1. Statistical Models

These are the oldest, math-heavy models based on statistics and probability.

Examples in the image: Linear Regression, Logistic Regression

How they work:

They assume relationships between variables follow certain patterns (often linear).

Predictions are based on equations and probability distributions.

Real-world examples:

Linear Regression: Predicting house prices using square footage, number of bedrooms, etc.

Logistic Regression: Predicting whether a customer will buy a product (Yes/No) based on income and browsing history.

2. Machine Learning Models

Algorithms that learn patterns automatically from data (without needing you to hard-code rules).

Examples in the image: Decision Trees, Random Forests, SVM (Support Vector Machines)

How they work:

They split data, find rules, or separate groups in clever ways.

They improve by training on past data.

Real-world examples:

Decision Trees: A bank deciding if someone is eligible for a loan based on income, credit score, and age.

Random Forests: Predicting customer churn (whether they’ll leave a service) by combining multiple decision trees.

SVM: Classifying whether an email is spam or not spam.

3. Deep Learning Models

A subfield of ML using neural networks with many layers.

Examples in the image: CNNs, RNNs, Transformers

How they work:

They mimic how the human brain processes data.

Very powerful for large and complex datasets like images, speech, and text.

Real-world examples:

CNN (Convolutional Neural Network): Detecting objects in photos (e.g., recognizing cats in pictures).

RNN (Recurrent Neural Network): Predicting the next word in a sentence or time-series forecasting (e.g., stock market trends).

Transformer (like GPT models): Powering chatbots and translation tools (e.g., Google Translate, ChatGPT).

4. Generative Models

Advanced deep learning models that create new content, not just predict.

Examples in the image: GANs, Diffusion Models, LLMs (Large Language Models)

How they work:

They learn data distributions and generate new data that looks realistic.

Real-world examples:

GANs (Generative Adversarial Networks): Creating realistic fake faces (like deepfakes) or artwork.

Diffusion Models: Generating images from text prompts (e.g., DALL·E, Stable Diffusion).

LLMs (Large Language Models): Writing human-like text (e.g., ChatGPT generating essays, poems, or code).