KOENIG SOLUTIONS · COURSE OUTLINE

Scikit-Learn: Classification, Regression & Clustering

Learn to build, evaluate and deploy classification, regression and clustering models using Scikit-Learn.

11
MODULES

22
TOPICS

COURSE OVERVIEW

Welcome to “Machine Learning with Python Scikit Learn”. This comprehensive course is designed to guide you through the fundamentals and advanced concepts of machine learning using the Scikit Learn library in Python. By the end of this course, you will be equipped with the skills to implement, evaluate, and improve machine learning models for real-world applications. Whether you are a beginner or have some prior experience, this course will enhance your understanding of how to leverage Scikit Learn for effective data-driven decision-making.

WHO THIS COURSE IS FOR

- **Data Analysts**
- **Data Scientists**
- **Machine Learning Engineers**
- **Python Developers**
- **Business Intelligence Analysts**

LEARNING OBJECTIVES

- Explain core concepts and types of machine learning
- Prepare and explore data through cleaning and visualisation
- Apply classification algorithms such as Decision Trees and SVMs
- Evaluate classification models using accuracy, precision and recall
- Apply regression techniques such as Linear and Ridge Regression
- Implement clustering and dimensionality reduction methods such as PCA
- Configure cross-validation and hyperparameter tuning with GridSearchCV
- Deploy and monitor machine learning models in production

COURSE SYLLABUS

11 Modules, 22 Topics

01

Introduction to Machine Learning

TOPICS

- Understand the basic concepts and types of machine learning, including supervised and unsupervised learning
- Explore the real-world applications of machine learning across various industries

02

Setting Up Your Environment

TOPICS

- Guide through the installation of Python and Scikit Learn, ensuring all necessary packages are available
- Introduction to Jupyter Notebooks as a tool for developing and testing machine learning models

03

Data Preprocessing and Exploration

TOPICS

- Learn techniques for data cleaning and preparation, crucial steps before model training
- Explore data using visualization and descriptive statistics to uncover insights and trends

04

Supervised Learning - Classification

TOPICS

- Dive into classification algorithms, such as Decision Trees and Support Vector Machines
- Understand how to assess classification model performance using metrics like accuracy, precision, recall, and F1-score

05

Supervised Learning - Regression

TOPICS

- Explore regression techniques for continuous data prediction, including Linear Regression and Ridge Regression
- Learn to evaluate regression models with metrics such as Mean Absolute Error and R-squared

06

Unsupervised Learning Techniques

TOPICS

- Introduction to clustering algorithms like K-Means and Hierarchical Clustering for discovering data patterns
- Examine dimensionality reduction methods such as PCA for simplifying complex datasets

07

Model Evaluation and Selection

TOPICS

- Understand cross-validation techniques to assess model reliability and avoid overfitting
- Learn to use Scikit Learn's GridSearchCV for hyperparameter tuning to optimize model performance

08

Advanced Topics in Machine Learning

TOPICS

- Explore ensemble methods like Random Forest and Gradient Boosting for improved prediction accuracy
- Introduction to neural networks and deep learning concepts as a precursor to more advanced studies

09

Deployment and Maintenance of Models

TOPICS

- Learn best practices for deploying machine learning models into production environments
- Discuss techniques for model monitoring and maintenance to ensure continued performance

10

Case Studies and Real-World Applications

TOPICS

- Walkthrough real-world scenarios where machine learning provides business value
- Analyze case studies to understand the end-to-end process of model development and deployment

11

Final Project and Assessment

TOPICS

- Apply the skills learned throughout the course to complete a capstone project
- Conduct a comprehensive evaluation to demonstrate your understanding and proficiency in machine learning with Scikit Learn

NOTES

Course Conclusion

- Recap of the key concepts covered in the course and their practical applications.
- Provide guidance on further learning resources and next steps in the field of machine learning.
- By completing this course, you will have a solid foundation in machine learning with Scikit Learn and be ready to tackle complex data challenges with confidence.

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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