

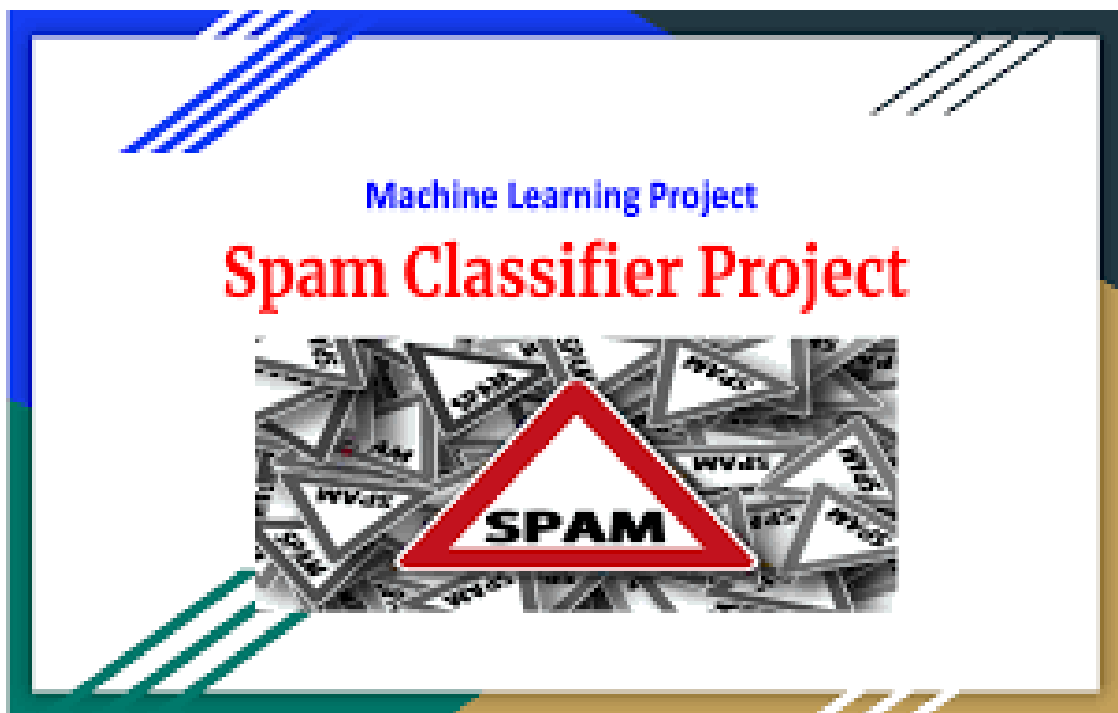
# Building a smarter AI using spam classifier

## PHASE 3 SUBMISSION

### Project:

**To Identify the spam and ham messages using spam classifier**

(using given data set("C:\Users\DELL\Downloads\spam(1).csv")).

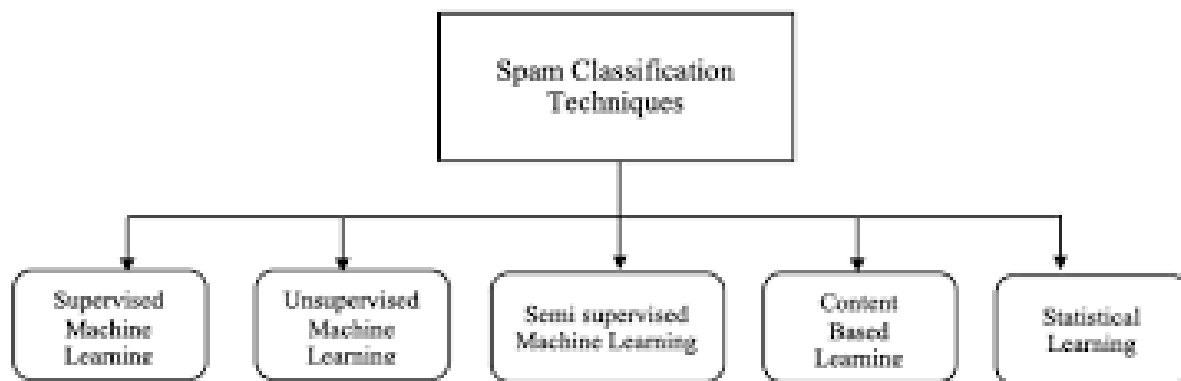


**Name: R.VENUVANESHWARI**

**REG.NO:912421104053**

## MACHINE LEARNING MODEL:

Machine learning is a branch of artificial intelligence (AI) and computer science which focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy.



## DATA COLLECTION:

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes.

## DATA PREPROCESSING:

Data preprocessing is an important step in the data mining process. It refers to the cleaning, transforming, and integrating of data in order to make it ready for analysis. The goal of data preprocessing is to improve the quality of the data and to make it more suitable for the specific data mining task.

# Steps involved in spam classifier:

- 1. Load and simplify the dataset**
- 2. Explore the dataset: Bar Chart**
- 3. Explore the dataset: Word Clouds**
- 4. Handle imbalanced datasets**
- 5. Split the dataset**
- 6. Apply Tf-IDF Vectorizer for feature extraction**
- 7. Train our Naive Bayes Model**
- 8. Check out the accuracy, and f-measure**
- 9. View the confusion matrix and classification report**
- 10. Heatmap for our Confusion Matrix**

## SUPPORT VECTOR MACHINE:

This probabilistic algorithm is commonly used for spam identification. It calculates the probability that a message is spam or ham based on the occurrence of words in the message.

SVMs are used for text classification tasks and can create a hyperplane that separates spam and ham messages in a high-dimensional feature space.

