KOENIG SOLUTIONS · COURSE OUTLINE

ML Classification: Logistic Regression, SVM & Random Forest

Learn to build and evaluate classification models using Scikit Learn, from data pre-processing to logistic regression, SVM and random forest.

11	55	17
MODULES	TOPICS	HANDS-ON ACTIVITIES

COURSE OVERVIEW

This course covers the fundamentals of machine learning and the Scikit Learn library before moving into data pre-processing and feature engineering techniques. It then works through classification algorithms including logistic regression, support vector machines, k-nearest neighbour, classification trees and naive Bayes, each with data loading, visualisation, cleaning, training and testing. It continues with ensemble techniques such as bagging, random forest and boosting, and closes with model selection and tuning, covering hyperparameters, imbalanced classes, confusion matrices and scoring for multi-class problems.

WHO THIS COURSE IS FOR

Data Analysts | **Machine Learning Engineers** | **Data Scientists** | **Software Developers** | **Business Analysts**

LEARNING OBJECTIVES

- Explain core machine learning concepts, types and challenges
- Apply Scikit Learn conventions to implement models
- Handle missing and categorical data during pre-processing
- Apply feature engineering techniques such as scaling and encoding
- Build logistic regression, SVM, KNN and naive Bayes classifiers
- Implement classification trees and evaluate their trade-offs
- Implement ensemble techniques such as bagging, boosting and random forest
- Evaluate models using confusion matrices, accuracy, precision and recall

COURSE SYLLABUS

11 Modules, 55 Topics

01

Introduction to Machine Learning

TOPICS

Basics of Machine Learning · What and why Machine Learning · Applications of Machine Learning · Types of Machine Learning · Main Challenges of Machine Learning

02

Demo

Scikit Learn

TOPICS

Introduction to Scikit Learn · Features of Scikit-Learn · Conventions · Implementation Steps

03

3 Demos

Data Pre-processing

TOPICS

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

04

4 Demos

Feature Engineering

TOPICS

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

05

Demo

Logistic Regression

TOPICS

Introduction to Logistic Regression · Confusion Matrix · Loading Data · Visualisation · Data Cleaning · Training · Testing

06

Demo

Support Vector Machine

TOPICS

Loading Data · Visualisation · Data Cleaning · Training and Testing

07

Demo

K-Nearest Neighbour

TOPICS

Loading Data · Visualisation · Data Cleaning · Training and Testing

08

Demo

Classification Tree

TOPICS

- Classification tree
- Preprocessing
- Training
- Advantages and Disadvantages of Decision Trees

09

Demo

Naive Bayes

TOPICS

Loading Data · Visualisation · Data Cleaning · Training and Testing

11

3 Demos

Ensemble Technique

TOPICS

Implementation of Bagging · Implementation of Random Forest · Implementation of Boosting · Decision Tree

12

Demo

Model Selection and Tuning

TOPICS

- Intro to Selection & Tuning
- Hyperparameters
- Imbalanced Classes
- Confusion Matrix
- Accuracy, Precision & Recall
- Multi-class Confusion Matrix
- Multi-class Scoring
- Model Selection
- Model Drift
- Model Selection & Tuning

HANDS-ON ACTIVITIES

Practise What You Learn

#	MODULE	ACTIVITY
02	**Scikit Learn**	Scikit-Learn Introduction and model training
03	**Data Pre-processing**	■ Missing value imputation by Mean, Median ■ Handling Missing Value ■ Handling Categorical Value
04	**Feature Engineering**	■ Feature Scaling ■ Discretisation ■ Feature Encoding ■ Feature Transformation
05	**Logistic Regression**	Logistic Regression Project
06	**Support Vector Machine**	SVM Project
07	**K-Nearest Neighbour**	KNN Project
08	**Classification Tree**	Classification Tree Implementation
09	**Naive Bayes**	Naive Bayes Project
11	**Ensemble Technique**	■ Implementation of Bagging ■ Implementation of Random Forest 1 ■ Ensemble Implementation
12	**Model Selection and Tuning**	Model Selection Implementation

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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