Building a Smarter AI-Powered Spam Classifier

1.Abstract

Nowadays communication plays a major role in everything be it professional or personal. Email communication service is being used extensively because of its free use services, low-cost operations, accessibility, and popularity. Emails have one major security flaw that is anyone can send an email to anyone just by getting their unique user id. This security flaw is being exploited by some businesses and ill-motivated persons for advertising, phishing, malicious purposes, and finally fraud. This produces a kind of email category called SPAM.

Spam refers to any email that contains an advertisement, unrelated and frequent emails. These emails are increasing day by day in numbers. Studies show that around 55 percent of all emails are some kind of spam. A lot of effort is being put into this by service providers. Spam is evolving by changing the obvious markers of detection. Moreover, the spam detection of service providers can never be aggressive with classification because it may cause potential information loss to incase of a misclassification.

To tackle this problem we present a new and efficient method to detect spam using machine learning and natural language processing. A tool that can detect and classify spam. In addition to that, it also provides information regarding the text provided in a quick view format for user convenience.

2.Introduction

Today, Spam has become a major problem in communication over internet. It has been accounted that around 55% of all emails are reported as spam and the number

has been growing steadily. Spam which is also known as unsolicited bulk email has led to the increasing use of email as email provides the perfect ways to send the unwanted advertisement or junk newsgroup posting at no cost for the sender. This chances has been extensively exploited by irresponsible organizations and resulting to clutter the mail boxes of millions of people all around the world.

Spam has been a major concern given the offensive content of messages, spam is a waste of time. End user is at risk of deleting legitimate mail by mistake. Moreover, spam also impacted the economical which led some countries to adopt legislation.

Text classification is used to determine the path of incoming mail/message either into inbox or straight to spam folder. It is the process of assigning categories to text according to its content. It is used to organized, structures and categorize text. It can be done either manually or automatically. Machine learning automatically classifies the text in a much faster way than manual technique. Machine learning uses pre-labelled text to learn the different associations between pieces of text and it output. It used feature extraction to transform each text to numerical representation in form of vector which represents the frequency of word in predefined dictionary.

Text classification is important to structure the unstructured and messy nature of text such as documents and spam messages in a cost-effective way. Machine learning can make more accurate precisions in real-time and help to improve the manual slow process to much better and faster analysing big data. It is important especially to a company to analyse text data, help inform business decisions and even automate business processes.

In this project, machine learning techniques are used to detect the spam message of a mail. Machine learning is where computers can learn to do something without the need to explicitly program them for the task.

It uses data and produce a program to perform a task such as classification. Compared to knowledge engineering, machine learning techniques require messages that have been successfully pre-classified. The pre-classified messages make the

training dataset which will be used to fit the learning algorithm to the model in machine learning studio.

A combination of algorithms are used to learn the classification rules from messages. These algorithms are used for classification of objects of different classes. These algorithms are provided with pre labelled data and an unknown text. After learning from the prelabelled data each of these algorithms predict which class the unknown text may belong to and the category predicted by majority is considered as final.

3. Objectives and Scope

Problem Statement

Spammers are in continuous war with Email service providers. Email service providers implement various spam filtering methods to retain their users, and spammers are continuously changing patterns, using various embedding tricks to get through filtering. These filters can never be too aggressive because a slight misclassification may lead to important information loss for consumer. A rigid filtering method with additional reinforcements is needed to tackle this problem.

Objectives

The objectives of this project are

i. To create a ensemble algorithm for classification of spam with highest possible accuracy.

ii. To study on how to use machine learning for spam detection.

iii. To study how natural language processing techniques can be implemented in spam detection. iv. To provide user with insights of the given text leveraging the created algorithm and NLP.

Project Scope

This project needs a coordinated scope of work.

i. Combine existing machine learning algorithms to form a better ensemble algorithm.

ii. Clean, processing and make use of the dataset for training and testing the model created.

iii. Analyse the texts and extract entities for presentation.

Limitations

This Project has certain limitations.

i. This can only predict and classify spam but not block it.

ii. Analysis can be tricky for some alphanumeric messages and it may struggle with entity detection.

iii. Since the data is reasonably large it may take a few seconds to classify and anlayse the message.

4.Experimentation and Methods

Introduction

This chapter will explain the specific details on the methodology being used to develop this project. Methodology is an important role as a guide for this project to make sure it is in the right path and working as well as plan. There is different type of methodology used in order to do spam detection and filtering. So, it is important to choose the right and suitable methodology thus it is necessary to understand the application functionality itself.

System Architecture

The application overview has been presented below and it gives a basic structure of the application.