## MODEL DEPLOYMENT:

Model deployment is the process of putting machine learning models into production. This makes the model's predictions available to users, developers or systems, so they can make business decisions based on data, interact with their application (like recognize a face in an image) and so on.

## FALSE POSITIVE AND FALSE NEGATIVE HANDLING:

A false positive is when a scientist determines something is true when it is actually false (also called a type I error). A false positive is a “false alarm.” A false negative is saying something is false when it is actually true (also called a type II error).

## Data source:

Data link: (<https://www.kaggle.com/datasets/uciml/sms-spam-collection-dataset>)

```
class
text_formatv2SORT
```

```
sms
text_formatSORT
text_formatSORT
ham87%
spam13%
```

**5169**

unique values

[null]99%

bt not his girlfrnd... Good night...@ "0%

Other (47)1%

[null]100%

MK17 92H. 450Ppw 16"0%

Other (10)0%

ham

Go until jurong point, crazy.. Available only in bugis n great world la e buffet... Cine there got a...

ham

Ok lar... Joking wif u oni...

spam

Free entry in 2 a wkly comp to win FA Cup final tkts 21st May 2005. Text FA to 87121 to receive entr...

ham

U dun say so early hor... U c already then say...

ham

Nah I don't think he goes to usf, he lives around here though

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 s...

ham

Even my brother is not like to speak with me. They treat me like aids patent.

ham

As per your request 'Melle Melle (Oru Minnaminunginte Nurungu Vettam)' has been set as your callertu...

spam

WINNER!! As a valued network customer you have been selected to receive a £900 prize reward! To claim...

spam

Had your mobile 11 months or more? U R entitled to Update to the latest colour mobiles with camera f...

ham

I'm gonna be home soon and i don't want to talk about this stuff anymore tonight, k? I've cried enou...

spam

SIX chances to win CASH! From 100 to 20,000 pounds txt> CSH11 and send to 87575. Cost 150p/day, 6day...

spam

URGENT! You have won a 1 week FREE membership in our £100,000 Prize Jackpot! Txt the word: CLAIM to ...

ham

I've been searching for the right words to thank you for this breather. I promise i wont take your h...

ham

I HAVE A DATE ON SUNDAY WITH WILL!!

spam

XXXMobileMovieClub: To use your credit, click the WAP link in the next txt message or click here>> h...

ham

Oh k...i'm watching here:)

ham

Eh u remember how 2 spell his name... Yes i did. He v naughty make until i v wet.

ham

Fine if that££s the way u feel. That££s the way its gota b

spam

England v Macedonia - dont miss the goals/team news. Txt ur national team to 87077 eg ENGLAND to 870...

ham

Is that seriously how you spell his name?

ham

I£££m going to try for 2 months ha ha only joking

ham

So £\_ pay first lar... Then when is da stock comin...

ham

Aft i finish my lunch then i go str down lor. Ard 3 smth lor. U finish ur lunch already?

ham

Ffffffffff. Alright no way I can meet up with you sooner?

ham

Just forced myself to eat a slice. I'm really not hungry tho. This sucks. Mark is getting worried. H...

ham

Lol your always so convincing.

ham

Did you catch the bus ? Are you frying an egg ? Did you make a tea? Are you eating your mom's left o...

ham

I'm back & we're packing the car now, I'll let you know if there's room

ham

Ahhh. Work. I vaguely remember that! What does it feel like? Lol

ham

Wait that's still not all that clear, were you not sure about me being sarcastic or that that's why ...

ham

Yeah he got in at 2 and was v apologetic. n had fallen out and she was actin like spoilt child and h...

ham

K tell me anything about you.

ham

For fear of fainting with the of all that housework you just did? Quick have a cuppa

spam

Thanks for your subscription to Ringtone UK your mobile will be charged £5/month Please confirm by r...

ham

Yup... Ok i go home look at the timings then i msg £\_ again... Xuhui going to learn on 2nd may too b...

ham

Oops, I'll let you know when my roommate's done

ham

I see the letter B on my car

ham

Anything lor... U decide...

ham

Hello! How's you and how did saturday go? I was just texting to see if you'd decided to do anything ...

ham

Pls go ahead with watts. I just wanted to be sure. Do have a great weekend. Abiola

ham

Did I forget to tell you ? I want you , I need you, I crave you ... But most of all ... I love you m...

spam

07732584351 - Rodger Burns - MSG = We tried to call you re your reply to our sms for a free nokia mo...

ham

WHO ARE YOU SEEING?

ham

Great! I hope you like your man well endowed. I am &lt;#&gt; inches...

ham

No calls..messages..missed calls

ham

Didn't you get hep b immunisation in nigeria.

ham

Fair enough, anything going on?

ham

Yeah hopefully, if tyler can't do it I could maybe ask around a bit

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 no...

ham

What you thinked about me. First time you saw me in class.

ham

A gram usually runs like &lt;#&gt; , a half eighth is smarter though and gets you almost a whole se...

ham

K fyi x has a ride early tomorrow morning but he's crashing at our place tonight

ham

Wow. I never realized that you were so embarassed by your accomodations. I thought you liked it, sin...

spam

SMS. ac Sptv: The New Jersey Devils and the Detroit Red Wings play Ice Hockey. Correct or Incorrect?...

ham

Do you know what Mallika Sherawat did yesterday? Find out now @ &lt;URL&gt;

spam

Congrats! 1 year special cinema pass for 2 is yours. call 09061209465 now! C Suprman V, Matrix3, Sta...

ham

Sorry, I'll call later in meeting.

ham

Tell where you reached

ham

Yes..gauti and sehwag out of odi series.

