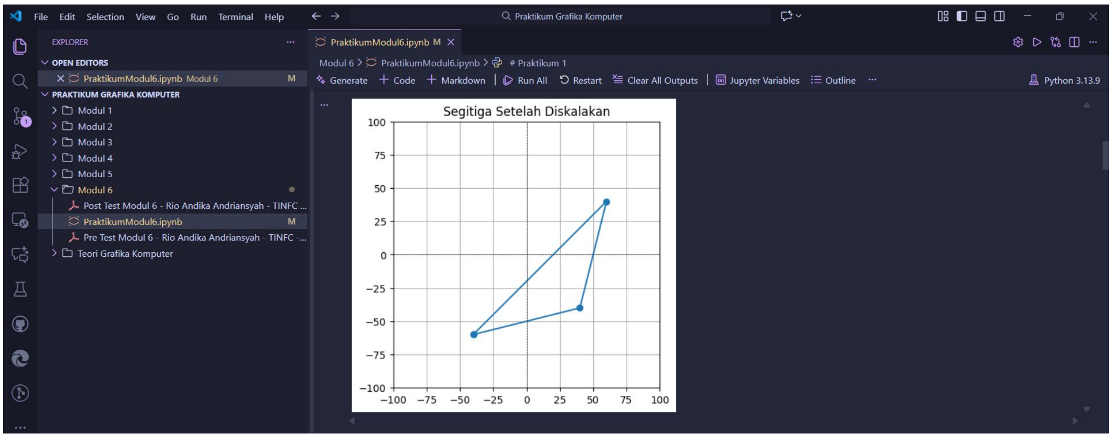
**UNIVERSITAS KUNINGAN**

# DAFTAR ISI

# PRAKTIKUM

## Praktikum 1



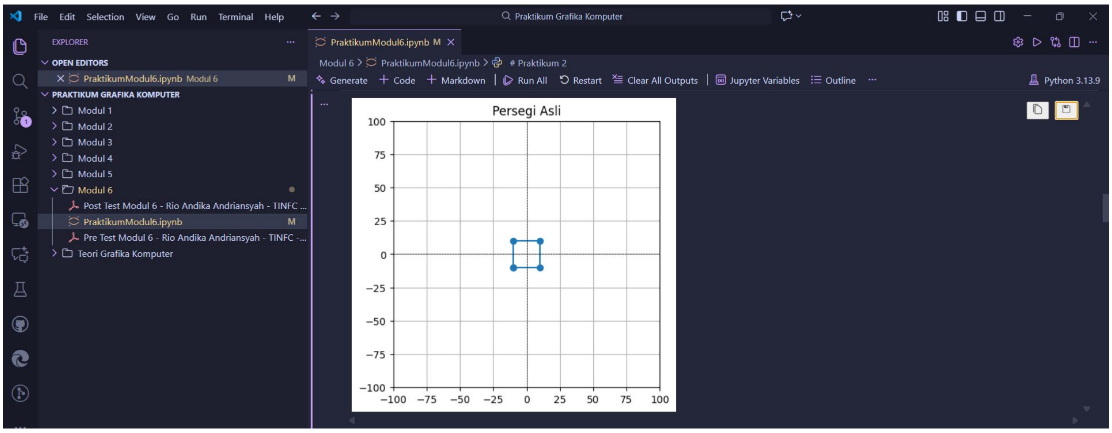


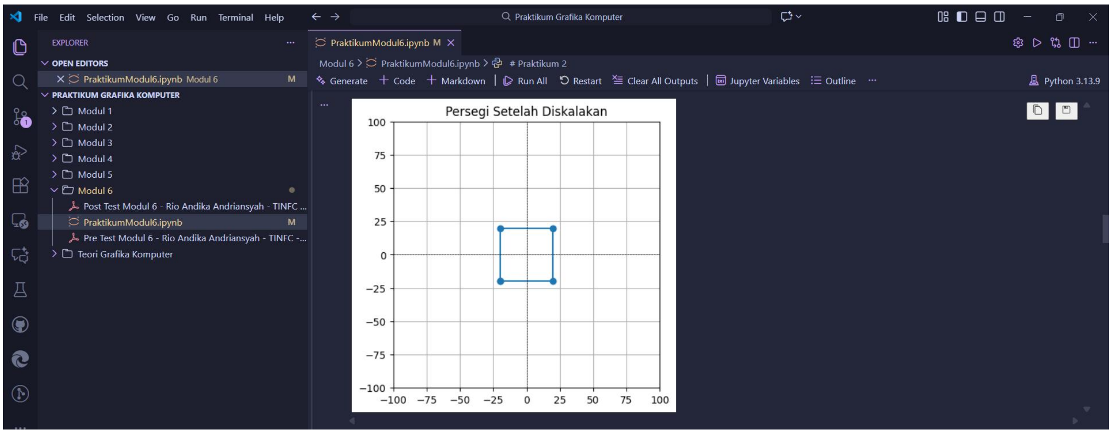
Source Code:

```
# Praktikum 1

import matplotlib.pyplot as plt

def drawTriangle(vertices, title):
    x, y = zip(*vertices)

    x += (x[0],)
    y += (y[0],)

    plt.figure()
    plt.plot(x, y, marker='o')
    plt.title(title)
    plt.xlim(-100, 100)
    plt.ylim(-100, 100)
    plt.axhline(0, color='black', linewidth=0.5, ls='--')
    plt.axvline(0, color='black', linewidth=0.5, ls='--')
    plt.grid()
    plt.gca().set_aspect('equal', adjustable='box')
    plt.show()

def scaleTriangle(vertices, scaleFactor):
