



In [3]: `pip install scikit-multilearn`

```
Collecting scikit-multilearn
  Downloading https://files.pythonhosted.org/packages/bb/1f/e6ff649c72a1cdf2c7a1d31eb21705110ce1c5d3e7e26b2cc300e1637272/scikit_multilearn-0.2.0-py3-none-any.whl (89kB)
    |████████████████████████████████████████| 92kB 10.2MB/s
Installing collected packages: scikit-multilearn
Successfully installed scikit-multilearn-0.2.0
```

```
In [0]: import warnings
warnings.filterwarnings("ignore")
import pandas as pd
import sqlite3
import csv
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
from wordcloud import WordCloud
import re
import os
from sqlalchemy import create_engine # database connection
import datetime as dt
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
from nltk.stem.snowball import SnowballStemmer
from sklearn.feature_extraction.text import CountVectorizer
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.multiclass import OneVsRestClassifier
from sklearn.linear_model import SGDClassifier
from sklearn import metrics
from sklearn.metrics import f1_score, precision_score, recall_score
from sklearn import svm
from sklearn.linear_model import LogisticRegression
from skmultilearn.adapt import mlknn
from skmultilearn.problem_transform import ClassifierChain
from skmultilearn.problem_transform import BinaryRelevance
from skmultilearn.problem_transform import LabelPowerset
from sklearn.naive_bayes import GaussianNB
from datetime import datetime
```

## Stack Overflow: Tag Prediction

### 1. Business Problem

## 1.1 Description

### Description

Stack Overflow is the largest, most trusted online community for developers to learn, share their programming knowledge, and build their careers.

Stack Overflow is something which every programmer use one way or another. Each month, over 50 million developers come to Stack Overflow to learn, share their knowledge, and build their careers. It features questions and answers on a wide range of topics in computer programming. The website serves as a platform for users to ask and answer questions, and, through membership and active participation, to vote questions and answers up or down and edit questions and answers in a fashion similar to a wiki or Digg. As of April 2014 Stack Overflow has over 4,000,000 registered users, and it exceeded 10,000,000 questions in late August 2015. Based on the type of tags assigned to questions, the top eight most discussed topics on the site are: Java, JavaScript, C#, PHP, Android, jQuery, Python and HTML.

### Problem Statement

Suggest the tags based on the content that was there in the question posted on Stackoverflow.

**Source:** <https://www.kaggle.com/c/facebook-recruiting-iii-keyword-extraction/>

## 1.2 Source / useful links

Data Source : <https://www.kaggle.com/c/facebook-recruiting-iii-keyword-extraction/data>  
(<https://www.kaggle.com/c/facebook-recruiting-iii-keyword-extraction/data>)

Youtube : <https://youtu.be/nNDqbUhtIRg> (<https://youtu.be/nNDqbUhtIRg>)

Research paper : <https://www.microsoft.com/en-us/research/wp-content/uploads/2016/02/tagging-1.pdf>  
(<https://www.microsoft.com/en-us/research/wp-content/uploads/2016/02/tagging-1.pdf>)

Research paper : <https://dl.acm.org/citation.cfm?id=2660970&dl=ACM&coll=DL> (<https://dl.acm.org/citation.cfm?id=2660970&dl=ACM&coll=DL>)

## 1.3 Real World / Business Objectives and Constraints

1. Predict as many tags as possible with high precision and recall.
2. Incorrect tags could impact customer experience on StackOverflow.
3. No strict latency constraints.

## 2. Machine Learning problem

### 2.1 Data

#### 2.1.1 Data Overview

Refer: <https://www.kaggle.com/c/facebook-recruiting-iii-keyword-extraction/data>  
(<https://www.kaggle.com/c/facebook-recruiting-iii-keyword-extraction/data>)

All of the data is in 2 files: Train and Test.

**Train.csv** contains 4 columns: Id,Title,Body,Tags.

**Test.csv** contains the same columns but without the Tags, which you are to predict.

**Size of Train.csv** - 6.75GB

**Size of Test.csv** - 2GB

**Number of rows in Train.csv** = 6034195

The questions are randomized and contains a mix of verbose text sites as well as sites related to math and programming. The number of questions from each site may vary, and no filtering has been performed on the questions (such as closed questions).

## Data Field Explanation

Dataset contains 6,034,195 rows. The columns in the table are:

**Id** - Unique identifier for each question

**Title** - The question's title

**Body** - The body of the question

**Tags** - The tags associated with the question in a space-separated format (all lower case, should not contain tabs '\t' or ampersands '&')

### 2.1.2 Example Data point

**Title:** Implementing Boundary Value Analysis of Software Testing in a C++ program?

**Body :**

```

#include<
iostream>\n
#include<
stdlib.h>\n\n
using namespace std;\n\n
int main()\n
{\n
    int n,a[n],x,c,u[n],m[n],e[n][4];\n
    cout<<"Enter the number of variables";\n          cin>>n;\n
\n
    cout<<"Enter the Lower, and Upper Limits of the variable
s";\n

    for(int y=1; y<n+1; y++)\n
    {\n
        cin>>m[y];\n
        cin>>u[y];\n
    }\n
    for(x=1; x<n+1; x++)\n
    {\n
        a[x] = (m[x] + u[x])/2;\n
    }\n
    c=(n*4)-4;\n
    for(int a1=1; a1<n+1; a1++)\n
    {\n\n
        e[a1][0] = m[a1];\n
        e[a1][1] = m[a1]+1;\n
        e[a1][2] = u[a1]-1;\n
        e[a1][3] = u[a1];\n
    }\n
    for(int i=1; i<n+1; i++)\n
    {\n
        for(int l=1; l<=i; l++)\n
        {\n
            if(l!=1)\n
            {\n
                cout<<a[l]<<"\\t";\n
            }\n
        }\n
        for(int j=0; j<4; j++)\n
        {\n
            cout<<e[i][j];\n
            for(int k=0; k<n-(i+1); k++)\n
            {\n
                cout<<a[k]<<"\\t";\n
            }\n
            cout<<"\\n";\n
        }\n
    }\n
}      \n\n

```

```
        system("PAUSE");\n        return 0;    \n    }\n
```

\n\n

The answer should come in the form of a table like

\n\n

1	50	50\n
2	50	50\n

## 2.2 Mapping the real-world problem to a Machine Learning Problem

### 2.2.1 Type of Machine Learning Problem

It is a multi-label classification problem

**Multi-label Classification:** Multilabel classification assigns to each sample a set of target labels. This can be thought as predicting properties of a data-point that are not mutually exclusive, such as topics that are relevant for a document. A question on Stackoverflow might be about any of C, Pointers, FileIO and/or memory-management at the same time or none of these.

\_\_Credit\_\_: <http://scikit-learn.org/stable/modules/multiclass.html>

### 2.2.2 Performance metric

**Micro-Averaged F1-Score (Mean F Score)** : The F1 score can be interpreted as a weighted average of the precision and recall, where an F1 score reaches its best value at 1 and worst score at 0. The relative contribution of precision and recall to the F1 score are equal. The formula for the F1 score is:

$$F1 = 2 * (precision * recall) / (precision + recall)$$

In the multi-class and multi-label case, this is the weighted average of the F1 score of each class.

**'Micro f1 score':**

Calculate metrics globally by counting the total true positives, false negatives and false positives. This is a better metric when we have class imbalance.

**'Macro f1 score':**

Calculate metrics for each label, and find their unweighted mean. This does not take label imbalance into account.

<https://www.kaggle.com/wiki/MeanFScore> (<https://www.kaggle.com/wiki/MeanFScore>)  
[http://scikit-learn.org/stable/modules/generated/sklearn.metrics.f1\\_score.html](http://scikit-learn.org/stable/modules/generated/sklearn.metrics.f1_score.html) ([http://scikit-learn.org/stable/modules/generated/sklearn.metrics.f1\\_score.html](http://scikit-learn.org/stable/modules/generated/sklearn.metrics.f1_score.html))

**Hamming loss** : The Hamming loss is the fraction of labels that are incorrectly predicted.

<https://www.kaggle.com/wiki/HammingLoss> (<https://www.kaggle.com/wiki/HammingLoss>)

## 3. Exploratory Data Analysis

### 3.1 Data Loading and Cleaning

#### 3.1.1 Using Pandas with SQLite to Load the data



```
In [0]: #Creating db file from csv
#Learn SQL: https://www.w3schools.com/sql/default.asp
if not os.path.isfile('train.db'):
    start = datetime.now()
    disk_engine = create_engine('sqlite:///train.db')
    start = dt.datetime.now()
    chunksize = 180000
    j = 0
    index_start = 1
    for df in pd.read_csv("Train.csv", names=['Id', 'Title', 'Body', 'Tags'],
chunksize=chunksize, iterator=True, encoding='utf-8', ):
        df.index += index_start
        j+=1
        print('{} rows'.format(j*chunksize))
        df.to_sql('data', disk_engine, if_exists='append')
        index_start = df.index[-1] + 1
    print("Time taken to run this cell :", datetime.now() - start)
```

```
180000 rows
360000 rows
540000 rows
720000 rows
900000 rows
1080000 rows
1260000 rows
1440000 rows
1620000 rows
1800000 rows
1980000 rows
2160000 rows
2340000 rows
2520000 rows
2700000 rows
2880000 rows
3060000 rows
3240000 rows
3420000 rows
3600000 rows
3780000 rows
3960000 rows
4140000 rows
4320000 rows
4500000 rows
4680000 rows
4860000 rows
5040000 rows
5220000 rows
5400000 rows
5580000 rows
5760000 rows
5940000 rows
6120000 rows
Time taken to run this cell : 0:03:36.128704
```

### 3.1.2 Counting the number of rows

```
In [0]: if os.path.isfile("train.db"):
        start = datetime.now()
        con = sqlite3.connect("train.db")
        num_rows = pd.read_sql_query("""SELECT count(*) FROM data""", con)
        #Always remember to close the database
        print("Number of rows in the database :", "\n", num_rows['count(*)'].values[0])
        con.close()
        print("Time taken to count the number of rows :", datetime.now() - start)
    else:
        print("Please download the train.db file from drive or run the above cell to generate train.db file")
```

Number of rows in the database :  
6034196  
Time taken to count the number of rows : 0:00:15.580333

```
In [0]: num_rows
```

Out[0]:

	count(*)
0	6034196

### 3.1.3 Checking for duplicates

```
In [0]: #Learn SQL: https://www.w3schools.com/sql/default.asp
        if os.path.isfile("train.db"):
            start = datetime.now()
            con = sqlite3.connect("train.db")
            df_no_dup = pd.read_sql_query('SELECT Title, Body, Tags, COUNT(*) as cnt_dup FROM data GROUP BY Title, Body, Tags', con)
            con.close()
            print("Time taken to run this cell :", datetime.now() - start)
        else:
            print("Please download the train.db file from drive or run the first to generate train.db file")
```

```
In [0]: df_no_dup.head()
        # we can observe that there are duplicates
```

```
In [0]: print("number of duplicate questions :", num_rows['count(*)'].values[0] - df_no_dup.shape[0], "(", (1 - ((df_no_dup.shape[0]) / (num_rows['count(*)'].values[0]))) * 100, "% )")
```

number of duplicate questions : 1827881 ( 30.2920389063 % )

```
In [0]: # number of times each question appeared in our database
df_no_dup.cnt_dup.value_counts()
```

```
Out[0]: 1    2656284
        2    1272336
        3     277575
        4         90
        5         25
        6          5
        Name: cnt_dup, dtype: int64
```

```
In [0]: start = datetime.now()
df_no_dup["tag_count"] = df_no_dup["Tags"].apply(lambda text: len(text.split("
")))
# adding a new feature number of tags per question
print("Time taken to run this cell :", datetime.now() - start)
df_no_dup.head()
```

Time taken to run this cell : 0:00:03.169523

```
Out[0]:
```

	Title	Body	Tags	cnt_dup	ta
0	Implementing Boundary Value Analysis of S...	<pre>#include<istream>\n#include<...	c++ c	1	
1	Dynamic Datagrid Binding in Silverlight?	<p>I should do binding for datagrid dynamicall...	c# silverlight data-binding	1	
2	Dynamic Datagrid Binding in Silverlight?	<p>I should do binding for datagrid dynamicall...	c# silverlight data-binding columns	1	
3	java.lang.NoClassDefFoundError: javax/serv...	<p>I followed the guide in <a href="http://sta...	jsp jstl	1	
4	java.sql.SQLException:[Microsoft][ODBC Dri...	<p>I use the following code</p>\n\n<pre> <code>...	java jdbc	2	

```
In [0]: # distribution of number of tags per question
df_no_dup.tag_count.value_counts()
```

```
Out[0]: 3    1206157
        2    1111706
        4    814996
        1    568298
        5    505158
        Name: tag_count, dtype: int64
```

```
In [0]: #Creating a new database with no duplicates
if not os.path.isfile('train_no_dup.db'):
    disk_dup = create_engine("sqlite:///train_no_dup.db")
    no_dup = pd.DataFrame(df_no_dup, columns=['Title', 'Body', 'Tags'])
    no_dup.to_sql('no_dup_train', disk_dup)
```

```
In [0]: #This method seems more appropriate to work with this much data.
#creating the connection with database file.
if os.path.isfile("train_no_dup.db"):
    start = datetime.now()
    con = sqlite3.connect("train_no_dup.db")
    tag_data = pd.read_sql_query("""SELECT Tags FROM no_dup_train""", con)
    #Always remember to close the database
    con.close()

    # Let's now drop unwanted column.
    tag_data.drop(tag_data.index[0], inplace=True)
    #Printing first 5 columns from our data frame
    tag_data.head()
    print("Time taken to run this cell :", datetime.now() - start)
else:
    print("Please download the train.db file from drive or run the above cells
    to generate train.db file")
```

Time taken to run this cell : 0:00:32.693158

```
In [0]: tag_data.head()
```

Out[0]:

	Tags
1	c# silverlight data-binding
2	c# silverlight data-binding columns
3	jsp jstl
4	java jdbc
5	facebook api facebook-php-sdk

```
In [0]: con = sqlite3.connect("D:\\chrome_down\\train_no_dup.db")
dat = pd.read_sql_query("""SELECT * FROM no_dup_train LIMIT 10""", con)
dat
con.close()
```

In [0]: dat

Out[0]:

	index	Title	Body	Tags
0	0	Implementing Boundary Value Analysis of S...	<pre>\n#include<iosstream>\n#include<...</pre>	c++ c
1	1	Dynamic Datagrid Binding in Silverlight?	<p>I should do binding for datagrid dynamically...	c# silverlight data-binding
2	2	Dynamic Datagrid Binding in Silverlight?	<p>I should do binding for datagrid dynamically...	c# silverlight data-binding columns
3	3	java.lang.NoClassDefFoundError: javax.serv...	<p>I followed the guide in <a href="http://sta...	jsp jstl
4	4	java.sql.SQLException:[Microsoft][ODBC Dri...	<p>I use the following code</p>\n\n<pre>\n<code>...	java jdbc
5	5	Better way to update feed on FB with PHP SDK	<p>I am a novice with the Facebook API. I have...	facebook api facebook-php-sdk
6	6	btnAdd click event opens two window after r...	<p>i m opening window(search.aspx)using below ...	javascript asp.net web
7	7	"SQL Injection" issue preventing correct for...	<p>So I've been checking everything I can thin...	php forms
8	8	Countable subadditivity of the Lebesgue measure	<p>Let $\{F_n\}$ be a sequence of ...	real-analysis measure-theory
9	9	HQL equivalent to this Sql Query	<pre>\nselect\npart.Pald,part.PaName,part.P...	hibernate hql

## 3.2 Analysis of Tags

### 3.2.1 Total number of unique tags

```
In [0]: # Importing & Initializing the "CountVectorizer" object, which
#is scikit-learn's bag of words tool.

#by default 'split()' will tokenize each tag using space.
vectorizer = CountVectorizer(tokenizer = lambda x: x.split())
# fit_transform() does two functions: First, it fits the model
# and learns the vocabulary; second, it transforms our training data
# into feature vectors. The input to fit_transform should be a list of string
s.
tag_dtm = vectorizer.fit_transform(tag_data['Tags'])
```

In [0]: tag\_dtm.shape

Out[0]: (4206314, 42048)

```
In [0]: print("Number of data points :", tag_dtm.shape[0])
        print("Number of unique tags :", tag_dtm.shape[1])
```

```
Number of data points : 4206314
Number of unique tags : 42048
```

```
In [0]: #'get_feature_name()' gives us the vocabulary.
        tags = vectorizer.get_feature_names()
        #Lets look at the tags we have.
        print("Some of the tags we have :", tags[:10])
```

```
Some of the tags we have : ['.a', '.app', '.asp.net-mvc', '.aspxauth', '.bash
-profile', '.class-file', '.cs-file', '.doc', '.drv', '.ds-store']
```

### 3.2.3 Number of times a tag appeared

```
In [0]: print(tag_dtm)
```

```
(0, 4337)      1
(0, 33111)     1
(0, 7926)      1
(1, 4337)      1
(1, 33111)     1
(1, 7926)      1
(1, 6177)      1
(2, 18897)     1
(2, 18942)     1
(3, 18069)     1
(3, 18294)     1
(4, 11884)     1
(4, 1733)      1
(4, 11930)     1
(5, 18157)     1
(5, 2215)      1
(5, 39860)     1
(6, 27249)     1
(6, 13158)     1
(7, 30046)     1
(7, 21577)     1
(8, 15535)     1
(8, 15868)     1
(9, 17643)     1
(9, 10842)     1
:             :
(4206304, 4337)      1
(4206304, 33111)     1
(4206304, 40494)     1
(4206305, 33246)     1
(4206305, 32110)     1
(4206306, 4346)      1
(4206306, 25587)     1
(4206307, 20205)     1
(4206308, 27249)     1
(4206308, 27265)     1
(4206308, 27251)     1
(4206308, 41914)     1
(4206309, 40790)     1
(4206309, 40797)     1
(4206310, 27249)     1
(4206310, 23452)     1
(4206310, 36491)     1
(4206311, 27249)     1
(4206311, 5972)      1
(4206311, 5150)      1
(4206312, 27249)     1
(4206312, 26129)     1
(4206312, 10828)     1
(4206312, 22166)     1
(4206313, 15900)     1
```

```
In [0]: # https://stackoverflow.com/questions/15115765/how-to-access-sparse-matrix-elements
# Lets now store the document term matrix in a dictionary.
freqs = tag_dtm.sum(axis=0).A1
result = dict(zip(tags, freqs))
```

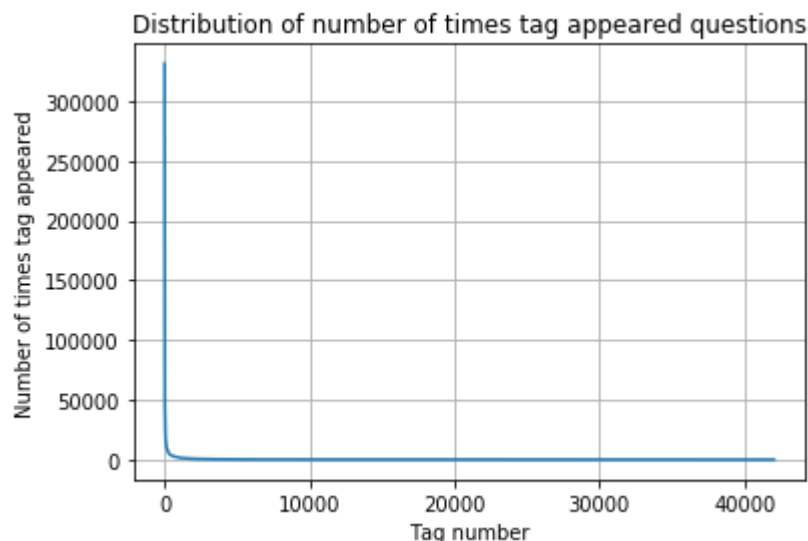
```
In [0]: # Saving this dictionary to csv files.
if not os.path.isfile('tag_counts_dict_dtm.csv'):
    with open('tag_counts_dict_dtm.csv', 'w') as csv_file:
        writer = csv.writer(csv_file)
        for key, value in result.items():
            writer.writerow([key, value])
tag_df = pd.read_csv("tag_counts_dict_dtm.csv", names=['Tags', 'Counts'])
tag_df.head()
```

Out[0]:

	Tags	Counts
0	.a	18
1	.app	37
2	.asp.net-mvc	1
3	.aspxauth	21
4	.bash-profile	138

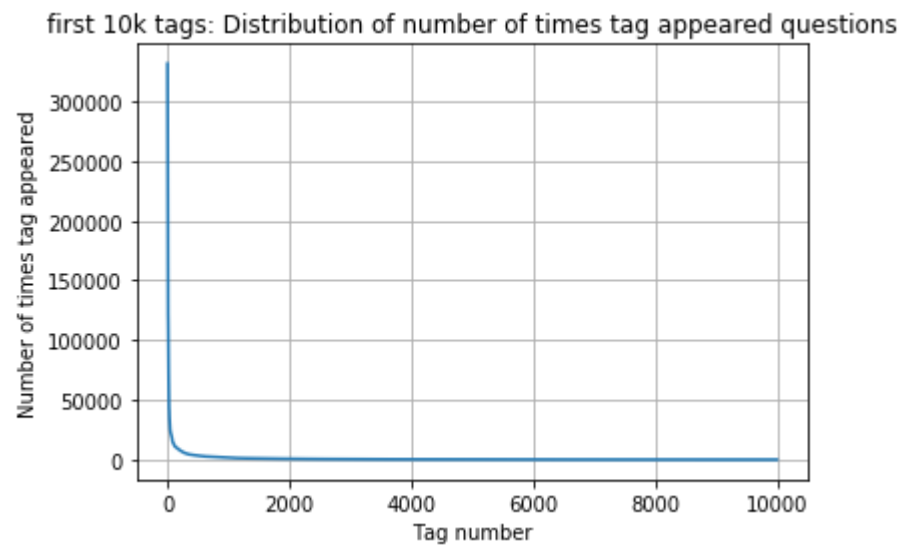
```
In [0]: tag_df_sorted = tag_df.sort_values(['Counts'], ascending=False)
tag_counts = tag_df_sorted['Counts'].values
```

```
In [0]: plt.plot(tag_counts)
plt.title("Distribution of number of times tag appeared questions")
plt.grid()
plt.xlabel("Tag number")
plt.ylabel("Number of times tag appeared")
plt.show()
```



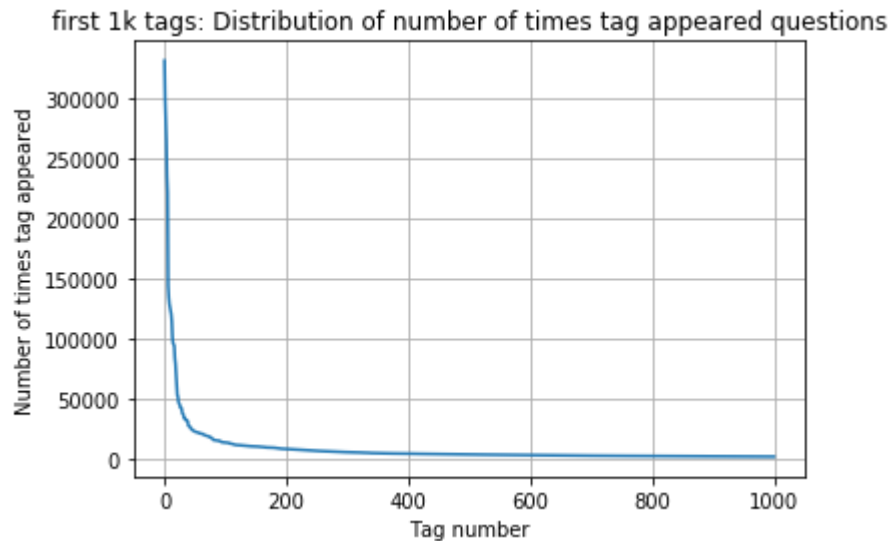


```
In [0]: plt.plot(tag_counts[0:10000])
plt.title('first 10k tags: Distribution of number of times tag appeared questions')
plt.grid()
plt.xlabel("Tag number")
plt.ylabel("Number of times tag appeared")
plt.show()
print(len(tag_counts[0:10000:25]), tag_counts[0:10000:25])
```



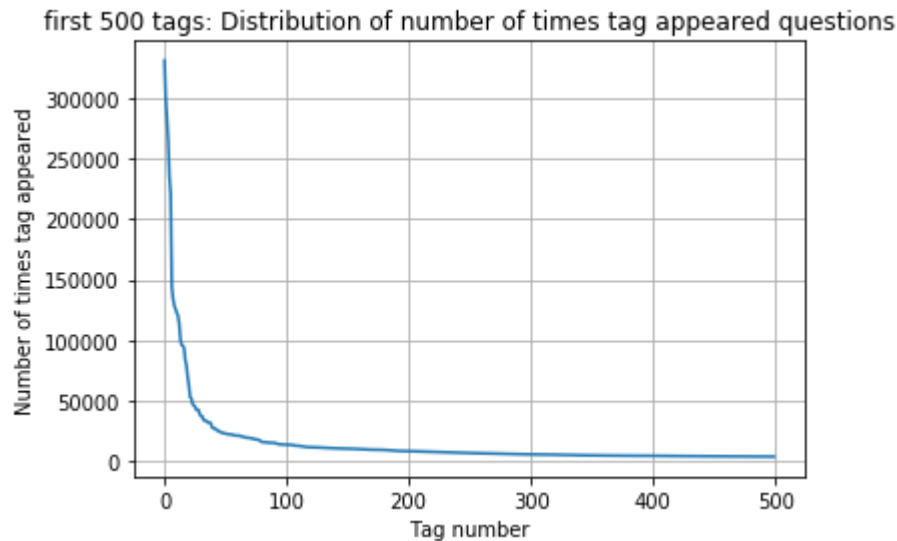
400	[331505	44829	22429	17728	13364	11162	10029	9148	8054	7151
6466	5865	5370	4983	4526	4281	4144	3929	3750	3593	
3453	3299	3123	2989	2891	2738	2647	2527	2431	2331	
2259	2186	2097	2020	1959	1900	1828	1770	1723	1673	
1631	1574	1532	1479	1448	1406	1365	1328	1300	1266	
1245	1222	1197	1181	1158	1139	1121	1101	1076	1056	
1038	1023	1006	983	966	952	938	926	911	891	
882	869	856	841	830	816	804	789	779	770	
752	743	733	725	712	702	688	678	671	658	
650	643	634	627	616	607	598	589	583	577	
568	559	552	545	540	533	526	518	512	506	
500	495	490	485	480	477	469	465	457	450	
447	442	437	432	426	422	418	413	408	403	
398	393	388	385	381	378	374	370	367	365	
361	357	354	350	347	344	342	339	336	332	
330	326	323	319	315	312	309	307	304	301	
299	296	293	291	289	286	284	281	278	276	
275	272	270	268	265	262	260	258	256	254	
252	250	249	247	245	243	241	239	238	236	
234	233	232	230	228	226	224	222	220	219	
217	215	214	212	210	209	207	205	204	203	
201	200	199	198	196	194	193	192	191	189	
188	186	185	183	182	181	180	179	178	177	
175	174	172	171	170	169	168	167	166	165	
164	162	161	160	159	158	157	156	156	155	
154	153	152	151	150	149	149	148	147	146	
145	144	143	142	142	141	140	139	138	137	
137	136	135	134	134	133	132	131	130	130	
129	128	128	127	126	126	125	124	124	123	
123	122	122	121	120	120	119	118	118	117	
117	116	116	115	115	114	113	113	112	111	
111	110	109	109	108	108	107	106	106	106	
105	105	104	104	103	103	102	102	101	101	
100	100	99	99	98	98	97	97	96	96	
95	95	94	94	93	93	93	92	92	91	
91	90	90	89	89	88	88	87	87	86	
86	86	85	85	84	84	83	83	83	82	
82	82	81	81	80	80	80	79	79	78	
78	78	78	77	77	76	76	76	75	75	
75	74	74	74	73	73	73	73	72	72]	

```
In [0]: plt.plot(tag_counts[0:1000])
plt.title('first 1k tags: Distribution of number of times tag appeared questions')
plt.grid()
plt.xlabel("Tag number")
plt.ylabel("Number of times tag appeared")
plt.show()
print(len(tag_counts[0:1000:5]), tag_counts[0:1000:5])
```



```
200 [331505 221533 122769 95160 62023 44829 37170 31897 26925 24537
22429 21820 20957 19758 18905 17728 15533 15097 14884 13703
13364 13157 12407 11658 11228 11162 10863 10600 10350 10224
10029 9884 9719 9411 9252 9148 9040 8617 8361 8163
8054 7867 7702 7564 7274 7151 7052 6847 6656 6553
6466 6291 6183 6093 5971 5865 5760 5577 5490 5411
5370 5283 5207 5107 5066 4983 4891 4785 4658 4549
4526 4487 4429 4335 4310 4281 4239 4228 4195 4159
4144 4088 4050 4002 3957 3929 3874 3849 3818 3797
3750 3703 3685 3658 3615 3593 3564 3521 3505 3483
3453 3427 3396 3363 3326 3299 3272 3232 3196 3168
3123 3094 3073 3050 3012 2989 2984 2953 2934 2903
2891 2844 2819 2784 2754 2738 2726 2708 2681 2669
2647 2621 2604 2594 2556 2527 2510 2482 2460 2444
2431 2409 2395 2380 2363 2331 2312 2297 2290 2281
2259 2246 2222 2211 2198 2186 2162 2142 2132 2107
2097 2078 2057 2045 2036 2020 2011 1994 1971 1965
1959 1952 1940 1932 1912 1900 1879 1865 1855 1841
1828 1821 1813 1801 1782 1770 1760 1747 1741 1734
1723 1707 1697 1688 1683 1673 1665 1656 1646 1639]
```

```
In [0]: plt.plot(tag_counts[0:500])
plt.title('first 500 tags: Distribution of number of times tag appeared questions')
plt.grid()
plt.xlabel("Tag number")
plt.ylabel("Number of times tag appeared")
plt.show()
print(len(tag_counts[0:500:5]), tag_counts[0:500:5])
```

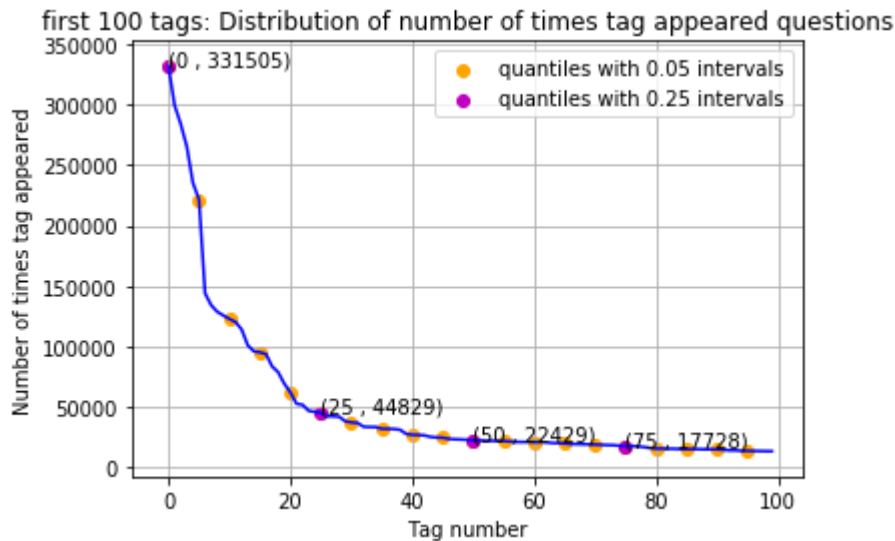


```
100 [331505 221533 122769 95160 62023 44829 37170 31897 26925 24537
22429 21820 20957 19758 18905 17728 15533 15097 14884 13703
13364 13157 12407 11658 11228 11162 10863 10600 10350 10224
10029 9884 9719 9411 9252 9148 9040 8617 8361 8163
8054 7867 7702 7564 7274 7151 7052 6847 6656 6553
6466 6291 6183 6093 5971 5865 5760 5577 5490 5411
5370 5283 5207 5107 5066 4983 4891 4785 4658 4549
4526 4487 4429 4335 4310 4281 4239 4228 4195 4159
4144 4088 4050 4002 3957 3929 3874 3849 3818 3797
3750 3703 3685 3658 3615 3593 3564 3521 3505 3483]
```

```
In [0]: plt.plot(tag_counts[0:100], c='b')
plt.scatter(x=list(range(0,100,5)), y=tag_counts[0:100:5], c='orange', label=
"quantiles with 0.05 intervals")
# quantiles with 0.25 difference
plt.scatter(x=list(range(0,100,25)), y=tag_counts[0:100:25], c='m', label = "q
uantiles with 0.25 intervals")

for x,y in zip(list(range(0,100,25)), tag_counts[0:100:25]):
    plt.annotate(s="({} , {})".format(x,y), xy=(x,y), xytext=(x-0.05, y+500))

plt.title('first 100 tags: Distribution of number of times tag appeared questi
ons')
plt.grid()
plt.xlabel("Tag number")
plt.ylabel("Number of times tag appeared")
plt.legend()
plt.show()
print(len(tag_counts[0:100:5]), tag_counts[0:100:5])
```



```
20 [331505 221533 122769 95160 62023 44829 37170 31897 26925 24537
22429 21820 20957 19758 18905 17728 15533 15097 14884 13703]
```

```
In [0]: # Store tags greater than 10K in one List
lst_tags_gt_10k = tag_df[tag_df.Counts>10000].Tags
#Print the length of the List
print ('{} Tags are used more than 10000 times'.format(len(lst_tags_gt_10k)))
# Store tags greater than 100K in one List
lst_tags_gt_100k = tag_df[tag_df.Counts>100000].Tags
#Print the length of the List.
print ('{} Tags are used more than 100000 times'.format(len(lst_tags_gt_100k
)))
```

```
153 Tags are used more than 10000 times
14 Tags are used more than 100000 times
```

**Observations:**

1. There are total 153 tags which are used more than 10000 times.
2. 14 tags are used more than 100000 times.
3. Most frequent tag (i.e. c#) is used 331505 times.
4. Since some tags occur much more frequently than others, Micro-averaged F1-score is the appropriate metric for this problem.

**3.2.4 Tags Per Question**

```
In [0]: #Storing the count of tag in each question in List 'tag_count'
tag_quest_count = tag_dtm.sum(axis=1).tolist()
#Converting list of lists into single list, we will get [[3], [4], [2], [2],
[3]] and we are converting this to [3, 4, 2, 2, 3]
tag_quest_count=[int(j) for i in tag_quest_count for j in i]
print ('We have total {} datapoints.'.format(len(tag_quest_count)))

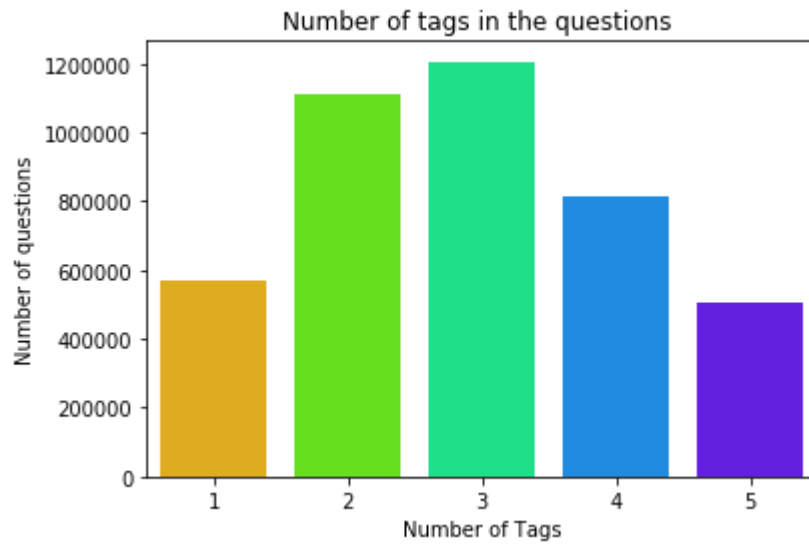
print(tag_quest_count[:5])
```

We have total 4206314 datapoints.  
[3, 4, 2, 2, 3]

```
In [0]: print( "Maximum number of tags per question: %d"%max(tag_quest_count))
print( "Minimum number of tags per question: %d"%min(tag_quest_count))
print( "Avg. number of tags per question: %f"% ((sum(tag_quest_count)*1.0)/len
(tag_quest_count)))
```

Maximum number of tags per question: 5  
Minimum number of tags per question: 1  
Avg. number of tags per question: 2.899440

```
In [0]: sns.countplot(tag_quest_count, palette='gist_rainbow')
plt.title("Number of tags in the questions ")
plt.xlabel("Number of Tags")
plt.ylabel("Number of questions")
plt.show()
```



#### Observations:

1. Maximum number of tags per question: 5
2. Minimum number of tags per question: 1
3. Avg. number of tags per question: 2.899
4. Most of the questions are having 2 or 3 tags

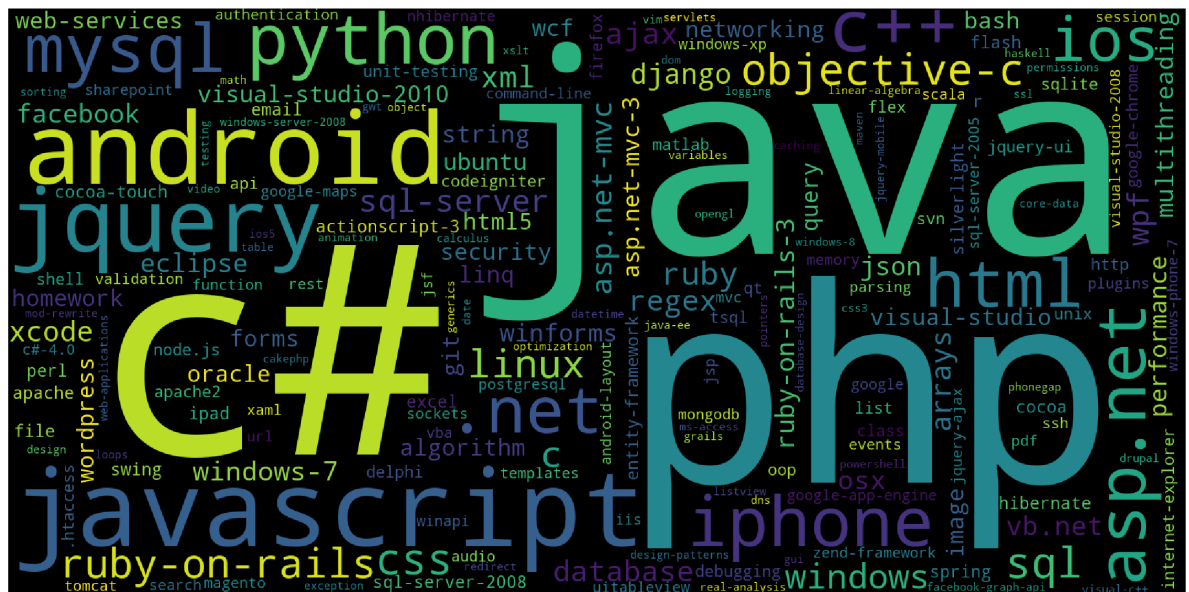
### 3.2.5 Most Frequent Tags



```
In [0]: # Plotting word cloud
start = datetime.now()

# Lets first convert the 'result' dictionary to 'list of tuples'
tup = dict(result.items())
#Initializing WordCloud using frequencies of tags.
wordcloud = WordCloud(    background_color='black',
                           width=1600,
                           height=800,
                           ).generate_from_frequencies(tup)

fig = plt.figure(figsize=(30,20))
plt.imshow(wordcloud)
plt.axis('off')
plt.tight_layout(pad=0)
fig.savefig("tag.png")
plt.show()
print("Time taken to run this cell :", datetime.now() - start)
```



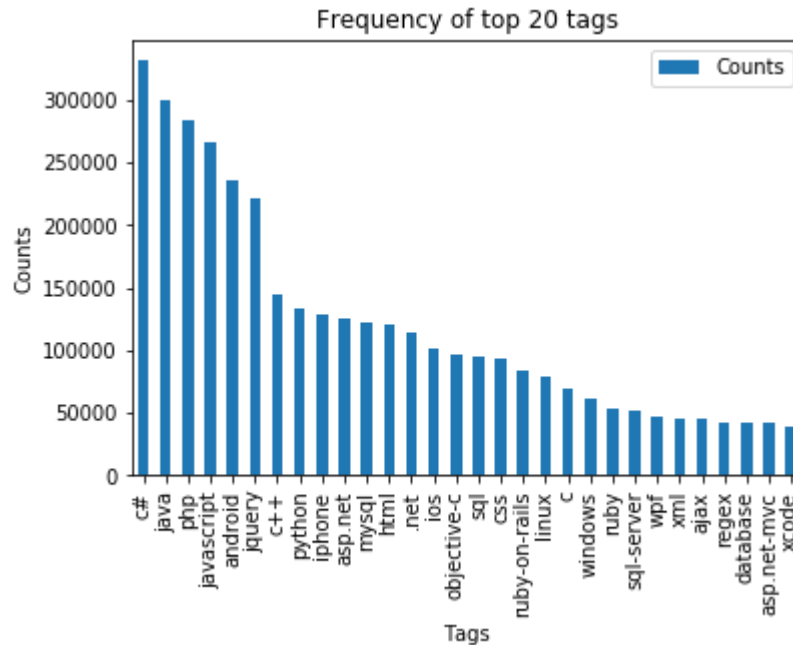
Time taken to run this cell : 0:00:04.545879

**Observations:**

A look at the word cloud shows that "c#", "java", "php", "asp.net", "javascript", "c++" are some of the most frequent tags.

### 3.2.6 The top 20 tags

```
In [0]: i=np.arange(30)
tag_df_sorted.head(30).plot(kind='bar')
plt.title('Frequency of top 20 tags')
plt.xticks(i, tag_df_sorted['Tags'])
plt.xlabel('Tags')
plt.ylabel('Counts')
plt.show()
```



### Observations:

1. Majority of the most frequent tags are programming language.
2. C# is the top most frequent programming language.
3. Android, IOS, Linux and windows are among the top most frequent operating systems.

