# uCertify Course Outline

Pandas for Everyone: Python Data Analysis



19 May 2024

- 1. Course Objective
- 2. Pre-Assessment
- 3. Exercises, Quizzes, Flashcards & Glossary

Number of Questions

- 4. Expert Instructor-Led Training
- 5. ADA Compliant & JAWS Compatible Platform
- 6. State of the Art Educator Tools
- 7. Award Winning Learning Platform (LMS)
- 8. Chapter & Lessons

Syllabus

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Chapter 2: Pandas DataFrame Basics

Chapter 3: Pandas Data Structures Basics

Chapter 4: Plotting Basics

Chapter 5: Tidy Data

Chapter 6: Apply Functions

Chapter 7: Data Assembly

Chapter 8: Data Normalization

Chapter 9: Groupby Operations: Split-Apply-Combine

Chapter 10: Missing Data

Chapter 11: Data Types

Chapter 12: Strings and Text Data

Chapter 13: Dates and Times

Chapter 14: Linear Regression (Continuous Outcome Variable)

Chapter 15: Generalized Linear Models

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Chapter 46: Appendix Y: New York ACS Logistic Regression Example

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Videos and How To

9. Practice Test

Here's what you get

Features

10. Live labs

Lab Tasks

Here's what you get

11. Post-Assessment

# 1. Course Objective

Pandas is an open-source Python library for data analysis. The Pandas for Everyone: Python Data Analysis course focuses on loading data into Python with the help of the Pandas library. This course contains interactive lessons with knowledge checks, quizzes, and hands-on labs to get a deeper understanding of the concepts such as Pandas DataFrame and Data Structure Basics, Plotting Basics, Tidy Data, Data Assembly, Data Normalization, linear regression, survival models, and so on.

# 2. Pre-Assessment

Pre-Assessment lets you identify the areas for improvement before you start your prep. It determines what students know about a topic before it is taught and identifies areas for improvement with question assessment before beginning the course.

# 3. Exercises

There is no limit to the number of times learners can attempt these. Exercises come with detailed remediation, which ensures that learners are confident on the topic before proceeding.



# 4. (?) Quiz

Quizzes test your knowledge on the topics of the exam when you go through the course material. There is no limit to the number of times you can attempt it.



# 5. flashcards

Flashcards are effective memory-aiding tools that help you learn complex topics easily. The flashcard will help you in memorizing definitions, terminologies, key concepts, and more. There is no limit to the number of times learners can attempt these. Flashcards help master the key concepts.



# 6. Glossary of terms

uCertify provides detailed explanations of concepts relevant to the course through Glossary. It contains a list of frequently used terminologies along with its detailed explanation. Glossary defines the key terms.



# 7. Expert Instructor-Led Training

uCertify uses the content from the finest publishers and only the IT industry's finest instructors. They have a minimum of 15 years real-world experience and are subject matter experts in their fields. Unlike a live class, you can study at your own pace. This creates a personal learning experience and gives you all the benefit of hands-on training with the flexibility of doing it around your schedule 24/7.

# 8. ( ADA Compliant & JAWS Compatible Platform

uCertify course and labs are ADA (Americans with Disability Act) compliant. It is now more accessible to students with features such as:

- Change the font, size, and color of the content of the course
- Text-to-speech, reads the text into spoken words
- Interactive videos, how-tos videos come with transcripts and voice-over
- Interactive transcripts, each word is clickable. Students can clip a specific part of the video by clicking on a word or a portion of the text.

JAWS (Job Access with Speech) is a computer screen reader program for Microsoft Windows that reads the screen either with a text-to-speech output or by a Refreshable Braille display. Student can easily navigate uCertify course using JAWS shortcut keys.

# 9. ( State of the Art Educator Tools

uCertify knows the importance of instructors and provide tools to help them do their job effectively. Instructors are able to clone and customize course. Do ability grouping. Create sections. Design grade scale and grade formula. Create and schedule assessments. Educators can also move a student from self-paced to mentor-guided to instructor-led mode in three clicks.

