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DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING
3rd YEAR 6th SEMESTER
DOMAIN NAME: GENERATRED AI
PROJECT TITLE: LYRICS GENERATED **[DEEP LEARING]**
ALGORITHM : RNN-RECURRENT NEWRAL NETWORKS

LYRICS GENERATED IN DEEP LEARNING AGORITHM USING IN RNN-RECURRENT NEWRAL NETWORKS

INPUT:

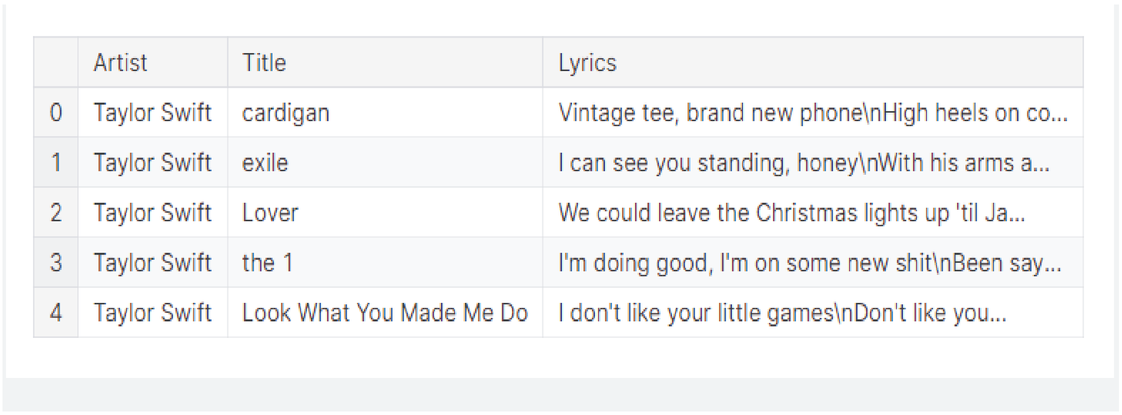
```
#importing the libraries
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
import string, os
import nltk
import re
import keras
import random
import io
from keras.utils import np_utils
from keras.models import Sequential
from keras.layers import LSTM, Dense, Dropout
from keras.optimizers import Adamax
import sys
from PIL import Image
from wordcloud import WordCloud, STOPWORDS, ImageColorGenerator
from PIL import Image, ImageDraw, ImageFont
import warnings
warnings.filterwarnings("ignore")
data = pd.read_csv("../input/lyrics/Songs.csv")
data.head()
print("Artists in the data:\n",data.Artist.value_counts())
print("Size of Dataset:",data.shape)
data["No_of_Characters"] = data["Lyrics"].apply(len)
```

```
data["No_of_Words"]=data.apply(lambda row: nltk.word_tokenize(row["Lyrics"]), ax
is=1).apply(len)
data["No_of_Lines"] = data["Lyrics"].str.split('\n').apply(len)
data.describe()
plt.figure(figsize=(15,15))
ax = sns.pairplot(data, hue="Artist", palette="plasma")
stopwords = set(STOPWORDS)
wordcloud = WordCloud(stopwords=stopwords, background_color="#444160",color
map="Purples", max_words=800).generate(" ".join(data["L
          yrics"]))
plt.figure(figsize=(12,12))
plt.imshow(wordcloud, interpolation="bilinear")
plt.show()
def My_song(song):
   img = Image.open("../input/image-for-notebook/Pink and White                    Geo
metric Marketing Presentation (1).png")
   Text_on_image = ImageDraw.Draw(img)
  myFont = ImageFont.truetype("../input/font-style/DancingScript
  -VariableFont_wght.ttf", 45)
   Text_on_image.text((620,90), song, font=myFont, fill =(255, 2
                  55, 255))
   return img
My_song(data.Lyrics[42][:500])
```

```
Corpus =''
for listitem in data.Lyrics:
   Corpus += listitem

Corpus = Corpus.lower() #converting all alphabets to lowecase
print("Number of unique characters:", len(set(Corpus)))
print("The unique characters:",sorted(set(Corpus)))
to_remove = ['{', '}', '~', '©', 'à', 'á', 'ã', 'ä', 'ç', 'è', 'é', 'ê', 'ë', 'í', 'ñ', 'ó', 'ö', 'ü', 'ŏ',
          'e', 'ا', 'س', 'ل', 'م', 'و', '\u2005', '\u200a', '\u200b', '–', '—', '‘', '’', ',', '“', '”',
          '…', '\u205f', '\ufeff', '!', '&', '(', ')', '*', '-                                    ', '/',
 ]
for symbol in to_remove:
   Corpus = Corpus.replace(symbol," ")
print("The unique characters:",sorted(set(Corpus)))
symb = sorted(list(set(Corpus)))

L_corpus = len(Corpus) #length of corpus
L_symb = len(symb) #length of total unique characters
mapping = dict((c, i) for i, c in enumerate(symb))
reverse_mapping = dict((i, c) for i, c in enumerate(symb))

print("Total number of characters:", L_corpus)
print("Number of unique characters:", L_symb)
length = 40
features = []
targets = []
```