## 3.3 Cleaning and preprocessing of Questions

### 3.3.1 Preprocessing

1. Sample 1M data points
2. Separate out code-snippets from Body
3. Remove Special characters from Question title and description (not in code)
4. Remove stop words (Except 'C')
5. Remove HTML Tags
6. Convert all the characters into small letters
7. Use SnowballStemmer to stem the words

```
In [0]: import nltk
nltk.download('stopwords')
```

```
[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Unzipping corpora/stopwords.zip.
```

```
Out[0]: True
```

```
In [0]: def striphtml(data):
        cleanr = re.compile('<.*?>')
        cleantext = re.sub(cleanr, ' ', str(data))
        return cleantext
stop_words = set(stopwords.words('english'))
stemmer = SnowballStemmer("english")
```

```

In [0]: #http://www.sqlitetutorial.net/sqlite-python/create-tables/
def create_connection(db_file):
    """ create a database connection to the SQLite database
        specified by db_file
    :param db_file: database file
    :return: Connection object or None
    """
    try:
        conn = sqlite3.connect(db_file)
        return conn
    except Error as e:
        print(e)

    return None

def create_table(conn, create_table_sql):
    """ create a table from the create_table_sql statement
    :param conn: Connection object
    :param create_table_sql: a CREATE TABLE statement
    :return:
    """
    try:
        c = conn.cursor()
        c.execute(create_table_sql)
    except Error as e:
        print(e)

def checkTableExists(dbcon):
    cursr = dbcon.cursor()
    str = "select name from sqlite_master where type='table'"
    table_names = cursr.execute(str)
    print("Tables in the database:")
    tables = table_names.fetchall()
    print(tables[0][0])
    return(len(tables))

def create_database_table(database, query):
    conn = create_connection(database)
    if conn is not None:
        create_table(conn, query)
        checkTableExists(conn)
    else:
        print("Error! cannot create the database connection.")
    conn.close()

sql_create_table = """CREATE TABLE IF NOT EXISTS QuestionsProcessed (question
    text NOT NULL, code text, tags text, words_pre integer, words_post integer, i
    s_code integer);"""
create_database_table("Processed.db", sql_create_table)

```

```

In [0]: # http://www.sqlitetutorial.net/sqlite-delete/
# https://stackoverflow.com/questions/2279706/select-random-row-from-a-sqlite-table
start = datetime.now()
read_db = "D:\chrome_down\train_no_dup.db"
write_db = 'Processed.db'
if os.path.isfile(read_db):
    conn_r = create_connection(read_db)
    if conn_r is not None:
        reader = conn_r.cursor()
        reader.execute("SELECT Title, Body, Tags From no_dup_train ORDER BY RANDOM() LIMIT 1000000;")

if os.path.isfile(write_db):
    conn_w = create_connection(write_db)
    if conn_w is not None:
        tables = checkTableExists(conn_w)
        writer = conn_w.cursor()
        if tables != 0:
            writer.execute("DELETE FROM QuestionsProcessed WHERE 1")
            print("Cleared All the rows")
print("Time taken to run this cell :", datetime.now() - start)

```

Tables in the databse:

QuestionsProcessed

Cleared All the rows

Time taken to run this cell : 0:06:32.806567

**we create a new data base to store the sampled and preprocessed questions**

```

In [0]: #http://www.bernzilla.com/2008/05/13/selecting-a-random-row-from-an-sqlite-tab
        le/

start = datetime.now()
preprocessed_data_list=[]
reader.fetchone()
questions_with_code=0
len_pre=0
len_post=0
questions_proccesed = 0
for row in reader:

    is_code = 0

    title, question, tags = row[0], row[1], row[2]

    if '<code>' in question:
        questions_with_code+=1
        is_code = 1
    x = len(question)+len(title)
    len_pre+=x

    code = str(re.findall(r'<code>(.*?)</code>', question, flags=re.DOTALL))

    question=re.sub('<code>(.*?)</code>', '', question, flags=re.MULTILINE|re.
DOTALL)
    question=striphtml(question.encode('utf-8'))

    title=title.encode('utf-8')

    question=str(title)+" "+str(question)
    question=re.sub(r'^A-Za-z+', ' ',question)
    words=word_tokenize(str(question.lower()))

    #Removing all single letter and and stopwords from question exceptt for th
e letter 'c'
    question=' '.join(str(stemmer.stem(j)) for j in words if j not in stop_wor
ds and (len(j)!=1 or j=='c'))

    len_post+=len(question)
    tup = (question,code,tags,x,len(question),is_code)
    questions_proccesed += 1
    writer.execute("insert into QuestionsProcessed(question,code,tags,words_pr
e,words_post,is_code) values (?,?,?,?,?,?)",tup)
    if (questions_proccesed%100000==0):
        print("number of questions completed=",questions_proccesed)

no_dup_avg_len_pre=(len_pre*1.0)/questions_proccesed
no_dup_avg_len_post=(len_post*1.0)/questions_proccesed

print( "Avg. length of questions(Title+Body) before processing: %d"%no_dup_avg
_len_pre)
print( "Avg. length of questions(Title+Body) after processing: %d"%no_dup_avg_
len_post)
print( "Percent of questions containing code: %d"%((questions_with_code*100.0)
/questions_proccesed))

```

```
print("Time taken to run this cell :", datetime.now() - start)
```

```
number of questions completed= 100000
number of questions completed= 200000
number of questions completed= 300000
number of questions completed= 400000
number of questions completed= 500000
number of questions completed= 600000
number of questions completed= 700000
number of questions completed= 800000
number of questions completed= 900000
Avg. length of questions(Title+Body) before processing: 1169
Avg. length of questions(Title+Body) after processing: 327
Percent of questions containing code: 57
Time taken to run this cell : 0:47:05.946582
```

```
In [0]: dat.Title[:1].values[0]
```

```
Out[0]: '      Implementing Boundary Value Analysis of Software Testing in a C++ program?'
```

```
In [0]: import nltk
nltk.download('punkt')
```

```
[nltk_data] Downloading package punkt to
[nltk_data]      C:\Users\LENOVO\AppData\Roaming\nltk_data...
[nltk_data]   Unzipping tokenizers\punkt.zip.
```

```
Out[0]: True
```

```
In [0]: words=word_tokenize(str(dat.Title[:1].values[0].lower()))
```

```
In [0]: words
```

```
Out[0]: ['implementing',
        'boundary',
        'value',
        'analysis',
        'of',
        'software',
        'testing',
        'in',
        'a',
        'c++',
        'program',
        '?']
```

```
In [0]: # dont forget to close the connections, or else you will end up with locks
conn_r.commit()
conn_w.commit()
conn_r.close()
conn_w.close()
```

```
In [0]: write_db = "D:\\chrome_down\\Processed.db"
```

```
In [0]: if os.path.isfile(write_db):
        conn_r = create_connection(write_db)
        if conn_r is not None:
            reader = conn_r.cursor()
            reader.execute("SELECT question From QuestionsProcessed LIMIT 10")
            print("Questions after preprocessed")
            print('='*100)
            reader.fetchone()
            for row in reader:
                print(row)
                print('-'*100)
        conn_r.commit()
        conn_r.close()
```



## Questions after preprocessed

```

=====
('display size grayscale qimage qt abl display image label qt use someth like fo
llow fullcharacterarray array unsigned char map array imagedata word imheight imwidt
h byte problem seem like portion image show label image larg would like display
full image scale fit label aspect ratio preserv also qimage format one could fi
nd seem give close represent image want display expect use one byte per pixel
unsigned char value seem like rgb doesnt make much sense data type none one displ
ay anyth remot correct edit nfollow dan gallagh advic implement code caus pro
gram unexpected finish code',)
-----

('datagrid selecteditem set back null eventtocommand call silverlight app cre
at mvvm light nin view datagrid bound viewmodel selecteditem bound selecteditem
viewmodel work click item grid selecteditem viewmodel set correct ad button ro
w datagrid ad eventtocommand button bound viewmodel command fire work correct
problem selecteditem properti set earlier want use set null eventtocommand re
set selecteditem properti stop use',)
-----

('filter string collect base listview item resolv odd appear happen collect i
ter element everi singl item would remov user list ad addit check ensur add
work perfect love code thing expect initi issu bit confus connect server give
n string collect result pars string collect add name listview howev need also
pars listview remov item appear string collect seem figur way proper know eas
i fail far anyth tri total cool code filter string collect listview add dupli
c convers compar item listview item string collect remov exist debug inform o
dd even though collect contain item contain nick call match',)
-----

('disabl home button without use type keyguard creat lockscreen applic need d
isabl home button phone stolen phone access lockscreen fullscreen activ im us
e code disabl home button gave bug code code gave bug like notif status area
still access even activ full screen mode turn display turn bug like first tim
e applic start still problem turn screen power button turn main problem locks
creen notif area still access lockscreen use idea solv pleas help also face p
roblem press end key button',)
-----

('php gd multipl image white background warn use php imagecoloralloc imagefil
image upload also let png file white background like post imagescreatetruecolo
r white background part code concern get warn warn imagecopyres expect paramet
resource boolean given line warn imagecopyres expect paramet resource boolean
given line warn imagecopyres expect paramet resource boolean given line warn i
magejpeg expect paramet resource boolean given line warn imagejpeg expect para
met resource boolean given line warn imagejpeg expect paramet resource boolean
given line warn imagedestroy expect paramet resource boolean given line warn i
magedestroy expect paramet resource boolean given line warn imagedestroy expec
t paramet resource boolean given line code without imagecoloralloc imagefil w
ork perfect fine howev find error differ post code anyon idea thank advanc ps
want save image jpg convert pngs jpg edit sorri got confus return array width
height bit channel mime image jpeg everyth fine',)
-----

('object c sqlite select work make select tabl sqlite databas follow code cop
i sqlite file user directori select log show get test hope someone help',)

```

```
-----
('extend function random class tri extend function random class doubt second
function reseedrandomnumbergener need someth mani class interact random class
class instanc suposs invok reseedrandom possibl other class refresh updat new
seed know work mayb need static properti sure',)
-----
```

```
-----
('android tablet develop easili done ic futur employ keep tell make sure hone
ycomb tablet develop mag tablet magazin mdash websit say publish ipad amp and
roid honeycomb tablet may updat employ know heap android io guru wonder buy n
ew toshiba excit someth come stock ic backward compat would work need',)
-----
```

```
-----
('one explain java c implement graph data structur one explain java c impleme
nt graph data structur adjac list structur direct graph visual idea graph dat
a structur one explain code code understand quick one',)
-----
```

```
In [0]: #Taking 1 Million entries to a dataframe.
write_db = "Processed.db"
if os.path.isfile(write_db):
    conn_r = create_connection(write_db)
    if conn_r is not None:
        preprocessed_data = pd.read_sql_query("""SELECT question, Tags FROM Qu
estionsProcessed""", conn_r)
    conn_r.commit()
    conn_r.close()
```

```
In [10]: preprocessed_data.head()
```

```
Out[10]:
```

	question	tags
0	chang cpu soni vaio pcg grx tri everywher find...	cpu motherboard sony-vaio replacement disassembly
1	display size grayscale qimag qt abl display ima...	c++ qt qt4
2	datagrid selecteditem set back null eventto com...	mvvm silverlight-4.0
3	filter string collect base listview item resol...	c# winforms string listview collections
4	disabl home button without use type keyguard c...	android android-layout android-manifest androi...

```
In [11]: print("number of data points in sample :", preprocessed_data.shape[0])
print("number of dimensions :", preprocessed_data.shape[1])
```

```
number of data points in sample : 999999
number of dimensions : 2
```

```
In [12]: preprocessed_data.shape
```

```
Out[12]: (999999, 2)
```

## 4. Machine Learning Models

### 4.1 Converting tags for multilabel problems

X	y1	y2	y3	y4
x1	0	1	1	0
x1	1	0	0	0
x1	0	1	0	0

```
In [0]: # binary='true' will give a binary vectorizer
vectorizer = CountVectorizer(tokenizer = lambda x: x.split(), binary='true')
multilabel_y = vectorizer.fit_transform(preprocessed_data['tags'])
```

```
In [13]: multilabel_y.sum(axis=1)
```

```
Out[13]: matrix([[5],
                 [3],
                 [2],
                 ...,
                 [2],
                 [3],
                 [2]])
```

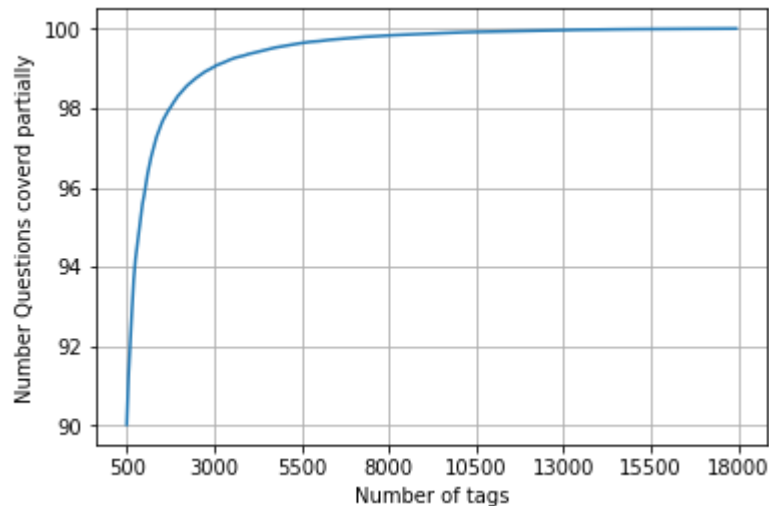
We will sample the number of tags instead considering all of them (due to limitation of computing power)

```
In [0]: def tags_to_choose(n):
        t = multilabel_y.sum(axis=0).tolist()[0]
        sorted_tags_i = sorted(range(len(t)), key=lambda i: t[i], reverse=True)
        multilabel_yn=multilabel_y[:,sorted_tags_i[:n]]
        return multilabel_yn

        def questions_explained_fn(n):
            multilabel_yn = tags_to_choose(n)
            x= multilabel_yn.sum(axis=1)
            return (np.count_nonzero(x==0))
```

```
In [0]: questions_explained = []
total_tags=multilabel_y.shape[1]
total_qs=preprocessed_data.shape[0]
for i in range(500, total_tags, 100):
    questions_explained.append(np.round(((total_qs-questions_explained_fn(i))/
total_qs)*100,3))
```

```
In [0]: fig, ax = plt.subplots()
ax.plot(questions_explained)
xlabel = list(500+np.array(range(-50,450,50))*50)
ax.set_xticklabels(xlabel)
plt.xlabel("Number of tags")
plt.ylabel("Number Questions covered partially")
plt.grid()
plt.show()
# you can choose any number of tags based on your computing power, minimum is 50(it covers 90% of the tags)
print("with ",5500,"tags we are covering ",questions_explained[50],"% of questions")
```



with 5500 tags we are covering 99.035 % of questions

```
In [0]: multilabel_yx = tags_to_choose(5500)
print("number of questions that are not covered :", questions_explained_fn(5500), "out of ", total_qs)
```

number of questions that are not covered : 9645 out of 999999

```
In [0]: print("Number of tags in sample :", multilabel_y.shape[1])
print("number of tags taken :", multilabel_yx.shape[1], "(", (multilabel_yx.shape[1]/multilabel_y.shape[1])*100, "%")
```

Number of tags in sample : 35422  
number of tags taken : 5500 ( 15.527073570097679 %)

**We consider top 15% tags which covers 99% of the questions**

## 4.2 Split the data into test and train (80:20)

```
In [0]: total_size=preprocessed_data.shape[0]
train_size=int(0.80*total_size)

x_train=preprocessed_data.head(train_size)
x_test=preprocessed_data.tail(total_size - train_size)

y_train = multilabel_yx[0:train_size,:]
y_test = multilabel_yx[train_size:total_size,:]
```

```
In [0]: print("Number of data points in train data :", y_train.shape)
print("Number of data points in test data :", y_test.shape)
```

```
Number of data points in train data : (799999, 5500)
Number of data points in test data : (200000, 5500)
```

## 4.3 Featurizing data

```
In [0]: start = datetime.now()
vectorizer = TfidfVectorizer(min_df=0.00009, max_features=200000, smooth_idf=True, norm="l2", \
                             tokenizer = lambda x: x.split(), sublinear_tf=False, ngram_range=(1,3))
x_train_multilabel = vectorizer.fit_transform(x_train['question'])
x_test_multilabel = vectorizer.transform(x_test['question'])
print("Time taken to run this cell :", datetime.now() - start)
```

```
In [0]: print("Dimensions of train data X:",x_train_multilabel.shape, "Y :",y_train.shape)
print("Dimensions of test data X:",x_test_multilabel.shape,"Y:",y_test.shape)
```

```

In [0]: # https://www.analyticsvidhya.com/blog/2017/08/introduction-to-multi-label-classification/
#https://stats.stackexchange.com/questions/117796/scikit-multi-label-classification
# classifier = LabelPowerset(GaussianNB())
"""
from skmultilearn.adapt import MLkNN
classifier = MLkNN(k=21)

# train
classifier.fit(x_train_multilabel, y_train)

# predict
predictions = classifier.predict(x_test_multilabel)
print(accuracy_score(y_test, predictions))
print(metrics.f1_score(y_test, predictions, average = 'macro'))
print(metrics.f1_score(y_test, predictions, average = 'micro'))
print(metrics.hamming_loss(y_test, predictions))

"""
# we are getting memory error because the multilearn package
# is trying to convert the data into dense matrix
# -----
#MemoryError                                Traceback (most recent call last)
#<ipython-input-170-f0e7c7f3e0be> in <module>()
#----> classifier.fit(x_train_multilabel, y_train)

```

```

Out[0]: "\nfrom skmultilearn.adapt import MLkNN\n\nclassifier = MLkNN(k=21)\n\n# train\n\nclassifier.fit(x_train_multilabel, y_train)\n\n# predict\n\npredictions = classifier.predict(x_test_multilabel)\n\nprint(accuracy_score(y_test, predictions))\n\nprint(metrics.f1_score(y_test, predictions, average = 'macro'))\n\nprint(metrics.f1_score(y_test, predictions, average = 'micro'))\n\nprint(metrics.hamming_loss(y_test, predictions))\n\n"

```

## 4.4 Applying Logistic Regression with OneVsRest Classifier

```
In [0]: # this will be taking so much time try not to run it, download the lr_with_equal_weight.pkl file and use to predict  
# This takes about 6-7 hours to run.  
classifier = OneVsRestClassifier(SGDClassifier(loss='log', alpha=0.00001, penalty='l1'), n_jobs=-1)  
classifier.fit(x_train_multilabel, y_train)  
predictions = classifier.predict(x_test_multilabel)  
  
print("accuracy :",metrics.accuracy_score(y_test,predictions))  
print("macro f1 score :",metrics.f1_score(y_test, predictions, average = 'macro'))  
print("micro f1 score :",metrics.f1_score(y_test, predictions, average = 'micro'))  
print("hamming loss :",metrics.hamming_loss(y_test,predictions))  
print("Precision recall report :\n",metrics.classification_report(y_test, predictions))
```

accuracy : 0.081965  
 macro f1 score : 0.0963020140154  
 micro f1 scoore : 0.374270748817  
 hamming loss : 0.00041225090909090907  
 Precision recall report :

	precision	recall	f1-score	support
0	0.62	0.23	0.33	15760
1	0.79	0.43	0.56	14039
2	0.82	0.55	0.66	13446
3	0.76	0.42	0.54	12730
4	0.94	0.76	0.84	11229
5	0.85	0.64	0.73	10561
6	0.70	0.30	0.42	6958
7	0.87	0.61	0.72	6309
8	0.70	0.40	0.50	6032
9	0.78	0.43	0.55	6020
10	0.86	0.62	0.72	5707
11	0.52	0.17	0.25	5723
12	0.55	0.10	0.16	5521
13	0.59	0.25	0.35	4722
14	0.61	0.22	0.32	4468
15	0.79	0.52	0.63	4536
16	0.58	0.27	0.37	4545
17	0.80	0.53	0.64	4069
18	0.61	0.24	0.35	3638
19	0.57	0.18	0.27	3218
20	0.33	0.06	0.10	3000
21	0.73	0.34	0.46	2585
22	0.59	0.29	0.38	2439
23	0.88	0.61	0.72	2199
24	0.64	0.39	0.48	2157
25	0.67	0.39	0.49	2123
26	0.86	0.65	0.74	1948
27	0.35	0.07	0.12	2027
28	0.59	0.29	0.39	2013
29	0.61	0.20	0.30	1801
30	0.48	0.24	0.32	1728
31	0.94	0.75	0.84	1725
32	0.60	0.26	0.36	1581
33	0.49	0.14	0.22	1533
34	0.81	0.33	0.47	1565
35	0.75	0.62	0.68	1568
36	0.76	0.50	0.60	1542
37	0.74	0.50	0.59	1536
38	0.37	0.12	0.19	1524
39	0.40	0.12	0.19	1345
40	0.65	0.38	0.48	1292
41	0.41	0.11	0.17	1264
42	0.69	0.25	0.37	1265
43	0.59	0.29	0.38	1171
44	0.41	0.15	0.22	1173
45	0.38	0.10	0.16	1137
46	0.62	0.12	0.20	1125
47	0.26	0.07	0.11	1116
48	0.44	0.15	0.22	1042
49	0.40	0.02	0.03	1096



50	0.63	0.38	0.48	1031
51	0.47	0.14	0.22	1033
52	0.87	0.68	0.76	1042
53	0.32	0.09	0.14	1027
54	0.53	0.14	0.22	1063
55	0.63	0.34	0.44	1048
56	0.78	0.42	0.54	1054
57	0.91	0.77	0.83	1058
58	0.37	0.10	0.16	1000
59	0.26	0.03	0.05	973
60	0.76	0.42	0.54	978
61	0.74	0.43	0.54	977
62	0.27	0.06	0.10	957
63	0.81	0.22	0.34	958
64	0.88	0.63	0.73	944
65	0.76	0.49	0.60	923
66	0.67	0.36	0.47	959
67	0.55	0.15	0.24	951
68	0.38	0.13	0.20	924
69	0.71	0.25	0.37	897
70	0.78	0.47	0.59	900
71	0.82	0.40	0.54	893
72	0.21	0.01	0.01	836
73	0.74	0.16	0.26	850
74	0.58	0.37	0.45	838
75	0.88	0.64	0.74	855
76	0.47	0.28	0.35	837
77	0.68	0.41	0.52	824
78	0.14	0.01	0.01	793
79	0.34	0.09	0.14	751
80	0.31	0.08	0.13	793
81	0.71	0.33	0.45	758
82	0.60	0.28	0.38	764
83	0.82	0.59	0.69	710
84	0.82	0.48	0.61	734
85	0.79	0.42	0.55	723
86	0.44	0.23	0.30	708
87	0.93	0.58	0.72	714
88	0.91	0.53	0.67	683
89	0.58	0.20	0.30	711
90	0.71	0.42	0.53	699
91	0.44	0.03	0.06	725
92	0.71	0.47	0.57	676
93	0.47	0.10	0.16	672
94	0.66	0.40	0.50	645
95	0.86	0.66	0.75	691
96	0.57	0.09	0.15	664
97	0.91	0.59	0.72	633
98	0.64	0.38	0.48	615
99	0.53	0.19	0.29	667
100	0.89	0.71	0.79	656
101	0.22	0.03	0.05	648
102	0.64	0.13	0.22	654
103	0.92	0.63	0.75	653
104	0.87	0.52	0.65	656
105	0.20	0.02	0.04	607
106	0.68	0.34	0.45	635

107	0.23	0.03	0.05	594
108	0.40	0.18	0.25	592
109	0.32	0.07	0.12	604
110	0.46	0.21	0.29	606
111	0.70	0.39	0.50	567
112	0.68	0.27	0.38	571
113	0.61	0.36	0.45	578
114	0.47	0.18	0.26	564
115	0.35	0.13	0.19	537
116	0.93	0.66	0.77	583
117	0.59	0.09	0.15	534
118	0.66	0.35	0.46	566
119	0.20	0.04	0.07	567
120	0.48	0.16	0.24	497
121	0.55	0.19	0.29	536
122	0.24	0.05	0.08	528
123	0.81	0.53	0.64	550
124	0.50	0.21	0.29	563
125	0.35	0.06	0.10	545
126	0.49	0.18	0.27	544
127	0.95	0.76	0.84	549
128	0.63	0.34	0.44	495
129	0.94	0.59	0.73	509
130	0.34	0.11	0.16	501
131	0.28	0.04	0.07	524
132	0.48	0.26	0.34	485
133	0.55	0.37	0.45	515
134	0.32	0.04	0.08	536
135	0.77	0.38	0.51	526
136	0.67	0.34	0.45	493
137	0.40	0.08	0.14	501
138	0.31	0.05	0.09	501
139	0.29	0.02	0.04	523
140	0.88	0.64	0.74	508
141	0.33	0.11	0.16	490
142	0.77	0.50	0.60	482
143	0.49	0.25	0.33	461
144	0.74	0.48	0.58	496
145	0.62	0.17	0.26	521
146	0.39	0.13	0.19	481
147	0.00	0.00	0.00	486
148	0.37	0.09	0.14	497
149	0.54	0.09	0.16	470
150	0.37	0.11	0.17	459
151	0.74	0.45	0.56	464
152	0.50	0.24	0.32	482
153	0.46	0.09	0.15	507
154	0.29	0.04	0.07	503
155	0.90	0.59	0.71	456
156	0.50	0.27	0.35	480
157	0.54	0.26	0.35	443
158	0.92	0.70	0.80	457
159	0.57	0.08	0.13	478
160	0.16	0.03	0.05	470
161	0.37	0.18	0.24	468
162	0.24	0.05	0.09	428
163	0.40	0.08	0.13	462

164	0.73	0.32	0.45	493
165	0.93	0.68	0.79	437
166	0.40	0.20	0.26	435
167	0.30	0.02	0.03	448
168	0.53	0.16	0.25	436
169	0.36	0.10	0.15	437
170	0.38	0.09	0.15	410
171	0.59	0.32	0.41	450
172	0.69	0.39	0.50	435
173	0.91	0.67	0.77	427
174	0.45	0.16	0.24	427
175	0.43	0.17	0.24	424
176	0.64	0.43	0.52	410
177	0.67	0.29	0.40	426
178	0.74	0.49	0.59	459
179	0.52	0.13	0.20	433
180	0.71	0.36	0.48	452
181	0.91	0.62	0.74	427
182	0.46	0.13	0.20	410
183	0.28	0.02	0.04	404
184	0.69	0.42	0.52	406
185	0.68	0.41	0.52	411
186	0.22	0.02	0.03	394
187	0.90	0.65	0.75	414
188	0.64	0.10	0.18	430
189	0.16	0.04	0.06	389
190	0.28	0.03	0.05	418
191	0.36	0.16	0.22	371
192	0.83	0.57	0.68	363
193	0.91	0.55	0.69	389
194	0.44	0.04	0.07	411
195	0.49	0.22	0.31	383
196	0.95	0.74	0.83	423
197	0.91	0.54	0.68	378
198	0.69	0.38	0.49	382
199	0.12	0.01	0.02	344
200	0.71	0.31	0.44	383
201	0.77	0.34	0.47	390
202	0.18	0.02	0.04	405
203	0.43	0.07	0.11	365
204	0.42	0.14	0.21	346
205	0.21	0.05	0.08	378
206	0.67	0.27	0.39	390
207	0.33	0.07	0.11	379
208	0.39	0.11	0.17	386
209	0.42	0.15	0.22	339
210	0.27	0.07	0.12	382
211	0.37	0.05	0.08	374
212	0.62	0.38	0.47	364
213	0.94	0.76	0.84	372
214	0.96	0.63	0.76	350
215	0.76	0.38	0.50	352
216	0.00	0.00	0.00	351
217	0.64	0.29	0.40	329
218	0.72	0.31	0.44	341
219	0.94	0.71	0.81	331
220	0.49	0.27	0.35	342

221	0.76	0.39	0.52	339
222	0.29	0.04	0.06	332
223	0.43	0.12	0.18	327
224	0.31	0.06	0.11	324
225	0.51	0.21	0.30	352
226	0.65	0.30	0.41	317
227	0.54	0.12	0.20	355
228	0.57	0.19	0.29	341
229	0.58	0.37	0.46	334
230	0.64	0.49	0.56	304
231	0.43	0.04	0.07	321
232	0.77	0.50	0.61	311
233	0.32	0.10	0.15	312
234	0.09	0.01	0.02	306
235	0.03	0.00	0.01	305
236	0.16	0.02	0.04	340
237	0.58	0.30	0.40	316
238	0.65	0.23	0.34	297
239	0.35	0.13	0.19	305
240	0.73	0.44	0.55	310
241	0.67	0.36	0.47	307
242	0.58	0.16	0.25	316
243	0.26	0.07	0.11	314
244	0.51	0.12	0.19	316
245	0.67	0.46	0.55	313
246	0.79	0.46	0.58	325
247	0.60	0.36	0.45	291
248	0.33	0.01	0.02	311
249	0.57	0.24	0.33	314
250	0.38	0.05	0.09	309
251	0.30	0.08	0.13	300
252	0.55	0.27	0.36	325
253	0.76	0.51	0.61	316
254	0.43	0.09	0.15	306
255	0.54	0.19	0.28	289
256	0.49	0.11	0.18	304
257	0.16	0.02	0.04	268
258	0.85	0.58	0.69	266
259	0.06	0.00	0.01	298
260	0.55	0.36	0.43	292
261	0.25	0.05	0.08	289
262	0.50	0.01	0.01	305
263	0.00	0.00	0.00	281
264	0.59	0.25	0.35	295
265	0.16	0.02	0.04	281
266	0.83	0.52	0.64	269
267	0.45	0.12	0.19	312
268	0.75	0.40	0.52	294
269	0.34	0.05	0.09	285
270	0.56	0.33	0.42	279
271	0.50	0.28	0.36	269
272	0.59	0.38	0.46	277
273	0.69	0.31	0.43	272
274	0.36	0.01	0.03	285
275	0.94	0.69	0.80	295
276	0.46	0.19	0.27	283
277	0.65	0.29	0.40	250

278	0.57	0.20	0.30	281
279	0.86	0.58	0.69	270
280	0.62	0.35	0.44	272
281	0.32	0.07	0.11	278
282	0.00	0.00	0.00	264
283	0.85	0.59	0.70	281
284	0.78	0.53	0.63	261
285	0.33	0.09	0.14	283
286	0.00	0.00	0.00	275
287	0.29	0.03	0.05	274
288	0.37	0.04	0.06	284
289	0.00	0.00	0.00	260
290	0.54	0.24	0.34	245
291	0.07	0.00	0.01	267
292	0.33	0.07	0.11	263
293	0.30	0.09	0.14	268
294	0.33	0.11	0.16	270
295	0.48	0.06	0.10	261
296	0.84	0.59	0.69	240
297	0.43	0.22	0.29	250
298	0.81	0.51	0.63	245
299	0.11	0.01	0.01	283
300	0.51	0.21	0.30	236
301	0.78	0.51	0.62	267
302	0.19	0.02	0.04	243
303	0.26	0.04	0.06	276
304	0.89	0.71	0.79	280
305	0.37	0.14	0.20	249
306	0.24	0.02	0.04	258
307	0.00	0.00	0.00	262
308	0.53	0.20	0.29	248
309	0.58	0.25	0.35	244
310	0.33	0.06	0.09	254
311	0.41	0.10	0.16	263
312	0.52	0.25	0.33	232
313	0.75	0.55	0.63	235
314	0.61	0.11	0.19	248
315	0.49	0.16	0.25	263
316	0.33	0.08	0.12	264
317	0.61	0.06	0.12	216
318	0.05	0.00	0.01	230
319	0.53	0.27	0.36	230
320	0.00	0.00	0.00	239
321	0.45	0.08	0.13	265
322	0.69	0.32	0.44	253
323	0.23	0.04	0.06	238
324	0.72	0.37	0.49	232
325	0.22	0.05	0.08	239
326	0.49	0.18	0.26	261
327	0.64	0.14	0.23	261
328	0.67	0.47	0.55	231
329	0.46	0.13	0.20	264
330	0.18	0.02	0.03	242
331	0.80	0.37	0.50	231
332	0.63	0.28	0.39	234
333	0.50	0.32	0.39	212
334	0.26	0.05	0.09	221

335	0.15	0.03	0.05	242
336	0.57	0.30	0.40	211
337	0.20	0.01	0.03	212
338	0.00	0.00	0.00	222
339	0.22	0.02	0.04	227
340	0.66	0.30	0.41	216
341	0.57	0.26	0.36	231
342	0.45	0.22	0.29	233
343	0.17	0.03	0.04	232
344	0.28	0.02	0.04	209
345	0.37	0.11	0.17	216
346	0.27	0.09	0.13	222
347	0.48	0.19	0.28	243
348	0.51	0.26	0.35	222
349	0.57	0.12	0.20	228
350	0.44	0.12	0.18	205
351	0.58	0.30	0.39	177
352	0.77	0.39	0.52	234
353	0.96	0.57	0.71	230
354	0.47	0.21	0.29	195
355	0.90	0.42	0.57	209
356	0.06	0.00	0.01	205
357	0.50	0.11	0.18	211
358	0.43	0.16	0.23	230
359	0.27	0.08	0.12	211
360	0.39	0.09	0.14	221
361	0.24	0.04	0.08	200
362	0.82	0.15	0.25	219
363	0.36	0.07	0.12	222
364	0.62	0.27	0.38	213
365	0.94	0.36	0.52	199
366	0.80	0.37	0.51	200
367	0.76	0.29	0.42	199
368	0.57	0.26	0.36	212
369	0.93	0.71	0.80	214
370	0.10	0.02	0.03	197
371	0.20	0.03	0.05	212
372	0.41	0.14	0.21	210
373	0.43	0.03	0.05	211
374	0.41	0.15	0.22	213
375	0.00	0.00	0.00	216
376	0.87	0.53	0.66	195
377	0.95	0.67	0.79	187
378	0.15	0.03	0.04	191
379	0.17	0.02	0.04	178
380	0.79	0.48	0.60	193
381	0.13	0.02	0.04	187
382	0.67	0.03	0.06	193
383	0.17	0.04	0.06	204
384	0.28	0.15	0.19	193
385	0.12	0.02	0.04	207
386	0.84	0.45	0.59	211
387	0.06	0.00	0.01	210
388	0.31	0.04	0.06	223
389	0.24	0.09	0.13	203
390	0.72	0.24	0.36	199
391	0.40	0.08	0.13	200

392	0.22	0.05	0.09	183
393	0.62	0.31	0.41	189
394	0.96	0.66	0.78	194
395	0.53	0.18	0.27	183
396	0.43	0.21	0.28	189
397	0.71	0.34	0.46	191
398	0.34	0.06	0.11	206
399	0.33	0.01	0.03	221
400	0.28	0.04	0.07	196
401	0.28	0.09	0.14	179
402	0.28	0.08	0.12	187
403	0.51	0.22	0.31	203
404	0.46	0.12	0.19	205
405	0.35	0.08	0.13	218
406	0.19	0.04	0.06	196
407	0.72	0.35	0.47	206
408	0.31	0.06	0.10	203
409	0.70	0.43	0.53	187
410	0.85	0.54	0.66	208
411	0.83	0.45	0.58	193
412	0.33	0.02	0.03	192
413	0.66	0.36	0.46	182
414	0.45	0.19	0.27	175
415	0.64	0.49	0.55	181
416	0.00	0.00	0.00	202
417	0.92	0.44	0.60	202
418	0.17	0.01	0.02	195
419	0.78	0.25	0.38	177
420	0.26	0.07	0.11	168
421	0.80	0.45	0.58	187
422	0.92	0.46	0.62	209
423	0.66	0.16	0.26	177
424	0.35	0.06	0.10	182
425	0.52	0.14	0.23	187
426	0.22	0.04	0.07	185
427	0.43	0.13	0.20	185
428	0.42	0.18	0.25	185
429	0.92	0.46	0.61	175
430	0.90	0.49	0.64	190
431	0.31	0.03	0.05	185
432	0.71	0.03	0.05	189
433	0.60	0.20	0.30	184
434	0.79	0.36	0.49	200
435	0.20	0.01	0.01	167
436	0.21	0.01	0.03	209
437	0.50	0.07	0.12	200
438	0.29	0.09	0.14	169
439	0.44	0.15	0.23	170
440	0.25	0.04	0.07	182
441	0.62	0.34	0.44	156
442	0.20	0.02	0.03	170
443	0.00	0.00	0.00	189
444	0.00	0.00	0.00	172
445	0.33	0.11	0.16	180
446	0.21	0.06	0.10	175
447	0.48	0.12	0.19	187
448	0.00	0.00	0.00	170

449	0.41	0.24	0.30	170
450	0.35	0.10	0.16	176
451	0.62	0.15	0.24	194
452	0.61	0.31	0.41	175
453	0.19	0.04	0.07	187
454	0.11	0.01	0.01	181
455	0.62	0.14	0.23	177
456	0.50	0.18	0.26	170
457	0.24	0.03	0.05	182
458	0.68	0.37	0.48	172
459	0.00	0.00	0.00	190
460	0.43	0.16	0.23	183
461	0.94	0.63	0.75	182
462	0.35	0.16	0.22	173
463	0.91	0.69	0.79	171
464	0.58	0.27	0.37	173
465	0.77	0.41	0.53	184
466	0.72	0.22	0.34	175
467	0.43	0.19	0.26	162
468	0.12	0.01	0.02	176
469	0.91	0.46	0.61	177
470	0.52	0.07	0.13	167
471	0.27	0.06	0.10	192
472	0.50	0.32	0.39	168
473	0.32	0.05	0.09	188
474	0.31	0.05	0.08	163
475	0.44	0.17	0.24	160
476	0.89	0.56	0.69	180
477	0.92	0.46	0.61	182
478	0.49	0.27	0.35	171
479	0.57	0.18	0.27	174
480	0.96	0.52	0.68	162
481	0.21	0.04	0.06	169
482	0.33	0.03	0.06	157
483	0.77	0.48	0.59	200
484	0.58	0.21	0.31	177
485	0.51	0.26	0.34	175
486	0.64	0.51	0.57	185
487	0.96	0.52	0.67	167
488	0.00	0.00	0.00	192
489	0.30	0.09	0.14	176
490	0.00	0.00	0.00	167
491	0.33	0.01	0.01	177
492	0.47	0.26	0.33	160
493	0.46	0.22	0.30	159
494	0.15	0.03	0.04	159
495	0.31	0.10	0.15	162
496	0.82	0.46	0.59	167
497	0.17	0.02	0.03	168
498	0.40	0.12	0.19	154
499	0.00	0.00	0.00	184
500	0.14	0.03	0.05	167
501	0.41	0.20	0.27	153
502	0.78	0.55	0.65	143
503	0.22	0.07	0.10	177
504	0.69	0.32	0.44	177
505	0.90	0.50	0.64	152



506	0.80	0.40	0.54	179
507	0.60	0.12	0.20	171
508	0.61	0.28	0.39	151
509	0.51	0.23	0.32	162
510	0.63	0.24	0.35	158
511	0.18	0.03	0.05	164
512	0.00	0.00	0.00	149
513	0.78	0.60	0.68	174
514	0.51	0.15	0.23	172
515	0.34	0.14	0.20	144
516	0.57	0.15	0.23	164
517	0.88	0.67	0.76	152
518	0.60	0.02	0.03	175
519	0.29	0.04	0.06	168
520	0.52	0.11	0.18	145
521	0.89	0.38	0.53	165
522	0.91	0.55	0.69	151
523	0.93	0.57	0.71	171
524	0.89	0.53	0.66	160
525	0.59	0.41	0.49	139
526	0.57	0.19	0.29	165
527	0.57	0.22	0.31	148
528	0.64	0.21	0.32	178
529	0.31	0.06	0.10	152
530	0.11	0.01	0.01	143
531	0.57	0.20	0.30	174
532	0.63	0.20	0.30	135
533	0.35	0.05	0.09	179
534	0.26	0.04	0.08	135
535	0.29	0.09	0.14	157
536	0.88	0.53	0.66	163
537	0.79	0.39	0.53	127
538	0.34	0.13	0.19	130
539	0.55	0.20	0.29	155
540	0.43	0.18	0.25	165
541	0.35	0.11	0.16	139
542	0.38	0.05	0.09	159
543	0.44	0.18	0.25	140
544	0.76	0.17	0.28	143
545	0.44	0.12	0.19	147
546	0.47	0.18	0.26	153
547	0.76	0.28	0.41	165
548	0.35	0.10	0.16	149
549	0.62	0.26	0.37	123
550	0.82	0.06	0.11	148
551	0.68	0.41	0.51	145
552	0.50	0.04	0.07	157
553	0.46	0.23	0.31	151
554	0.50	0.01	0.01	152
555	0.43	0.17	0.24	147
556	0.72	0.35	0.47	143
557	0.47	0.20	0.28	139
558	0.92	0.54	0.68	165
559	0.37	0.10	0.16	147
560	0.27	0.13	0.17	139
561	0.29	0.08	0.12	152
562	0.45	0.26	0.33	132

563	0.41	0.17	0.24	150
564	0.30	0.08	0.13	165
565	0.73	0.38	0.50	147
566	0.27	0.05	0.08	151
567	0.52	0.24	0.33	153
568	0.48	0.19	0.27	148
569	0.17	0.04	0.06	142
570	0.11	0.02	0.04	140
571	0.07	0.01	0.01	149
572	1.00	0.02	0.04	146
573	0.51	0.29	0.37	135
574	0.73	0.24	0.36	137
575	0.50	0.11	0.18	142
576	0.24	0.10	0.14	145
577	0.82	0.25	0.38	145
578	0.72	0.33	0.45	131
579	0.40	0.15	0.22	142
580	0.00	0.00	0.00	143
581	0.38	0.09	0.15	139
582	0.57	0.15	0.24	150
583	0.00	0.00	0.00	121
584	0.57	0.28	0.38	148
585	0.61	0.41	0.49	134
586	0.64	0.37	0.47	151
587	0.74	0.11	0.20	150
588	0.48	0.11	0.18	141
589	0.20	0.03	0.05	137
590	0.79	0.36	0.50	154
591	0.52	0.22	0.31	126
592	0.85	0.49	0.62	144
593	0.29	0.06	0.10	130
594	0.46	0.15	0.22	148
595	0.13	0.02	0.03	115
596	0.64	0.46	0.53	142
597	0.95	0.46	0.62	123
598	0.63	0.21	0.32	150
599	0.00	0.00	0.00	134
600	0.24	0.04	0.07	154
601	0.36	0.08	0.14	165
602	0.50	0.02	0.04	150
603	0.49	0.15	0.23	137
604	0.89	0.53	0.67	133
605	0.38	0.14	0.21	146
606	0.88	0.12	0.21	129
607	0.17	0.03	0.05	151
608	0.86	0.55	0.67	138
609	0.36	0.13	0.19	124
610	0.40	0.01	0.03	144
611	0.00	0.00	0.00	150
612	0.00	0.00	0.00	130
613	0.21	0.05	0.08	127
614	0.41	0.17	0.24	141
615	0.10	0.02	0.03	133
616	0.54	0.29	0.38	132
617	0.67	0.02	0.03	131
618	0.21	0.03	0.06	125
619	0.63	0.37	0.46	123

620	0.00	0.00	0.00	148
621	0.12	0.01	0.02	117
622	0.72	0.47	0.57	129
623	0.36	0.04	0.06	113
624	0.88	0.51	0.64	110
625	0.92	0.63	0.75	121
626	0.22	0.08	0.12	125
627	0.95	0.59	0.73	132
628	0.67	0.30	0.42	116
629	0.81	0.38	0.52	126
630	0.29	0.04	0.07	126
631	0.28	0.06	0.10	148
632	0.91	0.61	0.74	140
633	0.50	0.02	0.03	128
634	0.40	0.16	0.22	128
635	0.00	0.00	0.00	140
636	0.95	0.41	0.57	130
637	0.62	0.23	0.34	126
638	0.75	0.08	0.15	143
639	0.67	0.31	0.42	121
640	0.16	0.04	0.07	117
641	0.36	0.12	0.19	112
642	0.46	0.14	0.21	137
643	0.96	0.61	0.74	141
644	0.71	0.37	0.49	127
645	0.28	0.06	0.10	128
646	0.10	0.01	0.01	124
647	0.11	0.03	0.05	138
648	0.13	0.03	0.04	119
649	0.00	0.00	0.00	137
650	0.33	0.01	0.02	121
651	0.07	0.02	0.03	108
652	0.72	0.41	0.52	122
653	0.61	0.26	0.36	139
654	0.40	0.02	0.03	112
655	0.53	0.14	0.22	125
656	0.64	0.19	0.29	124
657	0.30	0.08	0.12	117
658	0.50	0.20	0.28	116
659	0.37	0.08	0.14	130
660	0.15	0.02	0.03	121
661	0.75	0.35	0.48	124
662	0.48	0.12	0.19	121
663	0.84	0.63	0.72	126
664	0.00	0.00	0.00	118
665	0.18	0.06	0.09	113
666	0.00	0.00	0.00	128
667	0.53	0.12	0.20	139
668	0.29	0.04	0.07	131
669	0.26	0.05	0.08	127
670	0.47	0.07	0.12	125
671	0.33	0.02	0.03	111
672	0.55	0.37	0.44	127
673	0.72	0.48	0.57	130
674	0.19	0.02	0.04	130
675	0.60	0.20	0.30	126
676	0.15	0.02	0.03	104

677	0.53	0.14	0.22	127
678	0.57	0.15	0.24	130
679	0.26	0.10	0.14	112
680	0.43	0.09	0.15	131
681	0.00	0.00	0.00	140
682	0.53	0.35	0.42	114
683	0.78	0.12	0.22	112
684	0.35	0.06	0.10	115
685	0.66	0.15	0.24	128
686	0.57	0.10	0.17	122
687	0.25	0.03	0.05	109
688	0.29	0.02	0.03	108
689	0.00	0.00	0.00	125
690	0.50	0.01	0.02	117
691	0.36	0.09	0.15	127
692	0.80	0.35	0.49	129
693	0.42	0.16	0.23	118
694	0.72	0.37	0.49	151
695	0.67	0.29	0.41	112
696	0.81	0.22	0.34	119
697	0.19	0.05	0.07	109
698	0.58	0.33	0.42	122
699	0.96	0.49	0.65	102
700	0.29	0.07	0.11	102
701	0.46	0.26	0.33	107
702	0.25	0.03	0.05	105
703	0.25	0.01	0.02	113
704	0.62	0.27	0.37	98
705	0.21	0.05	0.08	100
706	0.72	0.33	0.45	131
707	0.45	0.21	0.29	112
708	0.44	0.03	0.06	119
709	0.28	0.07	0.11	105
710	0.18	0.03	0.04	117
711	0.39	0.14	0.21	115
712	0.41	0.10	0.16	129
713	0.68	0.27	0.38	101
714	0.57	0.10	0.17	122
715	0.00	0.00	0.00	97
716	0.38	0.16	0.23	116
717	0.43	0.08	0.14	110
718	0.38	0.04	0.08	113
719	0.75	0.49	0.59	110
720	0.78	0.05	0.10	130
721	0.00	0.00	0.00	104
722	0.89	0.66	0.75	119
723	0.00	0.00	0.00	108
724	0.43	0.22	0.29	112
725	0.32	0.05	0.08	126
726	0.93	0.67	0.78	120
727	0.30	0.05	0.09	130
728	0.67	0.02	0.04	103
729	0.70	0.17	0.28	111
730	0.33	0.03	0.05	110
731	0.00	0.00	0.00	96
732	0.55	0.05	0.10	112
733	0.39	0.08	0.13	90

734	0.28	0.11	0.15	95
735	0.80	0.39	0.52	116
736	0.40	0.02	0.03	128
737	0.25	0.09	0.13	93
738	0.89	0.15	0.26	107
739	0.58	0.29	0.39	99
740	0.40	0.04	0.07	105
741	0.46	0.05	0.09	116
742	0.68	0.43	0.53	105
743	0.40	0.19	0.26	84
744	0.44	0.14	0.21	102
745	0.69	0.23	0.34	111
746	0.36	0.10	0.15	104
747	0.44	0.14	0.21	110
748	0.58	0.21	0.30	92
749	0.87	0.57	0.69	106
750	0.00	0.00	0.00	116
751	0.28	0.09	0.14	109
752	0.85	0.54	0.66	104
753	1.00	0.01	0.02	119
754	0.27	0.06	0.10	96
755	0.17	0.04	0.06	104
756	0.00	0.00	0.00	101
757	0.50	0.19	0.28	114
758	0.00	0.00	0.00	112
759	0.67	0.04	0.08	95
760	0.00	0.00	0.00	102
761	0.31	0.11	0.17	105
762	0.57	0.25	0.35	109
763	0.09	0.01	0.02	112
764	0.94	0.40	0.56	116
765	0.60	0.31	0.41	109
766	0.00	0.00	0.00	96
767	0.50	0.09	0.15	114
768	0.00	0.00	0.00	99
769	0.65	0.15	0.25	98
770	0.48	0.21	0.30	107
771	0.00	0.00	0.00	103
772	0.00	0.00	0.00	96
773	0.00	0.00	0.00	106
774	0.76	0.33	0.46	97
775	0.27	0.03	0.06	91
776	0.00	0.00	0.00	101
777	0.76	0.38	0.50	109
778	0.00	0.00	0.00	104
779	0.33	0.08	0.13	116
780	0.00	0.00	0.00	102
781	0.85	0.26	0.40	106
782	0.64	0.15	0.24	108
783	0.80	0.08	0.15	95
784	0.91	0.36	0.52	108
785	0.94	0.43	0.59	113
786	0.40	0.06	0.10	109
787	0.78	0.41	0.54	112
788	0.00	0.00	0.00	104
789	0.43	0.17	0.25	92
790	0.44	0.06	0.11	116

791	0.29	0.04	0.07	96
792	0.58	0.15	0.24	118
793	0.64	0.27	0.38	106
794	0.26	0.06	0.10	93
795	0.80	0.31	0.45	103
796	0.39	0.12	0.18	104
797	0.57	0.09	0.16	89
798	0.55	0.06	0.11	97
799	0.00	0.00	0.00	92
800	0.55	0.14	0.22	85
801	1.00	0.04	0.08	93
802	0.79	0.28	0.41	93
803	0.36	0.13	0.19	102
804	0.65	0.12	0.20	108
805	0.87	0.37	0.52	111
806	0.61	0.14	0.23	98
807	0.20	0.03	0.06	94
808	0.15	0.02	0.04	84
809	0.84	0.32	0.46	100
810	0.22	0.02	0.04	92
811	0.37	0.11	0.17	88
812	0.39	0.13	0.20	104
813	0.50	0.04	0.08	90
814	0.38	0.07	0.12	109
815	0.23	0.04	0.06	81
816	0.70	0.22	0.33	96
817	0.98	0.53	0.69	88
818	0.56	0.24	0.33	101
819	0.94	0.45	0.61	103
820	0.00	0.00	0.00	94
821	0.72	0.17	0.27	108
822	0.29	0.06	0.09	90
823	0.81	0.44	0.57	97
824	0.50	0.02	0.04	90
825	0.52	0.23	0.32	102
826	0.12	0.01	0.02	85
827	0.20	0.02	0.03	109
828	0.30	0.03	0.05	103
829	0.98	0.40	0.56	106
830	0.88	0.26	0.40	108
831	0.50	0.04	0.07	84
832	0.00	0.00	0.00	98
833	0.77	0.26	0.39	92
834	0.50	0.10	0.17	91
835	0.87	0.28	0.43	92
836	0.28	0.07	0.11	104
837	0.63	0.24	0.34	102
838	0.22	0.07	0.11	111
839	0.00	0.00	0.00	96
840	0.41	0.15	0.22	86
841	0.34	0.10	0.16	105
842	0.20	0.01	0.02	92
843	0.39	0.16	0.23	86
844	0.00	0.00	0.00	108
845	0.45	0.06	0.11	82
846	0.22	0.04	0.07	101
847	0.97	0.60	0.74	94

848	1.00	0.41	0.58	101
849	0.39	0.14	0.20	88
850	0.88	0.36	0.51	81
851	0.79	0.10	0.18	109
852	0.45	0.13	0.20	101
853	0.25	0.03	0.06	91
854	0.29	0.06	0.10	95
855	0.20	0.01	0.02	99
856	0.14	0.01	0.02	79
857	0.67	0.32	0.43	91
858	0.00	0.00	0.00	89
859	0.42	0.09	0.15	91
860	0.49	0.19	0.28	88
861	0.32	0.07	0.11	101
862	0.51	0.30	0.37	81
863	0.69	0.20	0.31	101
864	0.28	0.11	0.16	80
865	0.00	0.00	0.00	97
866	0.88	0.46	0.60	94
867	0.00	0.00	0.00	97
868	0.29	0.07	0.11	91
869	0.35	0.09	0.14	88
870	0.53	0.25	0.34	112
871	0.93	0.57	0.71	94
872	0.00	0.00	0.00	84
873	0.89	0.53	0.66	74
874	0.91	0.53	0.67	80
875	0.46	0.23	0.31	79
876	0.56	0.07	0.12	71
877	0.77	0.26	0.39	92
878	1.00	0.08	0.15	99
879	0.56	0.14	0.23	98
880	0.37	0.18	0.24	82
881	0.70	0.35	0.47	80
882	0.91	0.55	0.69	94
883	0.07	0.01	0.02	102
884	0.88	0.22	0.35	95
885	0.91	0.57	0.70	87
886	0.20	0.01	0.02	88
887	0.41	0.08	0.13	90
888	0.84	0.46	0.60	104
889	0.20	0.01	0.02	93
890	0.14	0.02	0.04	83
891	0.00	0.00	0.00	92
892	0.58	0.17	0.26	88
893	0.00	0.00	0.00	74
894	1.00	0.40	0.57	98
895	0.47	0.22	0.30	73
896	0.00	0.00	0.00	87
897	0.29	0.03	0.05	73
898	0.58	0.22	0.32	86
899	0.24	0.08	0.12	100
900	0.43	0.14	0.21	93
901	0.82	0.36	0.50	86
902	0.38	0.07	0.12	107
903	0.43	0.03	0.06	97
904	0.52	0.17	0.26	88

