

Course 1 (Week 1)

Introduction to Data Analytics, Python Programming, and GitHub Copilot

Lecture 4: NumPy and Python





Which city do you want to visit at least once,
and why?

Skills Covered

- XXXX

Objectives for today

1. xxxx

Learning Outcomes

- XXXX



Introduction to Data Analysis

Sections

Section 1

Section 2

Section 3

Section 4

Section 5

Data Analysis

- XX

Python Libraries

- XX

Numpy

- XX

Pandas

- XX

Installing and Setting Up the Libraries

- XX

Let's go to the JN

NumPy



Sections

Section 1

Section 2

Section 3

Section 4

Section 5

NumPy

- Introduction to NumPy Arrays: Understanding the difference between NumPy arrays and Python lists.
- Creating Arrays: Various methods (from lists, using `arange()`, `linspace()`, etc.).
- Array Operations: Basic arithmetic, broadcasting, and aggregation functions (`sum`, `mean`, etc.).
- Indexing and Slicing: Accessing and modifying data in arrays.
- Hands-on Exercise: Create and manipulate NumPy arrays to perform basic data manipulation.



Data Manipulation with Pandas

Sections

Section 1

Section 2

Section 3

Section 4

Section 5

Pandas

- Filtering and Sorting Data: Applying conditions, sorting by columns, and working with indexes.
- Data Cleaning Techniques: Removing duplicates, dealing with NaNs, renaming columns, etc.
- Data Transformation: Using functions like `apply()`, `map()`, and vectorized operations for efficient transformations.
- GroupBy and Aggregation: Summarizing data using grouping and aggregate functions.
- Hands-on Exercise: Apply filtering, sorting, and grouping operations on a sample dataset.



Advanced Pandas: Merging and Joining DataFrames

Sections

Section 1

Section 2

Section 3

Section 4

Section 5

Data Manipulation with Pandas

- Combining DataFrames: Concatenation, merging, and joining datasets.
- Pivot Tables: Creating and using pivot tables to summarize data.
- Exporting Data: Saving cleaned and processed data to CSV or Excel formats.
- Hands-on Exercise: Merge multiple datasets and create pivot tables for data insights.

Key highlights

That's a wrap

Any Questions?

Bibliography

- XXX