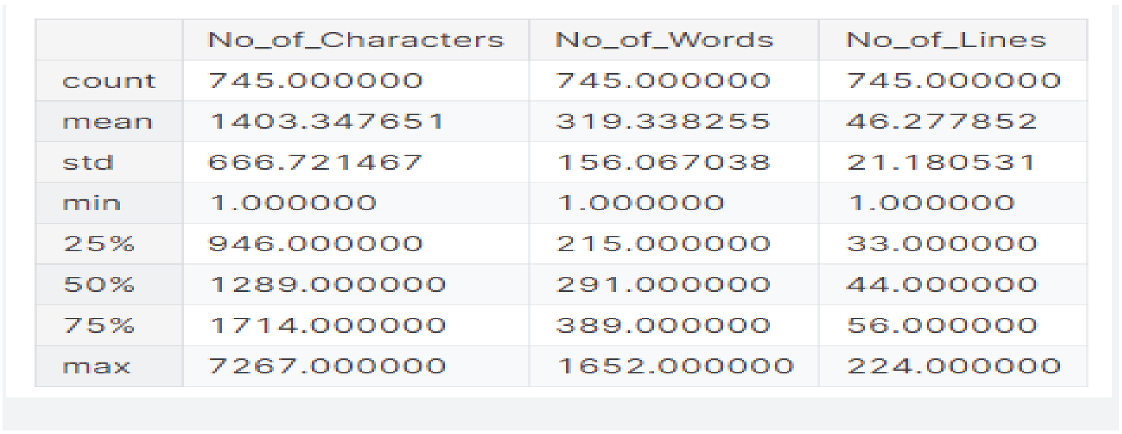
```
for i in range(0, L_corpus - length, 1):
    feature = Corpus[i:i + length]
    target = Corpus[i + length]
    features.append([mapping[j] for j in feature])
    targets.append(mapping[target])


L_datapoints = len(targets)
print("Total number of sequences in the Corpus:", L_datapoints)
X = (np.reshape(features, (L_datapoints, length, 1)))/ float(L_sy
                           mb)
y = np_utils.to_categorical(targets)
model = Sequential()
model.add(LSTM(256, input_shape=(X.shape[1], X.shape[2])))
model.add(Dense(y.shape[1], activation='softmax'))
opt = Adamax(learning_rate=0.01)
model.compile(loss='categorical_crossentropy', optimizer=opt)
model.summary()
history = model.fit(X, y, batch_size=128, epochs=100)
history_df = pd.DataFrame(history.history)
fig = plt.figure(figsize=(15,4), facecolor="#B291B6")
fig.suptitle("Learning Plot of Model for Loss")
pl=sns.lineplot(data=history_df["loss"],color="#444160")
pl.set(ylabel ="Training Loss")
pl.set(xlabel ="Epochs")
def Lyrics_Generator(starter,Ch_count): #,temperature=1.0):
    generated= ""
    starter = starter
    seed=[mapping[char] for char in starter]
    generated += starter
    for i in range(Ch_count):
        seed=[mapping[char] for char in starter]
        x_pred = np.reshape(seed, (1, len(seed), 1))
        x_pred = x_pred/ float(L_symb)
        prediction = model.predict(x_pred, verbose=0)[0]
        prediction = np.asarray(prediction).astype('float64')
        prediction = np.log(prediction) / 1.0
        exp_preds = np.exp(prediction)
        prediction = exp_preds / np.sum(exp_preds)
        probas = np.random.multinomial(1, prediction, 1)
        index = np.argmax(prediction)
        next_char = reverse_mapping[index]
        generated += next_char
        starter = starter[1:] + next_char
       return generated
song_1 = Lyrics_Generator("the shoe shrunk, and the school belt g
      ot ridiculously petit", 400)
My_song(song_1)
song_2 = Lyrics_Generator("i'm a sunflower, a little funny", 400)
My_song(song_2)
```