ham

Your gonna have to pick up a \$1 burger for yourself on your way home. I can't even move. Pain is kil...

ham

Ha ha ha good joke. Girls are situation seekers.

ham

Its a part of checking IQ

ham

Sorry my roommates took forever, it ok if I come by now?

ham

Ok lar i double check wif da hair dresser already he said wun cut v short. He said will cut until i ...

spam

As a valued customer, I am pleased to advise you that following recent review of your Mob No. you ar...

ham

Today is \song dedicated day..\\" Which song will u dedicate for me? Send this to all ur valuable frn...

spam

Urgent UR awarded a complimentary trip to EuroDisinc Trav, Aco&Entry41 Or 1000. To claim txt DIS to...

spam

Did you hear about the new \Divorce Barbie\\"? It comes with all of Ken's stuff!"

ham

I plane to give on this month end.

ham

Wah lucky man... Then can save money... Hee...

ham

Finished class where are you.

ham

HI BABE IM AT HOME NOW WANNA DO SOMETHING? XX

ham

K..k:)where are you?how did you performed?

ham

U can call me now...

ham

I am waiting machan. Call me once you free.

ham

Thats cool. i am a gentleman and will treat you with dignity and respect.

ham

I like you peoples very much:) but am very shy pa.

ham

Does not operate after &#x26; or what

ham

Its not the same here. Still looking for a job. How much do Ta's earn there.

ham

Sorry, I'll call later

ham

K. Did you call me just now ah?

ham

Ok i am on the way to home hi hi

ham

You will be in the place of that man

ham

Yup next stop.

ham

I call you later, don't have network. If urgnt, sms me.

ham

For real when u getting on yo? I only need 2 more tickets and one more jacket and I'm done. I already...

ham

Yes I started to send requests to make it but pain came back so I'm back in bed. Double coins at the...

ham

I'm really not up to it still tonight babe

ham

Ela kano.,il download, come wen ur free..

ham

Yeah do! Don't stand to close tho- you'll catch something!

ham

Sorry to be a pain. Is it ok if we meet another night? I spent late afternoon in casualty and that m...

ham

Smile in Pleasure Smile in Pain Smile when trouble pours like Rain Smile when sun1 Hurts U Smile bec...

spam

Please call our customer service representative on 0800 169 6031 between 10am-9pm as you have WON a ...

ham



Havent planning to buy later. I check already lido only got 530 show in e afternoon. U finish work a...

spam

Your free ringtone is waiting to be collected. Simply text the password \MIX\" to 85069 to verify. G...

PO Box 5249

MK17 92H. 450Ppw 16"

ham

Watching telugu movie..wat abt u?

ham

i see. When we finish we have loads of loans to pay

ham

Hi. Wk been ok - on hols now! Yes on for a bit of a run. Forgot that i have hairdressers appointment...

ham

Please don't text me anymore. I have nothing else to say.

ham

Okay name ur price as long as its legal! Wen can I pick them up? Y u ave x ams xx

ham

I'm still looking for a car to buy. And have not gone 4the driving test yet.

ham

As per your request 'Melle Melle (Oru Minnaminunginte Nurungu Vettam)' has been set as your callertu...

ham

wow. You're right! I didn't mean to do that. I guess once i gave up on boston men and changed my sea...

ham

Umma my life and vava umma love you lot dear

ham

Thanks a lot for your wishes on my birthday. Thanks you for making my birthday truly memorable.

ham

Aight, I'll hit you up when I get some cash

ham

How would my ip address test that considering my computer isn't a minecraft server

ham

I know! Grumpy old people. My mom was like you better not be lying. Then again I am always the one t...

ham

Dont worry. I guess he's busy.

ham

What is the plural of the noun research?

ham

Going for dinner.msg you after.

ham

I'm ok wif it cos i like 2 try new things. But i scared u dun like mah. Cos u said not too loud.

spam

GENT! We are trying to contact you. Last weekends draw shows that you won a ♦1000 prize GUARANTEED. ...

ham

Wa, ur openin sentence very formal... Anyway, i'm fine too, juz tt i'm eatin too much n puttin on we...

ham

As I entered my cabin my PA said, '' Happy B'day Boss !!''. I felt special. She askd me 4 lunch. Aft...

spam

You are a winner U have been specially selected 2 receive ♦1000 or a 4\* holiday (flights inc) speak ...

ham

Goodo! Yes we must speak friday - egg-potato ratio for tortilla needed!

ham

Hmm...my uncle just informed me that he's paying the school directly. So pls buy food.

spam

PRIVATE! Your 2004 Account Statement for 07742676969 shows 786 unredeemed Bonus Points. To claim cal...

spam

URGENT! Your Mobile No. was awarded £2000 Bonus Caller Prize on 5/9/03 This is our final try to cont...

ham

here is my new address -apples&pairs&all that malarky

spam

Todays Voda numbers ending 7548 are selected to receive a \$350 award. If you have a match please cal...

ham

I am going to sao mu today. Will be done only at 12

ham

predict wat time \_'ll finish buying?

ham

Good stuff, will do.

ham

Just so that you know,yetunde hasn't sent money yet. I just sent her a text not to bother sending. S...

ham

Are you there in room.

ham

HEY GIRL. HOW R U? HOPE U R WELL ME AN DEL R BAK! AGAIN LONG TIME NO C! GIVE ME A CALL SUM TIME FROM...

ham

K..k:)how much does it cost?

ham

I'm home.

ham

Dear, will call Tmorrow.pls accomodate.

ham

First answer my question.

spam

Sunshine Quiz Wkly Q! Win a top Sony DVD player if u know which country the Algarve is in? Txt ansr ...

