

# **Brain International School**

Vikas Puri, New Delhi

## ASSIGNMENT NO. 1

## SUBJECT: INFORMATICS PRACTICES CLASS-XII

APRIL,2025

### **CH 1: Python Pandas**

- 1. What is Pandas in Python? How is it different from NumPy?
- 2. Differentiate between a Series and a DataFrame with examples.
- 3. What do you understand by 'index' in a Pandas Series and DataFrame? How is it useful?
- 4. Write the output of the following code:

import pandas as pd

s = pd.Series([10, 20, 30], index=['a', 'b', 'c'])

print(s[1])

5. Explain the difference between loc[] and iloc[] with examples.

6. Create a Pandas Series to store the names of five fruits. Set custom indexes as the first letters of each fruit. Print the series.

7. Given a list of student names and their marks, create a Series and display the students who scored more than 80.

names = ['Ankit', 'Priya', 'Rahul', 'Sneha', 'Divya']

marks = [76, 89, 92, 67, 85]

- 8. Create a DataFrame using a dictionary with the following data and display it: {'Name': ['Amit', 'Riya'], 'Age': [17, 18], 'Class': ['XII', 'XII']}
- 9. Write a program to create a DataFrame from a list of dictionaries as shown below: data = [{'Product': 'Pen', 'Price': 20}, {'Product': 'Pencil', 'Price': 10}]
- 10. Given the following DataFrame:

import pandas as pd

df = pd.DataFrame({ 'Name': ['Ali', 'Sara', 'Ravi'], 'Marks': [85, 90, 78]})

a) Display only the "Name" column.

b) Add a new column "Grade" with values 'A', 'A+', 'B'.

11. Write a program to create a Series using a dictionary of subject marks and print only the keys (subjects).

{'Maths': 90, 'English': 85, 'CS': 95}

12. Given a DataFrame of students:

df = pd.DataFrame({

'RollNo': [1, 2, 3],

'Name': ['Anu', 'Vikram', 'Neha'],

'Marks': [87, 91, 76] })

Write code to:

(a) Display the second row using iloc.

(b) Display names of students who scored more than 80.

13. Write a Pandas program to create a DataFrame with columns "Name", "Age", "City" for 3 people. Then, update the age of the second person to 25.

14. How can we convert a Series to a list and a DataFrame to a dictionary? Give example code for both.

- 15. Given this Series:
  - s = pd.Series([5, 10, 15, 20], index=['a', 'b', 'c', 'd'])
  - Write Python code to:
  - (a) Change the value at index 'c' to 50
  - (b) Drop the value at index 'b'

### CH 3: Plotting with pyplot

1. What is the purpose of the matplotlib.pyplot module in Python? Name any three types of plots supported by it.

- 2. Predict the output of the following code: import matplotlib.pyplot as plt x = [1, 2, 3, 4] y = [2, 4, 6, 8] plt.plot(x, y, marker='o', linestyle='--', color='g') plt.title('Simple Line Plot') plt.xlabel('X-axis') plt.ylabel('Y-axis') plt.show() Explain what each line does.
- 3. Write a Python program using matplotlib.pyplot to plot a line chart for the following data: Months: ['Jan', 'Feb', 'Mar', 'Apr'] Sales: [200, 250, 300, 280] Include labels for axes and a title.
- 4. Write a Python program to plot a bar chart for the following data: Subjects: ['Math', 'Physics', 'Chemistry', 'Biology'] Marks: [95, 88, 76, 90] Include labels for axes and a title.
- 5. Write a program to plot both sine and cosine curves on the same graph using NumPy and Matplotlib. Include: A legend, X and Y labels, and a grid.