OUTPUT:



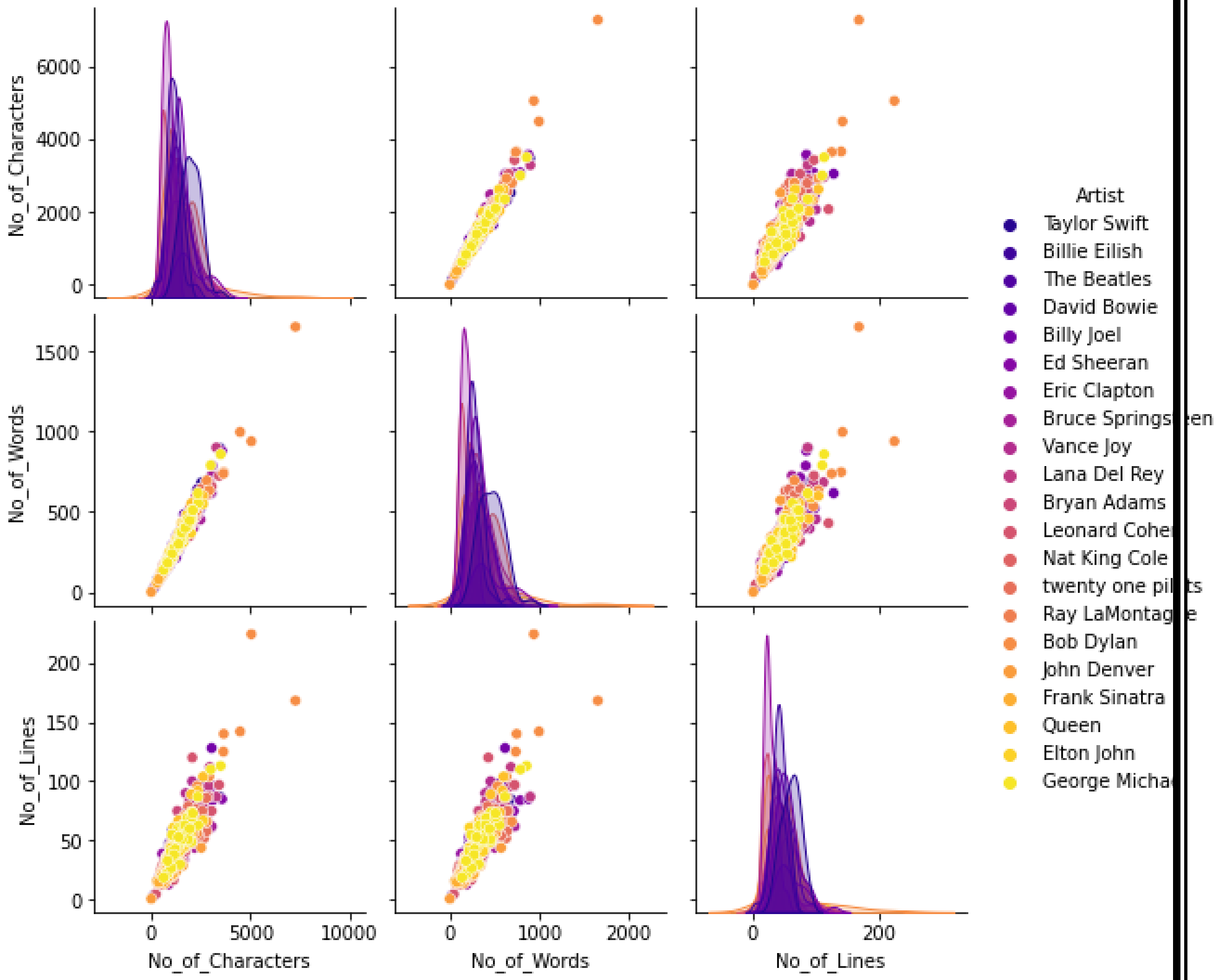
	Artist	Title	Lyrics
0	Taylor Swift	cardigan	Vintage tee, brand new phone\nHigh heels on co...
1	Taylor Swift	exile	I can see you standing, honey\nWith his arms a...
2	Taylor Swift	Lover	We could leave the Christmas lights up 'til Ja...
3	Taylor Swift	the 1	I'm doing good, I'm on some new shit\nBeen say...
4	Taylor Swift	Look What You Made Me Do	I don't like your little games\nDon't like you...