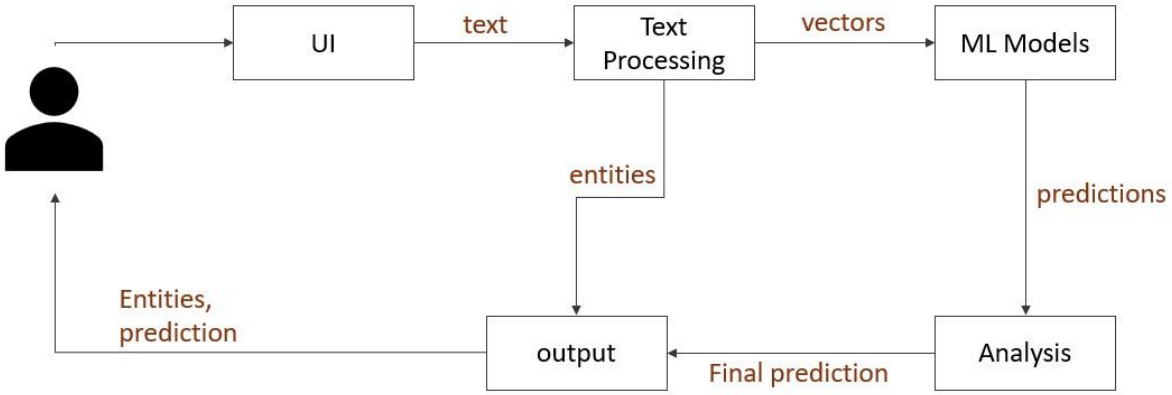


fig no. Architecture

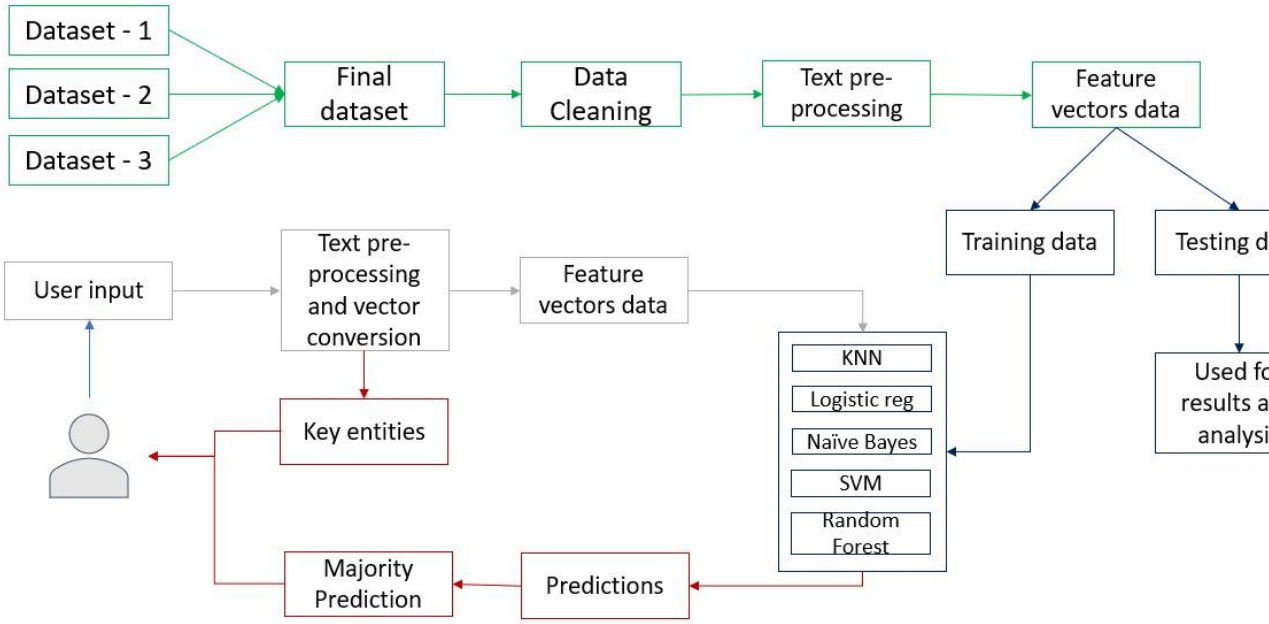
The UI, Text processing and ML Models are the three important modules of this project.

Each Module's explanation has been given in the later sections of this chapter.

A more complicated and detailed view of architecture is presented in the workflow section.

WorkFlow

fig no. Workflow



In the above architecture, the objects depicted in Green belong to a module called Data Processing. It includes several functions related to data processing, natural Language Processing. The objects depicted in Blue belong to the Machine Learning module. It is where everything related to ML is embedded. The red objects represent final results and outputs.

5.Results and Discussion

Language Model Selection

While selecting the best language model the data has been converted into both types of vectors and then the models been tested for to determine the best model for classifying spam.

The results from individual models are presented in the experimentation section under methodology. Now comparing the results from the models.

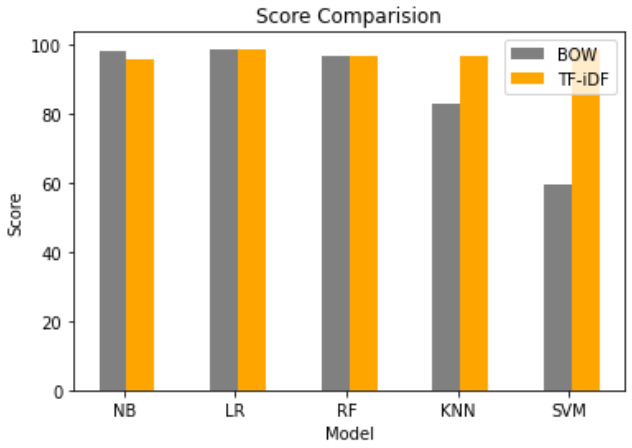


fig no. Bow vs TF-IDF (Cumulative)

From the figure it is clear that TF-IDF proves to be better than BoW in every model tested. Hence TF-IDF has been selected as the primary language model for textual data conversion in feature vector formation.

Proposed Model results

To determine which model is effective we used three metrics Accuracy, Precision, and F1score.

