Instance-Based Vs Model-Based Learning | Types of Machine Learning

Machine 2 method say sakhta hai.

1)Memorizing

2)Generalizing

Jo model ratty laga tha hai Yani memorizing karta hau usay hum instance-based learning kehtay hain

Or jo model principle yani generalizing ko follow karta hai usay hum Model Based Learning kehtay hain

1) Instance-Based Learning

- Model **data ko yaad rakhta hai**.
- Jab naya input aata hai, model **similar old data** dhond kar uski base par prediction karta hai.
- Yani koi “internal formula/model” nahi banata — **bas examples compare karta hai**.

Example:

- K-Nearest Neighbors (KNN)
- Case-based reasoning

➡️ Yani: *“Model examples ko store karta hai aur unki similarity check karke decision banata hai.”*

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2) Model-Based Learning

- Ismein model **data se rule ya formula** learn karta hai.
- Ek **general model** banta hai jo new data par use hota hai.
- Model training ke baad “data ko yaad” nahi rakhta — sirf learned model use karta hai.

Example:

- Linear Regression
- Logistic Regression
- Neural Networks
- Decision Trees

➡️ Yani: *“Model poore data ka ek math formula ya rule learn karta hai aur phir use new data par apply karta hai.”*

Feature	**Instance-Based Learning**	**Model-Based Learning**
Learning Type	Memorizes examples	Learns a general model
Memory Usage	High (stores many instances)	Low (stores only model parameters)
Speed (Training)	Fast (no heavy training)	Slow (requires training)
Speed (Prediction)	Slow (must compare each time)	Fast (just applies formula)
Generalization	Weak generalization	Strong generalization
Examples	KNN, Case-based reasoning	Linear Regression, Neural Networks
Use Case	Small datasets, simple tasks	Large datasets, complex tasks