

Machine learning **VS** Deep learning

 swipe

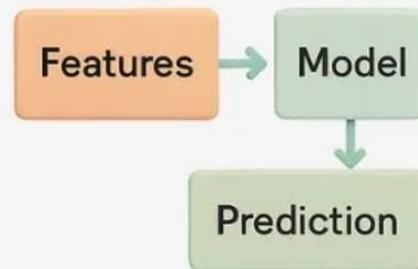


Introduction



🔥 Everyone talks about **AI**... but do you actually know the difference between **Deep Learning (DL)** and "normal" **Machine Learning (ML)**?

Give me **2 minutes** and you will never confuse them again. 🙌



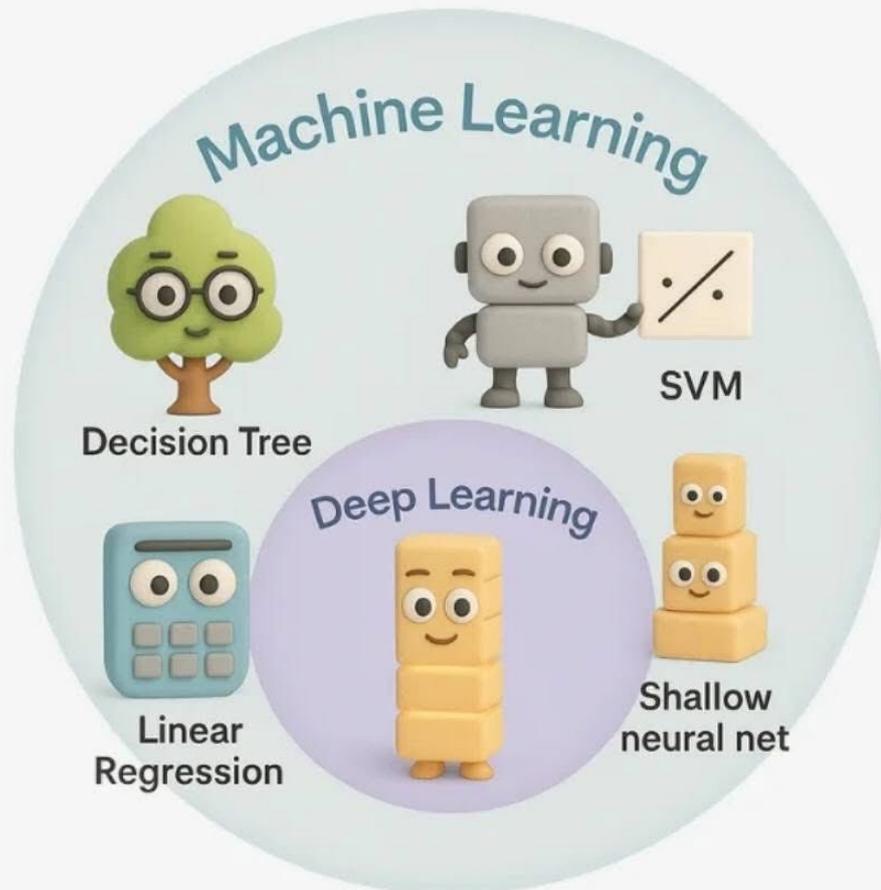
Big Picture



Think of **ML** as the entire family 🧑🧒🧓

And **DL** as one very intense kid inside that family 🤖

Same home, very different personality.



