# Data Handling in Python Training

Duration: **3 Day**

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## Overview

Python has become one of the most widely used programming languages for data analysis, data engineering, machine learning, and artificial intelligence. Its powerful ecosystem enables professionals to efficiently collect, clean, transform, analyse, and visualise data from a wide variety of sources.

**Data Handling in Python** is a three-day hands-on training programme designed to provide participants with a practical foundation in Python for data processing. Throughout the course, learners explore Python fundamentals while working extensively with industry-standard libraries including NumPy, Pandas, Matplotlib, and Seaborn.

Through practical exercises and guided technical labs, participants learn how to prepare datasets, automate repetitive tasks, perform statistical analysis, and produce meaningful visualisations that support data-driven decision making.

The programme also establishes the essential Python skills required for more advanced learning in data engineering, data science, machine learning, and artificial intelligence.

## Prerequisites

Previous Python experience is not required.

Participants should have a basic understanding of common data concepts such as tables, records, columns, rows, and data types. General data literacy will help maximise the learning experience.

## Who Should Attend

This course is suitable for:

- Data Analysts
- Data Engineers
- DataOps Professionals
- Business Intelligence Specialists
- Professionals preparing for Data Science roles
- Developers working with AI services
- Anyone seeking practical Python skills for data analysis

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## What You Will Learn

Upon completion of this course, participants will be able to:

- Use Python effectively for data processing tasks.
- Perform numerical computations with NumPy.
- Analyse and manipulate datasets using Pandas.
- Create informative data visualisations with Matplotlib and Seaborn.
- Work confidently within the Jupyter Notebook environment.
- Import and export data from CSV, Excel, JSON, and other structured file formats.
- Clean and prepare datasets for analysis.
- Automate repetitive data processing tasks using Python.
- Build a strong programming foundation for future learning in Data Engineering, Data Science, Machine Learning, and Artificial Intelligence.

## Outline

### Module 1 – Introduction to Programming for Data Processing

- Benefits of programming for data analysis
- Common programming languages used in analytics
- Programming versus traditional analytical tools
- Python's role in modern data workflows

### Module 2 – Python Fundamentals and Jupyter Notebook

- Python language fundamentals
- Working with Jupyter Notebook
- Writing basic Python programs
- Variables and data types
- Strings
- Integers
- Floating-point values
- Boolean logic

### Module 3 – Data Structures and Program Flow

- Lists
- Tuples
- Dictionaries
- Sets
- Conditional statements
- Loops
- Creating reusable functions
- File input and output
- Process automation

### Module 4 – Numerical Computing with NumPy

- NumPy arrays

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- Array creation
- Indexing
- Filtering
- Masking
- Querying data
- Vectorised operations
- Mathematical computations

### Module 5 – Data Analysis with Pandas

- Series and DataFrames
- Reading and writing datasets
- Index management
- Data type conversion
- Summary statistics
- Aggregation
- CSV
- Excel
- JSON
- Structured data formats

### Module 6 – Data Cleaning

- Handling missing values
- Removing duplicate records
- Data transformation
- Text processing
- String methods
- Regular Expressions (Regex)

### Module 7 – Data Manipulation

- Pivot tables
- Combining datasets
- Time series analysis
- Streaming large datasets
- Performance optimisation

### Module 8 – Data Visualisation

- Creating charts with Matplotlib
- Visual analytics using Seaborn
- Numeric and categorical visualisations
- Aggregated data visualisation
- Designing effective and meaningful charts