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Applications of Naïve Bayes

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0:00 Earlier in the week, you used a Naive Bayes method to classify tweets. But that's going to be used to do a number of things like identify who's an author of a text. I'll give you a few ideas of what those things may be. When you use Naive Bayes to predict the sentiment of a tweet, what you're actually doing is estimating the probability for each class by using the joint probability of the words in classes. The Naive Bayes formula is as the ratio between these two probabilities, the products of the priors and the likelihoods. You can use this ratio between conditional probabilities for much more than sentiment analysis. For one, you could do author identification. If you had two large corpora, each written by different authors, you could train a model to recognize whether a new document was written by one or the other. Or if you had some works by Shakespeare and some works by Hemingway, you could calculate the Lambda for each word to predict how likely a new word is to be used by Shakespeare or alternatively by Hemingway. This method also allows you to determine author Identity. Another common use is spam filtering. Using information taken from the sender, subjects and content, you could decide whether an email is spam or not. One of the earliest uses of Naive Bayes was filtering between relevant and irrelevant documents in a database given the sets of keywords in a query. In this case, you only needed to calculate the likelihood of the documents given the query. You can't know beforehand what's a relevant or irrelevant document looks like. You can compute the likelihood for each document in your dataset and then store the documents based on its likelihoods. You can choose to keep the first m results or the ones that have a likelihood larger than a certain threshold. Finally, you can also use Naive Bayes for word disambiguation, which is to say, breaking down words for contextual clarity. Consider that you have only two possible interpretations of a given word within a text. Let's say you don't know if the word bank in your reading is referring to the bank of a river or to a financial institution. To disambiguate your word, calculate the score of the documents, given that it refers to each one of the possible meanings. In this case, if the text refers to the concept of river, instead of the concept of money, then the score will be bigger than one. That's cool, right? In summary, Bayes rule and its Naive approximation has a wide range of applications in sentiment analysis, author identification, information retrieval, and word disambiguation. It's a popular method since it's relatively simple to train use and interpret. You'll be using the Bayes rule and Naive Bayes again in the weeks ahead. Now, you're fully equipped. As you've seen in this video, Naive Bayes can be used for many classification tasks. Next, I'll show you the assumptions that underlie the Naive Bayes method.