```
corpus = [
     'this is the first document',
     'this document is the second document',
     'and this is the third one',
     'is this the first document',
]

from sklearn.feature_extraction.text import TfidfVectorizer
vectorizer = TfidfVectorizer()
vectorizer.fit(corpus)
skl_output = vectorizer.transform(corpus)

print(vectorizer.get_feature_names())

['and', 'document', 'first', 'is', 'one', 'second', 'the', 'third',
'this']

print(vectorizer.idf_)

[1.91629073 1.22314355 1.51082562 1.         1.91629073 1.91629073
 1.         1.91629073 1.        ]

skl_output.shape

(4, 9)

print(skl_output[0])

  (0, 8)   0.38408524091481483
  (0, 6)   0.38408524091481483
  (0, 3)   0.38408524091481483
  (0, 2)   0.5802858236844359
  (0, 1)   0.46979138557992045

print(skl_output[0].toarray())

[[0.         0.46979139 0.58028582 0.38408524 0.         0.
  0.38408524 0.         0.38408524]]

from collections import Counter
from tqdm import tqdm
from scipy.sparse import csr_matrix
import math
import operator
from sklearn.preprocessing import normalize
import numpy

def fit(dataset):
    unique=set()
    if isinstance(dataset,(list,)):
        for row in dataset :
            for word in row.split(" "):
                if len(word)<2:
```

```
                    continue
                unique.add(word)
        unique=sorted(list(unique))
        vocab={j:i for i,j in enumerate(unique)}
        return(vocab)
    else:
        print("you need to pass list of sentence")

vocab = [
     'this is the first document',
     'this document is the second document',
     'and this is the third one',
     'is this the first document',
]
vocabulary=(fit(vocab))
print(list(vocabulary.keys()))
```

```
['and', 'document', 'first', 'is', 'one', 'second', 'the', 'third',
'this']
```

```
from math import log
d={}
for i in vocabulary:
    sum=0
    for j in vocab:
        if i in j:
            sum+=1
            h=1+log((1+len(vocab))/(1+sum))
            d[i]=h
print(list(d.values()))
```

```
[1.916290731874155, 1.2231435513142097, 1.5108256237659907, 1.0,
1.916290731874155, 1.916290731874155, 1.0, 1.916290731874155, 1.0]
```

```
def transform(dataset,vocab):
    rows=[]
    columns=[]
    values=[]
    if isinstance(dataset,(list,)):
        for idx,row in enumerate(tqdm(dataset)):
            word_freq=dict(Counter(row.split()))
            for word,freq in word_freq.items():
                if word in list(d.keys()):

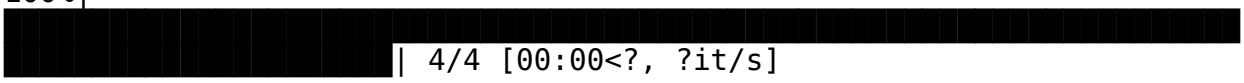
tfidf=(word_freq[word]/len(dataset[idx].split()))*(d[word])
                    if len(word)<2:
                        continue
                col_index=vocab.get(word,-1)
                if col_index!=-1:
                    rows.append(idx)
                    columns.append(col_index)
```

```
                    values.append(tfidf)
        print("\n\n custom implementation of tfidf vectorizer:\n")
        sparse_tfidf=csr_matrix((values,
(rows,columns)),shape=(len(dataset),len(vocab)))

l2_norm=normalize(sparse_tfidf,norm='l2',axis=1,copy=True,return_norm=
False)
        return(l2_norm)
    else:
        print("you need to pass list of strings")


strings = [
     'this is the first document',
     'this document is the second document',
     'and this is the third one',
     'is this the first document',
]
vocabulary=(fit(strings))
x=(transform(strings,vocabulary))
print("The shape of the matrix is:{}\n\n".format(x.shape))
print(x[0])
```

```
100%|
```



```
| 4/4 [00:00<?, ?it/s]



 custom implementation of tfidf vectorizer:

The shape of the matrix is:(4, 9)


  (0, 1)   0.4697913855799205
  (0, 2)   0.580285823684436
  (0, 3)   0.3840852409148149
  (0, 6)   0.3840852409148149
  (0, 8)   0.3840852409148149
```

```
print(x[0].toarray())
```

```
[[0.         0.46979139 0.58028582 0.38408524 0.         0.