The resulted values for the proposed model are

Accuracy – 99.0

Precision – 98.5

F1 Score – 98.6

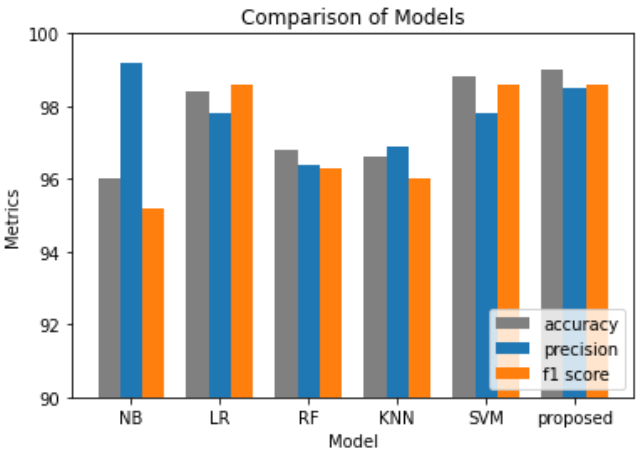
Comparison

The results from the proposed model has been compared with all the models individually in tabular form to illustrate the differences clearly.

Metric / Model	Accuracy	Precision	F1 Score
Naïve Bayes	96.0	99.2	95.2
Logistic Regression	98.4	97.8	98.6
Random forest	96.8	96.4	96.3
KNN	96.6	96.9	96.0
SVM	98.8	97.8	98.6
Proposed model	**99.0**	**98.5**	**98.6**

Table no.Models and results

The color REDindicates that the value is lower thanthe proposed model and GREENindicates equal or higher.



Here we can observe that our proposed model outperforms almost every other model in every metric.

Only one model(naïve Bayes) has slightly higher accuracy than our model but it is considerably lagging in other metrics.

The results are visually presented below for easier understanding and comparison.

fig no. Comparision of Models

From the above comparison barchart we can clearly see that all models individually are not as efficient as the proposed method.

Summary

There are two main tasks in the project implementation. Language model selection for completing the textual processing phase and proposed model creation using the individual algorithms. These two tasks require comparison from other models and select of various parameters for better efficiency.

During the language model selection phase two models, Bag of Words and TF-IDF are compared to select the best model and from the results obtained it is evident that TF-IDF performs better.

During the proposed model design various algorithms are tested with different parameters to get best parameters. Models are merged to form a ensemble algorithm and the results obtained are presented and compared above. It is clear from the results that the proposed model outperforms others in almost every metric derived.

6.Conclusion and Future Scope

Conclusion

From the results obtained we can conclude that an ensemble machine learning model is more effective in detection and classification of spam than any individual algorithms. We can also conclude that TF-IDF (term frequency inverse document frequency) language model is more effective than Bag of words model in classification of spam when combined with several algorithms. And finally we can say that spam detection can get better if machine learning algorithms are combined and tuned to needs.

Future work

There are numerous appilcations to machine learning and natural language processing and when combined they can solve some of the most troubling problems concerned with texts. This application can be scaled to intake text in bulk so that classification can be done more affectively in some public sites.

Other contexts such as negative, phishing, malicious, etc,. can be used to train the model to filter things such as public comments in various social sites. This application can be converted to online type of machine learning system and can be easily updated with latest trends of spam and other mails so that the system can adapt to new types of spam emails and texts.

Appendices A.Source code

1. Module – Data Processing

```
import re
from nltk.tokenize import sent_tokenize,word_tokenize
from nltk import pos_tag from nltk.corpus import
wordnet as wn from nltk.corpus import stopwords from
nltk.stem.wordnet import WordNetLemmatizer from
collections import defaultdict import spacy

tag_map = defaultdict(lambda : wn.NOUN)
tag_map['J'] = wn.ADJ tag_map['V'] =
wn.VERB tag_map['R'] = wn.ADV
lemmatizer=WordNetLemmatizer()
stop_words=set(stopwords.words('english'))
nlp=spacy.load('en_core_web_sm')

def process_sentence(sentence):
    nouns = list() base_words = list()
    final_words = list() words_2 =
    word_tokenize(sentence) sentence =
    re.sub(r'[^ \w\s]', '', sentence) sentence =
    re.sub(r'_', ' ', sentence) words =
    word_tokenize(sentence) pos_tagged_words =
    pos_tag(words) for token, tag in
    pos_tagged_words:

base_words.append(lemmatizer.lemmatize(token,tag_map[tag[0]])) for
    word in base_words:
        if word not in stop_words:
            final_words.append(word)
    sym = ' '
    sent = sym.join(final_words)
    pos_tagged_sent = pos_tag(words_2)
    for token, tag in pos_tagged_sent:
        if tag == 'NN' and len(token)>1:
            nouns.append(token)
    return sent, nouns

def clean(email):
    email = email.lower() sentences
    = sent_tokenize(email)
    total_nouns = list() string = ""
    for sent in sentences:
```

```
        sentence, nouns = process_sentence(sent)
        string += " " + sentence
        total_nouns += nouns
    return string, nouns


def ents(text): doc
    = nlp(text)
    expls = dict()
    if doc.ents:
        for ent in doc.ents: labels =
            list(expls.keys()) label =
            ent.label_ word = ent.text
            if label in labels: words =
            expls[label]
            words.append(word)
            expls[label] = words
            else: expls[label] =
                [word]
        return expls
    else:
        return 'no'
```

