

Machine Learning – Detailed Explanation Notes

Introduction to Machine Learning

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Types of Machine Learning

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Linear Regression

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Decision Trees

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Naive Bayes

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K-Nearest Neighbors

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Clustering Techniques

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Principal Component Analysis

Principal Component Analysis is a fundamental concept that forms the backbone of modern computer science and software development. In this section, we explore the theoretical foundations of Principal Component Analysis, explaining why it exists, how it evolved, and how it is applied in real-world systems. The discussion includes definitions, internal working mechanisms, advantages, limitations, and performance considerations. Practical examples are provided to help learners understand how Principal Component Analysis is used in industry-scale applications. We also analyze common mistakes, optimization strategies, and best practices followed by professionals. This detailed explanation ensures conceptual clarity and prepares learners for interviews, academic exams, and real-world problem solving.

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Model Evaluation Metrics

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Bias Variance Tradeoff

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Ensemble Learning

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Random Forest

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Support Vector Machines

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Neural Networks

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Deep Learning Basics

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Natural Language Processing

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Machine Learning Tools and Libraries

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