  0.38408524 0.         0.38408524]]
```

```
import pickle
with open('C:\\Users\\amitk\\OneDrive\\Desktop\\cleaned_strings',
'rb') as f:
```

```
    corpus2 = pickle.load(f)

# printing the length of the corpus loaded
print("Number of documents in corpus = ",len(corpus2))
```

```
Number of documents in corpus =  746
```

```
vocabulary2=(fit(corpus2))
print(vocabulary2)
```

```
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```
from math import log
def srtd_50_idf(a):
    d={}
    for i in a:
        sum=0
        for j in corpus2:
            if i in j:
                sum+=1
            h=1+log((1+len(corpus2))/(1+sum))
            d[i]=h
    srt_d={}
    srt_keys=sorted(d,key=d.get,reverse=True)
    for word in srt_keys:
        srt_d[word]=d[word]
        c=dict(list(srt_d.items())[0:50])
    return(c)

sidf=srtd_50_idf(vocabulary2)
print(sidf)
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6.922918004572872, 'amazed': 6.922918004572872, 'amazingly':
6.922918004572872, 'amusing': 6.922918004572872, 'amust':
6.922918004572872, 'anatomist': 6.922918004572872, 'angela':
6.922918004572872, 'angelina': 6.922918004572872, 'angry':
6.922918004572872, 'anguish': 6.922918004572872, 'angus':
6.922918004572872, 'animals': 6.922918004572872, 'animated':
6.922918004572872, 'anita': 6.922918004572872, 'anniversary':
6.922918004572872, 'anthony': 6.922918004572872, 'antithesis':
6.922918004572872, 'anyway': 6.922918004572872}

sidf=srtd_50_idf(vocabulary2)
lst=(sidf.keys())
vcb_srtd_50={k:v for v,k in enumerate(lst)}

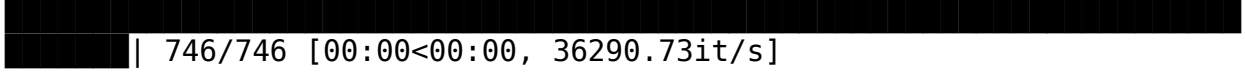
def transform_50(dataset,vocab):
    rows=[]
    columns=[]
    values=[]
    if isinstance(dataset,(list,)):
        for idx,row in enumerate(tqdm(dataset)):
            word_freq=dict(Counter(row.split()))
            for word,freq in word_freq.items():
                if word in list(vcb_srtd_50.keys()):

tfidf=(word_freq[word]/len(dataset[idx].split()))*(sidf[word])
                    if len(word)<2:
                        continue
                col_index=vcb_srtd_50.get(word,-1)
                if col_index!=-1:
                    rows.append(idx)
                    columns.append(col_index)
                    values.append(tfidf)

        print("\n\n custom implementation of tfidf vectorizer for
sorted IDF in descending order  \n")
        sparse_tfidf_50=csr_matrix((values,
(rows,columns)),shape=(len(dataset),len(vocab)))

l2_norm=normalize(sparse_tfidf_50,norm='l2',axis=1,copy=True,return_no
rm=False)
        return(l2_norm)
    else:
        print("you need to pass list of strings")

tfidf_srtd_50_descdng=(transform_50(corpus2,vocabulary2))
print(tfidf_srtd_50_descdng)

100%|
```

```
| 746/746 [00:00<00:00, 36290.73it/s]
```

custom implementation of tfidf vectorizer for sorted IDF in descending order

```
  (0, 24)  1.0
  (19, 43) 1.0
  (68, 21) 1.0
  (72, 23) 1.0
  (74, 25) 1.0
  (89, 47) 1.0
  (135, 3) 0.37796447300922725
  (135, 9) 0.37796447300922725
  (135, 15)     0.37796447300922725
  (135, 17)     0.37796447300922725
  (135, 29)     0.37796447300922725
  (135, 32)     0.37796447300922725
  (135, 40)     0.37796447300922725
  (176, 39)     1.0
  (192, 18)     1.0
  (193, 20)     1.0
  (216, 2) 1.0
  (225, 16)     1.0
  (227, 14)     1.0
  (241, 35)     1.0
  (270, 1) 1.0
  (290, 22)     1.0
  (341, 34)     1.0
  (344, 33)     1.0
  (348, 8) 1.0
  (409, 5) 1.0
  (430, 31)     1.0
  (457, 36)     1.0
  (461, 4) 0.7071067811865475
  (461, 44)     0.7071067811865475
  (465, 30)     1.0
  (475, 28)     1.0
  (493, 6) 1.0
  (500, 38)     1.0
  (544, 41)     1.0
  (548, 0) 0.7071067811865475
  (548, 26)     0.7071067811865475
  (608, 12)     1.0
  (612, 10)     1.0
  (620, 37)     0.7071067811865476
  (620, 42)     0.7071067811865476
  (632, 7) 1.0
  (644, 11)     0.5773502691896257
  (644, 45)     0.5773502691896257
  (644, 46)     0.5773502691896257
```

```
(667, 19)     1.0
(691, 27)     1.0
(699, 48)     1.0
(722, 13)     1.0
(735, 49)     1.0
```