        return [(x * scaleFactor, y * scaleFactor) for x, y in vertices]

x1, y1 = map(float, input("Titik 1 (x1, y1): ").split(','))
x2, y2 = map(float, input("Titik 2 (x2, y2): ").split(','))
```

```
x3, y3 = map(float, input("Titik 3 (x3, y3): ").split(','))

scaleFactor = float(input("Faktor skala: "))

triangleVertices = [(x1, y1), (x2, y2), (x3, y3)]
drawTriangle(triangleVertices, "Segitiga Asli")
scaledVertices = scaleTriangle(triangleVertices, scaleFactor)
drawTriangle(scaledVertices, "Segitiga Setelah Diskalakan")
```

## Praktikum 2

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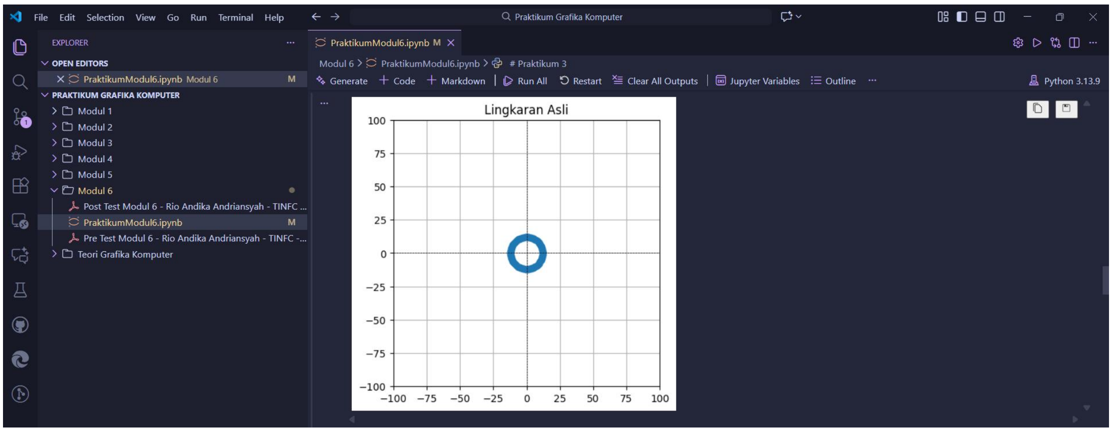
Python 3.13.9
Persegi Setelah Diskalakan
100
75
50
25
0
−25
−50
−75
−100
−100 −75 −50 −25 0 25 50 75 100