spam

Want 2 get laid tonight? Want real Dogging locations sent direct 2 ur mob? Join the UK's largest Dog...

ham

I only haf msn. It's [yijue@hotmail.com](mailto:yijue@hotmail.com)

ham

He is there. You call and meet him

ham

No no. I will check all rooms befor activities

spam

You'll not rcv any more msgs from the chat svc. For FREE Hardcore services text GO to: 69988 If u ge...

ham

Got c... I lazy to type... I forgot \_ in lect... I saw a pouch but like not v nice...

ham

K, text me when you're on the way

ham

Sir, Waiting for your mail.

ham

A swt thought: \Nver get tired of doing little things 4 lovable persons..\\" Coz..sometimes those litt...

ham

I know you are. Can you pls open the back?

ham

Yes see ya not on the dot

ham

Whats the staff name who is taking class for us?

spam

FreeMsg Why haven't you replied to my text? I'm Randy, sexy, female and live local. Luv to hear from...

ham

Ummaa.will call after check in.our life will begin from qatar so pls pray very hard.

ham

K..i deleted my contact that why?

ham

Sindu got job in birla soft ..

ham

The wine is flowing and i'm i have nevering..

ham

Yup i thk cine is better cos no need 2 go down 2 plaza mah.

ham

Ok... Ur typical reply...

ham

As per your request 'Melle Melle (Oru Minnaminunginte Nurungu Vettam)' has been set as your callertu...

ham

You are everywhere dirt, on the floor, the windows, even on my shirt. And sometimes when i open my m...

ham

Aaaaaooright are you at work?

ham

I'm leaving my house now...

ham

Hello, my love. What are you doing? Did you get to that interview today? Are you you happy? Are you ...

spam

Customer service announcement. You have a New Years delivery waiting for you. Please call 07046744435...

spam

You are a winner U have been specially selected 2 receive £1000 cash or a 4\* holiday (flights inc) s...

ham

Keep yourself safe for me because I need you and I miss you already and I envy everyone that see's y...

ham

New car and house for my parents.:)i have only new job in hand:)

ham

I'm so in love with you. I'm excited each day i spend with you. You make me so happy.

spam

-PLS STOP bootydelious (32/F) is inviting you to be her friend. Reply YES-434 or NO-434

See her: www...

spam

BangBabes Ur order is on the way. U SHOULD receive a Service Msg 2 download UR content. If U do not,...

ham

I place all ur points on e cultures module already.

spam

URGENT! We are trying to contact you. Last weekends draw shows that you have won a £900 prize GUARAN...

ham

Hi frnd, which is best way to avoid missunderstding wit our beloved one's?

ham

Great escape. I fancy the bridge but needs her lager. See you tomo

ham

Yes :)it completely in out of form:)clark also utter waste.

ham

Sir, I need AXIS BANK account no and bank address.

ham

Hmmm.. Thk sure got time to hop ard... Ya, can go 4 free abt... Muz call u to discuss liao...

ham

What time you coming down later?

ham

Bloody hell, cant believe you forgot my surname Mr . Ill give u a clue, its spanish and begins with ...

ham

Well, i'm gonna finish my bath now. Have a good...fine night.

ham

Let me know when you've got the money so carlos can make the call

ham

U still going to the mall?

ham

Turns out my friends are staying for the whole show and won't be back til ~ &#x2014; , so feel free...

ham

Text her. If she doesnt reply let me know so i can have her log in

ham

Hi! You just spoke to MANEESHA V. We'd like to know if you were satisfied with the experience. Reply...

ham

You lifted my hopes with the offer of money. I am in need. Especially when the end of the month appr...

ham

Lol no. U can trust me.

ham

ok. I am a gentleman and will treat you with dignity and respect.

ham

He will, you guys close?

ham

Going on nothing great.bye

ham

Hello handsome ! Are you finding that job ? Not being lazy ? Working towards getting back that net f...

ham

Haha awesome, be there in a minute

spam

Please call our customer service representative on FREEPHONE 0808 145 4742 between 9am-11pm as you h...

ham

Have you got Xmas radio times. If not i will get it now

ham

I jus reached home. I go bathe first. But my sis using net tell u when she finishes k...

spam

Are you unique enough? Find out from 30th August. [www.areyouunique.co.uk](http://www.areyouunique.co.uk)

ham

I'm sorry. I've joined the league of people that dont keep in touch. You mean a great deal to me. Yo...

ham

Hi :)finally i completed the course:)

ham

It will stop on itself. I however suggest she stays with someone that will be able to give ors for e...

ham

How are you doing? Hope you've settled in for the new school year. Just wishin you a gr8 day

ham

Gud mrng dear hav a nice day

ham

Did u got that persons story

ham

is your hamster dead? Hey so tmr i meet you at 1pm orchard mrt?

ham

Hi its Kate how is your evening? I hope i can see you tomorrow for a bit but i have to bloody babyjo...

ham

Found it, ENC &#x2014; , where you at?

ham

I sent you &#x26; bucks

ham

Hello darlin ive finished college now so txt me when u finish if u can love Kate xxx

ham

Your account has been refilled successfully by INR &#x26; . Your KeralaCircle prepaid acco...

ham

Goodmorning sleeping ga.

ham

U call me alter at 11 ok.

ham

say until like dat i dun buy ericsson oso cannot oredi lar...

ham

As I entered my cabin my PA said, '' Happy B'day Boss !!''. I felt special. She askd me 4 lunch. Aft...

ham

Aight yo, dats straight dogg

ham

You please give us connection today itself before &#x26; or refund the bill

ham

Both :) i shoot big loads so get ready!

ham

What's up bruv, hope you had a great break. Do have a rewarding semester.

