KOENIG
step forward

KOENIG SOLUTIONS · COURSE OUTLINE

Data Analysis with Python (Tableau)

Learn to gather, clean and analyse data with Python, using NumPy, pandas and visualization techniques for practical insights.

5 Days	18	157
DURATION	MODULES	TOPICS

COURSE OVERVIEW

This course is intended to convert a professional into a job-ready data analyst. To achieve that, we will cover the fundamental topics extensively. In other words, we are not going to teach you how to analyse data before you know how to gather and clean it. The course provides complete preparation for someone who wants to become a data. We believe that this course will significantly boost your chances of landing a job, as it will prepare you for practical tasks and concepts that are frequently included in interviews.

WHO THIS COURSE IS FOR

- **Aspiring Data Analysts**
- **Python Programmers**
- **Business Analysts**
- **Data Processing Specialists**
- **Reporting Analysts**

LEARNING OBJECTIVES

In this course, you will learn:

- Acquire a big picture understanding of the data analyst role
- Be able to work with text files
- Complete a data cleaning exercise
- Learn how to create pie, bar, line, area, histogram, scatter, regression, and combo charts
- Python programming, NumPy, pandas, data preparation - data collection, data cleaning, data preprocessing
- Learn beginner and advanced Python
- Understand different data types and their memory usage
- Master data visualization

COURSE SYLLABUS

18 Modules, 157 Topics

01

Introduction to Data Analytics

TOPICS

- Introduction to the World of Business and Data
- Key terms
- Data Analyst vs. Other Data Jobs
- What is Programming
- Getting started with Jupyter

02

Python Basics with Exercises

TOPICS

- Python Variables
- Types of Data - Numbers and Boolean Values
- Types of Data - Strings
- Arithmetic Operators
- The Double Equality Sign
- Reassign Values
- Add Comments
- Line Continuation
- Indentation
- Comparison Operators
- Logical and Identity Operators

CONDITIONAL STATEMENTS

- The IF Statement
- The ELSE Statement
- The ELIF Statement
- A Note on Boolean Values

FUNCTIONS

- Defining a Function in Python
- Creating a Function with a Parameter
- Another Way to Define a Function
- Using a Function in Another Function
- Combining Conditional Statements and Functions
- Creating Functions That Contain a Few Arguments
- Notable Built-in Functions in Python

SEQUENCES

- Lists
- Methods
- List Slicing
- Tuples
- Dictionaries

ITERATIONS

- For Loops
- While Loops and Incrementing
- Create Lists with the range () Function
- Use Conditional Statements and Loops Together
- Conditional Statements, Functions, and Loops
- Iterating over Dictionaries

03

Fundamentals for Coding in Python

TOPICS

- Object-Oriented Programming
- Modules, Packages, and the Python Standard Library
- Importing Modules
- Introduction to Using NumPy and pandas
- What is Software Documentation?
- The Python Documentation

04

Mathematics for Python

TOPICS

- What is Matrix
- Scalars and Vectors
- Linear Algebra and Geometry
- Arrays in Python
- What Is a Tensor?
- Adding and Subtracting Matrices
- Errors When Adding Matrices
- Transpose
- Dot Product of Vectors
- Dot Product of Matrices

05

NumPy Basics

TOPICS

Importance of NumPy Package · Installing/Upgrading NumPy · Nd array

06

Pandas Basics

TOPICS

- Introduction to the pandas Library
- Installing and Running pandas
- Introduction to pandas Series
- Working with Attributes in Python
- Using an Index in pandas
- Label-based vs Position-based Indexing
- Working with Indices in Python
- Using Methods
- Parameters vs Arguments
- Introduction to pandas DataFrames
- Creating DataFrames from Scratch

07

Working with Text Files

TOPICS

- Working with Files in Python
- File vs File Object, Read vs Parse
- Structured vs Semi-Structured and Unstructured Data
- Data Connectivity through Text Files
- Principles of Importing Data in Python
- More on Text Files (*.txt vs *.csv)
- Fixed-width Files
- Common Naming Conventions Used in Programming

IMPORTING DATA

- Text Files in Python (open())
- Importing *.csv Files with pandas
- “index_col” Parameter
- Working with Excel Data
- Importing Data with the pandas' “Squeeze” Method
- Saving Your Data with pandas and NumPy
- With NumPy - .loadtxt() vs genfromtxt()
- With NumPy - Partial Cleaning While Importing
- *.json Files

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Working with Text Data

TOPICS

- Working with Text Data and Argument Specifiers
- Manipulating Python Strings
- Using Various Python String Methods
- String Accessors
- Using the .format() Method

09

Python Tools

TOPICS

Iterating Over Range Objects

NESTED FOR LOOPS

Introduction · Triple Nested For Loops

List Comprehensions · Anonymous (Lambda) Functions

10

Data Processing

TOPICS

Data Gathering and Collection · Cleaning and Pre-processing

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Pandas

TOPICS

- Running Pandas
- .unique(), .nunique()
- Converting Series into Arrays
- .sort_values()
- Attribute and Method Chaining
- .sort_index()
- Recap to Pandas DataFrames
- Common Attributes for Working with DataFrames
- Data Selection in pandas DataFrames

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NumPy Fundamentals

TOPICS

Indexing in NumPy · Assigning Values in NumPy · Elementwise Properties of Arrays · Types of Data Supported by NumPy · Characteristics of NumPy Functions · Ndarrays · Arrays vs Lists · Strings vs Object vs Number

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Working with Arrays

TOPICS

Basic Slicing in NumPy · Stepwise Slicing in NumPy · Conditional Slicing in NumPy · Dimensions and the Squeeze Function

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Generating Data with NumPy

TOPICS

- Arrays of 0s and 1s
- “_like” Functions in NumPy
- A Non-Random Sequence of Numbers
- Random Generators and Seeds
- Basic Random Functions in NumPy
- Probability Distributions in NumPy
- Applications of Random Data in NumPy

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Statistics with NumPy

TOPICS

Using Statistical Functions in NumPy · Minimal and Maximal Values in NumPy · Statistical Order Functions in NumPy · Averages and Variance in NumPy · Covariance and Correlation in NumPy · Histograms in NumPy

16

NumPy - Preprocessing

TOPICS

- Checking for Missing Values in Ndarrays
- Substituting Missing Values in Ndarrays
- Reshaping Ndarrays
- Removing Values from Ndarrays
- Sorting Ndarrays
- Argument Sort in NumPy
- Argument Where in NumPy
- Shuffling Ndarrays
- Casting Ndarrays
- Striping Values from Ndarrays
- Stacking Ndarrays
- Concatenating Ndarrays

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Data Visualization

TOPICS

- What Is Data Visualization and Why Is It Important?
- Why Learn Data Visualization?
- Choosing the Right Visualization
- Introduction into Colors and Color Theory
- Bar Chart
- Pie Chart
- Stacked Area Chart
- Line Chart
- Histogram
- Scatter Plot
- Regression Plot
- Combination Charts

Practical Case Studies

TOPICS

A Loan Data Example with NumPy · The “Absenteeism”

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

FLEXIBLE DELIVERY

Learn the Way That Suits You

Classroom Training | Live Online Classes (ILO) | Fly-Me-A-Trainer (FMAT) | Flexi (Self-Paced) | 1-on-1 Training

Ready to Get Started?

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