Source Code:

```
# Praktikum 2

import matplotlib.pyplot as plt

def drawSquare(vertices, title):
    x, y = zip(*vertices)

    x += (x[0],)
    y += (y[0],)

    plt.figure()
    plt.plot(x, y, marker='o')
    plt.title(title)
    plt.xlim(-100, 100)
    plt.ylim(-100, 100)
    plt.axhline(0, color='black', linewidth=0.5, ls='--')
    plt.axvline(0, color='black', linewidth=0.5, ls='--')
    plt.grid()
    plt.gca().set_aspect('equal', adjustable='box')
    plt.show()

def scaleSquare(vertices, scaleFactor):
        return [(x * scaleFactor, y * scaleFactor) for x, y in vertices]

x1, y1 = map(float, input("Titik 1 (x1, y1): ").split(','))
x2, y2 = map(float, input("Titik 2 (x2, y2): ").split(','))
x3, y3 = map(float, input("Titik 3 (x3, y3): ").split(','))
x4, y4 = map(float, input("Titik 4 (x4, y4): ").split(','))

scaleFactor = float(input("Faktor skala: "))

squareVertices = [(x1, y1), (x2, y2), (x3, y3), (x4, y4)]
drawSquare(squareVertices, "Persegi Asli")
scaledVertices = scaleTriangle(squareVertices, scaleFactor)
drawSquare(scaledVertices, "Persegi Setelah Diskalakan")
```

## Praktikum 3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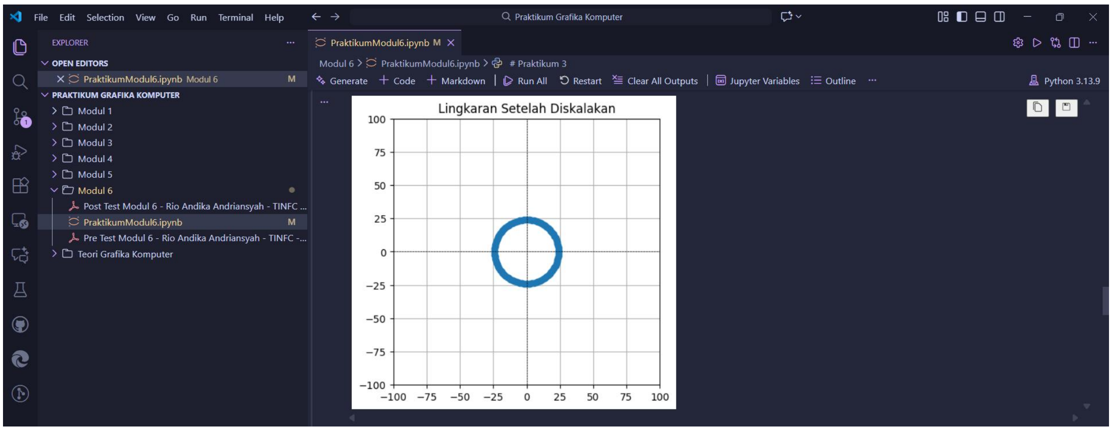
Generate + Code + Markdown Run All Restart Clear All Outputs Jupyter Variables Outline
Python 3.13.9
Lingkaran Asli
100
75
50
25
0
−25
−50
−75
−100
−100 −75 −50 −25 0 25 50 75 100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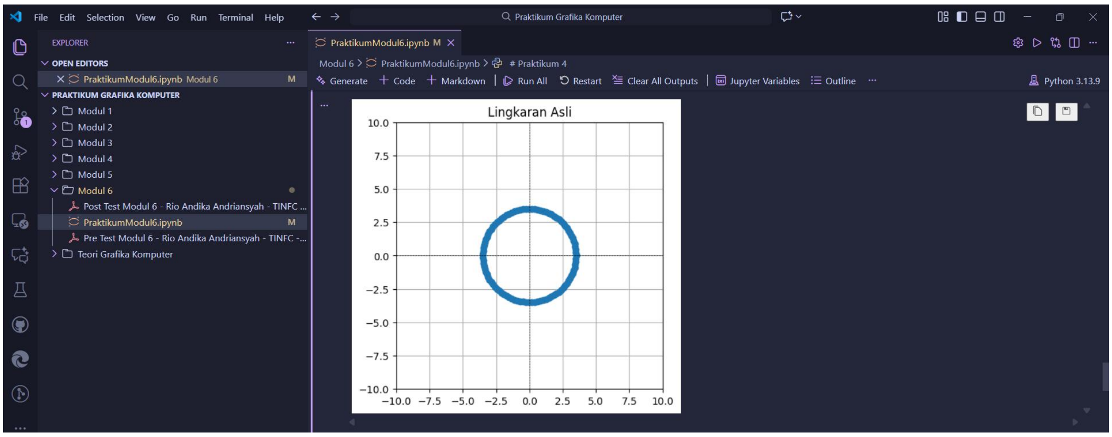
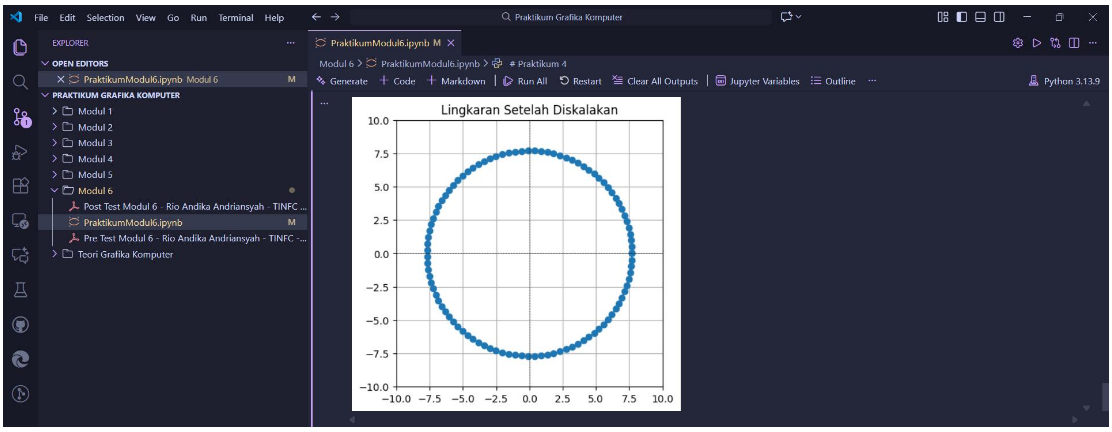
Generate + Code + Markdown Run All Restart Clear All Outputs Jupyter Variables Outline
Python 3.13.9
Lingkaran Setelah Diskalakan
100
75
50
25
0
−25
−50
−75
−100
−100 −75 −50 −25 0 25 50 75 100

