

Training Day 9 Report

Date: 3 July 2025

Topic: Introduction to Pandas (Series and Operations)

Overview

Pandas is a powerful, open-source Python library used for **data analysis and manipulation**. It is built on top of **NumPy** and provides high-level data structures like **Series** and **DataFrame** for handling structured data efficiently.

- **Series** → One-dimensional labeled array (like a column in Excel).
- **DataFrame** → Two-dimensional labeled data structure (like a table in Excel).

On Day 9, we focused on **Pandas Series** and performed **basic arithmetic operations** between Series.

Key Concepts Covered

1. Creating a Pandas Series

```
import pandas as pd
```

```
s1 = pd.Series([10, 20, 30, 40])
```

```
s2 = pd.Series([1, 2, 3, 4])
```

- `s1` and `s2` are Pandas Series objects.
- Each element has an **index** (0, 1, 2, 3).

2. Arithmetic Operations on Series

- **Addition**

```
add = s1 + s2
```

```
print(add)
```

Output:

```
0  11
1  22
2  33
3  44
dtype: int64
```

- **Subtraction**

```
sub = s1 - s2
print(sub)
```

Output:

```
0   9
1  18
2  27
3  36
dtype: int64
```

- **Multiplication**

```
mul = s1 * s2
print(mul)
```

Output:

```
0   10
1   40
2   90
3  160
dtype: int64
```

- **Division**

```
div = s1 / s2
print(div)
```

Output:

```
0    10.0
1    10.0
2    10.0
3    10.0
dtype: float64
```

3. Key Points Learned

- Pandas **automatically aligns indexes** during operations.
- Supports **vectorized operations** (fast, no loops required).
- Results are returned as **Series objects** with preserved indexes.
- Data types are automatically adjusted (e.g., division results in float).

Summary

On 3 July, we learned:

- ✓ What **Pandas** is and why it is useful for data analysis.
- ✓ How to **create Series** and perform **arithmetic operations** on them.
- ✓ Observed how Pandas handles **indexes and data types** during operations.

Learning Outcomes

- ✓ Understood **Pandas Series** and its similarity to Excel/NumPy arrays.
- ✓ Learned how to perform **addition, subtraction, multiplication, and division** between Series.
- ✓ Gained clarity on **index alignment** and **automatic data type handling**.
- ✓ Built a strong foundation to move towards **Pandas DataFrames** (next step).