Innovation
Phase 2 Project

Modules and Explanation

The Application consists of three modules.
i. UI
ii. Machine Learning
iii. Data Processing
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I. UI Module

a. This Module contains all the functions related to UI(user interface).
b. The user interface of this application is designed using Streamlit library from python based packages.
c. The user inputs are acquired using the functions of this library and forwarded to data processing module for processing and conversion.
d. Finally the output from ML module is sent to this module and from this module to user in visual form.

II. Machine Learning Module

a. This module is the main module of all three modules.
b. This modules performs everything related to machine learning and results analysis.
c. Some main functions of this module are
i. Training machine learning models.
ii. Testing the model
iii. Determining the respective parameter values for each model.
iv. Key-word extraction.
v. Final output calculation
d. The output from this module is forwarded to UI for providing visual response to user

III. Data Processing Module

a. The raw data undergoes several modifications in this module for further process.
b. Some of the main functions of this module includes
i. Data cleaning
ii. Data merging of datasets
iii. Text Processing using NLP
iv. Conversion of text data into numerical data(feature vectors).
v. Splitting of data.
c. All the data processing is done using Pandas and NumPy libraries.
d. Text processing and text conversion is done using NLT. K and scikit-learn libraries

Requirements

Hardware Requirements

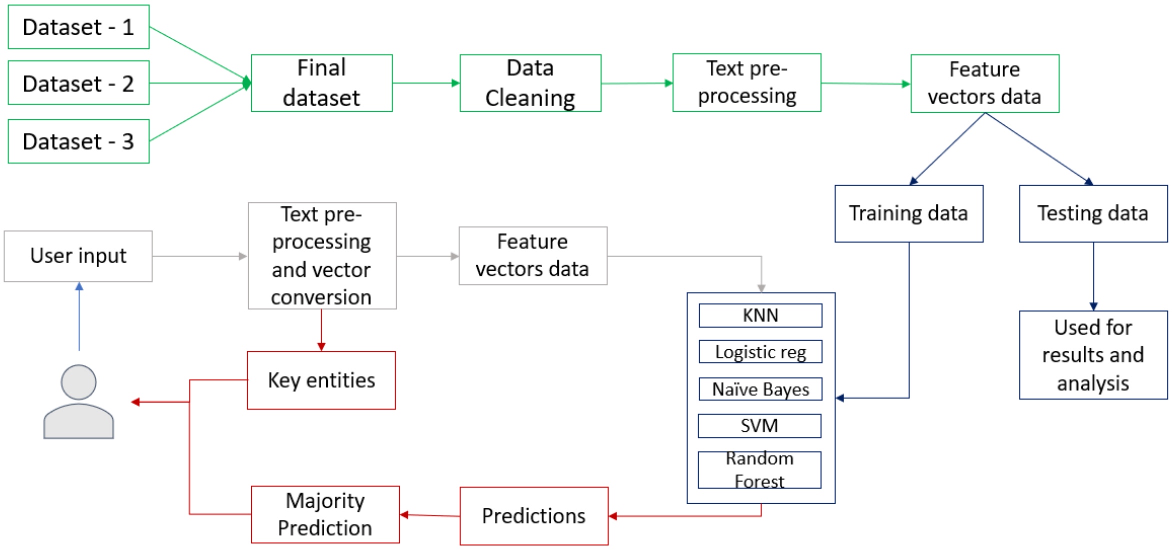
- PC/Laptop
- Ram – 8 Gig
- Storage – 100-200 Mb

Software Requirements

OS – Windows 7 and above

Code Editor – Pycharm, VS Code, Built in IDE
Anaconda environment with packages nltk, numpy, pandas, sklearn, tkinter, nltk data.
Supported browser such as chrome, firefox, opera etc..

WorkFlow



Data Collection and Description

● Data plays an important role when it comes to prediction and classification, the more the data the more the accuracy will be.
● The data used in this project is completely open-source and has been taken from various resources like Kaggle and UCI
● For the purpose of accuracy and diversity in data multiple datasets are taken. 2 datasets containing approximately over 12000 mails and their labels are used for training and testing the application.
● 6000 spam mails are taken for generalisation of data and to increase the accuracy.

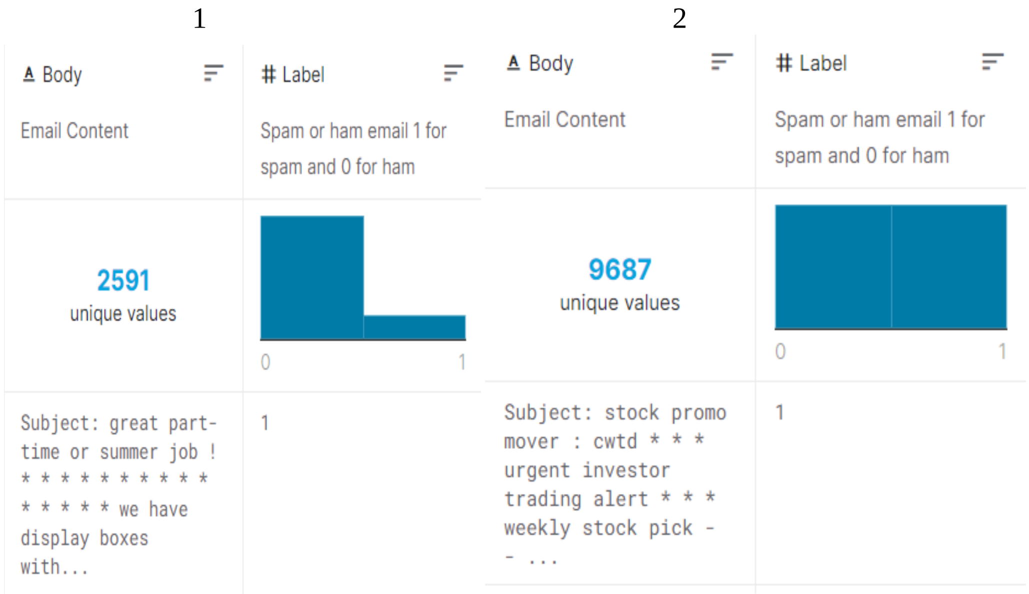
Data Description

Dataset : enronSpamSubset.
Source : Kaggle
Description : this dataset is part of a larger dataset called enron. This dataset contains a set of spam and non-spam emails with 0 for non spam and 1 for spam in label attribute.
Composition :

- Unique values : 9687
- Spam values : 5000

- Non-spam values : 4687

Dataset : **lingspam.**
Source : Kaggle
Description : This dataset is part of a larger dataset called Enron1 which contains emails classified as spam or ham(not-spam).
Composition :
Unique values : 2591
Spam values : 419
Non-spam values : 2172



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Body	Label
Email Content	Spam or ham email 1 for spam and 0 for ham
2591 unique values	0 1
Subject: great part-time or summer job ! * * * * * * * * * * * * * * * we have display boxes with...	1

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Body	Label
Email Content	Spam or ham email 1 for spam and 0 for ham
9687 unique values	0 1
Subject: stock promo mover : cwtd * * * urgent investor trading alert * * * weekly stock pick - - ...	1

Fig; lingspam