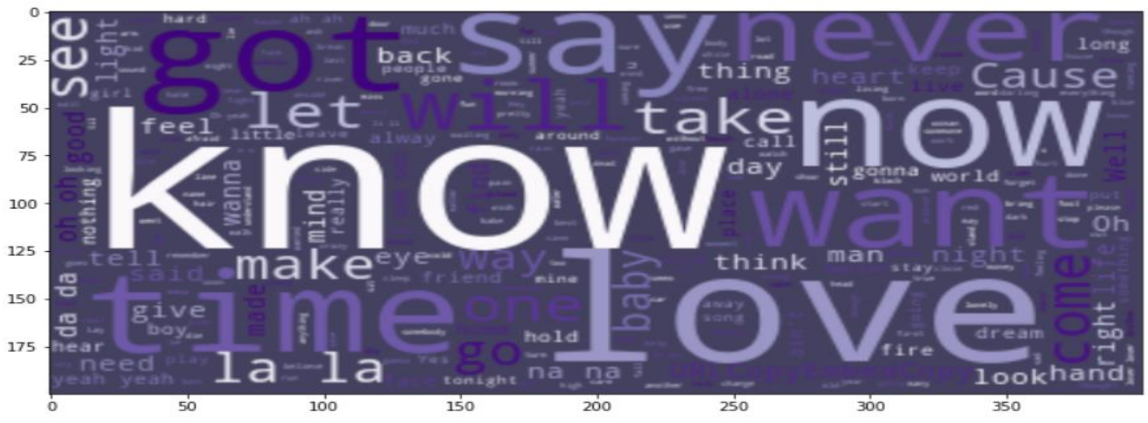
```
Artists in the data:
 David Bowie          50
Billy Joel           50
Taylor Swift         50
Billie Eilish        50
Eric Clapton         50
Leonard Cohen        50
Bruce Springsteen    40
The Beatles          35
George Michael       30
Vance Joy            30
Frank Sinatra        30
Elton John           30
twenty one pilots    30
John Denver          30
Bryan Adams          30
Nat King Cole        30
Ray LaMontagne       30
Queen                30
Lana Del Rey         30
Ed Sheeran           20
Bob Dylan            20
Name: Artist, dtype: int64

Size of Dataset: (745, 3)
```