2. Module – Machine Learning

```
from sklearn.feature_extraction.text import
CountVectorizer,TfidfVectorizer
import numpy as np
from sklearn.model_selection import train_test_split
from sklearn.naive_bayes import MultinomialNB from
sklearn.svm import SVC
from sklearn.linear_model import LogisticRegression
from sklearn.neighbors import KNeighborsClassifier from
sklearn.ensemble import RandomForestClassifier import
pandas as pd

class model:
    def __init__(self):
        self.df = pd.read_csv('Cleaned_Data.csv')
        self.df['Email'] = self.df.Email.apply(lambda email:
np.str_(email)) self.Data = self.df.Email
        self.Labels = self.df.Label
        self.training_data, self.testing_data,
self.training_labels, self.testing_labels =
train_test_split(self.Data,self.Labels,random_state=10)
self.training_data_list = self.training_data.to_list()
self.vectorizer = TfidfVectorizer() self.training_vectors =
self.vectorizer.fit_transform(self.training_data_list)
        self.model_nb = MultinomialNB() self.model_svm
        = SVC(probability=True) self.model_lr =
        LogisticRegression()
```

```
        self.model_knn = KNeighborsClassifier(n_neighbors=9)
        self.model_rf = RandomForestClassifier(n_estimators=19)
        self.model_nb.fit(self.training_vectors,
self.training_labels) self.model_lr.fit(self.training_vectors,
self.training_labels) self.model_rf.fit(self.training_vectors,
self.training_labels) self.model_knn.fit(self.training_vectors,
self.training_labels) self.model_svm.fit(self.training_vectors,
self.training_labels) def
    get_prediction(self,vector):
        pred_nb=self.model_nb.predict(vector)[0]
        pred_lr=self.model_lr.predict(vector)[0]
        pred_rf=self.model_rf.predict(vector)[0]
        pred_svm=self.model_svm.predict(vector)[0]
        pred_knn=self.model_knn.predict(vector)[0]
        preds=[pred_nb,pred_lr,pred_rf,pred_svm,pred_knn]
        spam_counts=preds.count(1) if spam_counts>=3:
        return 'Spam' return 'Non-Spam'
    def get_probabilities(self,vector):
        prob_nb=self.model_nb.predict_proba(vector)[0]*100
        prob_lr = self.model_lr.predict_proba(vector)[0] * 100
        prob_rf = self.model_rf.predict_proba(vector)[0] * 100
        prob_knn = self.model_knn.predict_proba(vector)[0] * 100
        prob_svm = self.model_svm.predict_proba(vector)[0] * 100
        return [prob_nb,prob_lr,prob_rf,prob_knn,prob_svm]

    def get_vector(self,text):
        return self.vectorizer.transform([text])
```

3. Module – User interface

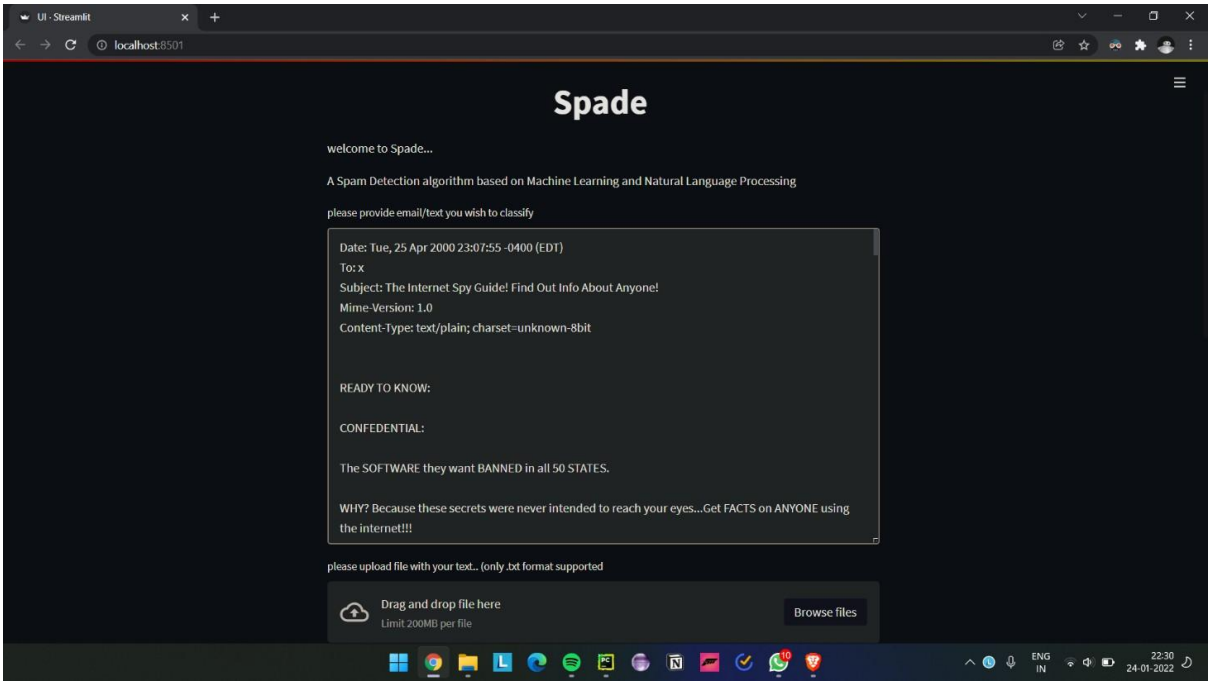
```
import time from ML
import model import
streamlit as st from
DP import *
import matplotlib.pyplot as plt
```

