

NLP_assignment_1_20180528

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1 0. Introduction

Rahul Singh

Task: fake news text classification

1. Workplace Setup
2. Data Cleaning
3. Preprocessing Text
4. Modeling: Text Classifier
5. Final Model Selection and Prediction

2 1. Workplace Setup

```
In [63]: # libraries
import pandas as pd # reading dataset
import numpy as np
import matplotlib.pyplot as plt # plotting
import seaborn as sns # plotting
import nltk # natural language processing

pd.set_option("max_columns", None)
%matplotlib inline

In [64]: # read in dataset
train = pd.read_csv("fake_or_real_news_training.csv")
test = pd.read_csv("fake_or_real_news_test.csv")
```

3 2. Cleaning Data

```
In [65]: # training dataset summary
print(train.info())

# first few lines of training dataset
train.head(3)
```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3999 entries, 0 to 3998
Data columns (total 6 columns):
ID          3999 non-null int64
title       3999 non-null object
text        3999 non-null object
label       3999 non-null object
X1          33 non-null object
X2          2 non-null object
dtypes: int64(1), object(5)
memory usage: 187.5+ KB
None

```

```

Out [65]:
      ID                                     title \
0   8476                                You Can Smell Hillarys Fear
1 10294  Watch The Exact Moment Paul Ryan Committed Pol...
2   3608                Kerry to go to Paris in gesture of sympathy

      text label  X1  X2
0  Daniel Greenfield, a Shillman Journalism Fello...  FAKE  NaN  NaN
1  Google Pinterest Digg Linkedin Reddit Stumbleu...  FAKE  NaN  NaN
2  U.S. Secretary of State John F. Kerry said Mon...  REAL  NaN  NaN

```

```

In [66]: # test dataset summary
print(test.info())

# first few lines of test dataset
test.head(3)

```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2321 entries, 0 to 2320
Data columns (total 3 columns):
ID          2321 non-null int64
title       2321 non-null object
text        2321 non-null object
dtypes: int64(1), object(2)
memory usage: 54.5+ KB
None

```

```

Out [66]:
      ID                                     title \
0 10498  September New Homes Sales Rise-Back To 1992 ...
1   2439  Why The Obamacare Doomsday Cult Can't Admit It...
2    864  Sanders, Cruz resist pressure after NY losses,...

      text
0  September New Homes Sales Rise Back To 1992 Le...

```

- 1 But when Congress debated and passed the Patie...
- 2 The Bernie Sanders and Ted Cruz campaigns vowe...

The training dataset has columns X1 and X2 that have multiple null values. Let's check what these columns contain and see if we need them for the analysis (since the same columns don't exist in the test set).

```
In [67]: # get only rows with X1 values
#uncomplited_x1 = train[(train.X1.isnull()!=True) & (train.X2.isnull()==True)]
#uncomplited_x1.head(5)
```

```
train[train.X1.notnull()]
```

```
Out [67]:
```

	ID	title \
192	599	Election Day: No Legal Pot In Ohio
308	10194	Who rode it best? Jesse Jackson mounts up to f...
382	356	Black Hawk crashes off Florida
660	2786	Afghanistan: 19 die in air attacks on hospital
889	3622	Al Qaeda rep says group directed Paris magazin...
911	7375	Shallow 5.4 magnitude earthquake rattles centr...
1010	9097	ICE Agent Commits Suicide in NYC
1043	9203	Political Correctness for Yuengling Brewery
1218	1602	Poll gives Biden edge over Clinton against GOP...
1438	4562	Russia begins airstrikes in Syria
1493	4748	Trump & amp
1591	3508	Belgian police mount raids
1630	7559	STATE OF GEORGIA FIRES PASTOR BECAUSE OF HIS F...
1716	3634	The Latest On Paris Attack: Manhunt Continues
1900	8470	The Amish In America Commit Their Vote To Dona...
1968	6404	#BREAKING: SECOND Assassination Attempt On Tru...
2176	10499	30th Infantry Division: Work Horse of the Wes...
2184	9	Planned Parenthoods lobbying effort
2493	10492	TOP BRITISH GENERAL WARNS OF NUCLEAR WAR WITH ...
2549	10138	Inside The Mind Of An FBI Informant
2880	4953	Gary Johnson Avoids Typical Third-Party Fade
2920	496	Nearly 300K New Jobs In February
3010	5741	Why Trump Won
3069	4131	Jesse Matthew charged in Hannah Graham's murder
3110	8748	WATCH: Mass Shooting Occurs During #TrumpRiot
3130	6717	Jim Rogers: Its Time To Prepare
3210	2943	Islamic State admits defeat in Kobani
3372	5248	Clinton Cries Racism Tagging Trump with KKK
3478	3624	Suspects In Paris Magazine Attack Killed
3537	6268	Chart Of The Day: Since 2009Recovery For The 5%
3578	2738	Ted Cruz launches bid
3649	4025	State Dept. IDs 2 Americans killed in Nepal quake
3706	9954	Incredible smoke haze seen outside NDTV office...

text \

192 Democrats Lose In The South
308 Leonardo DiCaprio to the rescue?
382 human remains found
660 U.S. investigating
889 US issues travel warning
911 shakes buildings in Rome
1010 Leaves Note Revealing Govt Plans to Round-up...
1043 What About Our Opioid Epidemic?
1218 VP meets with Trumka
1438 U.S. warns of new concerns in conflict
1493 Clinton Were Very Convincing...on How Lousy t...
1591 prosecutors acknowledge missed opportunities
1630 GOVERNMENT DIDNT APPROVE BIBLICAL SERMONS
1716 Brothers Were On No-Fly List
1900 Mathematically Guaranteeing Him A Presidentia...
1968 Suspect Detained (LIVE BLOG)
2176 The Big Picture TV-211
2184 pay raises for federal workers
2493 THE END OF LIFE AS WE KNOW IT
2549 Terri Linnell Admits Role As Govt Snitch
2880 Best Polling Since Perot in 92
2920 Unemployment Dips To 5.5 Percent
3010 Why Clinton Lost
3069 DA will not pursue death penalty
3110 Media Ignores (Video)
3130 Economic And Financial Collapse Imminent (VIDEO)
3210 blames airstrikes
3372 Trump Says 'She Lies'
3478 Market Gunman And 4 Hostages Also Dead
3537 Stagnation for the 95%
3578 Some pundits paint him as scary extremist
3649 2 others reportedly dead
3706 bursting of firecrackers suspected

label \

192 Election Day: No Legal Pot In Ohio; Democrats ...
308 Who rode it best? Jesse Jackson mounts up to f...
382 (CNN) Thick fog forced authorities to suspend ...
660 (CNN) Aerial bombardments blew apart a Doctors...
889 A member of Al Qaeda's branch in Yemen said Fr...
911 00 UTC I USGS Map of the earthquake's epicent...
1010 Email Print After writing a lengthy suicide no...
1043 We Are Change \n\nIn todays political climate...
1218 A new national poll shows Vice President Biden...
1438 Russian warplanes began airstrikes in Syria on...
1493 Let's pretend for a moment that the biggest he...
1591 Belgian authorities missed a chance to press a...

1630 Home SOCIETY | US NEWS STATE OF GEORGIA FI...
1716 The Latest On Paris Attack: Manhunt Continues;...
1900 18 SHARE The Amish in America have committed t...
1968 We Are Change \nDonald Trump on Saturday was q...
2176 Published on Oct 27, 2016 by Jeff Quitney The ...
2184 and the future Fed rates
2493 Paul Joseph Watson Senior British army officer...
2549 Inside The Mind Of An FBI Informant; Terri Lin...
2880 A couple of weeks ago in this space I pushed b...
2920 Nearly 300K New Jobs In February; Unemployment...
3010 WashingtonsBlog \nBy Robert Parry, the inves...
3069 Jesse Matthew Jr., a former hospital worker, w...
3110 WATCH: Mass Shooting Occurs During #TrumpRio...
3130 By: The Voice of Reason | Regardless of how mu...
3210 Islamic State militants have acknowledged for ...
3372 With only about 70 days left until the electio...
3478 Suspects In Paris Magazine Attack Killed; Mark...
3537 Chart Of The Day: Since 2009 Recovery For The 5%
3578 Before he got to repealing ObamaCare, before h...
3649 The State Department identified two Americans ...
3706 Incredible smoke haze seen outside NDTV office...

	X1	X2
192	REAL	NaN
308	FAKE	NaN
382	REAL	NaN
660	REAL	NaN
889	REAL	NaN
911	FAKE	NaN
1010	FAKE	NaN
1043	FAKE	NaN
1218	REAL	NaN
1438	REAL	NaN
1493	REAL	NaN
1591	REAL	NaN
1630	FAKE	NaN
1716	REAL	NaN
1900	FAKE	NaN
1968	FAKE	NaN
2176	FAKE	NaN
2184	PLANNED PARENTHOODS LOBBYING GETS AGGRESSIVE...	REAL
2493	FAKE	NaN
2549	FAKE	NaN
2880	REAL	NaN
2920	REAL	NaN
3010	FAKE	NaN
3069	REAL	NaN
3110	FAKE	NaN

3130		FAKE	NaN
3210		REAL	NaN
3372		REAL	NaN
3478		REAL	NaN
3537	Stagnation for the 95%	FAKE	
3578		REAL	NaN
3649		REAL	NaN
3706		FAKE	NaN

It seems that X1 and X2 are actually columns that have been created because some texts contain ',', which is probably what is used to separate columns when reading in the csv file. Let's add the text together back to title and text columns, and the label to the label column.

```
In [68]: # Clean rows that have been extended to X1 column
for i in range(len(train)):
    if train.loc[i, 'X1'] is not np.nan and train.loc[i, 'X2'] is np.nan:
        train.loc[i, 'title'] = train.loc[i, 'title'] + train.loc[i, 'text']
        train.loc[i, 'text'] = train.loc[i, 'label']
        train.loc[i, 'label'] = train.loc[i, 'X1']

# Clean rows that have been extended to X2 column
# Clean separately as they seem to have different separations
t1 = train.loc[2184, 'title'] + train.loc[2184, 'text'] + train.loc[2184, 'label']
train.loc[2184, 'title'] = t1
train.loc[2184, 'text'] = train.loc[2184, 'X1']
train.loc[2184, 'label'] = train.loc[2184, 'X2']
t2 = train.loc[3537, 'title'] + train.loc[3537, 'text']
train.loc[3537, 'text'] = train.loc[3537, 'label'] + train.loc[3537, 'X1']
train.loc[3537, 'label'] = train.loc[3537, 'X2']

In [69]: # check that the label column only contains 'REAL' and 'FAKE'
train.label.value_counts()

Out[69]: REAL    2008
         FAKE    1991
         Name: label, dtype: int64
```

There are 1991 fake news and 2008 real news in the training dataset, which is pretty well balanced.

```
In [70]: # drop X1 and X2 columns
train = train.drop(['X1', 'X2'], axis = 1)

In [71]: # shape of training and test data
print("There are {} texts and {} features for training set.".format(train.shape[0], train.shape[1]))
print("Feature names for training set:", train.columns.tolist())
print("\nThere are {} texts and {} features for test set.".format(test.shape[0], test.shape[1]))
print("Feature names for test set:", test.columns.tolist())
```

There are 3999 texts and 4 features for training set.
Feature names for training set: ['ID', 'title', 'text', 'label']

There are 2321 texts and 3 features for test set.
Feature names for test set: ['ID', 'title', 'text']

4 3. Preprocessing Text Data

In this part, we will be going to go through several methods to preprocess text data so that they can be used to train classifiers. These include:

- tokenization
 - stopwords (with and without punctuations)
 - unigram vs ngrams
- normalization:
 - capitalization
 - stemming, lemmatizing (with POS tagging)

4.1 3-1. Tokenization

4.1.1 Tokenization: standard work_tokenize from nltk

```
In [72]: # function tokenize text in a standard format
def tokenize_normal(text):
    return [t for t in nltk.word_tokenize(text)]

# function to count top 20 most occurring tokens
from collections import Counter
def word_counter(tokenized_text):
    return Counter(tokenized_text)

def top_count(tokenized_text, n = 20):
    counted = word_counter(tokenized_text)
    for word, freq in counted.most_common(n):
        print("{} appeared {} times.".format(word, freq))

In [73]: # test tokenization
np.random.seed(42)
top_count(tokenize_normal(train.loc[np.random.randint(len(train)), 'text']))
```

the appeared 27 times.
, appeared 18 times.
to appeared 16 times.
China appeared 15 times.
of appeared 15 times.
and appeared 15 times.

```
. appeared 13 times.
that appeared 9 times.
  appeared 9 times.
s appeared 9 times.
its appeared 7 times.
for appeared 7 times.
a appeared 7 times.
has appeared 6 times.
The appeared 5 times.
will appeared 5 times.
military appeared 5 times.
sway appeared 4 times.
in appeared 4 times.
nation appeared 4 times.
```

Since there has been no stopwords removed (words that are filtered out either because it adds no value to the task, which in this case is text classification), we see that the top words include punctuations (like a comma) and articles (like the). Since they are also not normalized, we see that they include both 'the' and 'The', which are same words with different spellings.

For now, let's leave the possible stopwords and compare most common words for both training and test title and text between 'Real' and 'Fake' documents.

```
In [74]: def tokenize_whole(series):
          # tokenize
          tokenized = series.apply(lambda x: tokenize_normal(x))
          # group them all into one list
          all_tokens = []
          for i in tokenized:
              all_tokens.extend(i)
          return all_tokens

In [75]: # top 20 most occurring for training title and text
          print("Top 20 most occurring words for title in training set:")
          top_count(tokenize_whole(train.title))
          print("\nTop 20 most occurring words for text in training set:")
          top_count(tokenize_whole(train.text))
```

```
Top 20 most occurring words for title in training set:
: appeared 1028 times.
, appeared 891 times.
  appeared 864 times.
to appeared 831 times.
the appeared 740 times.
Trump appeared 682 times.
The appeared 591 times.
of appeared 549 times.
in appeared 523 times.
s appeared 457 times.
```


Clinton appeared 429 times.
for appeared 383 times.
on appeared 371 times.
? appeared 362 times.
and appeared 351 times.
's appeared 350 times.
Hillary appeared 344 times.
a appeared 315 times.
Obama appeared 247 times.
is appeared 245 times.

Top 20 most occurring words for text in training set:
the appeared 163827 times.
, appeared 161647 times.
. appeared 129791 times.
to appeared 86776 times.
of appeared 80936 times.
and appeared 71180 times.
a appeared 65363 times.
in appeared 56431 times.
that appeared 43147 times.
appeared 36911 times.
is appeared 33769 times.
for appeared 27683 times.
on appeared 24305 times.
s appeared 22561 times.
appeared 21977 times.
appeared 21556 times.
The appeared 19137 times.
with appeared 18733 times.
as appeared 18578 times.
it appeared 18462 times.

```
In [76]: # top 20 most occurring for test title and text
print("Top 20 most occurring words for title in test set:")
top_count(tokenize_whole(test.title))
print("\nTop 20 most occurring words for text in test set:")
top_count(tokenize_whole(test.text))
```

Top 20 most occurring words for title in test set:
: appeared 588 times.
, appeared 518 times.
appeared 513 times.
to appeared 451 times.
the appeared 428 times.
Trump appeared 376 times.
in appeared 331 times.

The appeared 321 times.
of appeared 312 times.
s appeared 270 times.
Clinton appeared 259 times.
on appeared 224 times.
and appeared 212 times.
's appeared 211 times.
Hillary appeared 211 times.
for appeared 211 times.
? appeared 191 times.
a appeared 179 times.
is appeared 166 times.
To appeared 161 times.

Top 20 most occurring words for text in test set:

the appeared 94291 times.
, appeared 93002 times.
. appeared 73174 times.
to appeared 49810 times.
of appeared 46852 times.
and appeared 40816 times.
a appeared 37449 times.
in appeared 32478 times.
that appeared 24668 times.
appeared 21184 times.
is appeared 19538 times.
for appeared 15953 times.
on appeared 13910 times.
s appeared 12958 times.
appeared 12784 times.
appeared 12589 times.
it appeared 10947 times.
The appeared 10840 times.
with appeared 10788 times.
as appeared 10467 times.

This is hard to see, so let's create a function that generates frequency graphs.

```
In [77]: # function to create normal frequency and cumulative counts
def plot_freq(tokenized_text, n = 50, cum = True, prob = False):
    # length of whole tokenized text
    token_count = len(tokenized_text)
    # freqdistribution
    text_fd = nltk.FreqDist(tokenized_text)
    if prob:
        for k,v in text_fd.items():
            text_fd[k] = v / token_count
```

```

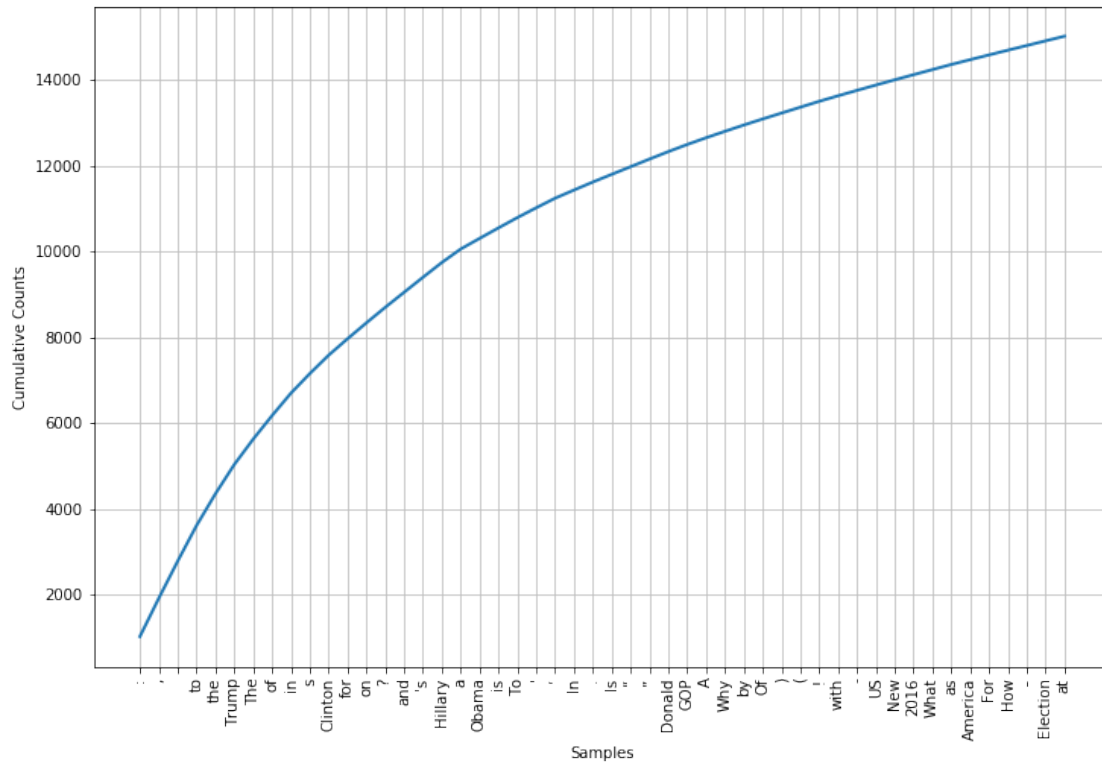
# return graph
plt.figure(figsize = (12,8))
text_fd.plot(n, cumulative = cum)
return plt.show()

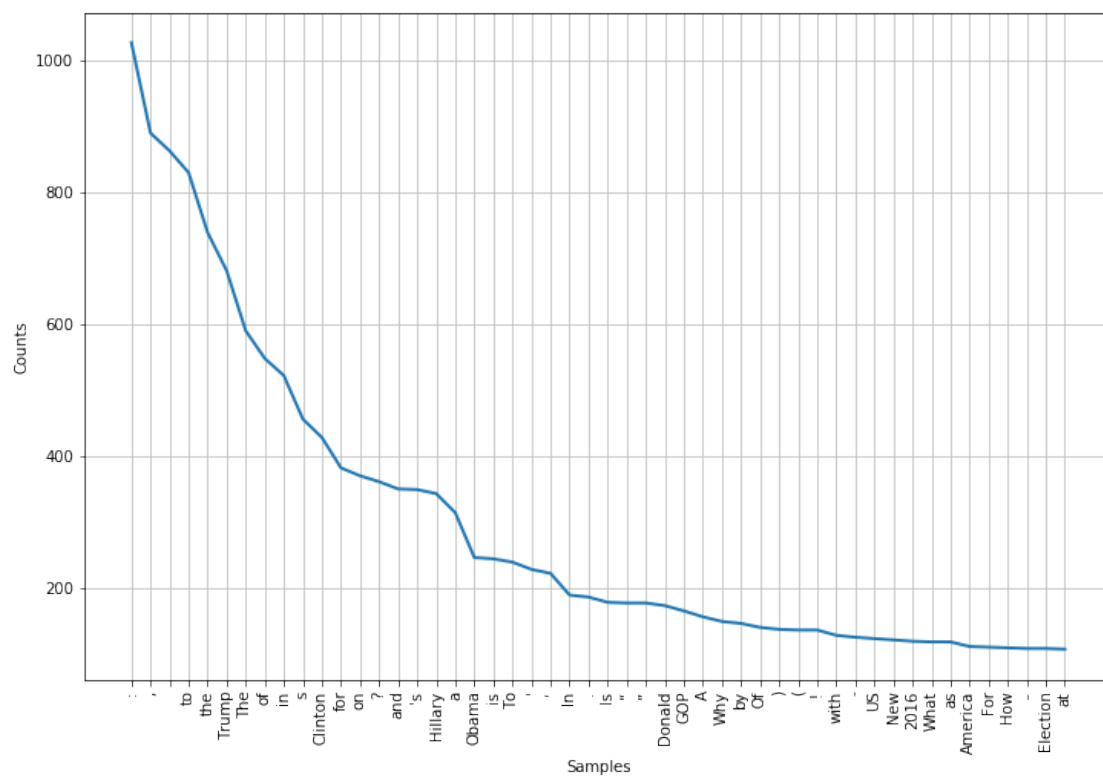
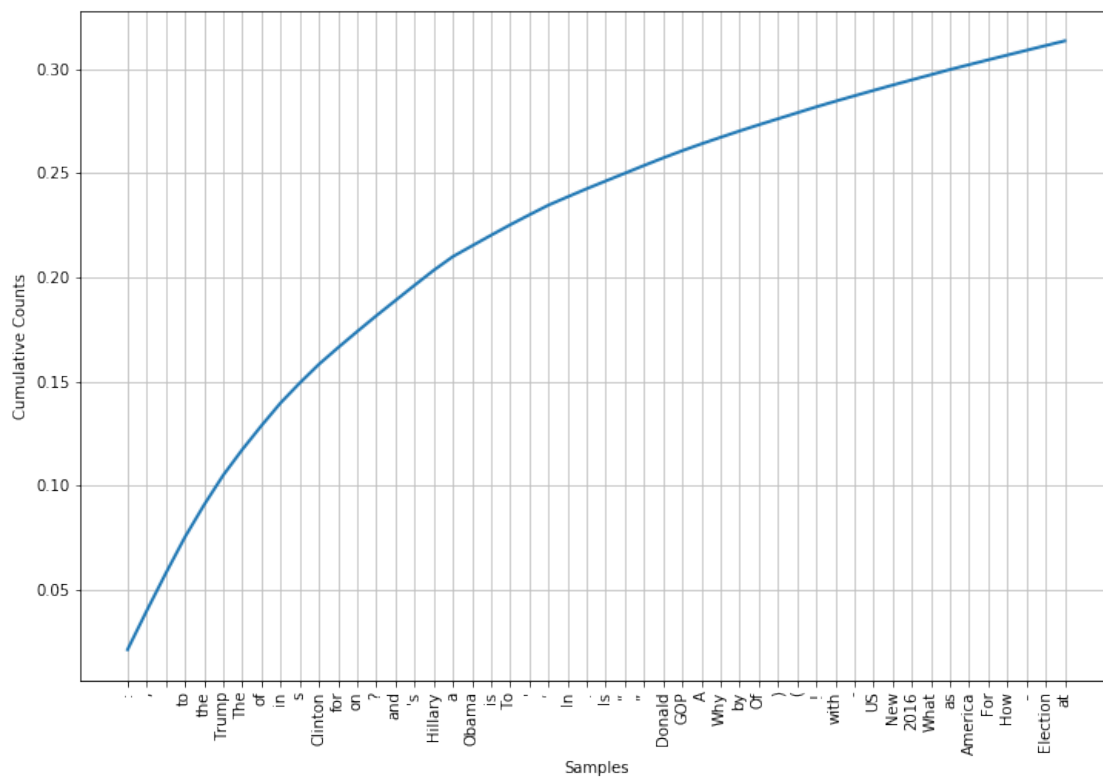
```

```

In [78]: # training title
plot_freq(tokenize_whole(train.title))
plot_freq(tokenize_whole(train.title),prob = True)
plot_freq(tokenize_whole(train.title), cum = False)

```





We can see that from the cumulative probability distribution, the most common 50 tokens consist about 30% of the whole training title texts. Let's compare it between Fake and Real news.

