**What is a Classifier?**

* It is a machine learning model which can be trained and predicts the output based on input datasets.

**Types of Classifiers:**

1. KNN (K-Nearest Neighbours)
2. HTM (Hierarchical Temporal Memory)
3. **KNN**: It is a distance-based classifier, supervised learning algorithm, used for classification and regression.

In **K-Nearest Neighbours (KNN)**, the **"K"** represents the number of nearest neighbours considered when making a classification or regression prediction.

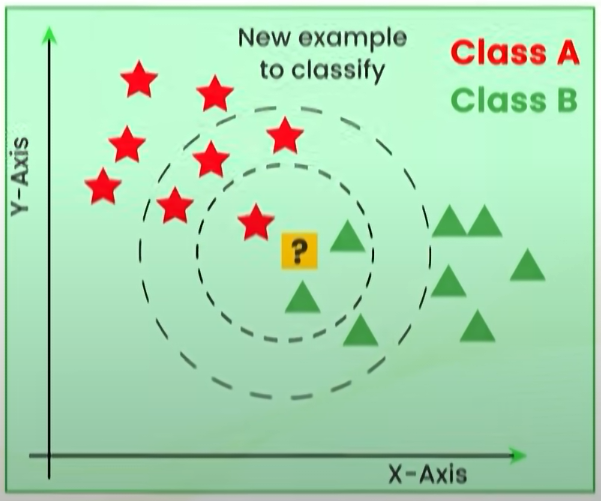
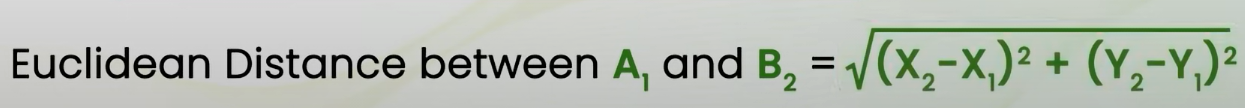


Figure 1: example of KNN

In the Figure 1, the inner circle and outer circle contains **3** and **7** nearest neighbours respectively.

**How does KNN algorithm works?**

* Stores all the data points (examples) and their corresponding labels (in case of classification).
* Calculates distance
  + Compute the distance between data point and all other points in the dataset.
  + **Euclidean distance**: 

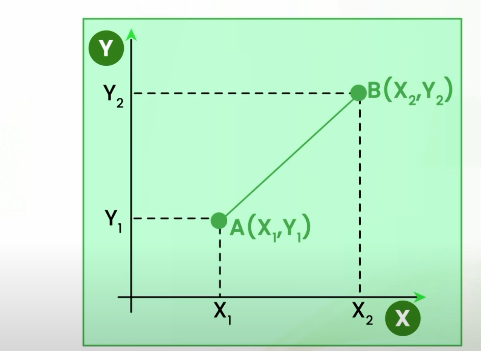


Figure 2:Understanding Euclidean distance

* **Find K Nearest Neighbours**:
  + Sort the distances and select the K-closest points.
* **Make a Prediction**:
  + **Classification**:
    - Count the classes of the K neighbours and assign the most frequent class (majority vote) to x.
* **Regression**:
  + Compute the average (or weighted average) of the values of the K neighbours to predict the value for x.