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Section: AI Yellow

Lab No: 1st

Task No 1

Student Marks Analysis (NumPy)

```
marks = np.array([56, 78, 90, 45, 67, 88, 92, 75, 61, 80])
avg = np.mean(marks)
above_avg = np.sum(marks > avg)
reshaped = marks.reshape(2, 5)
row_max = np.max(reshaped, axis=1)
```

Description:

I used NumPy functions to calculate the average marks of the class, counted how many students scored above the average, reshaped the marks into a 2×5 matrix, and found the highest marks in each row.

Task no 2

Fruit Shop Inventory (Pandas Series)

```
fruits = pd.Series({'Apples': 10, 'Bananas': 0, 'Dates': 5})
print(fruits[fruits == 0])  # out of stock

fruits['Apples'] += 5
fruits['Bananas'] += 10
fruits['Dates'] += 12
print("Updated:", fruits)

total_stock = fruits.sum()
```

Description:

Here, I created a Pandas Series to store fruit stocks, identified the fruits that were out of stock, updated the Series after receiving new deliveries, and calculated the total stock available.

Task no 3

Student Records (Pandas DataFrame)

```
data = {'Name': ['Maaz', 'Ahmad', 'Jawad'],
        'Score': [85, 92, 78]}
df = pd.DataFrame(data)

highest = df.loc[df['Score'].idxmax()]
average = df['Score'].mean()
above_avg = df[df['Score'] > average]
```

Description:

In this task, I built a DataFrame for student records, found the student with the highest score, calculated the class average, and listed all students who scored above the average.

Conclusion:

From this lab, I learned how to use NumPy for numerical operations and Pandas for handling tabular data. I practiced creating arrays, Series, and DataFrames, and applied functions to analyze data in different ways. This helped me understand the difference between NumPy (numerical focus) and Pandas (data handling and analysis).