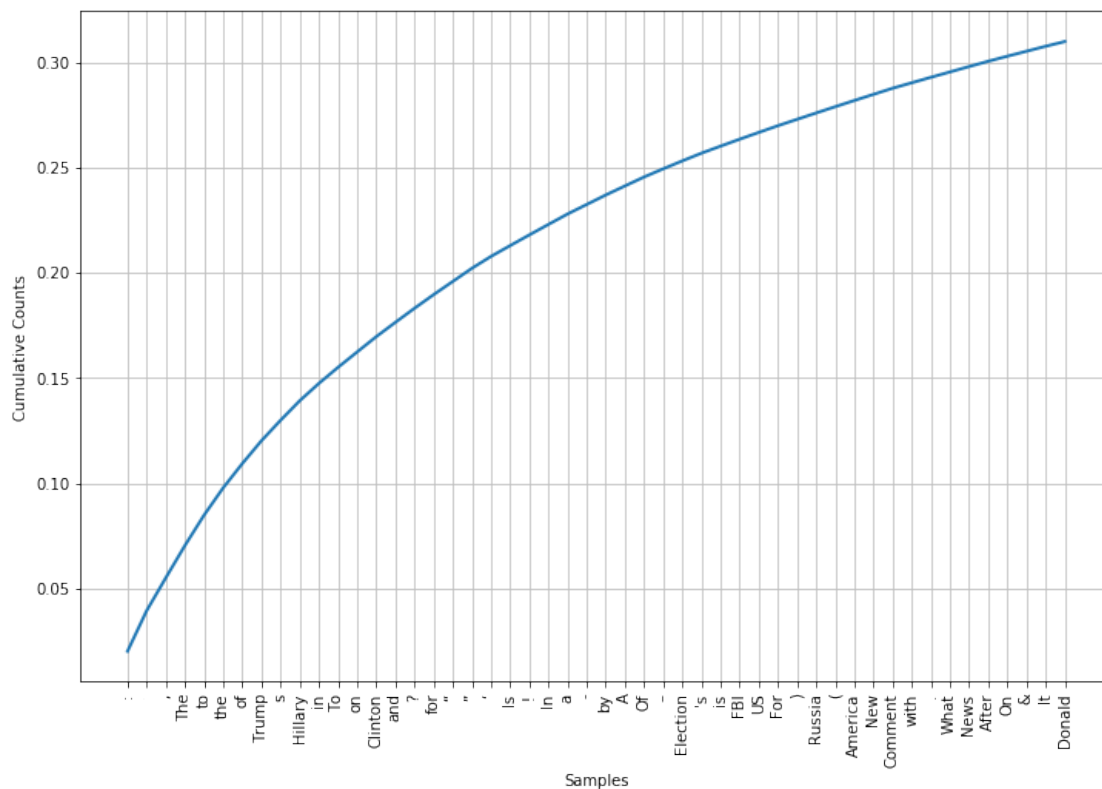
```
In [79]: # training title fake vs real
print("Fake title")
plot_freq(tokenize_whole(train[train.label == 'FAKE'].title),prob = True)

print("\n Real title")
plot_freq(tokenize_whole(train[train.label == 'REAL'].title),prob = True)

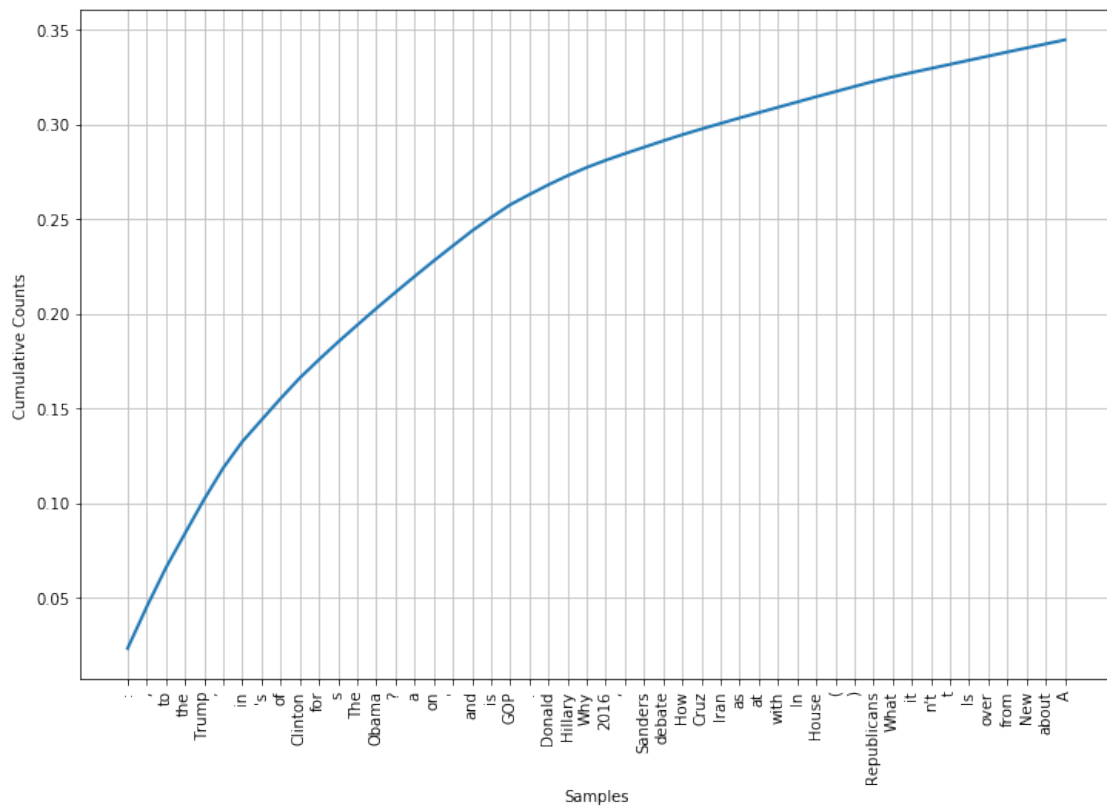
print("Fake text")
plot_freq(tokenize_whole(train[train.label == 'FAKE'].text),prob = True)

print("\n Real text")
plot_freq(tokenize_whole(train[train.label == 'REAL'].text),prob = True)
```

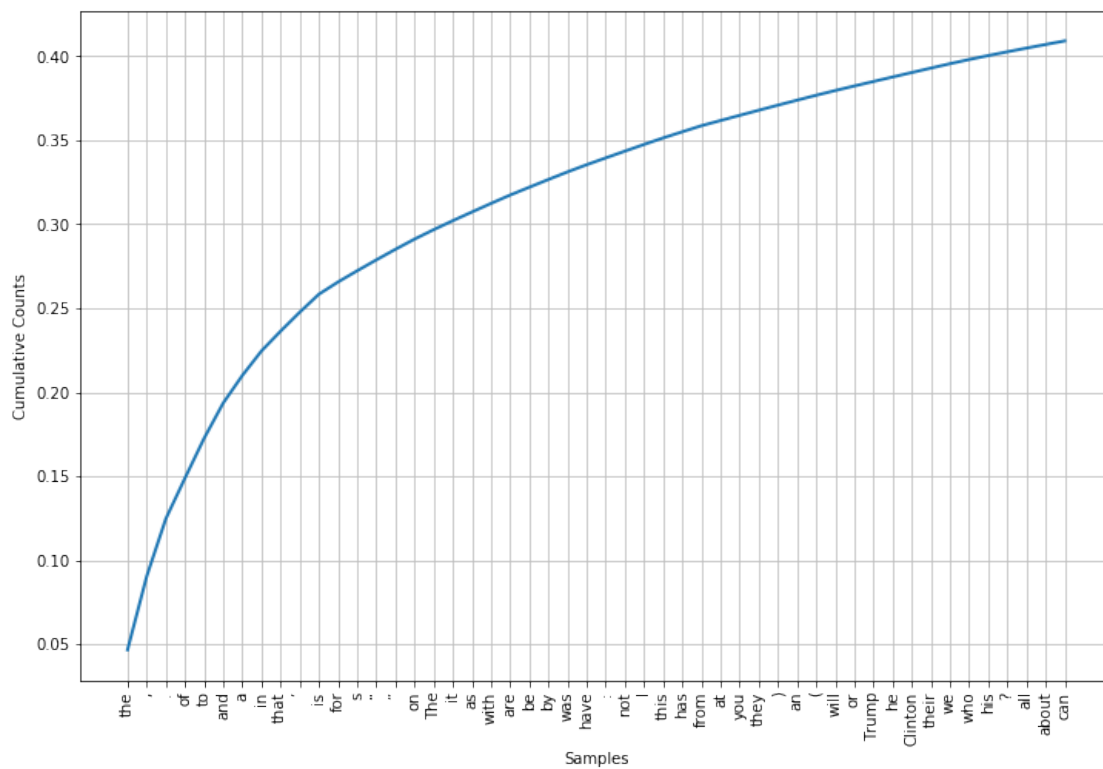
Fake title



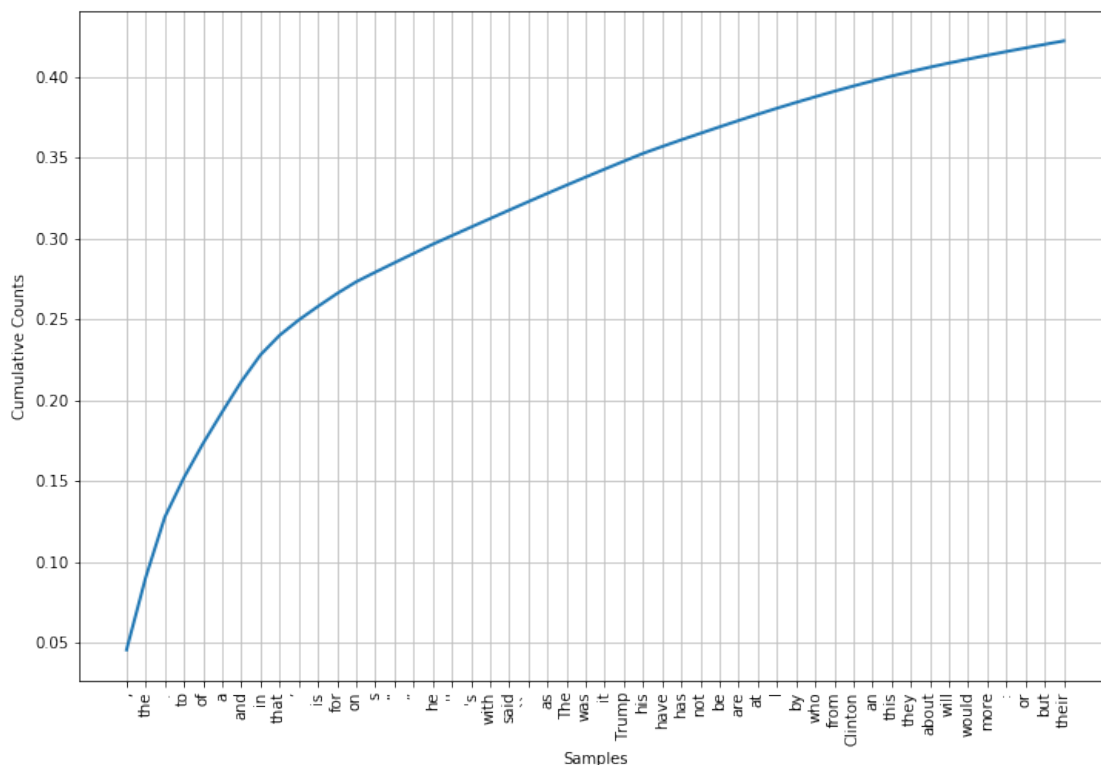
Real title



Fake text



Real text



As seen, it's hard to distinguish between fake and real text as some words are just used a lot in both texts. We need to construct set of stopwords and also normalize the text to see real differences.

```
In [80]: train_text_length = [len(tokenize_normal(i)) for i in train.text]
train_title_length = [len(tokenize_normal(i)) for i in train.title]
test_text_length = [len(tokenize_normal(i)) for i in test.text]
test_title_length = [len(tokenize_normal(i)) for i in test.title]
```

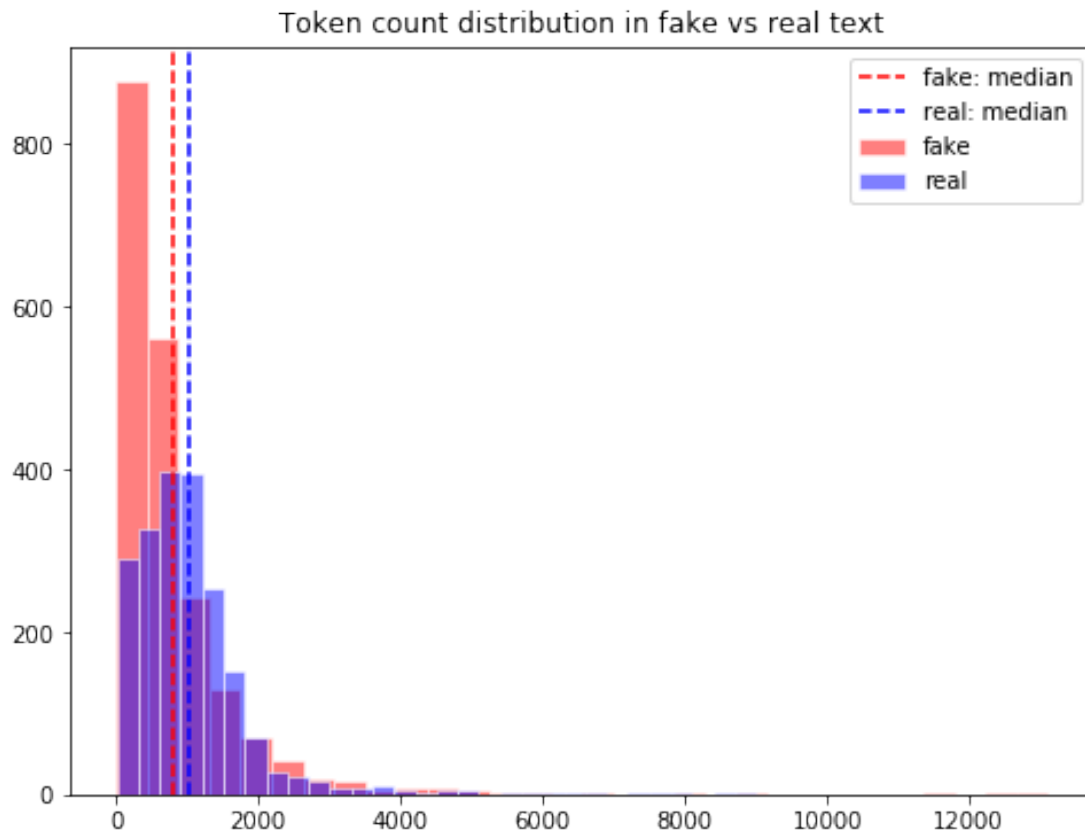
```
In [81]: # index for fake text
train_fake_index = train[train.label == 'FAKE'].index.tolist()
train_real_index = train[train.label == 'REAL'].index.tolist()
train_text_fake_length = [train_text_length[i] for i in train_fake_index]
train_text_real_length = [train_text_length[i] for i in train_real_index]
train_title_fake_length = [train_title_length[i] for i in train_fake_index]
train_title_real_length = [train_title_length[i] for i in train_real_index]
```

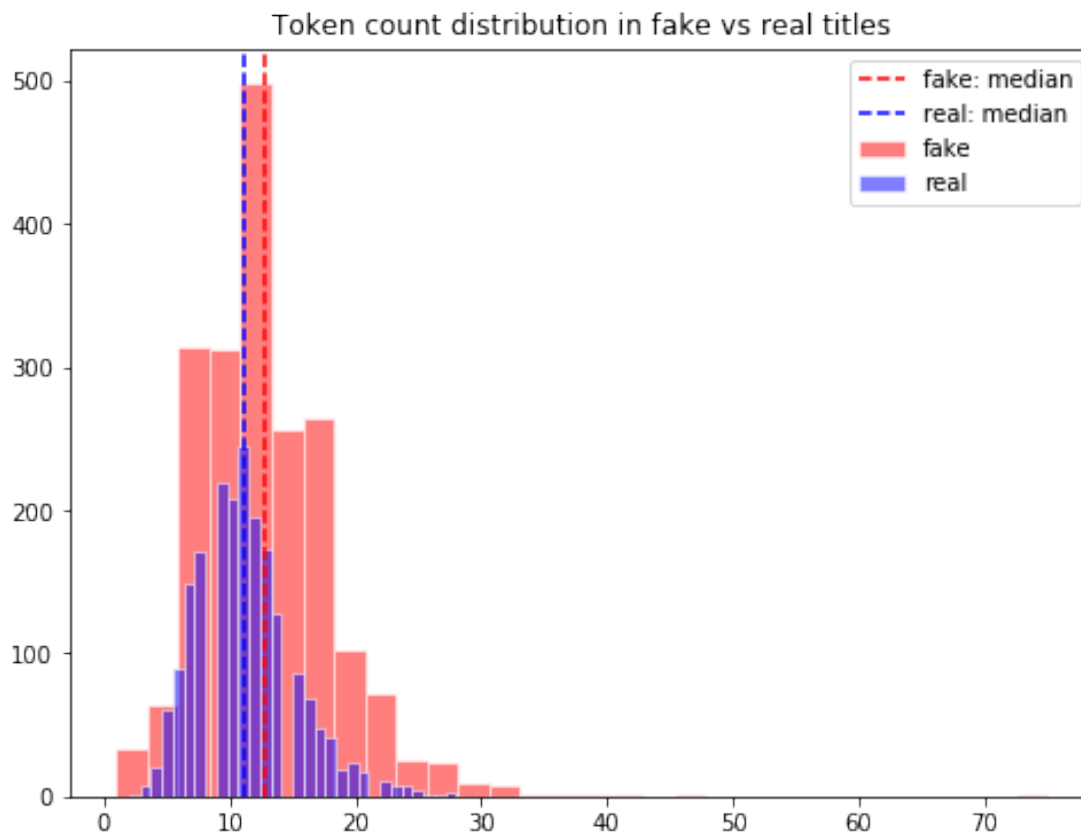
```
In [82]: plt.figure(figsize = (8,6))
plt.title("Token count distribution in fake vs real text")
plt.hist(train_text_fake_length, edgecolor = 'white', bins = 30, color = 'red', alpha = 0.5)
plt.hist(train_text_real_length, edgecolor = 'white', bins = 30, color = 'blue', alpha = 0.5)
plt.axvline(np.mean(train_text_fake_length), color = 'red', linestyle = '--', label = 'Fake Mean')
plt.axvline(np.mean(train_text_real_length), color = 'blue', linestyle = '--', label = 'Real Mean')
plt.legend()
```



```
plt.show()
```

```
plt.figure(figsize = (8,6))  
plt.title("Token count distribution in fake vs real titles")  
plt.hist(train_title_fake_length, edgecolor = 'white', bins = 30, color = 'red', alpha=0.5)  
plt.hist(train_title_real_length, edgecolor = 'white', bins = 30, color = 'blue', alpha=0.5)  
plt.axvline(np.mean(train_title_fake_length), color = 'red', linestyle = '--', label = 'fake: median')  
plt.axvline(np.mean(train_title_real_length), color = 'blue', linestyle = '--', label = 'real: median')  
plt.legend()  
plt.show()
```





An interesting thing to note is the distribution of number of tokens used in a text for fake and real texts. The number of words used for each text is smaller in general for fake news than it is for real news. We see that while most of the news are less 500 words for fake news, the distribution is more widely spread for real news.

4.1.2 Tokenization: standard `word_tokenize` from `nlTK` with stopwords

```
In [83]: # function to tokenize text with stopwords
def tokenize_stopwords(text, stopwords):
    return [t for t in nltk.word_tokenize(text) if t.lower() not in stopwords]
```

For now, I will use the standard stopwords from the `nlTK` corpus and some punctuations from python's `string` module.

```
In [84]: # define stopwords from nltk.corpus.stopwords.words('english') and string punctuation
import string
stopwords = nltk.corpus.stopwords.words('english') + list(string.punctuation)
print(stopwords)
```

```
['i', 'me', 'my', 'myself', 'we', 'our', 'ours', 'ourselves', 'you', "you're", "you've", "you!",
```

```
In [85]: # update whole tokenization function to include stopword tokenization
def tokenize_whole(series, stopword_tokenize = False, stopwords=stopwords):
    # tokenize
    if stopword_tokenize:
        tokenized = series.apply(lambda x: tokenize_stopwords(x, stopwords))
    else:
        tokenized = series.apply(lambda x: tokenize_normal(x))
    # group them all into one list
    all_tokens = []
    for i in tokenized:
        all_tokens.extend(i)
    return all_tokens

In [86]: # test tokenization with stopwords
np.random.seed(42)
top_count(tokenize_stopwords(train.loc[np.random.randint(len(train)), 'text'], stopwords
```

```
In [87]: # we see that there are some punctuations not added
         # in the standard string.punctuation
         # we can remove that by adding new punctuations to the rule
stopwords.extend(['!', ',', '.', ':', ';', '"', '\'', '"""', '"""', ',', '.', ':'])
#stopwords.remove('?')
#stopwords.remove('!!')
```

```

stopwords2 = nltk.corpus.stopwords.words('english')
for i in ['but', 'because', 'until', 'against', 'between', 'again', 'any', 'most', 'f',
        'only', 'too', 'very', "don't", 'should', "should've", "couldn't",
        "didn't", "doesn't", "hadn't", "hasn't", "haven't", "isn't", "mightn",
        "needn't", "shouldn't", "wasn't", "weren't", "won't", "wouldn't"]:
    stopwords2.remove(i)
punctuations = list(string.punctuation)
punctuations.remove('!')
punctuations.remove('?')
punctuations.extend(['', ' ', ' ', ' ', ' ', '"', '`', "'", ',', '.', ':'])

remove_2 = stopwords2 + punctuations

```

4.2 3-2. Normalization

We can use different stemmers and lemmatizers to normalize the text data. We also apply POS tagging for lemmatization so that the lemmatization process is more accurate.

```

In [89]: # function to normalize text data
        # use standard format as porterstemmer

        # method names = [ps, ls, ss, wnl]

def normalize_text(text, method, stopwords=stopwords, stop = True, lower = True):
    # tokenize text
    if stop:
        tokens = tokenize_stopwords(text, stopwords)
    else:
        tokens = tokenize_normal(text)

    # lowercase
    if lower:
        tokens_l = [t.lower() for t in tokens]
    else:
        tokens_l = tokens

    # for all stemming methods
    if method != wnl:
        # stem tokens
        stemmed_tokens = [method.stem(t) for t in tokens_l]
        return stemmed_tokens
    else:
        # lemmatize tokens
        lemmatized_tokens = [method.lemmatize(t) for t in tokens_l]
        return lemmatized_tokens

# initialize normalizing methods
ps = nltk.stem.PorterStemmer()

```

```

ls = nltk.stem.LancasterStemmer()
ss = nltk.stem.SnowballStemmer('english')
wnl = nltk.stem.WordNetLemmatizer()

```

```

In [90]: # pos tagging for lemmatization
from nltk.corpus import wordnet

```

```

def get_wordnet_pos(treebank_tag):
    if treebank_tag.startswith('J'):
        return wordnet.ADJ
    elif treebank_tag.startswith('V'):
        return wordnet.VERB
    elif treebank_tag.startswith('N'):
        return wordnet.NOUN
    elif treebank_tag.startswith('R'):
        return wordnet.ADV
    else:
        return None

def penn_to_wn(tag):
    return get_wordnet_pos(tag)

def pos_tagger_lemmatizer(tokenized_text, lemm = wnl):
    tagged = nltk.pos_tag(tokenized_text)
    lem = []
    for word, tag in tagged:
        wntag = get_wordnet_pos(tag)
        if wntag is None:
            l = lemm.lemmatize(word)
        else:
            l = lemm.lemmatize(word, pos=wntag)
        lem.append(l)
    return lem

