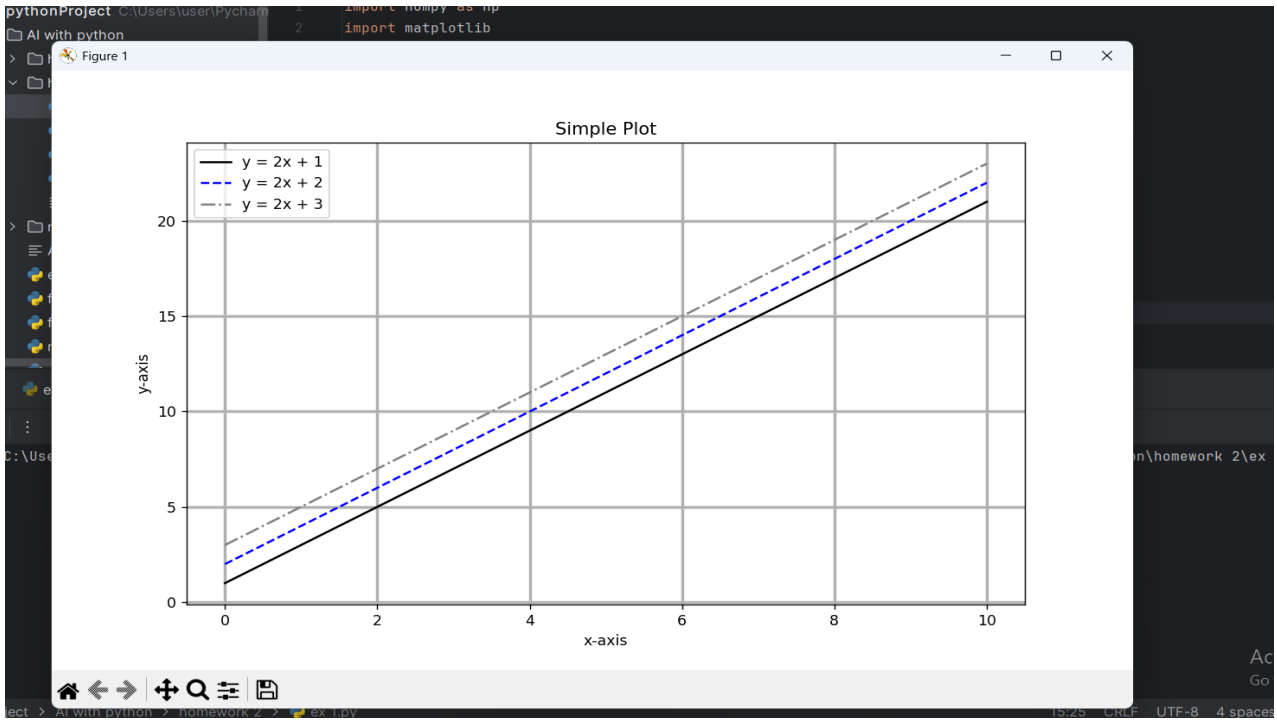
Assignment: Assignment 2 : Module 2 : Array

