18. Suppose a hospital tested the age and body fat data for 18 randomly selected adults with the

following result.

\*Question:\*

Calculate the mean, median and standard deviation of age and %fat using Pandas.

 Draw the boxplots for age and %fat.

 Draw a scatter plot and a q-q plot based on these two variables

Code :

#18

import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

import scipy.stats as stats

# Load the dataset from Excel

df = pd.read\_excel(r"C:\Users\hares\Downloads\q18\_05.xlsx")

# Calculate mean, median, and standard deviation

print("=== Descriptive Statistics ===")

print(f"Mean Age: {df['Age'].mean():.2f}")

print(f"Median Age: {df['Age'].median():.2f}")

print(f"Standard Deviation of Age: {df['Age'].std():.2f}")

print(f"\nMean Body Fat %: {df['BodyFat%'].mean():.2f}")

print(f"Median Body Fat %: {df['BodyFat%'].median():.2f}")

print(f"Standard Deviation of Body Fat %: {df['BodyFat%'].std():.2f}")

# Plotting

plt.figure(figsize=(12, 10))

# Boxplots

plt.subplot(2, 2, 1)

sns.boxplot(x=df['Age'], color='lightblue')

plt.title("Boxplot of Age")

plt.subplot(2, 2, 2)

sns.boxplot(x=df['BodyFat%'], color='lightcoral')

plt.title("Boxplot of Body Fat %")

# Scatter Plot

plt.subplot(2, 2, 3)

sns.scatterplot(x='Age', y='BodyFat%', data=df, color='green')

plt.title("Scatter Plot: Age vs Body Fat %")

# Q-Q Plot

plt.subplot(2, 2, 4)

stats.probplot(df['BodyFat%'], dist="norm", plot=plt)

plt.title("Q-Q Plot of Body Fat %")

plt.tight\_layout()

plt.show()

Output :

=== Descriptive Statistics ===

Mean Age: 38.67

Median Age: 37.00

Standard Deviation of Age: 10.66

Mean Body Fat %: 23.53

Median Body Fat %: 23.55

Standard Deviation of Body Fat %: 3.50

