

COMP 6721 Report

**Spam Detector using Naïve Bayes Approach**

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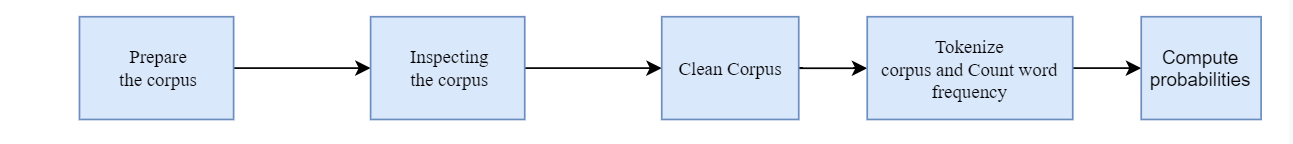
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**Analysis**

In order to calculate the accuracy, precision, recall and F1-measure for Spam & Ham Class as well as a confusion matrix, series of steps performed to generate classification result such as Common Aspect of Text Mining and Naïve Bayes Classifier Approach.

1. Common Aspect of Text Mining:



1. Naïve Bayes Classifier Approach:

Step 1: Build the Vocabulary of words by separating Spam and Ham from training Data.

Step 2: Store Vocabulary of words in a file.

Step 3: Train Classifier on Vocabulary.

Step 4: Evaluate Performance on Test data.

Step 5: Display Confusion and Evaluation Matrix

**Confusion Matrix:**

We considered SPAM as a positive class and HAM as the negative class,

|  |  |  |
| --- | --- | --- |
|  | SPAM (Predicted) | HAM (Predicted) |
| SPAM (Actual) | 336 | 64 |
| HAM (Actual) | 6 | 394 |

**Evaluation Matrix:**

|  |  |
| --- | --- |
| Accuracy | 91.25 |
| Precision | 98.24 |
| Recall | 84 |
| F1 | 90.566 |

* **Accuracy**:
* **Precision**:
* **Recall**:
* **F1-Score**:

In our model, there is high probability of getting mail in SPAM class due to very high precision. It was also found that in our model, around 16 % of a mail is predicted as HAM class instead of SPAM due to lower recall.

**References**

[1] <https://www3.nd.edu/~steve/computing_with_data/20_text_mining/text_mining_example.html#/>

[2] <https://towardsdatascience.com/spam-filtering-using-naive-bayes-98a341224038>

[3] <https://medium.com/coinmonks/spam-detector-using-naive-bayes-c22cc740e257>

[4] https://en.wikipedia.org/wiki/Naive\_Bayes\_spam\_filtering