ham

Home so we can always chat

ham

K:)k:)good:)study well.

ham

Yup... How \_ noe leh...

ham

Sounds great! Are you home now?

ham

Finally the match heading towards draw as your prediction.

ham

Tired. I haven't slept well the past few nights.

ham

Easy ah?sen got selected means its good..

ham

I have to take exam with march 3

ham

Yeah you should. I think you can use your gt atm now to register. Not sure but if there's anyway i c...

ham

Ok no prob. Take ur time.

ham

There is os called ubandu which will run without installing in hard disk...you can use that os to co...

ham

Sorry, I'll call later

ham

U say leh... Of course nothing happen lar. Not say v romantic jus a bit only lor. I thk e nite scene...

spam

500 New Mobiles from 2004, MUST GO! Txt: NOKIA to No: 89545 & collect yours today!From ONLY 1 [www.4...](http://www.4...)

ham

Would really appreciate if you call me. Just need someone to talk to.

spam

Will u meet ur dream partner soon? Is ur career off 2 a flyng start? 2 find out free, txt HORO follo...

ham

Hey company elama po mudyadhu.

ham

Life is more strict than teacher... Bcoz Teacher teaches lesson & then conducts exam,  
But Life f...  
ham  
Dear good morning now only i am up  
ham  
Get down in gandhipuram and walk to cross cut road. Right side & street road and  
turn at fir...  
ham  
Dear we are going to our rubber place  
ham  
Sorry battery died, yeah I'm here  
ham  
Yes:)here tv is always available in work place..  
spam  
Text & meet someone sexy today. U can find a date or even flirt its up to U. Join 4 just  
10p. REPLY ...  
ham  
I have printed it oh. So & come upstairs  
ham  
Or ill be a little closer like at the bus stop on the same street  
ham  
Where are you?when wil you reach here?  
ham  
New Theory: Argument wins d SITUATION, but loses the PERSON. So dont argue with ur friends  
just.. . ...  
spam  
U 447801259231 have a secret admirer who is looking 2 make contact with U-find out who  
they R\*reveal...  
ham  
Tomarrow final hearing on my laptop case so i cant.  
ham  
PLEASSSSSSSEEEEE TEL ME V AVENT DONE SPORTSx  
ham  
Okay. No no, just shining on. That was meant to be signing, but that sounds better.  
ham  
Although i told u dat i'm into baig face watches now but i really like e watch u gave cos  
it's fr u....  
ham  
U don't remember that old commercial?  
ham  
Too late. I said i have the website. I didn't i have or dont have the slippers  
ham  
I asked you to call him now ok  
ham  
Kallis wont bat in 2nd innings.  
ham  
It didnt work again oh. Ok goodnight then. I.ll fix and have it ready by the time you wake  
up. You a...  
spam  
Congratulations ur awarded 500 of CD vouchers or 125gift guaranteed & Free entry 2 100  
wkly draw txt...  
ham  
Ranjith cal drpd Deeraj and deepak 5min hold  
ham  
Wen ur lovable bcums angry wid u, dnt take it seriously.. Coz being angry is d most  
childish n true ...  
ham  
What you doing?how are you?  
ham  
Ups which is 3days also, and the shipping company that takes 2wks. The other way is usps  
which takes...  
ham  
I'm back, lemme know when you're ready  
ham

Don't necessarily expect it to be done before you get back though because I'm just now  
headin out  
ham  
Mmm so yummy babe ... Nice jolt to the suzy  
ham  
Where are you lover ? I need you ...  
spam  
We tried to contact you re your reply to our offer of a Video Handset? 750 anytime  
networks mins? UN...  
ham  
I~~000~~m parked next to a MINI!!!! When are you coming in today do you think?  
ham  
Yup  
ham  
Anyway i'm going shopping on my own now. Cos my sis not done yet. Dun disturb u liao.  
ham  
MY NO. IN LUTON 0125698789 RING ME IF UR AROUND! H\*  
spam  
Hey I am really horny want to chat or see me naked text hot to 69698 text charged at 150pm  
to unsubs...  
ham  
Why you Dint come with us.  
ham  
Same. Wana plan a trip sometme then  
ham  
Not sure yet, still trying to get a hold of him  
spam  
Ur ringtone service has changed! 25 Free credits! Go to club4mobiles.com to choose content  
now! Stop...  
ham  
The evo. I just had to download flash. Jealous?  
spam  
Ringtone Club: Get the UK singles chart on your mobile each week and choose any top  
quality ringtone...  
ham  
Come to mu, we're sorting out our narcotics situation  
ham  
Night has ended for another day, morning has come in a special way. May you smile like the  
sunny ray...  
spam  
HMV BONUS SPECIAL 500 pounds of genuine HMV vouchers to be won. Just answer 4 easy  
questions. Play N...  
ham  
Usf I guess, might as well take 1 car  
ham  
No objection. My bf not coming.  
ham  
Thanx...  
ham  
Tell rob to mack his gf in the theater  
ham  
Awesome, I'll see you in a bit  
ham  
Just sent it. So what type of food do you like?  
ham  
All done? All handed in? Celebrations in full swing yet?  
ham  
You got called a tool?  
ham  
\Wen u miss someone  
the person is definitely special for u..... But if the person is so special  
why to miss them  
ham  
Ok. I asked for money how far

ham

Okie...

ham

Yeah I think my usual guy's still passed out from last night, if you get ahold of anybody let me know...

ham

K, I might come by tonight then if my class lets out early

ham

Ok..

ham

hi baby im cruisin with my girl friend what r u up 2? give me a call in an hour at home if thats all...