905	0.00	0.00	0.00	94
906	0.14	0.02	0.04	83
907	0.00	0.00	0.00	85
908	0.00	0.00	0.00	90
909	0.14	0.01	0.02	83
910	0.60	0.07	0.13	83
911	0.19	0.03	0.06	87
912	0.94	0.38	0.54	87
913	0.56	0.10	0.18	86
914	0.52	0.16	0.25	91
915	0.25	0.02	0.04	87
916	0.00	0.00	0.00	92
917	0.00	0.00	0.00	92
918	0.81	0.37	0.51	78
919	0.44	0.10	0.16	81
920	0.00	0.00	0.00	87
921	0.00	0.00	0.00	95
922	0.85	0.27	0.41	82
923	0.33	0.02	0.04	89
924	0.00	0.00	0.00	73
925	0.41	0.09	0.14	82
926	0.43	0.03	0.06	91
927	0.38	0.10	0.15	83
928	0.33	0.03	0.05	79
929	0.55	0.07	0.12	89
930	0.29	0.07	0.11	85
931	0.00	0.00	0.00	95
932	0.25	0.01	0.02	80
933	0.50	0.07	0.12	72
934	0.64	0.29	0.40	79
935	0.52	0.15	0.23	75
936	0.70	0.22	0.34	85
937	0.47	0.09	0.16	75
938	0.23	0.09	0.13	69
939	0.00	0.00	0.00	85
940	0.11	0.01	0.02	72
941	0.00	0.00	0.00	69
942	0.44	0.09	0.14	94
943	0.00	0.00	0.00	85
944	0.94	0.36	0.52	89
945	0.19	0.04	0.06	77
946	0.78	0.15	0.25	93
947	0.00	0.00	0.00	81
948	0.95	0.50	0.66	78
949	0.00	0.00	0.00	75
950	0.00	0.00	0.00	80
951	0.12	0.01	0.02	88
952	0.29	0.03	0.05	80
953	1.00	0.71	0.83	85
954	0.83	0.55	0.66	71
955	0.00	0.00	0.00	80
956	0.81	0.37	0.51	68
957	0.87	0.52	0.65	75
958	0.43	0.13	0.20	90
959	0.81	0.15	0.25	87
960	0.89	0.38	0.53	87
961	0.74	0.29	0.42	68



962	0.65	0.26	0.37	86
963	0.57	0.19	0.28	85
964	0.43	0.15	0.23	78
965	0.76	0.44	0.56	88
966	0.93	0.46	0.61	85
967	0.52	0.23	0.32	70
968	0.33	0.04	0.07	82
969	0.88	0.47	0.61	92
970	0.31	0.05	0.09	73
971	0.00	0.00	0.00	77
972	0.46	0.16	0.24	82
973	0.80	0.10	0.18	80
974	0.12	0.01	0.02	83
975	0.98	0.58	0.73	76
976	0.00	0.00	0.00	85
977	0.00	0.00	0.00	65
978	0.57	0.11	0.19	72
979	0.33	0.02	0.04	85
980	0.23	0.05	0.08	64
981	0.25	0.03	0.05	76
982	0.58	0.07	0.13	96
983	0.94	0.31	0.46	94
984	0.29	0.02	0.04	87
985	0.33	0.01	0.03	75
986	0.00	0.00	0.00	79
987	0.00	0.00	0.00	86
988	0.50	0.01	0.02	88
989	0.00	0.00	0.00	84
990	0.52	0.14	0.22	95
991	0.37	0.15	0.22	71
992	0.57	0.38	0.46	68
993	0.00	0.00	0.00	75
994	0.00	0.00	0.00	90
995	0.95	0.43	0.60	83
996	0.89	0.43	0.58	79
997	0.71	0.08	0.14	64
998	0.27	0.04	0.07	74
999	0.81	0.36	0.50	81
1000	0.00	0.00	0.00	74
1001	0.14	0.02	0.03	62
1002	0.67	0.25	0.37	71
1003	0.00	0.00	0.00	72
1004	0.50	0.08	0.14	75
1005	0.93	0.53	0.67	72
1006	0.52	0.15	0.23	81
1007	0.00	0.00	0.00	74
1008	0.17	0.01	0.03	72
1009	0.00	0.00	0.00	75
1010	0.47	0.16	0.24	91
1011	0.59	0.18	0.27	90
1012	0.62	0.25	0.36	80
1013	0.00	0.00	0.00	88
1014	0.80	0.06	0.11	71
1015	0.57	0.11	0.18	74
1016	0.88	0.22	0.35	68
1017	0.70	0.39	0.50	71
1018	0.65	0.21	0.32	80

1019	0.00	0.00	0.00	83
1020	0.46	0.08	0.14	74
1021	0.93	0.49	0.64	78
1022	0.86	0.32	0.47	77
1023	0.12	0.01	0.02	78
1024	0.68	0.31	0.43	67
1025	0.50	0.01	0.02	80
1026	0.69	0.23	0.35	77
1027	0.80	0.32	0.46	88
1028	0.24	0.06	0.09	70
1029	0.00	0.00	0.00	79
1030	0.33	0.07	0.12	67
1031	0.88	0.47	0.61	75
1032	0.56	0.28	0.38	64
1033	0.88	0.21	0.34	70
1034	0.17	0.06	0.09	69
1035	0.44	0.10	0.16	72
1036	0.30	0.04	0.07	79
1037	0.24	0.05	0.08	84
1038	0.00	0.00	0.00	87
1039	0.68	0.35	0.46	65
1040	0.72	0.36	0.48	73
1041	0.00	0.00	0.00	77
1042	0.27	0.05	0.09	77
1043	0.16	0.07	0.09	60
1044	0.00	0.00	0.00	73
1045	0.00	0.00	0.00	67
1046	0.43	0.04	0.07	83
1047	1.00	0.40	0.57	70
1048	1.00	0.02	0.03	65
1049	0.62	0.14	0.22	74
1050	0.50	0.02	0.03	62
1051	0.58	0.16	0.25	70
1052	0.00	0.00	0.00	69
1053	0.25	0.08	0.12	72
1054	0.44	0.15	0.23	72
1055	0.90	0.52	0.66	73
1056	0.74	0.34	0.46	92
1057	0.67	0.05	0.10	73
1058	0.31	0.12	0.17	68
1059	0.00	0.00	0.00	71
1060	0.33	0.10	0.16	69
1061	0.85	0.24	0.37	72
1062	0.44	0.29	0.35	66
1063	0.14	0.01	0.02	84
1064	0.00	0.00	0.00	78
1065	0.81	0.45	0.58	66
1066	0.21	0.04	0.07	69
1067	0.11	0.01	0.02	80
1068	1.00	0.01	0.03	71
1069	0.52	0.18	0.27	60
1070	0.20	0.01	0.02	77
1071	0.88	0.29	0.43	80
1072	0.25	0.06	0.10	80
1073	0.00	0.00	0.00	74
1074	0.21	0.04	0.07	69
1075	0.44	0.07	0.12	56

1076	0.32	0.13	0.18	63
1077	0.58	0.19	0.29	58
1078	0.00	0.00	0.00	63
1079	0.83	0.24	0.37	85
1080	0.52	0.15	0.24	78
1081	0.00	0.00	0.00	84
1082	0.74	0.42	0.54	73
1083	0.09	0.02	0.03	55
1084	0.51	0.26	0.34	70
1085	0.69	0.26	0.38	85
1086	0.00	0.00	0.00	68
1087	0.40	0.02	0.05	82
1088	0.00	0.00	0.00	67
1089	0.81	0.44	0.57	78
1090	0.70	0.11	0.19	64
1091	0.35	0.09	0.15	75
1092	0.38	0.16	0.23	61
1093	0.65	0.17	0.28	63
1094	0.00	0.00	0.00	77
1095	0.36	0.13	0.19	70
1096	0.86	0.34	0.48	71
1097	0.44	0.12	0.18	69
1098	0.58	0.22	0.32	63
1099	0.80	0.49	0.61	67
1100	0.57	0.06	0.11	68
1101	0.00	0.00	0.00	57
1102	0.90	0.54	0.67	69
1103	0.14	0.01	0.03	70
1104	0.40	0.05	0.09	75
1105	0.21	0.05	0.08	62
1106	0.25	0.01	0.03	72
1107	0.00	0.00	0.00	76
1108	0.00	0.00	0.00	72
1109	0.00	0.00	0.00	86
1110	0.85	0.43	0.57	82
1111	0.00	0.00	0.00	70
1112	0.50	0.01	0.03	72
1113	0.65	0.24	0.35	70
1114	0.20	0.02	0.03	57
1115	0.25	0.04	0.07	68
1116	0.00	0.00	0.00	64
1117	0.29	0.03	0.05	66
1118	0.50	0.11	0.18	81
1119	0.68	0.24	0.35	63
1120	0.15	0.06	0.09	62
1121	0.00	0.00	0.00	79
1122	0.80	0.21	0.34	56
1123	0.24	0.06	0.09	71
1124	0.00	0.00	0.00	78
1125	0.80	0.06	0.11	66
1126	0.00	0.00	0.00	62
1127	0.75	0.18	0.29	66
1128	0.00	0.00	0.00	70
1129	0.94	0.46	0.62	65
1130	0.85	0.37	0.51	63
1131	0.89	0.52	0.66	79
1132	0.38	0.07	0.12	67

1133	0.00	0.00	0.00	64
1134	0.20	0.03	0.05	67
1135	0.73	0.21	0.32	78
1136	0.44	0.07	0.13	54
1137	0.00	0.00	0.00	64
1138	0.39	0.09	0.15	76
1139	0.00	0.00	0.00	64
1140	0.00	0.00	0.00	67
1141	0.06	0.01	0.02	70
1142	0.44	0.06	0.11	66
1143	0.74	0.40	0.52	62
1144	0.00	0.00	0.00	67
1145	0.43	0.06	0.11	47
1146	0.35	0.09	0.14	69
1147	0.71	0.40	0.51	63
1148	0.37	0.10	0.16	70
1149	0.41	0.13	0.19	55
1150	0.57	0.33	0.42	49
1151	0.57	0.07	0.12	58
1152	0.00	0.00	0.00	65
1153	0.00	0.00	0.00	67
1154	0.00	0.00	0.00	66
1155	0.94	0.52	0.67	62
1156	0.62	0.07	0.12	72
1157	0.90	0.42	0.57	62
1158	0.00	0.00	0.00	60
1159	0.43	0.16	0.23	64
1160	0.30	0.05	0.09	59
1161	0.10	0.02	0.03	55
1162	0.51	0.29	0.37	63
1163	0.77	0.36	0.49	64
1164	0.00	0.00	0.00	54
1165	0.32	0.10	0.15	62
1166	0.00	0.00	0.00	73
1167	0.46	0.21	0.29	56
1168	0.33	0.03	0.06	60
1169	0.35	0.11	0.17	63
1170	0.80	0.05	0.10	73
1171	0.60	0.31	0.41	58
1172	0.29	0.03	0.06	59
1173	0.23	0.04	0.07	68
1174	0.45	0.14	0.22	63
1175	0.98	0.60	0.74	70
1176	0.87	0.42	0.57	62
1177	0.00	0.00	0.00	62
1178	0.00	0.00	0.00	45
1179	0.97	0.37	0.53	79
1180	0.70	0.12	0.21	58
1181	0.88	0.30	0.44	71
1182	0.12	0.02	0.03	56
1183	0.00	0.00	0.00	63
1184	0.00	0.00	0.00	72
1185	0.33	0.04	0.06	56
1186	0.82	0.19	0.30	75
1187	0.17	0.02	0.03	57
1188	0.45	0.08	0.14	60
1189	0.25	0.02	0.03	65

1190	0.50	0.01	0.03	68
1191	0.59	0.16	0.25	62
1192	0.00	0.00	0.00	68
1193	0.00	0.00	0.00	66
1194	0.40	0.04	0.06	57
1195	0.11	0.01	0.03	67
1196	0.88	0.10	0.18	69
1197	0.36	0.06	0.10	66
1198	0.40	0.03	0.06	62
1199	0.33	0.08	0.14	59
1200	0.92	0.21	0.34	57
1201	1.00	0.31	0.47	62
1202	0.87	0.47	0.61	58
1203	0.00	0.00	0.00	67
1204	0.63	0.35	0.45	74
1205	0.50	0.02	0.04	55
1206	0.55	0.09	0.16	65
1207	0.47	0.11	0.17	75
1208	0.63	0.20	0.30	61
1209	0.69	0.39	0.49	62
1210	0.14	0.02	0.03	59
1211	0.50	0.19	0.28	47
1212	0.00	0.00	0.00	59
1213	0.95	0.36	0.52	59
1214	1.00	0.03	0.05	74
1215	0.25	0.02	0.03	65
1216	0.00	0.00	0.00	60
1217	0.53	0.19	0.27	54
1218	0.00	0.00	0.00	62
1219	0.93	0.68	0.79	78
1220	0.85	0.57	0.68	72
1221	0.75	0.35	0.48	60
1222	0.43	0.14	0.21	63
1223	0.00	0.00	0.00	66
1224	0.56	0.14	0.23	69
1225	0.00	0.00	0.00	69
1226	0.80	0.18	0.29	68
1227	0.53	0.17	0.26	58
1228	0.00	0.00	0.00	51
1229	0.00	0.00	0.00	59
1230	0.00	0.00	0.00	75
1231	0.50	0.11	0.18	64
1232	0.00	0.00	0.00	66
1233	0.29	0.03	0.06	58
1234	0.00	0.00	0.00	63
1235	0.06	0.02	0.03	62
1236	0.00	0.00	0.00	57
1237	1.00	0.01	0.03	77
1238	0.81	0.40	0.54	52
1239	0.86	0.30	0.45	63
1240	0.90	0.40	0.55	48
1241	0.00	0.00	0.00	71
1242	0.79	0.18	0.29	62
1243	0.43	0.10	0.16	61
1244	0.00	0.00	0.00	53
1245	0.09	0.01	0.02	75
1246	0.38	0.05	0.10	55

1247	0.50	0.02	0.04	55
1248	0.00	0.00	0.00	49
1249	0.33	0.05	0.09	74
1250	0.97	0.47	0.64	59
1251	0.38	0.14	0.21	56
1252	0.33	0.10	0.15	63
1253	0.59	0.21	0.31	48
1254	0.95	0.60	0.73	62
1255	0.00	0.00	0.00	69
1256	0.30	0.05	0.08	65
1257	0.00	0.00	0.00	62
1258	0.39	0.14	0.20	51
1259	0.62	0.12	0.21	64
1260	0.00	0.00	0.00	64
1261	0.00	0.00	0.00	63
1262	0.93	0.22	0.36	58
1263	0.36	0.07	0.12	54
1264	0.00	0.00	0.00	62
1265	0.00	0.00	0.00	59
1266	0.90	0.46	0.60	57
1267	0.14	0.02	0.03	51
1268	0.25	0.04	0.07	46
1269	0.97	0.53	0.68	55
1270	0.88	0.10	0.18	69
1271	0.60	0.14	0.22	65
1272	0.38	0.08	0.14	60
1273	0.35	0.10	0.16	59
1274	0.25	0.05	0.08	62
1275	0.00	0.00	0.00	52
1276	0.40	0.07	0.12	57
1277	0.29	0.03	0.06	61
1278	0.70	0.11	0.19	62
1279	0.93	0.57	0.71	47
1280	0.25	0.03	0.06	63
1281	0.58	0.11	0.19	61
1282	0.60	0.18	0.28	50
1283	0.27	0.08	0.12	52
1284	0.68	0.23	0.35	56
1285	0.67	0.04	0.07	57
1286	0.71	0.10	0.18	49
1287	0.57	0.14	0.23	56
1288	0.57	0.27	0.36	49
1289	0.00	0.00	0.00	55
1290	0.00	0.00	0.00	68
1291	0.90	0.50	0.64	52
1292	0.29	0.03	0.05	73
1293	0.88	0.43	0.58	67
1294	0.00	0.00	0.00	54
1295	0.25	0.06	0.10	34
1296	1.00	0.34	0.51	56
1297	0.00	0.00	0.00	66
1298	1.00	0.03	0.06	68
1299	0.57	0.06	0.11	64
1300	0.91	0.50	0.65	64
1301	0.00	0.00	0.00	48
1302	0.00	0.00	0.00	63
1303	0.00	0.00	0.00	62

1304	0.50	0.02	0.04	54
1305	0.23	0.10	0.14	51
1306	0.22	0.07	0.11	55
1307	0.00	0.00	0.00	53
1308	0.61	0.31	0.41	54
1309	0.67	0.16	0.26	61
1310	0.00	0.00	0.00	42
1311	0.25	0.02	0.03	55
1312	0.00	0.00	0.00	64
1313	0.00	0.00	0.00	58
1314	0.90	0.36	0.51	50
1315	0.00	0.00	0.00	57
1316	0.59	0.22	0.32	46
1317	1.00	0.05	0.09	42
1318	0.50	0.22	0.30	74
1319	0.00	0.00	0.00	55
1320	0.00	0.00	0.00	59
1321	1.00	0.02	0.04	56
1322	0.00	0.00	0.00	61
1323	0.00	0.00	0.00	43
1324	0.47	0.18	0.26	45
1325	0.62	0.09	0.16	56
1326	0.72	0.35	0.47	52
1327	0.52	0.20	0.29	56
1328	0.00	0.00	0.00	56
1329	0.56	0.10	0.17	51
1330	0.00	0.00	0.00	54
1331	0.50	0.12	0.19	51
1332	0.00	0.00	0.00	48
1333	0.00	0.00	0.00	51
1334	0.00	0.00	0.00	38
1335	0.91	0.42	0.58	50
1336	0.00	0.00	0.00	48
1337	0.38	0.10	0.15	52
1338	0.58	0.21	0.31	52
1339	0.25	0.04	0.06	56
1340	0.50	0.04	0.07	52
1341	1.00	0.02	0.03	58
1342	0.00	0.00	0.00	56
1343	0.33	0.03	0.06	62
1344	0.93	0.32	0.47	44
1345	0.38	0.06	0.10	53
1346	0.20	0.02	0.03	53
1347	0.00	0.00	0.00	52
1348	0.50	0.10	0.17	58
1349	0.64	0.36	0.46	50
1350	0.00	0.00	0.00	62
1351	0.96	0.39	0.55	59
1352	0.00	0.00	0.00	57
1353	0.63	0.24	0.35	50
1354	0.67	0.11	0.19	55
1355	0.00	0.00	0.00	55
1356	0.17	0.02	0.03	56
1357	0.16	0.08	0.11	38
1358	0.20	0.04	0.06	53
1359	1.00	0.23	0.37	44
1360	1.00	0.23	0.38	56

1361	0.25	0.04	0.06	56
1362	1.00	0.33	0.49	46
1363	0.73	0.22	0.34	49
1364	0.00	0.00	0.00	66
1365	0.33	0.05	0.09	60
1366	0.86	0.11	0.19	56
1367	0.00	0.00	0.00	63
1368	0.53	0.15	0.23	67
1369	1.00	0.44	0.61	59
1370	0.94	0.33	0.48	49
1371	0.76	0.25	0.38	51
1372	0.20	0.02	0.04	50
1373	0.93	0.40	0.56	63
1374	0.20	0.02	0.03	55
1375	0.00	0.00	0.00	60
1376	0.52	0.18	0.27	60
1377	0.00	0.00	0.00	42
1378	0.94	0.30	0.45	54
1379	0.00	0.00	0.00	50
1380	0.00	0.00	0.00	45
1381	0.60	0.06	0.12	47
1382	0.11	0.02	0.03	54
1383	0.33	0.04	0.08	45
1384	0.00	0.00	0.00	52
1385	0.73	0.23	0.35	48
1386	0.60	0.06	0.11	50
1387	0.17	0.02	0.04	47
1388	0.75	0.16	0.26	57
1389	0.00	0.00	0.00	49
1390	0.55	0.27	0.36	44
1391	0.00	0.00	0.00	58
1392	0.77	0.19	0.30	54
1393	0.38	0.12	0.18	51
1394	0.50	0.02	0.04	51
1395	0.83	0.21	0.33	48
1396	0.67	0.13	0.22	61
1397	1.00	0.02	0.03	61
1398	0.62	0.15	0.24	55
1399	0.74	0.25	0.37	57
1400	0.50	0.06	0.11	49
1401	0.50	0.04	0.07	56
1402	0.54	0.13	0.22	52
1403	0.75	0.12	0.21	49
1404	0.92	0.80	0.86	41
1405	0.75	0.32	0.44	57
1406	0.33	0.02	0.04	54
1407	0.70	0.55	0.62	47
1408	0.38	0.07	0.12	41
1409	1.00	0.39	0.56	49
1410	1.00	0.44	0.61	48
1411	0.17	0.02	0.03	55
1412	0.73	0.13	0.23	60
1413	1.00	0.01	0.03	67
1414	0.00	0.00	0.00	50
1415	0.00	0.00	0.00	53
1416	0.40	0.10	0.16	59
1417	0.53	0.14	0.22	66



1418	0.67	0.04	0.08	50
1419	0.80	0.11	0.20	36
1420	0.30	0.06	0.11	47
1421	0.00	0.00	0.00	46
1422	0.38	0.10	0.16	51
1423	0.82	0.18	0.30	49
1424	0.50	0.07	0.12	56
1425	0.00	0.00	0.00	51
1426	0.67	0.04	0.07	53
1427	0.30	0.06	0.11	47
1428	0.00	0.00	0.00	39
1429	0.97	0.56	0.71	50
1430	0.86	0.20	0.33	59
1431	0.00	0.00	0.00	67
1432	0.00	0.00	0.00	53
1433	0.38	0.08	0.14	72
1434	0.62	0.10	0.17	51
1435	0.54	0.12	0.20	56
1436	0.67	0.11	0.18	56
1437	0.57	0.16	0.25	51
1438	0.00	0.00	0.00	46
1439	0.67	0.04	0.07	52
1440	0.00	0.00	0.00	41
1441	1.00	0.04	0.08	47
1442	1.00	0.02	0.04	45
1443	0.10	0.02	0.03	54
1444	0.15	0.04	0.06	52
1445	0.00	0.00	0.00	52
1446	0.61	0.25	0.35	44
1447	1.00	0.17	0.29	47
1448	0.00	0.00	0.00	48
1449	0.33	0.02	0.03	56
1450	0.00	0.00	0.00	54
1451	0.12	0.02	0.03	65
1452	0.50	0.07	0.13	55
1453	0.29	0.07	0.11	61
1454	0.00	0.00	0.00	62
1455	0.65	0.22	0.33	49
1456	0.20	0.02	0.03	53
1457	0.62	0.31	0.41	42
1458	0.75	0.05	0.10	59
1459	0.00	0.00	0.00	49
1460	0.71	0.10	0.18	50
1461	0.00	0.00	0.00	45
1462	0.42	0.11	0.17	47
1463	0.71	0.33	0.45	45
1464	1.00	0.04	0.08	50
1465	0.33	0.05	0.08	62
1466	0.00	0.00	0.00	51
1467	0.33	0.02	0.03	62
1468	0.93	0.48	0.63	54
1469	0.50	0.11	0.17	38
1470	0.81	0.26	0.40	65
1471	1.00	0.29	0.45	52
1472	0.50	0.09	0.15	44
1473	0.17	0.04	0.06	50
1474	0.00	0.00	0.00	56

1475	0.00	0.00	0.00	58
1476	0.12	0.02	0.03	58
1477	0.00	0.00	0.00	39
1478	0.96	0.48	0.64	50
1479	0.00	0.00	0.00	49
1480	0.00	0.00	0.00	41
1481	0.83	0.33	0.47	57
1482	0.00	0.00	0.00	49
1483	0.00	0.00	0.00	49
1484	1.00	0.10	0.18	59
1485	0.93	0.28	0.43	47
1486	0.50	0.02	0.04	53
1487	0.00	0.00	0.00	42
1488	0.00	0.00	0.00	47
1489	0.33	0.02	0.04	52
1490	0.72	0.30	0.42	44
1491	0.00	0.00	0.00	47
1492	0.81	0.25	0.39	51
1493	0.00	0.00	0.00	39
1494	0.00	0.00	0.00	38
1495	0.40	0.12	0.19	49
1496	0.62	0.16	0.26	49
1497	0.00	0.00	0.00	51
1498	1.00	0.04	0.07	52
1499	0.50	0.06	0.11	48
1500	0.00	0.00	0.00	51
1501	0.25	0.02	0.03	56
1502	0.00	0.00	0.00	48
1503	0.82	0.48	0.61	58
1504	0.50	0.02	0.04	44
1505	0.00	0.00	0.00	45
1506	0.20	0.02	0.04	44
1507	0.00	0.00	0.00	55
1508	0.33	0.04	0.08	45
1509	0.62	0.17	0.27	46
1510	0.00	0.00	0.00	46
1511	0.00	0.00	0.00	43
1512	0.89	0.19	0.31	42
1513	0.00	0.00	0.00	44
1514	0.58	0.33	0.42	45
1515	1.00	0.48	0.65	42
1516	1.00	0.36	0.53	42
1517	0.22	0.10	0.14	49
1518	1.00	0.18	0.30	51
1519	0.50	0.02	0.04	47
1520	0.00	0.00	0.00	48
1521	0.00	0.00	0.00	54
1522	0.22	0.05	0.09	38
1523	0.00	0.00	0.00	44
1524	0.67	0.04	0.07	55
1525	0.00	0.00	0.00	47
1526	0.00	0.00	0.00	55
1527	0.00	0.00	0.00	48
1528	0.67	0.04	0.07	54
1529	0.67	0.06	0.12	63
1530	0.77	0.25	0.38	40
1531	0.00	0.00	0.00	40

1532	0.22	0.04	0.07	48
1533	0.00	0.00	0.00	49
1534	0.00	0.00	0.00	45
1535	1.00	0.19	0.32	42
1536	1.00	0.06	0.11	54
1537	0.64	0.12	0.21	56
1538	0.50	0.03	0.05	38
1539	0.00	0.00	0.00	47
1540	0.44	0.10	0.16	40
1541	0.82	0.20	0.32	46
1542	1.00	0.15	0.26	46
1543	0.25	0.02	0.04	42
1544	0.70	0.33	0.45	48
1545	1.00	0.02	0.05	41
1546	0.00	0.00	0.00	35
1547	0.00	0.00	0.00	45
1548	0.20	0.04	0.06	55
1549	0.88	0.30	0.44	47
1550	1.00	0.12	0.22	48
1551	0.84	0.68	0.75	40
1552	0.67	0.04	0.07	51
1553	0.75	0.07	0.12	44
1554	0.91	0.20	0.32	51
1555	0.00	0.00	0.00	59
1556	0.50	0.18	0.27	60
1557	1.00	0.07	0.12	46
1558	0.67	0.05	0.09	43
1559	0.00	0.00	0.00	52
1560	0.67	0.09	0.16	44
1561	0.95	0.50	0.66	38
1562	0.40	0.10	0.15	42
1563	0.30	0.06	0.10	49
1564	1.00	0.15	0.25	48
1565	1.00	0.38	0.56	52
1566	0.97	0.63	0.76	46
1567	0.00	0.00	0.00	46
1568	0.81	0.44	0.57	39
1569	0.57	0.09	0.15	47
1570	0.60	0.12	0.21	48
1571	0.00	0.00	0.00	47
1572	0.00	0.00	0.00	52
1573	0.00	0.00	0.00	31
1574	0.95	0.38	0.55	55
1575	0.14	0.02	0.04	49
1576	1.00	0.43	0.61	46
1577	0.25	0.02	0.03	55
1578	0.00	0.00	0.00	42
1579	0.89	0.20	0.32	41
1580	0.00	0.00	0.00	47
1581	0.40	0.08	0.13	50
1582	0.00	0.00	0.00	47
1583	0.50	0.11	0.18	54
1584	0.50	0.04	0.08	49
1585	0.25	0.06	0.09	35
1586	0.00	0.00	0.00	43
1587	0.64	0.13	0.22	53
1588	0.00	0.00	0.00	49

1589	0.00	0.00	0.00	44
1590	0.50	0.05	0.09	39
1591	0.00	0.00	0.00	36
1592	0.00	0.00	0.00	46
1593	0.75	0.22	0.34	55
1594	0.91	0.21	0.34	47
1595	1.00	0.22	0.35	51
1596	0.00	0.00	0.00	42
1597	0.00	0.00	0.00	50
1598	0.53	0.20	0.29	40
1599	0.00	0.00	0.00	38
1600	0.00	0.00	0.00	47
1601	0.88	0.38	0.53	37
1602	0.25	0.02	0.03	62
1603	0.00	0.00	0.00	43
1604	0.00	0.00	0.00	66
1605	0.33	0.03	0.06	33
1606	0.00	0.00	0.00	35
1607	1.00	0.29	0.44	42
1608	0.96	0.57	0.71	44
1609	0.67	0.05	0.09	40
1610	0.91	0.46	0.61	46
1611	0.33	0.04	0.07	55
1612	0.88	0.35	0.50	43
1613	0.00	0.00	0.00	51
1614	0.69	0.24	0.35	38
1615	0.00	0.00	0.00	47
1616	0.45	0.10	0.16	51
1617	0.00	0.00	0.00	52
1618	0.25	0.02	0.04	43
1619	1.00	0.03	0.05	37
1620	0.00	0.00	0.00	50
1621	0.00	0.00	0.00	44
1622	0.56	0.12	0.20	41
1623	0.50	0.13	0.21	46
1624	1.00	0.05	0.09	42
1625	0.94	0.33	0.49	48
1626	0.20	0.02	0.04	51
1627	0.00	0.00	0.00	37
1628	0.20	0.04	0.07	48
1629	0.00	0.00	0.00	43
1630	0.00	0.00	0.00	50
1631	0.00	0.00	0.00	41
1632	0.29	0.04	0.08	45
1633	0.90	0.40	0.55	45
1634	0.43	0.11	0.17	56
1635	0.71	0.27	0.39	44
1636	1.00	0.33	0.50	39
1637	0.74	0.27	0.40	51
1638	0.00	0.00	0.00	31
1639	0.00	0.00	0.00	53
1640	1.00	0.19	0.31	59
1641	0.20	0.03	0.05	35
1642	0.38	0.10	0.15	52
1643	0.00	0.00	0.00	32
1644	0.00	0.00	0.00	45
1645	0.00	0.00	0.00	50

1646	0.36	0.08	0.13	52
1647	0.53	0.26	0.34	39
1648	0.25	0.02	0.03	56
1649	0.75	0.32	0.45	37
1650	0.30	0.07	0.12	42
1651	0.62	0.09	0.16	55
1652	0.89	0.47	0.62	34
1653	0.83	0.12	0.22	40
1654	0.00	0.00	0.00	45
1655	0.00	0.00	0.00	56
1656	0.00	0.00	0.00	50
1657	0.00	0.00	0.00	46
1658	0.84	0.37	0.52	43
1659	0.88	0.45	0.59	49
1660	0.80	0.23	0.36	52
1661	1.00	0.02	0.04	54
1662	0.00	0.00	0.00	43
1663	0.00	0.00	0.00	59
1664	0.00	0.00	0.00	45
1665	0.00	0.00	0.00	51
1666	0.00	0.00	0.00	47
1667	0.17	0.02	0.04	50
1668	0.86	0.30	0.44	40
1669	0.25	0.03	0.05	38
1670	1.00	0.14	0.24	37
1671	0.50	0.02	0.04	51
1672	0.86	0.51	0.64	47
1673	0.86	0.12	0.21	49
1674	0.25	0.02	0.04	45
1675	0.00	0.00	0.00	46
1676	0.00	0.00	0.00	45
1677	0.38	0.07	0.11	45
1678	0.00	0.00	0.00	43
1679	1.00	0.02	0.04	52
1680	0.60	0.07	0.13	41
1681	0.00	0.00	0.00	41
1682	0.00	0.00	0.00	35
1683	0.67	0.05	0.09	41
1684	0.50	0.11	0.19	35
1685	1.00	0.02	0.04	53
1686	0.00	0.00	0.00	43
1687	0.00	0.00	0.00	39
1688	0.00	0.00	0.00	38
1689	0.50	0.18	0.26	51
1690	0.50	0.06	0.11	47
1691	0.00	0.00	0.00	30
1692	0.64	0.23	0.34	30
1693	0.00	0.00	0.00	47
1694	0.00	0.00	0.00	51
1695	0.00	0.00	0.00	43
1696	0.86	0.30	0.44	40
1697	0.00	0.00	0.00	33
1698	0.00	0.00	0.00	45
1699	0.00	0.00	0.00	42
1700	1.00	0.42	0.59	45
1701	0.83	0.38	0.53	39
1702	0.00	0.00	0.00	56

1703	1.00	0.36	0.53	44
1704	0.83	0.34	0.48	44
1705	1.00	0.40	0.57	40
1706	1.00	0.23	0.37	35
1707	0.00	0.00	0.00	32
1708	1.00	0.27	0.42	45
1709	0.00	0.00	0.00	37
1710	0.00	0.00	0.00	47
1711	0.25	0.07	0.11	30
1712	0.00	0.00	0.00	38
1713	0.00	0.00	0.00	39
1714	0.73	0.31	0.43	36
1715	0.00	0.00	0.00	38
1716	0.20	0.02	0.03	55
1717	0.60	0.07	0.13	42
1718	0.55	0.24	0.33	46
1719	0.54	0.14	0.22	51
1720	0.27	0.11	0.16	35
1721	0.85	0.47	0.61	36
1722	0.89	0.42	0.57	38
1723	0.92	0.30	0.45	40
1724	0.67	0.04	0.07	53
1725	0.00	0.00	0.00	27
1726	0.20	0.02	0.04	48
1727	0.83	0.50	0.62	38
1728	0.18	0.05	0.08	38
1729	0.86	0.11	0.19	57
1730	0.85	0.47	0.60	47
1731	0.00	0.00	0.00	48
1732	0.00	0.00	0.00	41
1733	0.15	0.06	0.09	33
1734	0.33	0.05	0.09	37
1735	0.50	0.04	0.08	45
1736	0.95	0.41	0.57	44
1737	0.80	0.26	0.39	47
1738	1.00	0.38	0.55	48
1739	0.25	0.02	0.04	48
1740	0.00	0.00	0.00	51
1741	0.91	0.24	0.38	42
1742	0.93	0.29	0.44	45
1743	1.00	0.14	0.24	43
1744	0.00	0.00	0.00	50
1745	1.00	0.25	0.40	40
1746	0.67	0.16	0.26	49
1747	0.00	0.00	0.00	37
1748	0.83	0.42	0.56	36
1749	0.40	0.05	0.09	41
1750	0.00	0.00	0.00	41
1751	0.91	0.29	0.44	34
1752	0.00	0.00	0.00	37
1753	0.80	0.20	0.31	41
1754	0.00	0.00	0.00	46
1755	0.00	0.00	0.00	35
1756	0.59	0.22	0.32	46
1757	0.00	0.00	0.00	44
1758	0.50	0.05	0.09	43
1759	0.17	0.03	0.06	30

1760	0.00	0.00	0.00	46
1761	0.00	0.00	0.00	39
1762	0.00	0.00	0.00	41
1763	0.00	0.00	0.00	47
1764	0.86	0.18	0.29	34
1765	0.00	0.00	0.00	32
1766	0.71	0.29	0.41	42
1767	0.90	0.24	0.38	38
1768	0.00	0.00	0.00	35
1769	0.57	0.12	0.20	33
1770	0.67	0.05	0.10	39
1771	0.00	0.00	0.00	37
1772	0.54	0.15	0.23	48
1773	1.00	0.33	0.49	46
1774	0.67	0.14	0.23	44
1775	0.50	0.02	0.03	63
1776	0.80	0.10	0.18	40
1777	1.00	0.03	0.05	39
1778	0.50	0.08	0.14	38
1779	0.00	0.00	0.00	44
1780	0.92	0.55	0.69	44
1781	0.67	0.05	0.09	40
1782	0.33	0.05	0.08	43
1783	0.00	0.00	0.00	39
1784	0.44	0.09	0.15	44
1785	0.71	0.13	0.22	38
1786	0.00	0.00	0.00	39
1787	1.00	0.05	0.09	44
1788	0.00	0.00	0.00	46
1789	0.70	0.17	0.28	40
1790	0.75	0.27	0.39	45
1791	0.00	0.00	0.00	39
1792	0.20	0.05	0.08	41
1793	0.71	0.21	0.33	47
1794	0.38	0.07	0.12	43
1795	0.76	0.38	0.51	34
1796	0.72	0.40	0.51	45
1797	1.00	0.19	0.32	31
1798	0.25	0.06	0.09	36
1799	0.68	0.27	0.39	55
1800	0.00	0.00	0.00	30
1801	0.00	0.00	0.00	35
1802	1.00	0.23	0.37	48
1803	0.12	0.03	0.04	38
1804	0.00	0.00	0.00	35
1805	0.00	0.00	0.00	32
1806	0.71	0.27	0.39	37
1807	1.00	0.19	0.32	37
1808	0.00	0.00	0.00	36
1809	0.00	0.00	0.00	42
1810	0.00	0.00	0.00	42
1811	0.00	0.00	0.00	35
1812	0.57	0.10	0.17	39
1813	0.71	0.28	0.40	36
1814	0.43	0.06	0.11	48
1815	1.00	0.44	0.62	45
1816	0.75	0.26	0.39	34

1817	0.67	0.19	0.29	32
1818	1.00	0.27	0.43	44
1819	0.00	0.00	0.00	46
1820	0.00	0.00	0.00	40
1821	0.00	0.00	0.00	37
1822	0.00	0.00	0.00	35
1823	0.00	0.00	0.00	33
1824	0.00	0.00	0.00	38
1825	1.00	0.05	0.10	38
1826	0.73	0.18	0.29	45
1827	0.00	0.00	0.00	36
1828	0.00	0.00	0.00	45
1829	0.96	0.68	0.80	38
1830	0.17	0.03	0.05	35
1831	0.75	0.26	0.39	34
1832	0.50	0.03	0.06	33
1833	0.60	0.13	0.21	23
1834	0.50	0.02	0.04	44
1835	0.00	0.00	0.00	50
1836	1.00	0.05	0.09	44
1837	0.86	0.26	0.40	46
1838	0.00	0.00	0.00	33
1839	0.60	0.20	0.30	45
1840	0.00	0.00	0.00	37
1841	1.00	0.03	0.05	39
1842	0.00	0.00	0.00	40
1843	0.00	0.00	0.00	41
1844	0.33	0.05	0.08	43
1845	0.00	0.00	0.00	36
1846	0.00	0.00	0.00	38
1847	0.00	0.00	0.00	33
1848	0.00	0.00	0.00	37
1849	1.00	0.12	0.21	34
1850	0.00	0.00	0.00	42
1851	0.60	0.41	0.48	37
1852	0.80	0.11	0.19	37
1853	0.91	0.24	0.38	41
1854	1.00	0.45	0.62	40
1855	0.00	0.00	0.00	40
1856	0.00	0.00	0.00	39
1857	0.00	0.00	0.00	30
1858	0.33	0.02	0.04	49
1859	0.67	0.28	0.39	29
1860	0.00	0.00	0.00	45
1861	0.25	0.05	0.08	40
1862	0.90	0.23	0.37	39
1863	0.00	0.00	0.00	37
1864	0.81	0.35	0.49	37
1865	0.91	0.28	0.43	36
1866	0.00	0.00	0.00	39
1867	0.38	0.07	0.12	42
1868	0.73	0.25	0.37	44
1869	0.00	0.00	0.00	39
1870	0.00	0.00	0.00	46
1871	0.00	0.00	0.00	43
1872	0.14	0.03	0.05	34
1873	0.40	0.04	0.08	47



1874	0.57	0.10	0.17	39
1875	0.33	0.03	0.05	36
1876	0.56	0.14	0.22	37
1877	0.00	0.00	0.00	47
1878	0.50	0.06	0.11	48
1879	0.67	0.19	0.29	32
1880	0.87	0.28	0.43	46
1881	0.17	0.03	0.05	38
1882	0.00	0.00	0.00	36
1883	0.00	0.00	0.00	40
1884	0.38	0.09	0.14	34
1885	0.00	0.00	0.00	41
1886	0.00	0.00	0.00	42
1887	0.00	0.00	0.00	38
1888	1.00	0.02	0.04	49
1889	1.00	0.42	0.59	36
1890	0.70	0.19	0.30	36
1891	0.67	0.23	0.34	44
1892	0.33	0.04	0.07	24
1893	0.00	0.00	0.00	36
1894	1.00	0.39	0.56	46
1895	0.00	0.00	0.00	33
1896	1.00	0.12	0.21	42
1897	0.00	0.00	0.00	35
1898	0.00	0.00	0.00	31
1899	0.71	0.33	0.45	36
1900	0.00	0.00	0.00	30
1901	0.62	0.10	0.18	49
1902	0.67	0.12	0.20	34
1903	1.00	0.07	0.14	40
1904	0.00	0.00	0.00	42
1905	0.00	0.00	0.00	44
1906	0.84	0.34	0.48	47
1907	0.00	0.00	0.00	46
1908	0.57	0.33	0.42	36
1909	1.00	0.06	0.11	35
1910	0.00	0.00	0.00	46
1911	0.00	0.00	0.00	39
1912	0.85	0.29	0.43	38
1913	0.00	0.00	0.00	38
1914	0.73	0.19	0.30	43
1915	0.84	0.52	0.64	31
1916	0.33	0.08	0.12	39
1917	0.00	0.00	0.00	38
1918	0.75	0.20	0.32	45
1919	0.58	0.19	0.29	37
1920	0.00	0.00	0.00	29
1921	0.00	0.00	0.00	31
1922	0.61	0.34	0.44	41
1923	0.17	0.02	0.03	54
1924	0.80	0.12	0.22	32
1925	0.00	0.00	0.00	32
1926	0.00	0.00	0.00	38
1927	0.94	0.38	0.54	42
1928	0.00	0.00	0.00	41
1929	0.00	0.00	0.00	47
1930	1.00	0.40	0.57	30

1931	1.00	0.05	0.09	41
1932	0.00	0.00	0.00	40
1933	0.62	0.19	0.29	43
1934	0.00	0.00	0.00	42
1935	0.33	0.06	0.10	36
1936	0.57	0.29	0.38	42
1937	1.00	0.03	0.05	36
1938	0.94	0.50	0.65	32
1939	1.00	0.12	0.21	50
1940	0.33	0.03	0.05	35
1941	0.00	0.00	0.00	41
1942	0.80	0.20	0.32	40
1943	0.00	0.00	0.00	38
1944	0.84	0.47	0.60	34
1945	0.00	0.00	0.00	42
1946	0.90	0.32	0.47	28
1947	0.00	0.00	0.00	37
1948	0.00	0.00	0.00	32
1949	0.00	0.00	0.00	32
1950	0.69	0.35	0.46	26
1951	0.00	0.00	0.00	49
1952	0.00	0.00	0.00	32
1953	0.50	0.03	0.06	31
1954	0.71	0.12	0.21	40
1955	0.00	0.00	0.00	47
1956	1.00	0.07	0.13	43
1957	0.00	0.00	0.00	38
1958	0.77	0.26	0.39	38
1959	0.00	0.00	0.00	34
1960	0.32	0.21	0.25	39
1961	1.00	0.03	0.06	34
1962	0.20	0.02	0.04	42
1963	0.60	0.09	0.16	32
1964	0.00	0.00	0.00	41
1965	0.33	0.02	0.04	42
1966	0.00	0.00	0.00	37
1967	0.00	0.00	0.00	41
1968	0.86	0.60	0.71	30
1969	0.50	0.24	0.32	25
1970	0.50	0.15	0.23	40
1971	0.00	0.00	0.00	43
1972	0.00	0.00	0.00	42
1973	0.00	0.00	0.00	32
1974	0.00	0.00	0.00	33
1975	1.00	0.21	0.35	28
1976	0.00	0.00	0.00	35
1977	0.92	0.22	0.36	49
1978	1.00	0.33	0.49	49
1979	0.00	0.00	0.00	34
1980	0.00	0.00	0.00	28
1981	1.00	0.24	0.38	34
1982	0.00	0.00	0.00	30
1983	0.50	0.03	0.05	40
1984	0.00	0.00	0.00	38
1985	0.00	0.00	0.00	42
1986	0.00	0.00	0.00	32
1987	0.00	0.00	0.00	37

1988	0.25	0.03	0.05	34
1989	0.75	0.15	0.24	41
1990	0.00	0.00	0.00	34
1991	0.00	0.00	0.00	34
1992	0.00	0.00	0.00	30
1993	0.67	0.17	0.27	36
1994	0.83	0.16	0.26	32
1995	0.00	0.00	0.00	38
1996	0.00	0.00	0.00	32
1997	0.00	0.00	0.00	39
1998	0.00	0.00	0.00	32
1999	0.73	0.18	0.29	44
2000	0.50	0.02	0.05	41
2001	1.00	0.24	0.39	37
2002	0.30	0.08	0.12	38
2003	0.00	0.00	0.00	31
2004	0.00	0.00	0.00	35
2005	0.80	0.24	0.36	34
2006	0.80	0.24	0.36	34
2007	1.00	0.06	0.12	31
2008	0.00	0.00	0.00	40
2009	1.00	0.25	0.40	40
2010	0.40	0.05	0.09	39
2011	0.62	0.14	0.22	37
2012	0.00	0.00	0.00	35
2013	0.00	0.00	0.00	27
2014	0.00	0.00	0.00	38
2015	0.00	0.00	0.00	34
2016	0.00	0.00	0.00	33
2017	0.00	0.00	0.00	31
2018	1.00	0.06	0.11	34
2019	0.00	0.00	0.00	40
2020	0.00	0.00	0.00	29
2021	0.00	0.00	0.00	34
2022	0.00	0.00	0.00	37
2023	0.54	0.23	0.33	30
2024	0.00	0.00	0.00	34
2025	0.00	0.00	0.00	36
2026	0.92	0.22	0.36	49
2027	0.00	0.00	0.00	22
2028	0.94	0.38	0.55	39
2029	0.00	0.00	0.00	36
2030	1.00	0.49	0.65	37
2031	0.90	0.28	0.43	32
2032	1.00	0.17	0.29	41
2033	0.00	0.00	0.00	28
2034	0.30	0.08	0.12	38
2035	0.00	0.00	0.00	26
2036	0.00	0.00	0.00	33
2037	0.00	0.00	0.00	32
2038	0.80	0.22	0.34	37
2039	0.00	0.00	0.00	32
2040	0.55	0.15	0.24	40
2041	0.40	0.07	0.12	29
2042	0.00	0.00	0.00	30
2043	0.00	0.00	0.00	33
2044	0.00	0.00	0.00	35

2045	0.50	0.18	0.26	34
2046	0.50	0.03	0.06	31
2047	0.50	0.06	0.11	32
2048	0.00	0.00	0.00	36
2049	1.00	0.02	0.05	43
2050	0.00	0.00	0.00	27
2051	0.50	0.10	0.16	31
2052	0.00	0.00	0.00	34
2053	0.00	0.00	0.00	32
2054	0.71	0.11	0.19	45
2055	0.00	0.00	0.00	39
2056	0.95	0.58	0.72	33
2057	0.40	0.05	0.09	38
2058	0.25	0.03	0.05	33
2059	0.00	0.00	0.00	44
2060	1.00	0.46	0.63	35
2061	0.40	0.10	0.16	40
2062	0.00	0.00	0.00	31
2063	1.00	0.44	0.61	32
2064	0.00	0.00	0.00	45
2065	0.93	0.40	0.56	35
2066	0.00	0.00	0.00	37
2067	0.40	0.06	0.10	35
2068	0.00	0.00	0.00	43
2069	0.00	0.00	0.00	26
2070	0.00	0.00	0.00	40
2071	1.00	0.46	0.63	37
2072	0.00	0.00	0.00	31
2073	0.40	0.11	0.18	35
2074	0.00	0.00	0.00	35
2075	0.00	0.00	0.00	31
2076	0.00	0.00	0.00	30
2077	0.83	0.18	0.29	28
2078	0.00	0.00	0.00	37
2079	0.00	0.00	0.00	38
2080	0.00	0.00	0.00	28
2081	0.00	0.00	0.00	28
2082	0.00	0.00	0.00	33
2083	1.00	0.11	0.19	28
2084	1.00	0.26	0.41	23
2085	0.84	0.46	0.59	35
2086	0.60	0.08	0.14	39
2087	0.00	0.00	0.00	31
2088	0.00	0.00	0.00	25
2089	0.77	0.46	0.58	37
2090	0.00	0.00	0.00	34
2091	0.00	0.00	0.00	34
2092	0.00	0.00	0.00	38
2093	0.00	0.00	0.00	36
2094	0.29	0.06	0.10	33
2095	0.40	0.05	0.09	40
2096	0.67	0.11	0.18	38
2097	0.33	0.04	0.07	25
2098	0.00	0.00	0.00	33
2099	1.00	0.19	0.32	42
2100	0.00	0.00	0.00	29
2101	0.00	0.00	0.00	29

