Machine Learning Essentials with Python Training

Duration: **3 Day**

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Overview

Explore Core Skills, Unsupervised vs Supervised Learning, Data Wrangling, Neural Networks, Generative AI, GPT & More

Dive into the fascinating world of AI and Machine Learning with our three-day, comprehensive course, "Machine Learning Essentials with Python". This course, perfect for basic Python developers, equips you with the skills to leverage Python for intelligent applications like data analysis, predictive modeling, automation, and chatbots, transforming your project capabilities. Participants will get hands-on experience with popular machine learning algorithms, exploring their potential applications and limitations.

Our highly-experienced instructors will share their practical expertise, guiding you through learning these new skills and empowering you to confidently apply them in your job or role. Throughout the course you'll explore learning and using Supervised and Unsupervised Learning techniques, Data Wrangling and Preprocessing, Ensemble Learning, and Model Evaluation and Validation. Hands-on labs replicating real-world scenarios form a core part of the learning experience, ensuring you acquire practical, applicable skills. Each hands-on lab will provide you with practical experience using innovative skills with cutting edge tools, applied in a practical and meaningful way.

If time permits, you'll also explore innovative technologies such as Generative AI with GPT-4, as well as practical AI integration into applications, highlighting the tools and technologies transforming the AI landscape. By the end of the course, you will not only have gained a deep understanding of AI and Machine Learning concepts but also the ability to apply these in your work context, leading to more complex and impactful projects.

Who Should Attend?

This course is ideally suited for Python developers, data analysts, and aspiring data scientists looking to expand their skills into AI and Machine Learning. It is also highly beneficial for product managers and business leaders aiming to acquire a hands-on understanding of AI's impact on product development and business strategy.

Prerequisites

To ensure a smooth learning experience and maximize the benefits of attending this course, you should have the following prerequisite skills:

- Basic Understanding of Python as well as familiarity with Python Libraries (Pandas and Numpy, etc.)
- Basic Math and Problem-Solving Skills
- Understanding of Basic Data Structures

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What You Will Learn

This course combines engaging instructor-led presentations and useful demonstrations with valuable hands-on labs and engaging group activities. Throughout the course you'll learn how to:

- Master the Python Programming for Data Science: Gain an in-depth understanding of Python's role in data science and AI, including proficiency in using key Python data science libraries like Pandas, NumPy, and Matplotlib.
- Understand the Fundamentals of AI and Machine Learning: Develop a strong grasp of AI and Machine Learning concepts, their applications, and how to differentiate between AI, Machine Learning, and Deep Learning.
- Dive into Supervised and Unsupervised Learning Techniques: Acquire hands-on skills to conduct Regression Analysis, Binary Classification, and k-means Clustering - key methods in Supervised and Unsupervised Learning.
- Apply Data Wrangling and Preprocessing Techniques: Learn to handle missing data, outliers, and categorical data effectively and perform feature scaling and normalization - crucial steps in Machine Learning projects.
- Create and Evaluate Machine Learning Models: Get a grip on the lifecycle of AI projects, including model creation, evaluation, validation, and the application of Ensemble Learning techniques.
- Understand and implement crucial data preprocessing techniques in Python: Attendees will acquire the ability to handle missing data, outliers, and categorical data, essential for creating reliable machine learning models.
- Develop competency in creating and interpreting data visualizations: Students will learn how to leverage Python's powerful libraries such as Matplotlib and Seaborn to create compelling visualizations and extract meaningful insights from data.
- Construct a machine learning pipeline for real-world applications: Participants will gain the practical know-how to carry a machine learning project from initial data collection through to final model deployment, using Python.
- (Optional / Bonus Topics): Implement AI into Real-World Applications: By the end of the course, you'll be able to build applications that integrate AI functionalities, using popular Python frameworks and modern AI technologies, like GPT, CoPilot etc.

Outline

1. **Introduction to AI & Machine Learning**
   - Understand what AI and Machine Learning are and why they're critical for modern business
   - Exploring definitions and types of AI
   - Discussing AI in the Modern Age and its role in business
   - Embrace Change: Learn and Build Confidence using the Tools – Don't be Replaced By Them
2. **Deeper Dive into Machine Learning**
   - Basics of how mathematics are used in or apply to AI
   - Algorithms: What are they and how are they used in AI and ML
   - Supervised vs Unsupervised
   - Classification, Regression, Clustering, Dimensionality Reduction, and Ensemble Methods
   - The role of Machine Learning in AI and business decision-making
   - Review a real business scenario where Machine Learning was used to increase efficiency.
3. **Leveraging AI in Business & Decision Making**
   - Discussing key business areas where AI adds value: Operations, Marketing, Sales, HR, content development, coding and software development
   - Explore how AI is used in business decision-making

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    - Introduction to predictive analytics
    - Using AI for strategic decision-making
4. **Hot Trends for AI in Business: Large Language Models (LLM), Generative AI and GPT**
    - Understand the basics of Generative AI and how it differs from other AI techniques
    - Introduction to GPT and its applications in various sectors
    - Explore how GPT uses machine learning to generate human-like text based on the input it receives.
    - Understand the concept of language models and how they are trained using large amounts of text data
5. **Basics of Neural Networks**
    - What are they and how are they used?
    - Basic parts: Neurons, activation functions, interactions.
    - Types: Feedforward, recurrent, convolutional neural networks overview.
    - How they learn: Forward propagation, backpropagation explained.
    - Training Neural Networks: Importance of data preprocessing in training.
    - Deep Neural Networks: Advantages and practical applications overview.
    - In Action: Image recognition, language processing, etc. use cases.
    - Ethical Considerations: Addressing biases and ethical concerns in neural networks.
6. **Natural Language Processing (NLP) & Sentiment Analysis**
    - What is NLP and how is it used?
    - NLP Language and Semantic Meaning, Bigrams, Trigrams, n-Grams, Root Stemming and Branching
    - Introduction to Sentiment Analysis: Sentiment indicators, Sentiment Sampling, Predicting Elections based on Sentiment Analysis
7. **Using AI for Image, Video, and Audio Processing**
    - Learn about Image processing and Identification, Facial Analysis, Audio Processing
    - Discuss the role of AI in analyzing streaming video and real-world AV processing
8. **AI for Business Technical Tools: Data Science, Deep Learning & The Cloud**
    - Applying AI in Data Science overview
    - Tools: Python, NumPy, Pandas, SciKitLearn, Hadoop, Spark
    - NoSQL Databases
    - Deep Learning overview
    - AI for Business in the Cloud overview
9. **Practical Applications and the Future of AI in Business**
    - What's next in applied AI for businesses
    - New AI trends shaping the future of business
    - Ethical considerations when implementing AI

Next-Steps

- Hands-on Practice
- Resources
- AI & ML Communities