The Tag Knows You

— A Text Prediction Model of Tags, Based on Reddit.com.

Produced by Bald Daddy

QIN Jiali, YE Qianying, GAO Ge, ZHAO Feier

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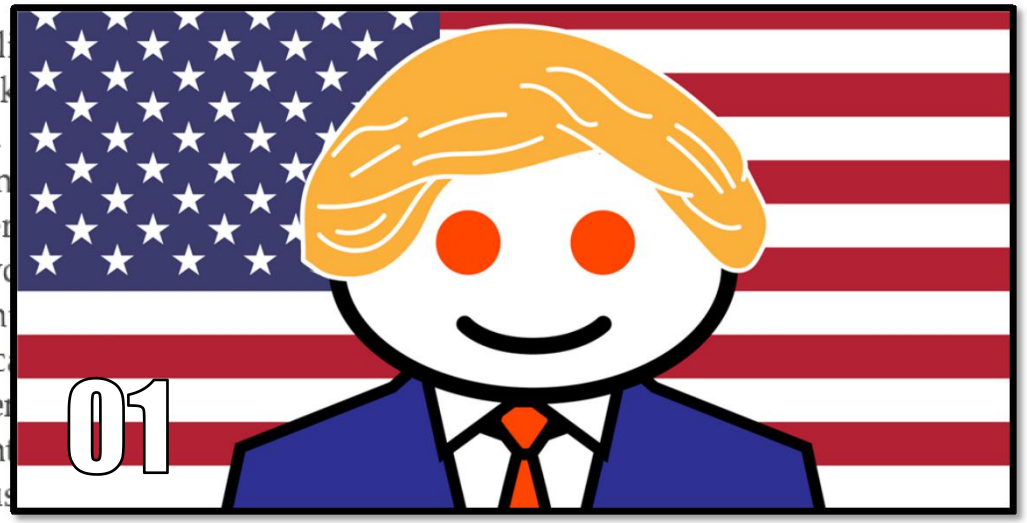
All Resources Based on



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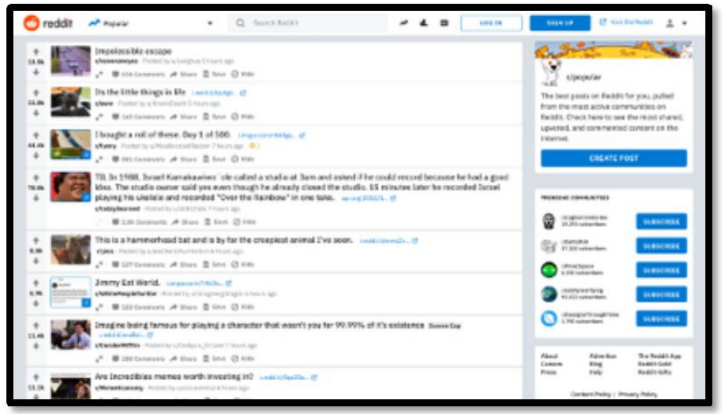
reddit



- An American social news aggregation, web content rating, and discussion website. Reddit had 542 million monthly visitors (234 million unique users), ranking as the **#6 most visited website** in U.S. and **#21** in the world
- Registered members submit content to the site such as **links, text posts, and images,** which are then **voted up or down** by other members.
- a variety of topics including **news, science, movies, video games, music, books, fitness, food, and image-sharing**.
- With the multireddits, users see top stories from a collection of **subreddits**.
- Reddit released its **"spoiler tags"** feature in January 2017. The feature warns users of potential spoilers in posts and pixelates preview images.

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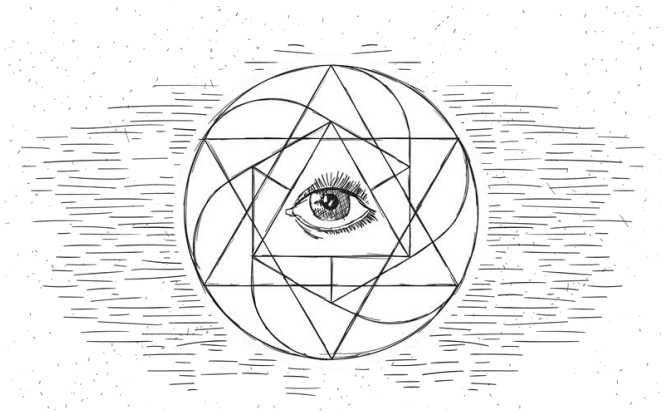

To build a system to predict the tags on the social platform according to the text users have edited.