# 10. Award Winning Learning Platform (LMS)

uCertify has developed an award winning, highly interactive yet simple to use platform. The SIIA CODiE Awards is the only peer-reviewed program to showcase business and education technology's finest products and services. Since 1986, thousands of products, services and solutions have been

recognized for achieving excellence. uCertify has won CODiE awards consecutively for last 7 years:

#### • 2014

1. Best Postsecondary Learning Solution

#### 2015

- 1. Best Education Solution
- 2. Best Virtual Learning Solution
- 3. Best Student Assessment Solution
- 4. Best Postsecondary Learning Solution
- 5. Best Career and Workforce Readiness Solution
- 6. Best Instructional Solution in Other Curriculum Areas
- 7. Best Corporate Learning/Workforce Development Solution

#### • 2016

- 1. Best Virtual Learning Solution
- 2. Best Education Cloud-based Solution
- 3. Best College and Career Readiness Solution
- 4. Best Corporate / Workforce Learning Solution
- 5. Best Postsecondary Learning Content Solution
- 6. Best Postsecondary LMS or Learning Platform
- 7. Best Learning Relationship Management Solution

#### • 2017

- 1. Best Overall Education Solution
- 2. Best Student Assessment Solution
- 3. Best Corporate/Workforce Learning Solution
- 4. Best Higher Education LMS or Learning Platform

#### • 2018

1. Best Higher Education LMS or Learning Platform

- 2. Best Instructional Solution in Other Curriculum Areas
- 3. Best Learning Relationship Management Solution

#### 2019

- 1. Best Virtual Learning Solution
- 2. Best Content Authoring Development or Curation Solution
- 3. Best Higher Education Learning Management Solution (LMS)

#### • 2020

- 1. Best College and Career Readiness Solution
- 2. Best Cross-Curricular Solution
- 3. Best Virtual Learning Solution

# 11. Chapter & Lessons

uCertify brings these textbooks to life. It is full of interactive activities that keeps the learner engaged. uCertify brings all available learning resources for a topic in one place so that the learner can efficiently learn without going to multiple places. Challenge questions are also embedded in the chapters so learners can attempt those while they are learning about that particular topic. This helps them grasp the concepts better because they can go over it again right away which improves learning.

Learners can do Flashcards, Exercises, Quizzes and Labs related to each chapter. At the end of every lesson, uCertify courses guide the learners on the path they should follow.

# **Syllabus**

## Chapter 1: Preface

- Breakdown of the Course
- How to Read This Course
- Setup

### Chapter 2: Pandas DataFrame Basics

- Introduction
- Load Your First Data Set
- Look at Columns, Rows, and Cells
- Grouped and Aggregated Calculations
- Basic Plot
- Conclusion

# Chapter 3: Pandas Data Structures Basics

- Create Your Own Data
- The Series
- The DataFrame
- Making Changes to Series and DataFrames
- Exporting and Importing Data
- Conclusion

# Chapter 4: Plotting Basics

• Why Visualize Data?

- Matplotlib Basics
- Statistical Graphics Using matplotlib
- Seaborn
- Pandas Plotting Method
- Conclusion

# Chapter 5: Tidy Data

- Columns Contain Values, Not Variables
- Columns Contain Multiple Variables
- Variables in Both Rows and Columns
- Conclusion

# Chapter 6: Apply Functions

- Primer on Functions
- Apply (Basics)
- Vectorized Functions
- Lambda Functions (Anonymous Functions)
- Conclusion

### Chapter 7: Data Assembly

- Combine Data Sets
- Concatenation
- Observational Units Across Multiple Tables
- Merge Multiple Data Sets
- Conclusion

# Chapter 8: Data Normalization

- Multiple Observational Units in a Table (Normalization)
- Conclusion

# Chapter 9: Groupby Operations: Split-Apply-Combine

- Aggregate
- Transform
- Filter
- The pandas.core.groupby. DataFrameGroupBy object
- Working With a MultiIndex
- Conclusion

