Hands-On Practical Python for Data Wrangling & Transformation - TTPS4880

Hands-On Practical Python for Data Wrangling & Transformation   Explore Python Foundation, NumPy, Pandas, SQL, Matplotlib, Web Scraping & More

Duration: 4 Days
Skill Level: Introductory
Available Format: Instructor-Led Online ; On Public Schedule

Python, renowned for its simplicity and robustness, has become an indispensable language in various fields, including data science, machine learning, and business analytics. Its extensive libraries for data manipulation and analysis make Python a go-to tool for individuals and organizations aiming to derive meaningful insights from data.

What You'll Learn

Overview

Python, renowned for its simplicity and robustness, has become an indispensable language in various fields, including data science, machine learning, and business analytics. Its extensive libraries for data manipulation and analysis make Python a go-to tool for individuals and organizations aiming to derive meaningful insights from data. Geared for technical users new to Python, **Hands-On Practical Python for Data Wrangling & Transformation** is a four-day, comprehensive hands-on course that will provide you with the hands-on practice and foundational skills needed to navigate Python programming and data wrangling effectively.

Throughout the course you'll explore critical topics such as leveraging Python's built-in types, structuring and organizing code, manipulating file code, and deep-diving into data wrangling. You will also gain exposure to advanced topics, including SQL and RDBMS, and their integration with Python for efficient data handling and management. The focus

remains firmly on delivering practical skills that can be directly applied in a professional setting.

Our hands-on approach sets this course apart. A significant portion of the learning experience will be dedicated to practical lab exercises where you will apply Python, along with tools like NumPy, Pandas, Matplotlib, SQLite, and SQLAlchemy, to real-world data scenarios. These labs aim to simulate real job tasks, from data transformation to web scraping, preparing you to handle similar tasks in your current or future roles. The course also includes a few bonus, time-permitting chapters on applying Generative AI / AI / GPT to Python and Data Wrangling.

The course leverages our innovative Learning Experience Platform, promoting an interactive and collaborative learning environment, under the real-time live guidance of our industry expert. Upon course completion, you will have a strong foundation in Python programming and data wrangling, be capable of handling files and databases efficiently, and possess the skills to extract meaningful insights from complex datasets, directly benefiting your professional endeavors.

Objectives

This course is approximately **50% hands-on**, combining expert lecture, real-world demonstrations and group discussions with machine-based practical labs and exercises. Our engaging instructors and mentors are highly experienced practitioners who bring years of current "on-the-job" experienceinto every classroom.

Working in a hands-on learning environment, guided by our expert team, attendees will learn to:

- Master the essentials of Python programming: From basic syntax to complex functionalities, you'll develop the skills to create, test, and debug Python programs with ease.
- Get comfortable with Python's built-in data types and structures: You'll understand how to effectively use lists, tuples, sets, and dictionaries in Python, providing the foundational building blocks for data manipulation and analysis.

- Learn to structure and organize your code: We'll help you write clean, efficient, and well-organized Python code, a crucial skill for any programming role.
- Grasp the art of data wrangling: By the end of the course, you'll be able to clean, transform, and enrich raw data to a form that's suitable for analysis - a skill in high demand in today's data-driven world.
- Get hands-on experience with Python libraries: You'll learn to use popular Python libraries such as NumPy, Pandas, and Matplotlib, empowering you to perform complex data analysis and create stunning data visualizations.
- Apply Python skills to real-world scenarios: Through our practical labs and capstone project, you'll get to apply your Python and data wrangling skills to real-world data scenarios. This experience will prepare you to tackle similar challenges in your professional life with confidence.

Need different skills or topics? If your team requires different topics or tools, additional skills or custom approach, this course may be further adjusted to accommodate. We offer additional python, data science, AI / machine learning and other related topics that may be blended with this course for a track that best suits your needs. Our team will collaborate with you to understand your needs and will target the course to focus on your specific learning objectives and goals.

Audience

The ideal audience for this course are individuals in technical roles who have a basic understanding of data science and are looking to expand their skill set with Python programming and data wrangling. This may include data analysts, business intelligence professionals, junior data scientists, and IT professionals involved in data-focused roles. Additionally, researchers, academics, or other professionals seeking to streamline data analysis and management processes in their work might also find significant value in attending.

Pre-Requisites

In order to be successful in the course you should have:
- Basic understanding of any programming language: Familiarity with concepts like variables, loops, and functions would be beneficial, even if not in Python.

- Fundamental knowledge of Data Science: A general understanding of what data science is and why it's valuable would help provide context for the Python and data wrangling skills taught in this course.
- Comfort with basic Mathematical Concepts: As Python is heavily used in data analysis, a comfort level with basic math and statistics would be beneficial, though advanced mathematical skills are not necessary.