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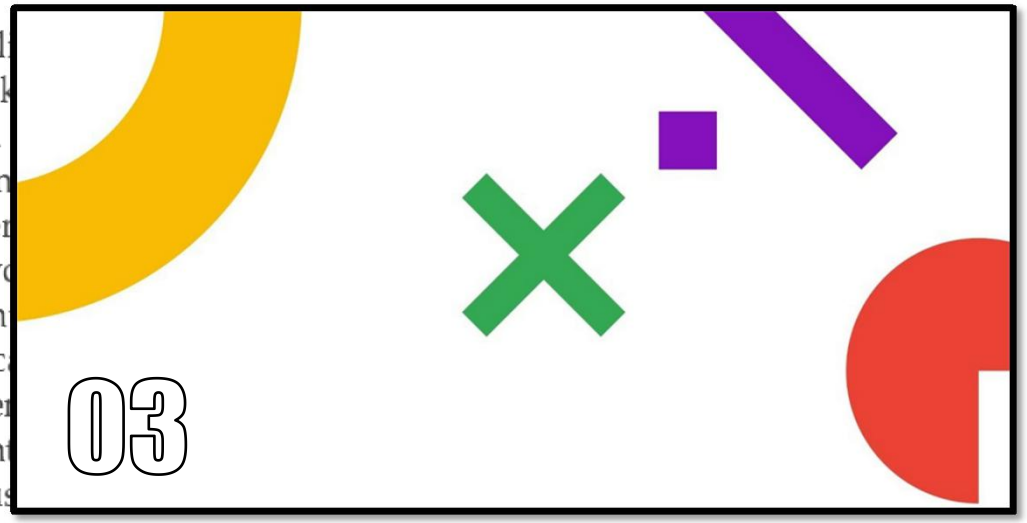
All Resources Based on



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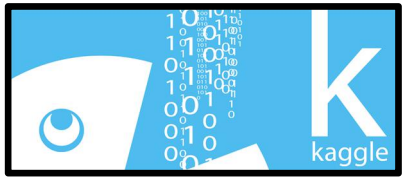
Original Data

Dataset from



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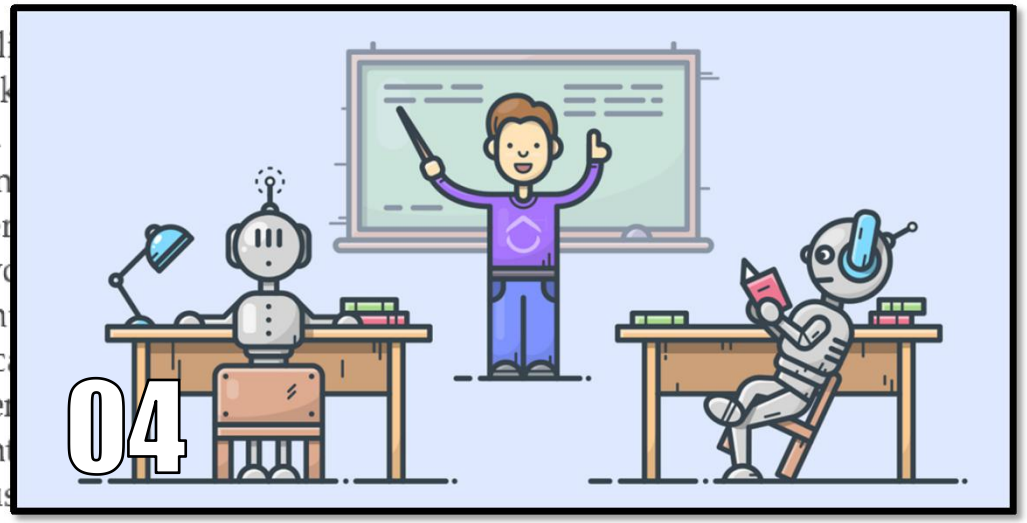
A id	A subreddit	A title	A selftext
post id	the subreddit the post was posted to	title of post (newline characters and tabs are converted to < lb \> and < tab \> , without spaces respectively)	text content of post (newline characters and tabs are converted to < lb \> and < tab \> , without spaces respectively)
1013000 unique values	1013 unique values	1002124 unique values	1013000 unique values

The dataset consists of **1.013M self-posts**, posted from **1013 subreddits** (1000 examples per class). For each post the subreddit, the title and content of the self-post are given.