```

```

In [91]: # normalize training text data stopwords default

```

```

train['lemmatized'] = [normalize_text(t, wnl) for t in train.text]
train['stemmed_porter'] = [normalize_text(t, ps) for t in train.text]
train['stemmed_lancaster'] = [normalize_text(t, ls) for t in train.text]
train['stemmed_snowball'] = [normalize_text(t, ss) for t in train.text]

```

```

train['lemmatized_sw2'] = [normalize_text(t, wnl, stopwords= remove_2) for t in train
train['stemmed_porter_sw2'] = [normalize_text(t, ps, stopwords= remove_2) for t in tr
train['stemmed_lancaster_sw2'] = [normalize_text(t, ls, stopwords= remove_2) for t in
train['stemmed_snowball_sw2'] = [normalize_text(t, ss, stopwords= remove_2) for t in t

```

```

In [92]: # normalize training title data

```

```

train['lemmatized_title'] = [normalize_text(t, wnl) for t in train.title]
train['stemmed_porter_title'] = [normalize_text(t, ps) for t in train.title]

```

```

train['stemmed_lancaster_title'] = [normalize_text(t, ls) for t in train.title]
train['stemmed_snowball_title'] = [normalize_text(t, ss) for t in train.title]

train['lemmatized_title_sw2'] = [normalize_text(t, wnl, stopwords= remove_2) for t in train.title]
train['stemmed_porter_title_sw2'] = [normalize_text(t, ps, stopwords= remove_2) for t in train.title]
train['stemmed_lancaster_title_sw2'] = [normalize_text(t, ls, stopwords= remove_2) for t in train.title]
train['stemmed_snowball_title_sw2'] = [normalize_text(t, ss, stopwords= remove_2) for t in train.title]

In [93]: # normalize test text data
test['lemmatized'] = [normalize_text(t, wnl) for t in test.text]
test['stemmed_porter'] = [normalize_text(t, ps) for t in test.text]
test['stemmed_lancaster'] = [normalize_text(t, ls) for t in test.text]
test['stemmed_snowball'] = [normalize_text(t, ss) for t in test.text]

test['lemmatized_sw2'] = [normalize_text(t, wnl, stopwords = remove_2) for t in test.text]
test['stemmed_porter_sw2'] = [normalize_text(t, ps, stopwords = remove_2) for t in test.text]
test['stemmed_lancaster_sw2'] = [normalize_text(t, ls, stopwords = remove_2) for t in test.text]
test['stemmed_snowball_sw2'] = [normalize_text(t, ss, stopwords = remove_2) for t in test.text]

In [94]: # normalize test title data
test['lemmatized_title'] = [normalize_text(t, wnl) for t in test.title]
test['stemmed_porter_title'] = [normalize_text(t, ps) for t in test.title]
test['stemmed_lancaster_title'] = [normalize_text(t, ls) for t in test.title]
test['stemmed_snowball_title'] = [normalize_text(t, ss) for t in test.title]

test['lemmatized_title_sw2'] = [normalize_text(t, wnl, stopwords = remove_2) for t in test.title]
test['stemmed_porter_title_sw2'] = [normalize_text(t, ps, stopwords = remove_2) for t in test.title]
test['stemmed_lancaster_title_sw2'] = [normalize_text(t, ls, stopwords = remove_2) for t in test.title]
test['stemmed_snowball_title_sw2'] = [normalize_text(t, ss, stopwords = remove_2) for t in test.title]

In [95]: # lemmatizier with pos tag
train['lemmatized_pos'] = [pos_tagger_lemmatizer(t2) for t2 in [tokenize_stopwords(t) for t in train.text]]
train['lemmatized_pos_title'] = [pos_tagger_lemmatizer(t2) for t2 in [tokenize_stopwords(t) for t in train.title]]
test['lemmatized_pos'] = [pos_tagger_lemmatizer(t2) for t2 in [tokenize_stopwords(t) for t in test.text]]
test['lemmatized_pos_title'] = [pos_tagger_lemmatizer(t2) for t2 in [tokenize_stopwords(t) for t in test.title]]

train['lemmatized_pos_sw2'] = [pos_tagger_lemmatizer(t2) for t2 in [tokenize_stopwords(t) for t in train.text]]
train['lemmatized_pos_title_sw2'] = [pos_tagger_lemmatizer(t2) for t2 in [tokenize_stopwords(t) for t in train.title]]
test['lemmatized_pos_sw2'] = [pos_tagger_lemmatizer(t2) for t2 in [tokenize_stopwords(t) for t in test.text]]
test['lemmatized_pos_title_sw2'] = [pos_tagger_lemmatizer(t2) for t2 in [tokenize_stopwords(t) for t in test.title]]

In [96]: # export current dataframe as intermediary csv files
#train.to_csv("train_tokandstem.csv")
#test.to_csv("test_tokandstem.csv")

In [97]: # view training data
train.head(2)

Out[97]:
   ID                                     title \
0   8476                                You Can Smell Hillarys Fear

```

```

1 10294 Watch The Exact Moment Paul Ryan Committed Pol...

                                text label \
0 Daniel Greenfield, a Shillman Journalism Fello... FAKE
1 Google Pinterest Digg Linkedin Reddit Stumbleu... FAKE

                                lemmatized \
0 [daniel, greenfield, shillman, journalism, fel...
1 [google, pinterest, digg, linkedin, reddit, st...

                                stemmed_porter \
0 [daniel, greenfield, shillman, journal, fellow...
1 [googl, pinterest, digg, linkedin, reddit, stu...

                                stemmed_lancaster \
0 [daniel, greenfield, shillm, journ, fellow, fr...
1 [googl, pinterest, dig, linkedin, reddit, stum...

                                stemmed_snowball \
0 [daniel, greenfield, shillman, journal, fellow...
1 [googl, pinterest, digg, linkedin, reddit, stu...

                                lemmatized_sw2 \
0 [daniel, greenfield, shillman, journalism, fel...
1 [google, pinterest, digg, linkedin, reddit, st...

                                stemmed_porter_sw2 \
0 [daniel, greenfield, shillman, journal, fellow...
1 [googl, pinterest, digg, linkedin, reddit, stu...

                                stemmed_lancaster_sw2 \
0 [daniel, greenfield, shillm, journ, fellow, fr...
1 [googl, pinterest, dig, linkedin, reddit, stum...

                                stemmed_snowball_sw2 \
0 [daniel, greenfield, shillman, journal, fellow...
1 [googl, pinterest, digg, linkedin, reddit, stu...

                                lemmatized_title \
0 [smell, hillary, fear]
1 [watch, exact, moment, paul, ryan, committed, ...

                                stemmed_porter_title \
0 [smell, hillari, fear]
1 [watch, exact, moment, paul, ryan, commit, pol...

                                stemmed_lancaster_title \
0 [smel, hil, fear]

```

```

1 [watch, exact, mom, paul, ryan, commit, polit,...
                                stemmed_snowball_title \
0                                [smell, hillari, fear]
1 [watch, exact, moment, paul, ryan, commit, pol...
                                lemmatized_title_sw2 \
0                                [smell, hillary, fear]
1 [watch, exact, moment, paul, ryan, committed, ...
                                stemmed_porter_title_sw2 \
0                                [smell, hillari, fear]
1 [watch, exact, moment, paul, ryan, commit, pol...
                                stemmed_lancaster_title_sw2 \
0                                [smel, hil, fear]
1 [watch, exact, mom, paul, ryan, commit, polit,...
                                stemmed_snowball_title_sw2 \
0                                [smell, hillari, fear]
1 [watch, exact, moment, paul, ryan, commit, pol...
                                lemmatized_pos \
0 [Daniel, Greenfield, Shillman, Journalism, Fel...
1 [Google, Pinterest, Digg, Linkedin, Reddit, St...
                                lemmatized_pos_title \
0                                [Smell, Hillary, Fear]
1 [Watch, Exact, Moment, Paul, Ryan, Committed, ...
                                lemmatized_pos_sw2 \
0 [Daniel, Greenfield, Shillman, Journalism, Fel...
1 [Google, Pinterest, Digg, Linkedin, Reddit, St...
                                lemmatized_pos_title_sw2
0                                [Smell, Hillary, Fear]
1 [Watch, Exact, Moment, Paul, Ryan, Committed, ...

```

```

In [98]: # view test data
test.head(2)

```

```

Out[98]:      ID                                title \
0  10498  September New Homes Sales Rise-Back To 1992 ...
1   2439  Why The Obamacare Doomsday Cult Can't Admit It...

                                text \
0  September New Homes Sales Rise Back To 1992 Le...
1  But when Congress debated and passed the Patie...

```



```

                                lemmatized \
0 [september, new, home, sale, rise, back, 1992,...
1 [congress, debated, passed, patient, protectio...

                                stemmed_porter \
0 [septemb, new, home, sale, rise, back, 1992, l...
1 [congress, debat, pass, patient, protect, affo...

                                stemmed_lancaster \
0 [septemb, new, hom, sal, ris, back, 1992, leve...
1 [congress, deb, pass, paty, protect, afford, c...

                                stemmed_snowball \
0 [septemb, new, home, sale, rise, back, 1992, l...
1 [congress, debat, pass, patient, protect, affo...

                                lemmatized_sw2 \
0 [september, new, home, sale, rise, back, 1992,...
1 [but, congress, debated, passed, patient, prot...

                                stemmed_porter_sw2 \
0 [septemb, new, home, sale, rise, back, 1992, l...
1 [but, congress, debat, pass, patient, protect,...

                                stemmed_lancaster_sw2 \
0 [septemb, new, hom, sal, ris, back, 1992, leve...
1 [but, congress, deb, pass, paty, protect, affo...

                                stemmed_snowball_sw2 \
0 [septemb, new, home, sale, rise, back, 1992, l...
1 [but, congress, debat, pass, patient, protect,...

                                lemmatized_title \
0 [september, new, home, sale, rise-back, 1992...
1 [obamacare, doomsday, cult, ca, n't, admit, 's...

                                stemmed_porter_title \
0 [septemb, new, home, sale, rise-back, 1992, ...
1 [obamacar, doomsday, cult, ca, n't, admit, 's,...

                                stemmed_lancaster_title \
0 [septemb, new, hom, sal, rise-back, 1992, le...
1 [obamac, doomsday, cult, ca, n't, admit, 's, w...

                                stemmed_snowball_title \
0 [septemb, new, home, sale, rise-back, 1992, ...
1 [obamacar, doomsday, cult, ca, n't, admit, 's,...

```

```

                                lemmatized_title_sw2 \
0 [september, new, home, sale, rise-back, 1992...
1 [obamacare, doomsday, cult, ca, n't, admit, 's...

                                stemmed_porter_title_sw2 \
0 [septemb, new, home, sale, rise-back, 1992, ...
1 [obamacar, doomsday, cult, ca, n't, admit, 's,...

                                stemmed_lancaster_title_sw2 \
0 [septemb, new, hom, sal, rise-back, 1992, le...
1 [obamac, doomsday, cult, ca, n't, admit, 's, w...

                                stemmed_snowball_title_sw2 \
0 [septemb, new, home, sale, rise-back, 1992, ...
1 [obamacar, doomsday, cult, ca, n't, admit, 's,...

                                lemmatized_pos \
0 [September, New, Homes, Sales, Rise, Back, 199...
1 [Congress, debate, pass, Patient, Protection, ...

                                lemmatized_pos_title \
0 [September, New, Homes, Sales, Rise-Back, 19...
1 [Obamacare, Doomsday, Cult, Ca, n't, Admit, 's...

                                lemmatized_pos_sw2 \
0 [September, New, Homes, Sales, Rise, Back, 199...
1 [But, Congress, debate, pass, Patient, Protect...

                                lemmatized_pos_title_sw2
0 [September, New, Homes, Sales, Rise-Back, 19...
1 [Obamacare, Doomsday, Cult, Ca, n't, Admit, 's...

```

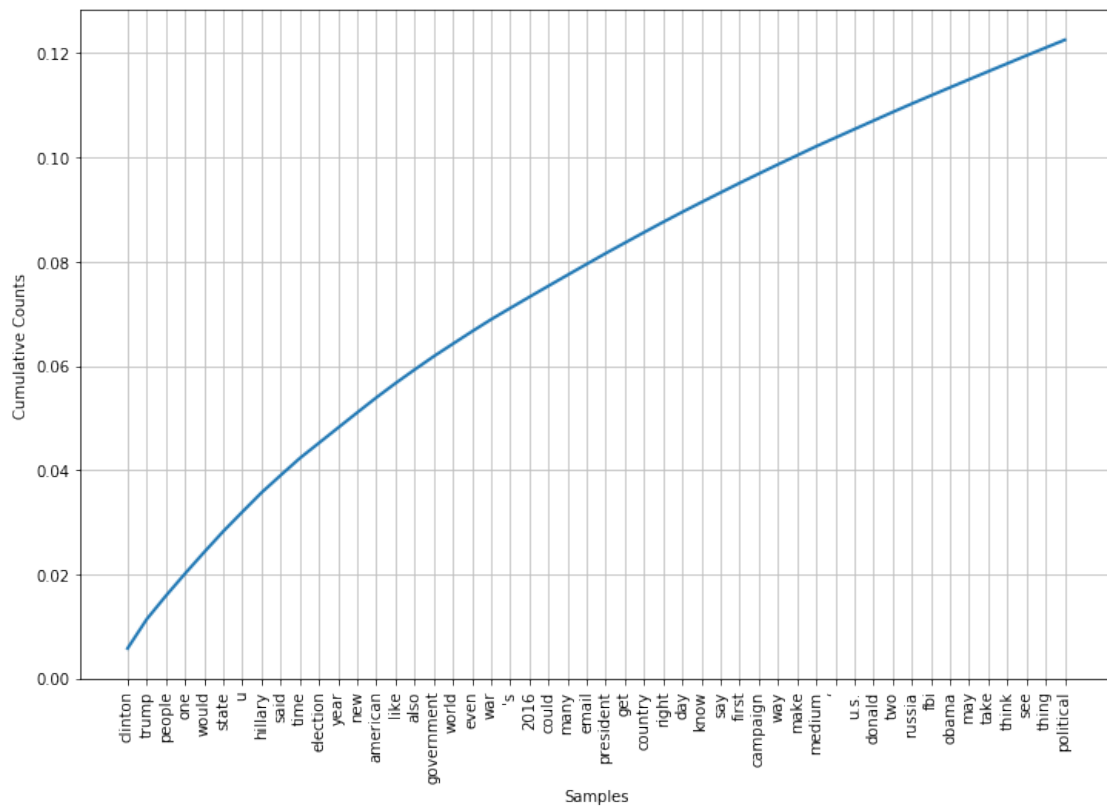
Let's look at the common words now that the stopwords are removed, and texts have been normalized.

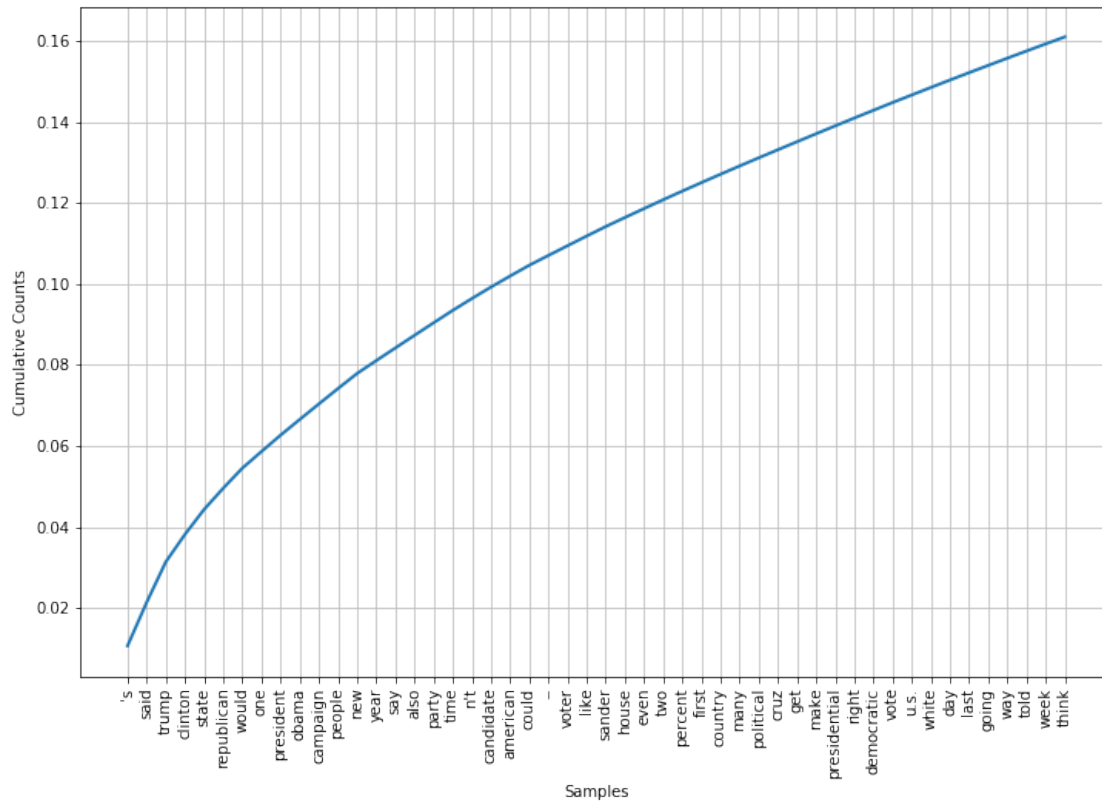
```

In [99]: def series_to_single_list(tokenized_series):
          all_list = []
          for i in tokenized_series:
              all_list.extend(i)
          return all_list

In [100]: plot_freq(series_to_single_list(train[train.label == 'FAKE'].lemmatized),prob = True)
          plot_freq(series_to_single_list(train[train.label == 'REAL'].lemmatized),prob = True)

```





4.3 3-3. Visualizing common words: Word Cloud

Let's compare the top most occurring words by 'FAKE' and 'REAL' labels. We can visualize this by using the wordcloud.

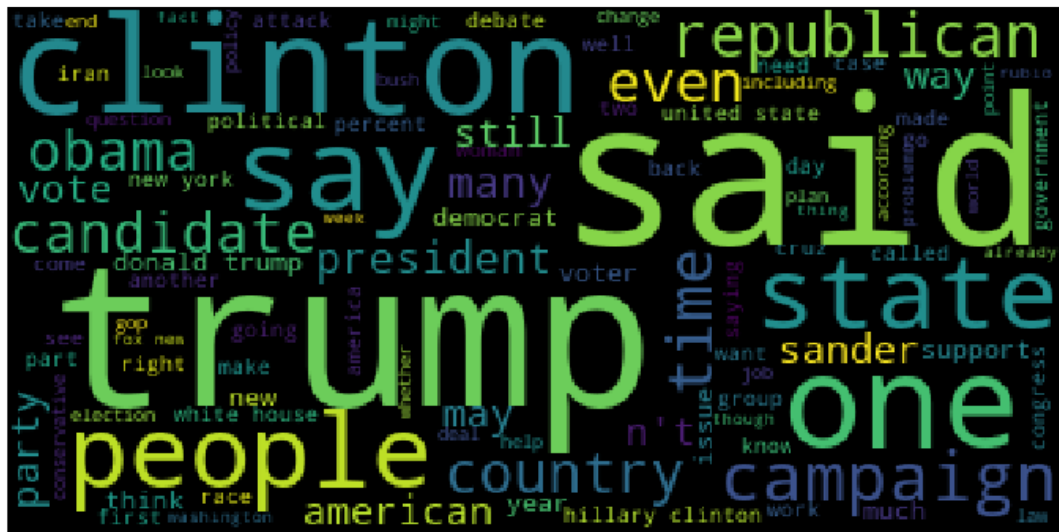
```
In [101]: # import library
          from wordcloud import WordCloud

In [102]: # function to create wordcloud
          def create_wordcloud(token_list, max_words = 100):
              # initiate wordcloud
              wc = WordCloud(max_words = max_words)
              # generate wordcloud with string of all tokens
              wc.generate_from_text(' '.join(token_list))
              # produce output
              plt.figure(figsize = (12,12))
              plt.imshow(wc)
              plt.axis('off')
              return plt.show()

In [103]: # wordcloud for single lemmatized training text for an example
          create_wordcloud(train.loc[np.random.randint(len(train)), 'lemmatized'])
```

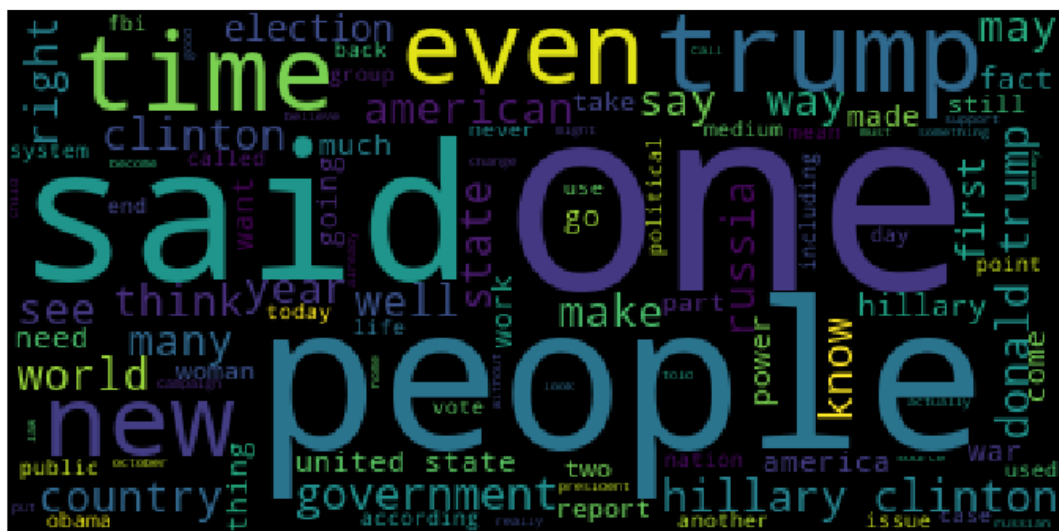


```
create_wordcloud(real_lem)
```



```
fake_lem = []
for i in train[train.label == 'FAKE'].lemmatized:
    fake_lem.extend(i)
```

```
create_wordcloud(fake_lem)
```



5 4. Modeling: Text Classifier

```
In [107]: # concat title and text
def list_to_str(lists):
    for i in range(len(lists)):
        lists[i] = " ".join(lists[i])
    return lists

train_lem = train.lemmatized_title + train.lemmatized
train_lem = list_to_str(train_lem)
test_lem = test.lemmatized_title + test.lemmatized
test_lem = list_to_str(test_lem)
train_lem_sw2 = train.lemmatized_title_sw2 + train.lemmatized_sw2
train_lem_sw2 = list_to_str(train_lem_sw2)
test_lem_sw2 = test.lemmatized_title_sw2 + test.lemmatized_sw2
test_lem_sw2 = list_to_str(test_lem_sw2)

train_ps = train.stemmed_porter_title + train.stemmed_porter
train_ps = list_to_str(train_ps)
test_ps = test.stemmed_porter_title + test.stemmed_porter
test_ps = list_to_str(test_ps)
train_ps_sw2 = train.stemmed_porter_title_sw2 + train.stemmed_porter_sw2
train_ps_sw2 = list_to_str(train_ps_sw2)
test_ps_sw2 = test.stemmed_porter_title_sw2 + test.stemmed_porter_sw2
test_ps_sw2 = list_to_str(test_ps_sw2)

train_ls = train.stemmed_lancaster_title + train.stemmed_lancaster
train_ls = list_to_str(train_ls)
test_ls = test.stemmed_lancaster_title + test.stemmed_lancaster
test_ls = list_to_str(test_ls)
train_ls_sw2 = train.stemmed_lancaster_title_sw2 + train.stemmed_lancaster_sw2
train_ls_sw2 = list_to_str(train_ls_sw2)
test_ls_sw2 = test.stemmed_lancaster_title_sw2 + test.stemmed_lancaster_sw2
test_ls_sw2 = list_to_str(test_ls_sw2)

train_ss = train.stemmed_snowball_title + train.stemmed_snowball
train_ss = list_to_str(train_ss)
test_ss = test.stemmed_snowball_title + test.stemmed_snowball
test_ss = list_to_str(test_ss)
train_ss_sw2 = train.stemmed_snowball_title_sw2 + train.stemmed_snowball_sw2
train_ss_sw2 = list_to_str(train_ss_sw2)
test_ss_sw2 = test.stemmed_snowball_title_sw2 + test.stemmed_snowball_sw2
test_ss_sw2 = list_to_str(test_ss_sw2)
```

```

train_lem_pos = train.lemmatized_pos_title + train.lemmatized_pos
train_lem_pos = list_to_str(train_lem_pos)
test_lem_pos = test.lemmatized_pos_title + test.lemmatized_pos
test_lem_pos = list_to_str(test_lem_pos)
train_lem_pos_sw2 = train.lemmatized_pos_title_sw2 + train.lemmatized_pos_sw2
train_lem_pos_sw2 = list_to_str(train_lem_pos_sw2)
test_lem_pos_sw2 = test.lemmatized_pos_title_sw2 + test.lemmatized_pos_sw2
test_lem_pos_sw2 = list_to_str(test_lem_pos_sw2)

y = train.label.replace({'FAKE':0, 'REAL':1})