	No_of_Characters	No_of_Words	No_of_Lines
count	745.000000	745.000000	745.000000
mean	1403.347651	319.338255	46.277852
std	666.721467	156.067038	21.180531
min	1.000000	1.000000	1.000000
25%	946.000000	215.000000	33.000000
50%	1289.000000	291.000000	44.000000
75%	1714.000000	389.000000	56.000000
max	7267.000000	1652.000000	224.000000

```
Figure size 1080x1080 with 0 Axes>
```





Keep your helmet, keep your life, son
Just a flesh wound, here's your rifle
Crawling up the beaches now
"Sir, I think he's bleeding out"
And some things you just can't speak about

With you I serve, with you I fall down, down
Watch you breathe in, watch you breathing out, out

Something med school did not cover
Someone's daughter, someone's mother
Holds your hand through plastic now
"Doc, I think she's crashing out"
And some things you just can't speak about

Only twenty minutes to sleep
But you

Number of unique characters: 92

The unique characters: ['\n', ' ', '!', '"', '&', "'", '(', ')', '*', ',', '-', '.', '/', '0', '1', '2', '3', '4', '5', '6', '7', '8', '9', ':', ';', '>', '?', '`', 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z', '{', '}', '~', '©', 'à', 'á', 'ã', 'ä', 'ç', 'è', 'é', 'ê', 'ë', 'í', 'ñ', 'ó', 'ö', 'ü', 'ŏ', 'e', 'و', 'م', 'ل', 'س', '|', '\u2005', '\u200a', '\u200b', '–', '—', '‘', '’', '‚', '“', '”', '…', '\u205f', '\ufeff']

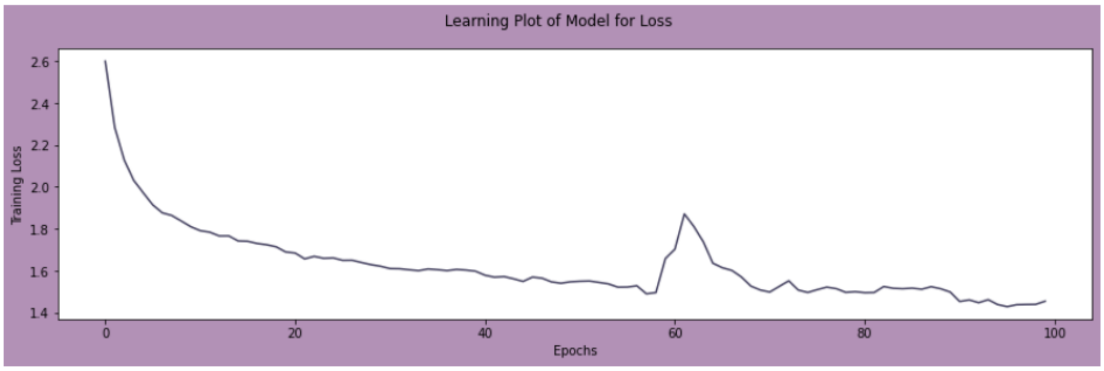
The unique characters: ['\n', ' ', '"', "'", ',', '.', '0', '1', '2', '3', '4', '5', '6', '7', '8', '9', ':', ';', '>', '?', '`', 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z']
linkcode

