KOENIG
step forward

KOENIG SOLUTIONS · COURSE OUTLINE

Python Data Prep: Pandas, EDA & Feature Engineering

Learn to use Python, NumPy and Pandas to clean, explore and engineer features from data for machine learning.

3 Days	18	89
DURATION	MODULES	TOPICS

COURSE OVERVIEW

This course begins with Python fundamentals, covering data types, control flow, operators, and core data structures such as lists, tuples, sets and dictionaries, along with functions, file handling and strings. It then introduces NumPy for array creation and manipulation, and Pandas for slicing, filtering, transforming and indexing dataframes. The final part covers machine learning concepts, data preprocessing including handling missing and categorical data, exploratory data analysis with plots and statistical measures, feature engineering techniques, and performance metrics such as confusion matrix, ROC curve and cross validation.

WHO THIS COURSE IS FOR

Python Developers | **Data Analysts** | **Aspiring Data Scientists** | **Machine Learning Practitioners** | **Data Engineers**

LEARNING OBJECTIVES

Topics Covering -

- Python Basics
- Numpy and Pandas
- Machine Learning Introduction
- Data Preprocessing - Imputation, EDA, Feature Engineering

COURSE SYLLABUS

18 Modules, 89 Topics

DAY 1

01 Introduction

TOPICS

Why Python · Applications · Features · Flavours & Versions · Comments · Literals · Reserved Words · input function

02 Data Types

TOPICS

int · float · bool · str

03 Decision Control Flows

TOPICS

- If / Nested If / If-else /If-elif-else statement
- While, for loop, While- else, for - else

04 Operators

TOPICS

Arithmetic Operators · Relational or Comparison Operators · Logical operators · Bitwise operators · Assignment operators · Ternary Operator

05 List

TOPICS

Ways of Accessing Values · Traversing elements · List Operations · List Methods · Membership Operator in List · List Comprehension

06 Tuples

TOPICS

Creating Tuples · Ways of Accessing Values · Tuple Vs immutability · Tuple Comprehension

07 Sets

TOPICS

Creating Sets · Ways of Accessing Values · Manipulating and Accessing Sets · Set Operations

08

Dictionary

TOPICS

Why Dictionary · Creating a Dictionary · Accessing Values · Update Dictionaries · Functions of dictionary

09

Functions and Methods

TOPICS

System defined Functions · User Defined Functions (UDFs) · Defining a Function · Structure of function · Types of Function Arguments · lambda Function · Why Use Lambda Functions?

DAY 2

10

File Handling

TOPICS

Types of Files · Opening and Closing Files · Writing, Appending and Reading Files · With keyword

11

String

TOPICS

String Literals · Single (‘) & Double Quotes(’’) · Triple Quotes (’’’) · Raw String (“...\'.....”) · Operations on Strings

12

NumPy Package

TOPICS

Introduction of NumPy · Install Numpy · Array Creation · Array Reshaping · Indexing · Operation

13

Pandas

TOPICS

Introduction · Slicing Dataframe · Filtering Dataframe · Transforming Dataframe · Advanced indexing

DAY 3

14

Introduction to Machine Learning

15

Data Pre-processing

TOPICS

Is your data clean? · What is Data Pre processing ? · Data cleaning techniques · Handling Missing data · Handling Categorical data

16

Exploratory Data Analysis (EDA)

TOPICS

- Introduction
- 2D Scatter-plot
- 3D Scatter-plot
- Pair plots
- Univariate, Bivariate and Multivariate
- Histogram
- Box-plot
- Variance, Standard Deviation
- Median
- IQR (InterQuartile Range)

17

Feature Engineering

TOPICS

- Introduction
- Need for Feature Engineering in Machine Learning
- Steps in Feature Engineering
- Feature Engineering Techniques

18

Performance Metrics

TOPICS

Confusion Matrix · ROC Curve · Cross Validation in Machine Learning · K fold Cross Validation & Grid search

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.

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