2102	0.50	0.06	0.10	35
2103	0.67	0.10	0.17	40
2104	0.00	0.00	0.00	42
2105	0.00	0.00	0.00	36
2106	0.00	0.00	0.00	33
2107	0.00	0.00	0.00	33
2108	0.00	0.00	0.00	34
2109	0.00	0.00	0.00	42
2110	0.00	0.00	0.00	28
2111	0.40	0.05	0.09	40
2112	1.00	0.04	0.08	24
2113	0.00	0.00	0.00	36
2114	0.43	0.09	0.15	33
2115	0.00	0.00	0.00	32
2116	0.67	0.15	0.24	27
2117	0.00	0.00	0.00	30
2118	0.79	0.38	0.51	29
2119	0.50	0.07	0.12	28
2120	0.94	0.46	0.62	35
2121	0.00	0.00	0.00	35
2122	0.00	0.00	0.00	37
2123	0.00	0.00	0.00	35
2124	0.40	0.06	0.10	35
2125	0.00	0.00	0.00	37
2126	0.00	0.00	0.00	35
2127	0.40	0.06	0.11	32
2128	0.36	0.13	0.20	30
2129	0.00	0.00	0.00	32
2130	0.00	0.00	0.00	41
2131	1.00	0.04	0.07	26
2132	0.00	0.00	0.00	34
2133	0.00	0.00	0.00	29
2134	0.00	0.00	0.00	36
2135	0.00	0.00	0.00	29
2136	0.00	0.00	0.00	35
2137	0.83	0.37	0.51	27
2138	0.00	0.00	0.00	35
2139	0.85	0.37	0.51	30
2140	0.00	0.00	0.00	33
2141	0.67	0.05	0.10	38
2142	0.00	0.00	0.00	37
2143	1.00	0.10	0.18	31
2144	0.71	0.14	0.24	35
2145	1.00	0.37	0.54	38
2146	1.00	0.17	0.29	35
2147	0.38	0.15	0.22	33
2148	0.00	0.00	0.00	32
2149	0.67	0.05	0.10	37
2150	0.00	0.00	0.00	41
2151	0.00	0.00	0.00	39
2152	0.00	0.00	0.00	36
2153	0.00	0.00	0.00	31
2154	0.00	0.00	0.00	30
2155	1.00	0.42	0.59	26
2156	0.00	0.00	0.00	32
2157	0.00	0.00	0.00	38
2158	0.00	0.00	0.00	33

2159	0.00	0.00	0.00	32
2160	0.33	0.03	0.06	32
2161	0.00	0.00	0.00	34
2162	0.50	0.22	0.31	27
2163	0.00	0.00	0.00	37
2164	1.00	0.03	0.06	30
2165	0.00	0.00	0.00	35
2166	0.56	0.21	0.30	24
2167	0.00	0.00	0.00	37
2168	0.87	0.50	0.63	26
2169	0.00	0.00	0.00	27
2170	0.00	0.00	0.00	39
2171	0.00	0.00	0.00	25
2172	0.00	0.00	0.00	33
2173	0.00	0.00	0.00	39
2174	0.94	0.43	0.59	35
2175	1.00	0.33	0.50	30
2176	0.00	0.00	0.00	36
2177	0.33	0.04	0.06	28
2178	0.00	0.00	0.00	34
2179	0.00	0.00	0.00	35
2180	0.00	0.00	0.00	23
2181	0.00	0.00	0.00	34
2182	0.00	0.00	0.00	27
2183	1.00	0.08	0.15	25
2184	0.00	0.00	0.00	33
2185	1.00	0.15	0.26	33
2186	0.33	0.16	0.21	19
2187	0.00	0.00	0.00	38
2188	0.00	0.00	0.00	20
2189	0.00	0.00	0.00	32
2190	0.33	0.06	0.11	31
2191	0.67	0.12	0.21	33
2192	0.00	0.00	0.00	28
2193	1.00	0.06	0.11	36
2194	0.00	0.00	0.00	35
2195	0.00	0.00	0.00	26
2196	0.00	0.00	0.00	32
2197	0.00	0.00	0.00	34
2198	1.00	0.03	0.06	33
2199	0.00	0.00	0.00	27
2200	0.60	0.10	0.17	31
2201	0.00	0.00	0.00	22
2202	0.00	0.00	0.00	28
2203	0.75	0.19	0.30	32
2204	0.00	0.00	0.00	34
2205	0.00	0.00	0.00	27
2206	1.00	0.11	0.21	35
2207	0.00	0.00	0.00	32
2208	1.00	0.03	0.06	31
2209	0.00	0.00	0.00	34
2210	0.00	0.00	0.00	31
2211	0.00	0.00	0.00	38
2212	1.00	0.03	0.07	29
2213	1.00	0.08	0.15	24
2214	0.00	0.00	0.00	26
2215	0.60	0.08	0.14	39

2216	0.50	0.11	0.18	28
2217	0.00	0.00	0.00	29
2218	0.00	0.00	0.00	39
2219	0.00	0.00	0.00	26
2220	0.00	0.00	0.00	29
2221	1.00	0.41	0.58	22
2222	0.00	0.00	0.00	28
2223	1.00	0.08	0.15	37
2224	0.00	0.00	0.00	31
2225	0.20	0.03	0.04	40
2226	1.00	0.18	0.31	33
2227	0.00	0.00	0.00	41
2228	0.00	0.00	0.00	33
2229	0.00	0.00	0.00	29
2230	0.00	0.00	0.00	34
2231	0.00	0.00	0.00	28
2232	0.86	0.23	0.36	26
2233	0.00	0.00	0.00	27
2234	1.00	0.23	0.38	26
2235	1.00	0.39	0.57	33
2236	0.00	0.00	0.00	33
2237	0.64	0.19	0.30	36
2238	1.00	0.16	0.27	38
2239	0.00	0.00	0.00	27
2240	0.93	0.37	0.53	35
2241	0.00	0.00	0.00	41
2242	0.50	0.03	0.06	30
2243	0.00	0.00	0.00	29
2244	0.00	0.00	0.00	37
2245	0.50	0.15	0.24	39
2246	0.00	0.00	0.00	29
2247	0.00	0.00	0.00	30
2248	0.00	0.00	0.00	37
2249	0.00	0.00	0.00	33
2250	0.50	0.04	0.07	27
2251	0.00	0.00	0.00	31
2252	0.00	0.00	0.00	27
2253	0.00	0.00	0.00	32
2254	0.73	0.23	0.35	35
2255	0.00	0.00	0.00	37
2256	0.00	0.00	0.00	33
2257	0.82	0.45	0.58	20
2258	0.00	0.00	0.00	28
2259	0.43	0.13	0.20	23
2260	0.00	0.00	0.00	31
2261	1.00	0.10	0.19	29
2262	0.60	0.12	0.19	26
2263	0.00	0.00	0.00	32
2264	0.00	0.00	0.00	35
2265	0.00	0.00	0.00	33
2266	0.67	0.23	0.34	35
2267	0.00	0.00	0.00	30
2268	0.50	0.05	0.08	22
2269	0.00	0.00	0.00	31
2270	0.00	0.00	0.00	32
2271	0.00	0.00	0.00	28
2272	0.83	0.19	0.31	26

2273	0.00	0.00	0.00	27
2274	0.00	0.00	0.00	33
2275	0.00	0.00	0.00	33
2276	0.50	0.09	0.15	22
2277	0.00	0.00	0.00	33
2278	0.00	0.00	0.00	36
2279	1.00	0.32	0.49	34
2280	0.00	0.00	0.00	24
2281	0.00	0.00	0.00	26
2282	0.40	0.09	0.15	22
2283	0.20	0.04	0.06	28
2284	0.00	0.00	0.00	43
2285	0.00	0.00	0.00	31
2286	0.00	0.00	0.00	30
2287	0.00	0.00	0.00	32
2288	0.00	0.00	0.00	28
2289	0.88	0.19	0.31	37
2290	0.00	0.00	0.00	23
2291	0.00	0.00	0.00	33
2292	0.50	0.03	0.06	33
2293	0.00	0.00	0.00	29
2294	0.00	0.00	0.00	28
2295	0.00	0.00	0.00	29
2296	0.00	0.00	0.00	24
2297	0.00	0.00	0.00	28
2298	1.00	0.15	0.27	26
2299	0.00	0.00	0.00	28
2300	1.00	0.10	0.18	31
2301	0.00	0.00	0.00	28
2302	0.00	0.00	0.00	34
2303	0.50	0.04	0.07	27
2304	0.00	0.00	0.00	31
2305	0.00	0.00	0.00	38
2306	0.00	0.00	0.00	37
2307	0.83	0.36	0.50	28
2308	1.00	0.04	0.07	28
2309	0.00	0.00	0.00	26
2310	1.00	0.21	0.35	28
2311	0.00	0.00	0.00	29
2312	1.00	0.11	0.19	38
2313	0.50	0.04	0.07	25
2314	1.00	0.05	0.09	22
2315	0.00	0.00	0.00	33
2316	0.00	0.00	0.00	30
2317	0.00	0.00	0.00	37
2318	0.00	0.00	0.00	26
2319	0.20	0.05	0.08	21
2320	0.00	0.00	0.00	29
2321	0.00	0.00	0.00	23
2322	0.00	0.00	0.00	33
2323	0.00	0.00	0.00	29
2324	0.00	0.00	0.00	29
2325	0.40	0.10	0.15	21
2326	0.00	0.00	0.00	36
2327	0.00	0.00	0.00	34
2328	0.00	0.00	0.00	25
2329	1.00	0.07	0.13	28



2330	0.00	0.00	0.00	30
2331	0.79	0.38	0.51	29
2332	0.00	0.00	0.00	32
2333	0.00	0.00	0.00	34
2334	0.50	0.03	0.06	30
2335	0.00	0.00	0.00	29
2336	1.00	0.03	0.06	30
2337	0.00	0.00	0.00	26
2338	0.92	0.40	0.56	30
2339	0.00	0.00	0.00	35
2340	0.00	0.00	0.00	26
2341	0.00	0.00	0.00	33
2342	1.00	0.15	0.27	39
2343	0.80	0.15	0.26	26
2344	0.00	0.00	0.00	39
2345	0.00	0.00	0.00	36
2346	0.00	0.00	0.00	37
2347	0.00	0.00	0.00	18
2348	0.60	0.10	0.17	31
2349	0.50	0.05	0.09	20
2350	0.00	0.00	0.00	32
2351	0.00	0.00	0.00	32
2352	0.00	0.00	0.00	28
2353	0.00	0.00	0.00	22
2354	0.92	0.33	0.49	36
2355	0.67	0.06	0.11	33
2356	0.00	0.00	0.00	31
2357	0.60	0.09	0.16	32
2358	0.12	0.05	0.07	19
2359	0.00	0.00	0.00	29
2360	0.00	0.00	0.00	27
2361	0.00	0.00	0.00	25
2362	1.00	0.04	0.08	24
2363	0.00	0.00	0.00	35
2364	0.00	0.00	0.00	32
2365	0.00	0.00	0.00	39
2366	0.00	0.00	0.00	32
2367	0.00	0.00	0.00	31
2368	0.00	0.00	0.00	32
2369	0.00	0.00	0.00	29
2370	0.00	0.00	0.00	32
2371	0.00	0.00	0.00	31
2372	0.00	0.00	0.00	32
2373	0.67	0.06	0.12	31
2374	0.00	0.00	0.00	30
2375	0.00	0.00	0.00	20
2376	0.83	0.18	0.29	28
2377	0.00	0.00	0.00	35
2378	0.00	0.00	0.00	24
2379	1.00	0.04	0.08	23
2380	0.00	0.00	0.00	31
2381	0.67	0.05	0.10	38
2382	0.00	0.00	0.00	26
2383	0.00	0.00	0.00	33
2384	0.00	0.00	0.00	36
2385	0.00	0.00	0.00	24
2386	0.54	0.33	0.41	21

2387	0.00	0.00	0.00	28
2388	0.00	0.00	0.00	22
2389	1.00	0.18	0.30	28
2390	0.88	0.20	0.33	35
2391	0.00	0.00	0.00	23
2392	0.00	0.00	0.00	27
2393	0.00	0.00	0.00	24
2394	1.00	0.43	0.61	23
2395	0.00	0.00	0.00	24
2396	1.00	0.03	0.06	31
2397	0.00	0.00	0.00	28
2398	0.00	0.00	0.00	35
2399	0.40	0.08	0.13	25
2400	0.00	0.00	0.00	33
2401	0.00	0.00	0.00	22
2402	0.25	0.03	0.05	36
2403	0.00	0.00	0.00	29
2404	0.50	0.08	0.13	26
2405	0.00	0.00	0.00	26
2406	0.58	0.42	0.49	26
2407	1.00	0.04	0.07	26
2408	1.00	0.03	0.06	32
2409	0.00	0.00	0.00	29
2410	0.00	0.00	0.00	26
2411	0.00	0.00	0.00	30
2412	0.00	0.00	0.00	30
2413	0.00	0.00	0.00	29
2414	0.00	0.00	0.00	33
2415	0.00	0.00	0.00	22
2416	0.00	0.00	0.00	27
2417	0.50	0.09	0.15	22
2418	0.00	0.00	0.00	33
2419	1.00	0.03	0.07	29
2420	0.00	0.00	0.00	38
2421	0.00	0.00	0.00	28
2422	0.00	0.00	0.00	25
2423	0.78	0.32	0.45	22
2424	0.50	0.03	0.05	35
2425	1.00	0.11	0.19	28
2426	0.50	0.03	0.06	34
2427	0.00	0.00	0.00	23
2428	0.00	0.00	0.00	30
2429	0.00	0.00	0.00	21
2430	0.00	0.00	0.00	26
2431	0.50	0.04	0.08	23
2432	0.00	0.00	0.00	33
2433	0.00	0.00	0.00	26
2434	0.78	0.48	0.60	29
2435	0.00	0.00	0.00	29
2436	0.00	0.00	0.00	29
2437	0.00	0.00	0.00	27
2438	0.00	0.00	0.00	26
2439	0.00	0.00	0.00	27
2440	0.00	0.00	0.00	28
2441	1.00	0.33	0.50	30
2442	0.00	0.00	0.00	26
2443	0.00	0.00	0.00	27

2444	0.00	0.00	0.00	30
2445	1.00	0.42	0.59	24
2446	0.00	0.00	0.00	21
2447	0.80	0.13	0.22	31
2448	1.00	0.04	0.08	23
2449	0.00	0.00	0.00	34
2450	0.00	0.00	0.00	33
2451	0.00	0.00	0.00	27
2452	1.00	0.07	0.13	29
2453	0.75	0.10	0.18	29
2454	0.00	0.00	0.00	28
2455	0.17	0.04	0.06	27
2456	0.00	0.00	0.00	25
2457	0.00	0.00	0.00	26
2458	0.71	0.16	0.26	31
2459	0.00	0.00	0.00	31
2460	0.00	0.00	0.00	30
2461	1.00	0.18	0.30	28
2462	0.67	0.07	0.12	30
2463	0.00	0.00	0.00	33
2464	0.00	0.00	0.00	29
2465	0.00	0.00	0.00	19
2466	0.00	0.00	0.00	25
2467	0.00	0.00	0.00	32
2468	0.00	0.00	0.00	29
2469	0.00	0.00	0.00	23
2470	0.92	0.41	0.56	27
2471	0.00	0.00	0.00	19
2472	0.00	0.00	0.00	25
2473	0.00	0.00	0.00	31
2474	0.00	0.00	0.00	27
2475	0.00	0.00	0.00	25
2476	0.92	0.37	0.52	30
2477	0.00	0.00	0.00	32
2478	0.67	0.07	0.13	28
2479	0.00	0.00	0.00	32
2480	0.00	0.00	0.00	36
2481	0.00	0.00	0.00	30
2482	0.00	0.00	0.00	23
2483	0.00	0.00	0.00	29
2484	0.62	0.22	0.32	23
2485	0.00	0.00	0.00	20
2486	0.00	0.00	0.00	24
2487	0.00	0.00	0.00	26
2488	0.00	0.00	0.00	27
2489	1.00	0.03	0.06	32
2490	0.00	0.00	0.00	32
2491	0.00	0.00	0.00	24
2492	0.50	0.19	0.27	27
2493	0.00	0.00	0.00	26
2494	0.00	0.00	0.00	24
2495	0.00	0.00	0.00	28
2496	0.00	0.00	0.00	20
2497	0.50	0.03	0.06	29
2498	1.00	0.18	0.30	34
2499	0.92	0.44	0.59	25
2500	0.00	0.00	0.00	30

2501	0.00	0.00	0.00	27
2502	0.50	0.14	0.22	28
2503	0.00	0.00	0.00	22
2504	0.00	0.00	0.00	26
2505	0.00	0.00	0.00	28
2506	0.33	0.04	0.08	23
2507	0.00	0.00	0.00	17
2508	0.00	0.00	0.00	25
2509	0.00	0.00	0.00	34
2510	0.00	0.00	0.00	24
2511	0.40	0.11	0.17	19
2512	0.00	0.00	0.00	27
2513	0.00	0.00	0.00	30
2514	0.75	0.12	0.21	24
2515	0.00	0.00	0.00	26
2516	0.00	0.00	0.00	18
2517	0.00	0.00	0.00	36
2518	1.00	0.03	0.06	30
2519	0.00	0.00	0.00	31
2520	0.00	0.00	0.00	33
2521	1.00	0.33	0.50	21
2522	0.00	0.00	0.00	12
2523	0.00	0.00	0.00	27
2524	0.89	0.35	0.50	23
2525	0.00	0.00	0.00	31
2526	0.00	0.00	0.00	35
2527	0.00	0.00	0.00	30
2528	0.00	0.00	0.00	24
2529	0.87	0.33	0.47	40
2530	0.25	0.03	0.05	33
2531	0.00	0.00	0.00	17
2532	0.00	0.00	0.00	29
2533	0.00	0.00	0.00	24
2534	1.00	0.07	0.13	28
2535	0.00	0.00	0.00	26
2536	0.00	0.00	0.00	26
2537	0.00	0.00	0.00	31
2538	0.00	0.00	0.00	28
2539	0.00	0.00	0.00	18
2540	0.67	0.20	0.31	30
2541	1.00	0.07	0.13	29
2542	0.00	0.00	0.00	23
2543	0.75	0.09	0.17	32
2544	1.00	0.19	0.31	27
2545	1.00	0.08	0.15	38
2546	1.00	0.04	0.07	26
2547	0.00	0.00	0.00	31
2548	0.00	0.00	0.00	27
2549	0.00	0.00	0.00	31
2550	0.67	0.08	0.14	26
2551	0.45	0.24	0.31	21
2552	0.00	0.00	0.00	28
2553	0.00	0.00	0.00	31
2554	0.67	0.11	0.18	19
2555	1.00	0.17	0.30	23
2556	0.60	0.39	0.47	23
2557	0.00	0.00	0.00	19

2558	0.00	0.00	0.00	23
2559	0.00	0.00	0.00	26
2560	0.00	0.00	0.00	20
2561	0.14	0.06	0.08	17
2562	1.00	0.10	0.18	20
2563	0.80	0.16	0.27	25
2564	0.00	0.00	0.00	21
2565	0.00	0.00	0.00	28
2566	0.00	0.00	0.00	26
2567	0.00	0.00	0.00	30
2568	0.00	0.00	0.00	37
2569	0.75	0.27	0.40	22
2570	1.00	0.12	0.22	24
2571	0.00	0.00	0.00	20
2572	0.00	0.00	0.00	26
2573	1.00	0.07	0.12	30
2574	0.00	0.00	0.00	29
2575	0.00	0.00	0.00	28
2576	0.00	0.00	0.00	22
2577	0.00	0.00	0.00	25
2578	0.00	0.00	0.00	24
2579	0.00	0.00	0.00	29
2580	0.00	0.00	0.00	27
2581	0.00	0.00	0.00	29
2582	0.00	0.00	0.00	21
2583	1.00	0.13	0.23	23
2584	0.00	0.00	0.00	27
2585	0.86	0.70	0.78	27
2586	0.00	0.00	0.00	25
2587	1.00	0.21	0.34	29
2588	0.00	0.00	0.00	20
2589	0.00	0.00	0.00	28
2590	0.00	0.00	0.00	28
2591	0.00	0.00	0.00	29
2592	1.00	0.05	0.10	20
2593	0.00	0.00	0.00	31
2594	0.00	0.00	0.00	19
2595	0.00	0.00	0.00	31
2596	0.00	0.00	0.00	28
2597	0.67	0.06	0.11	32
2598	0.60	0.10	0.18	29
2599	0.00	0.00	0.00	20
2600	0.00	0.00	0.00	18
2601	0.00	0.00	0.00	14
2602	0.00	0.00	0.00	29
2603	0.25	0.04	0.07	26
2604	0.00	0.00	0.00	25
2605	0.00	0.00	0.00	23
2606	1.00	0.05	0.09	22
2607	0.00	0.00	0.00	25
2608	1.00	0.04	0.08	25
2609	0.00	0.00	0.00	30
2610	0.00	0.00	0.00	26
2611	0.00	0.00	0.00	26
2612	0.00	0.00	0.00	30
2613	0.00	0.00	0.00	28
2614	0.00	0.00	0.00	28

2615	0.00	0.00	0.00	32
2616	0.00	0.00	0.00	23
2617	0.00	0.00	0.00	21
2618	0.00	0.00	0.00	26
2619	0.00	0.00	0.00	29
2620	0.86	0.32	0.46	19
2621	0.00	0.00	0.00	28
2622	0.00	0.00	0.00	23
2623	0.00	0.00	0.00	26
2624	0.00	0.00	0.00	24
2625	0.00	0.00	0.00	24
2626	0.00	0.00	0.00	30
2627	0.00	0.00	0.00	28
2628	0.83	0.29	0.43	17
2629	0.00	0.00	0.00	31
2630	0.00	0.00	0.00	30
2631	0.00	0.00	0.00	33
2632	0.00	0.00	0.00	31
2633	0.86	0.16	0.27	37
2634	0.00	0.00	0.00	21
2635	0.00	0.00	0.00	30
2636	0.00	0.00	0.00	22
2637	0.00	0.00	0.00	24
2638	0.00	0.00	0.00	29
2639	0.00	0.00	0.00	29
2640	0.00	0.00	0.00	20
2641	0.00	0.00	0.00	27
2642	0.00	0.00	0.00	28
2643	0.00	0.00	0.00	29
2644	0.89	0.31	0.46	26
2645	0.00	0.00	0.00	22
2646	0.00	0.00	0.00	20
2647	0.67	0.07	0.13	27
2648	0.00	0.00	0.00	30
2649	0.00	0.00	0.00	19
2650	0.00	0.00	0.00	15
2651	0.00	0.00	0.00	32
2652	0.00	0.00	0.00	19
2653	0.00	0.00	0.00	28
2654	1.00	0.35	0.52	23
2655	0.00	0.00	0.00	27
2656	0.00	0.00	0.00	26
2657	0.00	0.00	0.00	31
2658	0.00	0.00	0.00	21
2659	0.50	0.04	0.07	28
2660	0.00	0.00	0.00	24
2661	0.00	0.00	0.00	18
2662	0.83	0.19	0.31	26
2663	0.00	0.00	0.00	26
2664	0.00	0.00	0.00	28
2665	0.00	0.00	0.00	22
2666	0.67	0.07	0.13	28
2667	0.00	0.00	0.00	31
2668	0.00	0.00	0.00	18
2669	0.00	0.00	0.00	32
2670	0.00	0.00	0.00	24
2671	0.00	0.00	0.00	22

2672	0.00	0.00	0.00	23
2673	0.93	0.56	0.70	25
2674	0.50	0.04	0.07	26
2675	1.00	0.13	0.23	23
2676	0.00	0.00	0.00	23
2677	0.00	0.00	0.00	24
2678	0.00	0.00	0.00	26
2679	0.00	0.00	0.00	19
2680	0.00	0.00	0.00	19
2681	0.00	0.00	0.00	21
2682	0.89	0.27	0.41	30
2683	0.00	0.00	0.00	28
2684	0.00	0.00	0.00	26
2685	0.00	0.00	0.00	23
2686	0.50	0.11	0.18	28
2687	0.00	0.00	0.00	21
2688	0.00	0.00	0.00	32
2689	0.00	0.00	0.00	27
2690	1.00	0.17	0.30	23
2691	0.00	0.00	0.00	23
2692	0.00	0.00	0.00	24
2693	0.00	0.00	0.00	24
2694	0.00	0.00	0.00	20
2695	0.00	0.00	0.00	29
2696	0.00	0.00	0.00	20
2697	0.80	0.15	0.26	26
2698	0.00	0.00	0.00	30
2699	0.00	0.00	0.00	20
2700	0.00	0.00	0.00	25
2701	1.00	0.04	0.08	23
2702	0.00	0.00	0.00	24
2703	0.40	0.08	0.14	24
2704	0.00	0.00	0.00	29
2705	0.00	0.00	0.00	36
2706	0.20	0.03	0.06	29
2707	0.00	0.00	0.00	25
2708	0.00	0.00	0.00	21
2709	0.67	0.07	0.13	28
2710	0.00	0.00	0.00	14
2711	0.00	0.00	0.00	28
2712	0.00	0.00	0.00	21
2713	0.00	0.00	0.00	33
2714	0.00	0.00	0.00	21
2715	0.50	0.04	0.08	23
2716	0.00	0.00	0.00	26
2717	0.00	0.00	0.00	22
2718	0.50	0.07	0.12	30
2719	0.00	0.00	0.00	25
2720	0.00	0.00	0.00	25
2721	0.00	0.00	0.00	23
2722	0.00	0.00	0.00	20
2723	0.00	0.00	0.00	29
2724	0.00	0.00	0.00	20
2725	0.78	0.33	0.47	21
2726	0.00	0.00	0.00	25
2727	0.00	0.00	0.00	27
2728	0.00	0.00	0.00	24

2729	1.00	0.33	0.50	15
2730	0.00	0.00	0.00	26
2731	0.00	0.00	0.00	28
2732	0.00	0.00	0.00	30
2733	0.00	0.00	0.00	35
2734	0.80	0.17	0.28	24
2735	0.00	0.00	0.00	17
2736	0.50	0.19	0.28	26
2737	0.00	0.00	0.00	22
2738	0.00	0.00	0.00	33
2739	0.00	0.00	0.00	29
2740	0.00	0.00	0.00	28
2741	1.00	0.33	0.50	27
2742	1.00	0.52	0.69	23
2743	0.00	0.00	0.00	23
2744	0.00	0.00	0.00	20
2745	0.00	0.00	0.00	28
2746	0.00	0.00	0.00	25
2747	0.00	0.00	0.00	22
2748	0.00	0.00	0.00	24
2749	0.00	0.00	0.00	28
2750	1.00	0.10	0.19	29
2751	0.00	0.00	0.00	25
2752	0.00	0.00	0.00	23
2753	0.00	0.00	0.00	30
2754	0.00	0.00	0.00	20
2755	0.00	0.00	0.00	23
2756	0.00	0.00	0.00	26
2757	1.00	0.06	0.11	18
2758	0.80	0.22	0.35	18
2759	0.00	0.00	0.00	23
2760	0.00	0.00	0.00	30
2761	0.00	0.00	0.00	18
2762	0.00	0.00	0.00	21
2763	0.00	0.00	0.00	20
2764	0.00	0.00	0.00	17
2765	0.00	0.00	0.00	28
2766	1.00	0.06	0.11	18
2767	0.00	0.00	0.00	24
2768	1.00	0.25	0.40	24
2769	0.00	0.00	0.00	23
2770	0.00	0.00	0.00	19
2771	0.00	0.00	0.00	23
2772	1.00	0.11	0.19	19
2773	0.00	0.00	0.00	19
2774	1.00	0.24	0.38	21
2775	0.00	0.00	0.00	19
2776	0.00	0.00	0.00	23
2777	0.00	0.00	0.00	29
2778	0.00	0.00	0.00	21
2779	0.00	0.00	0.00	20
2780	0.00	0.00	0.00	23
2781	0.00	0.00	0.00	26
2782	0.00	0.00	0.00	31
2783	0.00	0.00	0.00	24
2784	0.00	0.00	0.00	23
2785	0.00	0.00	0.00	17



2786	0.00	0.00	0.00	26
2787	0.00	0.00	0.00	27
2788	0.71	0.20	0.31	25
2789	0.00	0.00	0.00	21
2790	0.00	0.00	0.00	23
2791	0.00	0.00	0.00	29
2792	0.00	0.00	0.00	35
2793	0.00	0.00	0.00	18
2794	0.00	0.00	0.00	17
2795	0.00	0.00	0.00	21
2796	0.00	0.00	0.00	19
2797	1.00	0.05	0.09	21
2798	0.00	0.00	0.00	17
2799	0.00	0.00	0.00	22
2800	1.00	0.04	0.08	24
2801	0.50	0.11	0.17	19
2802	0.00	0.00	0.00	23
2803	0.00	0.00	0.00	17
2804	0.00	0.00	0.00	23
2805	0.00	0.00	0.00	22
2806	0.00	0.00	0.00	24
2807	0.00	0.00	0.00	18
2808	1.00	0.04	0.08	24
2809	1.00	0.04	0.08	24
2810	0.00	0.00	0.00	20
2811	0.00	0.00	0.00	20
2812	0.00	0.00	0.00	23
2813	0.00	0.00	0.00	24
2814	0.00	0.00	0.00	17
2815	0.00	0.00	0.00	26
2816	0.00	0.00	0.00	16
2817	0.00	0.00	0.00	23
2818	0.00	0.00	0.00	26
2819	0.25	0.07	0.11	14
2820	0.00	0.00	0.00	22
2821	1.00	0.10	0.17	21
2822	0.00	0.00	0.00	24
2823	0.00	0.00	0.00	18
2824	0.00	0.00	0.00	26
2825	0.00	0.00	0.00	18
2826	0.75	0.15	0.25	20
2827	0.00	0.00	0.00	17
2828	0.00	0.00	0.00	25
2829	1.00	0.04	0.07	28
2830	0.00	0.00	0.00	19
2831	0.00	0.00	0.00	25
2832	0.00	0.00	0.00	20
2833	0.00	0.00	0.00	21
2834	0.00	0.00	0.00	25
2835	1.00	0.17	0.29	18
2836	0.00	0.00	0.00	26
2837	0.00	0.00	0.00	31
2838	1.00	0.08	0.15	24
2839	0.00	0.00	0.00	21
2840	0.00	0.00	0.00	20
2841	0.00	0.00	0.00	28
2842	1.00	0.23	0.37	35

2843	1.00	0.16	0.27	19
2844	0.00	0.00	0.00	24
2845	0.00	0.00	0.00	21
2846	1.00	0.08	0.15	25
2847	0.00	0.00	0.00	23
2848	0.00	0.00	0.00	26
2849	0.00	0.00	0.00	30
2850	0.00	0.00	0.00	31
2851	1.00	0.16	0.27	19
2852	0.00	0.00	0.00	29
2853	0.00	0.00	0.00	27
2854	0.00	0.00	0.00	22
2855	0.00	0.00	0.00	27
2856	0.00	0.00	0.00	18
2857	0.00	0.00	0.00	18
2858	0.00	0.00	0.00	22
2859	0.00	0.00	0.00	19
2860	0.00	0.00	0.00	22
2861	0.00	0.00	0.00	21
2862	0.00	0.00	0.00	23
2863	0.00	0.00	0.00	24
2864	0.00	0.00	0.00	28
2865	0.00	0.00	0.00	18
2866	0.67	0.27	0.39	22
2867	0.00	0.00	0.00	28
2868	0.00	0.00	0.00	27
2869	0.00	0.00	0.00	24
2870	0.00	0.00	0.00	21
2871	0.00	0.00	0.00	22
2872	0.00	0.00	0.00	21
2873	0.00	0.00	0.00	26
2874	0.00	0.00	0.00	25
2875	1.00	0.05	0.09	21
2876	0.00	0.00	0.00	25
2877	0.00	0.00	0.00	22
2878	0.80	0.19	0.31	21
2879	1.00	0.11	0.20	27
2880	1.00	0.04	0.08	24
2881	0.00	0.00	0.00	26
2882	0.00	0.00	0.00	29
2883	0.00	0.00	0.00	26
2884	0.00	0.00	0.00	25
2885	0.33	0.05	0.09	19
2886	0.83	0.26	0.40	19
2887	0.00	0.00	0.00	18
2888	0.00	0.00	0.00	22
2889	0.00	0.00	0.00	20
2890	0.00	0.00	0.00	28
2891	0.00	0.00	0.00	34
2892	0.00	0.00	0.00	18
2893	0.00	0.00	0.00	26
2894	0.00	0.00	0.00	19
2895	0.00	0.00	0.00	26
2896	0.00	0.00	0.00	17
2897	0.00	0.00	0.00	25
2898	0.00	0.00	0.00	19
2899	0.00	0.00	0.00	19

2900	0.00	0.00	0.00	28
2901	0.00	0.00	0.00	27
2902	0.00	0.00	0.00	19
2903	0.00	0.00	0.00	26
2904	0.00	0.00	0.00	21
2905	1.00	0.16	0.27	19
2906	0.00	0.00	0.00	19
2907	1.00	0.20	0.33	20
2908	0.00	0.00	0.00	19
2909	0.00	0.00	0.00	23
2910	0.00	0.00	0.00	20
2911	0.00	0.00	0.00	24
2912	1.00	0.05	0.09	22
2913	0.00	0.00	0.00	21
2914	0.00	0.00	0.00	28
2915	0.00	0.00	0.00	20
2916	0.00	0.00	0.00	24
2917	0.00	0.00	0.00	23
2918	1.00	0.04	0.08	25
2919	0.00	0.00	0.00	18
2920	1.00	0.14	0.25	21
2921	0.00	0.00	0.00	28
2922	0.00	0.00	0.00	17
2923	0.00	0.00	0.00	17
2924	0.00	0.00	0.00	25
2925	0.00	0.00	0.00	18
2926	0.00	0.00	0.00	20
2927	0.00	0.00	0.00	22
2928	1.00	0.05	0.09	21
2929	0.00	0.00	0.00	15
2930	0.00	0.00	0.00	21
2931	0.00	0.00	0.00	25
2932	0.00	0.00	0.00	21
2933	0.00	0.00	0.00	12
2934	0.00	0.00	0.00	29
2935	0.00	0.00	0.00	29
2936	0.00	0.00	0.00	20
2937	0.67	0.09	0.16	22
2938	0.00	0.00	0.00	24
2939	1.00	0.16	0.28	31
2940	0.00	0.00	0.00	23
2941	0.00	0.00	0.00	24
2942	0.00	0.00	0.00	23
2943	0.00	0.00	0.00	22
2944	0.00	0.00	0.00	17
2945	0.00	0.00	0.00	22
2946	0.00	0.00	0.00	17
2947	0.00	0.00	0.00	27
2948	0.00	0.00	0.00	18
2949	0.00	0.00	0.00	23
2950	0.00	0.00	0.00	22
2951	0.80	0.21	0.33	19
2952	0.00	0.00	0.00	15
2953	1.00	0.16	0.27	19
2954	0.00	0.00	0.00	19
2955	0.00	0.00	0.00	17
2956	0.00	0.00	0.00	20

2957	1.00	0.06	0.12	16
2958	0.00	0.00	0.00	17
2959	0.00	0.00	0.00	24
2960	0.00	0.00	0.00	23
2961	0.00	0.00	0.00	28
2962	0.50	0.05	0.10	19
2963	0.00	0.00	0.00	17
2964	0.00	0.00	0.00	25
2965	0.00	0.00	0.00	24
2966	0.00	0.00	0.00	18
2967	0.00	0.00	0.00	22
2968	0.00	0.00	0.00	17
2969	0.00	0.00	0.00	16
2970	0.00	0.00	0.00	24
2971	0.00	0.00	0.00	25
2972	0.00	0.00	0.00	18
2973	0.00	0.00	0.00	24
2974	0.00	0.00	0.00	19
2975	0.00	0.00	0.00	27
2976	0.00	0.00	0.00	21
2977	0.67	0.09	0.15	23
2978	0.00	0.00	0.00	26
2979	0.00	0.00	0.00	22
2980	0.00	0.00	0.00	24
2981	0.00	0.00	0.00	19
2982	1.00	0.05	0.09	21
2983	0.00	0.00	0.00	23
2984	0.00	0.00	0.00	24
2985	1.00	0.09	0.16	23
2986	1.00	0.09	0.16	23
2987	0.00	0.00	0.00	25
2988	1.00	0.17	0.29	24
2989	0.00	0.00	0.00	17
2990	0.00	0.00	0.00	23
2991	0.00	0.00	0.00	27
2992	0.00	0.00	0.00	18
2993	1.00	0.21	0.35	19
2994	0.00	0.00	0.00	27
2995	0.40	0.08	0.13	25
2996	0.00	0.00	0.00	21
2997	0.00	0.00	0.00	16
2998	0.00	0.00	0.00	28
2999	0.00	0.00	0.00	25
3000	0.00	0.00	0.00	16
3001	0.00	0.00	0.00	23
3002	0.00	0.00	0.00	20
3003	0.00	0.00	0.00	28
3004	0.00	0.00	0.00	14
3005	1.00	0.05	0.09	21
3006	0.00	0.00	0.00	19
3007	0.00	0.00	0.00	26
3008	0.00	0.00	0.00	27
3009	0.50	0.04	0.07	26
3010	0.00	0.00	0.00	20
3011	0.00	0.00	0.00	21
3012	0.00	0.00	0.00	21
3013	0.00	0.00	0.00	15

3014	0.00	0.00	0.00	27
3015	0.67	0.11	0.18	19
3016	1.00	0.05	0.10	19
3017	0.00	0.00	0.00	20
3018	0.00	0.00	0.00	19
3019	1.00	0.06	0.12	16
3020	0.00	0.00	0.00	15
3021	0.50	0.06	0.10	18
3022	0.00	0.00	0.00	18
3023	0.00	0.00	0.00	21
3024	1.00	0.27	0.42	26
3025	0.00	0.00	0.00	18
3026	0.50	0.04	0.08	23
3027	0.00	0.00	0.00	28
3028	0.83	0.24	0.37	21
3029	0.75	0.14	0.23	22
3030	0.00	0.00	0.00	21
3031	0.00	0.00	0.00	19
3032	0.00	0.00	0.00	23
3033	0.00	0.00	0.00	21
3034	0.00	0.00	0.00	17
3035	0.00	0.00	0.00	20
3036	0.67	0.10	0.17	21
3037	0.00	0.00	0.00	26
3038	0.00	0.00	0.00	27
3039	0.00	0.00	0.00	21
3040	0.00	0.00	0.00	19
3041	0.00	0.00	0.00	20
3042	0.00	0.00	0.00	24
3043	0.00	0.00	0.00	28
3044	0.00	0.00	0.00	18
3045	0.00	0.00	0.00	26
3046	0.00	0.00	0.00	26
3047	0.00	0.00	0.00	23
3048	0.00	0.00	0.00	18
3049	0.00	0.00	0.00	23
3050	1.00	0.18	0.30	17
3051	0.50	0.04	0.07	26
3052	0.00	0.00	0.00	32
3053	0.00	0.00	0.00	24
3054	0.00	0.00	0.00	16
3055	0.00	0.00	0.00	21
3056	0.00	0.00	0.00	23
3057	0.00	0.00	0.00	28
3058	0.00	0.00	0.00	13
3059	0.00	0.00	0.00	17
3060	0.00	0.00	0.00	15
3061	0.00	0.00	0.00	19
3062	0.00	0.00	0.00	18
3063	0.00	0.00	0.00	18
3064	0.00	0.00	0.00	22
3065	0.00	0.00	0.00	16
3066	0.00	0.00	0.00	18
3067	0.00	0.00	0.00	18
3068	0.00	0.00	0.00	22
3069	0.00	0.00	0.00	27
3070	0.00	0.00	0.00	23

3071	0.00	0.00	0.00	16
3072	0.00	0.00	0.00	24
3073	1.00	0.50	0.67	20
3074	0.00	0.00	0.00	22
3075	1.00	0.04	0.08	25
3076	0.00	0.00	0.00	18
3077	0.00	0.00	0.00	21
3078	0.00	0.00	0.00	18
3079	0.00	0.00	0.00	15
3080	1.00	0.07	0.12	15
3081	0.00	0.00	0.00	20
3082	0.00	0.00	0.00	23
3083	0.00	0.00	0.00	17
3084	0.00	0.00	0.00	16
3085	0.00	0.00	0.00	25
3086	0.00	0.00	0.00	13
3087	0.00	0.00	0.00	24
3088	0.00	0.00	0.00	22
3089	0.00	0.00	0.00	25
3090	0.00	0.00	0.00	21
3091	0.00	0.00	0.00	15
3092	0.00	0.00	0.00	19
3093	0.00	0.00	0.00	21
3094	0.00	0.00	0.00	22
3095	0.00	0.00	0.00	22
3096	0.00	0.00	0.00	26
3097	0.00	0.00	0.00	23
3098	0.00	0.00	0.00	22
3099	0.00	0.00	0.00	17
3100	1.00	0.22	0.36	18
3101	0.00	0.00	0.00	19
3102	0.00	0.00	0.00	15
3103	0.00	0.00	0.00	17
3104	0.00	0.00	0.00	20
3105	0.00	0.00	0.00	16
3106	0.00	0.00	0.00	14
3107	0.00	0.00	0.00	22
3108	0.00	0.00	0.00	24
3109	0.00	0.00	0.00	20
3110	0.00	0.00	0.00	19
3111	0.00	0.00	0.00	23
3112	0.00	0.00	0.00	21
3113	0.00	0.00	0.00	19
3114	0.00	0.00	0.00	18
3115	0.00	0.00	0.00	22
3116	0.00	0.00	0.00	19
3117	0.00	0.00	0.00	20
3118	0.00	0.00	0.00	18
3119	0.00	0.00	0.00	23
3120	0.00	0.00	0.00	18
3121	0.00	0.00	0.00	19
3122	1.00	0.19	0.32	16
3123	0.00	0.00	0.00	20
3124	0.50	0.05	0.08	22
3125	0.17	0.07	0.10	14
3126	0.00	0.00	0.00	16
3127	0.00	0.00	0.00	18

3128	0.00	0.00	0.00	33
3129	0.00	0.00	0.00	19
3130	0.00	0.00	0.00	28
3131	0.00	0.00	0.00	22
3132	0.00	0.00	0.00	20
3133	0.25	0.06	0.10	17
3134	0.00	0.00	0.00	19
3135	0.00	0.00	0.00	20
3136	0.00	0.00	0.00	20
3137	0.00	0.00	0.00	21
3138	0.00	0.00	0.00	21
3139	0.00	0.00	0.00	22
3140	0.00	0.00	0.00	18
3141	0.00	0.00	0.00	15
3142	0.00	0.00	0.00	20
3143	0.00	0.00	0.00	17
3144	0.00	0.00	0.00	23
3145	0.00	0.00	0.00	19
3146	0.00	0.00	0.00	17
3147	1.00	0.31	0.48	16
3148	0.80	0.50	0.62	16
3149	0.00	0.00	0.00	23
3150	0.00	0.00	0.00	25
3151	0.00	0.00	0.00	25
3152	0.00	0.00	0.00	26
3153	0.00	0.00	0.00	27
3154	0.00	0.00	0.00	20
3155	1.00	0.33	0.50	18
3156	0.00	0.00	0.00	17
3157	0.75	0.21	0.33	14
3158	0.00	0.00	0.00	23
3159	0.00	0.00	0.00	19
3160	0.50	0.05	0.09	20
3161	0.00	0.00	0.00	18
3162	0.00	0.00	0.00	19
3163	0.00	0.00	0.00	21
3164	0.00	0.00	0.00	16
3165	0.00	0.00	0.00	22
3166	0.00	0.00	0.00	19
3167	0.00	0.00	0.00	21
3168	0.00	0.00	0.00	27
3169	0.00	0.00	0.00	21
3170	0.00	0.00	0.00	23
3171	0.00	0.00	0.00	15
3172	0.00	0.00	0.00	24
3173	0.00	0.00	0.00	18
3174	0.00	0.00	0.00	21
3175	0.00	0.00	0.00	14
3176	0.00	0.00	0.00	19
3177	0.00	0.00	0.00	22
3178	0.00	0.00	0.00	20
3179	0.00	0.00	0.00	18
3180	0.00	0.00	0.00	20
3181	0.00	0.00	0.00	27
3182	0.00	0.00	0.00	23
3183	0.00	0.00	0.00	13
3184	0.00	0.00	0.00	22

3185	0.00	0.00	0.00	20
3186	0.00	0.00	0.00	28
3187	0.00	0.00	0.00	19
3188	0.00	0.00	0.00	23
3189	0.00	0.00	0.00	25
3190	0.00	0.00	0.00	21
3191	0.00	0.00	0.00	20
3192	0.00	0.00	0.00	22
3193	0.00	0.00	0.00	21
3194	0.00	0.00	0.00	16
3195	0.00	0.00	0.00	21
3196	0.00	0.00	0.00	21
3197	1.00	0.05	0.10	20
3198	0.00	0.00	0.00	18
3199	0.00	0.00	0.00	23
3200	0.33	0.05	0.09	19
3201	1.00	0.06	0.11	18
3202	0.00	0.00	0.00	25
3203	0.00	0.00	0.00	21
3204	1.00	0.07	0.12	15
3205	0.00	0.00	0.00	18
3206	0.00	0.00	0.00	23
3207	0.00	0.00	0.00	15
3208	0.00	0.00	0.00	20
3209	0.00	0.00	0.00	21
3210	0.00	0.00	0.00	20
3211	0.00	0.00	0.00	22
3212	0.00	0.00	0.00	21
3213	0.00	0.00	0.00	22
3214	0.00	0.00	0.00	25
3215	0.00	0.00	0.00	16
3216	0.00	0.00	0.00	7
3217	1.00	0.18	0.30	17
3218	0.00	0.00	0.00	26
3219	0.00	0.00	0.00	19
3220	0.00	0.00	0.00	29
3221	0.00	0.00	0.00	25
3222	0.00	0.00	0.00	14
3223	1.00	0.12	0.21	17
3224	0.00	0.00	0.00	23
3225	0.00	0.00	0.00	22
3226	0.00	0.00	0.00	20
3227	0.00	0.00	0.00	24
3228	0.00	0.00	0.00	17
3229	0.00	0.00	0.00	31
3230	0.00	0.00	0.00	21
3231	0.00	0.00	0.00	22
3232	0.00	0.00	0.00	15
3233	0.00	0.00	0.00	21
3234	0.00	0.00	0.00	23
3235	0.00	0.00	0.00	21
3236	0.00	0.00	0.00	14
3237	0.00	0.00	0.00	21
3238	0.00	0.00	0.00	17
3239	0.00	0.00	0.00	22
3240	0.00	0.00	0.00	22
3241	0.00	0.00	0.00	15



3242	0.00	0.00	0.00	21
3243	0.00	0.00	0.00	15
3244	0.00	0.00	0.00	29
3245	0.00	0.00	0.00	17
3246	0.00	0.00	0.00	22
3247	0.00	0.00	0.00	25
3248	0.00	0.00	0.00	20
3249	0.00	0.00	0.00	22
3250	0.00	0.00	0.00	24
3251	0.00	0.00	0.00	19
3252	0.00	0.00	0.00	17
3253	0.00	0.00	0.00	16
3254	0.00	0.00	0.00	25
3255	0.00	0.00	0.00	15
3256	0.00	0.00	0.00	17
3257	0.00	0.00	0.00	15
3258	0.00	0.00	0.00	21
3259	0.00	0.00	0.00	14
3260	0.00	0.00	0.00	18
3261	0.00	0.00	0.00	24
3262	0.00	0.00	0.00	20
3263	0.00	0.00	0.00	16
3264	1.00	0.05	0.10	19
3265	0.00	0.00	0.00	21
3266	0.00	0.00	0.00	20
3267	0.00	0.00	0.00	22
3268	0.00	0.00	0.00	13
3269	0.00	0.00	0.00	18
3270	0.00	0.00	0.00	15
3271	0.00	0.00	0.00	19
3272	0.00	0.00	0.00	25
3273	0.00	0.00	0.00	18
3274	0.00	0.00	0.00	22
3275	0.00	0.00	0.00	23
3276	0.00	0.00	0.00	17
3277	0.00	0.00	0.00	20
3278	0.00	0.00	0.00	22
3279	0.00	0.00	0.00	21
3280	0.00	0.00	0.00	19
3281	0.00	0.00	0.00	18
3282	0.00	0.00	0.00	20
3283	0.00	0.00	0.00	15
3284	0.00	0.00	0.00	17
3285	0.00	0.00	0.00	20
3286	0.00	0.00	0.00	11
3287	0.00	0.00	0.00	16
3288	0.00	0.00	0.00	14
3289	0.00	0.00	0.00	27
3290	0.00	0.00	0.00	26
3291	0.00	0.00	0.00	24
3292	0.00	0.00	0.00	19
3293	0.00	0.00	0.00	15
3294	1.00	0.05	0.09	22
3295	0.00	0.00	0.00	19
3296	0.00	0.00	0.00	26
3297	0.00	0.00	0.00	22
3298	0.00	0.00	0.00	16