All Resources Based on



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All Resources Based on

```
import nltk
from nltk.tokenize import word_tokenize
from nltk.stem.porter import *
from nltk.corpus import stopwords

from sklearn.naive_bayes import MultinomialNB
from sklearn.feature_extraction.text import TfidfTransformer
from sklearn.feature_extraction.text import CountVectorizer

nltk.download('punkt')
nltk.download('stopwords')
```

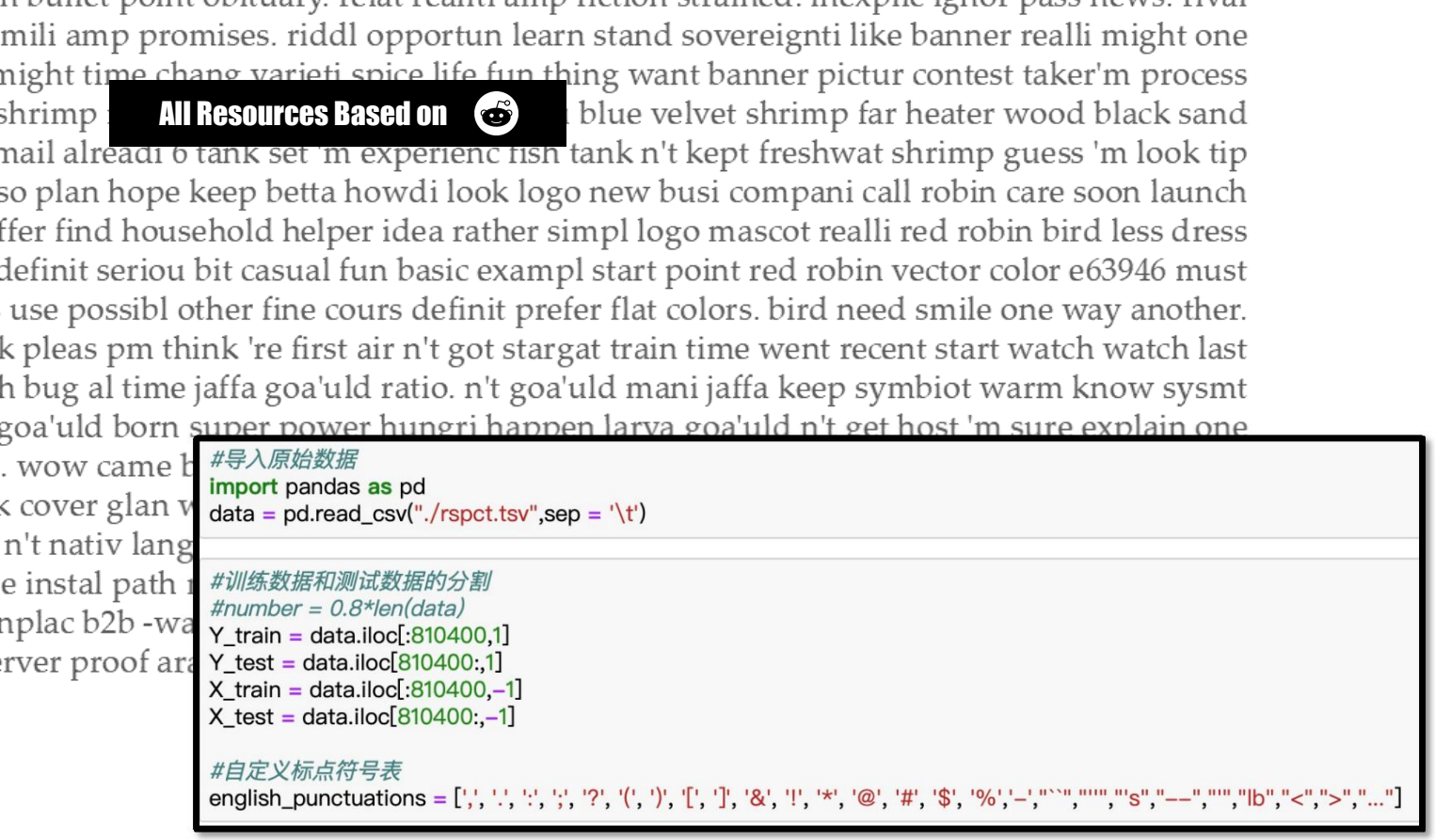
```
[nltk_data] Downloading package punkt to /Users/evondeng/nltk_data...
[nltk_data]   Package punkt is already up-to-date!
[nltk_data] Downloading package stopwords to
[nltk_data]     /Users/evondeng/nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
```