## Chapter 10: Missing Data

- What Is a NaN Value?
- Where Do Missing Values Come From?
- Working With Missing Data
- Pandas Built-In NA Missing
- Conclusion

# Chapter 11: Data Types

- Data Types
- Converting Types
- Categorical Data
- Conclusion

# Chapter 12: Strings and Text Data

- Introduction
- Strings
- String Methods
- More String Methods

- String Formatting (F-Strings)
- Regular Expressions (RegEx)
- The regex Library
- Conclusion

## Chapter 13: Dates and Times

- Python's datetime Object
- Converting to datetime
- Loading Data That Include Dates
- Extracting Date Components
- Date Calculations and Timedeltas
- Datetime Methods
- Getting Stock Data
- Subsetting Data Based on Dates
- Date Ranges
- Shifting Values
- Resampling
- Time Zones

- Arrow for Better Dates and Times
- Conclusion

# Chapter 14: Linear Regression (Continuous Outcome Variable)

- Simple Linear Regression
- Multiple Regression
- Models with Categorical Variables
- One-Hot Encoding in scikit-learn with Transformer Pipelines
- Conclusion

## Chapter 15: Generalized Linear Models

- About This Lesson
- Logistic Regression (Binary Outcome Variable)
- Poisson Regression (Count Outcome Variable)
- More Generalized Linear Models
- Conclusion

## Chapter 16: Survival Analysis

• Survival Data

- Kaplan Meier Curves
- Cox Proportional Hazard Model
- Conclusion

# Chapter 17: Model Diagnostics

- Residuals
- Comparing Multiple Models
- k-Fold Cross-Validation
- Conclusion

## Chapter 18: Regularization

- Why Regularize?
- LASSO Regression
- Ridge Regression
- Elastic Net
- Cross-Validation
- Conclusion

# Chapter 19: Clustering

k-MeansHierarchical ClusteringConclusion

# Chapter 20: Life Outside of Pandas

- The (Scientific) Computing Stack
- Performance
- Dask
- Siuba
- Ibis
- Polars
- PyJanitor
- Pandera
- Machine Learning
- Publishing
- Dashboards
- Conclusion

# Chapter 21: It's Dangerous To Go Alone!

- Local Meetups
- Conferences
- The Carpentries
- Podcasts
- Other Resources
- Conclusion
- Chapter 22: Appendix A: Concept Maps
- Chapter 23: Appendix B: Installation and Setup
  - B.1 Install Python
  - B.2 Install Python Packages
  - B.3 Download Book Data
- Chapter 24: Appendix C: Command Line
  - C.1 Installation
  - C.2 Basics
- Chapter 25: Appendix D: Project Templates
- Chapter 26: Appendix E: Using Python

- E.1 Command Line and Text Editor
- E.2 Python and IPython
- E.3 Jupyter
- E.4 Integrated Development Environments (IDEs)

Chapter 27: Appendix F: Working Directories

Chapter 28: Appendix G: Environments

- G.1 Conda Environments
- G.2 Pyenv + Pipenv

Chapter 29: Appendix H: Install Packages

- H.1 Updating Packages
- Chapter 30: Appendix I: Importing Libraries

Chapter 31: Appendix J: Code Style

• J.1 Line Breaks in Code

Chapter 32: Appendix K: Containers: Lists, Tuples, and Dictionaries

• K.1 Lists

- K.2 Tuples
- K.3 Dictionaries
- Chapter 33: Appendix L: Slice Values
- Chapter 34: Appendix M: Loops
- Chapter 35: Appendix N: Comprehensions
- Chapter 36: Appendix O: Functions
  - O.1 Default Parameters
  - O.2 Arbitrary Parameters
- Chapter 37: Appendix P: Ranges and Generators
- Chapter 38: Appendix Q: Multiple Assignment
- Chapter 39: Appendix R: Numpy ndarray
- Chapter 40: Appendix S: Classes
- Chapter 41: Appendix T: SettingWithCopyWarning
  - T.1 Modifying a Subset of Data
  - T.2 Replacing a Value