3299	0.00	0.00	0.00	19
3300	0.00	0.00	0.00	16
3301	1.00	0.05	0.10	19
3302	1.00	0.06	0.11	17
3303	0.00	0.00	0.00	17
3304	0.00	0.00	0.00	16
3305	0.00	0.00	0.00	26
3306	0.00	0.00	0.00	16
3307	0.00	0.00	0.00	21
3308	0.00	0.00	0.00	15
3309	0.00	0.00	0.00	14
3310	0.00	0.00	0.00	16
3311	0.00	0.00	0.00	26
3312	0.00	0.00	0.00	21
3313	0.00	0.00	0.00	17
3314	0.00	0.00	0.00	20
3315	0.00	0.00	0.00	18
3316	0.00	0.00	0.00	20
3317	0.00	0.00	0.00	20
3318	0.00	0.00	0.00	19
3319	0.00	0.00	0.00	11
3320	0.00	0.00	0.00	17
3321	0.00	0.00	0.00	21
3322	0.00	0.00	0.00	20
3323	0.00	0.00	0.00	19
3324	1.00	0.12	0.21	17
3325	0.00	0.00	0.00	13
3326	0.00	0.00	0.00	18
3327	0.00	0.00	0.00	15
3328	1.00	0.04	0.08	24
3329	0.00	0.00	0.00	23
3330	1.00	0.25	0.40	12
3331	0.33	0.06	0.11	16
3332	0.00	0.00	0.00	19
3333	0.00	0.00	0.00	23
3334	0.00	0.00	0.00	21
3335	0.00	0.00	0.00	12
3336	0.00	0.00	0.00	16
3337	0.00	0.00	0.00	8
3338	0.00	0.00	0.00	21
3339	0.00	0.00	0.00	22
3340	0.00	0.00	0.00	23
3341	0.00	0.00	0.00	14
3342	0.00	0.00	0.00	26
3343	0.00	0.00	0.00	19
3344	0.00	0.00	0.00	10
3345	0.00	0.00	0.00	22
3346	0.00	0.00	0.00	19
3347	0.00	0.00	0.00	21
3348	0.00	0.00	0.00	17
3349	0.00	0.00	0.00	20
3350	0.00	0.00	0.00	21
3351	0.00	0.00	0.00	21
3352	0.00	0.00	0.00	16
3353	0.00	0.00	0.00	19
3354	0.00	0.00	0.00	15
3355	0.00	0.00	0.00	19

3356	0.00	0.00	0.00	14
3357	0.00	0.00	0.00	17
3358	0.00	0.00	0.00	19
3359	0.00	0.00	0.00	17
3360	0.00	0.00	0.00	11
3361	0.00	0.00	0.00	20
3362	0.00	0.00	0.00	18
3363	0.00	0.00	0.00	23
3364	0.00	0.00	0.00	19
3365	0.00	0.00	0.00	15
3366	0.00	0.00	0.00	28
3367	1.00	0.06	0.12	16
3368	0.00	0.00	0.00	12
3369	0.00	0.00	0.00	16
3370	0.00	0.00	0.00	18
3371	0.00	0.00	0.00	24
3372	0.00	0.00	0.00	22
3373	0.00	0.00	0.00	12
3374	0.00	0.00	0.00	23
3375	0.00	0.00	0.00	23
3376	0.00	0.00	0.00	22
3377	0.00	0.00	0.00	16
3378	0.00	0.00	0.00	16
3379	0.00	0.00	0.00	14
3380	0.00	0.00	0.00	21
3381	0.00	0.00	0.00	17
3382	0.00	0.00	0.00	19
3383	0.00	0.00	0.00	16
3384	0.00	0.00	0.00	18
3385	0.00	0.00	0.00	10
3386	0.00	0.00	0.00	28
3387	0.00	0.00	0.00	18
3388	0.00	0.00	0.00	16
3389	1.00	0.06	0.12	16
3390	0.00	0.00	0.00	8
3391	0.00	0.00	0.00	24
3392	0.00	0.00	0.00	17
3393	0.00	0.00	0.00	15
3394	1.00	0.25	0.40	20
3395	0.00	0.00	0.00	23
3396	0.00	0.00	0.00	14
3397	0.00	0.00	0.00	13
3398	0.00	0.00	0.00	19
3399	0.00	0.00	0.00	21
3400	0.00	0.00	0.00	18
3401	0.00	0.00	0.00	22
3402	0.00	0.00	0.00	15
3403	0.00	0.00	0.00	15
3404	0.33	0.10	0.15	10
3405	0.00	0.00	0.00	19
3406	0.00	0.00	0.00	25
3407	0.00	0.00	0.00	19
3408	0.00	0.00	0.00	16
3409	0.00	0.00	0.00	19
3410	0.00	0.00	0.00	21
3411	0.00	0.00	0.00	16
3412	0.00	0.00	0.00	16

3413	0.00	0.00	0.00	12
3414	0.00	0.00	0.00	16
3415	0.00	0.00	0.00	19
3416	0.00	0.00	0.00	19
3417	0.00	0.00	0.00	19
3418	0.00	0.00	0.00	8
3419	0.00	0.00	0.00	20
3420	0.00	0.00	0.00	23
3421	0.00	0.00	0.00	12
3422	0.00	0.00	0.00	22
3423	0.00	0.00	0.00	20
3424	0.00	0.00	0.00	21
3425	0.00	0.00	0.00	16
3426	0.00	0.00	0.00	21
3427	0.00	0.00	0.00	17
3428	0.00	0.00	0.00	12
3429	0.00	0.00	0.00	15
3430	0.00	0.00	0.00	22
3431	0.00	0.00	0.00	16
3432	0.00	0.00	0.00	15
3433	0.00	0.00	0.00	16
3434	0.00	0.00	0.00	16
3435	0.00	0.00	0.00	21
3436	0.00	0.00	0.00	16
3437	0.00	0.00	0.00	14
3438	0.00	0.00	0.00	19
3439	0.00	0.00	0.00	12
3440	0.00	0.00	0.00	17
3441	0.00	0.00	0.00	16
3442	0.00	0.00	0.00	16
3443	0.00	0.00	0.00	15
3444	0.00	0.00	0.00	14
3445	0.00	0.00	0.00	21
3446	0.00	0.00	0.00	20
3447	0.00	0.00	0.00	23
3448	0.00	0.00	0.00	13
3449	0.00	0.00	0.00	19
3450	0.00	0.00	0.00	20
3451	0.00	0.00	0.00	11
3452	0.00	0.00	0.00	13
3453	0.00	0.00	0.00	21
3454	0.00	0.00	0.00	20
3455	0.00	0.00	0.00	11
3456	0.00	0.00	0.00	20
3457	0.00	0.00	0.00	16
3458	0.00	0.00	0.00	19
3459	0.00	0.00	0.00	14
3460	0.00	0.00	0.00	20
3461	0.00	0.00	0.00	19
3462	0.00	0.00	0.00	21
3463	0.00	0.00	0.00	20
3464	0.00	0.00	0.00	14
3465	0.00	0.00	0.00	13
3466	0.00	0.00	0.00	20
3467	0.00	0.00	0.00	22
3468	0.00	0.00	0.00	18
3469	0.00	0.00	0.00	14

3470	0.00	0.00	0.00	18
3471	0.00	0.00	0.00	17
3472	0.00	0.00	0.00	18
3473	0.00	0.00	0.00	15
3474	0.00	0.00	0.00	20
3475	1.00	0.16	0.27	19
3476	0.00	0.00	0.00	15
3477	0.00	0.00	0.00	11
3478	0.00	0.00	0.00	19
3479	0.00	0.00	0.00	16
3480	0.00	0.00	0.00	18
3481	0.00	0.00	0.00	14
3482	0.00	0.00	0.00	14
3483	0.00	0.00	0.00	20
3484	0.67	0.12	0.20	17
3485	0.00	0.00	0.00	16
3486	0.00	0.00	0.00	15
3487	0.00	0.00	0.00	21
3488	0.00	0.00	0.00	15
3489	0.00	0.00	0.00	21
3490	0.00	0.00	0.00	21
3491	0.00	0.00	0.00	19
3492	0.00	0.00	0.00	23
3493	1.00	0.12	0.21	17
3494	0.00	0.00	0.00	21
3495	0.00	0.00	0.00	11
3496	0.00	0.00	0.00	14
3497	0.00	0.00	0.00	15
3498	0.00	0.00	0.00	17
3499	0.00	0.00	0.00	19
3500	0.00	0.00	0.00	15
3501	0.00	0.00	0.00	20
3502	0.00	0.00	0.00	15
3503	0.00	0.00	0.00	19
3504	0.00	0.00	0.00	23
3505	0.50	0.06	0.11	16
3506	0.00	0.00	0.00	17
3507	0.00	0.00	0.00	20
3508	0.00	0.00	0.00	11
3509	0.00	0.00	0.00	20
3510	0.00	0.00	0.00	15
3511	0.00	0.00	0.00	14
3512	0.00	0.00	0.00	14
3513	0.00	0.00	0.00	17
3514	0.00	0.00	0.00	20
3515	0.00	0.00	0.00	19
3516	0.00	0.00	0.00	18
3517	0.00	0.00	0.00	16
3518	0.00	0.00	0.00	15
3519	0.00	0.00	0.00	19
3520	0.00	0.00	0.00	17
3521	0.00	0.00	0.00	15
3522	0.00	0.00	0.00	23
3523	0.00	0.00	0.00	17
3524	0.00	0.00	0.00	21
3525	0.00	0.00	0.00	17
3526	0.00	0.00	0.00	12

3527	0.00	0.00	0.00	20
3528	0.00	0.00	0.00	25
3529	0.00	0.00	0.00	19
3530	0.00	0.00	0.00	9
3531	0.00	0.00	0.00	18
3532	0.00	0.00	0.00	17
3533	0.00	0.00	0.00	13
3534	0.00	0.00	0.00	19
3535	0.00	0.00	0.00	12
3536	0.00	0.00	0.00	20
3537	0.00	0.00	0.00	22
3538	0.00	0.00	0.00	12
3539	1.00	0.06	0.12	16
3540	0.00	0.00	0.00	14
3541	0.60	0.20	0.30	15
3542	0.00	0.00	0.00	17
3543	0.00	0.00	0.00	17
3544	0.00	0.00	0.00	17
3545	0.00	0.00	0.00	14
3546	0.00	0.00	0.00	14
3547	0.00	0.00	0.00	18
3548	0.00	0.00	0.00	21
3549	0.00	0.00	0.00	11
3550	0.00	0.00	0.00	13
3551	0.00	0.00	0.00	17
3552	0.00	0.00	0.00	12
3553	0.00	0.00	0.00	13
3554	0.00	0.00	0.00	16
3555	0.00	0.00	0.00	24
3556	0.00	0.00	0.00	8
3557	0.00	0.00	0.00	15
3558	0.00	0.00	0.00	13
3559	0.00	0.00	0.00	22
3560	0.00	0.00	0.00	15
3561	0.00	0.00	0.00	19
3562	0.00	0.00	0.00	16
3563	0.00	0.00	0.00	21
3564	0.00	0.00	0.00	19
3565	0.00	0.00	0.00	19
3566	0.00	0.00	0.00	16
3567	0.00	0.00	0.00	13
3568	0.00	0.00	0.00	20
3569	0.00	0.00	0.00	13
3570	0.00	0.00	0.00	16
3571	1.00	0.04	0.08	25
3572	0.00	0.00	0.00	18
3573	0.00	0.00	0.00	11
3574	0.00	0.00	0.00	19
3575	0.00	0.00	0.00	23
3576	0.00	0.00	0.00	12
3577	0.00	0.00	0.00	21
3578	0.00	0.00	0.00	16
3579	0.00	0.00	0.00	21
3580	0.00	0.00	0.00	17
3581	0.00	0.00	0.00	21
3582	0.00	0.00	0.00	13
3583	0.00	0.00	0.00	24

3584	0.00	0.00	0.00	18
3585	0.00	0.00	0.00	13
3586	0.00	0.00	0.00	14
3587	0.00	0.00	0.00	22
3588	0.00	0.00	0.00	14
3589	0.00	0.00	0.00	18
3590	0.00	0.00	0.00	23
3591	0.00	0.00	0.00	18
3592	0.00	0.00	0.00	11
3593	0.00	0.00	0.00	16
3594	1.00	0.25	0.40	12
3595	0.00	0.00	0.00	21
3596	0.00	0.00	0.00	17
3597	0.00	0.00	0.00	19
3598	0.00	0.00	0.00	13
3599	0.00	0.00	0.00	18
3600	0.00	0.00	0.00	17
3601	0.00	0.00	0.00	18
3602	1.00	0.08	0.14	13
3603	0.00	0.00	0.00	12
3604	0.00	0.00	0.00	18
3605	0.00	0.00	0.00	16
3606	0.00	0.00	0.00	15
3607	0.00	0.00	0.00	22
3608	0.00	0.00	0.00	21
3609	0.00	0.00	0.00	20
3610	0.00	0.00	0.00	17
3611	0.00	0.00	0.00	19
3612	0.00	0.00	0.00	13
3613	0.00	0.00	0.00	12
3614	0.00	0.00	0.00	18
3615	0.00	0.00	0.00	7
3616	0.00	0.00	0.00	23
3617	0.00	0.00	0.00	14
3618	0.00	0.00	0.00	21
3619	0.00	0.00	0.00	18
3620	0.00	0.00	0.00	20
3621	0.00	0.00	0.00	15
3622	0.00	0.00	0.00	17
3623	0.00	0.00	0.00	16
3624	0.00	0.00	0.00	18
3625	0.00	0.00	0.00	21
3626	1.00	0.25	0.40	12
3627	0.00	0.00	0.00	18
3628	0.50	0.07	0.12	14
3629	0.00	0.00	0.00	13
3630	0.00	0.00	0.00	10
3631	0.00	0.00	0.00	17
3632	0.00	0.00	0.00	8
3633	0.00	0.00	0.00	16
3634	0.00	0.00	0.00	19
3635	0.00	0.00	0.00	14
3636	0.00	0.00	0.00	13
3637	0.00	0.00	0.00	18
3638	0.00	0.00	0.00	23
3639	0.00	0.00	0.00	20
3640	0.00	0.00	0.00	17

3641	0.00	0.00	0.00	20
3642	0.50	0.09	0.15	11
3643	0.00	0.00	0.00	13
3644	0.00	0.00	0.00	19
3645	0.00	0.00	0.00	11
3646	0.33	0.08	0.12	13
3647	0.00	0.00	0.00	13
3648	0.00	0.00	0.00	19
3649	0.00	0.00	0.00	19
3650	0.00	0.00	0.00	12
3651	0.00	0.00	0.00	18
3652	0.00	0.00	0.00	18
3653	0.00	0.00	0.00	12
3654	0.00	0.00	0.00	20
3655	0.00	0.00	0.00	22
3656	0.00	0.00	0.00	19
3657	0.00	0.00	0.00	10
3658	0.00	0.00	0.00	15
3659	0.00	0.00	0.00	11
3660	0.00	0.00	0.00	15
3661	0.00	0.00	0.00	18
3662	0.00	0.00	0.00	18
3663	0.00	0.00	0.00	19
3664	0.00	0.00	0.00	12
3665	1.00	0.04	0.08	24
3666	0.00	0.00	0.00	18
3667	0.00	0.00	0.00	16
3668	0.00	0.00	0.00	12
3669	0.00	0.00	0.00	22
3670	0.00	0.00	0.00	19
3671	0.00	0.00	0.00	19
3672	0.00	0.00	0.00	19
3673	0.00	0.00	0.00	14
3674	0.00	0.00	0.00	18
3675	0.00	0.00	0.00	16
3676	0.00	0.00	0.00	12
3677	0.00	0.00	0.00	17
3678	0.00	0.00	0.00	20
3679	0.00	0.00	0.00	21
3680	0.00	0.00	0.00	22
3681	0.00	0.00	0.00	15
3682	0.00	0.00	0.00	17
3683	0.00	0.00	0.00	19
3684	0.00	0.00	0.00	13
3685	0.00	0.00	0.00	17
3686	0.00	0.00	0.00	18
3687	0.00	0.00	0.00	26
3688	0.00	0.00	0.00	20
3689	1.00	0.10	0.18	20
3690	0.00	0.00	0.00	22
3691	0.00	0.00	0.00	18
3692	0.00	0.00	0.00	15
3693	0.00	0.00	0.00	15
3694	0.40	0.14	0.21	14
3695	0.00	0.00	0.00	19
3696	0.00	0.00	0.00	13
3697	0.00	0.00	0.00	13



3698	0.00	0.00	0.00	16
3699	0.00	0.00	0.00	17
3700	0.00	0.00	0.00	19
3701	0.00	0.00	0.00	15
3702	0.00	0.00	0.00	23
3703	0.00	0.00	0.00	19
3704	0.00	0.00	0.00	12
3705	0.00	0.00	0.00	21
3706	0.00	0.00	0.00	17
3707	0.00	0.00	0.00	19
3708	0.00	0.00	0.00	19
3709	0.00	0.00	0.00	13
3710	0.00	0.00	0.00	13
3711	0.00	0.00	0.00	11
3712	0.00	0.00	0.00	18
3713	0.00	0.00	0.00	17
3714	0.00	0.00	0.00	18
3715	0.00	0.00	0.00	13
3716	0.00	0.00	0.00	21
3717	0.00	0.00	0.00	17
3718	0.00	0.00	0.00	13
3719	0.00	0.00	0.00	18
3720	0.00	0.00	0.00	11
3721	0.00	0.00	0.00	15
3722	0.00	0.00	0.00	12
3723	0.00	0.00	0.00	19
3724	0.00	0.00	0.00	12
3725	0.00	0.00	0.00	14
3726	0.00	0.00	0.00	16
3727	0.00	0.00	0.00	14
3728	0.00	0.00	0.00	19
3729	0.00	0.00	0.00	15
3730	0.00	0.00	0.00	12
3731	0.00	0.00	0.00	16
3732	0.00	0.00	0.00	17
3733	0.00	0.00	0.00	17
3734	0.00	0.00	0.00	16
3735	0.00	0.00	0.00	18
3736	0.00	0.00	0.00	15
3737	0.00	0.00	0.00	15
3738	0.00	0.00	0.00	15
3739	0.00	0.00	0.00	19
3740	0.00	0.00	0.00	16
3741	0.00	0.00	0.00	20
3742	0.00	0.00	0.00	15
3743	0.00	0.00	0.00	13
3744	1.00	0.15	0.27	13
3745	0.00	0.00	0.00	15
3746	0.00	0.00	0.00	16
3747	0.00	0.00	0.00	19
3748	0.00	0.00	0.00	11
3749	0.00	0.00	0.00	20
3750	0.00	0.00	0.00	17
3751	0.00	0.00	0.00	11
3752	0.00	0.00	0.00	13
3753	0.00	0.00	0.00	18
3754	0.00	0.00	0.00	17

3755	0.00	0.00	0.00	20
3756	0.00	0.00	0.00	16
3757	0.00	0.00	0.00	14
3758	0.00	0.00	0.00	14
3759	0.00	0.00	0.00	22
3760	0.00	0.00	0.00	15
3761	0.00	0.00	0.00	17
3762	0.00	0.00	0.00	17
3763	0.00	0.00	0.00	15
3764	1.00	0.21	0.35	19
3765	0.00	0.00	0.00	17
3766	0.00	0.00	0.00	7
3767	0.00	0.00	0.00	15
3768	0.00	0.00	0.00	12
3769	0.00	0.00	0.00	14
3770	0.00	0.00	0.00	15
3771	0.00	0.00	0.00	16
3772	0.00	0.00	0.00	15
3773	0.00	0.00	0.00	16
3774	0.00	0.00	0.00	17
3775	0.00	0.00	0.00	16
3776	0.00	0.00	0.00	11
3777	0.00	0.00	0.00	19
3778	0.00	0.00	0.00	22
3779	0.00	0.00	0.00	9
3780	1.00	0.15	0.27	13
3781	0.00	0.00	0.00	12
3782	0.00	0.00	0.00	23
3783	0.00	0.00	0.00	13
3784	0.00	0.00	0.00	15
3785	0.00	0.00	0.00	19
3786	0.00	0.00	0.00	17
3787	0.00	0.00	0.00	13
3788	0.00	0.00	0.00	18
3789	1.00	0.06	0.11	17
3790	0.00	0.00	0.00	14
3791	0.00	0.00	0.00	13
3792	0.00	0.00	0.00	18
3793	0.00	0.00	0.00	12
3794	0.00	0.00	0.00	22
3795	0.00	0.00	0.00	14
3796	0.00	0.00	0.00	23
3797	0.00	0.00	0.00	8
3798	0.00	0.00	0.00	23
3799	0.00	0.00	0.00	9
3800	0.00	0.00	0.00	17
3801	0.00	0.00	0.00	17
3802	0.00	0.00	0.00	14
3803	0.00	0.00	0.00	21
3804	0.00	0.00	0.00	15
3805	0.00	0.00	0.00	13
3806	0.00	0.00	0.00	13
3807	0.00	0.00	0.00	10
3808	0.00	0.00	0.00	14
3809	0.00	0.00	0.00	17
3810	0.00	0.00	0.00	21
3811	0.00	0.00	0.00	14

3812	0.00	0.00	0.00	18
3813	0.00	0.00	0.00	19
3814	0.00	0.00	0.00	16
3815	0.00	0.00	0.00	14
3816	0.00	0.00	0.00	14
3817	0.00	0.00	0.00	14
3818	0.00	0.00	0.00	15
3819	0.00	0.00	0.00	18
3820	0.00	0.00	0.00	16
3821	0.00	0.00	0.00	19
3822	0.00	0.00	0.00	21
3823	0.00	0.00	0.00	16
3824	0.00	0.00	0.00	17
3825	0.00	0.00	0.00	16
3826	0.00	0.00	0.00	20
3827	0.00	0.00	0.00	17
3828	0.00	0.00	0.00	17
3829	0.00	0.00	0.00	16
3830	0.00	0.00	0.00	19
3831	0.00	0.00	0.00	15
3832	0.00	0.00	0.00	20
3833	0.00	0.00	0.00	16
3834	0.00	0.00	0.00	13
3835	0.00	0.00	0.00	14
3836	0.00	0.00	0.00	12
3837	0.00	0.00	0.00	14
3838	0.00	0.00	0.00	9
3839	0.00	0.00	0.00	13
3840	0.00	0.00	0.00	14
3841	0.00	0.00	0.00	19
3842	0.00	0.00	0.00	19
3843	0.00	0.00	0.00	16
3844	0.00	0.00	0.00	13
3845	0.00	0.00	0.00	21
3846	0.00	0.00	0.00	7
3847	0.00	0.00	0.00	16
3848	0.00	0.00	0.00	10
3849	0.00	0.00	0.00	19
3850	0.00	0.00	0.00	18
3851	0.00	0.00	0.00	11
3852	0.00	0.00	0.00	17
3853	0.00	0.00	0.00	13
3854	0.00	0.00	0.00	20
3855	0.00	0.00	0.00	20
3856	0.00	0.00	0.00	10
3857	0.00	0.00	0.00	20
3858	0.00	0.00	0.00	22
3859	0.00	0.00	0.00	13
3860	0.00	0.00	0.00	19
3861	0.00	0.00	0.00	16
3862	0.00	0.00	0.00	18
3863	0.00	0.00	0.00	10
3864	1.00	0.15	0.27	13
3865	0.00	0.00	0.00	15
3866	0.00	0.00	0.00	13
3867	0.00	0.00	0.00	18
3868	0.00	0.00	0.00	13

3869	0.00	0.00	0.00	17
3870	0.00	0.00	0.00	14
3871	0.00	0.00	0.00	11
3872	0.00	0.00	0.00	10
3873	0.00	0.00	0.00	17
3874	0.00	0.00	0.00	9
3875	0.00	0.00	0.00	13
3876	0.00	0.00	0.00	12
3877	0.00	0.00	0.00	13
3878	0.00	0.00	0.00	16
3879	0.00	0.00	0.00	17
3880	0.00	0.00	0.00	11
3881	0.00	0.00	0.00	17
3882	0.00	0.00	0.00	13
3883	0.00	0.00	0.00	11
3884	0.00	0.00	0.00	15
3885	0.00	0.00	0.00	17
3886	0.00	0.00	0.00	14
3887	1.00	0.20	0.33	10
3888	0.00	0.00	0.00	16
3889	0.00	0.00	0.00	13
3890	0.00	0.00	0.00	14
3891	0.00	0.00	0.00	15
3892	0.00	0.00	0.00	19
3893	0.00	0.00	0.00	9
3894	0.00	0.00	0.00	16
3895	0.00	0.00	0.00	18
3896	0.00	0.00	0.00	17
3897	0.00	0.00	0.00	18
3898	0.00	0.00	0.00	10
3899	0.00	0.00	0.00	14
3900	0.00	0.00	0.00	22
3901	0.00	0.00	0.00	23
3902	0.00	0.00	0.00	11
3903	0.00	0.00	0.00	10
3904	0.00	0.00	0.00	7
3905	0.00	0.00	0.00	19
3906	1.00	0.13	0.24	15
3907	0.00	0.00	0.00	9
3908	0.00	0.00	0.00	12
3909	0.00	0.00	0.00	17
3910	0.00	0.00	0.00	11
3911	0.00	0.00	0.00	14
3912	0.00	0.00	0.00	18
3913	0.00	0.00	0.00	12
3914	0.00	0.00	0.00	15
3915	0.00	0.00	0.00	12
3916	0.00	0.00	0.00	14
3917	0.00	0.00	0.00	12
3918	0.00	0.00	0.00	11
3919	0.00	0.00	0.00	12
3920	0.00	0.00	0.00	24
3921	0.00	0.00	0.00	13
3922	0.00	0.00	0.00	15
3923	1.00	0.07	0.12	15
3924	0.00	0.00	0.00	10
3925	0.00	0.00	0.00	20

3926	0.00	0.00	0.00	15
3927	0.00	0.00	0.00	20
3928	0.00	0.00	0.00	11
3929	0.00	0.00	0.00	15
3930	0.00	0.00	0.00	8
3931	0.00	0.00	0.00	16
3932	0.00	0.00	0.00	15
3933	0.00	0.00	0.00	15
3934	0.00	0.00	0.00	17
3935	0.00	0.00	0.00	10
3936	0.00	0.00	0.00	21
3937	0.00	0.00	0.00	14
3938	0.00	0.00	0.00	19
3939	0.00	0.00	0.00	17
3940	0.00	0.00	0.00	19
3941	0.00	0.00	0.00	13
3942	0.00	0.00	0.00	12
3943	0.00	0.00	0.00	18
3944	0.00	0.00	0.00	17
3945	0.00	0.00	0.00	17
3946	0.00	0.00	0.00	12
3947	0.00	0.00	0.00	15
3948	0.00	0.00	0.00	14
3949	0.00	0.00	0.00	17
3950	0.00	0.00	0.00	14
3951	0.00	0.00	0.00	15
3952	0.00	0.00	0.00	17
3953	0.00	0.00	0.00	11
3954	0.00	0.00	0.00	14
3955	0.00	0.00	0.00	15
3956	0.00	0.00	0.00	17
3957	0.00	0.00	0.00	9
3958	0.00	0.00	0.00	20
3959	1.00	0.33	0.50	9
3960	0.00	0.00	0.00	13
3961	0.00	0.00	0.00	18
3962	0.00	0.00	0.00	14
3963	0.00	0.00	0.00	15
3964	0.00	0.00	0.00	13
3965	0.00	0.00	0.00	16
3966	0.00	0.00	0.00	15
3967	0.00	0.00	0.00	15
3968	0.00	0.00	0.00	17
3969	0.00	0.00	0.00	20
3970	0.00	0.00	0.00	16
3971	0.00	0.00	0.00	19
3972	1.00	0.12	0.22	16
3973	0.00	0.00	0.00	15
3974	0.00	0.00	0.00	8
3975	0.00	0.00	0.00	16
3976	0.00	0.00	0.00	15
3977	0.00	0.00	0.00	14
3978	0.00	0.00	0.00	16
3979	0.00	0.00	0.00	13
3980	0.00	0.00	0.00	28
3981	0.00	0.00	0.00	16
3982	0.00	0.00	0.00	12

3983	0.00	0.00	0.00	13
3984	0.00	0.00	0.00	12
3985	0.00	0.00	0.00	15
3986	0.00	0.00	0.00	10
3987	0.00	0.00	0.00	20
3988	0.00	0.00	0.00	17
3989	0.00	0.00	0.00	14
3990	0.00	0.00	0.00	11
3991	0.00	0.00	0.00	14
3992	0.00	0.00	0.00	13
3993	1.00	0.23	0.38	13
3994	0.00	0.00	0.00	18
3995	0.00	0.00	0.00	13
3996	0.00	0.00	0.00	13
3997	0.00	0.00	0.00	19
3998	0.00	0.00	0.00	10
3999	1.00	0.13	0.24	15
4000	0.00	0.00	0.00	20
4001	0.00	0.00	0.00	16
4002	0.00	0.00	0.00	11
4003	0.00	0.00	0.00	14
4004	0.00	0.00	0.00	15
4005	0.00	0.00	0.00	21
4006	0.00	0.00	0.00	12
4007	0.00	0.00	0.00	15
4008	0.00	0.00	0.00	9
4009	0.50	0.06	0.11	16
4010	0.00	0.00	0.00	12
4011	0.00	0.00	0.00	16
4012	0.00	0.00	0.00	19
4013	0.00	0.00	0.00	13
4014	0.00	0.00	0.00	13
4015	0.00	0.00	0.00	13
4016	0.00	0.00	0.00	16
4017	0.00	0.00	0.00	17
4018	0.00	0.00	0.00	10
4019	0.00	0.00	0.00	12
4020	0.00	0.00	0.00	13
4021	0.00	0.00	0.00	17
4022	0.00	0.00	0.00	16
4023	0.00	0.00	0.00	14
4024	0.00	0.00	0.00	11
4025	0.00	0.00	0.00	8
4026	0.00	0.00	0.00	8
4027	0.00	0.00	0.00	18
4028	0.00	0.00	0.00	13
4029	0.00	0.00	0.00	11
4030	0.00	0.00	0.00	19
4031	0.00	0.00	0.00	9
4032	0.00	0.00	0.00	12
4033	0.00	0.00	0.00	14
4034	0.00	0.00	0.00	17
4035	0.00	0.00	0.00	10
4036	0.00	0.00	0.00	12
4037	0.00	0.00	0.00	13
4038	0.00	0.00	0.00	13
4039	0.00	0.00	0.00	13

4040	0.00	0.00	0.00	12
4041	0.00	0.00	0.00	17
4042	0.00	0.00	0.00	10
4043	0.00	0.00	0.00	15
4044	0.00	0.00	0.00	13
4045	0.00	0.00	0.00	20
4046	0.00	0.00	0.00	16
4047	0.00	0.00	0.00	12
4048	0.00	0.00	0.00	16
4049	0.00	0.00	0.00	14
4050	0.00	0.00	0.00	15
4051	0.00	0.00	0.00	20
4052	0.00	0.00	0.00	10
4053	0.00	0.00	0.00	14
4054	0.00	0.00	0.00	14
4055	0.00	0.00	0.00	5
4056	0.00	0.00	0.00	15
4057	1.00	0.07	0.12	15
4058	0.00	0.00	0.00	17
4059	0.00	0.00	0.00	13
4060	0.00	0.00	0.00	14
4061	0.00	0.00	0.00	10
4062	0.00	0.00	0.00	15
4063	0.00	0.00	0.00	15
4064	0.00	0.00	0.00	17
4065	0.00	0.00	0.00	17
4066	0.00	0.00	0.00	14
4067	0.00	0.00	0.00	15
4068	0.00	0.00	0.00	21
4069	0.00	0.00	0.00	9
4070	0.00	0.00	0.00	9
4071	0.00	0.00	0.00	21
4072	0.00	0.00	0.00	18
4073	0.00	0.00	0.00	9
4074	0.00	0.00	0.00	12
4075	0.00	0.00	0.00	20
4076	0.00	0.00	0.00	15
4077	0.00	0.00	0.00	15
4078	0.00	0.00	0.00	9
4079	0.00	0.00	0.00	15
4080	0.00	0.00	0.00	19
4081	0.00	0.00	0.00	10
4082	0.00	0.00	0.00	11
4083	0.00	0.00	0.00	12
4084	0.00	0.00	0.00	14
4085	0.00	0.00	0.00	9
4086	0.00	0.00	0.00	9
4087	0.00	0.00	0.00	9
4088	0.00	0.00	0.00	18
4089	0.00	0.00	0.00	14
4090	0.00	0.00	0.00	18
4091	0.00	0.00	0.00	14
4092	0.00	0.00	0.00	13
4093	0.00	0.00	0.00	16
4094	0.00	0.00	0.00	14
4095	0.00	0.00	0.00	19
4096	0.00	0.00	0.00	15

4097	0.00	0.00	0.00	14
4098	0.00	0.00	0.00	16
4099	0.00	0.00	0.00	21
4100	0.00	0.00	0.00	18
4101	0.00	0.00	0.00	15
4102	0.00	0.00	0.00	15
4103	0.00	0.00	0.00	17
4104	0.00	0.00	0.00	13
4105	0.00	0.00	0.00	15
4106	0.00	0.00	0.00	14
4107	0.00	0.00	0.00	13
4108	0.00	0.00	0.00	15
4109	0.00	0.00	0.00	15
4110	0.00	0.00	0.00	13
4111	0.00	0.00	0.00	16
4112	0.00	0.00	0.00	13
4113	0.00	0.00	0.00	12
4114	0.00	0.00	0.00	13
4115	0.00	0.00	0.00	11
4116	0.00	0.00	0.00	15
4117	0.00	0.00	0.00	12
4118	0.00	0.00	0.00	12
4119	0.00	0.00	0.00	18
4120	1.00	0.09	0.17	11
4121	0.00	0.00	0.00	9
4122	0.00	0.00	0.00	12
4123	0.00	0.00	0.00	11
4124	0.00	0.00	0.00	9
4125	0.00	0.00	0.00	9
4126	0.00	0.00	0.00	15
4127	0.00	0.00	0.00	16
4128	0.00	0.00	0.00	13
4129	0.00	0.00	0.00	11
4130	0.00	0.00	0.00	7
4131	0.00	0.00	0.00	12
4132	0.00	0.00	0.00	15
4133	1.00	0.08	0.15	12
4134	0.00	0.00	0.00	16
4135	0.00	0.00	0.00	16
4136	0.00	0.00	0.00	11
4137	0.00	0.00	0.00	12
4138	0.00	0.00	0.00	12
4139	0.00	0.00	0.00	21
4140	0.00	0.00	0.00	13
4141	0.00	0.00	0.00	7
4142	0.00	0.00	0.00	12
4143	0.00	0.00	0.00	19
4144	0.00	0.00	0.00	10
4145	0.00	0.00	0.00	13
4146	0.00	0.00	0.00	18
4147	0.00	0.00	0.00	14
4148	0.00	0.00	0.00	11
4149	0.00	0.00	0.00	7
4150	0.00	0.00	0.00	10
4151	0.00	0.00	0.00	18
4152	0.00	0.00	0.00	14
4153	0.00	0.00	0.00	16



4154	0.00	0.00	0.00	12
4155	0.00	0.00	0.00	10
4156	0.00	0.00	0.00	15
4157	0.00	0.00	0.00	16
4158	0.00	0.00	0.00	19
4159	0.00	0.00	0.00	10
4160	0.00	0.00	0.00	17
4161	0.00	0.00	0.00	18
4162	0.00	0.00	0.00	12
4163	0.00	0.00	0.00	11
4164	0.00	0.00	0.00	8
4165	0.00	0.00	0.00	17
4166	0.00	0.00	0.00	17
4167	0.00	0.00	0.00	8
4168	0.00	0.00	0.00	12
4169	0.00	0.00	0.00	19
4170	0.00	0.00	0.00	15
4171	0.00	0.00	0.00	10
4172	0.00	0.00	0.00	17
4173	0.00	0.00	0.00	12
4174	0.00	0.00	0.00	14
4175	0.00	0.00	0.00	18
4176	0.00	0.00	0.00	8
4177	0.00	0.00	0.00	20
4178	0.00	0.00	0.00	15
4179	0.00	0.00	0.00	16
4180	0.00	0.00	0.00	12
4181	0.00	0.00	0.00	18
4182	0.00	0.00	0.00	8
4183	0.00	0.00	0.00	18
4184	0.00	0.00	0.00	16
4185	0.00	0.00	0.00	12
4186	0.00	0.00	0.00	16
4187	0.00	0.00	0.00	14
4188	0.00	0.00	0.00	17
4189	0.00	0.00	0.00	13
4190	0.00	0.00	0.00	11
4191	0.00	0.00	0.00	14
4192	0.00	0.00	0.00	11
4193	0.00	0.00	0.00	11
4194	0.00	0.00	0.00	17
4195	0.00	0.00	0.00	6
4196	0.00	0.00	0.00	17
4197	0.00	0.00	0.00	13
4198	0.00	0.00	0.00	12
4199	0.00	0.00	0.00	9
4200	0.00	0.00	0.00	12
4201	0.00	0.00	0.00	13
4202	0.00	0.00	0.00	13
4203	0.00	0.00	0.00	15
4204	0.00	0.00	0.00	15
4205	0.00	0.00	0.00	11
4206	0.00	0.00	0.00	14
4207	0.00	0.00	0.00	9
4208	0.00	0.00	0.00	15
4209	0.00	0.00	0.00	14
4210	0.00	0.00	0.00	11

4211	0.00	0.00	0.00	12
4212	0.00	0.00	0.00	12
4213	0.00	0.00	0.00	14
4214	0.00	0.00	0.00	9
4215	0.00	0.00	0.00	7
4216	0.00	0.00	0.00	12
4217	0.00	0.00	0.00	11
4218	0.00	0.00	0.00	13
4219	1.00	0.09	0.17	11
4220	1.00	0.07	0.13	14
4221	0.00	0.00	0.00	11
4222	1.00	0.08	0.14	13
4223	0.00	0.00	0.00	4
4224	0.00	0.00	0.00	12
4225	0.00	0.00	0.00	13
4226	0.00	0.00	0.00	7
4227	0.00	0.00	0.00	14
4228	0.00	0.00	0.00	9
4229	0.00	0.00	0.00	14
4230	0.00	0.00	0.00	11
4231	0.00	0.00	0.00	13
4232	0.00	0.00	0.00	16
4233	0.00	0.00	0.00	20
4234	0.00	0.00	0.00	12
4235	0.00	0.00	0.00	12
4236	0.00	0.00	0.00	13
4237	0.00	0.00	0.00	11
4238	0.00	0.00	0.00	15
4239	0.00	0.00	0.00	10
4240	0.00	0.00	0.00	11
4241	0.00	0.00	0.00	17
4242	0.00	0.00	0.00	16
4243	0.00	0.00	0.00	17
4244	0.00	0.00	0.00	12
4245	0.00	0.00	0.00	16
4246	0.00	0.00	0.00	10
4247	0.00	0.00	0.00	19
4248	0.00	0.00	0.00	9
4249	0.00	0.00	0.00	15
4250	0.00	0.00	0.00	18
4251	0.00	0.00	0.00	11
4252	0.00	0.00	0.00	9
4253	0.00	0.00	0.00	16
4254	0.00	0.00	0.00	13
4255	0.00	0.00	0.00	7
4256	0.00	0.00	0.00	11
4257	0.00	0.00	0.00	17
4258	0.00	0.00	0.00	12
4259	0.00	0.00	0.00	12
4260	0.00	0.00	0.00	17
4261	0.00	0.00	0.00	12
4262	0.00	0.00	0.00	10
4263	0.00	0.00	0.00	21
4264	0.00	0.00	0.00	16
4265	0.00	0.00	0.00	13
4266	0.00	0.00	0.00	13
4267	0.00	0.00	0.00	12

4268	0.00	0.00	0.00	14
4269	0.00	0.00	0.00	16
4270	0.00	0.00	0.00	12
4271	0.00	0.00	0.00	10
4272	0.00	0.00	0.00	15
4273	0.00	0.00	0.00	9
4274	0.00	0.00	0.00	17
4275	0.00	0.00	0.00	16
4276	0.00	0.00	0.00	8
4277	0.00	0.00	0.00	14
4278	0.00	0.00	0.00	18
4279	0.00	0.00	0.00	17
4280	0.00	0.00	0.00	12
4281	0.00	0.00	0.00	4
4282	0.00	0.00	0.00	17
4283	0.00	0.00	0.00	14
4284	0.00	0.00	0.00	15
4285	0.00	0.00	0.00	22
4286	0.00	0.00	0.00	18
4287	0.00	0.00	0.00	9
4288	0.00	0.00	0.00	14
4289	0.00	0.00	0.00	9
4290	0.00	0.00	0.00	12
4291	0.00	0.00	0.00	11
4292	1.00	0.06	0.11	17
4293	0.00	0.00	0.00	8
4294	0.00	0.00	0.00	8
4295	0.00	0.00	0.00	9
4296	0.00	0.00	0.00	9
4297	0.00	0.00	0.00	19
4298	0.00	0.00	0.00	11
4299	0.00	0.00	0.00	6
4300	0.00	0.00	0.00	13
4301	0.00	0.00	0.00	14
4302	0.00	0.00	0.00	14
4303	0.00	0.00	0.00	15
4304	0.00	0.00	0.00	4
4305	0.00	0.00	0.00	13
4306	0.00	0.00	0.00	12
4307	0.00	0.00	0.00	7
4308	0.00	0.00	0.00	19
4309	0.00	0.00	0.00	12
4310	0.00	0.00	0.00	15
4311	0.00	0.00	0.00	13
4312	0.00	0.00	0.00	20
4313	0.00	0.00	0.00	10
4314	0.00	0.00	0.00	10
4315	0.00	0.00	0.00	12
4316	0.00	0.00	0.00	11
4317	0.00	0.00	0.00	11
4318	0.00	0.00	0.00	13
4319	0.00	0.00	0.00	11
4320	0.00	0.00	0.00	10
4321	0.00	0.00	0.00	13
4322	0.00	0.00	0.00	10
4323	0.00	0.00	0.00	14
4324	0.00	0.00	0.00	13

4325	0.00	0.00	0.00	8
4326	0.00	0.00	0.00	13
4327	0.00	0.00	0.00	15
4328	0.00	0.00	0.00	15
4329	0.00	0.00	0.00	15
4330	0.00	0.00	0.00	13
4331	0.00	0.00	0.00	9
4332	0.00	0.00	0.00	12
4333	0.00	0.00	0.00	13
4334	0.00	0.00	0.00	12
4335	0.00	0.00	0.00	16
4336	0.00	0.00	0.00	14
4337	0.00	0.00	0.00	11
4338	0.00	0.00	0.00	11
4339	0.00	0.00	0.00	18
4340	0.00	0.00	0.00	12
4341	0.00	0.00	0.00	13
4342	0.00	0.00	0.00	6
4343	0.00	0.00	0.00	16
4344	0.00	0.00	0.00	14
4345	0.00	0.00	0.00	15
4346	0.00	0.00	0.00	10
4347	0.00	0.00	0.00	14
4348	0.00	0.00	0.00	12
4349	0.00	0.00	0.00	14
4350	0.00	0.00	0.00	17
4351	0.00	0.00	0.00	16
4352	0.00	0.00	0.00	11
4353	0.00	0.00	0.00	9
4354	0.00	0.00	0.00	17
4355	0.00	0.00	0.00	23
4356	0.00	0.00	0.00	6
4357	0.00	0.00	0.00	10
4358	0.00	0.00	0.00	9
4359	0.00	0.00	0.00	10
4360	0.00	0.00	0.00	17
4361	0.00	0.00	0.00	5
4362	0.00	0.00	0.00	13
4363	0.00	0.00	0.00	11
4364	0.00	0.00	0.00	17
4365	0.00	0.00	0.00	14
4366	0.00	0.00	0.00	13
4367	0.00	0.00	0.00	10
4368	0.75	0.17	0.27	18
4369	0.00	0.00	0.00	7
4370	0.00	0.00	0.00	12
4371	0.00	0.00	0.00	14
4372	0.00	0.00	0.00	6
4373	0.00	0.00	0.00	8
4374	0.00	0.00	0.00	16
4375	0.00	0.00	0.00	11
4376	0.00	0.00	0.00	18
4377	0.00	0.00	0.00	9
4378	0.00	0.00	0.00	14
4379	0.00	0.00	0.00	8
4380	0.00	0.00	0.00	9
4381	0.00	0.00	0.00	10

4382	0.00	0.00	0.00	16
4383	0.00	0.00	0.00	13
4384	0.00	0.00	0.00	9
4385	0.00	0.00	0.00	12
4386	0.00	0.00	0.00	14
4387	0.00	0.00	0.00	11
4388	0.00	0.00	0.00	8
4389	0.00	0.00	0.00	12
4390	0.00	0.00	0.00	8
4391	0.00	0.00	0.00	16
4392	0.00	0.00	0.00	7
4393	0.00	0.00	0.00	8
4394	0.00	0.00	0.00	11
4395	0.00	0.00	0.00	9
4396	0.00	0.00	0.00	11
4397	0.00	0.00	0.00	13
4398	0.00	0.00	0.00	17
4399	0.00	0.00	0.00	10
4400	0.00	0.00	0.00	17
4401	0.00	0.00	0.00	8
4402	0.33	0.08	0.13	12
4403	0.00	0.00	0.00	14
4404	0.00	0.00	0.00	14
4405	0.00	0.00	0.00	10
4406	0.00	0.00	0.00	14
4407	0.00	0.00	0.00	13
4408	0.00	0.00	0.00	13
4409	0.00	0.00	0.00	11
4410	0.00	0.00	0.00	16
4411	0.00	0.00	0.00	12
4412	0.00	0.00	0.00	10
4413	0.00	0.00	0.00	16
4414	0.00	0.00	0.00	14
4415	0.00	0.00	0.00	11
4416	0.00	0.00	0.00	14
4417	0.00	0.00	0.00	13
4418	0.00	0.00	0.00	8
4419	0.00	0.00	0.00	12
4420	0.00	0.00	0.00	13
4421	0.00	0.00	0.00	15
4422	0.00	0.00	0.00	14
4423	0.00	0.00	0.00	15
4424	0.00	0.00	0.00	9
4425	0.00	0.00	0.00	10
4426	0.00	0.00	0.00	17
4427	0.00	0.00	0.00	12
4428	0.00	0.00	0.00	12
4429	0.00	0.00	0.00	13
4430	0.00	0.00	0.00	10
4431	0.00	0.00	0.00	10
4432	0.00	0.00	0.00	10
4433	0.00	0.00	0.00	15
4434	0.00	0.00	0.00	13
4435	0.00	0.00	0.00	21
4436	0.00	0.00	0.00	17
4437	0.00	0.00	0.00	9
4438	0.00	0.00	0.00	11

4439	0.00	0.00	0.00	17
4440	0.00	0.00	0.00	14
4441	0.00	0.00	0.00	15
4442	0.00	0.00	0.00	8
4443	0.00	0.00	0.00	13
4444	0.00	0.00	0.00	10
4445	0.00	0.00	0.00	13
4446	0.00	0.00	0.00	10
4447	0.00	0.00	0.00	10
4448	0.00	0.00	0.00	7
4449	0.00	0.00	0.00	12
4450	0.00	0.00	0.00	8
4451	0.00	0.00	0.00	13
4452	0.00	0.00	0.00	15
4453	0.00	0.00	0.00	8
4454	0.00	0.00	0.00	4
4455	0.00	0.00	0.00	15
4456	0.00	0.00	0.00	9
4457	0.00	0.00	0.00	10
4458	0.00	0.00	0.00	13
4459	0.00	0.00	0.00	14
4460	0.00	0.00	0.00	10
4461	0.00	0.00	0.00	12
4462	0.00	0.00	0.00	10
4463	0.00	0.00	0.00	12
4464	0.00	0.00	0.00	9
4465	0.00	0.00	0.00	9
4466	0.00	0.00	0.00	12
4467	0.00	0.00	0.00	10
4468	0.00	0.00	0.00	11
4469	0.00	0.00	0.00	13
4470	0.00	0.00	0.00	18
4471	0.00	0.00	0.00	11
4472	0.00	0.00	0.00	16
4473	0.00	0.00	0.00	12
4474	0.00	0.00	0.00	10
4475	0.00	0.00	0.00	11
4476	0.00	0.00	0.00	13
4477	0.00	0.00	0.00	12
4478	0.00	0.00	0.00	11
4479	0.00	0.00	0.00	14
4480	0.00	0.00	0.00	10
4481	0.00	0.00	0.00	11
4482	0.00	0.00	0.00	13
4483	0.00	0.00	0.00	13
4484	0.00	0.00	0.00	15
4485	0.00	0.00	0.00	13
4486	0.00	0.00	0.00	14
4487	0.00	0.00	0.00	15
4488	0.00	0.00	0.00	14
4489	0.00	0.00	0.00	13
4490	0.00	0.00	0.00	18
4491	0.00	0.00	0.00	10
4492	0.00	0.00	0.00	12
4493	0.00	0.00	0.00	16
4494	0.00	0.00	0.00	8
4495	0.00	0.00	0.00	9

