Email Spam Detection Case Study

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1. Problem Statement

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What is an Email Spam?

Spam emails are **unsolicited** email messages that are sent by **people you don’t know**. They are almost always **commercial** and driven by a **financial motive**.

It may includes:

- Promotional emails that you did not ask for
- Counterfeit messages that attempt to trick you into giving out personal information
- Fraudulent messages from hacked email accounts

Did You Know?

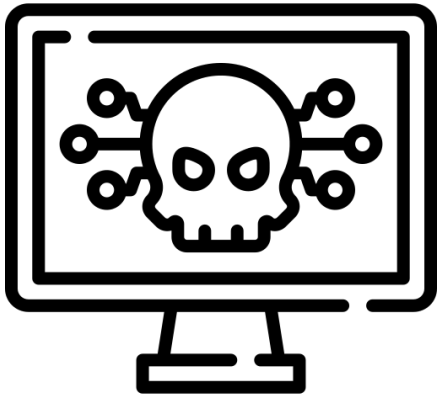
May 2019

Spam emails constituted almost **85%** of total emails sent globally

Why is Spam a Problem?

Waste of Time

Means for Malwares



Exploit Data Privacy

Why Do We Need Email Spam Detection?

Shielded From Attacks

- Prevent SPAM from getting into the inbox → spam filtering
- Effective anti-malware tools
- Reduce the risk of users clicking on things they shouldn't

Better Quality of Life

- Run smoother
- Used for desired purpose only
- Save time

2. About the Dataset

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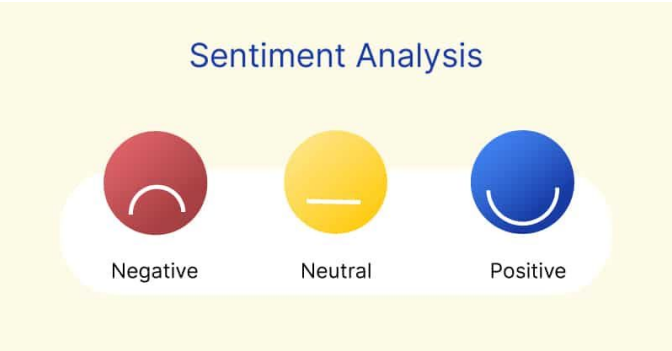
Dataset of Email Spam

- Contain the information of 5728 mails
- Dataset is categorical → Classification
- Two columns:
  - Text: context of mail
  - Spam:
    - 0 → NOT SPAM
    - 1 → SPAM

3. Algorithm Comparisons

Naive Bayes

- **Supervised learning** which based on **Bayes Theorem** and used for **classification** problems
- Mainly used in **text classification** that include **high-dimensional** dataset
- One of the **simple** and **most effective** classification algorithms
- Some popular examples are: spam filtration, sentimental analysis, and classifying articles



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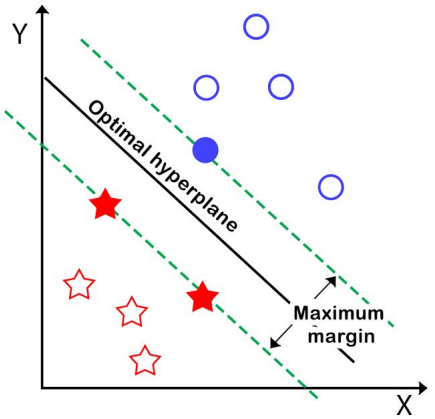
Support Vector Machine

- **Supervised learning** aim to create the **best line** or **decision boundary** that can **segregate** the data into classes
- Used for both **classification** and **regression** problems
- Suited for **linear** and **non-linear** dataset
- **Faster** prediction along with **better accuracy** compared to other classification algorithms



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Comparisons

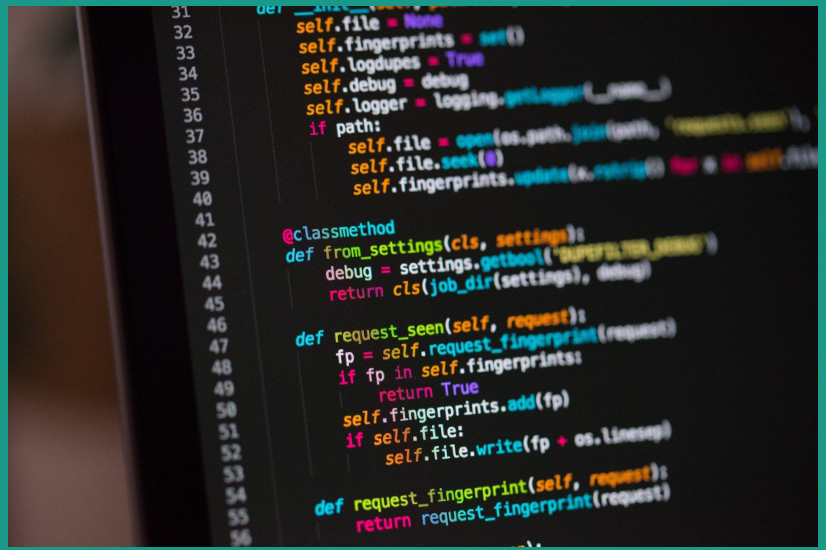
Naive Bayes

- Supervised learning
- Linear classifier
- Classification
- Fast & easy algorithm to predict a class of dataset
- Perform well in multi-classes classification

SVM

- Supervised learning
- Linear & non-linear classifier
- Classification & regression
- Effective in high dimensional spaces
- Doesn't support multi-classes classification
- Faster prediction with high accuracy

4. Code Demonstration



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