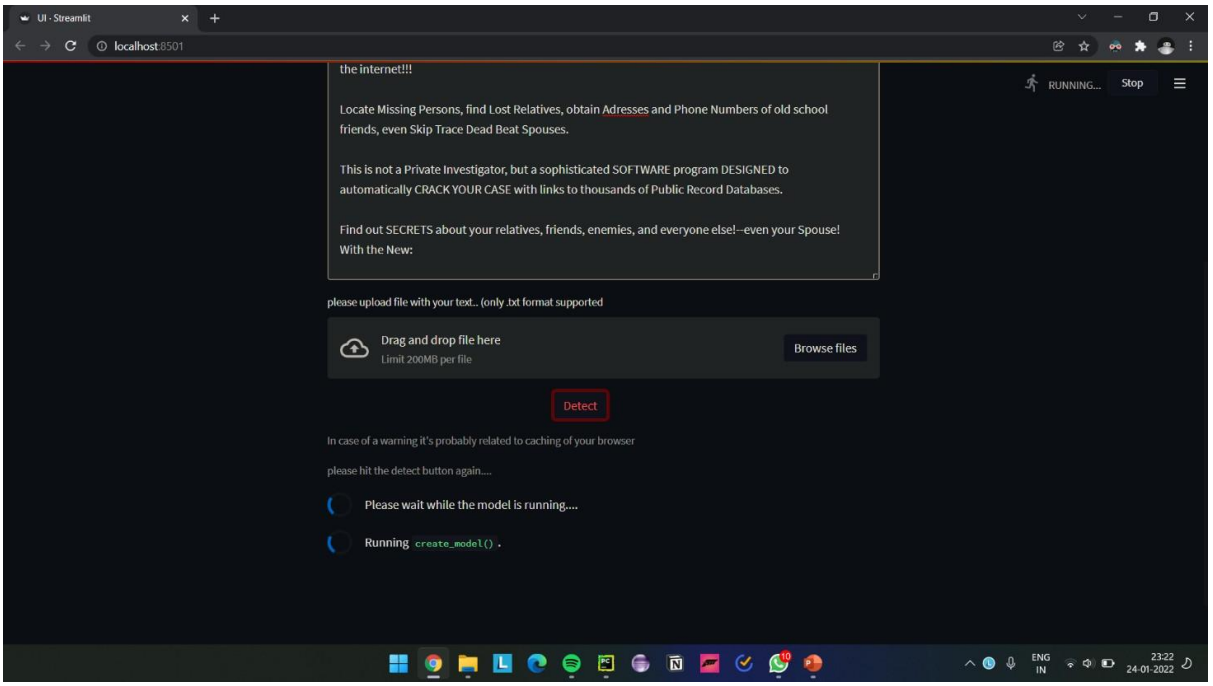
```
import seaborn as sns
inputs=[0,1] @st.cache() def
create_model(): mode=model()
return mode
col1,col2,col3,col4,col5=st.columns(5) with
col3:
    st.title("Spade")
st.write('welcome to Spade...')
st.write('A Spam Detection algorithm based on Machine Learning
and Natural Language Processing')
text=st.text_area('please provide email/text you wish to
classify',height=400,placeholder='type/paste more than 50
characters here')
file=st.file_uploader("please upload file with your text.. (only
.txt format supported")

if len(text)>20:
    inputs[0]=1
if file is None:
    inputs[1]=0
if inputs.count(1)>1:
    st.error('multiple inputs given please select only one
option')
else:
    if inputs[0]==1:
        e=text
        given_email = e
    if inputs[1]==1:
        bytes_data = file.getvalue()

        given_email = bytes_data
predictions=[] probs=[]
col1,col2,col3,col4,col5=st.columns(5)
with col3:
    clean_button = st.button('Detect')
st.caption("In case of a warning it's probably related to caching
of your browser")
st.caption("please hit the detect button again....")

if clean_button:
    if inputs.count(0)>1:
        st.error('No input given please try after giving the
input') else: with st.spinner('Please wait while the
    model is
running....'): mode =
            create_model()
        given_email,n=clean(given_email) vector =
        mode.get_vector(given_email)
        predictions.append(mode.get_prediction(vector))
        probs.append(mode.get_probabilities(vector))
        col1, col2, col3 = st.columns(3) with col2:
```