import nltk *# Natural Language Toolkit*

Tokenize	**分词**
Stem.porter	**提取词干**
Stopwords	**停用词** *# Stopwords: I, you...*

model of naive bayes

txt feature extraction



import nltk *# Natural Language Toolkit*

Tokenize	**分词**
Stem.porter	**提取词干**
Stopwords	**停用词** *# Stopwords: I, you...*

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All Resources Based on

```
#训练 文本数据的预处理和存储
for sentence in X_train:
    token=word_tokenize(sentence)
    tokens = []
    for t in token:
        t = t.lower()
        if t not in stopwords.words('english'):
            if t not in english_punctuations:
                stemmer = PorterStemmer()
                tokens.append(stemmer.stem(t))
    tokens = " ".join(tokens)
    csvFile = open("new_sentence_train.csv", "a", encoding="UTF-8")
    writer = csv.writer(csvFile)
    data = [
        tokens
    ]
    writer.writerow(data)
    csvFile.close()
```

```
# 测试 文本数据的预处理和存储
for sentence in X_test:
    token=word_tokenize(sentence)
    tokens = []
    for t in token:
        t = t.lower()
        if t not in stopwords.words('english'):
            if t not in english_punctuations:
                stemmer = PorterStemmer()
                tokens.append(stemmer.stem(t))
    tokens = " ".join(tokens)
    csvFile = open("new_sentence_test.csv", "a", encoding="UTF-8")
    writer = csv.writer(csvFile)
    data = [
        tokens
    ]
    writer.writerow(data)
    csvFile.close()
```

a. **Divide the data set by 8 : 2 - Train & Test**
b. **Filtered punctuation**
c. **Depunctuate, extract stem**
4. **Save as csv.**