1. Here,

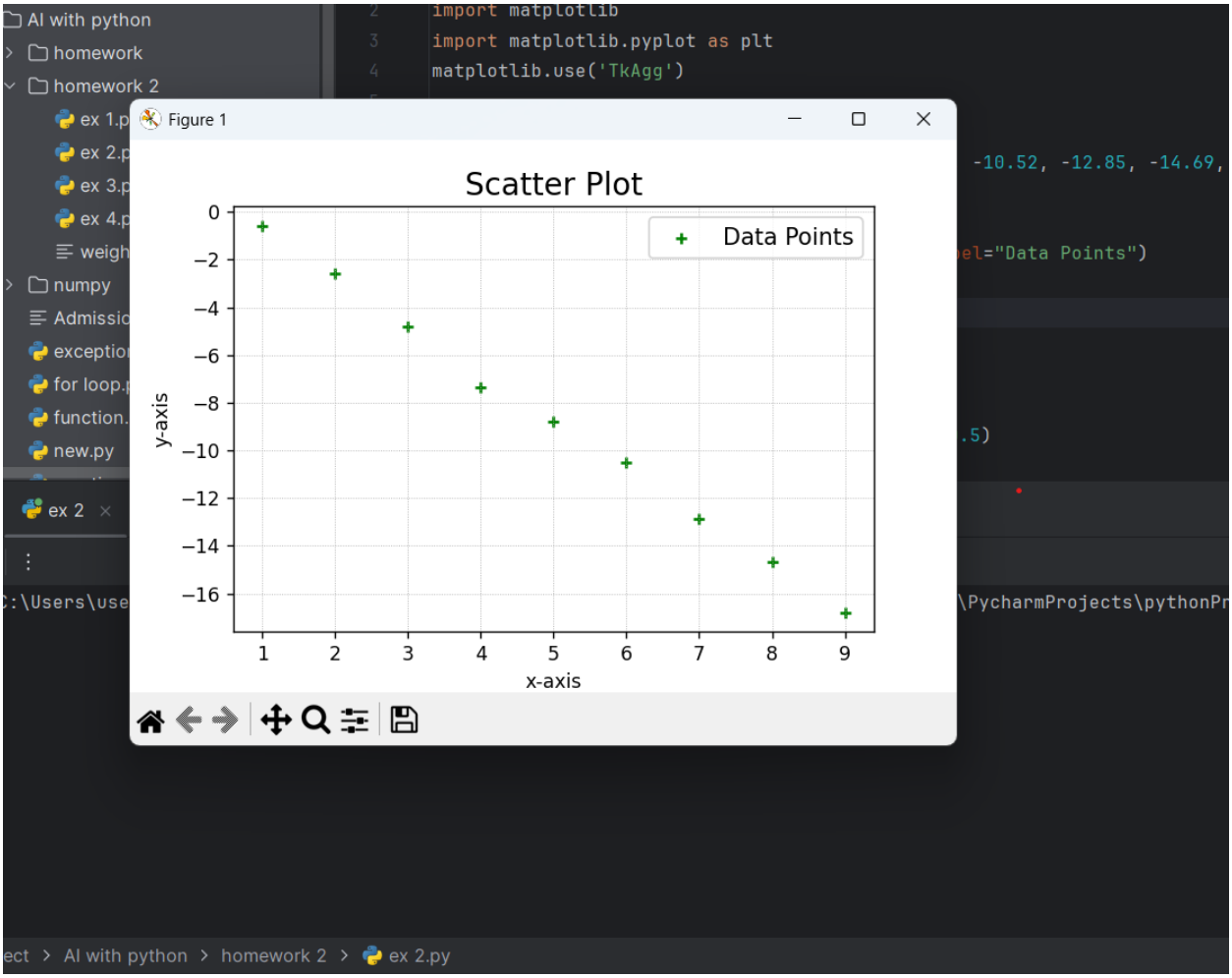
```
import numpy as np
import matplotlib
import matplotlib.pyplot as plt
matplotlib.use('TkAgg')
x = np.linspace(0, 10, 100)
y1 = 2 * x + 1
y2 = 2 * x + 2
y3 = 2 * x + 3

plt.figure(figsize = (10, 6))
plt.plot(x, y1, label = "y = 2x + 1", linestyle="-", color="black")
plt.plot(x, y2, label = "y = 2x + 2", linestyle="--", color="blue")
plt.plot(x, y3, label = "y = 2x + 3", linestyle="-.", color="grey")

plt.title("Simple Plot")
plt.xlabel("x-axis")
plt.ylabel("y-axis")

plt.grid(True, linestyle ='-', linewidth=2)
plt.legend()
plt.show()
```



