



## Hands-On Data Analysis with Pandas

Quick Start to Using the Pandas Library to Reshape, Clean, Aggregate, Analyze & Visualize Your Data

[www.triveratech.com](http://www.triveratech.com)

### Course Snapshot

- **Course: Hands-on Data Analysis with Pandas (TTPS4878)**
- **Duration:** 3 days
- **Audience & Skill-Level:** This **introductory-level** course is for anyone in IT interested in on basic exposure to leveraging Python for data science and analytics.
- **Hands-on Learning:** This hands-on course combines engaging expert lessons, demos and group discussions with real-world, skills-focused machine-based labs and exercises. Student machines are required.
- **Delivery Options:** This course is available for **onsite private classroom presentation, live online virtual presentation**, or can be presented in a **blended learning format**. Please also ask about our **Self-Paced / Video / QuickSkills** or **Mini-Camp / Short Course** flexible delivery options.
- **Public Schedule:** This course has active dates on our live-online open enrollment **Public Schedule**.
- **Customizable:** This course agenda, topics and labs can be further adjusted to target your specific training skills objectives, tools and learning goals. Please ask for details.

### Overview

Data analysis has become a necessary skill in a variety of domains where knowing how to work with data and extract insights can generate significant value. Geared for data team members with incoming Python scripting experience, **Hands-On Data Analysis with Pandas** will show you how to analyze your data, get started with machine learning, and work effectively with Python libraries often used for data science, such as pandas, NumPy, matplotlib, seaborn, and scikit-learn.

Using real-world datasets, you will learn how to use the powerful pandas library to perform data wrangling to reshape, clean, and aggregate your data. Then, you will be able to conduct exploratory data analysis by calculating summary statistics and visualizing the data to find patterns. In the concluding lessons, you will explore some applications of anomaly detection, regression, clustering, and classification using scikit-learn to make predictions based on past data. Students will leave the course armed with the skills required to use pandas to ensure the veracity of their data, visualize it for effective decision-making, and reliably reproduce analyses across multiple datasets.

NOTE: Students heading into real project work right after training might consider a more robust hands-on course with deeper topics and lab coverage for similar subjects, such as the **TTPS4873 JumpStart to Python for Data Science**

### Learning 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" experience into every classroom.

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

- Understand how data analysts and scientists gather and analyze data
- Perform data analysis and data wrangling using Python
- Combine, group, and aggregate data from multiple sources
- Create data visualizations with pandas, matplotlib, and seaborn
- Apply machine learning (ML) algorithms to identify patterns and make predictions
- Use Python data science libraries to analyze real-world datasets
- Use pandas to solve common data representation and analysis problems
- Build Python scripts, modules, and packages for reusable analysis code
- Perform efficient data analysis and manipulation tasks using pandas
- Apply pandas to different real-world domains with the help of step-by-step demonstrations
- Get accustomed to using pandas as an effective data exploration tool.

**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 & Pre-Requisites

This course is geared for Python-experienced attendees who wish to be equipped with the skills you need to use pandas to ensure the veracity of your data, visualize it for effective decision-making, and reliably reproduce analyses across multiple datasets.

**Take Before:** Students should have skills at least equivalent to the following course(s) or should have attended as a pre-requisite:

- TTDS6600 Understanding Data Science | A Technical Overview – 1 day (helpful but not required)
- TTPS4800 Introduction to Python Programming (3 days)

**Follow On Courses:** Our core Python, data science and machine learning training courses provide students with a solid foundation for continued learning based on role, goals, or their areas of specialty. Please see the attached **Python Training Suite** or **Machine Learning Series** list for additional topics and titles.

**Enhanced Learning Services:** Please also ask about our **Pre-Training Class OnRamp & Prep / Primer** offerings, **Skills Gap Assessment Services, Case Studies, Knowledge Check Quizzes, Skills Immersion Programs & Camps, Collaborative Mentoring Services** and **Extended Learning Support & Post Training** services.