```

```

In [108]: # classifiers
from sklearn.naive_bayes import MultinomialNB
from nltk.classify import NaiveBayesClassifier
from sklearn.linear_model import LogisticRegression
from nltk.classify import MaxentClassifier
from sklearn.svm import LinearSVC
from sklearn.linear_model import PassiveAggressiveClassifier, SGDClassifier
from sklearn.model_selection import cross_val_score
from sklearn.pipeline import Pipeline

# vectorizer using tfidf
from sklearn.feature_extraction.text import TfidfVectorizer
tfidf = TfidfVectorizer()

# initialize basic classifiers
mnb = MultinomialNB()
#nb = NaiveBayesClassifier()
lr = LogisticRegression()
#me = MaxentClassifier()
svc = LinearSVC()
pa = PassiveAggressiveClassifier()
sgd = SGDClassifier()

```

```

In [109]: # function to create a model based on pipeline
def classification_pipeline(classifier):
    model = Pipeline([
        ('vectorizer', TfidfVectorizer(
            tokenizer = None, preprocessor = None, lowercase = False)),
        ('classifier', classifier)
    ])
    return model

```

```

In [112]: # store mean cv score for each combination in a dataframe
scores = pd.DataFrame()
classification = [mnb, lr, svc, pa, sgd]
classification_str = ['mnb', 'lr', 'svc', 'pa', 'sgd']
text_type = [train_lem, train_ps, train_ls, train_ss, train_lem_pos]

```



```

text_type_str = ['train_lem', 'train_ps', 'train_ls', 'train_ss', 'train_lem_pos']
count = 0
for c in range(len(classification)):
    clf = classification[c]
    for t in range(len(text_type)):
        text = text_type[t]
        s = cross_val_score(classification_pipeline(clf),
                             text, y, cv = 10,
                             scoring = 'f1', verbose = 5)
        scores.loc[count, 'method'] = classification_str[c] + '_' + text_type_str[t]
        scores.loc[count, 'cv_score'] = s.mean()
        count = count+1

```

```

[CV] ...
[CV] ... , score=0.8583877995642701, total= 1.4s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s

```

```

[CV] ... , score=0.8466522678185745, total= 1.4s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.8s remaining: 0.0s

```

```

[CV] ... , score=0.8389830508474575, total= 1.3s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.1s remaining: 0.0s

```

```

[CV] ... , score=0.8425531914893616, total= 1.3s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.5s remaining: 0.0s

```

```

[CV] ... , score=0.8333333333333333, total= 1.3s
[CV] ...
[CV] ... , score=0.8577680525164114, total= 1.3s
[CV] ...
[CV] ... , score=0.8682505399568033, total= 1.4s
[CV] ...
[CV] ... , score=0.8280254777070063, total= 1.3s

```

```

[CV] ...
[CV] ... , score=0.8441558441558441, total= 1.4s
[CV] ...
[CV] ... , score=0.8382978723404255, total= 1.8s
[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.0s finished

[CV] ... , score=0.8615384615384616, total= 1.7s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.7s remaining: 0.0s

[CV] ... , score=0.843010752688172, total= 1.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.1s remaining: 0.0s

[CV] ... , score=0.8389830508474575, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.5s remaining: 0.0s

[CV] ... , score=0.8425531914893616, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.8s remaining: 0.0s

[CV] ... , score=0.840085287846482, total= 1.3s
[CV] ...
[CV] ... , score=0.8615384615384616, total= 1.2s
[CV] ...
[CV] ... , score=0.8701298701298702, total= 1.3s
[CV] ...
[CV] ... , score=0.8305084745762711, total= 1.3s
[CV] ...
[CV] ... , score=0.8434782608695651, total= 1.3s
[CV] ...
[CV] ... , score=0.8412017167381973, total= 1.4s
[CV] ...

```

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.6s finished

[CV] ... , score=0.8646288209606987, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s

[CV] ... , score=0.8382978723404254, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.6s remaining: 0.0s

[CV] ... , score=0.8354430379746836, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.0s remaining: 0.0s

[CV] ... , score=0.8407643312101911, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.5s remaining: 0.0s

[CV] ... , score=0.8369098712446352, total= 1.4s

[CV] ...

[CV] ... , score=0.8540305010893247, total= 1.3s

[CV] ...

[CV] ... , score=0.8676789587852495, total= 1.4s

[CV] ...

[CV] ... , score=0.8252631578947369, total= 1.4s

[CV] ...

[CV] ... , score=0.8398268398268398, total= 1.3s

[CV] ...

[CV] ... , score=0.8347457627118644, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.6s finished

[CV] ... , score=0.8552631578947368, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s

[CV] ... , score=0.843010752688172, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.9s remaining: 0.0s

[CV] ... , score=0.8372093023255813, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.2s remaining: 0.0s

[CV] ... , score=0.8425531914893616, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.5s remaining: 0.0s

[CV] ... , score=0.8365180467091295, total= 1.2s

[CV] ...

[CV] ... , score=0.8634361233480177, total= 1.3s

[CV] ...

[CV] ... , score=0.8645161290322582, total= 1.2s

[CV] ...

[CV] ... , score=0.8305084745762711, total= 1.4s

[CV] ...

[CV] ... , score=0.8453159041394335, total= 1.3s

[CV] ...

[CV] ... , score=0.8412017167381973, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.3s finished

[CV] ... , score=0.8504273504273504, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s

[CV] ... , score=0.8232848232848234, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.8s remaining: 0.0s

[CV] ... , score=0.8298755186721992, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.3s remaining: 0.0s

[CV] ... , score=0.8308977035490606, total= 2.2s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.4s remaining: 0.0s

[CV] ... , score=0.8250000000000001, total= 1.5s

[CV] ...

[CV] ... , score=0.8376068376068376, total= 1.5s

[CV] ...

[CV] ... , score=0.858974358974359, total= 1.5s

[CV] ...

[CV] ... , score=0.8232848232848234, total= 1.5s

[CV] ...

[CV] ... , score=0.8326359832635983, total= 1.5s

[CV] ...

[CV] ... , score=0.817427385892116, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.5s finished

[CV] ... , score=0.9122807017543859, total= 1.7s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.7s remaining: 0.0s

[CV] ... , score=0.8976377952755905, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.4s remaining: 0.0s

[CV] ... , score=0.9160305343511451, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 5.0s remaining: 0.0s

[CV] ... , score=0.9123711340206185, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.5s remaining: 0.0s

[CV] ... , score=0.8900523560209426, total= 1.6s

[CV] ...

[CV] ... , score=0.9086161879895561, total= 1.7s

[CV] ...

[CV] ... , score=0.94, total= 1.6s

[CV] ...

[CV] ... , score=0.8860103626943006, total= 1.6s

[CV] ...

[CV] ... , score=0.8997429305912596, total= 1.6s

[CV] ...

[CV] ... , score=0.9076923076923077, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 16.2s finished

[CV] ... , score=0.9118387909319899, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s

[CV] ... , score=0.9028871391076116, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.1s remaining: 0.0s

[CV] ... , score=0.9104859335038363, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.6s remaining: 0.0s

[CV] ... , score=0.902061855670103, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.2s remaining: 0.0s

[CV] ... , score=0.8923884514435695, total= 1.5s
[CV] ...
[CV] ... , score=0.9062499999999999, total= 1.4s
[CV] ...
[CV] ... , score=0.942643391521197, total= 1.3s
[CV] ...
[CV] ... , score=0.8979591836734694, total= 1.4s
[CV] ...
[CV] ... , score=0.900763358778626, total= 1.5s
[CV] ...
[CV] ... , score=0.9081632653061226, total= 1.7s
[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.1s finished

[CV] ... , score=0.9168765743073048, total= 1.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s

[CV] ... , score=0.9005235602094241, total= 1.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.9s remaining: 0.0s

[CV] ... , score=0.9002557544757034, total= 1.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.3s remaining: 0.0s

[CV] ... , score=0.9072164948453608, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.6s remaining: 0.0s

```
[CV] ... , score=0.8997429305912596, total= 1.3s
[CV] ...
[CV] ... , score=0.9062499999999999, total= 1.3s
[CV] ...
[CV] ... , score=0.95, total= 1.4s
[CV] ...
[CV] ... , score=0.8928571428571429, total= 1.4s
[CV] ...
[CV] ... , score=0.8956743002544529, total= 1.4s
[CV] ...
[CV] ... , score=0.9043927648578811, total= 1.3s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.8s finished
```

```
[CV] ... , score=0.9145728643216081, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s
```

```
[CV] ... , score=0.9028871391076116, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.8s remaining: 0.0s
```

```
[CV] ... , score=0.9048843187660668, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.2s remaining: 0.0s
```

```
[CV] ... , score=0.8992248062015503, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.5s remaining: 0.0s
```

```
[CV] ... , score=0.8923884514435695, total= 1.4s
[CV] ...
[CV] ... , score=0.9086161879895561, total= 1.4s
[CV] ...
```



```
[CV] ... , score=0.9476309226932668, total= 1.4s
[CV] ...
[CV] ... , score=0.8923076923076922, total= 1.4s
[CV] ...
[CV] ... , score=0.900763358778626, total= 1.5s
[CV] ...
[CV] ... , score=0.9081632653061226, total= 1.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.0s finished
```

```
[CV] ... , score=0.9118387909319899, total= 1.6s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.7s remaining: 0.0s
```

```
[CV] ... , score=0.9081364829396326, total= 1.6s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.3s remaining: 0.0s
```

```
[CV] ... , score=0.9156010230179028, total= 1.6s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.9s remaining: 0.0s
```

```
[CV] ... , score=0.9151670951156812, total= 1.6s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.6s remaining: 0.0s
```

```
[CV] ... , score=0.8912466843501327, total= 1.6s
[CV] ...
[CV] ... , score=0.903896103896104, total= 1.6s
[CV] ...
[CV] ... , score=0.9420654911838792, total= 1.5s
[CV] ...
[CV] ... , score=0.8917525773195877, total= 1.5s
[CV] ...
```

[CV] ... , score=0.8946015424164524, total= 1.6s
[CV] ...
[CV] ... , score=0.910941475826972, total= 1.6s
[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 16.0s finished

[CV] ... , score=0.912718204488778, total= 1.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s

[CV] ... , score=0.930232558139535, total= 1.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.0s remaining: 0.0s

[CV] ... , score=0.9305912596401028, total= 1.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.5s remaining: 0.0s

[CV] ... , score=0.9292929292929293, total= 1.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.0s remaining: 0.0s

[CV] ... , score=0.930232558139535, total= 1.6s
[CV] ...
[CV] ... , score=0.9309462915601023, total= 1.5s
[CV] ...
[CV] ... , score=0.96, total= 1.5s
[CV] ...
[CV] ... , score=0.9242424242424243, total= 1.6s
[CV] ...
[CV] ... , score=0.9172932330827068, total= 1.6s
[CV] ...
[CV] ... , score=0.9393939393939393, total= 1.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.4s finished

[CV] ... , score=0.9323308270676692, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s

[CV] ... , score=0.9408740359897172, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.8s remaining: 0.0s

[CV] ... , score=0.9363867684478373, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.2s remaining: 0.0s

[CV] ... , score=0.9326683291770573, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.6s remaining: 0.0s

[CV] ... , score=0.930232558139535, total= 1.5s

[CV] ...

[CV] ... , score=0.9258312020460358, total= 1.4s

[CV] ...

[CV] ... , score=0.9502487562189055, total= 1.3s

[CV] ...

[CV] ... , score=0.9246231155778896, total= 1.3s

[CV] ...

[CV] ... , score=0.9223057644110277, total= 1.3s

[CV] ...

[CV] ... , score=0.9343434343434343, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.8s finished

[CV] ... , score=0.9319899244332494, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s

[CV] ... , score=0.9246753246753247, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.5s remaining: 0.0s

[CV] ... , score=0.9340101522842639, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.9s remaining: 0.0s

[CV] ... , score=0.9402985074626865, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.2s remaining: 0.0s

[CV] ... , score=0.9203084832904884, total= 1.3s

[CV] ...

[CV] ... , score=0.923076923076923, total= 1.4s

[CV] ...

[CV] ... , score=0.95, total= 1.4s

[CV] ...

[CV] ... , score=0.9191919191919192, total= 1.3s

[CV] ...

[CV] ... , score=0.9118387909319899, total= 1.8s

[CV] ...

[CV] ... , score=0.9226932668329176, total= 1.8s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.3s finished

[CV] ... , score=0.9323308270676692, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.6s remaining: 0.0s

[CV] ... , score=0.9405684754521964, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.0s remaining: 0.0s

[CV] ... , score=0.9390862944162437, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.4s remaining: 0.0s

[CV] ... , score=0.93, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.8s remaining: 0.0s

[CV] ... , score=0.927461139896373, total= 1.4s

[CV] ...

[CV] ... , score=0.9258312020460358, total= 1.3s

[CV] ...

[CV] ... , score=0.9502487562189055, total= 1.3s

[CV] ...

[CV] ... , score=0.9246231155778896, total= 1.3s

[CV] ...

[CV] ... , score=0.9195979899497487, total= 1.3s

[CV] ...

[CV] ... , score=0.9343434343434343, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.7s finished

[CV] ... , score=0.9402985074626865, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.6s remaining: 0.0s

[CV] ... , score=0.9405684754521964, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.2s remaining: 0.0s

[CV] ... , score=0.9518987341772152, total= 1.5s

[CV] ...

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.6s remaining: 0.0s
```

```
[CV] ... , score=0.9353233830845771, total= 1.4s
```

```
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.1s remaining: 0.0s
```

```
[CV] ... , score=0.9378238341968912, total= 1.4s
```

```
[CV] ...
```

```
[CV] ... , score=0.9309462915601023, total= 1.6s
```

```
[CV] ...
```

```
[CV] ... , score=0.9625935162094762, total= 1.5s
```

```
[CV] ...
```

```
[CV] ... , score=0.9242424242424243, total= 1.5s
```

```
[CV] ...
```

```
[CV] ... , score=0.9242424242424242, total= 1.4s
```

```
[CV] ...
```

```
[CV] ... , score=0.9292929292929293, total= 1.4s
```

```
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.0s finished
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
```

```
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s
```

```
[CV] ... , score=0.9330024813895781, total= 1.3s
```

```
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
```

```
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.8s remaining: 0.0s
```

```
[CV] ... , score=0.9282051282051281, total= 1.4s
```

```
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
```

```
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.3s remaining: 0.0s
```

```
[CV] ... , score=0.9370277078085643, total= 1.5s
```

```
[CV] ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done    4 out of    4 | elapsed:    5.7s remaining:    0.0s

[CV] ... , score=0.9306930693069307, total=    1.5s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9340101522842639, total=    1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9265822784810127, total=    1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9554455445544553, total=    1.5s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9265822784810127, total=    1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9140049140049139, total=    1.3s
[CV] ...

```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.0s finished
```

```
[CV] ... , score=0.9346733668341709, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s
```

```
[CV] ... , score=0.9203980099502488, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.5s remaining: 0.0s
```

```
[CV] ... , score=0.9340101522842639, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.8s remaining: 0.0s
```

```
[CV] ... , score=0.93, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9207920792079208, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```



```
[CV] ... , score=0.9269521410579346, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9187817258883249, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9528535980148882, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.925, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.912718204488778, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.4s finished
```

```
[CV] ... , score=0.9319899244332494, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s
```

```
[CV] ... , score=0.9303482587064678, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.7s remaining: 0.0s
```

```
[CV] ... , score=0.9203084832904884, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.1s remaining: 0.0s
```

```
[CV] ... , score=0.9253731343283582, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.5s remaining: 0.0s
```

```
[CV] ... , score=0.9207920792079208, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9246231155778896, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9177057356608479, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9504950495049505, total= 1.2s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9296482412060302, total= 1.2s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9104477611940299, total= 1.2s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.1s finished
```

```
[CV] ... , score=0.923076923076923, total= 1.2s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s
```

```
[CV] ... , score=0.9362745098039216, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.5s remaining: 0.0s
```

```
[CV] ... , score=0.9387755102040817, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.9s remaining: 0.0s
```

```
[CV] ... , score=0.9203980099502488, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.3s remaining: 0.0s
```

```
[CV] ... , score=0.918918918918919, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9262086513994912, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9168765743073048, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9447236180904522, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9280397022332506, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9185185185185186, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.7s finished
```

```
[CV] ... , score=0.9326683291770573, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.6s remaining: 0.0s
```

```
[CV] ... , score=0.942643391521197, total= 1.6s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.2s remaining: 0.0s
```

```
[CV] ... , score=0.9408740359897172, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.6s remaining: 0.0s
```

```
[CV] ... , score=0.9597989949748743, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9276807980049875, total= 1.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9487179487179487, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.921119592875318, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9576059850374063, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9273182957393483, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9276807980049875, total= 1.8s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.8s finished
```

```
[CV] ... , score=0.9346733668341709, total= 1.6s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s
```

```
[CV] ... , score=0.9145728643216081, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.0s remaining: 0.0s
```

```
[CV] ... , score=0.9282051282051281, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.4s remaining: 0.0s
```

```
[CV] ... , score=0.9384615384615386, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.0s remaining: 0.0s
```

```
[CV] ... , score=0.9203980099502488, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9246753246753247, total= 1.8s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9309462915601023, total= 1.7s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9521410579345089, total= 1.6s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.93, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9226932668329176, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.4s finished
```

```
[CV] ... , score=0.9215189873417723, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9283950617283949, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.9s remaining: 0.0s
```

```
[CV] ... , score=0.9323308270676692, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.4s remaining: 0.0s
```



```
[CV] ... , score=0.9265822784810127, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.7s remaining: 0.0s
```

```
[CV] ... , score=0.9257425742574258, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.931297709923664, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9238578680203046, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9450000000000001, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9191919191919192, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9276807980049875, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9269521410579346, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.1s finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s
```

```
[CV] ... , score=0.9346733668341709, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.0s remaining: 0.0s
```

```
[CV] ... , score=0.9166666666666666, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.4s remaining: 0.0s
```

```
[CV] ... , score=0.9420289855072463, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.7s remaining: 0.0s
```

```
[CV] ... , score=0.9211822660098522, total= 1.3s
[CV] ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9292929292929293, total=    1.2s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.912718204488778, total=    1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.95, total=    1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9040404040404041, total=    1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9223057644110277, total=    1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed:   13.4s finished

[CV] ... , score=0.9108910891089109, total=    1.2s
[CV] ...

```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   1 out of   1 | elapsed:   1.3s remaining:   0.0s

[CV] ... , score=0.9276807980049875, total=   1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   2 out of   2 | elapsed:   2.8s remaining:   0.0s

[CV] ... , score=0.9267015706806282, total=   1.5s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   4.5s remaining:   0.0s

[CV] ... , score=0.9363867684478373, total=   1.7s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   4 out of   4 | elapsed:   5.9s remaining:   0.0s

[CV] ... , score=0.9191919191919192, total=   1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9309462915601023, total=   1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9137055837563451, total=   1.5s
[CV] ...

```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9523809523809523, total=    1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.925, total=    1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9168765743073047, total=    1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed:    14.4s finished

[CV] ... , score=0.9269521410579346, total=    1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed:    1.4s remaining:    0.0s

[CV] ... , score=0.9349999999999999, total=    1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed:    2.8s remaining:    0.0s

[CV] ... , score=0.9267015706806282, total=    1.4s
[CV] ...

```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:    4.5s remaining:    0.0s
```

```
[CV] ... , score=0.9571788413098237, total=   1.7s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   4 out of   4 | elapsed:    5.9s remaining:    0.0s
```

```
[CV] ... , score=0.9268292682926829, total=   1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9363867684478373, total=   1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9269521410579346, total=   1.7s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9624060150375939, total=   1.6s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9316455696202532, total=   1.7s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9177057356608479, total= 1.8s
[CV] ...
[CV] ... , score=0.9316455696202531, total= 1.5s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.7s finished
```

```
In [113]: # store mean cv score for each combination in a dataframe
scores2 = pd.DataFrame()
classification = [mnf, lr, svc, pa, sgd]
classification_str = ['mnf', 'lr', 'svc', 'pa', 'sgd']
text_type = [train_lem_sw2, train_ps_sw2, train_ls_sw2, train_ss_sw2, train_lem_pos_sw2]
text_type_str = ['train_lem_sw2', 'train_ps_sw2', 'train_ls_sw2', 'train_ss_sw2', 'train_lem_pos_sw2']
count = 0
for c in range(len(classification)):
    clf = classification[c]
    for t in range(len(text_type)):
        text = text_type[t]
        s = cross_val_score(classification_pipeline(clf),
                             text, y, cv = 10,
                             scoring = 'f1', verbose = 5)
        scores2.loc[count, 'method'] = classification_str[c] + '_' + text_type_str[t]
        scores2.loc[count, 'cv_score'] = s.mean()
        count = count+1
```

```
[CV] ...
[CV] ... , score=0.8602620087336246, total= 1.9s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.9s remaining: 0.0s
```

```
[CV] ... , score=0.8412017167381974, total= 1.6s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.5s remaining: 0.0s
```

```
[CV] ... , score=0.8372093023255813, total= 1.5s
[CV] ...
```

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 5.0s remaining: 0.0s

[CV] ... , score=0.8389830508474575, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.6s remaining: 0.0s

[CV] ... , score=0.835117773019272, total= 1.5s

[CV] ...

[CV] ... , score=0.8540305010893247, total= 1.7s

[CV] ...

[CV] ... , score=0.8682505399568033, total= 1.4s

[CV] ...

[CV] ... , score=0.8287526427061309, total= 1.4s

[CV] ...

[CV] ... , score=0.8387096774193549, total= 1.4s

[CV] ...

