UASimpleClassifier: An Implementation of Naive Bayes's Classifier, Probability density functions, and Cumulative distribution function

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Abstract

This is an abstract of your work. This should be written last.

1 Introduction

The UASimpleClassifer algorithm will take in a file with five features, with those features it will calculate the probabilities of each thing happening given each possible class. It will then construct a model that will be able to predict the class it belongs in with an accuracy of 80.5%

2 Background

Naive Bayes is based on conditional probability, and following from Bayes theorem, for a document d and a class c, it is given as $\mathrm{P(c}\|d) = \frac{P(d\|c)P(c)}{P(d)}$ [1]
Naive Bayes has been found to be very useful in the field of medical science for diagnosing heart patients due to it not being a hard model to build, and not having a complicated iterative parameter estimation. [2]

3 Specification

The main technique I use throughout this problem is the Naive Bayes formula, Cumulative distribution function, and Probability density functions. The formula's for each

Naive Bayes

$$\hat{c} = \mathrm{argmax}_{j\ldots k} \frac{Pr(C_j)\Pi_{i=1}^{n} Pr(f_i \mid C_j)}{\sum_{k}^{|C|} Pr(C_k)\Pi_{i=1}^{n} Pr(f_i \mid C_k)}$$

Probability Density Function

$$P(x_i \mid y) = \frac{1}{\sqrt{2\pi\sigma_y^2}} \mathrm{e}^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}^2\right)}$$

4 Implementation

Discuss your final project implementation while highlighting the decisions contributed to your design. Present your main algorithms. For some work, you may discuss libraries, tokenization methods, hyperparameter tuning, or other information that explains what you did (i.e. adopted experimental recommendations from [some paper reference]).

5 Evaluation

Provide evidence that supports or refutes your hypothesis. Experiments should be conducted and presented in this section. Provide all experimental diagnostics.

6 Conclusions

Summarize your results and discuss the significance.