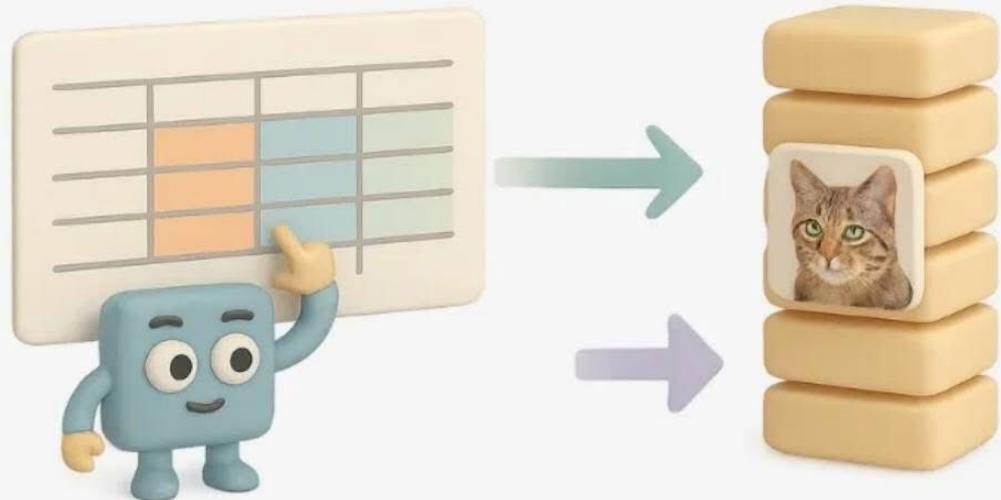
Core Difference



ML learns from **features you prepare** 🧩

DL learns from **raw data** by building features on its own 🧠

You guide ML. DL guides itself.



ML Intern

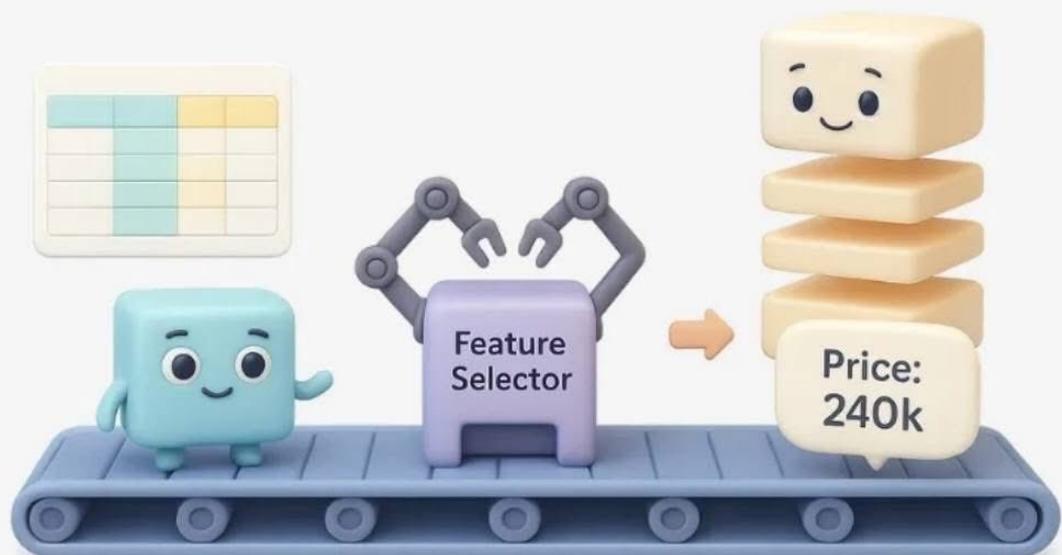
Classical ML: How It Learns



You clean the **data**. You pick the important columns.

ML looks at those **numbers** and finds **patterns** 📊

ML be like: **"Give me the groceries and I will cook"**.



ML Example: House Prices



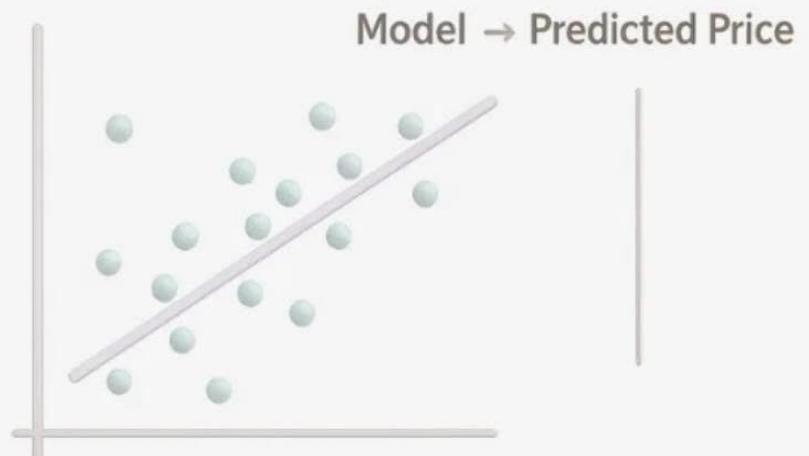
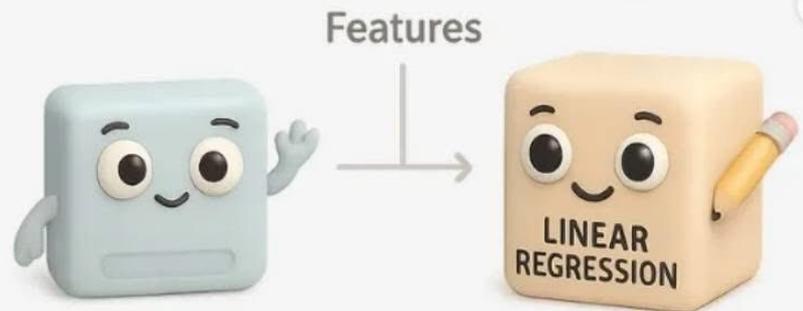
ML loves **structured data**.