[CV] ... , score=0.8365180467091295, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.5s finished

[CV] ... , score=0.8665207877461706, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s

[CV] ... , score=0.843010752688172, total= 1.3s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.6s remaining: 0.0s

[CV] ... , score=0.8389830508474575, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.0s remaining: 0.0s

[CV] ... , score=0.8354430379746836, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.4s remaining: 0.0s

[CV] ... , score=0.8382978723404254, total= 1.3s
[CV] ...
[CV] ... , score=0.8558951965065502, total= 1.5s
[CV] ...
[CV] ... , score=0.8663793103448276, total= 1.3s
[CV] ...
[CV] ... , score=0.8305084745762711, total= 1.5s
[CV] ...
[CV] ... , score=0.8416485900216919, total= 1.3s
[CV] ...
[CV] ... , score=0.8412017167381973, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.7s finished

[CV] ... , score=0.8671023965141613, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s

[CV] ... , score=0.8365180467091295, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.6s remaining: 0.0s

[CV] ... , score=0.8354430379746836, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.9s remaining: 0.0s

[CV] ... , score=0.8407643312101911, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.3s remaining: 0.0s

```
[CV] ... , score=0.835117773019272, total= 1.3s
[CV] ...
[CV] ... , score=0.8540305010893247, total= 1.3s
[CV] ...
[CV] ... , score=0.8695652173913043, total= 1.3s
[CV] ...
[CV] ... , score=0.8277310924369747, total= 1.6s
[CV] ...
[CV] ... , score=0.8380129589632829, total= 1.3s
[CV] ...
[CV] ... , score=0.8312236286919832, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.4s finished
```

```
[CV] ... , score=0.8577680525164114, total= 1.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s
```

```
[CV] ... , score=0.843010752688172, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.9s remaining: 0.0s
```

```
[CV] ... , score=0.8372093023255813, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.3s remaining: 0.0s
```

```
[CV] ... , score=0.8354430379746836, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.7s remaining: 0.0s
```

```
[CV] ... , score=0.8340425531914893, total= 1.4s
[CV] ...
[CV] ... , score=0.8577680525164114, total= 2.0s
[CV] ...
```

```
[CV] ... , score=0.8645161290322582, total= 1.9s
[CV] ...
[CV] ... , score=0.832271762208068, total= 1.6s
[CV] ...
[CV] ... , score=0.8398268398268398, total= 1.3s
[CV] ...
[CV] ... , score=0.8436830835117772, total= 1.3s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.3s finished
```

```
[CV] ... , score=0.8468085106382979, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s
```

```
[CV] ... , score=0.8250000000000001, total= 1.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.0s remaining: 0.0s
```

```
[CV] ... , score=0.8247422680412371, total= 1.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.5s remaining: 0.0s
```

```
[CV] ... , score=0.8316008316008315, total= 1.8s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.4s remaining: 0.0s
```

```
[CV] ... , score=0.8215767634854771, total= 1.5s
[CV] ...
[CV] ... , score=0.8376068376068376, total= 1.6s
[CV] ...
[CV] ... , score=0.8535031847133758, total= 1.5s
[CV] ...
[CV] ... , score=0.8215767634854771, total= 1.5s
[CV] ...
```

[CV] ... , score=0.8308977035490605, total= 1.5s
[CV] ...
[CV] ... , score=0.817427385892116, total= 1.6s
[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.6s finished

[CV] ... , score=0.9122807017543859, total= 1.6s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.6s remaining: 0.0s

[CV] ... , score=0.8952879581151834, total= 1.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.1s remaining: 0.0s

[CV] ... , score=0.9187817258883249, total= 1.7s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.9s remaining: 0.0s

[CV] ... , score=0.9043927648578812, total= 1.9s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.8s remaining: 0.0s

[CV] ... , score=0.8900523560209426, total= 1.5s
[CV] ...
[CV] ... , score=0.9033942558746736, total= 1.5s
[CV] ...
[CV] ... , score=0.9450000000000001, total= 1.5s
[CV] ...
[CV] ... , score=0.8831168831168832, total= 1.5s
[CV] ...
[CV] ... , score=0.8969072164948454, total= 1.5s
[CV] ...
[CV] ... , score=0.9076923076923077, total= 1.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.8s finished

[CV] ... , score=0.9118387909319899, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s

[CV] ... , score=0.9005235602094241, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.9s remaining: 0.0s

[CV] ... , score=0.913265306122449, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.3s remaining: 0.0s

[CV] ... , score=0.9095607235142119, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.7s remaining: 0.0s

[CV] ... , score=0.8906250000000001, total= 1.4s

[CV] ...

[CV] ... , score=0.905759162303665, total= 1.4s

[CV] ...

[CV] ... , score=0.9502487562189055, total= 1.4s

[CV] ...

[CV] ... , score=0.9002557544757034, total= 1.4s

[CV] ...

[CV] ... , score=0.9063291139240507, total= 1.4s

[CV] ...

[CV] ... , score=0.9104859335038362, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.1s finished

[CV] ... , score=0.9242424242424243, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s

[CV] ... , score=0.905759162303665, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.9s remaining: 0.0s

[CV] ... , score=0.9081632653061225, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.3s remaining: 0.0s

[CV] ... , score=0.9072164948453608, total= 1.4s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.7s remaining: 0.0s

[CV] ... , score=0.902061855670103, total= 1.4s

[CV] ...

[CV] ... , score=0.9090909090909092, total= 1.5s

[CV] ...

[CV] ... , score=0.9526184538653366, total= 1.4s

[CV] ...

[CV] ... , score=0.8900255754475703, total= 1.5s

[CV] ...

[CV] ... , score=0.8962025316455695, total= 1.5s

[CV] ...

[CV] ... , score=0.9072164948453608, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.5s finished

[CV] ... , score=0.9145728643216081, total= 1.7s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.8s remaining: 0.0s

[CV] ... , score=0.9005235602094241, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.3s remaining: 0.0s

[CV] ... , score=0.9076923076923077, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.9s remaining: 0.0s

[CV] ... , score=0.903896103896104, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.4s remaining: 0.0s

[CV] ... , score=0.8906250000000001, total= 1.6s

[CV] ...

[CV] ... , score=0.905759162303665, total= 1.6s

[CV] ...

[CV] ... , score=0.9502487562189055, total= 1.6s

[CV] ...

[CV] ... , score=0.8974358974358974, total= 1.6s

[CV] ...

[CV] ... , score=0.9090909090909091, total= 1.6s

[CV] ...

[CV] ... , score=0.9104859335038362, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 16.0s finished

[CV] ... , score=0.9118387909319899, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.7s remaining: 0.0s

[CV] ... , score=0.9114583333333334, total= 1.7s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.3s remaining: 0.0s

[CV] ... , score=0.9160305343511451, total= 1.7s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 5.0s remaining: 0.0s

[CV] ... , score=0.9123711340206185, total= 1.7s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.7s remaining: 0.0s

[CV] ... , score=0.8941798941798942, total= 1.7s

[CV] ...

[CV] ... , score=0.9062499999999999, total= 1.7s

[CV] ...

[CV] ... , score=0.945273631840796, total= 1.7s

[CV] ...

[CV] ... , score=0.8917525773195877, total= 1.7s

[CV] ...

[CV] ... , score=0.8951406649616369, total= 1.7s

[CV] ...

[CV] ... , score=0.9137055837563451, total= 1.7s

[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 16.8s finished

[CV] ... , score=0.925, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.6s remaining: 0.0s

[CV] ... , score=0.9270833333333333, total= 1.6s

[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.2s remaining: 0.0s

[CV] ... , score=0.9333333333333332, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.7s remaining: 0.0s

[CV] ... , score=0.9265822784810127, total= 1.5s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.2s remaining: 0.0s

[CV] ... , score=0.9326424870466321, total= 1.4s
[CV] ...
[CV] ... , score=0.9333333333333332, total= 1.4s
[CV] ...
[CV] ... , score=0.9625935162094762, total= 1.4s
[CV] ...
[CV] ... , score=0.9219143576826196, total= 1.6s
[CV] ...
[CV] ... , score=0.9118387909319899, total= 2.2s
[CV] ...
[CV] ... , score=0.9387755102040817, total= 1.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.8s finished

[CV] ... , score=0.9326683291770573, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s

[CV] ... , score=0.9387755102040817, total= 1.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.7s remaining: 0.0s

[CV] ... , score=0.9387755102040817, total= 1.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.1s remaining: 0.0s

[CV] ... , score=0.9276807980049875, total= 1.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.6s remaining: 0.0s

```

[CV] ... , score=0.9250645994832042, total= 1.5s
[CV] ...
[CV] ... , score=0.9340101522842639, total= 1.4s
[CV] ...
[CV] ... , score=0.9528535980148882, total= 1.4s
[CV] ...
[CV] ... , score=0.9242424242424243, total= 1.3s
[CV] ...
[CV] ... , score=0.9296482412060301, total= 1.4s
[CV] ...
[CV] ... , score=0.9393939393939393, total= 1.4s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.9s finished

```

```

[CV] ... , score=0.93734335839599, total= 1.4s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s

```

```

[CV] ... , score=0.9222797927461139, total= 1.5s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.9s remaining: 0.0s

```

```

[CV] ... , score=0.9393939393939394, total= 1.5s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.4s remaining: 0.0s

```

```

[CV] ... , score=0.9326683291770573, total= 1.5s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.9s remaining: 0.0s

```

```

[CV] ... , score=0.9119170984455959, total= 1.4s
[CV] ...
[CV] ... , score=0.9262086513994912, total= 1.4s
[CV] ...

```

```
[CV] ... , score=0.9502487562189055, total= 1.4s
[CV] ...
[CV] ... , score=0.9187817258883249, total= 1.5s
[CV] ...
[CV] ... , score=0.9168765743073047, total= 1.5s
[CV] ...
[CV] ... , score=0.92, total= 1.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.5s finished
```

```
[CV] ... , score=0.9349999999999999, total= 1.6s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.6s remaining: 0.0s
```

```
[CV] ... , score=0.9411764705882353, total= 1.7s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.3s remaining: 0.0s
```

```
[CV] ... , score=0.9414758269720102, total= 1.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.8s remaining: 0.0s
```

```
[CV] ... , score=0.9276807980049875, total= 1.6s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.4s remaining: 0.0s
```

```
[CV] ... , score=0.9226804123711341, total= 1.6s
[CV] ...
[CV] ... , score=0.9289340101522843, total= 1.8s
[CV] ...
[CV] ... , score=0.9504950495049505, total= 1.6s
[CV] ...
[CV] ... , score=0.9242424242424243, total= 1.5s
[CV] ...
```

[CV] ... , score=0.9323308270676693, total= 1.5s
[CV] ...
[CV] ... , score=0.9417721518987343, total= 1.6s
[CV] ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 16.0s finished

[CV] ... , score=0.9402985074626865, total= 1.7s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.7s remaining: 0.0s

[CV] ... , score=0.9329896907216496, total= 1.7s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.4s remaining: 0.0s

[CV] ... , score=0.949748743718593, total= 1.8s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 5.2s remaining: 0.0s

[CV] ... , score=0.9303482587064678, total= 1.8s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 7.1s remaining: 0.0s

[CV] ... , score=0.9430051813471503, total= 1.7s
[CV] ...
[CV] ... , score=0.9305912596401028, total= 1.7s
[CV] ...
[CV] ... , score=0.9547738693467337, total= 1.7s
[CV] ...
[CV] ... , score=0.9219143576826196, total= 1.6s
[CV] ...
[CV] ... , score=0.9242424242424242, total= 1.7s
[CV] ...
[CV] ... , score=0.9343434343434343, total= 1.7s
[CV] ...

```

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 17.2s finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9273182957393483, total= 1.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.8s remaining: 0.0s

[CV] ... , score=0.93573264781491, total= 1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.2s remaining: 0.0s

[CV] ... , score=0.9396984924623115, total= 1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.6s remaining: 0.0s

[CV] ... , score=0.9306930693069307, total= 1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9367088607594938, total= 1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... , score=0.9262086513994912, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9580246913580247, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9177057356608479, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9276807980049875, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.3s finished
```

```
[CV] ... , score=0.9393939393939393, total= 1.6s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s
```

```
[CV] ... , score=0.93734335839599, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.9s remaining: 0.0s
```

```
[CV] ... , score=0.9381443298969072, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.2s remaining: 0.0s
```

```
[CV] ... , score=0.9269521410579346, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.6s remaining: 0.0s
```

```
[CV] ... , score=0.913151364764268, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9265822784810127, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9219143576826196, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9578163771712159, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9323308270676692, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9207920792079208, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.1s finished
```

```
[CV] ... , score=0.935, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s
```

```
[CV] ... , score=0.9408866995073892, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9238578680203046, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.1s remaining: 0.0s
```

```
[CV] ... , score=0.9330024813895781, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.5s remaining: 0.0s
```



```
[CV] ... , score=0.9144254278728606, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9262086513994912, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9145728643216081, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9504950495049505, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9242424242424243, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9135802469135802, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.2s finished
```

```
[CV] ... , score=0.9181141439205954, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s
```

```
[CV] ... , score=0.9346733668341709, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.6s remaining: 0.0s
```

```
[CV] ... , score=0.9387755102040817, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.0s remaining: 0.0s
```

```
[CV] ... , score=0.9429280397022333, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.4s remaining: 0.0s
```

```
[CV] ... , score=0.9193154034229828, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9238578680203046, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9164556962025316, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.945273631840796, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9346733668341709, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9154228855721394, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.4s finished
```

```
[CV] ... , score=0.93, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s
```

```
[CV] ... , score=0.942643391521197, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.1s remaining: 0.0s
```

```
[CV] ... , score=0.9333333333333332, total= 1.6s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.6s remaining: 0.0s
```

```
[CV] ... , score=0.9576059850374063, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.1s remaining: 0.0s
```

```
[CV] ... , score=0.9303482587064678, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9487179487179487, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9309462915601023, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9603960396039605, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9296482412060302, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9257425742574258, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.2s finished
```

```
[CV] ... , score=0.9323308270676693, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s
```

```
[CV] ... , score=0.9219143576826196, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.9s remaining: 0.0s
```

```
[CV] ... , score=0.9071618037135277, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.4s remaining: 0.0s
```

```
[CV] ... , score=0.9414758269720102, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.8s remaining: 0.0s
```

```
[CV] ... , score=0.9226932668329176, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9218749999999999, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9340101522842639, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9550000000000001, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9226932668329176, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.925, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.5s finished
```

```
[CV] ... , score=0.9370277078085644, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s
```

```
[CV] ... , score=0.9303482587064678, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.7s remaining: 0.0s
```

```
[CV] ... , score=0.9329896907216496, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.0s remaining: 0.0s
```

```
[CV] ... , score=0.9360613810741688, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.3s remaining: 0.0s
```

```
[CV] ... , score=0.9181141439205955, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9164556962025316, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9269521410579346, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9492385786802031, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9273182957393483, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9226932668329176, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.6s finished
```

```
[CV] ... , score=0.9330024813895781, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s
```

```
[CV] ... , score=0.9353233830845771, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.7s remaining: 0.0s
```



```
[CV] ... , score=0.9289340101522843, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.0s remaining: 0.0s
```

```
[CV] ... , score=0.9367088607594938, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.4s remaining: 0.0s
```

```
[CV] ... , score=0.9172932330827067, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9195979899497488, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9203084832904884, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9655172413793103, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9086294416243654, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9090909090909091, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.6s finished
```

```
[CV] ... , score=0.9121951219512194, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s
```

```
[CV] ... , score=0.9283950617283949, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.3s remaining: 0.0s
```

```
[CV] ... , score=0.9417721518987341, total= 1.8s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.7s remaining: 0.0s
```

```
[CV] ... , score=0.9343065693430657, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.0s remaining: 0.0s
```

```
[CV] ... , score=0.9158415841584159, total= 1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9194805194805195, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.917098445595855, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9528535980148882, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9326683291770573, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.923076923076923, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.3s finished
```

```
[CV] ... , score=0.9326683291770573, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s
```

```
[CV] ... , score=0.9316455696202532, total= 1.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9347258485639688, total= 1.7s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 5.2s remaining: 0.0s
```

```
[CV] ... , score=0.9578163771712159, total= 2.0s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9336734693877551, total= 1.8s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 7.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9405684754521964, total= 1.7s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9270833333333333, total= 1.6s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9601990049751243, total= 1.7s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9276807980049875, total= 1.8s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9219143576826196, total= 1.9s
[CV] ...
[CV] ... , score=0.9363867684478372, total= 1.5s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 17.3s finished
```

```
In [114]: #function pass in classification pipeline + ngram grid search
from sklearn.feature_extraction.text import CountVectorizer, TfidfTransformer
from sklearn.model_selection import RandomizedSearchCV, GridSearchCV
def classification_pipeline_ngram(classifier):
    model = Pipeline([
        ('countvec', CountVectorizer()),
        ('tfidf', TfidfTransformer()),
        ('classifier', classifier)
    ])
    return model

ng_param = {'countvec__ngram_range': ((1,1), (1,2), (1,3))}

def ngram_grid_search(classifier,x,y):
    grid = GridSearchCV(classification_pipeline_ngram(classifier),
```

```

                                ng_param, cv = 10, verbose = 10)

        grid.fit(x, y)
        return grid

In [ ]: # store mean cv score for each combination in a dataframe
scores3 = pd.DataFrame()
classification = [mnbc, lr, svc, pa, sgd]
classification_str = ['mnbc_ngram', 'lr_ngram', 'svc_ngram', 'pa_ngram', 'sgd_ngram']
text_type = [train_lem, train_ps, train_ls, train_ss, train_lem_pos]
text_type_str = ['train_lem', 'train_ps', 'train_ls', 'train_ss', 'train_lem_pos']
count = 0
for c in range(len(classification)):
    clf = classification[c]
    for t in range(len(text_type)):
        text = text_type[t]
        g = ngram_grid_search(clf, text, y)
        s = cross_val_score(g.best_estimator_,
                             text, y, cv = 10,
                             scoring = 'f1', verbose = 5)
        scores3.loc[count, 'method'] = classification_str[c] + '_' + text_type_str[t]
        scores3.loc[count, 'cv_score'] = s.mean()
        count = count+1

In [117]: # store mean cv score for each combination in a dataframe
scores4 = pd.DataFrame()
classification = [mnbc, lr, svc, pa, sgd]
classification_str = ['mnbc_ngram', 'lr_ngram', 'svc_ngram', 'pa_ngram', 'sgd_ngram']
text_type = [train_lem_sw2, train_ps_sw2, train_ls_sw2, train_ss_sw2]
text_type_str = ['train_lem_sw2', 'train_ps_sw2', 'train_ls_sw2', 'train_ss_sw2']
count = 0
for c in range(len(classification)):
    clf = classification[c]
    for t in range(len(text_type)):
        text = text_type[t]
        g = ngram_grid_search(clf, text, y)
        s = cross_val_score(g.best_estimator_,
                             text, y, cv = 10,
                             scoring = 'f1', verbose = 5)
        scores4.loc[count, 'method'] = classification_str[c] + '_' + text_type_str[t]
        scores4.loc[count, 'cv_score'] = s.mean()
        count = count+1

Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...
[CV] countvec__ngram_range=(1, 1), score=0.8403990024937655, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.8s remaining: 0.0s

```

```

[CV] ... countvec_ngram_range=(1, 1), score=0.815, total= 1.5s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.6s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.8075, total= 1.5s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.4s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.81, total= 1.5s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 11.2s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.8075, total= 1.5s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 14.0s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.8325, total= 1.5s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 16.9s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.8475, total= 1.5s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 19.6s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.7975, total= 1.5s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 22.4s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.8120300751879699, total= 1.5s
[CV] countvec_ngram_range=(1, 1) ...

```

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 25.2s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.8070175438596491, total= 1.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.8104738154613467, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.78, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.7575, total= 8.9s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.78, total= 9.1s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.775, total= 9.0s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.805, total= 9.1s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.8075, total= 8.8s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.7725, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.7894736842105263, total= 8.4s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.7719298245614035, total= 8.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.8129675810473815, total= 18.1s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.7825, total= 18.8s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.7725, total= 18.2s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.7925, total= 17.9s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.7925, total= 18.0s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.8175, total= 18.0s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.815, total= 18.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.775, total= 18.1s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.7944862155388471, total= 18.0s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.7819548872180451, total= 17.7s

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.6min finished


```

[CV] ...
[CV] ... , score=0.8602620087336246, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s

[CV] ... , score=0.8412017167381974, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.6s remaining: 0.0s

[CV] ... , score=0.8372093023255813, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.0s remaining: 0.0s

[CV] ... , score=0.8389830508474575, total= 1.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.4s remaining: 0.0s

[CV] ... , score=0.835117773019272, total= 1.5s
[CV] ...
[CV] ... , score=0.8540305010893247, total= 1.5s
[CV] ...
[CV] ... , score=0.8682505399568033, total= 1.5s
[CV] ...
[CV] ... , score=0.8287526427061309, total= 1.5s
[CV] ...
[CV] ... , score=0.8387096774193549, total= 1.5s
[CV] ...
[CV] ... , score=0.8365180467091295, total= 1.5s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.4s finished

[CV] countvec_ngram_range=(1, 1), score=0.8478802992518704, total= 1.4s
[CV] countvec_ngram_range=(1, 1) ...

```

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.6s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.8175, total= 1.4s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.3s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.81, total= 1.4s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.9s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.805, total= 1.4s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.5s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.81, total= 1.4s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 13.1s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.835, total= 1.4s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 15.9s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.845, total= 1.5s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 18.7s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.8, total= 1.5s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 21.5s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.8170426065162907, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 24.4s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.8145363408521303, total= 1.5s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.8054862842892768, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.7775, total= 8.4s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.7525, total= 8.1s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.7775, total= 8.4s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.7625, total= 8.5s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.8025, total= 8.3s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.8075, total= 8.1s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.7725, total= 8.4s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.7919799498746867, total= 8.4s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.7593984962406015, total= 8.6s
[CV] countvec__ngram_range=(1, 3) ...
[CV] countvec__ngram_range=(1, 3), score=0.8154613466334164, total= 17.9s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.7775, total= 18.4s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.7675, total= 18.3s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.79, total= 17.9s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.78, total= 17.5s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.8175, total= 18.7s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.8125, total= 17.4s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.78, total= 17.4s
[CV] countvec__ngram_range=(1, 3) ...
[CV] countvec__ngram_range=(1, 3), score=0.7919799498746867, total= 18.0s
[CV] countvec__ngram_range=(1, 3) ...
[CV] countvec__ngram_range=(1, 3), score=0.7719298245614035, total= 17.6s

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.5min finished

[CV] ...
[CV] ... , score=0.8665207877461706, total= 1.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s

[CV] ... , score=0.843010752688172, total= 1.6s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.1s remaining: 0.0s

[CV] ... , score=0.8389830508474575, total= 1.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.6s remaining: 0.0s

[CV] ... , score=0.8354430379746836, total= 1.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 6.1s remaining: 0.0s

[CV] ... , score=0.8382978723404254, total= 1.5s
[CV] ...
[CV] ... , score=0.8558951965065502, total= 1.5s
[CV] ...
[CV] ... , score=0.8663793103448276, total= 1.5s
[CV] ...
[CV] ... , score=0.8305084745762711, total= 1.5s
[CV] ...
[CV] ... , score=0.8416485900216919, total= 1.5s
[CV] ...
[CV] ... , score=0.8412017167381973, total= 1.5s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 15.2s finished

[CV] countvec__ngram_range=(1, 1), score=0.8478802992518704, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.7s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.8075, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.4s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.805, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.2s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.8125, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 11.0s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.8075, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 13.8s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.8325, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 16.7s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.85, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 19.5s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.795, total= 1.6s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 22.4s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.8120300751879699, total= 1.5s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 25.3s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.7994987468671679, total= 1.4s

[CV] countvec_ngram_range=(1, 2) ...

[CV] countvec_ngram_range=(1, 2), score=0.7955112219451371, total= 8.2s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.7775, total= 8.2s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.74, total= 7.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.7725, total= 7.6s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.7625, total= 7.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.79, total= 7.6s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.7925, total= 7.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.765, total= 7.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] countvec_ngram_range=(1, 2), score=0.7794486215538847, total= 7.7s

[CV] countvec_ngram_range=(1, 2) ...

[CV] countvec_ngram_range=(1, 2), score=0.7493734335839599, total= 7.5s

[CV] countvec_ngram_range=(1, 3) ...