Source Code:

```
# Praktikum 3

import matplotlib.pyplot as plt
import numpy as np

def drawCircle(center, radius, title):

    theta = np.linspace(0, 2 * np.pi, 100)
    x = center[0] + radius * np.cos(theta)
    y = center[1] + radius * np.sin(theta)
    plt.figure()
    plt.plot(x, y, marker='o')
    plt.title(title)
    plt.xlim(-100, 100)
    plt.ylim(-100, 100)
    plt.axhline(0, color='black', linewidth=0.5, ls='--')
    plt.axvline(0, color='black', linewidth=0.5, ls='--')
    plt.grid()
    plt.gca().set_aspect('equal', adjustable='box')
    plt.show()

def scaleCircles(radius, scaleFactor):
        return  radius * scaleFactor

x1, y1 = map(float, input("Pusat Lingkaran (x1, y1): ").split(','))
radius = float(input("Radius Lingkaran: "))
scaleFactor = float(input("Faktor skala: "))

drawCircle((x1, y1), radius, "Lingkaran Asli")
scaledRadius = scaleCircles(radius, scaleFactor)
drawCircle((x1, y1), scaledRadius, "Lingkaran Setelah Diskalakan")
```

## Praktikum 4





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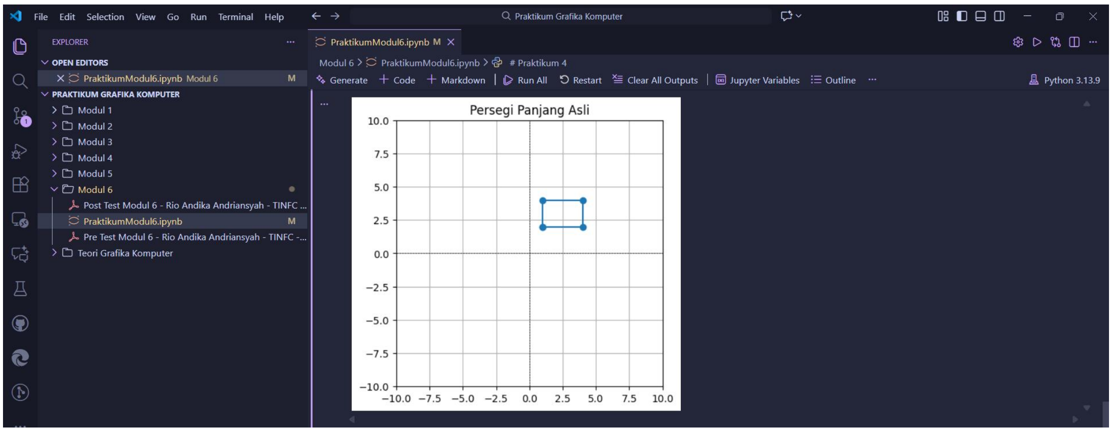
Clear All Outputs
Jupyter Variables
Outline
Python 3.13.9
Lingkaran Setelah Diskalakan
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−10.0
−10.0 −7.5 −5.0 −2.5 0.0 2.5 5.0 7.5 10.0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Modul 6 > PraktikumModul6.ipynb > # Praktikum 4
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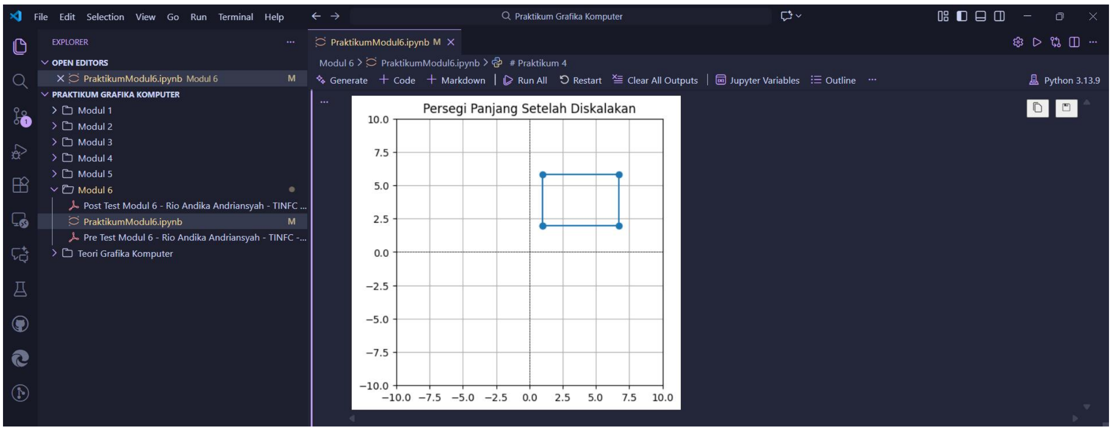
Python 3.13.9
Persegi Panjang Asli
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−10.0
−10.0 −7.5 −5.0 −2.5 0.0 2.5 5.0 7.5 10.0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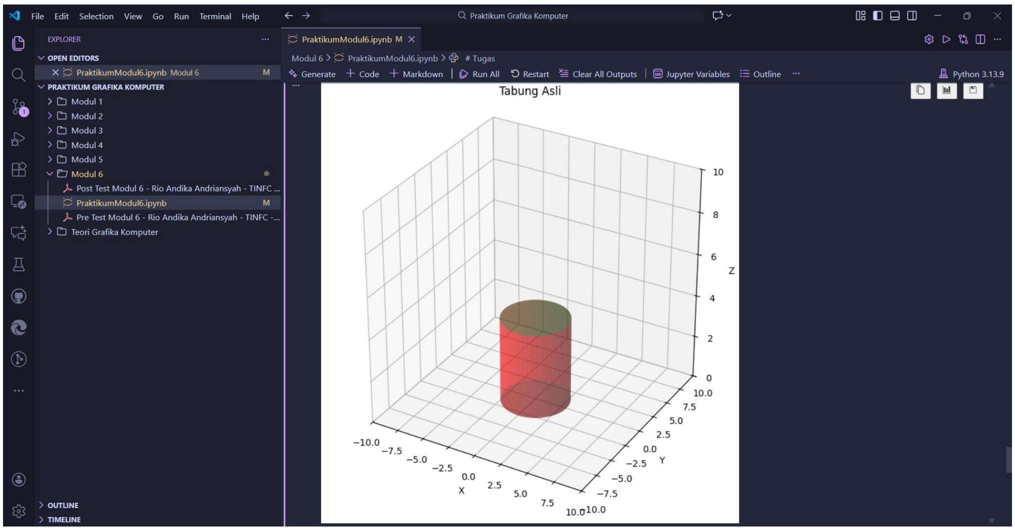
Python 3.13.9
Persegi Panjang Setelah Diskalakan
10.0
7.5
5.0
2.5
0.0
−2.5
−5.0
−7.5
−10.0
−10.0 −7.5 −5.0 −2.5 0.0 2.5 5.0 7.5 10.0