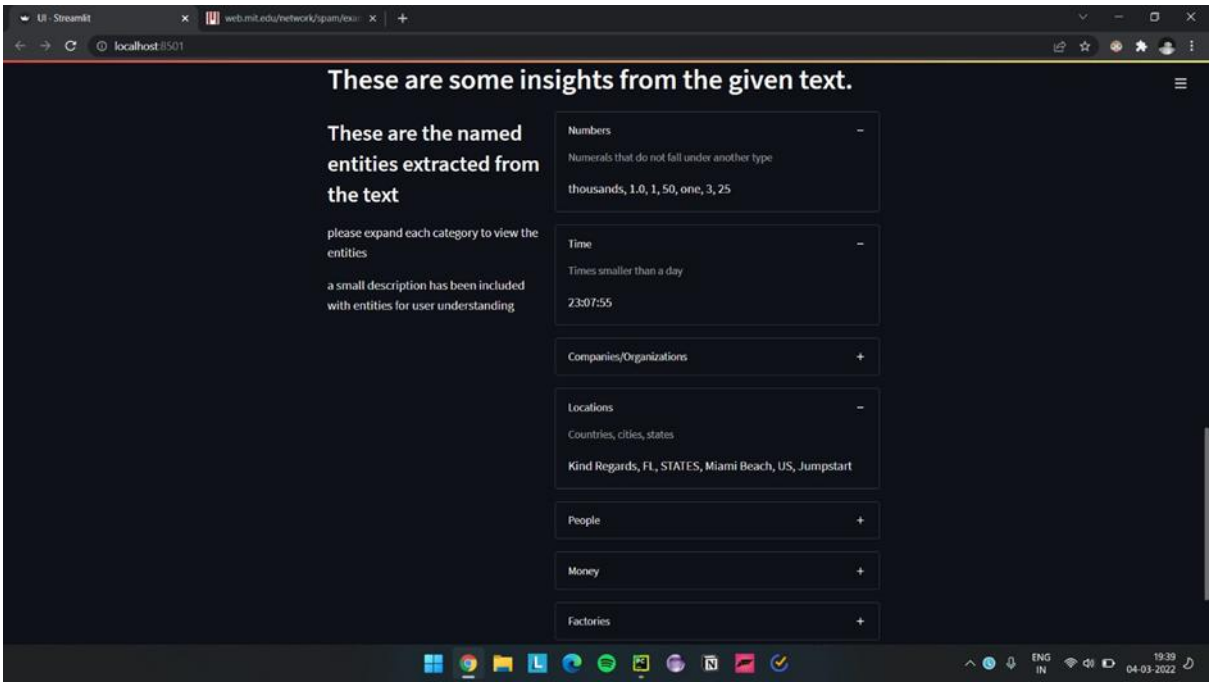
```
            st.header(f"{predictions[0]}")
        probs_pos = [i[1] for i in probs[0]]
        probs_neg = [i[0] for i in probs[0]]
        if predictions[0] == 'Spam':
            # st.caption(str(probs_pos))
            plot_values = probs_pos
        else:
            # st.caption(str(probs_neg))
            plot_values = probs_neg
        plot_values=[int(i) for i in plot_values]
        st.header(f'These are the results obtained from the
models') col1, col2 = st.columns([2,
        3]) with col1:
            st.subheader('predicted Accuracies of models')
            with st.expander('Technical Details'):
                st.write('Model-1 : Naive Bayes')
                st.write('Model-2 : Random Forest')
                st.write('Model-3 : Logistic Regression')
                st.write('Model-4 : K-Nearest Neighbors')
                st.write('Model-5 : Support Vector Machines')
        with col2:
            st.write('Model-1', plot_values[0])
            bar1 = st.progress(0) for i in
            range(plot_values[0]):
                time.sleep(0.01)
                bar1.progress(i)
            st.write('Model-2', plot_values[1])
            bar2 = st.progress(0) for i in
            range(plot_values[1]):
                time.sleep(0.01)
                bar2.progress(i)
            st.write('Model-3', plot_values[2])
            bar3 = st.progress(0) for i in
            range(plot_values[2]):
                time.sleep(0.01)
                bar3.progress(i)
            st.write('Model-4', plot_values[3])
            bar4 = st.progress(0) for i in
            range(plot_values[3]):
                time.sleep(0.01)
                bar4.progress(i)
            st.write('Model-5', plot_values[4])
            bar5 = st.progress(0) for i in
            range(plot_values[4]):
                time.sleep(0.01)
                bar5.progress(i)
         st.header('These are some insights from the given
text.') entities=ents(text)
        col1,col2=st.columns([2,3])
        with col1:
            st.subheader('These are the named entities extracted
from the text') st.write('please expand each category to view
            the
```

```
entities') st.write('a small description has been included with
entities for user understanding')
        with col2:
            if entities=='no':
                st.subheader('No Named Entities found.')
            else:
                renames = {'CARDINAL': 'Numbers', 'TIME':
'Time', 'ORG': 'Companies/Organizations', 'GPE': 'Locations',
                           'PERSON': 'People', 'MONEY': 'Money',
'FAC': 'Factories'} for i in
                renames.keys():
                    with st.expander(renames[i]):
                        st.caption(spacy.explain(i))
                        values = list(set(entities[i]))
                        strin = ',  '.join(values)
                        st.write(strin)
```

B. Screenshots




UI - Streamlit
localhost:8501
the internet!!!!
Locate Missing Persons, find Lost Relatives, obtain Adresses and Phone Numbers of old school friends, even Skip Trace Dead Beat Spouses.
This is not a Private Investigator, but a sophisticated SOFTWARE program DESIGNED to automatically CRACK YOUR CASE with links to thousands of Public Record Databases.
Find out SECRETS about your relatives, friends, enemies, and everyone else!--even your Spouse! With the New:
RUNNING...
Stop
please upload file with your text.. (only .txt format supported
Drag and drop file here
Limit 200MB per file
Browse files
Detect
In case of a warning it's probably related to caching of your browser
please hit the detect button again....
Please wait while the model is running....
Running create_model()
ENG
IN
23:22
24-01-2022