[CV] countvec_ngram_range=(1, 3), score=0.800498753117207, total= 17.0s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.78, total= 17.1s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.7525, total= 17.2s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.78, total= 17.1s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.775, total= 17.3s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.8025, total= 17.3s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.805, total= 17.2s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.7725, total= 17.2s

[CV] countvec_ngram_range=(1, 3) ...

```
[CV] countvec_ngram_range=(1, 3), score=0.7869674185463659, total= 17.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.7619047619047619, total= 17.2s
```

```
[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.2min finished
```

```
[CV] ...
[CV] ... , score=0.8671023965141613, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s
```

```
[CV] ... , score=0.8365180467091295, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.8s remaining: 0.0s
```

```
[CV] ... , score=0.8354430379746836, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.1s remaining: 0.0s
```

```
[CV] ... , score=0.8407643312101911, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.5s remaining: 0.0s
```

```
[CV] ... , score=0.835117773019272, total= 1.4s
[CV] ...
[CV] ... , score=0.8540305010893247, total= 1.4s
[CV] ...
[CV] ... , score=0.8695652173913043, total= 1.4s
[CV] ...
[CV] ... , score=0.8277310924369747, total= 1.4s
[CV] ...
[CV] ... , score=0.8380129589632829, total= 1.4s
[CV] ...
[CV] ... , score=0.8312236286919832, total= 1.4s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec_ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.7s finished

[CV] countvec__ngram_range=(1, 1), score=0.8379052369077307, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.6s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.8175, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.3s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.8075, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.0s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.805, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.7s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.805, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 13.4s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.8375, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 16.1s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.8425, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 18.7s remaining: 0.0s

```


[CV] ... countvec__ngram_range=(1, 1), score=0.8025, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 21.4s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.8145363408521303, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 24.0s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.8170426065162907, total= 1.4s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.8029925187032418, total= 7.9s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.78, total= 7.9s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.7525, total= 8.0s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.7775, total= 7.9s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.7625, total= 8.0s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.805, total= 8.1s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.8075, total= 7.9s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.7725, total= 8.0s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.7894736842105263, total= 7.9s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.7593984962406015, total= 7.9s
[CV] countvec__ngram_range=(1, 3) ...
[CV] countvec__ngram_range=(1, 3), score=0.8129675810473815, total= 17.4s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.7775, total= 17.3s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.7675, total= 17.4s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.79, total= 17.4s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.78, total= 17.5s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.815, total= 17.5s
[CV] countvec__ngram_range=(1, 3) ...
[CV] ... countvec__ngram_range=(1, 3), score=0.81, total= 17.4s

```
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.7775, total= 17.6s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.7894736842105263, total= 17.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.7719298245614035, total= 17.6s
```

```
[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.3min finished
```

```
[CV] ...
[CV] ... , score=0.8577680525164114, total= 1.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5s remaining: 0.0s
```

```
[CV] ... , score=0.843010752688172, total= 1.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.0s remaining: 0.0s
```

```
[CV] ... , score=0.8372093023255813, total= 1.4s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.4s remaining: 0.0s
```

```
[CV] ... , score=0.8354430379746836, total= 1.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.9s remaining: 0.0s
```

```
[CV] ... , score=0.8340425531914893, total= 1.4s
[CV] ...
[CV] ... , score=0.8577680525164114, total= 1.4s
[CV] ...
[CV] ... , score=0.8645161290322582, total= 1.4s
[CV] ...
[CV] ... , score=0.832271762208068, total= 1.4s
[CV] ...
[CV] ... , score=0.8398268398268398, total= 1.4s
```

```

[CV] ...
[CV] ... , score=0.8436830835117772, total= 1.4s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 14.4s finished

[CV] countvec__ngram_range=(1, 1), score=0.912718204488778, total= 1.6s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.9s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9, total= 1.6s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.9s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.92, total= 1.7s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.9s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9075, total= 1.7s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 11.9s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.895, total= 1.6s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 14.8s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9075, total= 1.6s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 17.8s remaining: 0.0s

```

[CV] ... countvec_ngram_range=(1, 1), score=0.945, total= 1.7s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 20.7s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.8875, total= 1.6s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 23.6s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.899749373433584, total= 1.6s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 26.6s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.9097744360902256, total= 1.6s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9052369077306733, total= 9.1s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9075, total= 8.9s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9025, total= 9.3s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.915, total= 9.2s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9075, total= 9.3s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9175, total= 9.2s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.94, total= 9.2s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.89, total= 9.2s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9047619047619048, total= 9.2s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9097744360902256, total= 9.2s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.8977556109725686, total= 19.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9125, total= 19.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9, total= 19.5s
[CV] countvec_ngram_range=(1, 3) ...

```

[CV] ... countvec_ngram_range=(1, 3), score=0.895, total= 19.6s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9075, total= 19.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.92, total= 18.8s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.935, total= 19.1s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.8925, total= 19.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9072681704260651, total= 19.6s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.8947368421052632, total= 19.2s

```

```

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.8min finished

```

```

[CV] ...
[CV] ... , score=0.905940594059406, total= 9.3s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 9.3s remaining: 0.0s

```

```

[CV] ... , score=0.9072681704260651, total= 9.3s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 18.7s remaining: 0.0s

```

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[CV] ... , score=0.9041769041769042, total= 9.3s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 28.1s remaining: 0.0s

```

```

[CV] ... , score=0.9154228855721394, total= 9.3s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 37.4s remaining: 0.0s

```

```

[CV] ... , score=0.9063291139240507, total= 9.4s
[CV] ...

```

```
[CV] ... , score=0.9160305343511451, total= 9.4s
[CV] ...
[CV] ... , score=0.9411764705882353, total= 9.5s
[CV] ...
[CV] ... , score=0.89, total= 9.3s
[CV] ...
[CV] ... , score=0.905, total= 9.3s
[CV] ...
[CV] ... , score=0.91, total= 9.2s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.6min finished
```

```
[CV] countvec__ngram_range=(1, 1), score=0.912718204488778, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.8s remaining: 0.0s
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.905, total= 1.6s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.6s remaining: 0.0s
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.915, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.4s remaining: 0.0s
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9125, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 11.1s remaining: 0.0s
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.895, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 13.9s remaining: 0.0s
```

[CV] ... countvec__ngram_range=(1, 1), score=0.91, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 16.7s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.95, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 19.4s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9025, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 22.1s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.9072681704260651, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 24.6s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.9122807017543859, total= 1.3s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.912718204488778, total= 8.5s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.91, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.9, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.905, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.9075, total= 8.8s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.92, total= 8.8s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.9425, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.895, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.9122807017543859, total= 8.8s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.9122807017543859, total= 8.7s

```

[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9002493765586035, total= 19.1s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9125, total= 18.8s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.895, total= 18.7s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.885, total= 19.0s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.8975, total= 18.7s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.92, total= 19.0s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.935, total= 20.1s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.89, total= 20.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9122807017543859, total= 20.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.8972431077694235, total= 20.3s

```

```

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.7min finished

```

```

[CV] ...
[CV] ... , score=0.9118387909319899, total= 1.4s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.4s remaining: 0.0s

```

```

[CV] ... , score=0.9005235602094241, total= 1.4s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.8s remaining: 0.0s

```

```

[CV] ... , score=0.913265306122449, total= 1.4s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.1s remaining: 0.0s

```

```

[CV] ... , score=0.9095607235142119, total= 1.4s
[CV] ...

```


[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.5s remaining: 0.0s

[CV] ... , score=0.8906250000000001, total= 1.4s

[CV] ...

[CV] ... , score=0.905759162303665, total= 1.4s

[CV] ...

[CV] ... , score=0.9502487562189055, total= 1.4s

[CV] ...

[CV] ... , score=0.9002557544757034, total= 1.4s

[CV] ...

[CV] ... , score=0.9063291139240507, total= 1.4s

[CV] ...

[CV] ... , score=0.9104859335038362, total= 1.4s

Fitting 10 folds for each of 3 candidates, totalling 30 fits

[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.9s finished

[CV] countvec__ngram_range=(1, 1), score=0.9251870324189526, total= 1.3s

[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.4s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.91, total= 1.3s

[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 4.8s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.91, total= 1.4s

[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.2s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.91, total= 1.3s

[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 9.6s remaining: 0.0s

```

[CV] ... countvec__ngram_range=(1, 1), score=0.905, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.0s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9125, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 14.5s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9525, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 16.9s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.8925, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 19.3s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.8972431077694235, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 21.7s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.9097744360902256, total= 1.3s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.9152119700748129, total= 8.8s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.91, total= 8.8s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.9, total= 7.5s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.9, total= 8.8s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.9025, total= 8.9s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.92, total= 8.9s
[CV] countvec__ngram_range=(1, 2) ...

```

```

[CV] ... countvec_ngram_range=(1, 2), score=0.945, total= 8.8s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.885, total= 8.6s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9097744360902256, total= 8.9s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9022556390977443, total= 8.8s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.8927680798004988, total= 20.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9125, total= 19.9s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.895, total= 19.0s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.885, total= 20.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9025, total= 19.7s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9175, total= 20.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9375, total= 20.4s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.8875, total= 19.8s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9097744360902256, total= 20.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.8947368421052632, total= 20.4s

```

```

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.8min finished

```

```

[CV] ...
[CV] ... , score=0.9242424242424243, total= 1.3s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s

```

```

[CV] ... , score=0.905759162303665, total= 1.3s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.7s remaining: 0.0s

```

```

[CV] ... , score=0.9081632653061225, total= 1.4s
[CV] ...

```

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.0s remaining: 0.0s

[CV] ... , score=0.9072164948453608, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.4s remaining: 0.0s

[CV] ... , score=0.902061855670103, total= 1.3s
[CV] ...
[CV] ... , score=0.9090909090909092, total= 1.4s
[CV] ...
[CV] ... , score=0.9526184538653366, total= 1.3s
[CV] ...
[CV] ... , score=0.8900255754475703, total= 1.3s
[CV] ...
[CV] ... , score=0.8962025316455695, total= 1.4s
[CV] ...
[CV] ... , score=0.9072164948453608, total= 1.4s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.5s finished

[CV] countvec__ngram_range=(1, 1), score=0.9152119700748129, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.5s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.905, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.0s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.91, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.5s remaining: 0.0s

```

[CV] ... countvec__ngram_range=(1, 1), score=0.9075, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 9.9s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.895, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.4s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.91, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 14.9s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.95, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 17.4s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 19.9s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.9097744360902256, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 22.4s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.9122807017543859, total= 1.4s
[CV] countvec__ngram_range=(1, 2) ...
[CV] countvec__ngram_range=(1, 2), score=0.9102244389027432, total= 9.2s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.9125, total= 9.1s
[CV] countvec__ngram_range=(1, 2) ...
[CV] ... countvec__ngram_range=(1, 2), score=0.9, total= 9.2s
[CV] countvec__ngram_range=(1, 2) ...

```

```

[CV] ... countvec_ngram_range=(1, 2), score=0.905, total= 8.4s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9075, total= 9.0s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9225, total= 9.1s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9425, total= 8.2s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.8925, total= 9.2s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9147869674185464, total= 9.2s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9122807017543859, total= 8.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9002493765586035, total= 20.8s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9125, total= 20.4s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.895, total= 20.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.885, total= 20.0s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.8975, total= 20.6s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.92, total= 18.9s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.935, total= 18.7s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.8875, total= 20.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9122807017543859, total= 18.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.899749373433584, total= 20.0s

```

```

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.8min finished

```

```

[CV] ...
[CV] ... , score=0.91, total= 9.2s
[CV] ...

```

```

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 9.2s remaining: 0.0s

```

```

[CV] ... , score=0.9118387909319899, total= 9.1s
[CV] ...

```

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 18.4s remaining: 0.0s

[CV] ... , score=0.9019607843137254, total= 8.9s

[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 27.4s remaining: 0.0s

[CV] ... , score=0.9054726368159204, total= 9.2s

[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 36.6s remaining: 0.0s

[CV] ... , score=0.9063291139240507, total= 8.1s

[CV] ...

[CV] ... , score=0.921119592875318, total= 9.0s

[CV] ...

[CV] ... , score=0.9434889434889434, total= 9.2s

[CV] ...

[CV] ... , score=0.8927680798004988, total= 9.3s

[CV] ...

[CV] ... , score=0.915, total= 8.7s

[CV] ...

[CV] ... , score=0.912280701754386, total= 9.9s

Fitting 10 folds for each of 3 candidates, totalling 30 fits

[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.5min finished

[CV] countvec__ngram_range=(1, 1), score=0.9251870324189526, total= 1.5s

[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.6s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.93, total= 1.4s

[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.2s remaining: 0.0s

```
[CV] ... countvec__ngram_range=(1, 1), score=0.935, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.7s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9275, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.3s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.935, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.9s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.935, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 15.5s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9625, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 18.1s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9225, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 20.7s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.9122807017543859, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 23.3s remaining: 0.0s
```



```

[CV] countvec_ngram_range=(1, 1), score=0.9398496240601504, total= 1.4s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9276807980049875, total= 9.4s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.935, total= 9.6s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9275, total= 9.6s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.94, total= 9.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.935, total= 9.6s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9375, total= 9.4s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9575, total= 9.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.915, total= 9.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9172932330827067, total= 9.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9348370927318296, total= 9.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9251870324189526, total= 20.1s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9325, total= 18.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.925, total= 20.4s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.92, total= 20.2s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.93, total= 20.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9375, total= 20.9s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.96, total= 20.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.92, total= 20.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9172932330827067, total= 20.4s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9298245614035088, total= 20.3s

```

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 7.0min finished

```

[CV] ...
[CV] ... , score=0.9290953545232274, total= 9.4s

```

```

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 9.4s remaining: 0.0s

[CV] ... , score=0.9346733668341709, total= 9.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 19.0s remaining: 0.0s

[CV] ... , score=0.9283950617283949, total= 9.6s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 28.7s remaining: 0.0s

[CV] ... , score=0.9405940594059407, total= 9.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 38.2s remaining: 0.0s

[CV] ... , score=0.9329896907216496, total= 9.6s
[CV] ...
[CV] ... , score=0.9363867684478373, total= 9.5s
[CV] ...
[CV] ... , score=0.9584352078239609, total= 9.5s
[CV] ...
[CV] ... , score=0.9162561576354681, total= 9.5s
[CV] ...
[CV] ... , score=0.9172932330827068, total= 9.6s
[CV] ...
[CV] ... , score=0.9353233830845772, total= 9.4s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.6min finished

[CV] countvec__ngram_range=(1, 1), score=0.9326683291770573, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.4s remaining: 0.0s

```

```

[CV] ... countvec__ngram_range=(1, 1), score=0.94, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 4.9s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.94, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.4s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9275, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 9.8s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9275, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.2s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.935, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 14.7s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9525, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 17.2s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 19.6s remaining: 0.0s

[CV] countvec__ngram_range=(1, 1), score=0.9298245614035088, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

```

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 22.0s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.9398496240601504, total= 1.3s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9301745635910225, total= 8.9s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.94, total= 8.9s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9375, total= 9.0s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9375, total= 8.9s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.935, total= 9.0s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9325, total= 8.9s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9525, total= 8.9s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.92, total= 9.0s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9323308270676691, total= 8.9s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9323308270676691, total= 8.9s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9301745635910225, total= 19.8s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.935, total= 19.4s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9275, total= 19.9s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.92, total= 19.1s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9275, total= 19.7s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9325, total= 20.1s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.95, total= 20.0s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9225, total= 19.7s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9223057644110275, total= 20.0s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9172932330827067, total= 19.8s

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.8min finished

```

[CV] ...
[CV] ... , score=0.9326683291770573, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s

[CV] ... , score=0.9387755102040817, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.7s remaining: 0.0s

[CV] ... , score=0.9387755102040817, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.0s remaining: 0.0s

[CV] ... , score=0.9276807980049875, total= 1.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.3s remaining: 0.0s

[CV] ... , score=0.9250645994832042, total= 1.3s
[CV] ...
[CV] ... , score=0.9340101522842639, total= 1.3s
[CV] ...
[CV] ... , score=0.9528535980148882, total= 1.3s
[CV] ...
[CV] ... , score=0.9242424242424243, total= 1.3s
[CV] ...
[CV] ... , score=0.9296482412060301, total= 1.3s
[CV] ...
[CV] ... , score=0.9393939393939393, total= 1.3s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.3s finished

[CV] countvec_ngram_range=(1, 1), score=0.9376558603491272, total= 1.3s
[CV] countvec_ngram_range=(1, 1) ...

```

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.3s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.925, total= 1.3s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 4.7s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.94, total= 1.3s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.1s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.9325, total= 1.3s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 9.4s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.915, total= 1.3s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 11.8s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.9275, total= 1.3s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 14.2s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.95, total= 1.3s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 16.6s remaining: 0.0s

[CV] ... countvec_ngram_range=(1, 1), score=0.92, total= 1.3s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 18.9s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.9172932330827067, total= 1.3s
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 21.3s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.9197994987468672, total= 1.3s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9351620947630923, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9375, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.94, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9325, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.935, total= 8.6s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9325, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.9575, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] ... countvec_ngram_range=(1, 2), score=0.92, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9197994987468672, total= 8.5s
[CV] countvec_ngram_range=(1, 2) ...
[CV] countvec_ngram_range=(1, 2), score=0.9172932330827067, total= 8.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9226932668329177, total= 19.2s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9375, total= 20.0s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9125, total= 19.7s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.915, total= 19.3s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.935, total= 19.6s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9325, total= 19.6s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.9525, total= 19.6s
[CV] countvec_ngram_range=(1, 3) ...
[CV] ... countvec_ngram_range=(1, 3), score=0.915, total= 19.6s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9197994987468672, total= 19.5s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9072681704260651, total= 19.3s

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.6min finished

[CV] ...
[CV] ... , score=0.9356435643564357, total= 8.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 8.5s remaining: 0.0s

[CV] ... , score=0.9370277078085643, total= 8.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 17.0s remaining: 0.0s

[CV] ... , score=0.9402985074626865, total= 8.6s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 25.6s remaining: 0.0s

[CV] ... , score=0.9330024813895781, total= 8.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 34.1s remaining: 0.0s

[CV] ... , score=0.9340101522842639, total= 8.5s
[CV] ...
[CV] ... , score=0.9309462915601023, total= 8.5s
[CV] ...
[CV] ... , score=0.9580246913580247, total= 8.5s
[CV] ...
[CV] ... , score=0.9211822660098522, total= 8.6s
[CV] ...
[CV] ... , score=0.9203980099502487, total= 8.8s
[CV] ...
[CV] ... , score=0.9181141439205954, total= 8.7s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.4min finished


```

[CV] countvec__ngram_range=(1, 1), score=0.9351620947630923, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.4s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9425, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 4.8s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9425, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.3s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.9275, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 9.7s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.2s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.93, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 14.6s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.95, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 17.1s remaining: 0.0s

[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

```

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 19.5s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.9323308270676691, total= 1.4s

[CV] countvec_ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 22.0s remaining: 0.0s

[CV] countvec_ngram_range=(1, 1), score=0.9423558897243107, total= 1.4s

[CV] countvec_ngram_range=(1, 2) ...

[CV] countvec_ngram_range=(1, 2), score=0.9301745635910225, total= 8.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.9425, total= 8.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.9375, total= 8.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.9375, total= 8.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.935, total= 8.9s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.9325, total= 8.9s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.9525, total= 8.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] ... countvec_ngram_range=(1, 2), score=0.9175, total= 8.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] countvec_ngram_range=(1, 2), score=0.9298245614035088, total= 8.8s

[CV] countvec_ngram_range=(1, 2) ...

[CV] countvec_ngram_range=(1, 2), score=0.9348370927318296, total= 8.7s

[CV] countvec_ngram_range=(1, 3) ...

[CV] countvec_ngram_range=(1, 3), score=0.9301745635910225, total= 19.7s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.9375, total= 19.8s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.9275, total= 19.6s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.92, total= 19.6s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.9275, total= 19.5s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.9375, total= 19.8s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.95, total= 19.9s

[CV] countvec_ngram_range=(1, 3) ...

[CV] ... countvec_ngram_range=(1, 3), score=0.9225, total= 19.9s

[CV] countvec_ngram_range=(1, 3) ...

```
[CV] countvec_ngram_range=(1, 3), score=0.9223057644110275, total= 19.9s
[CV] countvec_ngram_range=(1, 3) ...
[CV] countvec_ngram_range=(1, 3), score=0.9197994987468672, total= 19.3s
```

```
[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.7min finished
```

```
[CV] ...
[CV] ... , score=0.9349999999999999, total= 1.3s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3s remaining: 0.0s
```

```
[CV] ... , score=0.9411764705882353, total= 1.3s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.6s remaining: 0.0s
```

```
[CV] ... , score=0.9414758269720102, total= 1.3s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.0s remaining: 0.0s
```

```
[CV] ... , score=0.9276807980049875, total= 1.3s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 5.3s remaining: 0.0s
```

```
[CV] ... , score=0.9226804123711341, total= 1.3s
[CV] ...
[CV] ... , score=0.9289340101522843, total= 1.4s
[CV] ...
[CV] ... , score=0.9504950495049505, total= 1.4s
[CV] ...
[CV] ... , score=0.9242424242424243, total= 1.5s
[CV] ...
[CV] ... , score=0.9323308270676693, total= 1.5s
[CV] ...
[CV] ... , score=0.9417721518987343, total= 1.5s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec_ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.8s finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9251870324189526, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9425, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9425, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9375, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9225, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 15.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9575, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 17.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 20.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9122807017543859, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 22.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9373433583959899, total= 1.3s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 2), score=0.9351620947630923, total= 9.0s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.945, total= 9.0s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.95, total= 7.8s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9375, total= 9.0s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.94, total= 9.1s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.93, total= 9.1s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9675, total= 9.0s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.915, total= 8.9s
[CV] countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   countvec__ngram_range=(1, 2), score=0.9273182957393483, total=   9.0s
[CV]   countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   countvec__ngram_range=(1, 2), score=0.9348370927318296, total=   9.5s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   countvec__ngram_range=(1, 3), score=0.9326683291770573, total=  19.8s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.9375, total=  19.4s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.935, total=  19.6s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.92, total=  19.5s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.94, total= 19.8s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9325, total= 19.1s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.96, total= 19.3s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9225, total= 19.5s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.9273182957393483, total= 19.6s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.924812030075188, total= 19.3s
```

```
[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.8min finished
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ...
```



```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9336609336609337, total=    8.9s
[CV] ...

[Parallel(n_jobs=1)]: Done    1 out of    1 | elapsed:    8.9s remaining:    0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.93734335839599, total=    9.0s
[CV] ...

[Parallel(n_jobs=1)]: Done    2 out of    2 | elapsed:   18.0s remaining:    0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9484029484029484, total=    9.0s
[CV] ...

[Parallel(n_jobs=1)]: Done    3 out of    3 | elapsed:   27.0s remaining:    0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9478908188585607, total=    9.0s
[CV] ...

[Parallel(n_jobs=1)]: Done    4 out of    4 | elapsed:   36.1s remaining:    0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9360613810741688, total=    9.1s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9316455696202532, total=    9.1s
[CV] ...

```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9633251833740831, total= 9.0s
```

```
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9215686274509804, total= 9.4s
```

```
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9253731343283582, total= 9.4s
```

```
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9379652605459057, total= 9.1s
```

```
Fitting 10 folds for each of 3 candidates, totalling 30 fits
```

```
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.5min finished
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.940149625935162, total= 1.5s
```

```
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.7s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.935, total= 1.4s
```

```
[CV] countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9375, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9175, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.8s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9275, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 13.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.92, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 15.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.955, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 18.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9225, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 21.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9223057644110275, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 23.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9323308270676691, total= 1.4s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 2), score=0.942643391521197, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.95, total= 8.8s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9475, total= 8.9s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9375, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.945, total= 8.5s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.93, total= 8.4s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.95, total= 8.4s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.915, total= 8.5s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 2), score=0.9323308270676691, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 2), score=0.9373433583959899, total= 8.2s
[CV] countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   countvec__ngram_range=(1, 3), score=0.9326683291770573, total=   17.6s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.9375, total=   17.9s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.9275, total=   17.9s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.93, total=   17.9s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.94, total=   17.9s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.9275, total=   18.0s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9575, total= 17.7s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9225, total= 18.8s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.9197994987468672, total= 17.8s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.9147869674185464, total= 17.6s
```

```
[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.5min finished
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.938875305623472, total= 8.2s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 8.2s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.93734335839599, total= 8.1s
[CV] ...
```

```

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 16.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9481481481481482, total= 8.1s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 24.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.935960591133005, total= 8.0s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 32.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9333333333333332, total= 8.2s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9316455696202532, total= 8.2s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9556650246305418, total= 8.1s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9242053789731052, total= 8.2s
[CV] ...

```



```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9280397022332506, total=    8.1s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9336609336609336, total=    8.1s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.4min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9376558603491272, total=    1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9275, total=    1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.93, total=    1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9175, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 13.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.915, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 16.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.955, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 18.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9225, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 21.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9122807017543859, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 24.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]  countvec__ngram_range=(1, 1), score=0.9197994987468672, total= 1.4s
[CV]  countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]  countvec__ngram_range=(1, 2), score=0.940149625935162, total= 8.1s
[CV]  countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]  ... countvec__ngram_range=(1, 2), score=0.9375, total= 7.8s
[CV]  countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]  ... countvec__ngram_range=(1, 2), score=0.9475, total= 7.8s
[CV]  countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]  ... countvec__ngram_range=(1, 2), score=0.9325, total= 7.8s
[CV]  countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]  ... countvec__ngram_range=(1, 2), score=0.9325, total= 7.9s
[CV]  countvec__ngram_range=(1, 2) ...