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## Course Topics / Agenda

*Please note that this list of topics is based on our standard course offering, evolved from typical industry uses and trends. We'll work with you to tune this course and level of coverage to target the skills you need most. Topics, agenda and labs are subject to change, and may adjust during live delivery based on audience interests, skill-level and participation.*

- 1. Introduction to Data Analysis**
  - Fundamentals of data analysis
  - Statistical foundations
  - Setting up a virtual environment
- 2. Working with Pandas DataFrames**
  - Pandas data structures
  - Bringing data into a pandas DataFrame
  - Inspecting a DataFrame object
  - Grabbing subsets of the data
  - Adding and removing data
- 3. Data Wrangling with Pandas**
  - What is data wrangling?
  - Collecting temperature data
  - Cleaning up the data
  - Restructuring the data
  - Handling duplicate, missing, or invalid data
- 4. Aggregating Pandas DataFrames**
  - Database-style operations on DataFrames
  - DataFrame operations
  - Aggregations with pandas and numpy
- 5. Visualizing Data with Pandas and Matplotlib**
  - An introduction to matplotlib
  - Plotting with pandas
  - The pandas.plotting subpackage
- 6. Plotting with Seaborn and Customization Techniques**
  - Utilizing seaborn for advanced plotting
  - Formatting
  - Customizing visualizations
- 7. Financial Analysis - Bitcoin and the Stock Market**
  - Building a Python package
  - Data extraction with pandas
  - Exploratory data analysis
  - Technical analysis of financial instruments
  - Modeling performance
- 8. Rule-Based Anomaly Detection**
  - Simulating login attempts
- 9. Getting Started with Machine Learning in Python**
  - Learning the lingo
  - Exploratory data analysis
  - Preprocessing data
  - Clustering
  - Regression
  - Classification
- 10. Making Better Predictions - Optimizing Models**
  - Hyperparameter tuning with grid search
  - Feature engineering
  - Ensemble methods
  - Inspecting classification prediction confidence
  - Addressing class imbalance
  - Regularization
- 11. Machine Learning Anomaly Detection**
  - Exploring the data
  - Unsupervised methods

- Supervised methods
- Online learning

## 12. The Road Ahead

- Data resources
- Practicing working with data

- Python practice

**Hands-on Setup Made Simple!** All course software (limited versions, for course use only), courseware files or course notes (as applicable), labs / data sets and solutions (as applicable) are provided for you in our “easy access / no install required” high-speed remote lab environment. In most cases, we can also offer local (non-cloud) set up as an alternative. Either way, our dedicated live tech team works with every student to ensure everyone is set up with working access and ready to go prior to every course start date, ensuring a smooth delivery and great hands-on experience. All your coursework can be accessed or downloaded after class, so you never lose your work or materials. Please ask for details.

### For More Information

All courses can be presented **onsite** or **online**, or in a **combined / flex / blended learning format**, tailored to target your specific audience, needs and learning goals. We also offer focused, flexible **short courses, self-paced learning** options, **recorded sessions** and more. We train beginner to advanced skills in all areas we cover, and offer **New Hire / Cohort Training, Boot Camps, Skills Immersion Programs, Reskilling Programs, Skills Migration & Transition Programs**, and more. We collaborate with you to ensure all courses are truly targeted to meet your specific needs and learning skills, maximizing your valuable training time, as well as your important budget.

Please also visit our extensive **Public Training Schedule** for training for smaller groups or individuals. Please contact us for course details, **Corporate Rates** and **Special Discount Offers**.

For more information about our dedicated training services, collaborative coaching services, courseware licensing options, public course schedule, training management services, partner programs, or to see our complete list of course offerings and special offers please visit us at [www.triveratech.com](http://www.triveratech.com), email [Info@triveratech.com](mailto:Info@triveratech.com) or call us toll free at **844-475-4559**. Our pricing and services are always satisfaction guaranteed.

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[www.triveratech.com](http://www.triveratech.com) • toll free +1-844-475-4559 • [Info@triveratech.com](mailto:Info@triveratech.com) • Twitter TriveraTech

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Trivera Technologies is a Woman-Owned Small-Business Firm

### Explore Trivera’s Ways to Learn!

