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Advanced Machine Learning

Duration: 40 Hours (5 Days)

Overview

An advanced Python for Machine Learning course is designed to equip learners with the necessary skills to apply Python programming to machine learning problems. The course delves deep into various Machine Learning techniques and Algorithms, helping learners understand how to implement these solutions in Python effectively.Module 1: The Machine Learning Landscape provides an overview of the field, setting the stage for more complex topics ahead.Subsequent modules guide learners through practical aspects of machine learning projects, from Data preprocessing to Model selection and evaluation. Module 2: End-to-End Machine Learning Project is particularly focused on applying the skills learned in a hands-on project.As the course progresses through Modules 3 to 16, it covers a broad range of topics including Classification, Support Vector Machines, Decision Trees, Ensemble Learning, and advanced neural network architectures like Convolutional Neural Networks and Recurrent Neural Networks.This Python course for machine learning is tailored for those looking to specialize in machine learning and will help learners build a solid foundation in both the theoretical and practical aspects of the field. With a focus on advanced techniques, the course aims to enable participants to tackle complex machine learning challenges using Python.

Audience Profile

This Advanced Python for Machine Learning course equips participants with cutting-edge ML techniques and deep learning skills.

- Target Audience and Job Roles:
- Data Scientists seeking to enhance their machine learning proficiency
- Machine Learning Engineers looking to master Python for advanced algorithms
- Software Developers aiming to transition into the field of machine learning
- AI Researchers interested in deepening their understanding of neural networks and TensorFlow
- Data Analysts wanting to upgrade their skills to include predictive modeling and analysis
- IT Professionals pursuing knowledge in AI and machine learning applications
- Graduates in Computer Science or related fields exploring career opportunities in AI and ML
- Technical Project Managers overseeing machine learning projects
- Academics and Students focusing on artificial intelligence and machine learning research
- Research and Development Engineers working on AI-based solutions
- Technical Leads and Consultants providing strategic guidance on machine learning implementations

Course Syllabus

Day 1: Introduction to Machine Learning & Data Preparation

- Introduction to Machine Learning (ML)
- Types of Machine Learning
- Prepare Data for Machine Learning
- Activity: Discussion on Machine Learning Implementation across various Industries

Day 2: Supervised Learning - Regression & Classification & Advanced Algorithms

- Linear Regression
- Logistic Regression
- Evaluation Metrics for Supervised Learning
- Activity: Implementation of all above Algorithms using Scikit-learn

Day 3: Supervised Learning - Advanced Algorithms & Unsupervised Learning

- Decision Trees and Ensemble Methods
- Support Vector Machines (SVM)
- Unsupervised Learning: K-means Clustering & Hierarchical Clustering
- Activity: Implementation of all above Algorithms using Scikit-learn

Day 4: TensorFlow Across Devices and Servers & Deep Learning - Neural Networks & CNN

- Scaling Up with TensorFlow: Distribution across machines & Servers
- Handling large datasets, faster training, and efficient resource utilization.
- Distribution Strategies
- Artificial Neural Networks
- Structure of artificial neural networks: neurons, layers, activation functions.
- Feedforward networks and backpropagation for training.
- Convolutional Neural Networks (CNN)
- Introduction to CNNs: convolutional layers, filters, padding, and stride.
- Applications of CNNs in image recognition and computer vision.
- Implementation all algorithm using tensorflow and Keras Libraries

Day 5: Deep Learning, Auto Encoders & Reinforcement Learning

- Recurrent Neural Networks (RNN):
- Introduction to RNNs: memory cells, backpropagation through time (BPTT).
- Applications of RNNs in natural language processing (NLP).
- Auto Encoders
- The concept of Auto Encoders
- Implementing autoencoder using tensorflow
- Reinforcement Learning (RL):
- Introduction to RL: agents, environments, rewards, and state transitions.
- Q-Learning & Deep Q-Networks (DQN)
- Application of Reinforcement Learning in Industries.

Course Wrap-Up: Summarizing course and QnA