UI - Streamlit
web.mit.edu/network/spam/exa
localhost:8501
These are some insights from the given text.
These are the named entities extracted from the text
please expand each category to view the entities
a small description has been included with entities for user understanding
Numbers
Numerals that do not fall under another type
thousands, 1.0, 1, 50, one, 3, 25
Time
Times smaller than a day
23:07:55
Companies/Organizations
Locations
Countries, cities, states
Kind Regards, FL, STATES, Miami Beach, US, Jumpstart
People
Money
Factories
ENG
IN
19:39
04-03-2022

	v1	v2
2	ham	Go until jurong point, crazy.. Available only in bugis n great world la e buffet... Cine there got amore wat...
3	ham	Ok lar... Joking wif u oni...
4	spam	Free entry in 2 a wkly comp to win FA Cup final tkts 21st May 2005. Text FA to 87121 to receive entry question(std txt rate)T&C's apply 08452810075over18's
5	ham	U dun say so early hor... U c already then say...
6	ham	Nah I don't think he goes to usf, he lives around here though
7	spam	FreeMsg Hey there darling it's been 3 week's now and no word back! I'd like some fun you up for it still? Tb ok! XxX std chgs to send, å£1.50 to rcv
8	ham	Even my brother is not like to speak with me. They treat me like aids patent.
9	ham	As per your request 'Melle Melle (Oru Minnaminunginte Nurungu Vettam)' has been set as your callertune for all Callers. Press *9 to copy your friends Callertune
10	spam	WINNER!! As a valued network customer you have been selected to receivea å£900 prize reward! To claim call 09061701461. Claim code KL341. Valid 12 hours only.
11	spam	Had your mobile 11 months or more? U R entitled to Update to the latest colour mobiles with camera for Free! Call The Mobile Update Co FREE on 08002986030
12	ham	I'm gonna be home soon and i don't want to talk about this stuff anymore tonight, k? I've cried enough today.
13	spam	SIX chances to win CASH! From 100 to 20,000 pounds txt> CSH11 and send to 87575. Cost 150p/day, 6days, 16+ TsandCs apply Reply HL 4 info
14	spam	URGENT! You have won a 1 week FREE membership in our å£100,000 Prize Jackpot! Txt the word: CLAIM to No: 81010 T&C www.dbuk.net LCCLTD POBOX 4403LDNW1A7RW18
15	ham	I've been searching for the right words to thank you for this breather. I promise i wont take your help for granted and will fulfil my promise. You have been wonderful and a blessing at all times.
16	ham	I HAVE A DATE ON SUNDAY WITH WILL!!
17	spam	XXXMobileMovieClub: To use your credit, click the WAP link in the next txt message or click here>> http://wap. xxxmobilemovieclub.com?n=QJKGIGHJJGCBL
18	ham	Oh k...i'm watching here:)
19	ham	Eh u remember how 2 spell his name... Yes i did. He v naughty make until i v wet.
20	ham	Fine if thatåÕs the way u feel. ThatåÕs the way its gota b
21	spam	England v Macedonia - dont miss the goals/team news. Txt ur national team to 87077 eg ENGLAND to 87077 Try:WALES, SCOTLAND 4txt/ì¼1.20 POBOXox36504W45WQ 16+
22	ham	Is that seriously how you spell his name?
23	ham	I‰Û÷m going to try for 2 months ha ha only joking
24	ham	So ì_ pay first lar... Then when is da stock comin...
25	ham	Aft i finish my lunch then i go str down lor. Ard 3 smth lor. U finish ur lunch already?
26	ham	Ffffffffff. Alright no way I can meet up with you sooner?
27	ham	Just forced myself to eat a slice. I'm really not hungry tho. This sucks. Mark is getting worried. He knows I'm sick when I turn down pizza. Lol
28	ham	Lol your always so convincing.
29	ham	Did you catch the bus ? Are you frying an egg ? Did you make a tea? Are you eating your mom's left over dinner ? Do you feel my Love ?
30	ham	I'm back & we're packing the car now, I'll let you know if there's room
31	ham	Ahhh. Work. I vaguely remember that! What does it feel like? Lol
32	ham	Wait that's still not all that clear, were you not sure about me being sarcastic or that that's why x doesn't want to live with us
33	ham	Yeah he got in at 2 and was v apologetic. n had fallen out and she was actin like spoilt child and he got caught up in that. Till 2! But we won't go there! Not doing too badly cheers. You?
34	ham	K tell me anything about you.
35	ham	For fear of fainting with the of all that housework you just did? Quick have a cuppa
36	spam	Thanks for your subscription to Ringtone UK your mobile will be charged å£5/month Please confirm by replying YES or NO. If you reply NO you will not be charged
37	ham	Yup... Ok i go home look at the timings then i msg ì_ again... Xuhui going to learn on 2nd may too but her lesson is at 8am
38	ham	Oops, I'll let you know when my roommate's done
39	ham	I see the letter B on my car
40	ham	Anything lor... U decide...
41	ham	Hello! How's you and how did saturday go? I was just texting to see if you'd decided to do anything tomo. Not that i'm trying to invite myself or anything!
42	ham	Pls go ahead with watts. I just wanted to be sure. Do have a great weekend. Abiola
43	ham	Did I forget to tell you ? I want you , I need you, I crave you ... But most of all ... I love you my sweet Arabian steed ... Mmmmmm ... Yummy
44	spam	07732584351 - Rodger Burns - MSG = We tried to call you re your reply to our sms for a free nokia mobile + free camcorder. Please call now 08000930705 for delivery tomorrow
45	ham	WHO ARE YOU SEEING?
46	ham	Great! I hope you like your man well endowed. I am <#> inches...
47	ham	No calls..messages..missed calls
48	ham	Didn't you get hep b immunisation in nigeria.
49	ham	Fair enough, anything going on?
50	ham	Yeah hopefully, if tyler can't do it I could maybe ask around a bit