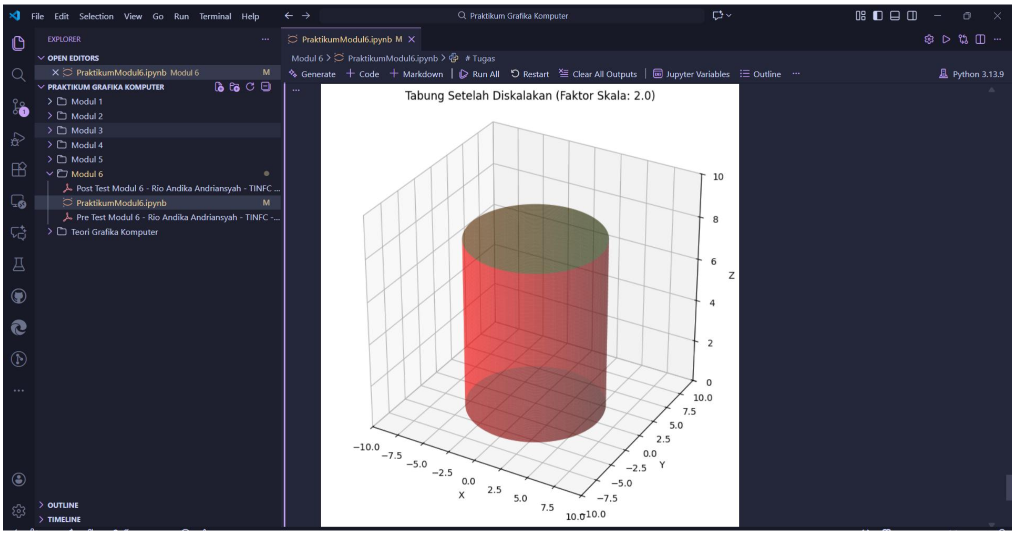
Source Code:

```
# Praktikum 4

import matplotlib.pyplot as plt
import numpy as np

def drawCircle(center, radius, title):

    theta = np.linspace(0, 2 * np.pi, 100)
    x = center[0] + radius * np.cos(theta)
    y = center[1] + radius * np.sin(theta)

    plt.figure()
    plt.plot(x, y, marker='o')
    plt.title(title)
    plt.xlim(-10, 10)
    plt.ylim(-10, 10)
    plt.axhline(0, color='black', linewidth=0.5, ls='--')
    plt.axvline(0, color='black', linewidth=0.5, ls='--')
    plt.grid()
    plt.gca().set_aspect('equal', adjustable='box')
    plt.show()

def drawRectangle(bottomLeft, width, height, title):
      x = [bottomLeft[0], bottomLeft[0] + width, bottomLeft[0] + width,
bottomLeft[0], bottomLeft[0]]
      y = [bottomLeft[1], bottomLeft[1], bottomLeft[1] + height,
bottomLeft[1] + height, bottomLeft[1]]
      plt.figure()
      plt.plot(x, y, marker='o')
      plt.title(title)
      plt.xlim(-10, 10)
      plt.ylim(-10, 10)
      plt.axhline(0, color='black', linewidth=0.5, ls='--')
      plt.axvline(0, color='black', linewidth=0.5, ls='--')
      plt.grid()
      plt.gca().set_aspect('equal', adjustable='box')
      plt.show()

def scaleCircles(radius, scaleFactorCircle):
        return  radius * scaleFactorCircle

def scaleRectangle(width, height, scaleFactorRectangle):
        return width * scaleFactorRectangle, height * scaleFactorRectangle

x1, y1 = map(float, input("Pusat Lingkaran (x1, y1): ").split(','))
radius = float(input("Radius Lingkaran: "))
scaleFactorCircle = float(input("Faktor skala: "))

x2, y2 = map(float, input("Titik Bawah Kiri Persegi Panjang (x2, y2): 
").split(','))
width = float(input("Lebar Persegi Panjang: "))
height = float(input("Tinggi Persegi Panjang: "))
scaleFactorRectangle = float(input("Faktor skala: "))

plt.figure(figsize=(12, 6))

drawCircle((x1, y1), radius, "Lingkaran Asli")
scaledRadius = scaleCircles(radius, scaleFactorCircle)
drawCircle((x1, y1), scaledRadius, "Lingkaran Setelah Diskalakan")

drawRectangle((x2, y2), width, height, "Persegi Panjang Asli")
scaledWidth, scaledHeight = scaleRectangle(width, height, 
scaleFactorRectangle)
drawRectangle((x2, y2), scaledWidth, scaledHeight, "Persegi Panjang 
Setelah Diskalakan")
```

