

€ TRAINING

Complete Machine Learning with Python





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Introduction:

This training program provides participants with essential knowledge and skills in machine learning using Python. It empowers them to understand and implement machine learning algorithms and techniques to solve real-world problems.

Program Objectives:

At the end of this program, participants will be able to:

- Understand the basics of machine learning and its applications.
- Utilize Python libraries for data analysis and machine learning.
- Implement various machine learning algorithms.
- Evaluate and improve the performance of machine learning models.
- Apply machine learning techniques to real-world datasets.

Targeted Audience:

- Data Scientists.
- Machine Learning Engineers.
- Data Analysts.
- Python Programmers interested in machine learning.

Program Outline:

Unit 1:

Introduction to Machine Learning and Python:

- Overview of machine learning concepts and types.
- Introduction to Python for machine learning.
- Setting up the Python environment Anaconda, Jupyter Notebook.
- Exploring essential Python libraries: NumPy, Pandas, Matplotlib, and Seaborn.

- Understanding data preprocessing and cleaning techniques.

Unit 2:

Supervised Learning Algorithms:

- Introduction to supervised learning and its applications.
- Implementing linear regression and logistic regression.
- Understanding decision trees and random forests.
- Exploring support vector machines SVM.
- Evaluating model performance with metrics accuracy, precision, recall, F1 score.

Unit 3:

Unsupervised Learning Algorithms:

- Introduction to unsupervised learning and its applications.
- Implementing k-means clustering and hierarchical clustering.
- Understanding principal component analysis PCA.
- Exploring anomaly detection techniques.
- Evaluating clustering performance and visualization techniques.

Unit 4:

Advanced Machine Learning Techniques:

- Introduction to ensemble methods bagging, boosting.
- Implementing gradient boosting and XGBoost.
- Understanding neural networks and deep learning basics.
- Utilizing TensorFlow and Keras for deep learning models.
- Exploring natural language processing NLP with Python.

Unit 5:

Model Evaluation and Optimization:



- Understanding overfitting and underfitting.
- Implementing cross-validation techniques.
- Exploring hyperparameter tuning Grid Search, Random Search.
- Using feature selection and engineering techniques.
- Applying machine learning models to real-world datasets and case studies.