For house prices it uses **features like:**

- square meters 🏠
- rooms
- neighborhood score
- year built

And learns how these relate to the price 📈

sqm	rooms	neighborhood..score	year. built
75	3	8	2001
85	5	8	1965
62	6	8	1501
65	7	8	1850



Famous ML Algorithms



ML is a whole playground of different **models** 🤖

The popular ones are:

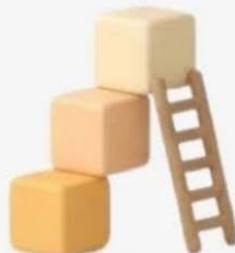
ML Zoo



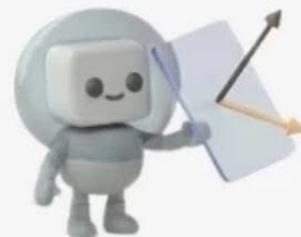
Decision Trees



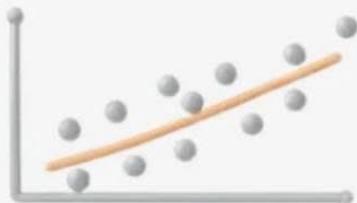
Random Forest



Gradient Boosting



SVM



Linear and Logistic Regression



KNN



Naive Bayes



Shallow Neural Nets

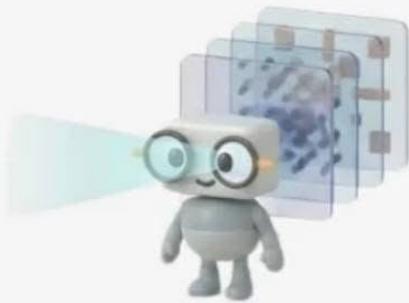
Famous DL Algorithms



DL is similar to **ML**, but it's models are more deep. Usually, those are **neural networks** with **multiple layers**

The popular ones are:

DL Zoo



CNN



RNN



LSTM

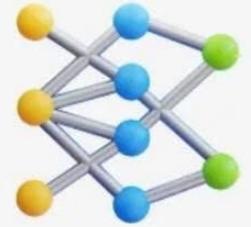


Transformer

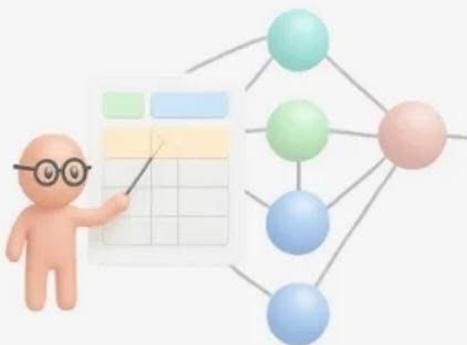


Autoencoder

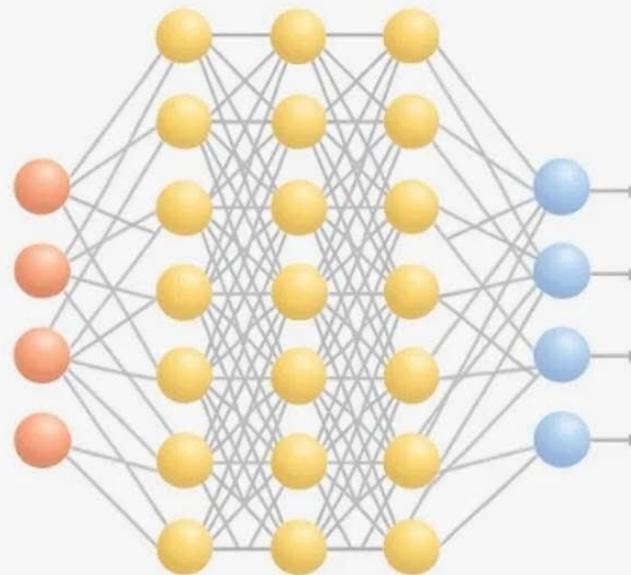
Are Neural Networks ML or DL?



Neural networks are usually considered to be part of **DL**. But If network has **only one hidden layer** (shallow), it is still classical **ML** 🙌



Shallow Neural Network



Deep Neural Network

What Makes DL Deep?



DL stacks **many hidden layers**.

More layers means stronger ability to learn **patterns** from raw **pixels** and raw **text** ⚡

It builds understanding step by step.



DL Example: Vision



Show **DL** a cat photo 🐱

Here is what happens layer by layer:

- first layer finds edges
- next finds textures
- next finds shapes
- later layers find cat parts
- final layer says "Cat"



How They Learn? (Side by Side)