ham

My life Means a lot to me, Not because I love my life, But because I love the people in my life, The...

ham

Dear, shall mail tonite. busy in the street, shall update you tonite. things are looking ok. varunnathu e...

ham

Hey you told your name to gautham ah?

ham

Haf u found him? I feel so stupid da v cam was working.

ham

Oops. 4 got that bit.

ham

Are you this much busy

ham

I accidentally deleted the message. Resend please.

spam

T-Mobile customer you may now claim your FREE CAMERA PHONE upgrade & a pay & go sim card for your lo...

ham

Unless it's a situation where YOU GO GURL would be more appropriate

ham

Hurt me... Tease me... Make me cry... But in the end of my life when i die plz keep one rose on my g...

ham

I cant pick the phone right now. Pls send a message

ham

Need a coffee run tomo? Can't believe it's that time of week already

ham

Awesome, I remember the last time we got somebody high for the first time with diesel :V

ham

Shit that is really shocking and scary, cant imagine for a second. Def up for night out.

Do u think ...

ham

Oh and by the way you do have more food in your fridge! Want to go out for a meal tonight?

ham

He is a wonderful actor

spam

SMS. ac Blind Date 4U!: Rodds1 is 21/m from Aberdeen, United Kingdom. Check Him out

<http://img>. sms....

ham

Yup... From what i remb... I think should be can book...

ham

Jos ask if u wana meet up?

ham

Lol yes. Our friendship is hanging on a thread cause u won't buy stuff.

spam

TheMob> Check out our newest selection of content, Games, Tones, Gossip, babes and sport, Keep your ...

ham

Where are the garage keys? They aren't on the bookshelf

ham



Today is ACCEPT DAY..U Accept me as? Brother Sister Lover Dear1 Best1 Clos1 Lvblefrnd  
Jstfrnd Cutfre...

spam

Think ur smart ? Win £200 this week in our weekly quiz, text PLAY to 85222 now!T&Cs  
WinnersClub PO Box 2

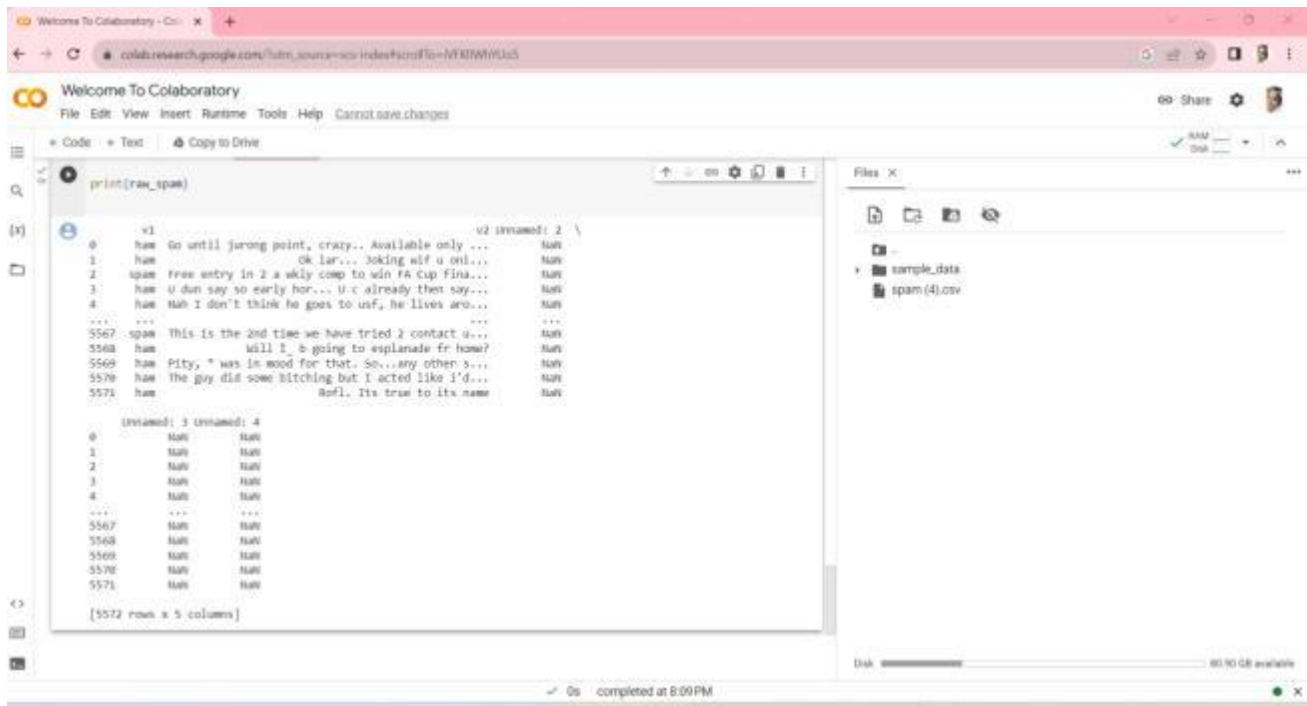
## PROGRAM:

```
import numpy as np
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.linear_model import LogisticRegression
from sklearn.metrics import accuracy_score

raw_spam=pd.read_csv('/spam.csv',encoding='latin-1')

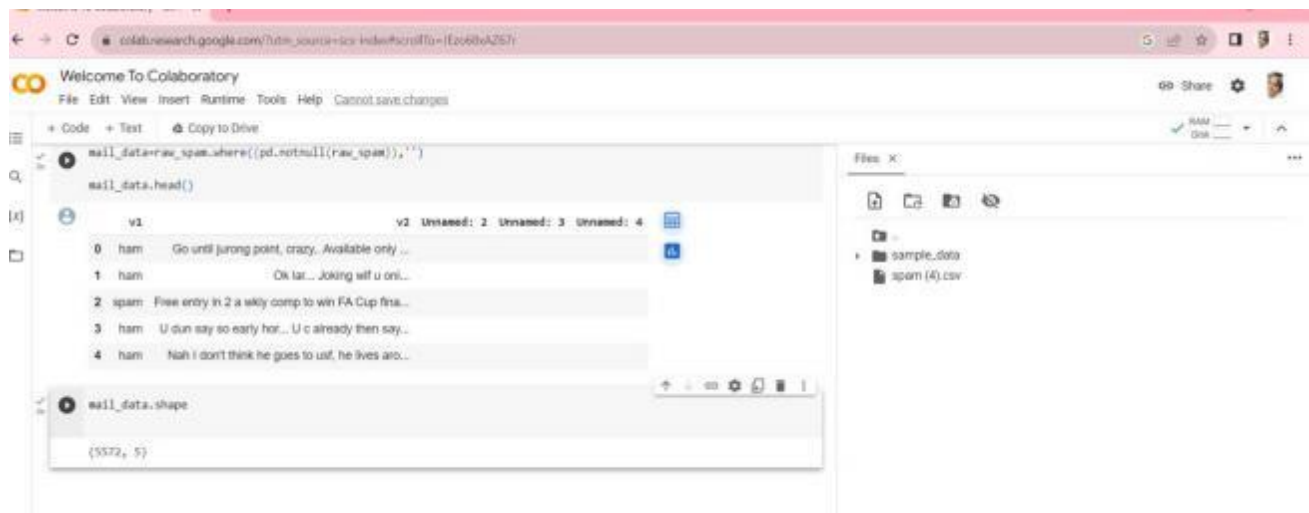
print(raw_spam)
```