Agenda

Please note that this list of topics is based on our standard course offering, evolved from typical industry uses and trends. We can work with you to tune this course and level of coverage to target the skills you need most. Course agenda, topics and labs are subject to adjust during live delivery in response to student skill level, interests and participation.

Introduction to Python
- Understand Python's significance and its application in modern enterprises.
- Python Basics and Syntax
- Python Built-in Types
- Variables, Lists, Dictionaries, and Tuples • Control Structures: If, For, While
- Lab: Hands-on Python basics using Python, Jupyter Notebook

Organizing and Structuring Code
- Gain skills to write efficient and organized Python code.
- Writing Functions and Classes
- Modules and Packages
- Error Handling and Exceptions • Pythonic Coding Practices
- Lab: Code organization and modularization

Manipulating Files
- Learn file handling in Python for reading and writing data

- Reading and Writing Text Files
- File Operations and Manipulation
- Working with JSON and CSV Files
- Directory Operations
- Lab: File operations and data extraction

Introduction to Data Wrangling with Python

- Grasp the concept of Data Wrangling and its importance in Python.
- Introduction to Data Wrangling
- Loading and Viewing Data
- Data Cleaning Techniques
- Data Transformation
- Lab: Initial data wrangling exercises

Deep Dive into NumPy, Pandas, and Matplotlib

- Discover essential Python libraries for data analysis and visualization.
- Introduction to NumPy
- Introduction to Pandas • Introduction to Matplotlib
- Data Analysis and Visualization Using Above Libraries
- Lab: Data manipulation and visualization tasks using Pandas, NumPy, Matplotlib

Advanced Data Wrangling with Python

- Gain advanced skills for wrangling data using Python.
- Merging and Joining DataFrames
- Handling Missing Data
- Date and Time Data
- String Manipulations
- Lab: Advanced data wrangling tasks using Python and Pandas

Web Scraping and Data Gathering

- Learn the techniques to extract data from the web.

- Introduction to Web Scraping • Using BeautifulSoup
- Regular Expressions in Python • APIs and JSON
- Lab: Web scraping tasks

Introduction to SQL and RDBMS

- Understand SQL's role in data wrangling and Python's integration with it.
- SQL Basics
- Python's sqlite3 module
- SQL vs. NoSQL
- Using SQLAlchemy with Python
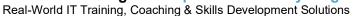- Lab: Database interactions and data extraction tasks

Real-world Data Wrangling

- Apply learned skills to real-world data wrangling scenarios.
- Case Studies in Data Wrangling
- Best Practices in Data Wrangling
- Dealing with Large Datasets
- Building a Data Wrangling Pipeline
- Lab: Real-world data wrangling task

Next Steps in Python and Data Wrangling

- Overview of Advanced Python Topics
- Overview of Machine Learning with Python
- Overview of Big Data Tools (e.g., Spark)
- Lab: Exploring Machine Learning and Big Data Tools: Use Scikit-learn to create a basic Machine Learning model and then apply PySpark to handle a small simulated Big Data task.

Capstone Projects / Optional

- Lab Project: Hands-on Real-world Data Wrangling Project - Apply the skills learned throughout the course in a practical project.

- Project 1: Building a Data Pipeline - Extract, transform, and load data from multiple sources.
- Project 2: Web Scraping and Data Analysis - Extract data from the web and perform analysis.

Addendum: Post-Training Skills Development

- Continued Learning Resources
- Suggestions for Practical Applications of Skills Learned
- Recommended Python and Data Science Communities and Forums
- Additional Tools for Data Science (e.g., Scikit-Learn, TensorFlow, PyTorch, etc.)
- Contributing to Open-Source Projects

Bonus Chapters: (Optional / Time Permitting)

Bonus: Generative AI for Python Programming and Data Wrangling

- Understand the role of AI in code generation and its applications in Python and Data Wrangling.
- Introduction to Generative AI •
- Overview of GPT Technology
- GPT Applications in Python Programming and Data Wrangling
- Using AI for Code Completion, Error Detection, and Data Analysis
- Lab: Exploring AI-assisted Python programming and data wrangling with GPT technology

Bonus: Advanced Python Skills Using AI Technologies

- Enhance Python skills and productivity using AI-powered tools.
- Overview of AI Tools for Python
- AI for Automated Testing and Debugging
- Using AI for Code Optimization • Machine Learning-based Predictive Analytics with Python
- Lab: Apply AI tools to improve Python programming and perform predictive analytics

 All applicable course software, digital courseware files or course notes, labs, data sets and solutions, live coaching support channels and rich extended learning and post training resources are provided for you in our "easy access, no install required" high-speed **Learning Experience Platform (LXP),** remote lab and content environment. Course materials, software, resources and post-training platform access periods vary by course.

For More Information

Please contact us or call 844-475-4559 toll free for more information about our training services (instructor-led, self-paced or blended), coaching and mentoring services, public course enrollment or questions, partner programs, courseware licensing options and more.