Faysal Aziz

Machine Learning with python

3-days hand-on course

FA-0297 · 3-days

Software Development · Data & Analytics

Introduction

This is an intensive 3-day course designed for individuals with a good grasp of Python, aiming to delve into the world of machine learning (ML). This course covers a broad spectrum of machine learning concepts, algorithms, and their implementation using Python's most powerful libraries. From understanding the basics of machine learning to hands-on experience with predictive models and exploring advanced machine learning techniques, participants will acquire the skills to apply machine learning algorithms effectively to solve real-world problems.

Learning outcomes

By the end of this course, participants will be able to:

- Understand the core principles of machine learning and its applications.
- Preprocess data to make it suitable for machine learning models.
- Implement supervised and unsupervised learning algorithms using Python.
- Evaluate and fine-tune the performance of machine learning models.
- Utilize Scikit-learn for various machine learning tasks.
- Explore advanced machine learning techniques, including neural networks and deep learning.
- Apply machine learning algorithms to real-world data sets to solve complex challenges.

Prerequisites

Proficiency in Python programming, including

- familiarity with data types,
- functions, and
- libraries.

Basic knowledge of

- statistics and mathematics
- linear algebra,
- calculus)

- An understanding of data manipulation and visualization with Pandas and Matplotlib.

Training outline

1. Foundations of Machine Learning

Introduction to Machine Learning

1. Overview and History of Machine Learning
2. Types of Machine Learning: Supervised, Unsupervised, and Reinforcement Learning

Data Preprocessing

1. Handling Missing Values
2. Feature Scaling and Normalization
3. Encoding Categorical Data
4. Splitting Data into Training and Test Sets

Supervised Learning Algorithms

1. Linear Regression
2. Logistic Regression
3. Decision Trees and Random Forests
4. Support Vector Machines (SVM)
5. K-Nearest Neighbors (KNN)

2. Advanced Machine Learning Techniques

Model Evaluation and Improvement

1. Confusion Matrix, Accuracy, Precision, Recall, F1 Score
2. Cross-Validation Techniques
3. Hyperparameter Tuning with Grid Search and Random Search

Unsupervised Learning Algorithms

1. K-Means Clustering
2. Hierarchical Clustering
3. Principal Component Analysis (PCA) for Dimensionality Reduction

Introduction to Neural Networks and Deep Learning

1. Overview of Neural Networks
2. Basics of TensorFlow and Keras
3. Building a Simple Neural Network Model

3. Real-World Applications and Project Work

Special Topics in Machine Learning

1. Introduction to Natural Language Processing (NLP)
2. Basics of Time Series Analysis
3. Introduction to Convolutional Neural Networks (CNNs) for Image Processing

Project Work

1. Applying machine learning algorithms on real-world datasets
2. Group Discussion: Reviewing project work, sharing insights, and discussing challenges

Future Directions in Machine Learning

1. Overview of Advanced Machine Learning and AI Research Trends
2. Ethical Considerations in Machine Learning

This accelerated course is structured to build upon your existing Python skills, guiding you through the landscape of machine learning with a blend of theoretical knowledge and practical application. Through lectures, hands-on exercises, and project work, you'll gain the expertise needed to implement machine learning solutions effectively.

© 2026 Faysal Aziz · Kuala Lumpur