51	ham	U don't know how stubborn I am. I didn't even want to go to the hospital. I kept telling Mark I'm not a weak sucker. Hospitals are for weak suckers.
52	ham	What you thinked about me. First time you saw me in class.
53	ham	A gram usually runs like <#> , a half eighth is smarter though and gets you almost a whole second gram for <#>
54	ham	K fyi x has a ride early tomorrow morning but he's crashing at our place tonight
55	ham	Wow. I never realized that you were so embarassed by your accomodations. I thought you liked it, since i was doing the best i could and you always seemed so happy about \the cave\". I'm sorry I didn't and don't h
56	spam	SMS. ac Sptv: The New Jersey Devils and the Detroit Red Wings play Ice Hockey. Correct or Incorrect? End? Reply END SPTV
57	ham	Do you know what Mallika Sherawat did yesterday? Find out now @ <URL>
58	spam	Congrats! 1 year special cinema pass for 2 is yours. call 09061209465 now! C Suprman V, Matrix3, StarWars3, etc all 4 FREE! bx420-ip4-5we. 150pm. Dont miss out!
59	ham	Sorry, I'll call later in meeting.
60	ham	Tell where you reached
61	ham	Yes..gauti and sehwag out of odi series.
62	ham	Your gonna have to pick up a $1 burger for yourself on your way home. I can't even move. Pain is killing me.
63	ham	Ha ha ha good joke. Girls are situation seekers.
64	ham	Its a part of checking IQ
65	ham	Sorry my roommates took forever, it ok if I come by now?
66	ham	Ok lar i double check wif da hair dresser already he said wun cut v short. He said will cut until i look nice.
67	spam	As a valued customer, I am pleased to advise you that following recent review of your Mob No. you are awarded with a å£1500 Bonus Prize, call 09066364589
68	ham	Today is \song dedicated day..\" Which song will u dedicate for me? Send this to all ur valuable frnds but first rply me..."
69	spam	Urgent UR awarded a complimentary trip to EuroDisinc Trav, Aco&Entry41 Or å£1000. To claim txt DIS to 87121 18+6*å£1.50(moreFrmMob. ShrAcomOrSglSuplt)10, LS1 3AJ
70	spam	Did you hear about the new \Divorce Barbie\"? It comes with all of Ken's stuff!"
71	ham	I plane to give on this month end.
72	ham	Wah lucky man... Then can save money... Hee...
73	ham	Finished class where are you.
74	ham	HI BABE IM AT HOME NOW WANNA DO SOMETHING? XX
75	ham	K..k:)where are you?how did you performed?
76	ham	U can call me now...
77	ham	I am waiting machan. Call me once you free.
78	ham	Thats cool. i am a gentleman and will treat you with dignity and respect.
79	ham	I like you peoples very much:) but am very shy pa.
80	ham	Does not operate after <#> or what
81	ham	Its not the same here. Still looking for a job. How much do Ta's earn there.
82	ham	Sorry, I'll call later
83	ham	K. Did you call me just now ah?
84	ham	Ok i am on the way to home hi hi
85	ham	You will be in the place of that man
86	ham	Yup next stop.
87	ham	I call you later, don't have network. If urgnt, sms me.
88	ham	For real when u getting on yo? I only need 2 more tickets and one more jacket and I'm done. I already used all my multis.
89	ham	Yes I started to send requests to make it but pain came back so I'm back in bed. Double coins at the factory too. I gotta cash in all my nitros.
90	ham	I'm really not up to it still tonight babe
91	ham	Ela kano.,il download, come wen ur free..
92	ham	Yeah do! Don‰Û÷t stand to close tho- you‰Û÷ll catch something!
93	ham	Sorry to be a pain. Is it ok if we meet another night? I spent late afternoon in casualty and that means i haven't done any of y stuff42moro and that includes all my time sheets and that. Sorry.
94	ham	Smile in Pleasure Smile in Pain Smile when trouble pours like Rain Smile when sum1 Hurts U Smile becoz SOMEONE still Loves to see u Smiling!!
95	spam	Please call our customer service representative on 0800 169 6031 between 10am-9pm as you have WON a guaranteed å£1000 cash or å£5000 prize!
96	ham	Havent planning to buy later. I check already lido only got 530 show in e afternoon. U finish work already?
97	spam	Your free PO Box 5 MK17 92H. 450Ppw 16"
98	ham	Watching telugu movie..wat abt u?
99	ham	i see. When we finish we have loads of loans to pay
100	ham	Hi. Wk been ok - on hols now! Yes on for a bit of a run. Forgot that i have hairdressers appointment at four so need to get home n shower beforehand. Does that cause prob for u?\"ham"
101	ham	Please don't text me anymore. I have nothing else to say.
102	ham	Okay name ur price as long as its legal! Wen can I pick them up? Y u ave x ams xx
103	ham	I'm still looking for a car to buy. And have not gone 4the driving test yet.
104	ham	As per your request 'Melle Melle (Oru Minnaminunginte Nurungu Vettam)' has been set as your callertune for all Callers. Press *9 to copy your friends Callertune
105	ham	wow. You're right! I didn't mean to do that. I guess once i gave up on boston men and changed my search location to nyc, something changed. Cuz on my signin page it still says boston.
106	ham	Umma my life and vava umma love you lot dear
107	ham	Thanks a lot for your wishes on my birthday. Thanks you for making my birthday truly memorable.
108	ham	Aight, I'll hit you up when I get some cash
109	ham	How would my ip address test that considering my computer isn't a minecraft server
110	ham	I know! Grumpy old people. My mom was like you better not be lying. Then again I am always the one to play jokes...
111	ham	Dont worry. I guess he's busy.
112	ham	What is the plural of the noun research?
113	ham	Going for dinner.msg you after.