AI Final Project  
 COMP 237  
  
Professor: Mehrdad Tirandazian

**Team members:**

**Miguel Chadid**  
**Matias Franco**

**Mattia Carganico**

**Kevin Chakkiath**

**Yohannes Fetle**

**Sergei Goncharov**

**Amir Mehrbod Panjnoush**

**Text Classifier for YouTube Comments Youtube04-Eminem**

**Project Goal:** The goal of the project is to create a text classifier using the Naive Bayes classifier and the Bag of Words language model. The objective is to classify YouTube comments as spam or non-spam using data sourced from the UCI Machine Learning Repository, specifically the "Youtube04-Eminem.csv" file.

**Data Overview:**

* **Source:** UCI Machine Learning Repository
* **Data File:** Youtube04-Eminem.csv
* **Columns:** COMMENT\_ID, AUTHOR, DATE, CONTENT, CLASS
* **Missing Values:** 'Date' column has 245 missing values
* **Number of Rows:** 448

**Data Preprocessing:**

* Tokenization and removal of stop words using NLTK.
* Columns COMMENT\_ID, AUTHOR, and DATE were dropped.
* All text converted to lowercase.
* Vectorization using TF-IDF from sklearn.

**Training:**

* Naive Bayes classifier used for its probabilistic classification capabilities based on Bayes' Theorem.
* Training and testing data split: 75% training, 25% testing.
* Cross-validation mean accuracy: 83.92%.

**Model Evaluation:**

* **Confusion Matrix:**
* [[37, 11],  
   [2, 62]]
* **Accuracy:** 88.39%
* The model can identify most spam comments with a few exceptions.

**Conclusion:**

* Successfully built a text classifier using the Bag of Words model and Naive Bayes.
* The model demonstrates promising performance based on accuracy and spam detection.
* Further optimization and maintenance can contribute to creating a safer online environment.

**Future Potential:**

* With continuous optimization and updates, the model has the potential to enhance online content filtering and contribute to a more enjoyable user experience.

This project demonstrates the successful application of a Naive Bayes classifier for YouTube comment classification, paving the way for further advancements in content moderation and online safety.