

# Naive Bayes Text Classification

The following analysis is done using a public set of comments collected for spam research. It has five datasets composed of 1,956 real messages extracted from five videos. These five videos are popular pop songs that were among the 10 most viewed in the collection period.

All five datasets have the following attributes:

Attribute: Attribute Explained

COMMENT\_ID: Unique ID representing the comment

AUTHOR: Author ID

DATE: Date the comment is posted

CONTENT: The comment

TAG: Attribute Explained

## Classification Results:

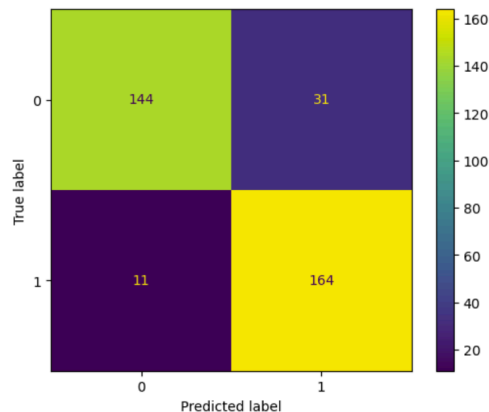
Using multinomial Naive Bayes classification, this model has an overall accuracy of 0.88.

Class 0 (Not Spam):

- Precision: 93% of the comments classified as not spam are indeed not spam.
- Recall: the model correctly identifies 82% of the actual not spam comments.
- F1-Score: 0.87, which is the harmonic mean of precision and recall, indicating a balance between precision and recall
- Support: 175, actual amount of not spam comments.

Class 1 (Spam):

- Precision: 84% of the comments classified as spam are actually spam.
- Recall: the model correctly identifies 94% of the actual spam comments.
- F1-Score: 0.89, which balances precision and recall for spam comments.
- Support: 175, actual amount of spam comments.



The model performs well, with high accuracy, precision, recall, and F1-scores for both spam and not spam classes. This method proves to be particularly accurate when identifying spam comments (94% recall) but slightly less accurate correctly identifying not spam comments (82% recall). This can be seen when analyzing the confusion matrix as it highlights the fact that there are more false positives (31) than false negatives (11). This suggests that the model is more conservative when classifying comments, which could be helpful when considering user satisfaction. Using this, spam comments can be tracked for individual users, which can inform disciplinary actions when these user's post spam beyond a designated threshold.