Definition:

> *Unsupervised machine learning is a type of machine learning that deals with unlabeled data.*

Unlike supervised learning, where the data is labeled with the correct output, unsupervised learning algorithms are given unlabeled data and must discover the underlying patterns or structure in the data on their own.

Main goals of Unsupervised Machine Learning:

- Clustering: Group similar data points together
- Dimensionality reduction: Reduce the number of features in a dataset
- Anomaly detection: Identify data points that are significantly different from the rest of the data

Some Unsupervised Machine Learning Algorithms:

1. K-means clustering: This algorithm is a simple and popular method for clustering data. It works by iteratively assigning data points to the nearest cluster centroid.

2. Hierarchical clustering: This algorithm builds a hierarchy of clusters, starting with individual data points and merging them together until a desired number of clusters is reached.

3. Principal component analysis (PCA): This algorithm is a popular method for dimensionality reduction. It works by transforming the data into a new coordinate system where the first few dimensions capture most of the variance in the data.

4. Anomaly detection algorithms: There are many different algorithms for anomaly detection, but some common approaches include isolation forests, local outlier factor (LOF), and one-class support vector machines (SVM).

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