2025

4Geeks Academy: data science cohort 12

DAY 23: NAIVE BAYES

TODO

NAIVE BAYES	Model details, applications and types
NAIVE BAYES PROJECT	Work on Naive Bayes Project Tutorial (Naive Bayes Algorithm module), plan to finish over the weekend
GRADIENT BOOSTING PROJECT	Submit Boosting Algorithms Project Tutorial (Gradient Boosting Algo. module), if you haven't already

TOPICS

01 NAIVE BAYES CLASSIFIER

02 APPLICATIONS

03 TYPES & CONSIDERATIONS

NAIVE BAYES CLASSIFIER

WHAT Very simple probabilistic classifier, uses conditional probability to assign labels

WHY Easy to train, does not need large dataset

HOW

text	the	food	was	good	awesome	terrible	review sentiment
The food was good	1	1	1	1	0	0	positive
The food was awesome	1	1	1	0	1	0	positive
The food was terrible	1	1	1	0	0	1	negative

- Probability of negative review: 1/3 = 33%
- Probability of negative review given ‘terrible’: 1/1 = 100%

APPLICATIONS

TYPES

- **GaussianNB**
  - Continuous features
  - Data should be normally distributed
- **MultinomialNB**
  - Discrete/categorical features
  - Data distribution should be multinomial
  - Good match for text classification
- **BernoulliNB**
  - Binary features
  - Often paired with one-hot encoding

PROS

- Computationally easy/fast to train
- Does not need large dataset

CONS

- Assumes features are independent
- Less powerful than other methods for large datasets