```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.9275, total=    8.1s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.96, total=    8.1s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.92, total=    8.9s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9197994987468672, total=    8.2s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9197994987468672, total=    7.9s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 3), score=0.9301745635910225, total=   18.0s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.94, total= 18.0s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.93, total= 18.0s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9275, total= 17.7s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9425, total= 18.0s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.935, total= 18.1s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.955, total= 18.0s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9225, total= 18.1s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   countvec__ngram_range=(1, 3), score=0.9172932330827067, total=   17.6s
[CV]   countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   countvec__ngram_range=(1, 3), score=0.9147869674185464, total=   17.2s
```

```
[Parallel(n_jobs=1)]: Done   30 out of   30 | elapsed:   6.4min finished
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   ... , score=0.9408866995073892, total=    8.6s
[CV]   ...
```

```
[Parallel(n_jobs=1)]: Done    1 out of    1 | elapsed:    8.6s remaining:    0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   ... , score=0.9390862944162437, total=    8.9s
[CV]   ...
```

```
[Parallel(n_jobs=1)]: Done    2 out of    2 | elapsed:   17.6s remaining:    0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   ... , score=0.95, total=    9.4s
[CV]   ...
```

```

[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   27.1s remaining:    0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9313725490196079, total=   9.8s
[CV] ...

[Parallel(n_jobs=1)]: Done   4 out of   4 | elapsed:   36.9s remaining:    0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9316455696202532, total=   8.8s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9319899244332494, total=   8.7s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9605911330049262, total=   8.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9261083743842363, total=   8.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9280397022332506, total=   9.1s
[CV] ...

```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9215686274509804, total=    8.8s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.5min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9326683291770573, total=    1.6s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 3.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.935, total=    1.6s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 6.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9375, total=    1.6s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 9.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.92, total=    1.6s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 12.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] ... countvec__ngram_range=(1, 1), score=0.93, total= 1.6s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 15.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.915, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 17.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.955, total= 1.7s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 20.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9175, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 23.8s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9223057644110275, total= 1.6s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 26.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9373433583959899, total= 1.6s
[CV] countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   countvec__ngram_range=(1, 2), score=0.9376558603491272, total=    9.4s
[CV]   countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 2), score=0.9425, total=    8.6s
[CV]   countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 2), score=0.9425, total=    8.7s
[CV]   countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 2), score=0.9325, total=    8.8s
[CV]   countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 2), score=0.935, total=    8.7s
[CV]   countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 2), score=0.9325, total=    8.6s
[CV]   countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9525, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.925, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 2), score=0.9223057644110275, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 2), score=0.9398496240601504, total= 8.6s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.9351620947630923, total= 18.5s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9425, total= 18.5s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9375, total= 18.6s
[CV] countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.925, total= 18.6s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.93, total= 18.6s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.935, total= 20.2s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.9525, total= 18.5s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.92, total= 18.6s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 3), score=0.9197994987468672, total= 18.1s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] countvec_ngram_range=(1, 3), score=0.9223057644110275, total= 18.0s
```

```
[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.7min finished  
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9385749385749387, total= 8.5s
```

```
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 8.5s remaining: 0.0s  
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9447236180904522, total= 8.5s
```

```
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 17.0s remaining: 0.0s  
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9429280397022333, total= 8.4s
```

```
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 25.5s remaining: 0.0s  
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9385749385749387, total= 8.4s
```

```
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 34.0s remaining: 0.0s  
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9282051282051281, total= 8.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9292929292929293, total= 8.2s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9486552567237164, total= 8.2s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9162561576354681, total= 8.2s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9306930693069307, total= 8.1s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9405940594059405, total= 8.2s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.4min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9251870324189526, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9175, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.94, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.8s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.92, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 13.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9325, total= 1.6s
[CV] countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 16.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9575, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 19.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9375, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 22.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9147869674185464, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 25.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9273182957393483, total= 1.5s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9326683291770573, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.9375, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...

```



```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.94, total=    8.6s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.94, total=    8.5s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.94, total=    8.6s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.935, total=    8.6s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.9575, total=    8.6s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.9225, total=    8.6s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] countvec__ngram_range=(1, 2), score=0.9172932330827067, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 2), score=0.9373433583959899, total= 8.6s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.9251870324189526, total= 18.6s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9375, total= 22.5s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.925, total= 17.9s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.935, total= 17.8s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.935, total= 17.9s
[CV] countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.935, total= 19.3s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.9575, total= 18.7s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.9175, total= 19.2s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 3), score=0.9197994987468672, total= 19.7s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 3), score=0.9323308270676691, total= 18.7s

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.7min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... , score=0.9330024813895781, total= 9.3s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 9.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9292929292929293, total= 8.8s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 18.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9382716049382716, total= 9.2s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 27.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9362745098039216, total= 9.1s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 36.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9384615384615386, total= 8.1s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9367088607594938, total= 8.0s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9584352078239609, total= 7.7s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9215686274509804, total= 9.2s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9211822660098523, total= 9.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9265822784810127, total= 9.3s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.5min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9326683291770573, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9275, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9425, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9225, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 13.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9275, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 15.8s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.945, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 18.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 20.8s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9147869674185464, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 23.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9348370927318296, total= 1.3s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9351620947630923, total= 7.6s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.9375, total= 7.6s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.9375, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.9375, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...

```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.935, total=    8.8s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.94, total=    7.9s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.955, total=    8.4s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.93, total=    8.7s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9348370927318296, total=    8.7s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9373433583959899, total=    8.6s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] countvec__ngram_range=(1, 3), score=0.9326683291770573, total= 18.4s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.94, total= 18.4s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9275, total= 19.2s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.915, total= 18.5s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9375, total= 19.6s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9325, total= 18.0s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9575, total= 19.1s
[CV] countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.9275, total= 18.7s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 3), score=0.9223057644110275, total= 18.2s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 3), score=0.9197994987468672, total= 18.7s

[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.5min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9283950617283949, total= 8.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 8.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9390862944162437, total= 8.6s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 17.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... , score=0.9313725490196079, total= 8.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 25.8s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9382716049382716, total= 8.5s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 34.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9363867684478373, total= 8.7s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9289340101522843, total= 9.0s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9580246913580247, total= 9.2s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9268292682926829, total= 8.1s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9261083743842364, total= 9.0s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9379652605459057, total= 9.2s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.5min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9226932668329177, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 4.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.935, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9275, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 9.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.92, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.93, total= 1.2s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 14.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.955, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 16.8s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9225, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 19.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9072681704260651, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 21.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] countvec__ngram_range=(1, 1), score=0.9122807017543859, total= 1.3s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 2), score=0.9326683291770573, total= 8.3s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.945, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9375, total= 8.3s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.94, total= 8.1s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9375, total= 8.2s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9325, total= 8.2s
[CV] countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.955, total=    8.5s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.92, total=    8.4s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9197994987468672, total=    8.6s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.924812030075188, total=    8.4s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 3), score=0.9251870324189526, total=   18.7s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.9325, total=   19.1s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.92, total= 18.7s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9225, total= 19.2s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9425, total= 18.5s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9375, total= 19.1s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.95, total= 19.4s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9175, total= 16.9s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.924812030075188, total= 18.2s
[CV] countvec__ngram_range=(1, 3) ...
```



```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   countvec__ngram_range=(1, 3), score=0.9097744360902256, total=   19.1s
```

```
[Parallel(n_jobs=1)]: Done   30 out of   30 | elapsed:   6.5min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   ... , score=0.9365853658536585, total=    7.1s
```

```
[CV]   ...
```

```
[Parallel(n_jobs=1)]: Done    1 out of    1 | elapsed:    7.1s remaining:    0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   ... , score=0.9349999999999999, total=    8.3s
```

```
[CV]   ...
```

```
[Parallel(n_jobs=1)]: Done    2 out of    2 | elapsed:   15.5s remaining:    0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   ... , score=0.9339853300733496, total=    7.7s
```

```
[CV]   ...
```

```
[Parallel(n_jobs=1)]: Done    3 out of    3 | elapsed:   23.3s remaining:    0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   ... , score=0.9353233830845771, total=    8.5s
```

```
[CV]   ...
```

```

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 31.8s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9285714285714286, total= 8.8s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9289340101522843, total= 9.1s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9607843137254902, total= 8.7s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9215686274509804, total= 8.7s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9265822784810127, total= 8.9s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.923076923076923, total= 8.5s
Fitting 10 folds for each of 3 candidates, totalling 30 fits
[CV] countvec__ngram_range=(1, 1) ...

```

```

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.4min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9276807980049875, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.94, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.94, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 13.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.93, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 15.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9475, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 18.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 21.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9197994987468672, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 24.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9273182957393483, total= 1.5s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 2), score=0.9351620947630923, total= 9.4s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9475, total= 9.1s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9325, total= 8.8s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.94, total= 8.6s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.93, total= 8.8s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9375, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9575, total= 8.9s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9275, total= 9.0s
[CV] countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   countvec__ngram_range=(1, 2), score=0.9223057644110275, total=    9.4s
[CV]   countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   countvec__ngram_range=(1, 2), score=0.9298245614035088, total=    8.8s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   countvec__ngram_range=(1, 3), score=0.940149625935162, total=   19.2s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.9325, total=   19.4s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.935, total=   19.5s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   ... countvec__ngram_range=(1, 3), score=0.915, total=   19.2s
[CV]   countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9325, total= 20.4s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9375, total= 19.5s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9525, total= 19.3s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9275, total= 19.1s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.9223057644110275, total= 19.3s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.9172932330827067, total= 19.5s
```

```
[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.9min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9287469287469288, total=    8.8s
[CV] ...

[Parallel(n_jobs=1)]: Done    1 out of    1 | elapsed:    8.8s remaining:    0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9447236180904522, total=    8.7s
[CV] ...

[Parallel(n_jobs=1)]: Done    2 out of    2 | elapsed:   17.5s remaining:    0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9365853658536585, total=    8.8s
[CV] ...

[Parallel(n_jobs=1)]: Done    3 out of    3 | elapsed:   26.3s remaining:    0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9287469287469288, total=    8.7s
[CV] ...

[Parallel(n_jobs=1)]: Done    4 out of    4 | elapsed:   35.0s remaining:    0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9354005167958657, total=    9.0s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9289340101522843, total=    8.9s
[CV] ...

```



```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9533169533169533, total= 9.0s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.929440389294404, total= 9.0s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.93, total= 8.8s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9356435643564356, total= 8.8s
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.5min finished
```

```
In [118]: # store all scores result in one dataframe
all_scores = pd.concat([scores, scores2, scores3, scores4])
```

```
In [119]: # view top 10 method combination
all_scores.sort_values('cv_score', ascending = False)[:10]
```

```
Out[119]:
```

	method	cv_score
18	pa_ngram_train_ss	0.939508
19	pa_train_lem_pos_sw2	0.939171
19	pa_train_lem_pos	0.938811
12	pa_ngram_train_lem_sw2	0.938324
19	pa_ngram_train_lem_pos	0.937741
14	svc_train_lem_pos	0.937723
16	pa_ngram_train_ps	0.937346
15	pa_ngram_train_lem	0.937194
24	sgd_train_lem_pos_sw2	0.937169
13	pa_ngram_train_ps_sw2	0.936688

5.1 Hyper parameter tuning for best models

```
In [120]: # 1. sgd classifier with ngram and lemmatized with stopwords 2
          # 2. pa classifier with ngram and lemmatized+postag with stopwords 1
          # 3. pa classifier with ngram and snowball stemmed with stopwords 2
          # 4. sgd classifier with ngram and snowball stemmed with stopwords 2
          # 5. svc classifier with ngram and lemmatized+postag with stopwords 1
          final_scores = pd.DataFrame()
```

```
In [121]: # 1. sgd classifier with ngram and lemmatized with stopwords 2
          param_sgd = {'countvec__ngram_range': ((1,1), (1,2), (1,3)),
                      'classifier__alpha': [1e-2, 1e-1, 1e0, 1e1, 1e2]}
          sgd_ngram_lem_sw2_grid = GridSearchCV(classification_pipeline_ngram(sgd),
                                                  param_sgd, cv = 10, verbose = 10)
          sgd_ngram_lem_sw2_grid.fit(train_lem_sw2,y)
          sgd_ngram_lem_sw2_clf = sgd_ngram_lem_sw2_grid.best_estimator_

          final_scores.loc[0,'method'] = 'sgd_ngram_lem_sw2'
          final_scores.loc[0,'cv_score'] = cross_val_score(sgd_ngram_lem_sw2_clf,train_lem_sw2
```

Fitting 10 folds for each of 15 candidates, totalling 150 fits

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.8653366583541147, total=
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.6s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.84, total= 1.4s
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.3s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.8525, total= 1.5s
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   8.1s remaining:   0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.8675, total=   1.4s
[CV]   classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done   4 out of   4 | elapsed:  10.7s remaining:   0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.845, total=   1.4s
[CV]   classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done   5 out of   5 | elapsed:  13.2s remaining:   0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.855, total=   1.4s
[CV]   classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done   6 out of   6 | elapsed:  15.7s remaining:   0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.91, total=   1.4s
[CV]   classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done   7 out of   7 | elapsed:  18.3s remaining:   0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV]   classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.815, total=   1.4s
[CV]   classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done   8 out of   8 | elapsed:  20.8s remaining:   0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.8596491228070176, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 23.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.8897243107769424, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.7356608478802993, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.52, total= 9.2s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.6475, total= 9.3s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.78, total= 9.2s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.8175, total= 9.6s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.625, total= 9.7s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.7475, total= 10.0s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.61, total= 9.9s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.8471177944862155, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.5338345864661654, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.7905236907730673, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.5025, total= 20.9s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.78, total= 20.5s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.615, total= 20.6s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.5125, total= 20.3s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.5075, total= 20.5s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.885, total= 18.9s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.525, total= 19.7s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.5012531328320802, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.7719298245614035, total=
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.6807980049875312, total=
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.8175, total= 1.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.5175, total= 1.5s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.8, total= 1.5s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.5075, total=    1.5s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.77, total=    1.5s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.86, total=    1.5s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.7625, total=    1.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.6616541353383458, total=
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.5162907268170426, total=
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.8603491271820449, total= 9.6s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.535, total= 9.6s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.72, total= 9.5s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.745, total= 9.5s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.725, total= 9.5s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.8175, total= 10.1s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.81, total= 9.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.745, total=    9.6s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.7694235588972431, total=    9.6s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.5012531328320802, total=    9.6s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.8104738154613467, total=   20.1s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.505, total=   20.1s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.8075, total=   19.3s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.6725, total= 19.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.7275, total= 18.6s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.865, total= 19.6s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.5125, total= 19.1s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.5025, total= 19.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.5889724310776943, total= 19.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.7819548872180451, total= 19.4s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.6084788029925187, total=
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5025, total=    1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.725, total=    1.4s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5025, total=    1.4s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.7225, total=    1.4s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5025, total=    1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.525, total= 1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5012531328320802, total= 1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5012531328320802, total= 1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5187032418952618, total= 1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.6325, total= 9.0s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5025, total= 9.1s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.7525, total=    9.4s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5025, total=    9.1s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5025, total=    9.1s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.4975, total=    9.0s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5025, total=    9.1s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.656641604010025, total=    9
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5137844611528822, total= 9
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5012468827930174, total= 19.4s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.4s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.8275, total= 19.5s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5425, total= 19.6s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5125, total= 19.7s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.4s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.4975, total= 18.7s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5012531328320802, total= 19.4s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.49874686716791977, total= 19.4s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.49875311720698257, total= 19.4s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.4s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.4s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.5012531328320802, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.49874686716791977, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.49875311720698257, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5025, total=    9.0s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5025, total=    9.3s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.4975, total=    9.7s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5025, total=    9.7s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.4975, total= 9.6s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.4975, total= 9.4s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5025, total= 9.4s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5012531328320802, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.49874686716791977, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5012468827930174, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5025, total= 20.0s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.2s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.4975, total= 19.0s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.6s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.4975, total= 19.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.4975, total= 19.4s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5012531328320802, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.49874686716791977, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.5012468827930174, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.4975, total=    1.3s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.4975, total=    1.3s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.5025, total=    1.4s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.4975, total=    1.3s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.3s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.3s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.4s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.5012531328320802, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.5012531328320802, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5012468827930174, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5025, total= 9.1s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5025, total= 9.0s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.9s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.4975, total= 9.1s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5025, total= 9.1s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.4975, total= 8.9s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5025, total= 9.1s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5012531328320802, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.49874686716791977, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5012468827930174, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.4975, total= 19.2s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.4975, total= 19.6s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.4s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5025, total= 20.1s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5025, total= 20.3s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.4975, total= 20.3s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5025, total= 20.6s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5012531328320802, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.49874686716791977, total=
```

```
[Parallel(n_jobs=1)]: Done 150 out of 150 | elapsed: 34.6min finished
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   1 out of   1 | elapsed:   1.4s remaining:   0.0s

[CV] ... , score=0.8528678304239401, total=   1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   2 out of   2 | elapsed:   2.7s remaining:   0.0s

[CV] ... , score=0.84, total=   1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   4.1s remaining:   0.0s

[CV] ... , score=0.84, total=   1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   4 out of   4 | elapsed:   5.4s remaining:   0.0s

[CV] ... , score=0.825, total=   1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.8575, total=   1.4s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.885, total=   1.4s
[CV] ...

```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.885, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.835, total= 1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.8546365914786967, total= 1.4s
[CV] ...
[CV] ... , score=0.8872180451127819, total= 1.5s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.9s finished
```

```
In [122]: # 2. pa classifier with ngram and lemmatized+postag with stopword 1
        param_pa = {'countvec__ngram_range': ((1,1), (1,2), (1,3)),
                    'classifier__C': [0.001, 0.01, 1, 10, 1000]}
        pa_ngram_lem_pos_grid = GridSearchCV(classification_pipeline_ngram(pa),
                                              param_pa, cv = 10, verbose = 10)
        pa_ngram_lem_pos_grid.fit(train_lem_pos,y)
        pa_ngram_lem_pos_clf = pa_ngram_lem_pos_grid.best_estimator_

        final_scores.loc[1,'method'] = 'pa_ngram_lem_pos'
        final_scores.loc[1,'cv_score'] = cross_val_score(pa_ngram_lem_pos_clf,train_lem_pos,
```

```
Fitting 10 folds for each of 15 candidates, totalling 150 fits
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.6034912718204489, total= 1.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5925, total= 1.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5675, total= 1.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.8s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.575, total= 1.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5725, total= 1.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5825, total= 1.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 15.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5925, total= 1.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 18.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.575, total= 1.5s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 21.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5864661654135338, total= 1.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 23.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.568922305764411, total= 1.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.6209476309226932, total= 8.8s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.6075, total= 8.7s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.5825, total= 9.2s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.585, total= 9.1s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.585, total= 9.1s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.5975, total= 9.1s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.61, total= 9.0s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.595, total= 9.1s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.6115288220551378, total= 9.
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.581453634085213, total= 8.6
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.6408977556109726, total= 18.
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.6225, total= 19.2s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.5975, total= 18.7s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.5975, total= 18.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.5975, total= 18.8s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.62, total= 17.1s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.62, total= 18.9s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.605, total= 19.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.6290726817042607, total= 19.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.5964912280701754, total= 18.9s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.8902743142144638, total= 1.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.8975, total= 1.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.89, total= 1.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.89, total= 1.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.8925, total= 1.5s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.91, total= 1.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.9175, total= 1.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.8675, total= 1.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.8922305764411027, total= 1.5s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.87468671679198, total= 1.5s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7755610972568578, total= 8.8s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.755, total= 8.9s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.725, total= 8.5s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7425, total= 9.2s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.75, total= 9.0s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7675, total= 8.8s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7925, total= 9.2s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.74, total= 9.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7468671679197995, total= 9.0s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7268170426065163, total= 8.5s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.6708229426433915, total= 18.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.66, total= 18.0s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.6225, total= 18.9s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.655, total= 18.8s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.65, total= 18.7s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.6625, total= 18.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.66, total= 18.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.635, total= 18.5s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.6516290726817042, total= 18.6s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.6290726817042607, total= 18.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9326683291770573, total= 1.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.94, total= 1.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.935, total= 1.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9225, total= 1.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.935, total= 1.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9275, total= 1.5s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9525, total= 1.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9325, total= 1.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9197994987468672, total= 1.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9298245614035088, total= 1.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9301745635910225, total= 8.5s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9475, total= 8.6s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9425, total= 8.8s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9275, total= 8.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9375, total= 8.6s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9375, total= 8.6s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.96, total= 8.7s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9125, total= 8.9s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9273182957393483, total= 9.0s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.924812030075188, total= 9.0s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9301745635910225, total= 19.5s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9475, total= 19.6s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9275, total= 19.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.925, total= 18.8s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9325, total= 18.9s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9325, total= 19.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.96, total= 19.1s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9175, total= 19.1s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9273182957393483, total= 19.5s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9147869674185464, total= 19.0s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9201995012468828, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9425, total= 1.4s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9425, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.93, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.94, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.925, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.95, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.925, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9147869674185464, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9323308270676691, total= 1.5s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9251870324189526, total= 8.5s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.95, total= 8.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.945, total= 8.7s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9325, total= 8.9s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9425, total= 8.7s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.935, total= 9.2s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9575, total= 8.7s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.915, total= 9.4s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.924812030075188, total= 8.1s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.924812030075188, total= 9.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9301745635910225, total= 19.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.945, total= 19.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9375, total= 19.4s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.925, total= 19.0s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9275, total= 19.1s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.935, total= 19.1s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.96, total= 19.1s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9125, total= 19.2s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.924812030075188, total= 19.1s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9072681704260651, total= 19.2s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9251870324189526, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.935, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9425, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9175, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.94, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.925, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9575, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9175, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9172932330827067, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9298245614035088, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9326683291770573, total= 8.7s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9525, total= 8.7s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9425, total= 8.8s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.93, total= 8.5s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.94, total= 9.2s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.935, total= 9.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9675, total= 9.0s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.92, total= 9.0s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9273182957393483, total= 9.1s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9323308270676691, total= 8.7s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9326683291770573, total= 19.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.945, total= 19.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.935, total= 19.7s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.925, total= 19.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9325, total= 19.9s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9375, total= 20.0s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.96, total= 19.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.915, total= 20.1s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.924812030075188, total= 18.6s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9122807017543859, total= 18.3s
```

```
[Parallel(n_jobs=1)]: Done 150 out of 150 | elapsed: 33.4min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9301745635910225, total= 8.2s
```

```
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 8.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9525, total= 8.4s
```

```
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 16.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9475, total= 8.4s
```

```
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 25.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9325, total= 8.3s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 33.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9375, total= 8.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9325, total= 8.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.96, total= 8.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9125, total= 8.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9223057644110275, total= 8.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9223057644110275, total= 8.4s
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.4min finished
```

```
In [123]: # 3. pa classifier with ngram and snowball stemmed with stopword 2
```

```
pa_ngram_ss_sw2_grid = GridSearchCV(classification_pipeline_ngram(pa),  
                                     param_pa, cv = 10, verbose = 10)
```

```
pa_ngram_ss_sw2_grid.fit(train_ss_sw2,y)
```

```
pa_ngram_ss_sw2_clf = pa_ngram_ss_sw2_grid.best_estimator_
```

```
final_scores.loc[2,'method'] = 'pa_ngram_ss_sw2'
```

```
final_scores.loc[2,'cv_score'] = cross_val_score(pa_ngram_ss_sw2_clf,train_ss_sw2,y,
```

