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50 ML Interview Questions

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1. What is the difference between supervised and unsupervised learning?

Supervised Learning Uses labeled data to train models for predictive tasks.

- **Regression** Predicts continuous values e.g., house price, temperature.
- **Classification** Predicts categories e.g., spam/not spam, disease diagnosis.

Unsupervised Learning Uses unlabeled data to discover patterns or groupings.

- **Clustering** Groups similar data e.g., customer segmentation.
- **Dimensionality Reduction** Reduces features e.g., PCA for visualization.

Supervised learning predicts outcomes; unsupervised learning uncovers hidden structures.

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2. What is the difference between classification and regression?

Classification predicts a discrete label or category. The model learns from labeled data and assigns new instances to predefined classes. Examples include identifying whether an email is spam or not. Classification is evaluated using metrics such as accuracy, precision, recall, F1-score, and ROC-AUC.

Regression predicts a continuous value. The model learns the relationship between input features and a real-valued target variable, aiming to estimate quantities such as house prices, temperature, or sales figures. Common evaluation metrics for regression include mean squared error (MSE), mean absolute error (MAE), and R-squared.