2. Here,

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

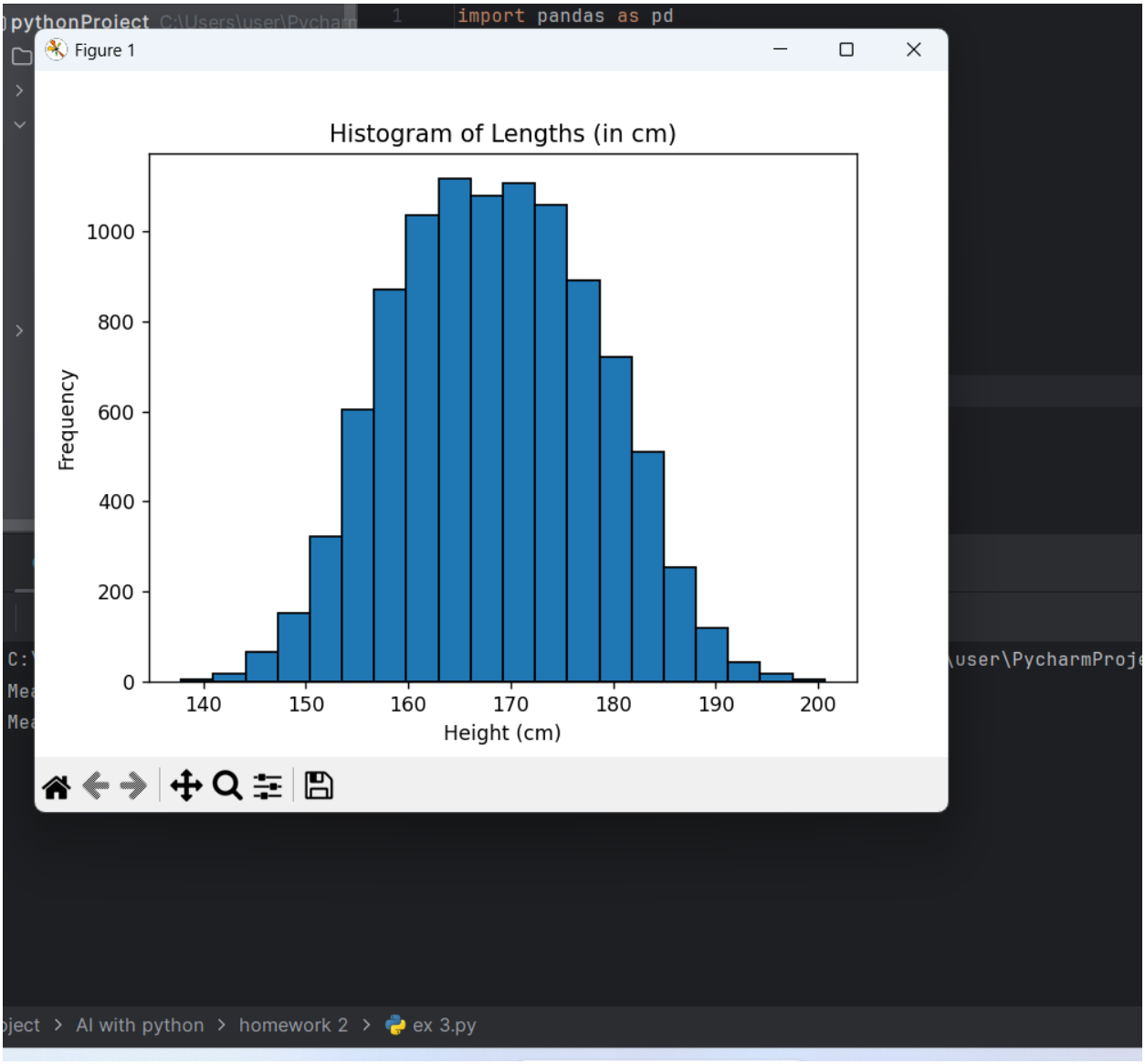
```
matplotlib.use('TkAgg')

x = np.array([1, 2, 3, 4, 5, 6, 7, 8, 9])
y = np.array([-0.57, -2.57, -4.80, -7.36, -8.78, -10.52, -12.85, -
14.69, -16.78])

plt.figure(figsize=(6,4))
plt.scatter(x, y, marker='+', color='green', label="Data Points")

plt.title("Scatter Plot", fontsize=16)
plt.xlabel("x-axis", fontsize=10)
plt.ylabel("y-axis", fontsize=10)

plt.grid(True, linestyle=':', linewidth=0.5)
plt.legend(fontsize=12)

plt.show()
```



3. Here,

```
import pandas as pd
import numpy as np
```

```
import matplotlib
import matplotlib.pyplot as plt
matplotlib.use('TkAgg')

df = pd.read_csv('weight-height.csv')
length_in_inches = df['Height'].values
weight_in_pounds = df['Weight'].values

length_in_cm = length_in_inches * 2.54

weight_in_kg = weight_in_pounds * 0.453592

mean_length = np.mean(length_in_cm)
mean_weight = np.mean(weight_in_kg)

print(f"Mean Height (cm): {mean_length}")
print(f"Mean weight (kg): {mean_weight}")

plt.hist(length_in_cm, bins=20, edgecolor='black')
plt.title('Histogram of Lengths (in cm)')
plt.xlabel('Height (cm)')
plt.ylabel('Frequency')
plt.show()
```



4. Here,

```
import numpy as np

A = np.array([[1, 2, 3],
              [0, 1, 4],
              [5, 6, 0]])

A_inv = np.linalg.inv(A)

product_A_A_inv = np.dot(A, A_inv)
product_A_inv_A = np.dot(A_inv, A)

print("Inverse of A:")
print(A_inv)
```

```
print("\nA * A_inv (close to identity matrix):")
print(product_A_A_inv)

print("\nA_inv * A (close to identity matrix):")
print(product_A_inv_A)
```