L07-18-10-24-P1-Text-Data

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In [1]:
```
import nltk
persuasion_raw = nltk.corpus.gutenberg.words('austen-persuasion.txt')
moby_raw = nltk.corpus.gutenberg.words('melville-moby_dick.txt')
```

In [2]:
```
persuasion_raw[:10]
```

Out[2]:
```
['[', 'Persuasion', 'by', 'Jane', 'Austen', '1818', ']', 'Chapter', '1', 'Sir']
```

In [3]:
```
def chunk(doc, chunk_size=5000):
    return [doc[i:i+chunk_size] for i in range(0, len(doc), chunk_size)]
```

In [4]:
```
persuasion_chunks = chunk(persuasion_raw)
moby_chunks = chunk(moby_raw)
```

In [5]:
```
print(len(persuasion_chunks))
print(len(moby_chunks))
```

```
20
53
```

In [6]:
```
import pandas as pd
all_docs = pd.DataFrame({'words':persuasion_chunks + moby_chunks})
all_docs.head()
```

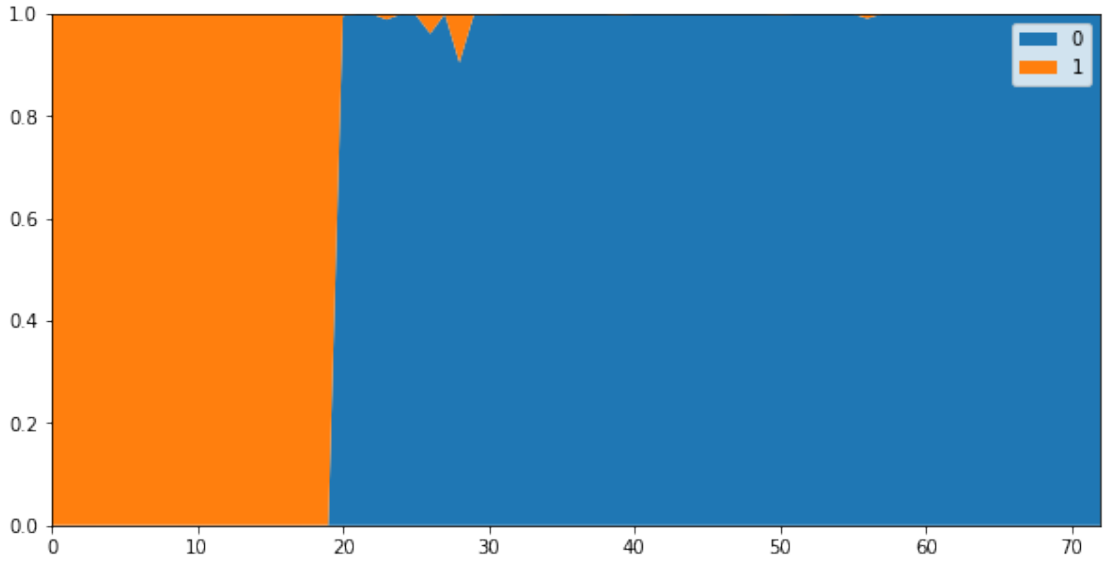
Out[6]:

	words
0	([, Persuasion, by, Jane, Austen, 1818,], Cha...
1	(with, the, daughter, of, Mr, Shepherd, ,, who...
2	(ever, with, her, own, discretion, ,, never, w...
3	(,, without, much, waiting, for, an, answer, ;...
4	(father, ,, through, the, gloom, of, the, even...

In [8]:
```
all_docs["chunks"] = all_docs["words"].str.join(" ")
all_docs["chunks"].head()
```

Out[8]:
```
0    [ Persuasion by Jane Austen 1818 ] Chapter 1 S...
1    with the daughter of Mr Shepherd , who had ret...
2    ever with her own discretion , never wished th...
3    , without much waiting for an answer ; or in t...
4    father , through the gloom of the evening , to...
Name: chunks, dtype: object
```

```
In [10]: from sklearn.feature_extraction.text import CountVectorizer
         tf_vectorizer = CountVectorizer(stop_words='english')
         tf = tf_vectorizer.fit_transform(all_docs['chunks'])

In [11]: tf

Out[11]: <73x18446 sparse matrix of type '<class 'numpy.int64'>'
                with 79224 stored elements in Compressed Sparse Row format>

In [12]: from sklearn.decomposition import LatentDirichletAllocation

In [43]: num_topics = 2
         lda = LatentDirichletAllocation(n_components=num_topics,
                                         random_state=42, max_iter=100)

In [44]: lda.fit(tf)

Out[44]: LatentDirichletAllocation(batch_size=128, doc_topic_prior=None,
                       evaluate_every=-1, learning_decay=0.7,
                       learning_method='batch', learning_offset=10.0,
                       max_doc_update_iter=100, max_iter=100, mean_change_tol=0.001,
                       n_components=2, n_jobs=None, n_topics=None, perp_tol=0.1,
                       random_state=42, topic_word_prior=None,
                       total_samples=1000000.0, verbose=0)

In [45]: document_topic = lda.transform(tf)

In [46]: document_topic.shape

Out[46]: (73, 2)

In [47]: %matplotlib inline
         import matplotlib.pyplot as plt
         import numpy as np
         fig, ax = plt.subplots(figsize=(10,5))
         x = np.arange(0, document_topic.shape[0])
         _ = ax.stackplot(x, document_topic.T,
                          labels=range(10))
         _ = ax.set_xlim(x[0], x[-1])
         _ = ax.set_ylim(0,1)
         _ = ax.legend()
```




```
In [48]: topic_word = lda.components_
         topic_word.shape

Out[48]: (2, 18446)

In [49]: words = np.array(tf_vectorizer.get_feature_names())
         for i, topic in enumerate(topic_word):
             sorted_idx = topic.argsort()[::-1]
             #print(i, dict(zip(words[sorted_idx][:10],
             #              topic[sorted_idx][:10])))
             print(i, words[sorted_idx][:10])

0 ['whale' 'like' 'man' 'ship' 'ahab' 'ye' 'sea' 'old' 'head' 'boat']
1 ['anne' 'captain' 'mrs' 'elliot' 'mr' 'lady' 'wentworth' 'good' 'little'
 'said']
```