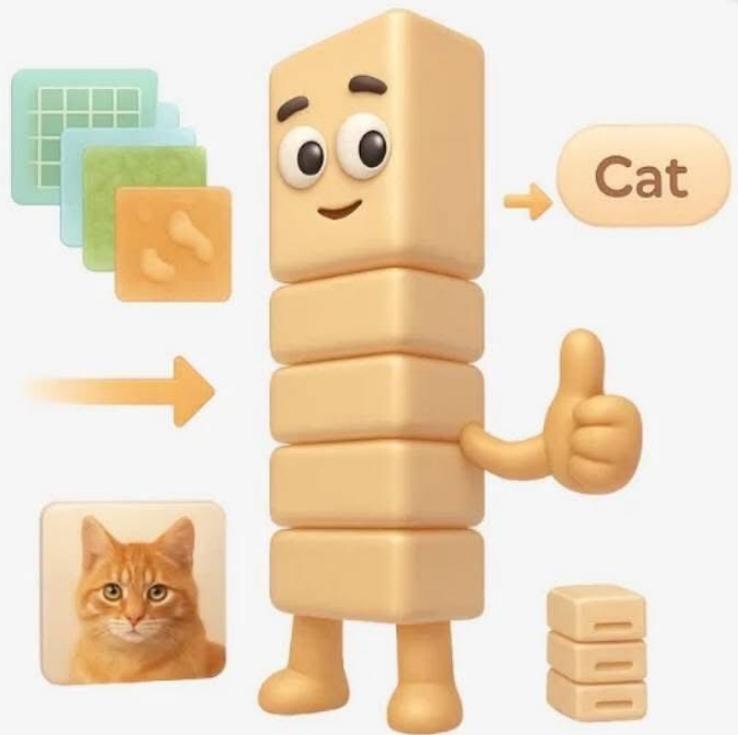


ML says: "Give me the right features" 📦

DL says: "Just give me the raw stuff. I will figure it out" 🔥

MANUAL

AUTOMATIC



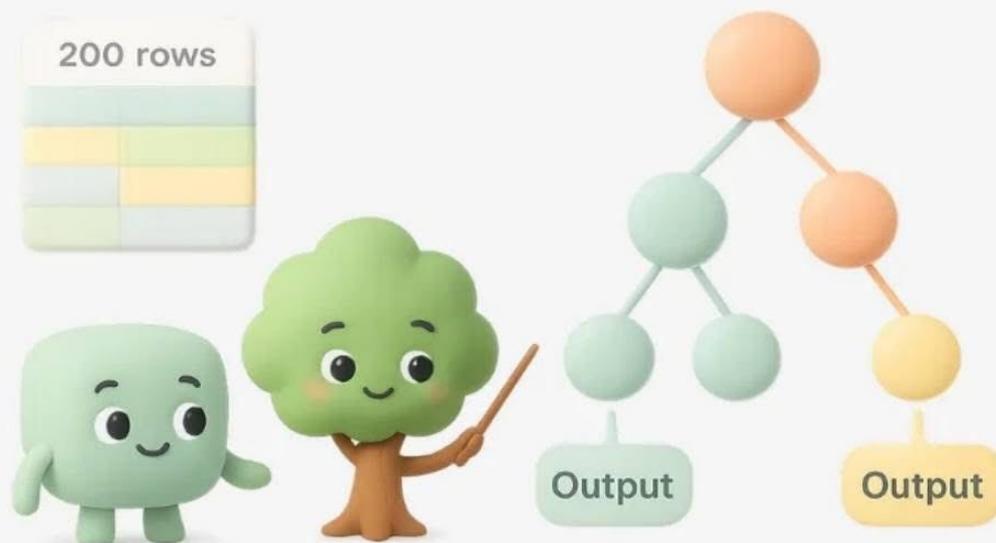
When ML Wins



Pick **ML** when:

- data is small 📊
 - training must be fast
 - you need clear explanations
 - resources are limited
- This is why **banks** love **ML**.

Decision Tree

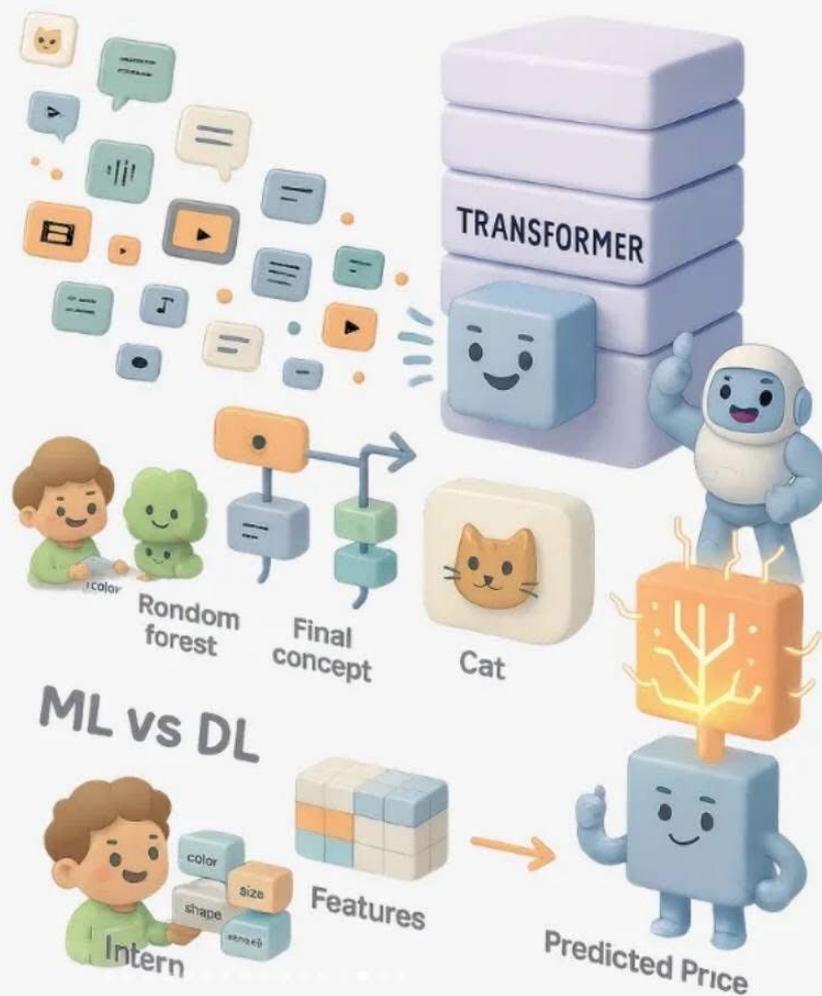


When DL Wins



Pick **DL** when:

- data is huge 📄
- patterns hide inside pixels or text
- you need top accuracy
- you work with **images, audio, video or NLP**



Final Summary



ML learns from features you design 🖋️

DL learns from raw **data** by creating **features** itself 🤖

Same goal. Two very different brains.

ML vs DL