4496	0.00	0.00	0.00	8
4497	0.00	0.00	0.00	13
4498	0.00	0.00	0.00	18
4499	0.00	0.00	0.00	11
4500	0.00	0.00	0.00	8
4501	0.00	0.00	0.00	17
4502	0.00	0.00	0.00	9
4503	0.00	0.00	0.00	12
4504	0.00	0.00	0.00	7
4505	0.00	0.00	0.00	13
4506	0.00	0.00	0.00	13
4507	0.00	0.00	0.00	12
4508	0.00	0.00	0.00	13
4509	0.00	0.00	0.00	19
4510	0.00	0.00	0.00	12
4511	0.00	0.00	0.00	12
4512	0.00	0.00	0.00	13
4513	0.00	0.00	0.00	11
4514	0.00	0.00	0.00	8
4515	0.00	0.00	0.00	9
4516	0.00	0.00	0.00	10
4517	0.00	0.00	0.00	13
4518	0.00	0.00	0.00	9
4519	0.00	0.00	0.00	12
4520	0.00	0.00	0.00	12
4521	0.00	0.00	0.00	14
4522	0.00	0.00	0.00	6
4523	0.00	0.00	0.00	14
4524	0.00	0.00	0.00	13
4525	0.00	0.00	0.00	11
4526	0.00	0.00	0.00	14
4527	0.00	0.00	0.00	12
4528	0.00	0.00	0.00	12
4529	0.00	0.00	0.00	10
4530	0.00	0.00	0.00	15
4531	0.00	0.00	0.00	16
4532	0.00	0.00	0.00	12
4533	0.00	0.00	0.00	14
4534	0.00	0.00	0.00	13
4535	0.00	0.00	0.00	12
4536	0.00	0.00	0.00	11
4537	0.00	0.00	0.00	18
4538	0.00	0.00	0.00	7
4539	0.00	0.00	0.00	11
4540	0.00	0.00	0.00	11
4541	0.00	0.00	0.00	12
4542	0.00	0.00	0.00	13
4543	0.00	0.00	0.00	9
4544	0.00	0.00	0.00	12
4545	0.00	0.00	0.00	12
4546	0.00	0.00	0.00	12
4547	0.00	0.00	0.00	8
4548	0.00	0.00	0.00	12
4549	0.00	0.00	0.00	9
4550	0.00	0.00	0.00	8
4551	0.00	0.00	0.00	13
4552	0.00	0.00	0.00	10

4553	0.00	0.00	0.00	8
4554	0.00	0.00	0.00	10
4555	0.00	0.00	0.00	8
4556	0.00	0.00	0.00	5
4557	0.00	0.00	0.00	10
4558	0.00	0.00	0.00	9
4559	0.00	0.00	0.00	14
4560	0.00	0.00	0.00	16
4561	0.00	0.00	0.00	15
4562	0.00	0.00	0.00	11
4563	0.00	0.00	0.00	9
4564	0.00	0.00	0.00	13
4565	0.00	0.00	0.00	12
4566	0.00	0.00	0.00	8
4567	0.00	0.00	0.00	5
4568	0.00	0.00	0.00	7
4569	0.00	0.00	0.00	7
4570	0.00	0.00	0.00	10
4571	0.00	0.00	0.00	12
4572	0.00	0.00	0.00	14
4573	0.00	0.00	0.00	12
4574	0.00	0.00	0.00	8
4575	0.00	0.00	0.00	11
4576	0.00	0.00	0.00	10
4577	0.00	0.00	0.00	9
4578	0.00	0.00	0.00	14
4579	0.00	0.00	0.00	13
4580	0.00	0.00	0.00	14
4581	0.00	0.00	0.00	9
4582	0.00	0.00	0.00	15
4583	0.00	0.00	0.00	13
4584	0.00	0.00	0.00	7
4585	0.00	0.00	0.00	9
4586	0.00	0.00	0.00	15
4587	0.00	0.00	0.00	13
4588	0.00	0.00	0.00	11
4589	0.00	0.00	0.00	6
4590	0.00	0.00	0.00	6
4591	0.00	0.00	0.00	11
4592	0.00	0.00	0.00	12
4593	0.00	0.00	0.00	12
4594	0.00	0.00	0.00	10
4595	0.00	0.00	0.00	14
4596	0.00	0.00	0.00	11
4597	0.00	0.00	0.00	11
4598	0.00	0.00	0.00	9
4599	0.00	0.00	0.00	7
4600	0.00	0.00	0.00	11
4601	0.00	0.00	0.00	12
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4603	0.00	0.00	0.00	13
4604	0.00	0.00	0.00	15
4605	0.00	0.00	0.00	11
4606	0.00	0.00	0.00	9
4607	0.00	0.00	0.00	10
4608	0.00	0.00	0.00	6
4609	0.00	0.00	0.00	6



4610	0.00	0.00	0.00	12
4611	0.00	0.00	0.00	9
4612	0.00	0.00	0.00	13
4613	0.00	0.00	0.00	14
4614	0.00	0.00	0.00	8
4615	0.00	0.00	0.00	12
4616	0.00	0.00	0.00	13
4617	0.00	0.00	0.00	7
4618	0.00	0.00	0.00	11
4619	0.00	0.00	0.00	14
4620	0.00	0.00	0.00	11
4621	0.00	0.00	0.00	9
4622	0.00	0.00	0.00	6
4623	0.00	0.00	0.00	12
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4625	0.00	0.00	0.00	10
4626	0.00	0.00	0.00	9
4627	0.00	0.00	0.00	8
4628	0.00	0.00	0.00	11
4629	0.00	0.00	0.00	11
4630	0.00	0.00	0.00	13
4631	0.00	0.00	0.00	15
4632	0.00	0.00	0.00	11
4633	0.00	0.00	0.00	7
4634	0.00	0.00	0.00	11
4635	0.00	0.00	0.00	8
4636	0.00	0.00	0.00	7
4637	0.00	0.00	0.00	8
4638	0.00	0.00	0.00	9
4639	0.00	0.00	0.00	13
4640	0.00	0.00	0.00	12
4641	0.00	0.00	0.00	11
4642	0.00	0.00	0.00	8
4643	0.00	0.00	0.00	12
4644	0.00	0.00	0.00	9
4645	0.00	0.00	0.00	12
4646	0.00	0.00	0.00	10
4647	0.00	0.00	0.00	17
4648	0.00	0.00	0.00	10
4649	0.00	0.00	0.00	12
4650	0.00	0.00	0.00	13
4651	0.00	0.00	0.00	12
4652	0.00	0.00	0.00	11
4653	0.00	0.00	0.00	10
4654	0.00	0.00	0.00	11
4655	0.00	0.00	0.00	14
4656	0.00	0.00	0.00	10
4657	0.00	0.00	0.00	9
4658	0.00	0.00	0.00	9
4659	0.00	0.00	0.00	9
4660	0.00	0.00	0.00	13
4661	0.00	0.00	0.00	8
4662	0.00	0.00	0.00	12
4663	0.00	0.00	0.00	12
4664	0.00	0.00	0.00	14
4665	0.00	0.00	0.00	11
4666	0.00	0.00	0.00	9

4667	0.00	0.00	0.00	7
4668	0.00	0.00	0.00	8
4669	0.00	0.00	0.00	6
4670	0.00	0.00	0.00	12
4671	0.00	0.00	0.00	6
4672	0.00	0.00	0.00	14
4673	0.00	0.00	0.00	14
4674	0.00	0.00	0.00	13
4675	0.00	0.00	0.00	12
4676	0.00	0.00	0.00	13
4677	0.00	0.00	0.00	12
4678	0.00	0.00	0.00	11
4679	0.00	0.00	0.00	14
4680	0.00	0.00	0.00	7
4681	0.00	0.00	0.00	9
4682	0.00	0.00	0.00	15
4683	0.00	0.00	0.00	10
4684	0.00	0.00	0.00	7
4685	0.00	0.00	0.00	12
4686	0.00	0.00	0.00	9
4687	0.00	0.00	0.00	11
4688	0.00	0.00	0.00	10
4689	0.00	0.00	0.00	17
4690	0.00	0.00	0.00	11
4691	0.00	0.00	0.00	16
4692	0.00	0.00	0.00	12
4693	0.00	0.00	0.00	9
4694	0.00	0.00	0.00	16
4695	0.00	0.00	0.00	10
4696	0.00	0.00	0.00	13
4697	0.00	0.00	0.00	10
4698	0.00	0.00	0.00	13
4699	0.00	0.00	0.00	12
4700	0.00	0.00	0.00	16
4701	0.00	0.00	0.00	5
4702	0.00	0.00	0.00	10
4703	0.00	0.00	0.00	8
4704	0.00	0.00	0.00	17
4705	0.00	0.00	0.00	12
4706	0.00	0.00	0.00	5
4707	0.00	0.00	0.00	11
4708	0.00	0.00	0.00	13
4709	0.00	0.00	0.00	11
4710	0.00	0.00	0.00	10
4711	0.00	0.00	0.00	12
4712	0.00	0.00	0.00	9
4713	0.00	0.00	0.00	14
4714	0.00	0.00	0.00	14
4715	0.00	0.00	0.00	11
4716	0.00	0.00	0.00	10
4717	0.00	0.00	0.00	16
4718	0.00	0.00	0.00	15
4719	0.00	0.00	0.00	14
4720	0.00	0.00	0.00	10
4721	0.00	0.00	0.00	18
4722	0.00	0.00	0.00	9
4723	0.00	0.00	0.00	15

4724	0.00	0.00	0.00	10
4725	0.00	0.00	0.00	6
4726	0.00	0.00	0.00	8
4727	0.00	0.00	0.00	9
4728	0.00	0.00	0.00	12
4729	0.00	0.00	0.00	10
4730	0.00	0.00	0.00	16
4731	0.00	0.00	0.00	9
4732	0.00	0.00	0.00	10
4733	0.00	0.00	0.00	13
4734	0.00	0.00	0.00	14
4735	0.00	0.00	0.00	20
4736	0.00	0.00	0.00	9
4737	0.00	0.00	0.00	8
4738	0.00	0.00	0.00	16
4739	0.00	0.00	0.00	6
4740	0.00	0.00	0.00	10
4741	0.00	0.00	0.00	10
4742	0.00	0.00	0.00	10
4743	0.00	0.00	0.00	8
4744	0.00	0.00	0.00	9
4745	0.00	0.00	0.00	12
4746	0.00	0.00	0.00	11
4747	0.00	0.00	0.00	18
4748	0.00	0.00	0.00	7
4749	0.00	0.00	0.00	10
4750	0.00	0.00	0.00	12
4751	0.00	0.00	0.00	13
4752	0.00	0.00	0.00	9
4753	0.00	0.00	0.00	8
4754	0.00	0.00	0.00	10
4755	0.00	0.00	0.00	14
4756	0.00	0.00	0.00	17
4757	0.00	0.00	0.00	15
4758	0.00	0.00	0.00	11
4759	0.00	0.00	0.00	10
4760	0.00	0.00	0.00	10
4761	0.00	0.00	0.00	14
4762	0.00	0.00	0.00	13
4763	0.00	0.00	0.00	13
4764	0.00	0.00	0.00	12
4765	0.00	0.00	0.00	8
4766	0.00	0.00	0.00	7
4767	0.00	0.00	0.00	14
4768	0.00	0.00	0.00	10
4769	0.00	0.00	0.00	11
4770	0.00	0.00	0.00	12
4771	0.00	0.00	0.00	11
4772	0.00	0.00	0.00	11
4773	0.00	0.00	0.00	17
4774	0.00	0.00	0.00	5
4775	0.00	0.00	0.00	5
4776	0.00	0.00	0.00	12
4777	0.00	0.00	0.00	12
4778	0.00	0.00	0.00	10
4779	0.00	0.00	0.00	16
4780	0.00	0.00	0.00	10

4781	0.00	0.00	0.00	5
4782	0.00	0.00	0.00	11
4783	0.00	0.00	0.00	7
4784	0.00	0.00	0.00	13
4785	0.00	0.00	0.00	8
4786	0.00	0.00	0.00	15
4787	0.00	0.00	0.00	8
4788	0.00	0.00	0.00	7
4789	0.00	0.00	0.00	10
4790	0.00	0.00	0.00	12
4791	0.00	0.00	0.00	11
4792	0.00	0.00	0.00	10
4793	0.00	0.00	0.00	13
4794	0.00	0.00	0.00	18
4795	0.00	0.00	0.00	6
4796	0.00	0.00	0.00	11
4797	0.00	0.00	0.00	9
4798	0.00	0.00	0.00	11
4799	0.00	0.00	0.00	10
4800	0.00	0.00	0.00	14
4801	0.00	0.00	0.00	9
4802	0.00	0.00	0.00	11
4803	0.00	0.00	0.00	12
4804	0.00	0.00	0.00	19
4805	0.00	0.00	0.00	10
4806	0.00	0.00	0.00	12
4807	0.00	0.00	0.00	12
4808	0.00	0.00	0.00	14
4809	0.00	0.00	0.00	12
4810	0.00	0.00	0.00	7
4811	0.00	0.00	0.00	16
4812	0.00	0.00	0.00	10
4813	0.00	0.00	0.00	14
4814	0.00	0.00	0.00	10
4815	0.00	0.00	0.00	10
4816	0.00	0.00	0.00	12
4817	0.00	0.00	0.00	14
4818	0.00	0.00	0.00	9
4819	0.00	0.00	0.00	13
4820	0.00	0.00	0.00	15
4821	0.00	0.00	0.00	5
4822	0.00	0.00	0.00	12
4823	0.00	0.00	0.00	11
4824	0.00	0.00	0.00	18
4825	0.00	0.00	0.00	8
4826	0.00	0.00	0.00	7
4827	0.00	0.00	0.00	13
4828	0.00	0.00	0.00	16
4829	0.00	0.00	0.00	5
4830	0.00	0.00	0.00	9
4831	0.00	0.00	0.00	12
4832	0.00	0.00	0.00	12
4833	0.00	0.00	0.00	12
4834	0.00	0.00	0.00	16
4835	0.00	0.00	0.00	9
4836	0.00	0.00	0.00	8
4837	0.00	0.00	0.00	10

4838	0.00	0.00	0.00	12
4839	0.00	0.00	0.00	10
4840	0.00	0.00	0.00	8
4841	0.00	0.00	0.00	13
4842	0.00	0.00	0.00	8
4843	0.00	0.00	0.00	10
4844	0.00	0.00	0.00	6
4845	0.00	0.00	0.00	13
4846	0.00	0.00	0.00	15
4847	0.00	0.00	0.00	16
4848	0.00	0.00	0.00	12
4849	0.00	0.00	0.00	13
4850	0.00	0.00	0.00	16
4851	0.00	0.00	0.00	13
4852	0.00	0.00	0.00	11
4853	0.00	0.00	0.00	10
4854	0.00	0.00	0.00	10
4855	0.00	0.00	0.00	7
4856	0.00	0.00	0.00	9
4857	0.00	0.00	0.00	12
4858	0.00	0.00	0.00	9
4859	0.00	0.00	0.00	11
4860	0.00	0.00	0.00	11
4861	0.00	0.00	0.00	15
4862	0.00	0.00	0.00	10
4863	0.00	0.00	0.00	9
4864	0.00	0.00	0.00	6
4865	0.00	0.00	0.00	14
4866	0.00	0.00	0.00	7
4867	0.00	0.00	0.00	8
4868	0.00	0.00	0.00	14
4869	0.00	0.00	0.00	10
4870	0.00	0.00	0.00	11
4871	0.00	0.00	0.00	11
4872	0.00	0.00	0.00	13
4873	0.00	0.00	0.00	9
4874	0.00	0.00	0.00	8
4875	0.00	0.00	0.00	10
4876	0.00	0.00	0.00	8
4877	0.00	0.00	0.00	8
4878	0.00	0.00	0.00	14
4879	0.00	0.00	0.00	11
4880	0.00	0.00	0.00	5
4881	0.00	0.00	0.00	10
4882	0.00	0.00	0.00	9
4883	0.00	0.00	0.00	10
4884	0.00	0.00	0.00	15
4885	0.00	0.00	0.00	11
4886	0.00	0.00	0.00	18
4887	0.00	0.00	0.00	12
4888	0.00	0.00	0.00	13
4889	0.00	0.00	0.00	8
4890	0.00	0.00	0.00	4
4891	0.00	0.00	0.00	10
4892	0.00	0.00	0.00	14
4893	0.00	0.00	0.00	12
4894	0.00	0.00	0.00	9

4895	1.00	0.12	0.22	8
4896	0.00	0.00	0.00	11
4897	0.00	0.00	0.00	14
4898	0.00	0.00	0.00	12
4899	0.00	0.00	0.00	11
4900	0.00	0.00	0.00	12
4901	0.00	0.00	0.00	13
4902	0.00	0.00	0.00	12
4903	0.00	0.00	0.00	11
4904	0.00	0.00	0.00	10
4905	0.00	0.00	0.00	11
4906	0.00	0.00	0.00	8
4907	0.00	0.00	0.00	9
4908	0.00	0.00	0.00	7
4909	0.00	0.00	0.00	13
4910	0.00	0.00	0.00	10
4911	0.00	0.00	0.00	10
4912	0.00	0.00	0.00	9
4913	0.00	0.00	0.00	13
4914	0.00	0.00	0.00	14
4915	0.00	0.00	0.00	12
4916	0.00	0.00	0.00	6
4917	0.00	0.00	0.00	8
4918	0.00	0.00	0.00	6
4919	0.00	0.00	0.00	6
4920	0.00	0.00	0.00	15
4921	0.00	0.00	0.00	10
4922	0.00	0.00	0.00	12
4923	0.00	0.00	0.00	7
4924	0.00	0.00	0.00	16
4925	0.00	0.00	0.00	13
4926	0.00	0.00	0.00	10
4927	0.00	0.00	0.00	8
4928	0.00	0.00	0.00	10
4929	0.00	0.00	0.00	10
4930	0.00	0.00	0.00	12
4931	0.00	0.00	0.00	11
4932	0.00	0.00	0.00	10
4933	0.00	0.00	0.00	11
4934	0.00	0.00	0.00	7
4935	0.00	0.00	0.00	13
4936	0.00	0.00	0.00	10
4937	0.00	0.00	0.00	13
4938	0.00	0.00	0.00	17
4939	0.00	0.00	0.00	13
4940	0.00	0.00	0.00	15
4941	0.00	0.00	0.00	13
4942	0.00	0.00	0.00	15
4943	0.00	0.00	0.00	13
4944	0.00	0.00	0.00	10
4945	0.00	0.00	0.00	9
4946	0.00	0.00	0.00	13
4947	0.00	0.00	0.00	7
4948	0.00	0.00	0.00	10
4949	0.00	0.00	0.00	9
4950	0.00	0.00	0.00	13
4951	0.00	0.00	0.00	12

4952	0.00	0.00	0.00	8
4953	0.00	0.00	0.00	14
4954	0.00	0.00	0.00	11
4955	0.00	0.00	0.00	11
4956	0.00	0.00	0.00	11
4957	0.00	0.00	0.00	8
4958	0.00	0.00	0.00	8
4959	0.00	0.00	0.00	13
4960	0.00	0.00	0.00	9
4961	0.00	0.00	0.00	12
4962	0.00	0.00	0.00	8
4963	0.00	0.00	0.00	3
4964	0.00	0.00	0.00	8
4965	0.00	0.00	0.00	14
4966	0.00	0.00	0.00	9
4967	0.00	0.00	0.00	12
4968	0.00	0.00	0.00	8
4969	0.00	0.00	0.00	7
4970	0.00	0.00	0.00	11
4971	0.00	0.00	0.00	8
4972	0.00	0.00	0.00	13
4973	0.00	0.00	0.00	12
4974	0.00	0.00	0.00	9
4975	0.00	0.00	0.00	14
4976	0.00	0.00	0.00	12
4977	0.00	0.00	0.00	8
4978	0.00	0.00	0.00	16
4979	0.00	0.00	0.00	12
4980	0.00	0.00	0.00	6
4981	0.00	0.00	0.00	15
4982	0.00	0.00	0.00	4
4983	0.00	0.00	0.00	8
4984	0.00	0.00	0.00	9
4985	0.00	0.00	0.00	13
4986	0.00	0.00	0.00	14
4987	0.00	0.00	0.00	7
4988	0.00	0.00	0.00	12
4989	0.00	0.00	0.00	15
4990	0.00	0.00	0.00	9
4991	0.00	0.00	0.00	13
4992	0.00	0.00	0.00	10
4993	0.00	0.00	0.00	8
4994	0.00	0.00	0.00	10
4995	0.00	0.00	0.00	11
4996	0.00	0.00	0.00	10
4997	0.00	0.00	0.00	4
4998	0.00	0.00	0.00	13
4999	0.00	0.00	0.00	8
5000	0.00	0.00	0.00	11
5001	0.00	0.00	0.00	5
5002	0.00	0.00	0.00	9
5003	0.00	0.00	0.00	6
5004	0.00	0.00	0.00	10
5005	0.00	0.00	0.00	8
5006	0.00	0.00	0.00	15
5007	0.00	0.00	0.00	14
5008	1.00	0.12	0.22	8

5009	0.00	0.00	0.00	10
5010	0.00	0.00	0.00	11
5011	0.00	0.00	0.00	10
5012	0.00	0.00	0.00	11
5013	0.00	0.00	0.00	14
5014	0.00	0.00	0.00	8
5015	0.00	0.00	0.00	14
5016	0.00	0.00	0.00	14
5017	0.00	0.00	0.00	11
5018	0.00	0.00	0.00	9
5019	0.00	0.00	0.00	14
5020	0.00	0.00	0.00	10
5021	0.00	0.00	0.00	15
5022	0.00	0.00	0.00	11
5023	0.00	0.00	0.00	6
5024	0.00	0.00	0.00	14
5025	0.00	0.00	0.00	8
5026	0.00	0.00	0.00	14
5027	0.00	0.00	0.00	6
5028	0.00	0.00	0.00	13
5029	0.00	0.00	0.00	5
5030	0.00	0.00	0.00	15
5031	0.00	0.00	0.00	8
5032	0.00	0.00	0.00	12
5033	0.00	0.00	0.00	13
5034	0.00	0.00	0.00	8
5035	0.00	0.00	0.00	11
5036	0.00	0.00	0.00	11
5037	0.00	0.00	0.00	12
5038	0.00	0.00	0.00	12
5039	0.00	0.00	0.00	17
5040	0.00	0.00	0.00	8
5041	0.00	0.00	0.00	9
5042	0.00	0.00	0.00	9
5043	0.00	0.00	0.00	14
5044	0.00	0.00	0.00	11
5045	0.00	0.00	0.00	9
5046	0.00	0.00	0.00	10
5047	0.00	0.00	0.00	10
5048	0.00	0.00	0.00	7
5049	0.00	0.00	0.00	9
5050	0.00	0.00	0.00	5
5051	0.00	0.00	0.00	10
5052	0.00	0.00	0.00	10
5053	0.00	0.00	0.00	14
5054	0.00	0.00	0.00	13
5055	0.00	0.00	0.00	7
5056	0.00	0.00	0.00	15
5057	0.00	0.00	0.00	8
5058	0.00	0.00	0.00	11
5059	0.00	0.00	0.00	9
5060	0.00	0.00	0.00	13
5061	0.00	0.00	0.00	13
5062	0.00	0.00	0.00	7
5063	0.00	0.00	0.00	14
5064	0.00	0.00	0.00	8
5065	0.00	0.00	0.00	6



5066	0.00	0.00	0.00	7
5067	0.00	0.00	0.00	10
5068	0.00	0.00	0.00	12
5069	0.00	0.00	0.00	9
5070	0.00	0.00	0.00	11
5071	0.00	0.00	0.00	8
5072	0.00	0.00	0.00	4
5073	0.00	0.00	0.00	14
5074	0.00	0.00	0.00	11
5075	0.00	0.00	0.00	14
5076	0.00	0.00	0.00	7
5077	0.00	0.00	0.00	10
5078	0.00	0.00	0.00	11
5079	0.00	0.00	0.00	10
5080	0.00	0.00	0.00	13
5081	0.00	0.00	0.00	12
5082	0.00	0.00	0.00	8
5083	0.00	0.00	0.00	15
5084	0.00	0.00	0.00	15
5085	0.00	0.00	0.00	11
5086	0.00	0.00	0.00	12
5087	0.00	0.00	0.00	9
5088	0.00	0.00	0.00	4
5089	0.00	0.00	0.00	8
5090	0.00	0.00	0.00	11
5091	0.00	0.00	0.00	6
5092	0.00	0.00	0.00	9
5093	0.00	0.00	0.00	10
5094	0.00	0.00	0.00	18
5095	0.00	0.00	0.00	6
5096	0.00	0.00	0.00	12
5097	0.00	0.00	0.00	9
5098	0.00	0.00	0.00	11
5099	0.00	0.00	0.00	7
5100	0.00	0.00	0.00	12
5101	0.00	0.00	0.00	7
5102	0.00	0.00	0.00	5
5103	0.00	0.00	0.00	11
5104	0.00	0.00	0.00	13
5105	0.00	0.00	0.00	10
5106	0.00	0.00	0.00	12
5107	0.00	0.00	0.00	7
5108	0.00	0.00	0.00	14
5109	0.00	0.00	0.00	11
5110	0.00	0.00	0.00	8
5111	0.00	0.00	0.00	10
5112	0.00	0.00	0.00	10
5113	0.00	0.00	0.00	9
5114	0.00	0.00	0.00	13
5115	0.00	0.00	0.00	8
5116	0.00	0.00	0.00	10
5117	0.00	0.00	0.00	8
5118	0.00	0.00	0.00	12
5119	0.00	0.00	0.00	8
5120	0.00	0.00	0.00	7
5121	0.00	0.00	0.00	12
5122	0.00	0.00	0.00	9

5123	0.00	0.00	0.00	9
5124	0.00	0.00	0.00	8
5125	0.00	0.00	0.00	8
5126	0.00	0.00	0.00	8
5127	0.00	0.00	0.00	13
5128	0.00	0.00	0.00	8
5129	0.00	0.00	0.00	9
5130	0.00	0.00	0.00	8
5131	0.00	0.00	0.00	10
5132	0.00	0.00	0.00	11
5133	0.00	0.00	0.00	11
5134	0.00	0.00	0.00	6
5135	0.00	0.00	0.00	11
5136	0.00	0.00	0.00	11
5137	0.00	0.00	0.00	12
5138	0.00	0.00	0.00	8
5139	0.00	0.00	0.00	10
5140	0.00	0.00	0.00	10
5141	0.00	0.00	0.00	10
5142	0.00	0.00	0.00	10
5143	0.00	0.00	0.00	5
5144	0.00	0.00	0.00	13
5145	0.00	0.00	0.00	11
5146	0.00	0.00	0.00	12
5147	0.00	0.00	0.00	9
5148	0.00	0.00	0.00	12
5149	0.00	0.00	0.00	8
5150	0.00	0.00	0.00	11
5151	0.00	0.00	0.00	10
5152	0.00	0.00	0.00	12
5153	0.00	0.00	0.00	12
5154	0.00	0.00	0.00	10
5155	0.00	0.00	0.00	10
5156	0.00	0.00	0.00	9
5157	0.00	0.00	0.00	13
5158	0.00	0.00	0.00	10
5159	0.00	0.00	0.00	6
5160	0.00	0.00	0.00	10
5161	0.00	0.00	0.00	12
5162	0.00	0.00	0.00	8
5163	0.00	0.00	0.00	10
5164	0.00	0.00	0.00	9
5165	0.00	0.00	0.00	11
5166	0.00	0.00	0.00	8
5167	0.00	0.00	0.00	9
5168	0.00	0.00	0.00	9
5169	0.00	0.00	0.00	8
5170	0.00	0.00	0.00	12
5171	0.00	0.00	0.00	6
5172	0.00	0.00	0.00	13
5173	0.00	0.00	0.00	11
5174	0.00	0.00	0.00	7
5175	0.00	0.00	0.00	7
5176	0.00	0.00	0.00	15
5177	0.00	0.00	0.00	10
5178	0.00	0.00	0.00	9
5179	0.00	0.00	0.00	7

5180	0.00	0.00	0.00	7
5181	0.00	0.00	0.00	11
5182	0.00	0.00	0.00	5
5183	0.00	0.00	0.00	17
5184	0.00	0.00	0.00	4
5185	0.00	0.00	0.00	7
5186	0.00	0.00	0.00	7
5187	0.00	0.00	0.00	10
5188	0.00	0.00	0.00	11
5189	0.00	0.00	0.00	13
5190	1.00	0.10	0.18	10
5191	0.00	0.00	0.00	8
5192	0.00	0.00	0.00	14
5193	0.00	0.00	0.00	12
5194	0.00	0.00	0.00	18
5195	0.00	0.00	0.00	10
5196	0.00	0.00	0.00	8
5197	0.00	0.00	0.00	8
5198	0.00	0.00	0.00	8
5199	0.00	0.00	0.00	11
5200	0.00	0.00	0.00	14
5201	0.00	0.00	0.00	12
5202	0.00	0.00	0.00	14
5203	0.00	0.00	0.00	13
5204	0.00	0.00	0.00	8
5205	0.00	0.00	0.00	10
5206	0.00	0.00	0.00	16
5207	0.00	0.00	0.00	9
5208	0.00	0.00	0.00	6
5209	0.00	0.00	0.00	8
5210	0.00	0.00	0.00	11
5211	0.00	0.00	0.00	11
5212	0.00	0.00	0.00	14
5213	0.00	0.00	0.00	6
5214	0.00	0.00	0.00	8
5215	0.00	0.00	0.00	11
5216	0.00	0.00	0.00	11
5217	0.00	0.00	0.00	9
5218	0.00	0.00	0.00	9
5219	0.00	0.00	0.00	10
5220	0.00	0.00	0.00	10
5221	0.00	0.00	0.00	10
5222	0.00	0.00	0.00	8
5223	0.00	0.00	0.00	8
5224	0.00	0.00	0.00	7
5225	0.00	0.00	0.00	7
5226	0.00	0.00	0.00	8
5227	0.00	0.00	0.00	13
5228	0.00	0.00	0.00	7
5229	0.00	0.00	0.00	6
5230	0.00	0.00	0.00	7
5231	0.00	0.00	0.00	10
5232	0.00	0.00	0.00	7
5233	0.00	0.00	0.00	9
5234	0.00	0.00	0.00	5
5235	0.00	0.00	0.00	1
5236	0.00	0.00	0.00	16

5237	0.00	0.00	0.00	7
5238	0.00	0.00	0.00	10
5239	0.00	0.00	0.00	14
5240	0.00	0.00	0.00	8
5241	0.00	0.00	0.00	8
5242	0.00	0.00	0.00	8
5243	0.00	0.00	0.00	5
5244	0.00	0.00	0.00	11
5245	0.00	0.00	0.00	8
5246	0.00	0.00	0.00	11
5247	0.00	0.00	0.00	11
5248	0.00	0.00	0.00	10
5249	0.00	0.00	0.00	13
5250	0.00	0.00	0.00	10
5251	0.00	0.00	0.00	12
5252	0.00	0.00	0.00	11
5253	0.00	0.00	0.00	12
5254	0.00	0.00	0.00	12
5255	0.00	0.00	0.00	10
5256	0.00	0.00	0.00	12
5257	0.00	0.00	0.00	11
5258	0.00	0.00	0.00	10
5259	0.00	0.00	0.00	8
5260	0.00	0.00	0.00	11
5261	0.00	0.00	0.00	10
5262	0.00	0.00	0.00	9
5263	0.00	0.00	0.00	10
5264	0.00	0.00	0.00	12
5265	1.00	0.09	0.17	11
5266	0.00	0.00	0.00	8
5267	0.00	0.00	0.00	12
5268	0.00	0.00	0.00	7
5269	0.00	0.00	0.00	9
5270	0.00	0.00	0.00	11
5271	0.00	0.00	0.00	9
5272	0.00	0.00	0.00	11
5273	0.00	0.00	0.00	7
5274	0.00	0.00	0.00	11
5275	0.00	0.00	0.00	11
5276	0.00	0.00	0.00	9
5277	0.00	0.00	0.00	7
5278	0.00	0.00	0.00	7
5279	0.00	0.00	0.00	8
5280	0.00	0.00	0.00	5
5281	0.00	0.00	0.00	8
5282	0.00	0.00	0.00	8
5283	0.00	0.00	0.00	13
5284	0.00	0.00	0.00	11
5285	0.00	0.00	0.00	6
5286	0.00	0.00	0.00	13
5287	0.00	0.00	0.00	15
5288	0.00	0.00	0.00	7
5289	0.00	0.00	0.00	8
5290	0.00	0.00	0.00	6
5291	0.00	0.00	0.00	9
5292	0.00	0.00	0.00	6
5293	0.00	0.00	0.00	9

5294	0.00	0.00	0.00	13
5295	0.00	0.00	0.00	11
5296	0.00	0.00	0.00	10
5297	0.00	0.00	0.00	13
5298	0.00	0.00	0.00	14
5299	0.00	0.00	0.00	10
5300	0.00	0.00	0.00	14
5301	0.00	0.00	0.00	11
5302	0.00	0.00	0.00	6
5303	0.00	0.00	0.00	6
5304	0.00	0.00	0.00	7
5305	0.00	0.00	0.00	9
5306	0.00	0.00	0.00	6
5307	0.00	0.00	0.00	10
5308	0.00	0.00	0.00	11
5309	0.00	0.00	0.00	11
5310	0.00	0.00	0.00	14
5311	0.00	0.00	0.00	10
5312	0.00	0.00	0.00	11
5313	0.00	0.00	0.00	11
5314	0.00	0.00	0.00	11
5315	0.00	0.00	0.00	11
5316	0.00	0.00	0.00	2
5317	0.00	0.00	0.00	5
5318	0.00	0.00	0.00	11
5319	0.00	0.00	0.00	12
5320	0.00	0.00	0.00	7
5321	0.00	0.00	0.00	7
5322	0.00	0.00	0.00	9
5323	0.00	0.00	0.00	9
5324	0.00	0.00	0.00	8
5325	0.00	0.00	0.00	10
5326	0.00	0.00	0.00	3
5327	0.00	0.00	0.00	13
5328	0.00	0.00	0.00	13
5329	0.00	0.00	0.00	7
5330	0.00	0.00	0.00	8
5331	0.00	0.00	0.00	9
5332	0.00	0.00	0.00	8
5333	0.00	0.00	0.00	11
5334	0.00	0.00	0.00	11
5335	0.00	0.00	0.00	6
5336	0.00	0.00	0.00	6
5337	0.00	0.00	0.00	6
5338	0.00	0.00	0.00	11
5339	0.00	0.00	0.00	12
5340	0.00	0.00	0.00	9
5341	0.00	0.00	0.00	8
5342	0.00	0.00	0.00	8
5343	0.00	0.00	0.00	7
5344	0.00	0.00	0.00	5
5345	0.00	0.00	0.00	11
5346	0.00	0.00	0.00	13
5347	0.00	0.00	0.00	10
5348	0.00	0.00	0.00	11
5349	0.00	0.00	0.00	7
5350	0.00	0.00	0.00	10

5351	0.00	0.00	0.00	7
5352	0.00	0.00	0.00	7
5353	0.00	0.00	0.00	11
5354	0.00	0.00	0.00	12
5355	0.00	0.00	0.00	12
5356	0.00	0.00	0.00	10
5357	0.00	0.00	0.00	9
5358	0.00	0.00	0.00	8
5359	0.00	0.00	0.00	7
5360	0.00	0.00	0.00	10
5361	0.00	0.00	0.00	6
5362	0.00	0.00	0.00	6
5363	0.00	0.00	0.00	9
5364	0.00	0.00	0.00	9
5365	0.00	0.00	0.00	17
5366	0.00	0.00	0.00	8
5367	0.00	0.00	0.00	9
5368	0.00	0.00	0.00	8
5369	0.00	0.00	0.00	8
5370	0.00	0.00	0.00	18
5371	0.00	0.00	0.00	14
5372	0.00	0.00	0.00	10
5373	0.00	0.00	0.00	7
5374	0.00	0.00	0.00	6
5375	0.00	0.00	0.00	12
5376	0.00	0.00	0.00	13
5377	0.00	0.00	0.00	9
5378	0.00	0.00	0.00	10
5379	0.00	0.00	0.00	10
5380	0.00	0.00	0.00	9
5381	0.00	0.00	0.00	7
5382	0.00	0.00	0.00	10
5383	0.00	0.00	0.00	9
5384	0.00	0.00	0.00	12
5385	0.00	0.00	0.00	15
5386	0.00	0.00	0.00	7
5387	0.00	0.00	0.00	8
5388	0.00	0.00	0.00	4
5389	0.00	0.00	0.00	7
5390	0.00	0.00	0.00	8
5391	0.00	0.00	0.00	4
5392	0.00	0.00	0.00	10
5393	0.00	0.00	0.00	7
5394	0.00	0.00	0.00	8
5395	0.00	0.00	0.00	16
5396	0.00	0.00	0.00	13
5397	0.00	0.00	0.00	11
5398	0.00	0.00	0.00	5
5399	0.00	0.00	0.00	5
5400	0.00	0.00	0.00	12
5401	0.00	0.00	0.00	7
5402	0.00	0.00	0.00	5
5403	0.00	0.00	0.00	12
5404	0.00	0.00	0.00	5
5405	0.00	0.00	0.00	10
5406	0.00	0.00	0.00	7
5407	0.00	0.00	0.00	12

5408	0.00	0.00	0.00	9
5409	0.00	0.00	0.00	9
5410	0.00	0.00	0.00	8
5411	0.00	0.00	0.00	6
5412	0.00	0.00	0.00	8
5413	0.00	0.00	0.00	6
5414	0.00	0.00	0.00	8
5415	0.00	0.00	0.00	16
5416	0.00	0.00	0.00	9
5417	0.00	0.00	0.00	11
5418	0.00	0.00	0.00	9
5419	0.00	0.00	0.00	14
5420	0.00	0.00	0.00	6
5421	0.00	0.00	0.00	11
5422	0.00	0.00	0.00	12
5423	0.00	0.00	0.00	8
5424	0.00	0.00	0.00	13
5425	0.00	0.00	0.00	4
5426	0.00	0.00	0.00	10
5427	0.00	0.00	0.00	9
5428	0.00	0.00	0.00	12
5429	0.00	0.00	0.00	11
5430	0.00	0.00	0.00	9
5431	0.00	0.00	0.00	15
5432	0.00	0.00	0.00	12
5433	0.00	0.00	0.00	8
5434	0.00	0.00	0.00	6
5435	0.00	0.00	0.00	12
5436	0.00	0.00	0.00	11
5437	0.00	0.00	0.00	10
5438	0.00	0.00	0.00	7
5439	0.00	0.00	0.00	9
5440	0.00	0.00	0.00	12
5441	0.00	0.00	0.00	10
5442	0.00	0.00	0.00	7
5443	0.00	0.00	0.00	12
5444	0.00	0.00	0.00	7
5445	0.00	0.00	0.00	9
5446	0.00	0.00	0.00	7
5447	0.00	0.00	0.00	6
5448	0.00	0.00	0.00	12
5449	0.00	0.00	0.00	9
5450	0.00	0.00	0.00	10
5451	0.00	0.00	0.00	6
5452	0.00	0.00	0.00	11
5453	0.00	0.00	0.00	7
5454	0.00	0.00	0.00	9
5455	0.00	0.00	0.00	11
5456	0.00	0.00	0.00	7
5457	0.00	0.00	0.00	9
5458	0.00	0.00	0.00	8
5459	0.00	0.00	0.00	11
5460	0.00	0.00	0.00	7
5461	0.00	0.00	0.00	11
5462	0.00	0.00	0.00	10
5463	0.00	0.00	0.00	9
5464	0.00	0.00	0.00	9

5465	0.00	0.00	0.00	7
5466	0.00	0.00	0.00	9
5467	0.00	0.00	0.00	14
5468	0.00	0.00	0.00	9
5469	0.00	0.00	0.00	12
5470	0.00	0.00	0.00	11
5471	0.00	0.00	0.00	8
5472	0.00	0.00	0.00	15
5473	0.00	0.00	0.00	4
5474	0.00	0.00	0.00	8
5475	0.00	0.00	0.00	9
5476	0.00	0.00	0.00	11
5477	0.00	0.00	0.00	8
5478	0.00	0.00	0.00	6
5479	0.00	0.00	0.00	7
5480	0.00	0.00	0.00	7
5481	0.00	0.00	0.00	10
5482	0.00	0.00	0.00	12
5483	0.00	0.00	0.00	6
5484	0.00	0.00	0.00	9
5485	0.00	0.00	0.00	8
5486	0.00	0.00	0.00	8
5487	0.00	0.00	0.00	9
5488	0.00	0.00	0.00	7
5489	0.00	0.00	0.00	10
5490	0.00	0.00	0.00	12
5491	0.00	0.00	0.00	6
5492	0.00	0.00	0.00	8
5493	0.00	0.00	0.00	13
5494	0.00	0.00	0.00	6
5495	0.00	0.00	0.00	10
5496	0.00	0.00	0.00	7
5497	0.00	0.00	0.00	9
5498	0.00	0.00	0.00	6
5499	0.00	0.00	0.00	13
avg / total	0.53	0.26	0.33	530065

```
In [0]: from sklearn.externals import joblib
joblib.dump(classifier, 'lr_with_equal_weight.pkl')
```

## 4.5 Modeling with less data points (0.5M data points) and more weight to title and 500 tags only.

```
In [0]: sql_create_table = """CREATE TABLE IF NOT EXISTS QuestionsProcessed (question
      text NOT NULL, code text, tags text, words_pre integer, words_post integer, i
      s_code integer);"""
create_database_table("Titlemoreweight.db", sql_create_table)
```

Tables in the databse:  
QuestionsProcessed



```

In [0]: # http://www.sqlitetutorial.net/sqlite-delete/
# https://stackoverflow.com/questions/2279706/select-random-row-from-a-sqlite-table

read_db = "train_no_dup.db"
write_db = "Titlemoreweight.db"
train_datasize = 400000
if os.path.isfile(read_db):
    conn_r = create_connection(read_db)
    if conn_r is not None:
        reader = conn_r.cursor()
        # for selecting first 0.5M rows
        reader.execute("SELECT Title, Body, Tags From no_dup_train LIMIT 50000
1;")
        # for selecting random points
        #reader.execute("SELECT Title, Body, Tags From no_dup_train ORDER BY R
ANDOM() LIMIT 500001;")

if os.path.isfile(write_db):
    conn_w = create_connection(write_db)
    if conn_w is not None:
        tables = checkTableExists(conn_w)
        writer = conn_w.cursor()
        if tables != 0:
            writer.execute("DELETE FROM QuestionsProcessed WHERE 1")
            print("Cleared All the rows")

```

### 4.5.1 Preprocessing of questions

1. Separate Code from Body
2. Remove Special characters from Question title and description (not in code)
3. **Give more weightage to title : Add title three times to the question**
4. Remove stop words (Except 'C')
5. Remove HTML Tags
6. Convert all the characters into small letters
7. Use SnowballStemmer to stem the words

```

In [0]: #http://www.bernzilla.com/2008/05/13/selecting-a-random-row-from-an-sqlite-tab
        le/
        start = datetime.now()
        preprocessed_data_list=[]
        reader.fetchone()
        questions_with_code=0
        len_pre=0
        len_post=0
        questions_proccesed = 0
        for row in reader:

            is_code = 0

            title, question, tags = row[0], row[1], str(row[2])

            if '<code>' in question:
                questions_with_code+=1
                is_code = 1
            x = len(question)+len(title)
            len_pre+=x

            code = str(re.findall(r'<code>(.*?)</code>', question, flags=re.DOTALL))

            question=re.sub('<code>(.*?)</code>', '', question, flags=re.MULTILINE|re.
            DOTALL)
            question=stripthtml(question.encode('utf-8'))

            title=title.encode('utf-8')

            # adding title three time to the data to increase its weight
            # add tags string to the training data

            question=str(title)+" "+str(title)+" "+str(title)+" "+question

            # if questions_proccesed<=train_datasize:
            #     question=str(title)+" "+str(title)+" "+str(title)+" "+question+" "+s
            tr(tags)
            # else:
            #     question=str(title)+" "+str(title)+" "+str(title)+" "+question

            question=re.sub(r'^A-Za-z0-9#+.\-]+', ' ',question)
            words=word_tokenize(str(question.lower()))

            #Removing all single letter and and stopwords from question exceptt for th
            e letter 'c'
            question=' '.join(str(stemmer.stem(j)) for j in words if j not in stop_wor
            ds and (len(j)!=1 or j=='c'))

            len_post+=len(question)
            tup = (question,code,tags,x,len(question),is_code)
            questions_proccesed += 1
            writer.execute("insert into QuestionsProcessed(question,code,tags,words_pr
            e,words_post,is_code) values (?,?,?,?,?,?)",tup)
            if (questions_proccesed%100000==0):
                print("number of questions completed=",questions_proccesed)

```

```

no_dup_avg_len_pre=(len_pre*1.0)/questions_proccesed
no_dup_avg_len_post=(len_post*1.0)/questions_proccesed

print( "Avg. length of questions(Title+Body) before processing: %d"%no_dup_avg_
_len_pre)
print( "Avg. length of questions(Title+Body) after processing: %d"%no_dup_avg_
_len_post)
print ("Percent of questions containing code: %d"%((questions_with_code*100.0)
/questions_proccesed))

print("Time taken to run this cell :", datetime.now() - start)

number of questions completed= 100000
number of questions completed= 200000
number of questions completed= 300000
number of questions completed= 400000
number of questions completed= 500000
Avg. length of questions(Title+Body) before processing: 1239
Avg. length of questions(Title+Body) after processing: 424
Percent of questions containing code: 57
Time taken to run this cell : 0:23:12.329039

```

```

In [0]: # never forget to close the conections or else we will end up with database Lo
cks
conn_r.commit()
conn_w.commit()
conn_r.close()
conn_w.close()

```

### Sample quesitons after preprocessing of data

```
In [0]: if os.path.isfile(write_db):
        conn_r = create_connection(write_db)
        if conn_r is not None:
            reader = conn_r.cursor()
            reader.execute("SELECT question From QuestionsProcessed LIMIT 10")
            print("Questions after preprocessed")
            print('='*100)
            reader.fetchone()
            for row in reader:
                print(row)
                print('-'*100)
        conn_r.commit()
        conn_r.close()
```

## Questions after preprocessed

```

=====
('dynam datagrid bind silverlight dynam datagrid bind silverlight dynam datag
rid bind silverlight bind datagrid dynam code wrote code debug code block see
m bind correct grid come column form come grid column although necessari bind
nthank repli advance..',)
-----

('java.lang.noclassdeffounderror javax servlet jsp tagext taglibraryvalid jav
a.lang.noclassdeffounderror javax servlet jsp tagext taglibraryvalid java.lan
g.noclassdeffounderror javax servlet jsp tagext taglibraryvalid follow guid l
ink instal jstl got follow error tri launch jsp page java.lang.noclassdeffoun
derror javax servlet jsp tagext taglibraryvalid taglib declar instal jstl 1.1
tomcat webapp tri project work also tri version 1.2 jstl still messag caus so
lv',)
-----

('java.sql.sqlexcept microsoft odbc driver manag invalid descriptor index jav
a.sql.sqlexcept microsoft odbc driver manag invalid descriptor index java.sq
l.sqlexcept microsoft odbc driver manag invalid descriptor index use follow c
ode display caus solv',)
-----

('better way updat feed fb php sdk better way updat feed fb php sdk better wa
y updat feed fb php sdk novic facebook api read mani tutori still confused.i
find post feed api method like correct second way use curl someth like way be
tter',)
-----

('btnadd click event open two window record ad btnadd click event open two wi
ndow record ad btnadd click event open two window record ad open window searc
h.aspx use code hav add button search.aspx nwhen insert record btnadd click e
vent open anoth window nafter insert record close window',)
-----

('sql inject issu prevent correct form submiss php sql inject issu prevent co
rrect form submiss php sql inject issu prevent correct form submiss php check
everyth think make sure input field safe type sql inject good news safe bad n
ews one tag mess form submiss place even touch life figur exact html use temp
lat file forgiv okay entir php script get execut see data post none forum fie
ld post problem use someth titl field none data get post current use print po
st see submit noth work flawless statement though also mention script work fl
awless local machin use host come across problem state list input test mes
s',)
-----

('countabl subaddit lebesgu measur countabl subaddit lebesgu measur countabl
subaddit lebesgu measur let lbrace rbrace sequenc set sigma -algebra mathcal
want show left bigcup right leq sum left right countabl addit measur defin se
t sigma algebra mathcal think use monoton properti somewher proof start appre
ci littl help nthank ad han answer make follow addit construct given han answ
er clear bigcup bigcup cap emptyset neq left bigcup right left bigcup right s
um left right also construct subset monoton left right leq left right final w
ould sum leq sum result follow',)
-----

