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WHITING SCHOOL  
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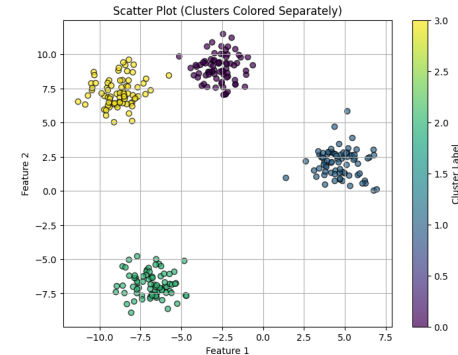
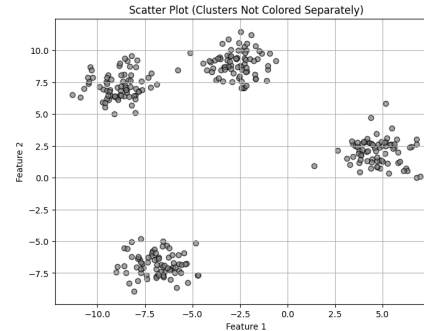
# Algorithms for Data Science

Data Modeling: Unsupervised Learning

# Unsupervised Learning

**What hidden patterns can we uncover when no labels are provided?**

- How do retailers group customers based on purchasing behavior?
- How do search engines collapse dimensionality for faster search?



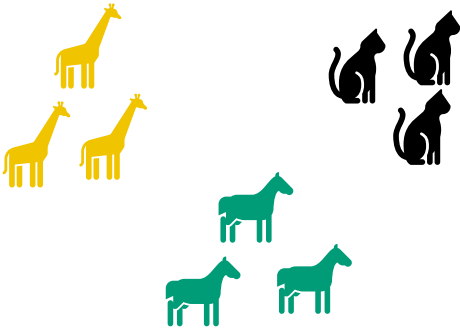
*Unsupervised learning reveals hidden structures in unlabeled data, guiding exploratory analysis and decision making.*

# Unsupervised Learning

**Unsupervised Learning analyzes unlabeled data to uncover hidden patterns, relationships, or structures.**

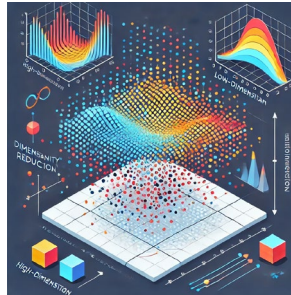
## Clustering

Grouping data points into distinct clusters.



## Dimensionality Reduction

Reducing the number of variables while retaining essential structure.



## Anomaly Detection

Identifying unusual or rare data points.





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