# TUGAS

1. Buatlah kode program sederhana untuk menggambar tabung!

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Python 3.13.9
Tabung Setelah Diskalakan (Faktor Skala: 2.0)
X
Y
Z
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
0
2
4
6
8
10

Source Code:

```
# Tugas

import matplotlib.pyplot as plt
import numpy as np

def drawCylinder(baseCenter, radius, height, title):
    fig = plt.figure(figsize=(8, 8))
    ax = fig.add_subplot(111, projection='3d')

    theta = np.linspace(0, 2 * np.pi, 90)
    z = np.linspace(0, height, 45)

    Theta, Z = np.meshgrid(theta, z)
    X = baseCenter[0] + radius * np.cos(Theta)
    Y = baseCenter[1] + radius * np.sin(Theta)
    Z = baseCenter[2] + Z
    ax.plot_surface(X, Y, Z, alpha=0.4, color="red",
edgecolor='none')

    theta_cap = np.linspace(0, 2 * np.pi, 90)
    r_cap = np.linspace(0, radius, 45)
    Theta_cap, R_cap = np.meshgrid(theta_cap, r_cap)
    X_base = baseCenter[0] + R_cap * np.cos(Theta_cap)
    Y_base = baseCenter[1] + R_cap * np.sin(Theta_cap)
    Z_base = np.full_like(X_base, baseCenter[2])
    ax.plot_surface(X_base, Y_base, Z_base, alpha=0.4,
color="black", edgecolor='none')

    Z_top = np.full_like(X_base, baseCenter[2] + height)
    ax.plot_surface(X_base, Y_base, Z_top, alpha=0.4, color="green",
edgecolor='none')

    ax.set_title(title)
    ax.set_xlabel('X')
    ax.set_ylabel('Y')
    ax.set_zlabel('Z')
    ax.set_xlim(-10, 10)
    ax.set_ylim(-10, 10)
    ax.set_zlim(0, 10)
    ax.set_box_aspect([1,1,1])
    plt.show()

def scaleCylinder(radius, height, scaleFactor):
    return radius * scaleFactor, height * scaleFactor

x1, y1, z1 = map(float, input("Titik Dasar Tabung (x1, y1, z1):
").split(','))
radius = float(input("Radius Tabung: "))
height = float(input("Tinggi Tabung: "))
scaleFactor = float(input("Faktor skala: "))

drawCylinder((x1, y1, z1), radius, height, "Tabung Asli")
scaledRadius, scaledHeight = scaleCylinder(radius, height,
scaleFactor)
drawCylinder((x1, y1, z1), scaledRadius, scaledHeight, "Tabung
Setelah Diskalakan (Faktor Skala: {})".format(scaleFactor))
```

Github: https://github.com/Andrian206/Praktikum-Grafika-Komputer/tree/main/Modul%206