## OUTPUT:



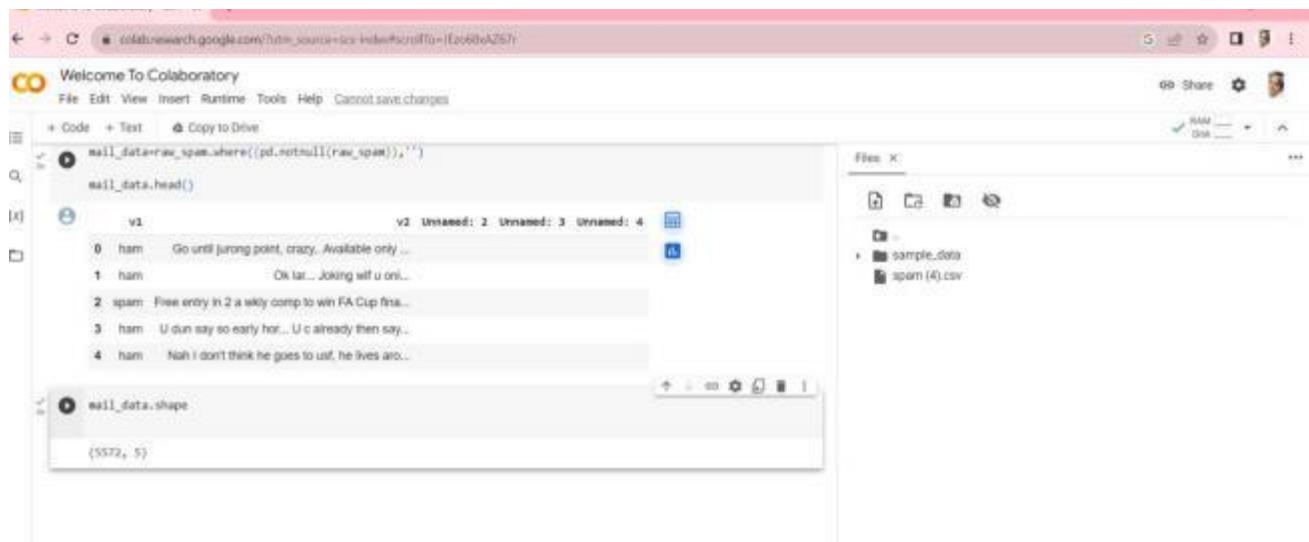
```
mail_data=raw_spam.where((pd.notnull(raw_spam)), '')
mail_data.head()
```

OUTPUT:



`mail_data.shape`

OUTPUT:



```
mail_data.loc[mail_data['v1'] == 'spam', 'v1',] = 0
```

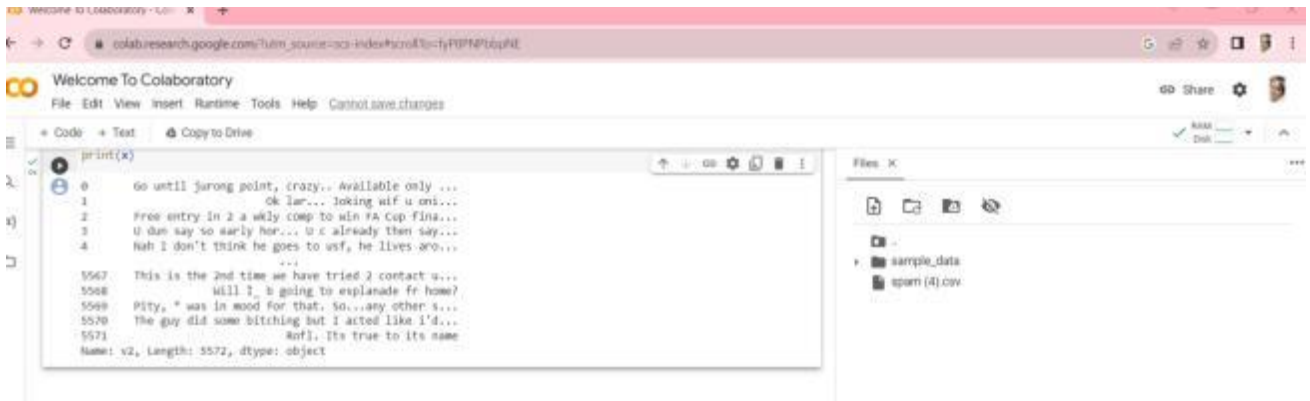
```
mail_data.loc[mail_data['v2']=='ham', 'v2',] = 1
```

```
x=mail_data['v2']
```

```
y=mail_data['v1']
```

```
print(x)
```