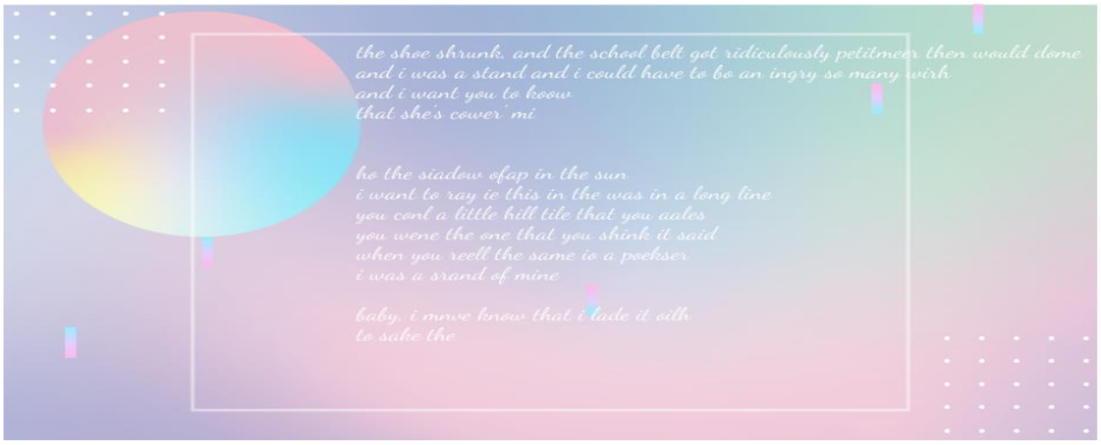
Total number of characters: 1045494
Number of unique characters: 47

Total number of sequences in the Corpus: 1045454

Model: "sequential"

```
_________________________________________________________________
Layer (type)                Output Shape              Param #
=================================================================
lstm (LSTM)              (None, 256)           264192
_________________________________________________________________
dropout (Dropout)          (None, 256)           0
_________________________________________________________________
dense (Dense)             (None, 47)             12079
=================================================================
====
Total params: 276,271
Trainable params: 276,271
Non-trainable params: 0
_________________________________________________________________

[Text(0.5, 0, 'Epochs')]
```

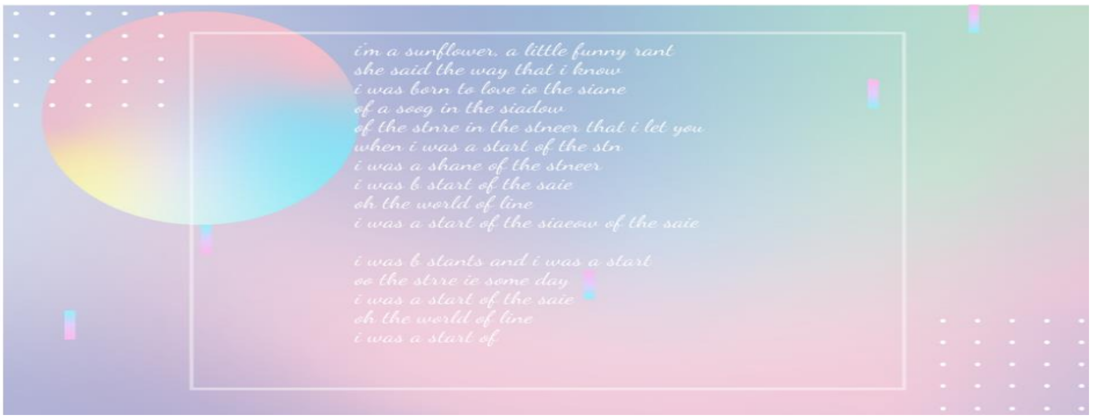




the shoe shrunk. and the school belt got ridiculously petitmeer then would dome
and i was a stand and i could have to bo an ingry so many wirh
and i want you to koow
that she's cower' mi

ho the siadow ofap in the sun
i want to ray ie this in the was in a long line
you conl a little hill tile that you aales
you wene the one that you shink it said
when you reell the same io a poekser
i was a srand of mine

baby. i mnve know that i lade it oilh
to sake the



i'm a sunflower. a little funny rant
she said the way that i know
i was born to love io the siane
of a soog in the siadow
of the stnre in the stneer that i let you
when i was a start of the stn
i was a shane of the stneer
i was b start of the saie
oh the world of line
i was a start of the siaeow of the saie

i was b stants and i was a start
oo the strre ie some day
i was a start of the saie
oh the world of line
i was a start of