All Resources Based on

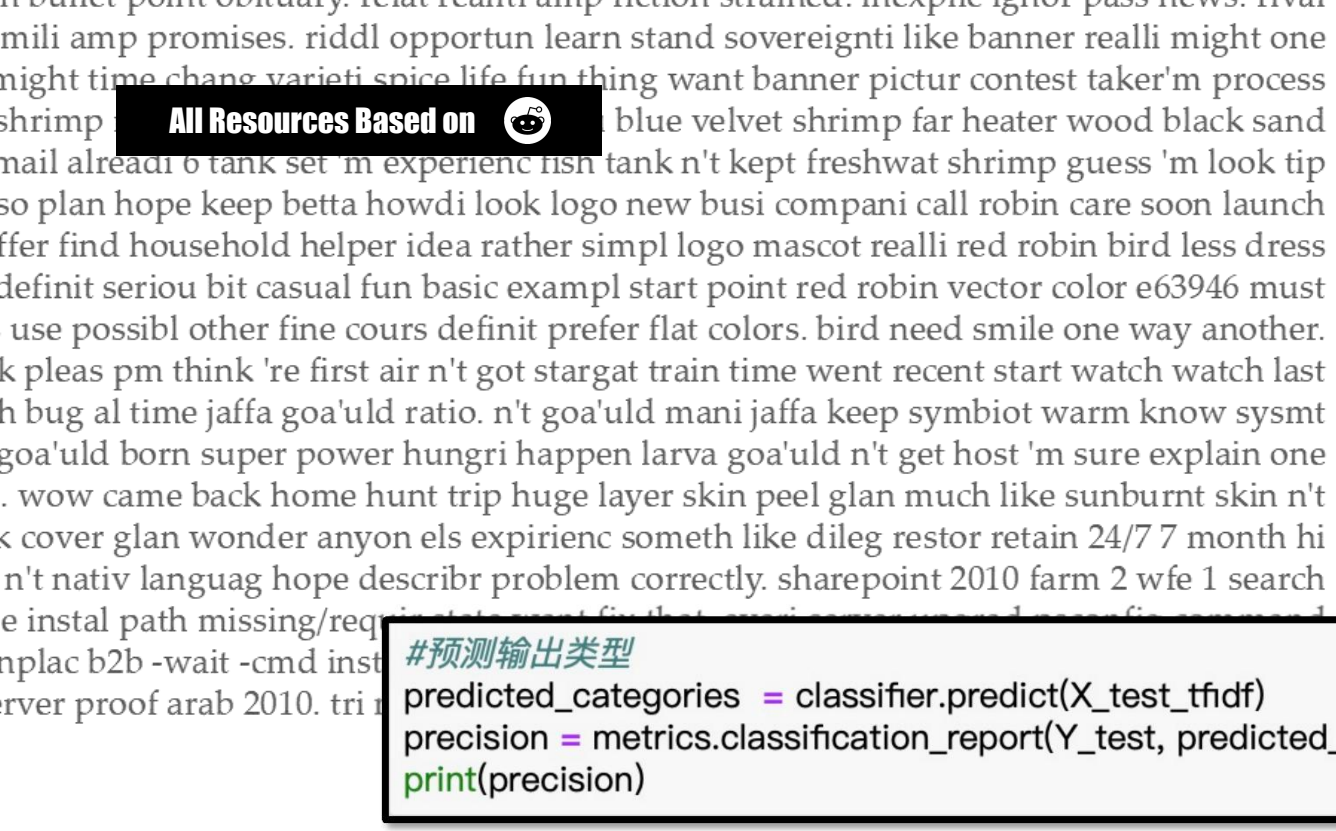
```
#从以保存的csv文件中取出数据
data1 = pd.read_csv("./new_sentence_train.csv",sep = ',')
data2 = pd.read_csv("./new_sentence_test.csv",sep = ',')
filtered_sentence_train = data1.iloc[:,0]
filtered_sentence_test = data2.iloc[:,0]
```

```
#定义文本特征提取器和tf-idf变换器
vectorizer=CountVectorizer()
transformer = TfidfTransformer()

# 用tf-idf变换器变换训练数据
X_train_tfidf = transformer.fit_transform(vectorizer.fit_transform(filtered_sentence_train))

# 多项式朴素贝叶斯分类器
classifier = MultinomialNB().fit(X_train_tfidf, Y_train)

#用tf-idf变换器变换测试数据
X_input_termcounts = vectorizer.transform(filtered_sentence_test)
X_test_tfidf = transformer.transform(X_input_termcounts)
```

tf-idf - weighting

a. Positive correlation with the frequency of occurrence in a document.

b. Negative correlation with the frequency of occurrence in the whole corpus.



to predict the output

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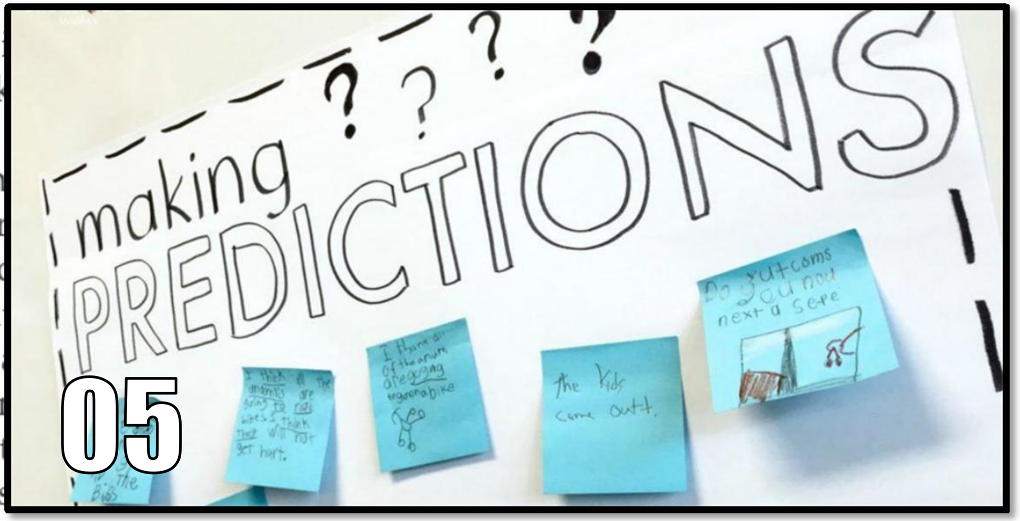

