Naive Bayes for Sentiment Analysis: Takeaways

Concepts

- The Naive Bayes classifier figures out how likely data attributes are associated with a certain class.
- The classifier is based on Bayes' theorem, which is

$$P(A \mid B) = \frac{P(B \mid A)(P(A))}{P(B)}, P(B) \neq 0$$

  where:

  - A and B are events.
  - $P(A \mid B)$ is a conditional probability. Specifically, the likelihood of event A occurring given the B is true.
  - $P(B \mid A)$ is also a conditional probability. Specifically, the likelihood of event B occurring given the A is true.
  - $P(A)$ and $P(B)$ are the probabilities of observing A and B independently of each other.

- Bayes' Theorem describes the probability of an event based on prior knowledge of conditions that might be related to the event.
- Naive Bayes extends Bayes' theorem to handle thee case of multiple data points by assuming each data point is independent.
- The formula for the classifier is the following

$$P(y \mid x_1, \ldots, x_n) = \frac{P(y)\prod_{i=1}^{n} P(x_i \mid y)}{P(x_1, \ldots, x_n)}$$

- To find the "right classification", we find out which classification ($P(y \mid x_1, \ldots, x_n)$) has the highest probability.

Resources

- Bayes' theorem
- Probability theory