```

```
('hql equival sql queri hql equival sql queri hql equival sql queri hql queri
replac name class properti name error occur hql error',)
-----
-----
```

```
('undefin symbol architectur i386 objc class skpsmtpmessag referenc error und
efin symbol architectur i386 objc class skpsmtpmessag referenc error undefin
symbol architectur i386 objc class skpsmtpmessag referenc error import framew
ork send email applic background import framework i.e skpsmtpmessag somebodi
suggest get error collect2 ld return exit status import framework correct sor
c taken framework follow mfmailcomposeviewcontrol question lock field updat a
nswer drag drop folder project click copi nthat',)
-----
-----
```

## Saving Preprocessed data to a Database

```
In [0]: #Taking 0.5 Million entries to a dataframe.
write_db = "Titlemoreweight.db"
if os.path.isfile(write_db):
    conn_r = create_connection(write_db)
    if conn_r is not None:
        preprocessed_data = pd.read_sql_query("""SELECT question, Tags FROM Qu
estionsProcessed LIMIT 50000""", conn_r)
    conn_r.commit()
    conn_r.close()
```

```
In [17]: preprocessed_data.head()
```

Out[17]:

	question	tags
0	dynam datagrid bind silverlight dynam datagrid...	c# silverlight data-binding
1	dynam datagrid bind silverlight dynam datagrid...	c# silverlight data-binding columns
2	java.lang.noclassdeffounderror javax servlet j...	jsp jstl
3	java.sql.sqlexcept microsoft odbc driver manag...	java jdbc
4	better way updat feed fb php sdk better way up...	facebook api facebook-php-sdk

```
In [18]: print("number of data points in sample :", preprocessed_data.shape[0])
print("number of dimensions :", preprocessed_data.shape[1])
```

```
number of data points in sample : 50000
number of dimensions : 2
```

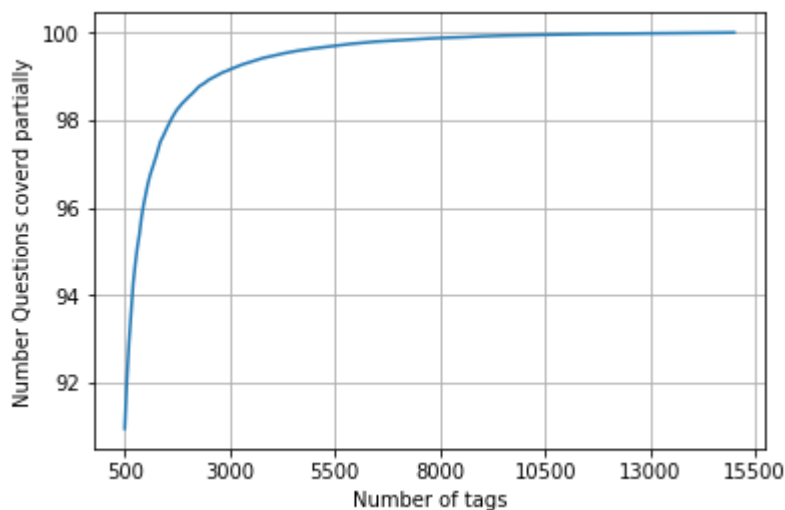
## Converting string Tags to multilable output variables

```
In [0]: vectorizer = CountVectorizer(tokenizer = lambda x: x.split(), binary='true')
multilabel_y = vectorizer.fit_transform(preprocessed_data['tags'])
```

## Selecting 500 Tags

```
In [0]: questions_explained = []
total_tags=multilabel_y.shape[1]
total_qs=preprocessed_data.shape[0]
for i in range(500, total_tags, 100):
    questions_explained.append(np.round(((total_qs-questions_explained_fn(i))/
total_qs)*100,3))
```

```
In [0]: fig, ax = plt.subplots()
ax.plot(questions_explained)
xlabel = list(500+np.array(range(-50,450,50))*50)
ax.set_xticklabels(xlabel)
plt.xlabel("Number of tags")
plt.ylabel("Number Questions covered partially")
plt.grid()
plt.show()
# you can choose any number of tags based on your computing power, minimum is 500(it covers 90% of the tags)
print("with ",5500,"tags we are covering ",questions_explained[50],"% of questions")
print("with ",500,"tags we are covering ",questions_explained[0],"% of questions")
```



with 5500 tags we are covering 99.157 % of questions

with 500 tags we are covering 90.956 % of questions

```
In [21]: # we will be taking 500 tags
multilabel_yx = tags_to_choose(500)
print("number of questions that are not covered :", questions_explained_fn(500),
      "out of ", total_qs)
```

number of questions that are not covered : 3933 out of 50000

```
In [0]: total_size=preprocessed_data.shape[0]
train_size=int(0.80*total_size)

x_train=preprocessed_data.head(train_size)
x_test=preprocessed_data.tail(preprocessed_data.shape[0] - train_size)

y_train = multilabel_yx[0:train_size,:]
y_test = multilabel_yx[train_size:preprocessed_data.shape[0],:]
```

```
In [23]: print("Number of data points in train data :", y_train.shape)
print("Number of data points in test data :", y_test.shape)
```

```
Number of data points in train data : (40000, 500)
Number of data points in test data : (10000, 500)
```

## 4.5.2 Featurizing data with Tfidf vectorizer

```
In [0]: start = datetime.now()
vectorizer = TfidfVectorizer(min_df=0.00009, max_features=200000, smooth_idf=True, norm="l2", \
                             tokenizer = lambda x: x.split(), sublinear_tf=False, ngram_range=(1,3))
x_train_multilabel = vectorizer.fit_transform(x_train['question'])
x_test_multilabel = vectorizer.transform(x_test['question'])
print("Time taken to run this cell :", datetime.now() - start)
```

```
Time taken to run this cell : 0:04:24.480370
```

```
In [0]: print("Dimensions of train data X:",x_train_multilabel.shape, "Y :",y_train.shape)
print("Dimensions of test data X:",x_test_multilabel.shape,"Y:",y_test.shape)
```

## 4.5.3 Applying Logistic Regression with OneVsRest Classifier



```
In [0]: start = datetime.now()
classifier = OneVsRestClassifier(SGDClassifier(loss='log', alpha=0.00001, penalty='l1'), n_jobs=-1)
classifier.fit(x_train_multilabel, y_train)
predictions = classifier.predict (x_test_multilabel)

print("Accuracy :",metrics.accuracy_score(y_test, predictions))
print("Hamming loss ",metrics.hamming_loss(y_test,predictions))

precision = precision_score(y_test, predictions, average='micro')
recall = recall_score(y_test, predictions, average='micro')
f1 = f1_score(y_test, predictions, average='micro')

print("Micro-average quality numbers")
print("Precision: {:.4f}, Recall: {:.4f}, F1-measure: {:.4f}".format(precision
, recall, f1))

precision = precision_score(y_test, predictions, average='macro')
recall = recall_score(y_test, predictions, average='macro')
f1 = f1_score(y_test, predictions, average='macro')

print("Macro-average quality numbers")
print("Precision: {:.4f}, Recall: {:.4f}, F1-measure: {:.4f}".format(precision
, recall, f1))

print (metrics.classification_report(y_test, predictions))
print("Time taken to run this cell :", datetime.now() - start)
```

Accuracy : 0.23623

Hamming loss 0.00278088

Micro-average quality numbers

Precision: 0.7216, Recall: 0.3256, F1-measure: 0.4488

Macro-average quality numbers

Precision: 0.5473, Recall: 0.2572, F1-measure: 0.3339

	precision	recall	f1-score	support
0	0.94	0.64	0.76	5519
1	0.69	0.26	0.38	8190
2	0.81	0.37	0.51	6529
3	0.81	0.43	0.56	3231
4	0.81	0.40	0.54	6430
5	0.82	0.33	0.47	2879
6	0.87	0.50	0.63	5086
7	0.87	0.54	0.67	4533
8	0.60	0.13	0.22	3000
9	0.81	0.53	0.64	2765
10	0.59	0.17	0.26	3051
11	0.70	0.33	0.45	3009
12	0.64	0.24	0.35	2630
13	0.71	0.23	0.35	1426
14	0.90	0.53	0.67	2548
15	0.66	0.18	0.28	2371
16	0.65	0.23	0.34	873
17	0.89	0.61	0.72	2151
18	0.62	0.23	0.33	2204
19	0.71	0.40	0.51	831
20	0.77	0.41	0.53	1860
21	0.27	0.07	0.11	2023
22	0.49	0.23	0.31	1513
23	0.91	0.49	0.64	1207
24	0.56	0.29	0.38	506
25	0.68	0.30	0.42	425
26	0.65	0.40	0.49	793
27	0.60	0.32	0.42	1291
28	0.75	0.36	0.48	1208
29	0.42	0.09	0.15	406
30	0.75	0.18	0.29	504
31	0.29	0.10	0.14	732
32	0.59	0.24	0.35	441
33	0.56	0.18	0.27	1645
34	0.71	0.25	0.37	1058
35	0.83	0.54	0.66	946
36	0.69	0.21	0.32	644
37	0.96	0.68	0.79	136
38	0.64	0.37	0.47	570
39	0.85	0.29	0.43	766
40	0.62	0.28	0.38	1132
41	0.46	0.19	0.27	174
42	0.81	0.51	0.63	210
43	0.80	0.41	0.54	433
44	0.66	0.50	0.57	626
45	0.75	0.32	0.45	852
46	0.75	0.42	0.54	534
47	0.34	0.14	0.20	350
48	0.74	0.51	0.60	496

49	0.79	0.62	0.70	785
50	0.16	0.04	0.06	475
51	0.33	0.10	0.15	305
52	0.50	0.04	0.07	251
53	0.68	0.40	0.50	914
54	0.45	0.16	0.23	728
55	0.31	0.02	0.03	258
56	0.46	0.19	0.27	821
57	0.47	0.09	0.15	541
58	0.78	0.27	0.41	748
59	0.94	0.62	0.75	724
60	0.34	0.07	0.12	660
61	0.83	0.19	0.31	235
62	0.91	0.71	0.80	718
63	0.83	0.63	0.71	468
64	0.55	0.33	0.41	191
65	0.36	0.11	0.17	429
66	0.29	0.05	0.08	415
67	0.76	0.49	0.60	274
68	0.82	0.52	0.64	510
69	0.67	0.45	0.54	466
70	0.30	0.06	0.10	305
71	0.49	0.15	0.23	247
72	0.79	0.47	0.59	401
73	0.98	0.73	0.84	86
74	0.73	0.36	0.48	120
75	0.89	0.68	0.77	129
76	0.50	0.00	0.01	473
77	0.36	0.25	0.30	143
78	0.79	0.44	0.57	347
79	0.72	0.23	0.35	479
80	0.53	0.30	0.39	279
81	0.78	0.18	0.29	461
82	0.16	0.01	0.02	298
83	0.77	0.45	0.56	396
84	0.55	0.33	0.41	184
85	0.67	0.21	0.32	573
86	0.48	0.05	0.09	325
87	0.48	0.27	0.35	273
88	0.43	0.21	0.28	135
89	0.28	0.06	0.10	232
90	0.55	0.30	0.39	409
91	0.63	0.25	0.36	420
92	0.76	0.53	0.63	408
93	0.69	0.49	0.58	241
94	0.31	0.04	0.07	211
95	0.34	0.08	0.12	277
96	0.26	0.03	0.05	410
97	0.90	0.33	0.48	501
98	0.76	0.57	0.65	136
99	0.54	0.31	0.40	239
100	0.55	0.13	0.21	324
101	0.93	0.59	0.72	277
102	0.92	0.70	0.79	613
103	0.48	0.17	0.25	157
104	0.21	0.05	0.09	295
105	0.84	0.34	0.49	334

106	0.77	0.12	0.21	335
107	0.75	0.50	0.60	389
108	0.58	0.24	0.34	251
109	0.54	0.40	0.46	317
110	0.78	0.07	0.14	187
111	0.54	0.10	0.17	140
112	0.56	0.24	0.34	154
113	0.64	0.18	0.28	332
114	0.44	0.27	0.33	323
115	0.47	0.22	0.30	344
116	0.77	0.49	0.60	370
117	0.57	0.22	0.32	313
118	0.78	0.68	0.73	874
119	0.50	0.21	0.29	293
120	0.00	0.00	0.00	200
121	0.77	0.48	0.59	463
122	0.40	0.10	0.16	119
123	0.75	0.01	0.02	256
124	0.91	0.70	0.79	195
125	0.40	0.12	0.18	138
126	0.79	0.49	0.60	376
127	0.14	0.03	0.05	122
128	0.14	0.03	0.05	252
129	0.45	0.10	0.16	144
130	0.44	0.08	0.14	150
131	0.14	0.01	0.02	210
132	0.66	0.26	0.37	361
133	0.94	0.54	0.69	453
134	0.89	0.72	0.79	124
135	0.31	0.04	0.08	91
136	0.68	0.27	0.38	128
137	0.57	0.35	0.43	218
138	0.77	0.15	0.25	243
139	0.39	0.18	0.25	149
140	0.76	0.43	0.55	318
141	0.29	0.11	0.16	159
142	0.66	0.36	0.47	274
143	0.86	0.72	0.79	362
144	0.59	0.17	0.26	118
145	0.65	0.36	0.46	164
146	0.58	0.27	0.37	461
147	0.66	0.39	0.49	159
148	0.32	0.13	0.19	166
149	0.98	0.46	0.62	346
150	0.62	0.08	0.14	350
151	0.90	0.64	0.74	55
152	0.79	0.45	0.58	387
153	0.52	0.10	0.17	150
154	0.60	0.12	0.20	281
155	0.30	0.05	0.09	202
156	0.76	0.62	0.68	130
157	0.26	0.07	0.11	245
158	0.88	0.58	0.70	177
159	0.49	0.26	0.34	130
160	0.50	0.13	0.21	336
161	0.93	0.57	0.71	220
162	0.12	0.02	0.03	229

163	0.90	0.41	0.56	316
164	0.74	0.34	0.47	283
165	0.63	0.32	0.43	197
166	0.48	0.24	0.32	101
167	0.47	0.18	0.26	231
168	0.58	0.21	0.31	370
169	0.44	0.20	0.27	258
170	0.29	0.05	0.08	101
171	0.39	0.22	0.29	89
172	0.50	0.32	0.39	193
173	0.44	0.22	0.29	309
174	0.51	0.14	0.22	172
175	0.94	0.71	0.81	95
176	0.94	0.59	0.73	346
177	0.92	0.45	0.60	322
178	0.64	0.46	0.54	232
179	0.35	0.06	0.11	125
180	0.56	0.27	0.36	145
181	0.37	0.09	0.15	77
182	0.17	0.02	0.04	182
183	0.61	0.32	0.42	257
184	0.08	0.01	0.02	216
185	0.36	0.07	0.11	242
186	0.39	0.16	0.23	165
187	0.76	0.57	0.65	263
188	0.31	0.10	0.15	174
189	0.71	0.29	0.41	136
190	0.88	0.49	0.63	202
191	0.42	0.16	0.23	134
192	0.71	0.40	0.51	230
193	0.44	0.18	0.25	90
194	0.57	0.47	0.52	185
195	0.16	0.04	0.06	156
196	0.41	0.07	0.13	160
197	0.57	0.06	0.11	266
198	0.39	0.05	0.09	284
199	0.35	0.06	0.10	145
200	0.94	0.70	0.80	212
201	0.67	0.21	0.32	317
202	0.78	0.53	0.63	427
203	0.31	0.08	0.13	232
204	0.51	0.23	0.32	217
205	0.48	0.43	0.45	527
206	0.13	0.02	0.03	124
207	0.52	0.11	0.18	103
208	0.89	0.49	0.63	287
209	0.33	0.08	0.13	193
210	0.72	0.31	0.44	220
211	0.82	0.19	0.31	140
212	0.14	0.02	0.03	161
213	0.52	0.21	0.30	72
214	0.60	0.44	0.51	396
215	0.87	0.34	0.49	134
216	0.53	0.06	0.11	400
217	0.53	0.24	0.33	75
218	0.97	0.76	0.85	219
219	0.74	0.36	0.48	210

220	0.90	0.59	0.71	298
221	0.97	0.59	0.73	266
222	0.78	0.41	0.54	290
223	0.09	0.01	0.01	128
224	0.80	0.40	0.53	159
225	0.59	0.29	0.39	164
226	0.63	0.36	0.46	144
227	0.56	0.32	0.40	276
228	0.15	0.02	0.03	235
229	0.23	0.01	0.03	216
230	0.36	0.18	0.24	228
231	0.70	0.47	0.56	64
232	0.44	0.07	0.12	103
233	0.71	0.30	0.42	216
234	0.71	0.09	0.15	116
235	0.60	0.40	0.48	77
236	0.96	0.64	0.77	67
237	0.54	0.06	0.11	218
238	0.26	0.05	0.08	139
239	0.17	0.01	0.02	94
240	0.55	0.30	0.39	77
241	0.50	0.08	0.14	167
242	0.83	0.28	0.42	86
243	0.40	0.14	0.21	58
244	0.64	0.19	0.29	269
245	0.19	0.05	0.08	112
246	0.95	0.73	0.83	255
247	0.46	0.19	0.27	58
248	0.25	0.02	0.04	81
249	0.00	0.00	0.00	131
250	0.40	0.20	0.27	93
251	0.67	0.28	0.39	154
252	0.40	0.05	0.08	129
253	0.61	0.30	0.40	83
254	0.38	0.09	0.14	191
255	0.15	0.02	0.04	219
256	0.35	0.05	0.08	130
257	0.46	0.29	0.36	93
258	0.69	0.41	0.52	217
259	0.32	0.09	0.14	141
260	0.95	0.13	0.23	143
261	0.52	0.11	0.17	219
262	0.53	0.28	0.37	107
263	0.39	0.23	0.29	236
264	0.26	0.17	0.21	119
265	0.34	0.14	0.20	72
266	0.00	0.00	0.00	70
267	0.28	0.12	0.17	107
268	0.66	0.41	0.51	169
269	0.29	0.09	0.14	129
270	0.74	0.52	0.61	159
271	0.82	0.33	0.47	190
272	0.62	0.22	0.33	248
273	0.91	0.70	0.79	264
274	0.92	0.63	0.75	105
275	0.62	0.08	0.14	104
276	0.14	0.02	0.03	115

277	0.83	0.60	0.70	170
278	0.66	0.24	0.35	145
279	0.91	0.60	0.72	230
280	0.57	0.41	0.48	80
281	0.67	0.55	0.61	217
282	0.74	0.47	0.58	175
283	0.33	0.06	0.11	269
284	0.65	0.27	0.38	74
285	0.86	0.50	0.63	206
286	0.90	0.59	0.71	227
287	0.85	0.30	0.44	130
288	0.35	0.06	0.11	129
289	0.50	0.03	0.05	80
290	0.13	0.06	0.08	99
291	0.77	0.31	0.44	208
292	0.25	0.03	0.05	67
293	0.81	0.43	0.56	109
294	0.40	0.24	0.30	140
295	0.24	0.08	0.12	241
296	0.22	0.08	0.12	72
297	0.22	0.04	0.06	107
298	0.77	0.38	0.51	61
299	0.93	0.35	0.51	77
300	0.18	0.06	0.09	111
301	0.00	0.00	0.00	126
302	0.00	0.00	0.00	73
303	0.57	0.35	0.44	176
304	0.96	0.71	0.82	230
305	0.95	0.60	0.74	156
306	0.51	0.37	0.43	146
307	0.29	0.08	0.13	98
308	0.00	0.00	0.00	78
309	0.78	0.07	0.14	94
310	0.76	0.35	0.48	162
311	0.81	0.52	0.63	116
312	0.48	0.26	0.34	57
313	0.75	0.05	0.09	65
314	0.50	0.36	0.42	138
315	0.54	0.21	0.30	195
316	0.43	0.23	0.30	69
317	0.35	0.10	0.15	134
318	0.49	0.34	0.40	148
319	0.85	0.44	0.58	161
320	0.20	0.14	0.17	104
321	0.86	0.55	0.67	156
322	0.59	0.33	0.42	134
323	0.56	0.36	0.44	232
324	0.41	0.17	0.24	92
325	0.45	0.30	0.36	197
326	0.10	0.02	0.03	126
327	0.45	0.04	0.08	115
328	0.98	0.64	0.77	198
329	0.61	0.30	0.40	125
330	0.78	0.17	0.28	81
331	0.50	0.09	0.15	94
332	1.00	0.02	0.04	56
333	0.15	0.03	0.05	260

334	0.20	0.03	0.06	60
335	0.28	0.07	0.12	110
336	0.64	0.42	0.51	71
337	0.13	0.03	0.05	66
338	0.45	0.31	0.37	150
339	0.00	0.00	0.00	54
340	0.85	0.53	0.65	195
341	0.93	0.18	0.30	79
342	0.41	0.18	0.25	38
343	0.68	0.40	0.50	43
344	0.52	0.22	0.31	68
345	0.69	0.40	0.50	73
346	0.27	0.03	0.05	116
347	0.89	0.36	0.51	111
348	0.30	0.10	0.14	63
349	0.83	0.62	0.71	104
350	0.63	0.43	0.51	44
351	0.70	0.17	0.28	40
352	0.98	0.39	0.56	136
353	0.44	0.22	0.30	54
354	0.43	0.04	0.08	134
355	0.59	0.28	0.38	120
356	0.51	0.21	0.29	228
357	0.66	0.28	0.39	269
358	0.69	0.36	0.48	80
359	0.87	0.41	0.56	140
360	0.37	0.13	0.19	125
361	0.89	0.61	0.72	169
362	0.11	0.04	0.05	56
363	0.94	0.66	0.77	154
364	0.45	0.09	0.14	58
365	0.23	0.11	0.15	71
366	1.00	0.63	0.77	54
367	0.33	0.04	0.08	116
368	0.00	0.00	0.00	54
369	0.00	0.00	0.00	71
370	0.20	0.03	0.06	61
371	0.40	0.06	0.10	71
372	0.66	0.48	0.56	52
373	0.79	0.36	0.50	150
374	0.33	0.13	0.19	93
375	0.14	0.03	0.05	67
376	0.00	0.00	0.00	76
377	0.73	0.18	0.29	106
378	0.27	0.03	0.06	86
379	0.33	0.07	0.12	14
380	1.00	0.40	0.57	122
381	0.19	0.03	0.05	104
382	0.28	0.08	0.12	66
383	0.50	0.28	0.36	110
384	0.00	0.00	0.00	155
385	0.36	0.08	0.13	50
386	0.25	0.11	0.15	64
387	0.36	0.05	0.09	93
388	0.59	0.28	0.38	102
389	0.07	0.01	0.02	108
390	0.96	0.65	0.78	178



391	0.62	0.17	0.27	115
392	0.78	0.43	0.55	42
393	0.00	0.00	0.00	134
394	0.50	0.02	0.03	112
395	0.38	0.11	0.17	176
396	0.48	0.10	0.16	125
397	0.73	0.21	0.33	224
398	0.90	0.56	0.69	63
399	0.00	0.00	0.00	59
400	0.47	0.30	0.37	63
401	0.46	0.17	0.25	98
402	0.57	0.17	0.26	162
403	0.41	0.14	0.21	83
404	0.73	0.84	0.78	19
405	0.30	0.07	0.11	92
406	0.83	0.12	0.21	41
407	0.64	0.33	0.43	43
408	0.82	0.34	0.48	160
409	0.14	0.08	0.10	50
410	0.00	0.00	0.00	19
411	0.37	0.10	0.15	175
412	0.33	0.06	0.10	72
413	0.56	0.05	0.10	95
414	0.19	0.03	0.05	97
415	0.33	0.17	0.22	48
416	0.45	0.30	0.36	83
417	0.50	0.07	0.13	40
418	0.33	0.07	0.11	91
419	0.51	0.30	0.38	90
420	0.29	0.22	0.25	37
421	0.00	0.00	0.00	66
422	0.61	0.34	0.44	73
423	0.48	0.25	0.33	56
424	0.93	0.82	0.87	33
425	0.00	0.00	0.00	76
426	0.25	0.05	0.08	81
427	0.99	0.67	0.80	150
428	0.95	0.66	0.78	29
429	0.99	0.70	0.82	389
430	0.63	0.35	0.45	167
431	0.48	0.08	0.14	123
432	0.43	0.33	0.38	39
433	0.30	0.16	0.21	82
434	1.00	0.64	0.78	66
435	0.66	0.45	0.54	93
436	0.51	0.25	0.34	87
437	0.22	0.05	0.08	86
438	0.74	0.47	0.58	104
439	0.62	0.13	0.21	100
440	0.20	0.01	0.01	141
441	0.43	0.24	0.31	110
442	0.37	0.13	0.19	123
443	0.47	0.11	0.18	71
444	0.39	0.06	0.11	109
445	0.39	0.19	0.25	48
446	0.43	0.25	0.32	76
447	0.28	0.13	0.18	38

448	0.68	0.52	0.59	81
449	0.53	0.14	0.23	132
450	0.47	0.28	0.35	81
451	0.88	0.29	0.44	76
452	0.00	0.00	0.00	44
453	0.00	0.00	0.00	44
454	0.94	0.43	0.59	70
455	0.30	0.04	0.07	155
456	0.47	0.16	0.24	43
457	0.48	0.19	0.28	72
458	0.31	0.08	0.13	62
459	0.71	0.14	0.24	69
460	0.08	0.01	0.02	119
461	0.79	0.14	0.24	79
462	0.69	0.23	0.35	47
463	0.20	0.04	0.06	104
464	0.66	0.33	0.44	106
465	0.50	0.11	0.18	64
466	0.56	0.28	0.37	173
467	0.81	0.36	0.50	107
468	0.82	0.11	0.20	126
469	0.00	0.00	0.00	114
470	0.94	0.79	0.86	140
471	0.92	0.28	0.43	79
472	0.41	0.30	0.35	143
473	0.69	0.30	0.42	158
474	0.36	0.07	0.11	138
475	0.00	0.00	0.00	59
476	0.57	0.30	0.39	88
477	0.86	0.56	0.68	176
478	0.94	0.71	0.81	24
479	0.09	0.01	0.02	92
480	0.82	0.50	0.62	100
481	0.47	0.17	0.26	103
482	0.47	0.23	0.31	74
483	0.85	0.57	0.68	105
484	0.25	0.02	0.04	83
485	0.17	0.01	0.02	82
486	0.36	0.11	0.17	71
487	0.43	0.18	0.26	120
488	0.33	0.02	0.04	105
489	0.72	0.30	0.42	87
490	1.00	0.81	0.90	32
491	0.00	0.00	0.00	69
492	0.00	0.00	0.00	49
493	0.00	0.00	0.00	117
494	0.52	0.18	0.27	61
495	0.98	0.65	0.78	344
496	0.36	0.19	0.25	52
497	0.60	0.18	0.28	137
498	0.33	0.04	0.07	98
499	0.65	0.16	0.26	79

avg / total	0.67	0.33	0.43	173812
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Time taken to run this cell : 0:10:14.264591

```
In [0]: joblib.dump(classifier, 'lr_with_more_title_weight.pkl')
```

```
Out[0]: ['lr_with_more_title_weight.pkl']
```

```
In [0]: start = datetime.now()
classifier_2 = OneVsRestClassifier(LogisticRegression(penalty='l1'), n_jobs=-1)
classifier_2.fit(x_train_multilabel, y_train)
predictions_2 = classifier_2.predict(x_test_multilabel)
print("Accuracy :", metrics.accuracy_score(y_test, predictions_2))
print("Hamming loss ", metrics.hamming_loss(y_test, predictions_2))

precision = precision_score(y_test, predictions_2, average='micro')
recall = recall_score(y_test, predictions_2, average='micro')
f1 = f1_score(y_test, predictions_2, average='micro')

print("Micro-average quality numbers")
print("Precision: {:.4f}, Recall: {:.4f}, F1-measure: {:.4f}".format(precision,
    recall, f1))

precision = precision_score(y_test, predictions_2, average='macro')
recall = recall_score(y_test, predictions_2, average='macro')
f1 = f1_score(y_test, predictions_2, average='macro')

print("Macro-average quality numbers")
print("Precision: {:.4f}, Recall: {:.4f}, F1-measure: {:.4f}".format(precision,
    recall, f1))

print(metrics.classification_report(y_test, predictions_2))
print("Time taken to run this cell :", datetime.now() - start)
```

Accuracy : 0.25108

Hamming loss 0.00270302

Micro-average quality numbers

Precision: 0.7172, Recall: 0.3672, F1-measure: 0.4858

Macro-average quality numbers

Precision: 0.5570, Recall: 0.2950, F1-measure: 0.3710

	precision	recall	f1-score	support
0	0.94	0.72	0.82	5519
1	0.70	0.34	0.45	8190
2	0.80	0.42	0.55	6529
3	0.82	0.49	0.61	3231
4	0.80	0.44	0.57	6430
5	0.82	0.38	0.52	2879
6	0.86	0.53	0.66	5086
7	0.87	0.58	0.70	4533
8	0.60	0.13	0.22	3000
9	0.82	0.57	0.67	2765
10	0.60	0.20	0.30	3051
11	0.68	0.38	0.49	3009
12	0.62	0.29	0.40	2630
13	0.73	0.30	0.43	1426
14	0.89	0.57	0.70	2548
15	0.65	0.23	0.34	2371
16	0.65	0.25	0.37	873
17	0.89	0.63	0.74	2151
18	0.60	0.25	0.35	2204
19	0.71	0.41	0.52	831
20	0.76	0.47	0.58	1860
21	0.29	0.09	0.14	2023
22	0.52	0.24	0.33	1513
23	0.89	0.55	0.68	1207
24	0.56	0.28	0.38	506
25	0.69	0.34	0.45	425
26	0.65	0.43	0.52	793
27	0.62	0.38	0.47	1291
28	0.74	0.39	0.51	1208
29	0.46	0.10	0.17	406
30	0.76	0.21	0.33	504
31	0.26	0.08	0.12	732
32	0.60	0.29	0.39	441
33	0.60	0.27	0.38	1645
34	0.69	0.26	0.38	1058
35	0.83	0.58	0.68	946
36	0.65	0.24	0.35	644
37	0.98	0.65	0.78	136
38	0.62	0.38	0.47	570
39	0.84	0.31	0.45	766
40	0.59	0.35	0.44	1132
41	0.47	0.18	0.26	174
42	0.76	0.49	0.59	210
43	0.75	0.42	0.54	433
44	0.66	0.52	0.58	626
45	0.71	0.36	0.47	852
46	0.77	0.45	0.57	534
47	0.37	0.15	0.22	350
48	0.75	0.52	0.62	496

49	0.78	0.64	0.71	785
50	0.21	0.06	0.09	475
51	0.37	0.13	0.19	305
52	0.42	0.03	0.06	251
53	0.66	0.40	0.50	914
54	0.49	0.17	0.26	728
55	0.47	0.03	0.05	258
56	0.45	0.24	0.31	821
57	0.46	0.10	0.17	541
58	0.76	0.31	0.45	748
59	0.94	0.66	0.77	724
60	0.35	0.10	0.15	660
61	0.78	0.20	0.31	235
62	0.92	0.74	0.82	718
63	0.83	0.69	0.75	468
64	0.55	0.36	0.43	191
65	0.33	0.11	0.17	429
66	0.29	0.06	0.10	415
67	0.74	0.50	0.59	274
68	0.82	0.53	0.64	510
69	0.67	0.45	0.54	466
70	0.30	0.09	0.13	305
71	0.49	0.17	0.25	247
72	0.78	0.53	0.64	401
73	0.99	0.77	0.86	86
74	0.72	0.42	0.53	120
75	0.92	0.67	0.78	129
76	0.47	0.02	0.04	473
77	0.40	0.29	0.33	143
78	0.79	0.49	0.60	347
79	0.69	0.25	0.36	479
80	0.56	0.34	0.43	279
81	0.70	0.23	0.34	461
82	0.34	0.04	0.07	298
83	0.78	0.50	0.61	396
84	0.55	0.29	0.38	184
85	0.61	0.24	0.35	573
86	0.50	0.07	0.12	325
87	0.51	0.29	0.37	273
88	0.49	0.21	0.30	135
89	0.36	0.11	0.17	232
90	0.56	0.34	0.43	409
91	0.61	0.27	0.37	420
92	0.78	0.57	0.66	408
93	0.66	0.44	0.53	241
94	0.30	0.04	0.07	211
95	0.37	0.10	0.15	277
96	0.28	0.04	0.07	410
97	0.86	0.43	0.57	501
98	0.75	0.63	0.69	136
99	0.54	0.34	0.42	239
100	0.57	0.15	0.24	324
101	0.91	0.68	0.78	277
102	0.91	0.75	0.82	613
103	0.47	0.17	0.25	157
104	0.22	0.06	0.10	295
105	0.75	0.43	0.55	334

106	0.88	0.28	0.43	335
107	0.75	0.54	0.63	389
108	0.58	0.27	0.37	251
109	0.58	0.45	0.51	317
110	0.68	0.10	0.18	187
111	0.73	0.11	0.20	140
112	0.67	0.43	0.52	154
113	0.58	0.20	0.29	332
114	0.46	0.27	0.34	323
115	0.47	0.26	0.33	344
116	0.75	0.55	0.63	370
117	0.58	0.24	0.34	313
118	0.78	0.73	0.75	874
119	0.45	0.21	0.29	293
120	0.11	0.01	0.01	200
121	0.77	0.51	0.61	463
122	0.32	0.10	0.15	119
123	0.67	0.02	0.03	256
124	0.91	0.70	0.79	195
125	0.44	0.14	0.21	138
126	0.81	0.53	0.64	376
127	0.27	0.03	0.06	122
128	0.20	0.04	0.07	252
129	0.48	0.22	0.30	144
130	0.42	0.11	0.18	150
131	0.33	0.03	0.06	210
132	0.65	0.28	0.39	361
133	0.92	0.59	0.72	453
134	0.89	0.77	0.82	124
135	0.31	0.05	0.09	91
136	0.69	0.28	0.40	128
137	0.55	0.38	0.45	218
138	0.67	0.18	0.28	243
139	0.45	0.18	0.26	149
140	0.77	0.46	0.58	318
141	0.32	0.10	0.15	159
142	0.63	0.38	0.47	274
143	0.85	0.79	0.82	362
144	0.54	0.21	0.30	118
145	0.63	0.39	0.48	164
146	0.54	0.31	0.39	461
147	0.68	0.45	0.54	159
148	0.30	0.12	0.17	166
149	0.97	0.55	0.70	346
150	0.64	0.13	0.21	350
151	0.93	0.67	0.78	55
152	0.78	0.52	0.63	387
153	0.51	0.17	0.25	150
154	0.58	0.12	0.21	281
155	0.25	0.06	0.10	202
156	0.81	0.67	0.73	130
157	0.28	0.06	0.10	245
158	0.93	0.63	0.75	177
159	0.53	0.34	0.41	130
160	0.48	0.18	0.26	336
161	0.90	0.65	0.75	220
162	0.28	0.06	0.09	229

163	0.87	0.44	0.58	316
164	0.78	0.44	0.56	283
165	0.60	0.34	0.44	197
166	0.65	0.43	0.51	101
167	0.45	0.18	0.26	231
168	0.56	0.27	0.36	370
169	0.40	0.21	0.27	258
170	0.36	0.08	0.13	101
171	0.38	0.24	0.29	89
172	0.53	0.36	0.43	193
173	0.47	0.26	0.33	309
174	0.62	0.14	0.23	172
175	0.92	0.73	0.81	95
176	0.93	0.62	0.74	346
177	0.86	0.57	0.69	322
178	0.65	0.51	0.57	232
179	0.20	0.04	0.07	125
180	0.65	0.33	0.44	145
181	0.44	0.10	0.17	77
182	0.26	0.06	0.10	182
183	0.60	0.32	0.41	257
184	0.21	0.03	0.05	216
185	0.35	0.09	0.14	242
186	0.43	0.18	0.25	165
187	0.75	0.59	0.66	263
188	0.39	0.12	0.18	174
189	0.75	0.40	0.53	136
190	0.89	0.55	0.68	202
191	0.44	0.16	0.24	134
192	0.68	0.40	0.51	230
193	0.44	0.18	0.25	90
194	0.57	0.48	0.52	185
195	0.26	0.05	0.09	156
196	0.33	0.07	0.11	160
197	0.49	0.10	0.16	266
198	0.47	0.13	0.20	284
199	0.32	0.04	0.07	145
200	0.93	0.74	0.82	212
201	0.65	0.26	0.37	317
202	0.78	0.59	0.67	427
203	0.36	0.11	0.17	232
204	0.51	0.29	0.37	217
205	0.50	0.46	0.48	527
206	0.24	0.03	0.06	124
207	0.50	0.17	0.26	103
208	0.85	0.53	0.65	287
209	0.33	0.11	0.16	193
210	0.75	0.38	0.50	220
211	0.72	0.21	0.32	140
212	0.12	0.02	0.03	161
213	0.63	0.43	0.51	72
214	0.64	0.45	0.53	396
215	0.87	0.34	0.49	134
216	0.61	0.17	0.27	400
217	0.51	0.24	0.33	75
218	0.96	0.76	0.85	219
219	0.77	0.42	0.54	210



220	0.88	0.64	0.74	298
221	0.96	0.70	0.81	266
222	0.76	0.45	0.57	290
223	0.11	0.01	0.01	128
224	0.78	0.45	0.57	159
225	0.55	0.29	0.38	164
226	0.58	0.31	0.41	144
227	0.56	0.29	0.38	276
228	0.19	0.03	0.05	235
229	0.33	0.03	0.06	216
230	0.40	0.17	0.23	228
231	0.70	0.48	0.57	64
232	0.48	0.10	0.16	103
233	0.72	0.35	0.47	216
234	0.72	0.11	0.19	116
235	0.54	0.36	0.43	77
236	0.90	0.67	0.77	67
237	0.57	0.12	0.20	218
238	0.40	0.14	0.20	139
239	0.00	0.00	0.00	94
240	0.54	0.34	0.42	77
241	0.47	0.08	0.14	167
242	0.78	0.37	0.50	86
243	0.40	0.10	0.16	58
244	0.62	0.27	0.38	269
245	0.16	0.04	0.07	112
246	0.95	0.76	0.84	255
247	0.44	0.24	0.31	58
248	0.44	0.05	0.09	81
249	0.23	0.02	0.04	131
250	0.43	0.24	0.31	93
251	0.61	0.29	0.39	154
252	0.36	0.04	0.07	129
253	0.69	0.40	0.50	83
254	0.34	0.08	0.13	191
255	0.15	0.03	0.05	219
256	0.32	0.05	0.09	130
257	0.48	0.26	0.34	93
258	0.65	0.48	0.55	217
259	0.41	0.13	0.20	141
260	0.86	0.17	0.29	143
261	0.62	0.17	0.27	219
262	0.55	0.27	0.36	107
263	0.41	0.27	0.32	236
264	0.33	0.22	0.26	119
265	0.57	0.24	0.33	72
266	0.00	0.00	0.00	70
267	0.36	0.14	0.20	107
268	0.67	0.44	0.53	169
269	0.32	0.14	0.19	129
270	0.74	0.53	0.62	159
271	0.88	0.48	0.62	190
272	0.61	0.27	0.37	248
273	0.90	0.75	0.82	264
274	0.90	0.68	0.77	105
275	0.52	0.12	0.20	104
276	0.08	0.01	0.02	115

277	0.83	0.63	0.72	170
278	0.74	0.41	0.52	145
279	0.90	0.70	0.78	230
280	0.58	0.42	0.49	80
281	0.66	0.54	0.59	217
282	0.75	0.50	0.60	175
283	0.33	0.13	0.18	269
284	0.65	0.32	0.43	74
285	0.82	0.49	0.61	206
286	0.89	0.66	0.75	227
287	0.84	0.41	0.55	130
288	0.32	0.07	0.11	129
289	0.57	0.05	0.09	80
290	0.21	0.09	0.13	99
291	0.76	0.35	0.48	208
292	0.42	0.07	0.13	67
293	0.84	0.48	0.61	109
294	0.46	0.26	0.34	140
295	0.24	0.12	0.16	241
296	0.31	0.12	0.18	72
297	0.44	0.11	0.18	107
298	0.77	0.49	0.60	61
299	0.89	0.51	0.64	77
300	0.21	0.08	0.12	111
301	0.00	0.00	0.00	126
302	0.25	0.01	0.03	73
303	0.57	0.43	0.49	176
304	0.91	0.79	0.85	230
305	0.92	0.72	0.81	156
306	0.50	0.37	0.43	146
307	0.34	0.11	0.17	98
308	0.00	0.00	0.00	78
309	0.80	0.13	0.22	94
310	0.74	0.41	0.53	162
311	0.79	0.51	0.62	116
312	0.52	0.28	0.36	57
313	0.83	0.08	0.14	65
314	0.52	0.36	0.42	138
315	0.54	0.22	0.31	195
316	0.56	0.35	0.43	69
317	0.29	0.13	0.18	134
318	0.56	0.39	0.46	148
319	0.84	0.50	0.63	161
320	0.24	0.19	0.21	104
321	0.82	0.61	0.70	156
322	0.60	0.37	0.46	134
323	0.58	0.44	0.50	232
324	0.34	0.15	0.21	92
325	0.41	0.24	0.31	197
326	0.14	0.03	0.05	126
327	0.20	0.03	0.05	115
328	0.99	0.70	0.82	198
329	0.59	0.32	0.41	125
330	0.73	0.20	0.31	81
331	0.45	0.10	0.16	94
332	0.54	0.12	0.20	56
333	0.19	0.05	0.08	260

334	0.42	0.13	0.20	60
335	0.35	0.08	0.13	110
336	0.62	0.49	0.55	71
337	0.18	0.05	0.07	66
338	0.47	0.36	0.41	150
339	0.00	0.00	0.00	54
340	0.84	0.57	0.68	195
341	0.91	0.52	0.66	79
342	0.38	0.26	0.31	38
343	0.62	0.42	0.50	43
344	0.56	0.29	0.38	68
345	0.62	0.33	0.43	73
346	0.14	0.03	0.04	116
347	0.86	0.43	0.57	111
348	0.33	0.11	0.17	63
349	0.84	0.65	0.74	104
350	0.62	0.48	0.54	44
351	0.57	0.30	0.39	40
352	0.93	0.57	0.70	136
353	0.38	0.15	0.21	54
354	0.39	0.09	0.15	134
355	0.64	0.35	0.45	120
356	0.54	0.29	0.38	228
357	0.66	0.36	0.47	269
358	0.62	0.38	0.47	80
359	0.84	0.59	0.69	140
360	0.39	0.18	0.24	125
361	0.90	0.71	0.79	169
362	0.14	0.05	0.08	56
363	0.92	0.73	0.82	154
364	0.46	0.10	0.17	58
365	0.22	0.08	0.12	71
366	1.00	0.69	0.81	54
367	0.30	0.07	0.11	116
368	0.38	0.06	0.10	54
369	0.33	0.03	0.05	71
370	0.00	0.00	0.00	61
371	0.40	0.08	0.14	71
372	0.72	0.44	0.55	52
373	0.78	0.41	0.54	150
374	0.41	0.14	0.21	93
375	0.20	0.04	0.07	67
376	0.00	0.00	0.00	76
377	0.58	0.28	0.38	106
378	0.25	0.02	0.04	86
379	0.50	0.14	0.22	14
380	0.93	0.52	0.67	122
381	0.23	0.07	0.10	104
382	0.46	0.20	0.28	66
383	0.54	0.35	0.42	110
384	0.14	0.01	0.01	155
385	0.69	0.22	0.33	50
386	0.20	0.06	0.10	64
387	0.32	0.08	0.12	93
388	0.53	0.24	0.33	102
389	0.07	0.01	0.02	108
390	0.96	0.68	0.80	178

391	0.49	0.17	0.26	115
392	0.81	0.40	0.54	42
393	0.00	0.00	0.00	134
394	0.22	0.04	0.06	112
395	0.54	0.27	0.36	176
396	0.47	0.13	0.20	125
397	0.74	0.37	0.49	224
398	0.84	0.67	0.74	63
399	0.30	0.05	0.09	59
400	0.51	0.32	0.39	63
401	0.49	0.23	0.32	98
402	0.51	0.19	0.27	162
403	0.38	0.14	0.21	83
404	0.76	0.84	0.80	19
405	0.34	0.11	0.17	92
406	0.69	0.22	0.33	41
407	0.64	0.37	0.47	43
408	0.80	0.46	0.58	160
409	0.20	0.12	0.15	50
410	0.00	0.00	0.00	19
411	0.35	0.11	0.17	175
412	0.28	0.07	0.11	72
413	0.38	0.05	0.09	95
414	0.12	0.02	0.04	97
415	0.33	0.10	0.16	48
416	0.53	0.35	0.42	83
417	0.43	0.07	0.13	40
418	0.48	0.16	0.25	91
419	0.53	0.37	0.43	90
420	0.38	0.27	0.32	37
421	0.04	0.02	0.02	66
422	0.69	0.45	0.55	73
423	0.48	0.25	0.33	56
424	0.94	0.88	0.91	33
425	0.00	0.00	0.00	76
426	0.27	0.05	0.08	81
427	0.98	0.73	0.84	150
428	0.95	0.69	0.80	29
429	0.99	0.93	0.96	389
430	0.63	0.40	0.49	167
431	0.57	0.11	0.18	123
432	0.52	0.31	0.39	39
433	0.33	0.21	0.25	82
434	1.00	0.70	0.82	66
435	0.55	0.38	0.45	93
436	0.56	0.37	0.44	87
437	0.10	0.02	0.04	86
438	0.72	0.53	0.61	104
439	0.54	0.13	0.21	100
440	0.38	0.04	0.06	141
441	0.43	0.33	0.37	110
442	0.37	0.15	0.22	123
443	0.57	0.18	0.28	71
444	0.32	0.06	0.11	109
445	0.45	0.31	0.37	48
446	0.47	0.29	0.36	76
447	0.39	0.18	0.25	38

448	0.67	0.54	0.60	81
449	0.67	0.26	0.37	132
450	0.42	0.27	0.33	81
451	0.89	0.32	0.47	76
452	0.00	0.00	0.00	44
453	0.00	0.00	0.00	44
454	0.84	0.51	0.64	70
455	0.39	0.18	0.25	155
456	0.50	0.21	0.30	43
457	0.54	0.28	0.37	72
458	0.35	0.13	0.19	62
459	0.63	0.25	0.35	69
460	0.00	0.00	0.00	119
461	0.71	0.19	0.30	79
462	0.61	0.23	0.34	47
463	0.39	0.14	0.21	104
464	0.70	0.42	0.52	106
465	0.64	0.22	0.33	64
466	0.55	0.35	0.43	173
467	0.78	0.42	0.55	107
468	0.56	0.26	0.36	126
469	0.20	0.01	0.02	114
470	0.93	0.81	0.87	140
471	0.85	0.42	0.56	79
472	0.40	0.35	0.37	143
473	0.67	0.37	0.47	158
474	0.48	0.10	0.17	138
475	0.00	0.00	0.00	59
476	0.63	0.33	0.43	88
477	0.83	0.65	0.73	176
478	0.95	0.79	0.86	24
479	0.22	0.04	0.07	92
480	0.79	0.50	0.61	100
481	0.51	0.28	0.36	103
482	0.40	0.22	0.28	74
483	0.78	0.63	0.69	105
484	0.20	0.02	0.04	83
485	0.20	0.02	0.04	82
486	0.48	0.15	0.23	71
487	0.45	0.21	0.29	120
488	0.50	0.06	0.10	105
489	0.73	0.37	0.49	87
490	1.00	0.81	0.90	32
491	0.33	0.03	0.05	69
492	0.33	0.02	0.04	49
493	0.11	0.02	0.03	117
494	0.52	0.23	0.32	61
495	0.95	0.79	0.87	344
496	0.32	0.13	0.19	52
497	0.59	0.28	0.38	137
498	0.31	0.10	0.15	98
499	0.48	0.20	0.29	79

avg / total	0.67	0.37	0.46	173812
-------------	------	------	------	--------

Time taken to run this cell : 1:09:41.236859

## 5. Assignments

1. Use bag of words upto 4 grams and compute the micro f1 score with Logistic regression(OvR)
2. Perform hyperparam tuning on alpha (or lambda) for Logistic regression to improve the performance using GridSearch
3. Try OneVsRestClassifier with Linear-SVM (SGDClassifier with loss-hinge)

```
In [24]: start = datetime.now()
vectorizer = CountVectorizer(min_df=0.00009, max_features=20000, \
                             tokenizer = lambda x: x.split(), ngram_range=(1,4
))
x_train_multilabel = vectorizer.fit_transform(x_train['question'])
x_test_multilabel = vectorizer.transform(x_test['question'])
print("Time taken to run this cell :", datetime.now() - start)
```