- T.3 More Resources
- Chapter 42: Appendix U: Method Chaining
- Chapter 43: Appendix V: Timing Code
- Chapter 44: Appendix W: String Formatting
  - W.1 C-Style
  - W.2 String Formatting: .format() Method
  - W.3 Formatting Numbers
- Chapter 45: Appendix X: Conditionals (if-elif-else)
- Chapter 46: Appendix Y: New York ACS Logistic Regression Example
- Chapter 47: Appendix Z: Replicating Results in R
  - Z.1 Linear Regression
  - Z.2 Logistic Regression
  - Z.3 Poisson Regression
- 12. Practice Test

# Here's what you get

**5**0

PRE-ASSESSMENTS QUESTIONS

**50** 

POST-ASSESSMENTS QUESTIONS

# **Features**

Each question comes with detailed remediation explaining not only why an answer option is correct but also why it is incorrect.

#### **Unlimited Practice**

Each test can be taken unlimited number of times until the learner feels they are prepared. Learner can review the test and read detailed remediation. Detailed test history is also available.

Each test set comes with learn, test and review modes. In learn mode, learners will attempt a question and will get immediate feedback and complete remediation as they move on to the next question. In test mode, learners can take a timed test simulating the actual exam conditions. In review mode, learners can read through one item at a time without attempting it.

# 13. Live Labs

The benefits of live-labs are:

- Exam based practical tasks
- Real equipment, absolutely no simulations
- Access to the latest industry technologies
- Available anytime, anywhere on any device
- Break and Reset functionality

• No hardware costs

# **Lab Tasks**

#### **Pandas DataFrame Basics**

• Performing Grouped and Aggregated Calculations Using the .groupby() Method

#### **Pandas Data Structures Basics**

• Creating a DataFrame and Making Changes to it

#### **Plotting Basics**

- Creating a Scatter Plot Using Multivariate Data
- Creating a Density Plot Using Bivariate Data

#### **Tidy Data**

Using Functions and Methods to Process and Tidy Data

#### **Apply Functions**

- Performing Calculations Across DataFrames
- Vectorizing Functions

#### **Data Assembly**

- Performing Concatenation Using the concat() Function
- Merging Multiple Data Sets Using the .merge() Function

#### **Data Normalization**

• Understanding Multiple Observational Units in a Data Set

#### **Groupby Operations: Split-Apply-Combine**

- Performing Data Summarization Using Group-by Operations
- Performing Boolean Subsetting on the Data
- Performing Operations on Grouped Objects

#### **Missing Data**

Finding and Cleaning Missing Data

#### **Data Types**

• Performing Data Type Conversion

#### **Strings and Text Data**

• Finding and Substituting a Pattern

#### **Dates and Times**

- Converting an Object Type into a datetime Type
- Extracting Date Components from the Data
- Getting Stock Data and Subsetting it Based on Dates
- Resampling Dates Using the .resample() Method

#### **Linear Regression (Continuous Outcome Variable)**

- Performing Linear Regression
- Performing Multiple Regression

#### **Generalized Linear Models**

- Performing Logistic Regression
- Performing Poisson Regression Using the poisson() Function

#### **Survival Analysis**

• Performing Survival Analysis Using the KaplanMeierFitter() Function

#### **Model Diagnostics**

• Comparing Models Using Cross-Validation

#### Regularization

- Performing L1 Regularization Using the Lasso() Function
- Performing L2 Regularization Using the Ridge() Function

#### Clustering

- Performing k-Means Clustering
- Using Hierarchical Clustering Algorithms

# Here's what you get

30 LIVE LABS

20
video tutorials

43
MINUTES

# 14. Post-Assessment

After completion of the uCertify course Post-Assessments are given to students and often used in conjunction with a Pre-Assessment to measure their achievement and the effectiveness of the exam.

# **GET IN TOUCH:**