OUTPUT:



`print(y)`

OUTPUT:

```
5567   0
5568   ham
```

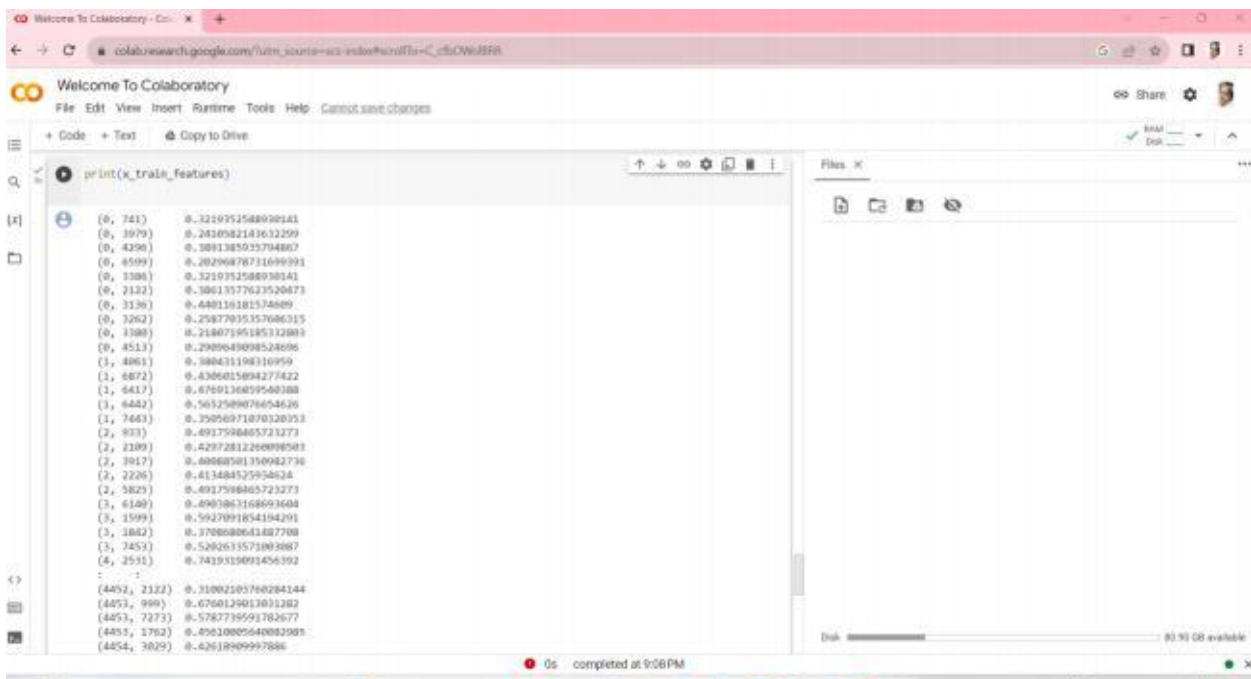
`x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.2,random_state=3)`

`print(x.shape)`

OUTPUT:

```
[15] print(x.shape)
(5572, 1)
```

```
print(x_train_features)
```



```
print(x_train_features)
```

```
(0, 741) 0.3219753588938141  
(0, 1979) 0.2410582143632299  
(0, 4296) 0.3881385935704867  
(0, 6599) 0.20296878731699991  
(0, 1386) 0.3219753588938141  
(0, 2122) 0.38613577623520473  
(0, 3136) 0.648116381574889  
(0, 3262) 0.25877875157686315  
(0, 1588) 0.21807195185312883  
(0, 4513) 0.2989648098524096  
(1, 4861) 0.388431198110959  
(1, 6872) 0.4386015894277422  
(1, 6417) 0.6769136859540388  
(1, 6442) 0.5652589076654626  
(1, 7443) 0.35056971870320353  
(2, 833) 0.6917598465723273  
(2, 2289) 0.42972811240890583  
(2, 3917) 0.68668501310082736  
(2, 2226) 0.413484525954624  
(2, 5825) 0.6917598465723273  
(3, 6140) 0.4981863168693604  
(3, 1599) 0.5927091854194191  
(3, 1842) 0.3708880641487708  
(3, 7453) 0.5282633573803887  
(4, 2551) 0.74293338993456392  
:  
(4452, 2122) 0.31002105760284144  
(4453, 999) 0.6760125017011282  
(4453, 7273) 0.5782739591782677  
(4453, 1762) 0.45010005640082083  
(4454, 3829) 0.62618949997886
```

## CONCLUSION:

In conclusion, our AI-powered spam identifier project successfully addresses the pervasive issue of spam messages in various communication channels. It contributes to a safer and more efficient digital communication experience, with room for further enhancements and adaptability in the future. As the digital landscape continues to evolve, our project serves as a robust solution to counteract the proliferation of spam and protect users from its detrimental effects.