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	precision	recall	f1-score	support
13ReasonsWhy	0.73	0.80	0.76	200
3Dprinting	0.72	0.60	0.66	200
3d6	0.44	0.94	0.60	200
4Runner	0.77	0.67	0.72	200
7daystodie	0.74	0.58	0.65	200
90DayFiance	0.95	0.44	0.60	200
ABDL	0.87	0.55	0.67	200
ABraThatFits	0.70	0.95	0.81	200
ACL	0.62	0.95	0.75	200
ACT	0.77	0.70	0.74	200
ADHD	0.38	0.50	0.43	200
APStudents	0.82	0.79	0.80	200
ASUS	0.72	0.46	0.56	200
AcademicPsychology	0.49	0.54	0.51	200
Accounting	0.84	0.38	0.52	200
Adobelllustrator	0.57	0.68	0.62	200
Adoption	0.57	0.84	0.68	200
workflow	0.87	0.80	0.83	200
wownoob	0.77	0.84	0.80	200
writing	0.41	0.48	0.44	200
xxfitness	0.37	0.61	0.46	200
xxketo	0.69	0.69	0.69	200
yandere_simulator	0.98	0.81	0.89	200
ynab	0.85	0.91	0.88	200
yoga	0.84	0.71	0.77	200
yorku	0.97	0.52	0.67	200
zootopia	0.91	0.68	0.78	200
micro avg	0.71	0.71	0.71	202600
macro avg	0.77	0.71	0.72	202600
weighted avg	0.77	0.71	0.72	202600

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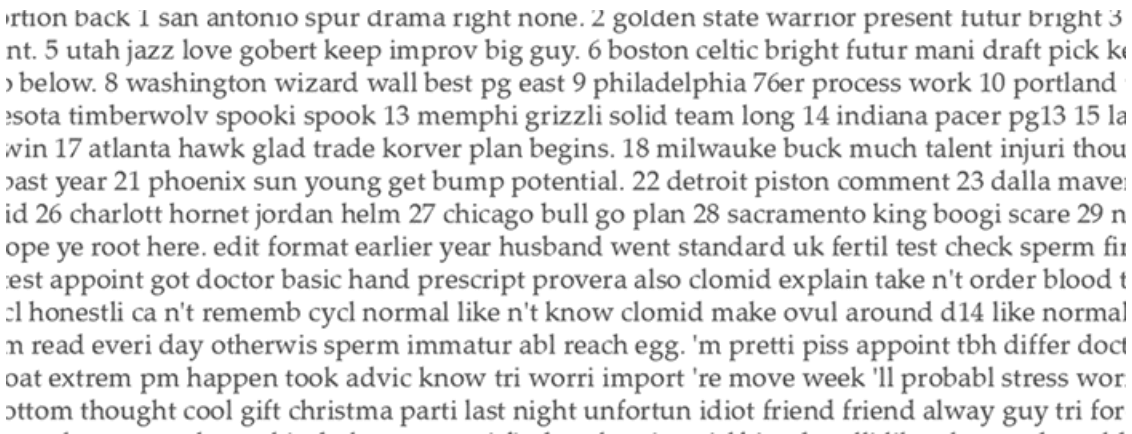
Overall, both precision and recall value is very high, so we can say that the model is somehow good.

limitation

We propose an assumption that we can construct a library in which some keywords can be added to a certain area;

For example we can define “lipstick” or “fragrance” to cosmetic area. That may improve the precision of the predict system of social platform tag.




That's all Folks!