

Bayes' Theorem in probability theory and statistics describes the probability of an event, based on prior knowledge of conditions that might be related to the event. It was named after Thomas Bayes. The formula for Bayes' theorem is given as:

$$P(A|B) = (P(B|A) * P(A)) / P(B)$$

Where $P(A|B)$ is Posterior probability: Probability of hypothesis A on the observed event B.

$P(B|A)$ is Likelihood probability: Probability of the evidence given that the probability of a hypothesis is true.

$P(A)$ is Prior Probability: Probability of hypothesis before observing the evidence.

$P(B)$ is Marginal Probability: Probability of Evidence.

Naive Bayes is a classification algorithm for binary (two-class) and multiclass classification problems. Its name comes from a simplification of the probabilities calculations for each class. Probabilities of each attribute value are not calculated. They are assumed to be conditionally independent given the class value. This strong assumption are rather unlikely for the real data. Despite the fact it performs surprisingly well. It is easy and quick to implement, since it does not need a model to be trained. Naïve bayes algorithm is used in machine learning e.g. for spam filtration, Sentimental analysis, classifying articles.