Time taken to run this cell : 0:00:38.711363

```
In [25]: print("Dimensions of train data X:",x_train_multilabel.shape, "Y :",y_train.sh
ape)
print("Dimensions of test data X:",x_test_multilabel.shape,"Y:",y_test.shape)
```

Dimensions of train data X: (40000, 20000) Y : (40000, 500)

Dimensions of test data X: (10000, 20000) Y: (10000, 500)

In [0]:

### 4.4 Applying Logistic Regression with OneVsRest Classifier

```
In [0]: from tqdm import tqdm_notebook as tqdm1
```

```
In [4]: alpha = [10**-5, 10**-4, 10**-3, 10**-2, 10**-1, 10**0, 10**1]

for i in tqdm1(alpha):
    start = datetime.now()
    classifier = OneVsRestClassifier(SGDClassifier(loss='log', alpha=i, penalty='l1'))
    classifier.fit(x_train_multilabel, y_train)
    predictions = classifier.predict(x_test_multilabel)

    print("Alpha : ",i)
    print("Accuracy :",metrics.accuracy_score(y_test, predictions))
    print("Hamming loss ",metrics.hamming_loss(y_test,predictions))

    precision = precision_score(y_test, predictions, average='micro')
    recall = recall_score(y_test, predictions, average='micro')
    f1 = f1_score(y_test, predictions, average='micro')

    print("Micro-average quality numbers")
    print("Precision: {:.4f}, Recall: {:.4f}, F1-measure: {:.4f}".format(precision, recall, f1))
    print("Time taken to run this iteration :", datetime.now() - start)
    print("-*-*60)
```





```
Alpha : 1e-05
Accuracy : 0.0676
Hamming loss 0.0088806
Micro-average quality numbers
Precision: 0.1705, Recall: 0.3847, F1-measure: 0.2363
Time taken to run this iteration : 0:13:33.722290
-*****
-*****
*-----
Alpha : 0.0001
Accuracy : 0.0673
Hamming loss 0.0070998
Micro-average quality numbers
Precision: 0.2191, Recall: 0.3855, F1-measure: 0.2794
Time taken to run this iteration : 0:08:45.953202
-*****
-*****
*-----
Alpha : 0.001
Accuracy : 0.1317
Hamming loss 0.0036734
Micro-average quality numbers
Precision: 0.4729, Recall: 0.2518, F1-measure: 0.3286
Time taken to run this iteration : 0:04:15.578403
-*****
-*****
*-----
Alpha : 0.01
Accuracy : 0.1211
Hamming loss 0.0033756
Micro-average quality numbers
Precision: 0.7152, Recall: 0.0906, F1-measure: 0.1608
Time taken to run this iteration : 0:02:39.368461
-*****
-*****
*-----
Alpha : 0.1
Accuracy : 0.0843
Hamming loss 0.0035638
Micro-average quality numbers
Precision: 0.7581, Recall: 0.0026, F1-measure: 0.0052
Time taken to run this iteration : 0:02:46.603301
-*****
-*****
*-----
Alpha : 1
Accuracy : 0.0838
Hamming loss 0.0035702
Micro-average quality numbers
Precision: 0.0000, Recall: 0.0000, F1-measure: 0.0000
Time taken to run this iteration : 0:02:13.453376
-*****
-*****
*-----
Alpha : 10
Accuracy : 0.0838
Hamming loss 0.0035702
```

Micro-average quality numbers

Precision: 0.0000, Recall: 0.0000, F1-measure: 0.0000

Time taken to run this iteration : 0:01:48.411516

```

-----*-----*-----*-----*-----*-----*-----*-----*-----*
-----*-----*-----*-----*-----*-----*-----*-----*-----*
*-----*-----*-----*-----*-----*-----*-----*-----*-----*

```

```

In [28]: start = datetime.now()
model = OneVsRestClassifier(SGDClassifier(loss='log', alpha=0.001, penalty='l1'))
model.fit(x_train_multilabel,y_train)
pred=model.predict(x_test_multilabel)
print("Time taken to run :", datetime.now() - start)

```

Time taken to run : 0:03:02.472318

```
In [29]: print("accuracy :",metrics.accuracy_score(y_test,pred))
print("macro f1 score :",metrics.f1_score(y_test, pred, average = 'macro'))
print("micro f1 scoore :",metrics.f1_score(y_test, pred, average = 'micro'))
print("hamming loss :",metrics.hamming_loss(y_test,pred))
print("Precision recall report :\n",metrics.classification_report(y_test, pred
))
```

accuracy : 0.1398

macro f1 score : 0.22255272487544928

micro f1 scoore : 0.32683827686277467

hamming loss : 0.0035722

Precision recall report :

	precision	recall	f1-score	support
0	0.50	0.23	0.32	224
1	0.45	0.13	0.20	619
2	0.74	0.51	0.61	417
3	0.66	0.58	0.62	279
4	0.81	0.25	0.38	877
5	0.02	0.25	0.04	4
6	0.79	0.44	0.57	441
7	0.77	0.54	0.64	343
8	0.64	0.40	0.49	250
9	0.51	0.20	0.29	504
10	0.74	0.47	0.57	532
11	0.77	0.64	0.70	200
12	0.74	0.67	0.70	200
13	0.54	0.24	0.34	160
14	0.54	0.30	0.39	112
15	1.00	1.00	1.00	4
16	0.68	0.52	0.59	157
17	0.79	0.18	0.29	172
18	0.61	0.14	0.22	148
19	0.00	0.00	0.00	13
20	0.60	0.57	0.59	101
21	0.49	0.17	0.25	99
22	0.24	0.08	0.12	79
23	0.29	0.05	0.08	250
24	0.51	0.24	0.32	140
25	0.49	0.36	0.41	76
26	0.29	0.25	0.27	8
27	0.26	0.20	0.22	61
28	0.30	0.03	0.06	247
29	0.31	0.15	0.20	101
30	0.75	0.32	0.45	56
31	0.77	0.31	0.44	74
32	0.08	0.09	0.09	32
33	0.91	0.79	0.84	98
34	0.22	0.36	0.27	42
35	0.20	0.06	0.10	170
36	0.10	0.12	0.11	8
37	0.22	0.19	0.20	68
38	0.33	0.04	0.07	153
39	0.67	0.47	0.55	43
40	0.52	0.39	0.45	157
41	0.27	0.32	0.29	41
42	0.70	0.36	0.48	53
43	0.18	0.24	0.21	72
44	0.35	0.25	0.29	48
45	0.24	0.20	0.21	82
46	0.29	0.41	0.34	64
47	0.54	0.35	0.42	20
48	0.85	0.64	0.73	55
49	0.75	0.19	0.30	178

50	0.31	0.41	0.35	59
51	0.29	0.40	0.33	5
52	0.52	0.56	0.54	136
53	0.40	0.14	0.21	28
54	0.40	0.31	0.35	32
55	0.49	0.40	0.44	80
56	0.51	0.65	0.57	40
57	0.60	0.09	0.15	68
58	0.34	0.68	0.45	28
59	0.61	0.45	0.52	31
60	0.66	0.46	0.54	41
61	0.86	0.39	0.53	31
62	0.77	0.27	0.39	211
63	0.67	0.41	0.51	160
64	0.56	0.26	0.35	93
65	0.59	0.26	0.36	50
66	0.21	0.11	0.15	35
67	0.18	0.25	0.21	12
68	0.88	0.16	0.27	87
69	0.88	0.56	0.68	27
70	0.50	0.01	0.02	107
71	0.70	0.61	0.65	23
72	0.74	0.43	0.55	118
73	0.21	0.12	0.15	112
74	0.67	0.45	0.54	138
75	0.30	0.08	0.13	36
76	0.39	0.12	0.19	57
77	0.73	0.10	0.18	77
78	0.00	0.00	0.00	120
79	0.00	0.00	0.00	7
80	0.00	0.00	0.00	98
81	1.00	0.07	0.13	89
82	0.00	0.00	0.00	206
83	1.00	0.50	0.67	2
84	0.44	0.45	0.45	71
85	0.58	0.47	0.52	30
86	0.46	0.06	0.11	97
87	0.16	0.11	0.13	36
88	0.38	0.17	0.23	36
89	0.21	0.32	0.25	22
90	0.00	0.00	0.00	8
91	0.25	0.07	0.11	15
92	0.45	0.06	0.10	88
93	0.33	0.07	0.12	27
94	0.32	0.23	0.27	30
95	0.58	0.63	0.60	35
96	0.87	0.24	0.38	54
97	1.00	0.02	0.03	58
98	0.79	0.11	0.20	133
99	0.00	0.00	0.00	2
100	0.75	0.55	0.63	22
101	0.43	0.39	0.41	31
102	0.00	0.00	0.00	22
103	1.00	0.20	0.33	5
104	0.48	0.14	0.21	73
105	0.20	0.17	0.18	6
106	1.00	0.17	0.30	23

107	1.00	0.12	0.21	17
108	1.00	0.06	0.11	34
109	0.00	0.00	0.00	6
110	0.00	0.00	0.00	1
111	0.24	0.19	0.21	42
112	0.50	0.05	0.09	40
113	0.56	0.45	0.50	22
114	0.50	0.24	0.32	17
115	0.67	0.11	0.19	18
116	0.07	0.06	0.06	34
117	0.00	0.00	0.00	8
118	0.00	0.00	0.00	12
119	0.28	0.38	0.32	13
120	0.73	0.42	0.53	19
121	0.00	0.00	0.00	46
122	0.75	0.08	0.15	72
123	0.50	0.13	0.21	112
124	0.50	0.05	0.09	21
125	0.86	0.63	0.73	19
126	0.00	0.00	0.00	37
127	0.00	0.00	0.00	32
128	0.33	0.47	0.39	19
129	0.07	0.04	0.05	28
130	0.80	0.04	0.08	100
131	1.00	0.15	0.27	13
132	0.38	0.20	0.26	30
133	1.00	0.64	0.78	25
134	0.00	0.00	0.00	6
135	0.36	0.34	0.35	83
136	0.50	0.50	0.50	2
137	0.00	0.00	0.00	51
138	0.20	0.06	0.10	16
139	0.15	0.30	0.20	10
140	0.56	0.20	0.29	25
141	0.64	0.56	0.60	16
142	0.44	0.53	0.48	15
143	0.20	0.09	0.13	11
144	0.40	0.07	0.12	56
145	0.20	0.08	0.11	26
146	0.00	0.00	0.00	18
147	0.00	0.00	0.00	13
148	0.31	0.17	0.22	30
149	0.00	0.00	0.00	15
150	0.25	0.25	0.25	4
151	0.00	0.00	0.00	17
152	0.42	0.41	0.42	34
153	0.00	0.00	0.00	33
154	0.40	0.50	0.44	4
155	0.38	0.60	0.46	5
156	0.67	0.73	0.70	11
157	0.00	0.00	0.00	73
158	0.16	0.43	0.23	21
159	0.00	0.00	0.00	58
160	1.00	0.40	0.57	5
161	0.69	0.32	0.43	57
162	0.00	0.00	0.00	0
163	0.38	0.08	0.14	36

164	0.12	0.21	0.16	14
165	0.13	0.38	0.19	16
166	0.00	0.00	0.00	1
167	0.06	0.07	0.06	15
168	0.33	0.12	0.18	8
169	0.23	0.20	0.22	49
170	0.38	0.30	0.33	10
171	0.06	0.03	0.04	35
172	0.71	0.56	0.63	18
173	0.00	0.00	0.00	45
174	0.83	1.00	0.91	5
175	0.40	0.36	0.38	11
176	0.45	0.13	0.20	38
177	0.86	0.13	0.23	46
178	0.86	0.17	0.28	36
179	0.00	0.00	0.00	69
180	0.30	0.38	0.33	8
181	1.00	0.19	0.32	16
182	1.00	0.33	0.50	12
183	0.27	0.12	0.17	25
184	0.71	0.40	0.51	25
185	0.33	0.50	0.40	10
186	0.26	0.23	0.24	26
187	0.02	0.25	0.04	4
188	0.41	0.61	0.49	28
189	0.00	0.00	0.00	45
190	0.08	0.22	0.12	9
191	0.00	0.00	0.00	45
192	1.00	0.09	0.17	11
193	0.88	0.30	0.45	23
194	1.00	0.04	0.07	52
195	0.65	0.21	0.32	52
196	0.83	0.20	0.33	49
197	0.00	0.00	0.00	40
198	0.38	0.50	0.43	12
199	0.00	0.00	0.00	27
200	0.92	0.65	0.76	17
201	0.30	0.21	0.25	14
202	0.27	0.23	0.25	13
203	0.00	0.00	0.00	55
204	0.00	0.00	0.00	4
205	0.38	0.42	0.40	26
206	0.50	0.10	0.17	10
207	0.00	0.00	0.00	27
208	0.50	0.50	0.50	2
209	0.00	0.00	0.00	8
210	0.00	0.00	0.00	42
211	0.13	0.42	0.20	12
212	0.00	0.00	0.00	22
213	0.00	0.00	0.00	7
214	0.21	0.14	0.16	37
215	0.55	0.65	0.59	17
216	0.00	0.00	0.00	71
217	0.41	0.45	0.43	20
218	0.50	0.20	0.29	5
219	0.00	0.00	0.00	81
220	0.50	0.25	0.33	8

221	0.00	0.00	0.00	19
222	0.00	0.00	0.00	3
223	0.00	0.00	0.00	6
224	0.10	0.09	0.10	11
225	0.00	0.00	0.00	13
226	0.73	0.67	0.70	12
227	0.12	0.15	0.13	13
228	0.40	0.22	0.29	18
229	0.00	0.00	0.00	39
230	0.57	0.12	0.20	33
231	1.00	0.54	0.70	26
232	0.17	0.09	0.11	23
233	0.00	0.00	0.00	17
234	0.00	0.00	0.00	1
235	0.00	0.00	0.00	18
236	0.00	0.00	0.00	10
237	0.20	0.08	0.11	13
238	0.62	0.31	0.41	26
239	0.62	0.56	0.59	9
240	0.14	0.19	0.16	16
241	0.57	0.33	0.42	12
242	1.00	0.80	0.89	5
243	0.67	0.17	0.27	12
244	0.03	0.04	0.03	23
245	0.12	0.06	0.08	17
246	0.80	0.44	0.57	18
247	1.00	0.43	0.60	7
248	0.67	0.20	0.31	10
249	0.50	0.40	0.44	15
250	1.00	0.03	0.06	30
251	0.25	0.33	0.29	3
252	0.00	0.00	0.00	13
253	0.57	0.18	0.28	22
254	0.62	0.68	0.65	19
255	0.67	0.13	0.22	15
256	0.75	0.43	0.55	7
257	1.00	0.36	0.53	14
258	0.00	0.00	0.00	3
259	0.50	0.44	0.47	9
260	0.60	0.30	0.40	10
261	0.43	0.12	0.19	24
262	0.00	0.00	0.00	46
263	0.09	0.08	0.09	12
264	0.00	0.00	0.00	34
265	0.00	0.00	0.00	4
266	0.59	0.57	0.58	23
267	0.24	0.16	0.19	31
268	0.36	0.31	0.33	13
269	0.00	0.00	0.00	11
270	0.00	0.00	0.00	9
271	0.83	0.83	0.83	6
272	0.17	0.15	0.16	27
273	0.57	0.34	0.43	35
274	0.40	0.29	0.33	7
275	0.00	0.00	0.00	14
276	0.12	0.06	0.08	18
277	0.00	0.00	0.00	31



278	0.38	0.38	0.38	16
279	0.00	0.00	0.00	2
280	0.14	0.07	0.10	14
281	0.00	0.00	0.00	17
282	0.75	0.43	0.55	7
283	0.00	0.00	0.00	32
284	0.00	0.00	0.00	11
285	0.00	0.00	0.00	2
286	0.75	0.11	0.19	28
287	0.18	0.15	0.17	13
288	1.00	0.25	0.40	4
289	1.00	0.06	0.12	16
290	0.00	0.00	0.00	16
291	0.40	0.12	0.19	16
292	0.33	0.60	0.43	5
293	0.54	0.78	0.64	9
294	0.00	0.00	0.00	11
295	0.25	0.22	0.24	9
296	0.00	0.00	0.00	0
297	0.00	0.00	0.00	12
298	0.25	0.10	0.14	10
299	0.25	0.12	0.17	8
300	0.67	0.33	0.44	6
301	0.00	0.00	0.00	1
302	0.67	0.40	0.50	5
303	0.33	0.25	0.29	12
304	0.00	0.00	0.00	37
305	0.70	0.78	0.74	9
306	0.58	0.28	0.38	25
307	0.25	0.12	0.16	17
308	0.00	0.00	0.00	11
309	0.00	0.00	0.00	9
310	0.00	0.00	0.00	7
311	0.00	0.00	0.00	0
312	0.46	0.46	0.46	13
313	0.00	0.00	0.00	12
314	1.00	0.57	0.73	7
315	0.00	0.00	0.00	7
316	0.00	0.00	0.00	2
317	0.25	0.17	0.20	6
318	0.00	0.00	0.00	6
319	0.00	0.00	0.00	14
320	0.00	0.00	0.00	6
321	0.00	0.00	0.00	9
322	0.18	0.29	0.22	7
323	0.00	0.00	0.00	17
324	0.62	0.83	0.71	6
325	0.33	0.20	0.25	5
326	0.33	0.33	0.33	3
327	0.44	0.67	0.53	12
328	0.14	0.03	0.05	31
329	1.00	0.56	0.71	9
330	0.00	0.00	0.00	3
331	0.12	0.20	0.15	5
332	0.33	0.19	0.24	16
333	0.00	0.00	0.00	15
334	0.33	0.50	0.40	2

335	0.57	0.24	0.33	17
336	0.00	0.00	0.00	6
337	0.00	0.00	0.00	2
338	0.00	0.00	0.00	10
339	0.70	0.64	0.67	11
340	0.20	0.11	0.14	9
341	0.00	0.00	0.00	7
342	0.00	0.00	0.00	12
343	0.00	0.00	0.00	2
344	0.00	0.00	0.00	11
345	0.00	0.00	0.00	7
346	0.00	0.00	0.00	2
347	0.00	0.00	0.00	7
348	0.00	0.00	0.00	48
349	0.00	0.00	0.00	15
350	0.50	0.29	0.36	7
351	0.17	0.60	0.26	5
352	0.00	0.00	0.00	24
353	1.00	0.40	0.57	5
354	0.00	0.00	0.00	4
355	0.00	0.00	0.00	16
356	0.67	0.44	0.53	9
357	0.00	0.00	0.00	3
358	0.50	0.08	0.14	12
359	0.00	0.00	0.00	21
360	1.00	0.21	0.35	19
361	0.37	0.41	0.39	27
362	0.00	0.00	0.00	11
363	0.00	0.00	0.00	21
364	0.75	0.55	0.63	11
365	1.00	0.33	0.50	3
366	0.09	0.10	0.10	10
367	0.00	0.00	0.00	10
368	0.40	0.18	0.25	22
369	0.00	0.00	0.00	21
370	1.00	0.67	0.80	3
371	0.33	0.14	0.20	21
372	0.00	0.00	0.00	12
373	0.00	0.00	0.00	2
374	0.00	0.00	0.00	2
375	0.00	0.00	0.00	25
376	0.50	0.14	0.22	7
377	0.33	0.17	0.22	6
378	0.67	0.15	0.24	27
379	0.00	0.00	0.00	4
380	0.67	0.50	0.57	8
381	0.11	0.14	0.12	7
382	0.40	0.67	0.50	6
383	0.00	0.00	0.00	10
384	0.40	1.00	0.57	4
385	0.00	0.00	0.00	26
386	0.67	0.18	0.29	11
387	0.50	0.25	0.33	8
388	0.00	0.00	0.00	6
389	0.08	0.12	0.10	8
390	0.00	0.00	0.00	0
391	0.00	0.00	0.00	20

392	0.64	0.50	0.56	14
393	0.50	0.50	0.50	2
394	0.00	0.00	0.00	9
395	1.00	0.14	0.25	7
396	1.00	0.47	0.64	19
397	0.50	0.27	0.35	15
398	0.00	0.00	0.00	0
399	0.18	0.50	0.27	4
400	1.00	0.33	0.50	3
401	0.00	0.00	0.00	26
402	0.00	0.00	0.00	1
403	0.25	0.11	0.15	9
404	0.33	0.07	0.12	14
405	0.00	0.00	0.00	3
406	0.06	0.07	0.07	14
407	0.50	0.67	0.57	3
408	0.00	0.00	0.00	11
409	0.71	0.59	0.65	17
410	0.83	0.50	0.62	10
411	0.00	0.00	0.00	1
412	0.00	0.00	0.00	5
413	0.00	0.00	0.00	7
414	0.00	0.00	0.00	1
415	0.60	0.75	0.67	4
416	0.00	0.00	0.00	13
417	0.75	0.75	0.75	4
418	0.00	0.00	0.00	17
419	0.00	0.00	0.00	0
420	0.00	0.00	0.00	2
421	0.50	0.25	0.33	4
422	0.00	0.00	0.00	13
423	0.00	0.00	0.00	16
424	0.75	0.27	0.40	11
425	0.00	0.00	0.00	8
426	0.20	0.20	0.20	5
427	0.00	0.00	0.00	1
428	0.00	0.00	0.00	2
429	0.00	0.00	0.00	4
430	0.00	0.00	0.00	16
431	0.00	0.00	0.00	9
432	1.00	0.43	0.60	14
433	0.00	0.00	0.00	6
434	0.00	0.00	0.00	5
435	0.62	0.56	0.59	9
436	0.50	0.17	0.25	6
437	0.33	0.17	0.22	6
438	0.40	0.40	0.40	5
439	0.00	0.00	0.00	1
440	0.08	0.12	0.10	8
441	0.00	0.00	0.00	9
442	0.00	0.00	0.00	10
443	0.08	0.12	0.10	8
444	0.00	0.00	0.00	13
445	0.00	0.00	0.00	25
446	0.00	0.00	0.00	11
447	0.33	0.12	0.18	8
448	0.00	0.00	0.00	11

449	0.00	0.00	0.00	19
450	0.50	0.14	0.22	7
451	0.00	0.00	0.00	10
452	0.00	0.00	0.00	4
453	0.00	0.00	0.00	1
454	0.00	0.00	0.00	10
455	0.00	0.00	0.00	4
456	0.00	0.00	0.00	11
457	0.09	0.09	0.09	11
458	0.40	0.40	0.40	5
459	0.00	0.00	0.00	3
460	0.12	0.10	0.11	10
461	1.00	0.50	0.67	4
462	0.20	0.10	0.13	10
463	0.33	0.24	0.28	17
464	0.00	0.00	0.00	23
465	0.00	0.00	0.00	5
466	0.50	0.33	0.40	3
467	0.00	0.00	0.00	4
468	0.00	0.00	0.00	11
469	0.00	0.00	0.00	19
470	0.00	0.00	0.00	7
471	0.00	0.00	0.00	7
472	0.00	0.00	0.00	9
473	0.50	0.14	0.22	7
474	0.00	0.00	0.00	24
475	0.50	0.33	0.40	3
476	0.00	0.00	0.00	9
477	0.00	0.00	0.00	4
478	0.14	0.33	0.20	3
479	0.00	0.00	0.00	14
480	0.08	0.12	0.10	8
481	0.00	0.00	0.00	15
482	0.33	0.67	0.44	3
483	0.20	0.12	0.15	8
484	0.00	0.00	0.00	8
485	0.00	0.00	0.00	14
486	0.00	0.00	0.00	0
487	0.00	0.00	0.00	20
488	0.86	0.33	0.48	18
489	0.00	0.00	0.00	5
490	1.00	0.44	0.62	9
491	0.05	0.50	0.09	2
492	0.50	0.36	0.42	11
493	0.00	0.00	0.00	2
494	0.00	0.00	0.00	5
495	1.00	0.50	0.67	4
496	0.00	0.00	0.00	18
497	0.00	0.00	0.00	12
498	0.00	0.00	0.00	6
499	0.67	0.40	0.50	10
micro avg	0.50	0.24	0.33	17851
macro avg	0.33	0.20	0.22	17851
weighted avg	0.48	0.24	0.30	17851
samples avg	0.30	0.24	0.24	17851

In [0]:

## Linear SVM using One Vs Rest

```
In [32]: alpha = [10**-5, 10**-4, 10**-3, 10**-2, 10**-1, 10**0, 10**1]
for i in tqdm1(alpha):
    start = datetime.now()
    classifier = OneVsRestClassifier(SGDClassifier(loss='hinge', alpha=i, penalty='l1'))
    classifier.fit(x_train_multilabel, y_train)
    predictions = classifier.predict(x_test_multilabel)

    print("Alpha : ",i)
    print("Accuracy :",metrics.accuracy_score(y_test, predictions))
    print("Hamming loss ",metrics.hamming_loss(y_test,predictions))

    precision = precision_score(y_test, predictions, average='micro')
    recall = recall_score(y_test, predictions, average='micro')
    f1 = f1_score(y_test, predictions, average='micro')

    print("Micro-average quality numbers")
    print(f"Precision: {precision}, Recall: {recall}, F1-measure: {f1}")
```

```

Alpha : 1e-05
Accuracy : 0.0682
Hamming loss 0.008931
Micro-average quality numbers
Precision: 0.1709065907081819, Recall: 0.389894123578511, F1-measure: 0.23764
404609475032
Alpha : 0.0001
Accuracy : 0.0716
Hamming loss 0.007253
Micro-average quality numbers
Precision: 0.21242503748125938, Recall: 0.38098705954848466, F1-measure: 0.27
276555637997074
Alpha : 0.001
Accuracy : 0.132
Hamming loss 0.003654
Micro-average quality numbers
Precision: 0.4771960378796125, Recall: 0.24558848243795867, F1-measure: 0.324
2843405577336
Alpha : 0.01
Accuracy : 0.1176
Hamming loss 0.003459
Micro-average quality numbers
Precision: 0.5967966573816156, Recall: 0.09601702985827125, F1-measure: 0.165
42006466245238
Alpha : 0.1
Accuracy : 0.0845
Hamming loss 0.0035626
Micro-average quality numbers
Precision: 0.7375, Recall: 0.003305136967116688, F1-measure: 0.00658078188611
9012
Alpha : 1
Accuracy : 0.0828
Hamming loss 0.0035942
Micro-average quality numbers
Precision: 0.00819672131147541, Recall: 5.601927062909641e-05, F1-measure: 0.
00011127802815334112
Alpha : 10
Accuracy : 0.0838
Hamming loss 0.0035702
Micro-average quality numbers
Precision: 0.0, Recall: 0.0, F1-measure: 0.0

```

```

In [33]: start = datetime.now()
model = OneVsRestClassifier(SGDClassifier(loss='hinge', alpha=0.001, penalty=
'11'))
model.fit(x_train_multilabel,y_train)
pred = model.predict(x_test_multilabel)
print("Time taken to run :", datetime.now() - start)

```

Time taken to run : 0:02:29.340072

```
In [34]: print("accuracy :",metrics.accuracy_score(y_test,pred))
print("macro f1 score :",metrics.f1_score(y_test, pred, average = 'macro'))
print("micro f1 scoore :",metrics.f1_score(y_test, pred, average = 'micro'))
print("hamming loss :",metrics.hamming_loss(y_test,pred))
print("Precision recall report :\n",metrics.classification_report(y_test, pred
))
```



accuracy : 0.131

macro f1 score : 0.19562197551140953

micro f1 scoore : 0.321585091886716

hamming loss : 0.0036842

Precision recall report :

	precision	recall	f1-score	support
0	0.49	0.24	0.32	224
1	0.51	0.04	0.07	619
2	0.79	0.54	0.64	417
3	0.56	0.63	0.59	279
4	0.74	0.31	0.44	877
5	0.03	0.25	0.05	4
6	0.67	0.45	0.54	441
7	0.86	0.45	0.59	343
8	0.66	0.34	0.45	250
9	0.35	0.01	0.02	504
10	0.73	0.55	0.63	532
11	0.78	0.66	0.72	200
12	0.73	0.67	0.70	200
13	0.44	0.29	0.35	160
14	0.37	0.35	0.36	112
15	0.50	0.50	0.50	4
16	0.65	0.57	0.61	157
17	0.74	0.23	0.35	172
18	0.30	0.17	0.22	148
19	0.00	0.00	0.00	13
20	0.48	0.60	0.54	101
21	0.23	0.28	0.26	99
22	0.00	0.00	0.00	79
23	0.08	0.02	0.04	250
24	0.52	0.20	0.29	140
25	0.38	0.39	0.39	76
26	0.00	0.00	0.00	8
27	0.41	0.18	0.25	61
28	0.30	0.15	0.20	247
29	0.34	0.15	0.21	101
30	0.83	0.27	0.41	56
31	0.40	0.28	0.33	74
32	0.03	0.03	0.03	32
33	0.83	0.82	0.82	98
34	0.48	0.31	0.38	42
35	0.25	0.02	0.04	170
36	0.06	0.25	0.09	8
37	0.38	0.19	0.25	68
38	0.29	0.18	0.22	153
39	0.43	0.47	0.45	43
40	0.37	0.27	0.32	157
41	0.40	0.24	0.30	41
42	0.78	0.53	0.63	53
43	0.00	0.00	0.00	72
44	0.19	0.27	0.23	48
45	0.18	0.07	0.10	82
46	0.50	0.48	0.49	64
47	0.50	0.35	0.41	20
48	0.75	0.76	0.76	55
49	0.73	0.34	0.47	178

50	0.38	0.39	0.39	59
51	0.20	0.40	0.27	5
52	0.74	0.45	0.56	136
53	0.00	0.00	0.00	28
54	0.42	0.25	0.31	32
55	0.56	0.53	0.54	80
56	0.48	0.72	0.58	40
57	0.00	0.00	0.00	68
58	0.81	0.79	0.80	28
59	0.57	0.42	0.48	31
60	0.39	0.32	0.35	41
61	0.50	0.42	0.46	31
62	0.46	0.46	0.46	211
63	0.64	0.44	0.52	160
64	0.24	0.22	0.23	93
65	0.00	0.00	0.00	50
66	0.14	0.14	0.14	35
67	0.50	0.08	0.14	12
68	0.69	0.33	0.45	87
69	0.63	0.63	0.63	27
70	0.00	0.00	0.00	107
71	0.47	0.39	0.43	23
72	0.48	0.59	0.53	118
73	0.50	0.08	0.14	112
74	0.85	0.28	0.42	138
75	0.16	0.17	0.16	36
76	0.00	0.00	0.00	57
77	0.62	0.10	0.18	77
78	0.00	0.00	0.00	120
79	0.00	0.00	0.00	7
80	0.00	0.00	0.00	98
81	0.65	0.29	0.40	89
82	0.00	0.00	0.00	206
83	0.00	0.00	0.00	2
84	0.44	0.35	0.39	71
85	0.52	0.37	0.43	30
86	0.00	0.00	0.00	97
87	0.10	0.19	0.13	36
88	0.00	0.00	0.00	36
89	0.25	0.32	0.28	22
90	0.00	0.00	0.00	8
91	0.00	0.00	0.00	15
92	0.29	0.25	0.27	88
93	0.00	0.00	0.00	27
94	0.13	0.23	0.16	30
95	0.31	0.49	0.38	35
96	0.77	0.37	0.50	54
97	1.00	0.02	0.03	58
98	0.67	0.15	0.25	133
99	0.00	0.00	0.00	2
100	0.56	0.45	0.50	22
101	0.64	0.52	0.57	31
102	0.00	0.00	0.00	22
103	0.00	0.00	0.00	5
104	0.50	0.26	0.34	73
105	0.50	0.17	0.25	6
106	0.00	0.00	0.00	23

107	0.00	0.00	0.00	17
108	0.00	0.00	0.00	34
109	0.00	0.00	0.00	6
110	0.00	0.00	0.00	1
111	0.15	0.17	0.16	42
112	0.80	0.20	0.32	40
113	0.55	0.50	0.52	22
114	0.42	0.59	0.49	17
115	0.80	0.22	0.35	18
116	0.00	0.00	0.00	34
117	0.33	0.25	0.29	8
118	0.00	0.00	0.00	12
119	0.26	0.38	0.31	13
120	0.23	0.32	0.27	19
121	0.00	0.00	0.00	46
122	0.44	0.06	0.10	72
123	0.00	0.00	0.00	112
124	0.00	0.00	0.00	21
125	0.81	0.68	0.74	19
126	0.00	0.00	0.00	37
127	0.00	0.00	0.00	32
128	0.40	0.42	0.41	19
129	0.00	0.00	0.00	28
130	0.81	0.13	0.22	100
131	0.00	0.00	0.00	13
132	0.43	0.20	0.27	30
133	0.77	0.80	0.78	25
134	0.00	0.00	0.00	6
135	0.38	0.47	0.42	83
136	0.14	0.50	0.22	2
137	0.00	0.00	0.00	51
138	0.00	0.00	0.00	16
139	0.14	0.20	0.17	10
140	0.60	0.36	0.45	25
141	0.33	0.44	0.38	16
142	0.56	0.60	0.58	15
143	0.05	0.09	0.07	11
144	1.00	0.04	0.07	56
145	0.00	0.00	0.00	26
146	0.00	0.00	0.00	18
147	0.00	0.00	0.00	13
148	0.00	0.00	0.00	30
149	0.00	0.00	0.00	15
150	0.50	0.50	0.50	4
151	0.00	0.00	0.00	17
152	0.23	0.44	0.31	34
153	0.00	0.00	0.00	33
154	0.75	0.75	0.75	4
155	0.21	0.60	0.32	5
156	0.64	0.82	0.72	11
157	0.00	0.00	0.00	73
158	0.52	0.52	0.52	21
159	0.00	0.00	0.00	58
160	0.40	0.80	0.53	5
161	0.62	0.44	0.52	57
162	0.00	0.00	0.00	0
163	0.27	0.17	0.21	36

164	0.06	0.21	0.09	14
165	0.90	0.56	0.69	16
166	0.00	0.00	0.00	1
167	0.40	0.13	0.20	15
168	0.08	0.12	0.10	8
169	0.00	0.00	0.00	49
170	0.17	0.10	0.12	10
171	0.04	0.03	0.03	35
172	0.69	0.50	0.58	18
173	1.00	0.07	0.12	45
174	0.57	0.80	0.67	5
175	0.00	0.00	0.00	11
176	0.00	0.00	0.00	38
177	0.32	0.22	0.26	46
178	1.00	0.22	0.36	36
179	0.00	0.00	0.00	69
180	0.00	0.00	0.00	8
181	0.60	0.19	0.29	16
182	0.82	0.75	0.78	12
183	0.07	0.12	0.08	25
184	0.67	0.24	0.35	25
185	0.31	0.40	0.35	10
186	0.23	0.27	0.25	26
187	0.15	0.50	0.24	4
188	0.12	0.32	0.18	28
189	0.00	0.00	0.00	45
190	0.00	0.00	0.00	9
191	0.00	0.00	0.00	45
192	0.00	0.00	0.00	11
193	0.75	0.39	0.51	23
194	0.27	0.08	0.12	52
195	0.68	0.25	0.37	52
196	0.75	0.24	0.37	49
197	0.00	0.00	0.00	40
198	0.21	0.58	0.31	12
199	0.00	0.00	0.00	27
200	0.80	0.71	0.75	17
201	0.29	0.14	0.19	14
202	0.12	0.15	0.13	13
203	0.23	0.13	0.16	55
204	0.11	0.25	0.15	4
205	0.00	0.00	0.00	26
206	0.12	0.20	0.15	10
207	0.00	0.00	0.00	27
208	0.00	0.00	0.00	2
209	0.00	0.00	0.00	8
210	0.00	0.00	0.00	42
211	0.00	0.00	0.00	12
212	0.00	0.00	0.00	22
213	0.00	0.00	0.00	7
214	0.38	0.16	0.23	37
215	0.59	0.59	0.59	17
216	0.00	0.00	0.00	71
217	0.89	0.40	0.55	20
218	0.20	0.20	0.20	5
219	0.00	0.00	0.00	81
220	0.00	0.00	0.00	8

221	0.00	0.00	0.00	19
222	0.33	0.67	0.44	3
223	0.00	0.00	0.00	6
224	0.00	0.00	0.00	11
225	0.00	0.00	0.00	13
226	0.50	0.67	0.57	12
227	1.00	0.08	0.14	13
228	0.75	0.17	0.27	18
229	0.00	0.00	0.00	39
230	0.17	0.24	0.20	33
231	1.00	0.54	0.70	26
232	0.00	0.00	0.00	23
233	0.00	0.00	0.00	17
234	0.00	0.00	0.00	1
235	0.00	0.00	0.00	18
236	0.00	0.00	0.00	10
237	0.00	0.00	0.00	13
238	0.50	0.42	0.46	26
239	1.00	0.44	0.62	9
240	0.07	0.06	0.06	16
241	1.00	0.08	0.15	12
242	1.00	0.80	0.89	5
243	0.80	0.33	0.47	12
244	0.00	0.00	0.00	23
245	0.12	0.12	0.12	17
246	0.44	0.22	0.30	18
247	1.00	0.29	0.44	7
248	0.44	0.40	0.42	10
249	0.50	0.33	0.40	15
250	0.00	0.00	0.00	30
251	0.11	0.33	0.17	3
252	0.40	0.31	0.35	13
253	0.33	0.14	0.19	22
254	0.41	0.58	0.48	19
255	0.00	0.00	0.00	15
256	0.67	0.29	0.40	7
257	1.00	0.21	0.35	14
258	0.00	0.00	0.00	3
259	0.50	0.11	0.18	9
260	0.21	0.30	0.25	10
261	0.20	0.17	0.18	24
262	0.00	0.00	0.00	46
263	0.00	0.00	0.00	12
264	0.00	0.00	0.00	34
265	0.00	0.00	0.00	4
266	0.57	0.70	0.63	23
267	0.22	0.13	0.16	31
268	0.00	0.00	0.00	13
269	0.00	0.00	0.00	11
270	0.10	0.11	0.11	9
271	0.50	0.83	0.62	6
272	0.00	0.00	0.00	27
273	0.00	0.00	0.00	35
274	1.00	0.14	0.25	7
275	0.00	0.00	0.00	14
276	0.00	0.00	0.00	18
277	0.00	0.00	0.00	31

278	0.20	0.12	0.15	16
279	0.00	0.00	0.00	2
280	0.08	0.14	0.11	14
281	0.00	0.00	0.00	17
282	0.67	0.29	0.40	7
283	0.15	0.06	0.09	32
284	0.00	0.00	0.00	11
285	0.00	0.00	0.00	2
286	0.50	0.04	0.07	28
287	0.00	0.00	0.00	13
288	0.00	0.00	0.00	4
289	0.40	0.25	0.31	16
290	0.00	0.00	0.00	16
291	0.16	0.31	0.21	16
292	1.00	0.80	0.89	5
293	0.50	1.00	0.67	9
294	0.00	0.00	0.00	11
295	0.00	0.00	0.00	9
296	0.00	0.00	0.00	0
297	0.00	0.00	0.00	12
298	0.25	0.10	0.14	10
299	0.04	0.12	0.06	8
300	0.11	0.33	0.16	6
301	0.00	0.00	0.00	1
302	0.40	0.40	0.40	5
303	0.00	0.00	0.00	12
304	0.00	0.00	0.00	37
305	0.50	0.56	0.53	9
306	0.48	0.52	0.50	25
307	0.00	0.00	0.00	17
308	0.00	0.00	0.00	11
309	0.00	0.00	0.00	9
310	0.14	0.14	0.14	7
311	0.00	0.00	0.00	0
312	0.38	0.62	0.47	13
313	0.00	0.00	0.00	12
314	0.71	0.71	0.71	7
315	0.00	0.00	0.00	7
316	0.00	0.00	0.00	2
317	0.43	0.50	0.46	6
318	0.17	0.17	0.17	6
319	0.00	0.00	0.00	14
320	0.00	0.00	0.00	6
321	0.00	0.00	0.00	9
322	0.45	0.71	0.56	7
323	0.00	0.00	0.00	17
324	1.00	0.67	0.80	6
325	0.33	0.20	0.25	5
326	0.50	0.33	0.40	3
327	0.56	0.83	0.67	12
328	0.00	0.00	0.00	31
329	0.86	0.67	0.75	9
330	0.00	0.00	0.00	3
331	0.25	0.20	0.22	5
332	0.42	0.31	0.36	16
333	0.00	0.00	0.00	15
334	0.00	0.00	0.00	2

335	0.67	0.12	0.20	17
336	0.00	0.00	0.00	6
337	0.00	0.00	0.00	2
338	0.00	0.00	0.00	10
339	0.47	0.64	0.54	11
340	0.00	0.00	0.00	9
341	0.00	0.00	0.00	7
342	0.00	0.00	0.00	12
343	0.00	0.00	0.00	2
344	0.00	0.00	0.00	11
345	0.00	0.00	0.00	7
346	0.00	0.00	0.00	2
347	0.00	0.00	0.00	7
348	0.00	0.00	0.00	48
349	0.00	0.00	0.00	15
350	0.25	0.14	0.18	7
351	0.11	0.40	0.17	5
352	0.00	0.00	0.00	24
353	0.00	0.00	0.00	5
354	0.00	0.00	0.00	4
355	0.00	0.00	0.00	16
356	0.57	0.44	0.50	9
357	0.00	0.00	0.00	3
358	0.06	0.08	0.07	12
359	0.00	0.00	0.00	21
360	1.00	0.42	0.59	19
361	0.00	0.00	0.00	27
362	0.00	0.00	0.00	11
363	0.00	0.00	0.00	21
364	0.55	0.55	0.55	11
365	0.00	0.00	0.00	3
366	0.00	0.00	0.00	10
367	0.06	0.10	0.07	10
368	0.38	0.14	0.20	22
369	0.00	0.00	0.00	21
370	0.67	0.67	0.67	3
371	0.50	0.24	0.32	21
372	0.00	0.00	0.00	12
373	0.00	0.00	0.00	2
374	0.00	0.00	0.00	2
375	0.40	0.08	0.13	25
376	0.15	0.43	0.22	7
377	0.00	0.00	0.00	6
378	0.71	0.37	0.49	27
379	0.00	0.00	0.00	4
380	0.57	0.50	0.53	8
381	0.09	0.14	0.11	7
382	0.56	0.83	0.67	6
383	0.00	0.00	0.00	10
384	1.00	1.00	1.00	4
385	0.07	0.12	0.09	26
386	0.25	0.18	0.21	11
387	0.60	0.38	0.46	8
388	0.00	0.00	0.00	6
389	0.00	0.00	0.00	8
390	0.00	0.00	0.00	0
391	0.00	0.00	0.00	20

392	0.60	0.21	0.32	14
393	0.12	0.50	0.20	2
394	0.17	0.11	0.13	9
395	0.50	0.71	0.59	7
396	0.80	0.42	0.55	19
397	0.00	0.00	0.00	15
398	0.00	0.00	0.00	0
399	0.67	0.50	0.57	4
400	1.00	0.33	0.50	3
401	0.00	0.00	0.00	26
402	0.00	0.00	0.00	1
403	0.33	0.22	0.27	9
404	0.38	0.36	0.37	14
405	0.00	0.00	0.00	3
406	0.10	0.43	0.17	14
407	0.33	0.67	0.44	3
408	0.00	0.00	0.00	11
409	0.67	0.47	0.55	17
410	1.00	0.40	0.57	10
411	0.00	0.00	0.00	1
412	0.00	0.00	0.00	5
413	0.00	0.00	0.00	7
414	0.00	0.00	0.00	1
415	0.43	0.75	0.55	4
416	1.00	0.38	0.56	13
417	0.50	0.75	0.60	4
418	0.00	0.00	0.00	17
419	0.00	0.00	0.00	0
420	0.00	0.00	0.00	2
421	0.00	0.00	0.00	4
422	0.00	0.00	0.00	13
423	0.00	0.00	0.00	16
424	0.50	0.64	0.56	11
425	1.00	0.12	0.22	8
426	0.00	0.00	0.00	5
427	0.00	0.00	0.00	1
428	0.00	0.00	0.00	2
429	0.00	0.00	0.00	4
430	1.00	0.06	0.12	16
431	0.00	0.00	0.00	9
432	1.00	0.50	0.67	14
433	0.00	0.00	0.00	6
434	0.00	0.00	0.00	5
435	0.57	0.44	0.50	9
436	0.50	0.17	0.25	6
437	0.00	0.00	0.00	6
438	0.60	0.60	0.60	5
439	0.00	0.00	0.00	1
440	0.60	0.38	0.46	8
441	0.00	0.00	0.00	9
442	0.00	0.00	0.00	10
443	0.00	0.00	0.00	8
444	0.00	0.00	0.00	13
445	0.00	0.00	0.00	25
446	0.00	0.00	0.00	11
447	0.19	0.38	0.25	8
448	0.00	0.00	0.00	11



449	0.00	0.00	0.00	19
450	0.00	0.00	0.00	7
451	0.00	0.00	0.00	10
452	0.00	0.00	0.00	4
453	0.00	0.00	0.00	1
454	0.00	0.00	0.00	10
455	0.00	0.00	0.00	4
456	0.00	0.00	0.00	11
457	0.00	0.00	0.00	11
458	0.00	0.00	0.00	5
459	0.00	0.00	0.00	3
460	0.08	0.20	0.11	10
461	0.50	0.75	0.60	4
462	0.15	0.20	0.17	10
463	0.00	0.00	0.00	17
464	0.00	0.00	0.00	23
465	0.00	0.00	0.00	5
466	0.00	0.00	0.00	3
467	0.00	0.00	0.00	4
468	0.00	0.00	0.00	11
469	1.00	0.05	0.10	19
470	0.00	0.00	0.00	7
471	0.00	0.00	0.00	7
472	0.00	0.00	0.00	9
473	0.25	0.14	0.18	7
474	0.00	0.00	0.00	24
475	0.00	0.00	0.00	3
476	1.00	0.11	0.20	9
477	0.00	0.00	0.00	4
478	0.00	0.00	0.00	3
479	0.00	0.00	0.00	14
480	0.00	0.00	0.00	8
481	0.00	0.00	0.00	15
482	0.00	0.00	0.00	3
483	0.12	0.12	0.12	8
484	0.00	0.00	0.00	8
485	0.18	0.14	0.16	14
486	0.00	0.00	0.00	0
487	0.00	0.00	0.00	20
488	0.62	0.28	0.38	18
489	0.00	0.00	0.00	5
490	0.67	0.22	0.33	9
491	0.25	0.50	0.33	2
492	0.42	0.45	0.43	11
493	0.00	0.00	0.00	2
494	0.00	0.00	0.00	5
495	0.50	0.25	0.33	4
496	0.00	0.00	0.00	18
497	0.00	0.00	0.00	12
498	0.00	0.00	0.00	6
499	0.50	0.70	0.58	10
micro avg	0.47	0.24	0.32	17851
macro avg	0.26	0.19	0.20	17851
weighted avg	0.41	0.24	0.28	17851
samples avg	0.30	0.24	0.25	17851

## Results(Pretty Table):

```
In [5]: from prettytable import PrettyTable
x = PrettyTable(['Model', '(Alpha)', 'Accuracy', 'Micro f1-score', 'Hamming Loss'
])
x.add_row(['LR', '0.001', '0.1398', '0.3268', '0.0035'])
x.add_row(['Linear SVM', '0.001', '0.131', '0.3215', '0.0036'])
print(x)
```

Model	(Alpha)	Accuracy	Micro f1-score	Hamming Loss
LR	0.001	0.1398	0.3268	0.0035
Linear SVM	0.001	0.131	0.3215	0.0036

## Conclusions:

1. First i used Count vectorizer with one, two, three, four grams for vectorizing text data
2. Then i hyperparameter tuned alpha for logistic regression and found out the best alpha to be 0.001
3. Then with alpha=0.001 , LR got a score of 0.3268 for micro-f1
4. Then i hyperparameter tuned alpha for Linear SVM and found out the best alpha also to be 0.001
5. Then with alpha=0.001 , LR got a score of 0.3215 for micro-f1

In [ ]: