

Machine Learning Training Models

These models are used during the **training phase** to learn from data and make predictions. These models can be easily implemented using popular Python libraries like **scikit-learn**, **TensorFlow**, and **Keras**.

1. Linear Regression

- **What it does:** Predicts a **continuous value** based on the relationship between input variables.
 - **Example:** Predicting house prices based on size.
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2. Logistic Regression

- **What it does:** Used for **binary classification** problems (two categories). It predicts the probability of an outcome.
 - **Example:** Predicting whether an email is **spam or not spam**.
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3. Decision Trees

- **What it does:** A model that makes decisions based on a series of **if-then** rules, like a flowchart.
 - **Example:** Deciding whether to approve a loan based on the applicant's age, income, etc.
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4. K-Nearest Neighbors (KNN)

- **What it does:** Classifies a data point based on how similar it is to nearby points. It looks at the "**K** nearest neighbors" and makes decisions based on the majority vote.
 - **Example:** Classifying a fruit as **apple** or **orange** based on its size and color, by looking at similar fruits in a dataset.
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5. Support Vector Machines (SVM)

- **What it does:** Finds a **boundary** (or a lane) that **separates** different categories with the **largest gap** between them.
 - **Example:** Classifying whether a review is positive or negative based on the words used in the text.
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6. Random Forest

- **What it does:** Combines many **decision trees** (a forest) and uses the majority vote for classification or average for regression. It reduces the chance of errors by relying on multiple models.
 - **Example:** Predicting customer churn or loan approval.
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7. Neural Networks

- **What it does:** Inspired by the human brain, these models can handle **complex patterns** and **large datasets**. They're made up of layers of nodes (like neurons).
 - **Example:** Image recognition, where the model can classify objects in pictures (e.g., identifying cats vs dogs).
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8. K-Means Clustering

- **What it does:** A type of **learning** that groups similar data points into **clusters**.
- **Example:** Grouping customers based on their buying behavior.

Each model is a **different approach** to solving problems like predicting, classifying, or grouping data based on patterns. The choice of model depends on the **type of problem** you're solving and the data you have.