```
Fitting 10 folds for each of 15 candidates, totalling 150 fits
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5910224438902744, total= 1.4
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.6s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.58, total= 1.4s
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.2s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5725, total= 1.3s
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.6s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
"and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5625, total= 1.3s
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5725, total= 1.3s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.58, total= 1.3s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 14.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5975, total= 1.3s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 17.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.575, total= 1.3s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 19.8s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.5839598997493735, total= 1.3s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 22.2s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 1), score=0.581453634085213, total= 1.3s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.6084788029925187, total= 8.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.5975, total= 8.8s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.575, total= 8.7s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.5825, total= 8.8s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.58, total= 8.7s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.59, total= 8.8s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.615, total= 8.6s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.595, total= 8.8s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.6090225563909775, total= 8.8s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 2), score=0.5839598997493735, total= 8.8s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.628428927680798, total= 18.9s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.6025, total= 19.1s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.59, total= 19.6s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.61, total= 18.4s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.595, total= 18.7s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.6125, total= 20.0s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.63, total= 18.7s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.6075, total= 18.9s
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.6265664160401002, total= 19.
[CV] classifier__C=0.001, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.001, countvec__ngram_range=(1, 3), score=0.6115288220551378, total= 18.8s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.8927680798004988, total= 1.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.905, total= 1.2s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.885, total= 1.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.8775, total= 1.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.9075, total= 1.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.9125, total= 1.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.9275, total= 1.4s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.875, total= 1.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.8897243107769424, total= 1.2s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 1), score=0.8872180451127819, total= 1.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7880299251870324, total= 8.8s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.77, total= 8.8s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7425, total= 8.6s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7525, total= 8.7s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.75, total= 8.6s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7725, total= 8.8s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.8, total= 8.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.745, total= 8.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7644110275689223, total= 8.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 2), score=0.7418546365914787, total= 8.3s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.6758104738154613, total= 18.6s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.655, total= 18.7s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.625, total= 17.6s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.65, total= 18.5s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.655, total= 19.2s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.665, total= 19.2s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.665, total= 18.8s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.64, total= 18.9s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.6591478696741855, total= 18.9s
[CV] classifier__C=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=0.01, countvec__ngram_range=(1, 3), score=0.6365914786967418, total= 18.7s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9351620947630923, total= 1.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.935, total= 1.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9425, total= 1.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.915, total= 1.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.935, total= 1.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.92, total= 1.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9525, total= 1.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.93, total= 1.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.924812030075188, total= 1.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9373433583959899, total= 1.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9351620947630923, total= 8.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9475, total= 8.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.945, total= 8.5s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.935, total= 8.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.94, total= 8.5s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.935, total= 8.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9525, total= 8.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.925, total= 8.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9298245614035088, total= 8.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9273182957393483, total= 8.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9326683291770573, total= 18.7s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9375, total= 18.9s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.935, total= 18.9s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.915, total= 17.1s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.935, total= 19.0s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.93, total= 19.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9525, total= 19.7s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.925, total= 20.0s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.924812030075188, total= 20.0s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.924812030075188, total= 20.0s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9301745635910225, total= 1.4s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.935, total= 1.4s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9425, total= 1.2s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.91, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9325, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9225, total= 1.4s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.95, total= 1.4s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.92, total= 1.5s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9298245614035088, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9398496240601504, total= 1.3s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9326683291770573, total= 8.6s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9475, total= 8.6s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.945, total= 8.6s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.935, total= 8.6s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9375, total= 8.7s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9325, total= 8.6s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9475, total= 9.1s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9175, total= 8.7s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9298245614035088, total= 8.9s
[CV] classifier__C=10, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9348370927318296, total= 8.6s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9351620947630923, total= 19.1s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.94, total= 19.0s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.93, total= 18.9s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.925, total= 19.0s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9325, total= 19.5s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.935, total= 19.2s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9525, total= 19.1s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.925, total= 19.6s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9223057644110275, total= 18.1s
[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9197994987468672, total= 18.9s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9301745635910225, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9375, total= 1.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9375, total= 1.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9225, total= 1.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9175, total= 1.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9225, total= 1.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9475, total= 1.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.92, total= 1.2s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9197994987468672, total= 1.2s
[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9348370927318296, total= 1.2s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9376558603491272, total= 8.6s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.95, total= 8.6s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9475, total= 8.6s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9325, total=    8.9s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.935, total=    8.6s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9325, total=    8.7s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9475, total=    8.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.915, total=    8.5s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9273182957393483, total=    8.7s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9348370927318296, total= 8.8s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9351620947630923, total= 19.1s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9425, total= 19.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.935, total= 19.2s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.915, total= 19.0s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.925, total= 19.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9325, total= 19.2s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9575, total= 19.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.925, total= 19.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9223057644110275, total= 19.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9197994987468672, total= 19.5s

[Parallel(n_jobs=1)]: Done 150 out of 150 | elapsed: 33.1min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.9326683291770573, total= 8.6s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 8.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... , score=0.945, total= 8.7s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 17.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9475, total= 8.9s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 26.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.93, total= 8.8s
[CV] ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 35.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.935, total= 8.7s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9325, total= 8.6s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.955, total= 8.5s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.93, total= 8.7s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9298245614035088, total= 8.9s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.9323308270676691, total= 8.3s
```

```
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 1.5min finished
```

```
In [124]: # 4. sgd classifier with ngram and snowball stemmed with stopword 2
sgd_ngram_ss_sw2_grid = GridSearchCV(classification_pipeline_ngram(sgd),
                                     param_sgd, cv = 10, verbose = 10)
sgd_ngram_ss_sw2_grid.fit(train_ss_sw2,y)
sgd_ngram_ss_sw2_clf = sgd_ngram_ss_sw2_grid.best_estimator_

final_scores.loc[3,'method'] = 'sgd_ngram_ss_sw2'
final_scores.loc[3,'cv_score'] = cross_val_score(sgd_ngram_ss_sw2_clf,train_ss_sw2,y
```

Fitting 10 folds for each of 15 candidates, totalling 150 fits

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.8703241895261845, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.3s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.85, total= 1.2s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 4.6s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.85, total= 1.2s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 6.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.8775, total= 1.3s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 9.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.8425, total= 1.4s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 11.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.9025, total= 1.3s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 14.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.8675, total= 1.3s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 17.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.84, total= 1.3s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 19.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.8446115288220551, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 21.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 1), score=0.87468671679198, total= 1
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.7456359102244389, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.79, total= 8.6s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.8025, total= 8.6s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```



```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.78, total= 8.6s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.5825, total= 8.9s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.7025, total= 8.2s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.8475, total= 8.8s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.8075, total= 8.7s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.8045112781954887, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 2), score=0.5739348370927319, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.7805486284289277, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.505, total= 19.0s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.5325, total= 19.5s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.815, total= 19.3s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.535, total= 19.1s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.8775, total= 20.2s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.55, total= 19.6s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.5025, total= 19.7s
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.8471177944862155, total=
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.01, countvec__ngram_range=(1, 3), score=0.5087719298245614, total=
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.8354114713216958, total=
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.8025, total= 1.2s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.545, total= 1.2s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.5275, total=    1.2s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.7575, total=    1.2s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.5225, total=    1.2s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.525, total=    1.2s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.6025, total=    1.2s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.731829573934837, total=    1
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 1), score=0.7117794486215538, total=
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.5012468827930174, total=
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.51, total= 8.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.5025, total= 8.5s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.5025, total= 8.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.7975, total= 8.9s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.5125, total= 8.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.5025, total= 8.6s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.7475, total= 8.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.5012531328320802, total= 8.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 2), score=0.8546365914786967, total= 8.4s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.5012468827930174, total= 19.0s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.64, total= 19.0s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.825, total= 18.1s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.5025, total= 18.5s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.595, total= 18.8s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.7825, total= 18.9s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.5125, total= 18.9s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.5075, total= 18.9s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.5012531328320802, total= 18.9s
[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=0.1, countvec__ngram_range=(1, 3), score=0.5388471177944862, total= 1
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.827930174563591, total= 1
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5075, total= 1.2s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.2s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5425, total= 1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.6875, total= 1.4s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.6425, total= 1.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5012531328320802, total=
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 1), score=0.5012531328320802, total=
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.49875311720698257, total=
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.5s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.51, total= 8.5s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.6s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5025, total= 9.0s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.77, total= 8.5s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.5s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.7s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.5012531328320802, total= 8
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 2), score=0.7243107769423559, total= 8
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.7955112219451371, total= 19.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.3s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.4975, total= 18.8s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5025, total= 18.5s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.8125, total= 18.9s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5025, total= 17.9s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5025, total= 18.8s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5825, total= 18.9s
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.681704260651629, total= 19
[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=1.0, countvec__ngram_range=(1, 3), score=0.5012531328320802, total= 1
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.49875311720698257, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.2s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.3s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.3s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.3s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.2s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.2s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.2s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.5012531328320802, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 1), score=0.49874686716791977, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5012468827930174, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.4975, total=      8.6s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5025, total=      8.6s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5025, total=      8.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.4975, total= 8.7s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.9s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.49874686716791977, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 2), score=0.49874686716791977, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5012468827930174, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5025, total= 18.9s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.4975, total= 18.8s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.4975, total= 19.0s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.4975, total= 19.5s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.0s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.4975, total= 19.1s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.6s
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5012531328320802, total=
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=10.0, countvec__ngram_range=(1, 3), score=0.5012531328320802, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.49875311720698257, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.2s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.2s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.2s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.2s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.5025, total= 1.2s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.2s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.4975, total= 1.2s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.49874686716791977, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 1), score=0.49874686716791977, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5012468827930174, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.4s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.3s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.4975, total= 8.3s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.4s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.4975, total= 8.5s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.5s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5025, total= 8.4s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5012531328320802, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 2), score=0.5012531328320802, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5012468827930174, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.4975, total= 19.4s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.7s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.4975, total= 19.0s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.4s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.1s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.7s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.5025, total= 19.0s
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.49874686716791977, total=
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] classifier__alpha=100.0, countvec__ngram_range=(1, 3), score=0.49874686716791977, total=
```

```

[Parallel(n_jobs=1)]: Done 150 out of 150 | elapsed: 33.0min finished
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   1 out of   1 | elapsed:   1.3s remaining:   0.0s

[CV] ... , score=0.8453865336658354, total=   1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   2 out of   2 | elapsed:   2.5s remaining:   0.0s

[CV] ... , score=0.8425, total=   1.2s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   3.7s remaining:   0.0s

[CV] ... , score=0.8425, total=   1.2s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done   4 out of   4 | elapsed:   5.0s remaining:   0.0s

[CV] ... , score=0.8475, total=   1.3s
[CV] ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... , score=0.8575, total=   1.3s
[CV] ...

```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.895, total=    1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.905, total=    1.3s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.8425, total=    1.4s
[CV] ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... , score=0.8521303258145363, total=    1.3s
[CV] ...
[CV] ... , score=0.8922305764411027, total=    1.3s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 13.1s finished
```

```
In [125]: # 5. svc classifier with ngram and lemmatized+postag with stopword 1
        param_svc = {
            'countvec__ngram_range': ((1,1), (1,2), (1,3)),
            'classifier__C': [1, 10, 100, 1000]
        }
```

```
        svc_ngram_lem_pos_grid = GridSearchCV(classification_pipeline_ngram(svc),
                                                param_svc, cv = 10, verbose = 10)
        svc_ngram_lem_pos_grid.fit(train_lem_pos,y)
        svc_ngram_lem_pos_clf = svc_ngram_lem_pos_grid.best_estimator_
```

```
        final_scores.loc[4,'method'] = 'svc_ngram_lem_pos'
        final_scores.loc[4,'cv_score'] = cross_val_score(svc_ngram_lem_pos_clf,train_lem_pos
```

```

Fitting 10 folds for each of 12 candidates, totalling 120 fits
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9301745635910225, total= 1.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.5s remaining: 0.0s

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9425, total= 1.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.0s remaining: 0.0s

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.94, total= 1.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.4s remaining: 0.0s

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9125, total= 1.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 9.9s remaining: 0.0s

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.935, total= 1.5s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.5s remaining: 0.0s

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.93, total= 1.5s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 15.1s remaining: 0.0s

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9575, total= 1.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 17.7s remaining: 0.0s

```


[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.92, total= 1.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 20.4s remaining: 0.0s

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9172932330827067, total= 1.5s
[CV] classifier__C=1, countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 23.0s remaining: 0.0s

[CV] classifier__C=1, countvec__ngram_range=(1, 1), score=0.9373433583959899, total= 1.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9301745635910225, total= 9.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.95, total= 9.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9325, total= 9.0s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.925, total= 9.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.935, total= 8.9s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.935, total= 9.0s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9575, total= 8.8s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9175, total= 8.8s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.9147869674185464, total= 9.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 2), score=0.924812030075188, total= 9.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9251870324189526, total= 19.4s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.935, total= 19.5s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.925, total= 17.3s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.915, total= 19.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9275, total= 19.8s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9375, total= 20.2s
[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9575, total= 19.9s

[CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.915, total= 20.3s
 [CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9197994987468672, total= 20.3s
 [CV] classifier__C=1, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=1, countvec__ngram_range=(1, 3), score=0.9147869674185464, total= 19.6s
 [CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9251870324189526, total= 1.6s
 [CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9375, total= 1.6s
 [CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.935, total= 1.6s
 [CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9175, total= 1.6s
 [CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9325, total= 1.7s
 [CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.925, total= 1.7s
 [CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9475, total= 1.6s
 [CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9225, total= 1.6s
 [CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9097744360902256, total= 1.6s
 [CV] classifier__C=10, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 1), score=0.9348370927318296, total= 1.6s
 [CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9351620947630923, total= 11.1s
 [CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.95, total= 11.0s
 [CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9375, total= 11.4s
 [CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.93, total= 10.8s
 [CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.94, total= 11.5s
 [CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9325, total= 11.0s
 [CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.96, total= 11.3s
 [CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9225, total= 11.3s
 [CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9273182957393483, total= 11.1s
 [CV] classifier__C=10, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 2), score=0.9273182957393483, total= 11.0s
 [CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9326683291770573, total= 24.8s

[CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.945, total= 25.2s
 [CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.935, total= 24.8s
 [CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.92, total= 25.0s
 [CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.93, total= 25.2s
 [CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.94, total= 24.9s
 [CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9575, total= 25.1s
 [CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9175, total= 23.8s
 [CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9223057644110275, total= 24.1s
 [CV] classifier__C=10, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=10, countvec__ngram_range=(1, 3), score=0.9147869674185464, total= 23.6s
 [CV] classifier__C=100, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 1), score=0.9226932668329177, total= 2.4s
 [CV] classifier__C=100, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 1), score=0.9375, total= 2.4s
 [CV] classifier__C=100, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 1), score=0.935, total= 2.5s
 [CV] classifier__C=100, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 1), score=0.92, total= 2.5s
 [CV] classifier__C=100, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 1), score=0.9325, total= 2.5s
 [CV] classifier__C=100, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 1), score=0.9225, total= 2.4s
 [CV] classifier__C=100, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 1), score=0.945, total= 2.4s
 [CV] classifier__C=100, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 1), score=0.9275, total= 2.3s
 [CV] classifier__C=100, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 1), score=0.9097744360902256, total= 2.5s
 [CV] classifier__C=100, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 1), score=0.9323308270676691, total= 2.5s
 [CV] classifier__C=100, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 2), score=0.9351620947630923, total= 19.1s
 [CV] classifier__C=100, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 2), score=0.9525, total= 19.4s
 [CV] classifier__C=100, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 2), score=0.94, total= 19.7s
 [CV] classifier__C=100, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 2), score=0.93, total= 20.3s
 [CV] classifier__C=100, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 2), score=0.94, total= 20.3s

[CV] classifier__C=100, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 2), score=0.9325, total= 20.5s
 [CV] classifier__C=100, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 2), score=0.96, total= 20.6s
 [CV] classifier__C=100, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 2), score=0.9225, total= 20.5s
 [CV] classifier__C=100, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 2), score=0.9273182957393483, total= 20.0s
 [CV] classifier__C=100, countvec__ngram_range=(1, 2) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 2), score=0.9298245614035088, total= 20.3s
 [CV] classifier__C=100, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 3), score=0.9326683291770573, total= 45.9s
 [CV] classifier__C=100, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 3), score=0.945, total= 45.9s
 [CV] classifier__C=100, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 3), score=0.935, total= 47.4s
 [CV] classifier__C=100, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 3), score=0.9225, total= 48.0s
 [CV] classifier__C=100, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 3), score=0.935, total= 46.3s
 [CV] classifier__C=100, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 3), score=0.94, total= 47.5s
 [CV] classifier__C=100, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 3), score=0.9575, total= 46.8s
 [CV] classifier__C=100, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 3), score=0.9175, total= 46.6s
 [CV] classifier__C=100, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 3), score=0.924812030075188, total= 44.7s
 [CV] classifier__C=100, countvec__ngram_range=(1, 3) ...
 [CV] classifier__C=100, countvec__ngram_range=(1, 3), score=0.9147869674185464, total= 45.8s
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9226932668329177, total= 2.7s
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9375, total= 2.7s
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.935, total= 2.8s
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.92, total= 2.7s
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.93, total= 2.5s
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9225, total= 2.6s
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.945, total= 2.6s
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9275, total= 2.5s
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
 [CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9072681704260651, total= 2.6s

```

[CV] classifier__C=1000, countvec__ngram_range=(1, 1) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 1), score=0.9323308270676691, total= 2.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9351620947630923, total= 21.2s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9525, total= 21.9s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.94, total= 21.8s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.93, total= 19.7s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.94, total= 21.9s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9325, total= 19.9s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.96, total= 20.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9225, total= 20.9s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9273182957393483, total= 20.6s
[CV] classifier__C=1000, countvec__ngram_range=(1, 2) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 2), score=0.9298245614035088, total= 20.8s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9326683291770573, total= 45.4s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.945, total= 45.9s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.935, total= 46.2s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9225, total= 48.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.935, total= 47.1s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.94, total= 51.0s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9575, total= 51.0s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9175, total= 50.2s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.924812030075188, total= 46.3s
[CV] classifier__C=1000, countvec__ngram_range=(1, 3) ...
[CV] classifier__C=1000, countvec__ngram_range=(1, 3), score=0.9147869674185464, total= 1.3min

```

```

[Parallel(n_jobs=1)]: Done 120 out of 120 | elapsed: 42.5min finished

```

```

[CV] ...
[CV] ... , score=0.9351620947630923, total= 18.9s

```

```

[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 18.9s remaining: 0.0s

[CV] ... , score=0.9525, total= 19.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 38.2s remaining: 0.0s

[CV] ... , score=0.94, total= 19.5s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 57.7s remaining: 0.0s

[CV] ... , score=0.93, total= 18.4s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 1.3min remaining: 0.0s

[CV] ... , score=0.94, total= 21.2s
[CV] ...
[CV] ... , score=0.9325, total= 19.5s
[CV] ...
[CV] ... , score=0.96, total= 19.7s
[CV] ...
[CV] ... , score=0.9225, total= 19.2s
[CV] ...
[CV] ... , score=0.9273182957393483, total= 17.6s
[CV] ...
[CV] ... , score=0.9298245614035088, total= 19.6s

[Parallel(n_jobs=1)]: Done 10 out of 10 | elapsed: 3.2min finished

```

```

In [126]: # top scores
          final_scores.sort_values('cv_score', ascending = False)

```

```

Out[126]:
          method  cv_score
2    pa_ngram_ss_sw2  0.936982
4    svc_ngram_lem_pos  0.936980
1    pa_ngram_lem_pos  0.934979
3    sgd_ngram_ss_sw2  0.862225
0    sgd_ngram_lem_sw2  0.856222

```

The scores are a little lower, but it may be because the parameters may be overfitting to training data.

6 5. Final Model Selection and Prediction

To avoid overfitting, we use 3 top models and take a majority voting to determine the final category of an input text.

```
In [127]: # sgd_ngram_train_lem_sw2
          final_model_1 = ngram_grid_search(sgd,train_lem_sw2,y).best_estimator_
          final_model_1_predictions = final_model_1.predict(test_lem_sw2)
```

Fitting 10 folds for each of 3 candidates, totalling 30 fits

```
[CV] countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9226932668329177, total= 1.3s
```

```
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.6s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.93, total= 1.4s
```

```
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 5.1s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.93, total= 1.4s
```

```
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.8s remaining: 0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.925, total= 1.4s
```

```
[CV] countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9425, total= 1.5s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 13.3s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9325, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 16.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9575, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 18.5s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 1), score=0.9225, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 21.1s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9172932330827067, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 23.7s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```



```
[CV] countvec__ngram_range=(1, 1), score=0.9323308270676691, total= 1.4s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 2), score=0.9351620947630923, total= 9.1s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.935, total= 9.3s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9275, total= 9.1s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.94, total= 9.1s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9375, total= 9.6s
[CV] countvec__ngram_range=(1, 2) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 2), score=0.9325, total= 9.1s
[CV] countvec__ngram_range=(1, 2) ...
```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.955, total=    9.5s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.9175, total=    9.3s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9273182957393483, total=    9.6s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9323308270676691, total=    9.4s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 3), score=0.9326683291770573, total=   20.2s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 3), score=0.9325, total=   18.3s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.92, total= 20.0s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9175, total= 19.6s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.935, total= 19.8s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.935, total= 19.8s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9575, total= 20.0s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.925, total= 19.9s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.9172932330827067, total= 20.2s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   countvec__ngram_range=(1, 3), score=0.9172932330827067, total=   20.1s
```

```
[Parallel(n_jobs=1)]: Done   30 out of   30 | elapsed:   7.0min finished
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
In [128]: # pa_ngram_train_lem_pos
```

```
    final_model_2 = ngram_grid_search(sgd,train_lem_pos,y).best_estimator_
    final_model_2_predictions = final_model_2.predict(test_lem_pos)
```

```
Fitting 10 folds for each of 3 candidates, totalling 30 fits
```

```
[CV]   countvec__ngram_range=(1, 1) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV]   countvec__ngram_range=(1, 1), score=0.9276807980049875, total=    1.4s
```

```
[CV]   countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done    1 out of    1 | elapsed:    2.5s remaining:    0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.94, total=    1.4s
```

```
[CV]   countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done    2 out of    2 | elapsed:    5.1s remaining:    0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.94, total=    1.5s
```

```
[CV]   countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done    3 out of    3 | elapsed:    7.8s remaining:    0.0s
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9175, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 10.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9225, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 12.9s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9275, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 6 out of 6 | elapsed: 15.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.9575, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 7 out of 7 | elapsed: 18.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 1), score=0.92, total= 1.3s
[CV] countvec__ngram_range=(1, 1) ...
```

```
[Parallel(n_jobs=1)]: Done 8 out of 8 | elapsed: 20.4s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 1), score=0.9097744360902256, total= 1.4s
[CV] countvec__ngram_range=(1, 1) ...
```

```

[Parallel(n_jobs=1)]: Done 9 out of 9 | elapsed: 23.0s remaining: 0.0s
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 1), score=0.9323308270676691, total= 1.3s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9276807980049875, total= 9.0s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.95, total= 8.9s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.935, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.925, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.9325, total= 8.7s
[CV] countvec__ngram_range=(1, 2) ...

```

```

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.935, total=    8.7s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.96, total=    8.8s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] ... countvec__ngram_range=(1, 2), score=0.9225, total=    8.8s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.9172932330827067, total=    8.7s
[CV] countvec__ngram_range=(1, 2) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 2), score=0.924812030075188, total=    8.7s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

[CV] countvec__ngram_range=(1, 3), score=0.9301745635910225, total=   19.3s
[CV] countvec__ngram_range=(1, 3) ...

/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)

```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.935, total= 18.7s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.925, total= 19.1s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9225, total= 18.6s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9275, total= 19.4s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9375, total= 19.0s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.955, total= 19.0s
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] ... countvec__ngram_range=(1, 3), score=0.9175, total= 19.2s
[CV] countvec__ngram_range=(1, 3) ...
```



```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.9223057644110275, total= 17.3s  
[CV] countvec__ngram_range=(1, 3) ...
```

```
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
[CV] countvec__ngram_range=(1, 3), score=0.9147869674185464, total= 19.0s
```

```
[Parallel(n_jobs=1)]: Done 30 out of 30 | elapsed: 6.6min finished  
/Users/rahul/anaconda3/lib/python3.6/site-packages/sklearn/linear_model/stochastic_gradient.py  
    "and default tol will be 1e-3." % type(self), FutureWarning)
```

```
In [129]: # sgd_ngram_ss_sw2_clf with parameters tuned  
         final_model_3 = sgd_ngram_ss_sw2_clf  
         final_model_3_predictions = final_model_3.predict(test_ss_sw2)
```

```
In [130]: # all model predictions in one dataframe  
         predictions = pd.DataFrame([final_model_1_predictions, final_model_2_predictions, final_model_3_predictions])  
         predictions.columns = ['m1', 'm2', 'm3']  
         predictions.replace({0: 'FAKE', 1: 'REAL'}, inplace = True)
```

```
In [131]: def all_same(items):  
         return all(x == items[0] for x in items)  
         predictions['all_same'] = [all_same(predictions.iloc[i,:3].tolist()) for i in range(len(predictions))]  
  
         # percentage of for each model that are not the same for at least 1 pair  
         len(predictions[~predictions.all_same]) / len(predictions)
```

```
Out[131]: 0.14907367514002584
```

```
In [132]: # get the mode value of predictions for voting  
         from statistics import mode  
         predictions['mode_pred'] = [mode(predictions.iloc[i,:3]) for i in range(len(predictions))]
```

```
In [133]: # final submission  
         submission = pd.concat([test.ID, predictions.mode_pred], axis = 1)  
         submission.mode_pred.value_counts()
```

```
Out[133]: FAKE      1164  
         REAL      1157  
         Name: mode_pred, dtype: int64
```

```
In [134]: # export prediction to csv file  
         submission.to_csv("submission_20180528_rahul.csv", index = False)
```