

HOOYIA 



E-HOOYIA

Formation sur le Machine Learning

Presented by:

Hooyia



+237 691435485

+237 697907096



e-hooyia.com



Bafoussam, Cameroon

contact@e-hooyia.com

Course Objectives.....	1
This 12-week Machine Learning training program aims to:.....	1
Specific objectives include:.....	1
FIRST MONTH.....	2
Week 1: Introduction to Machine Learning and Python.....	2
Week 2: Data Preprocessing and Exploration.....	2
Week 3: Supervised Learning: Regression.....	2
Week 4: Supervised Learning: Classification.....	3
SECOND MONTH.....	3
Week 5: Ensemble Methods and Boosting.....	3
Week 6: Unsupervised Learning: Clustering.....	3
Week 7: Unsupervised Learning: Dimensionality Reduction.....	4
Week 8: Neural Networks and Deep Learning.....	4
THIRD MONTH.....	4
Week 9: Natural Language Processing (NLP).....	4
Week 10: Time Series Analysis.....	5
Week 11: Model Deployment and MLOps.....	5
Week 12: Capstone Project.....	5

Course Objectives

This 12-week Machine Learning training program aims to:

- Provide a solid foundation in the principles and techniques of machine learning.
- Equip learners with practical skills in Python programming and data analysis.
- Teach learners to build and deploy machine learning models for various tasks.
- Foster problem-solving and critical thinking abilities.
- Prepare learners for careers in data science, machine learning, or related fields.

Specific objectives include:

- Understanding the different types of machine learning (supervised, unsupervised, reinforcement).
- Proficiency in using Python libraries like NumPy, Pandas, Matplotlib, Scikit-learn, TensorFlow, and Keras.
- Ability to preprocess and explore data effectively.
- Skill in building and evaluating regression and classification models.
- Knowledge of ensemble methods, boosting, and neural networks.
- Understanding of unsupervised learning techniques like clustering and dimensionality reduction.
- Familiarity with natural language processing and time series analysis.
- Ability to deploy machine learning models as web APIs.
- Development of a strong foundation for further learning and experimentation in machine learning.

FIRST MONTH

Week 1: Introduction to Machine Learning and Python

- Monday: Introduction to AI and Machine Learning, Python basics, Jupyter Notebook setup.
- Tuesday: Data types and structures in Python, NumPy for numerical operations.
- Wednesday: Pandas for data manipulation and analysis.
- Thursday: Matplotlib for data visualization.
- Friday: Introduction to Scikit-learn and its functionalities.
- Project: Create a simple linear regression model using Scikit-learn.

Week 2: Data Preprocessing and Exploration

- Monday: Data cleaning and handling missing values.
- Tuesday: Feature engineering and selection.
- Wednesday: Exploratory Data Analysis (EDA) using various visualization techniques.
- Thursday: Introduction to overfitting and underfitting.
- Friday: Handling imbalanced datasets.
- Project: Perform EDA on a real-world dataset and create visualizations.

Week 3: Supervised Learning: Regression

- Monday: Introduction to supervised learning and regression problems.
- Tuesday: Simple linear regression and multiple linear regression.
- Wednesday: Polynomial regression and regularization techniques.
- Thursday: Model evaluation metrics for regression.
- Friday: Hyperparameter tuning using grid search and random search.
- Project: Build a regression model to predict house prices.

Week 4: Supervised Learning: Classification

- Monday: Introduction to classification problems.
- Tuesday: Logistic regression and decision trees.
- Wednesday: Random forests and support vector machines (SVM).
- Thursday: K-nearest neighbors (KNN) and naive Bayes.
- Friday: Model evaluation metrics for classification.
- Project: Build a classification model to predict customer churn.

SECOND MONTH

Week 5: Ensemble Methods and Boosting

- Monday: Introduction to ensemble methods.
- Tuesday: Bagging and random forests.
- Wednesday: Boosting algorithms (AdaBoost, Gradient Boosting).
- Thursday: XGBoost and LightGBM.
- Friday: Stacking and blending.
- Project: Compare different ensemble methods for a classification problem.

Week 6: Unsupervised Learning: Clustering

- Monday: Introduction to unsupervised learning and clustering.
- Tuesday: K-means clustering.
- Wednesday: Hierarchical clustering.
- Thursday: DBSCAN and Gaussian Mixture Models (GMM).
- Friday: Evaluation of clustering algorithms.
- Project: Cluster customers based on their purchase behavior.

Week 7: Unsupervised Learning: Dimensionality Reduction

- Monday: Introduction to dimensionality reduction.

- Tuesday: Principal Component Analysis (PCA).
- Wednesday: t-SNE and UMAP.
- Thursday: Applications of dimensionality reduction.
- Friday: Feature selection techniques.
- Project: Apply PCA to reduce the dimensionality of a large dataset.

Week 8: Neural Networks and Deep Learning

- Monday: Introduction to neural networks.
- Tuesday: Feedforward neural networks and backpropagation.
- Wednesday: Convolutional Neural Networks (CNNs) for image processing.
- Thursday: Recurrent Neural Networks (RNNs) for sequential data.
- Friday: Transfer learning and fine-tuning.
- Project: Build a CNN to classify images.

THIRD MONTH

Week 9: Natural Language Processing (NLP)

- Monday: Introduction to NLP.
- Tuesday: Text preprocessing and tokenization.
- Wednesday: Word embeddings (Word2Vec, GloVe).
- Thursday: Recurrent Neural Networks for NLP (LSTM, GRU).
- Friday: Sentiment analysis and text classification.
- Project: Build a sentiment analysis model.

Week 10: Time Series Analysis

- Monday: Introduction to time series analysis.
- Tuesday: Time series forecasting techniques (ARIMA, SARIMA).
- Wednesday: Time series decomposition.

- Thursday: Prophet model.
- Friday: Evaluation of time series models.
- Project: Forecast stock prices using time series analysis.

Week 11: Model Deployment and MLOps

- Monday: Introduction to model deployment.
- Tuesday: REST API development using Django.
- Wednesday: Model serving platforms (Kubernetes, AWS SageMaker).
- Thursday: MLOps principles and best practices.
- Friday: Model monitoring and retraining.
- Project: Deploy a trained model as a web API.

Week 12: Capstone Project

- Monday-Friday: Work on a capstone project that integrates concepts learned throughout the course.