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**CIS625HOS2P2025 Machine Learning for Business**

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**April 17, 2025**

*Unit 5: Discussion*

## Clustering Methods in Automotive Business

Clustering methods can benefit daily business tasks, especially in the automotive industry. These methods help analyze car data and customer details to make better business decisions.

### Understanding Customer Preferences with Hierarchical Clustering

Consider a car dealership that looks at the sales data from 1,000 cars. Using hierarchical clustering, customers can be grouped based on similar buying habits. An example might look like this (Noble, 2024):

| Customer Type | Number of Customers | Price Range Preferred |
|---|---|---|
| Luxury Car Buyers | 300 | Over $50,000 |
| Budget Car Buyers | 400 | Under $15,000 |
| Mid-Range Car Buyers | 300 | $15,000 - $50,000 |

These groups help dealerships plan better marketing strategies for each type of customer.

### Managing Car Inventory with K-Means Clustering

K-means clustering is helpful for organizing car inventories. Suppose a dealership has 500 used cars. K-means helps quickly sort them into simple categories based on mileage and features (Sharma, 2025):

| Car Category | Number of Cars | Average Mileage |
|---|---|---|
| Economy Cars | 250 | 40,000 miles |
| Family Cars | 150 | 30,000 miles |
| Luxury Cars | 100 | 20,000 miles |

This way of organizing cars simplifies inventory management and marketing.

**Detecting Unusual Patterns with DBSCAN**

DBSCAN is great for spotting unusual activities. For example, if a dealership has 200 rental cars with GPS tracking, DBSCAN can quickly find cars that are not following regular routes (Kumar, 2024):

| Analysis Type | Cars Checked | Unusual Route Cars |
|---|---|---|
| Rental Fleet GPS | 200 | 10 |

Finding these unusual cases quickly helps dealerships address issues right away.
Each clustering method helps make the automotive business run more smoothly and efficiently.

**References**

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