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Learning Style: Online Instructor-Led

Technology:

Difficulty: Intermediate

Course Duration: 5 Days

Applied Python for Data Science (TTPS4876)



About This Course:

Applied Python for Data Science is a three-day hands-on course designed for Python enthusiasts looking to expand their data science and machine learning skills. Whether you're already familiar with Python basics or have dabbled in some coding, this course will take you further, focusing on practical applications of popular libraries like pandas, NumPy, and Scikit-Learn. By the end, you'll be ready to tackle intermediate data science tasks with confidence.

You'll start by diving deep into pandas, exploring its powerful DataFrame and Series structures to clean, filter, and manipulate data with ease. Then, you'll shift gears into the world of NumPy, learning to perform efficient numerical computations, a crucial skill for any data scientist. The course also introduces you to text data processing and teaches you how to visualize your results with Matplotlib, making your data easy to understand and present.

In the final stretch, you'll get hands-on with machine learning using Scikit-Learn. You'll learn to build simple models, train them on data, and evaluate their performance, giving you a solid foundation in the machine learning workflow. This course offers a comprehensive and approachable way to level up your Python skills and apply them to real-world data science problems.

Course Objectives:

- Mastering pandas Operations: Learn to navigate, manipulate, and explore data using pandas DataFrames and Series, improving your ability to handle diverse datasets.
- Enhancing Numerical Computation with NumPy: Gain proficiency in performing efficient numerical operations using NumPy arrays, essential for data-driven calculations.
- Working with Series Data in pandas: Understand how to create, manipulate, and apply methods to pandas Series for effective data slicing and mathematical operations.
- Filtering and Exploring DataFrames: Develop the ability to filter, conditionally select, and efficiently explore data within pandas DataFrames, even when working with large datasets.
- Processing and Analyzing Text Data: Learn to handle, clean, and analyze text data using pandas, preparing it for visualization or machine learning applications.
- Applying Machine Learning with Scikit-Learn: Build, evaluate, and apply simple machine learning models using Scikit-Learn to address basic predictive tasks and gain insights from data.

Audience:

- This course is geared for experienced data analysts, developers, engineers or anyone tasked with utilizing Python for data analytics or eventual machine learning tasks. Attending students are required to have a background in basic Python for data science.

Prerequisites:

- Attending students are required to have a background in basic Python for data science.

Course Outline:

MODULE 1: Getting Started

1. Introduction to pandas

- Overview of pandas library
- Installation and setup
- Understanding the importance of pandas in data science

2. A Whirlwind Tour of pandas

- Exploring basic operations in pandas
- Introduction to DataFrames and Series
- Overview of essential pandas functionalities

MODULE 2: The Python Ecosystem

3. Python Crash Course

- Python basics: Variables, data types, and control flow
- Functions and modules in Python
- Introduction to object-oriented programming in Python

4. NumPy Crash Course

- Understanding NumPy arrays
- Basic operations with NumPy
- Utilizing NumPy for numerical computing

MODULE 3: The Series

5. The Series Object

- Introduction to pandas Series
- Creating and manipulating Series objects
- Understanding indexing and slicing in Series

6. Series Methods

- Applying methods on Series
- Handling missing data in Series
- Performing mathematical operations on Series

MODULE 4: The DataFrame

7. The DataFrame Object

- Understanding the structure of DataFrames
- Creating DataFrames from various data sources
- Exploring data in DataFrames

8. Filtering a DataFrame

- Techniques for filtering data in DataFrames
- Applying conditions to DataFrames
- Handling large datasets with efficient filtering

MODULE 5: Working with Text Data

9. Working with Text Data

- Introduction to text data in pandas
- String operations and methods in pandas
- Handling and cleaning text data

MODULE 6: Working with AI and Visuals

10. Working with Matplotlib and PIL

    - Basics of Matplotlib for data visualization
    - Creating plots and charts
    - Introduction to the Python Imaging Library (PIL) for image processing

11. Machine Learning with Scikit-Learn

    - Introduction to machine learning concepts
    - Applying Scikit-Learn for basic machine learning tasks
    - Building and evaluating simple machine learning models