2025

4Geeks Academy: data science cohort 12

DAY 24: K-NEAREST NEIGHBORS

TODO

K-NEAREST NEIGHBORS	Model details, applications and types
NAIVE BAYES PROJECT	Submit Naive Bayes Project Tutorial (Naive Bayes Algorithm module), if you haven't done so already
K-NEAREST NEIGHBORS PROJECT	Work on K-nearest neighbors Project Tutorial (K-nearest neighbors module), plan to finish before class Friday

TOPICS

01 K-NEAREST NEIGHBORS

02 APPLICATIONS

03 HYPERPARAMETERS

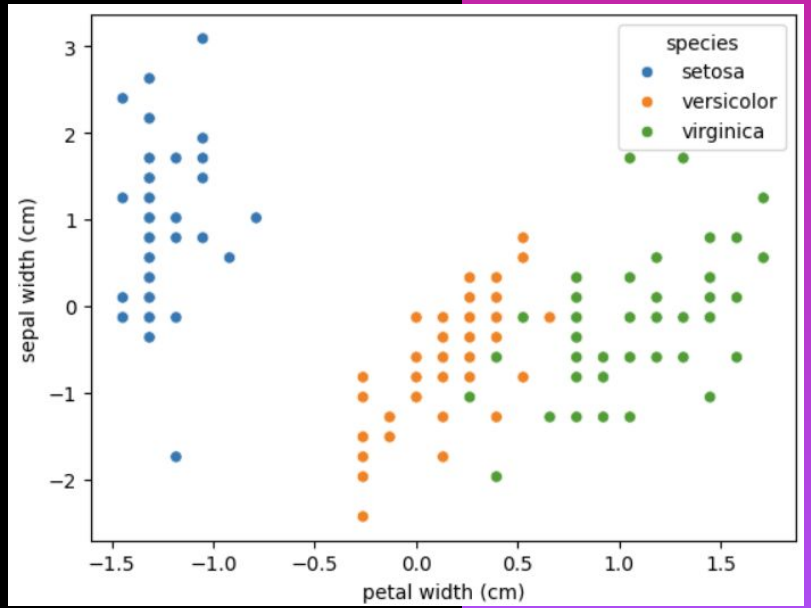
K-NEAREST NEIGHBORS

WHAT Supervised learning technique using set of similar example to assign label to unknown example

WHY No ‘training’ phase - simple and easy to implement

HOW

- Find nearest points in feature space
- Use majority voting for classification
- Use average for regression



APPLICATION (sklearn)

TYPES

- **NearestNeighbors**
  - Finds n most similar data points
- **KNeighborsRegressor**
  - Uses KNN for supervised regression
- **KNeighborsClassifier**
  - Uses KNN for classification

PROS

- No explicit training
- Simple hyperparameters
- Handles nonlinearity
- Good for search and recommendation

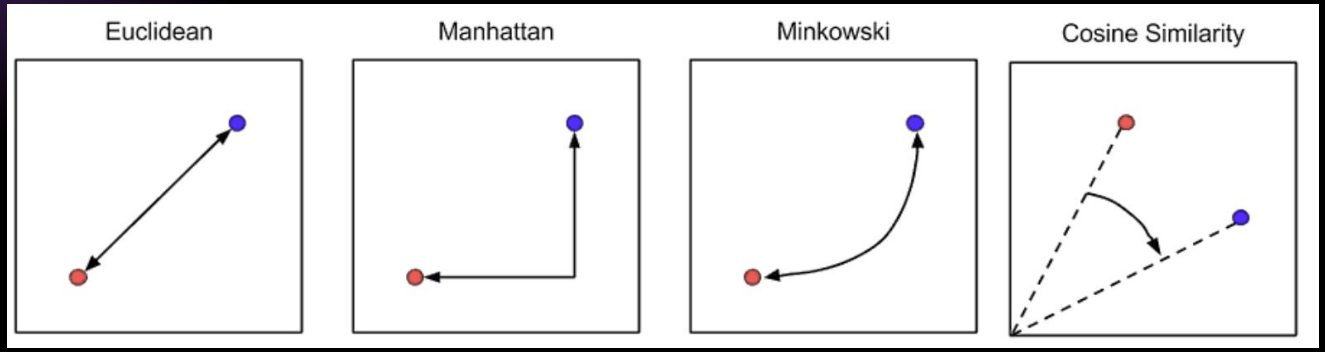
CONS

- Can become infeasible with large datasets
- Sensitive to local structure

HYPERPARAMETERS (sklearn)

DISTANCE

- `metric`: distance metric to use when finding neighbors



SEARCH

- `n_neighbors`: how many neighbors to consider
- `weights`: whether and how to weight neighbors for classification or regression