Document Classification System

User Manual

2014/15 Semester A

CS3343 LA1 – Acumen

Delivery Date: 5th Dec 2014

USER'S MANUAL

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1. GENERAL INFORMATION

1.1 System Overview

In this information age, increasing amount of information is conveyed in digital form. Our system aims to act as a smart “librarian” who can tell the catalogue of the document belongs to within the binary codes. The process of classifying documents to catalogues is no longer painstaking and time-consuming with help of this system. User can immediately get the catalogue of the document by simply input the location of the document, getting rid of the need to read the document from the beginning. Designed to be “smart”, the system will “learn” after each task it performs by expanding its own word library, making itself more and more powerful.

1.2 Major functions performed by the system

Functions:
1. The project can accept a user provided training data set and use it to train the matrix for classification. By default, the system will use training data set provided by us.
2. After building the matrix, we can use it to classify the category that user input file belongs to.

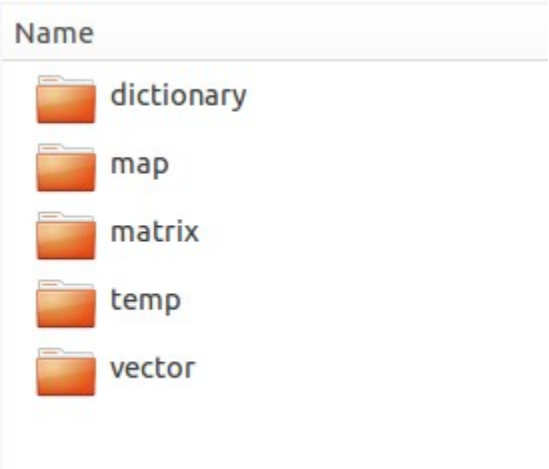
User Access Mode: command line.

Pre-requirement: jdk or jre installed.

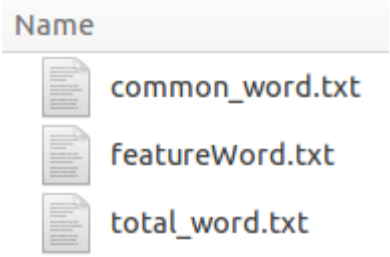
System name: Document Classification System

2. SYSTEM SUMMARY

2.1 Configuration Folder Structure

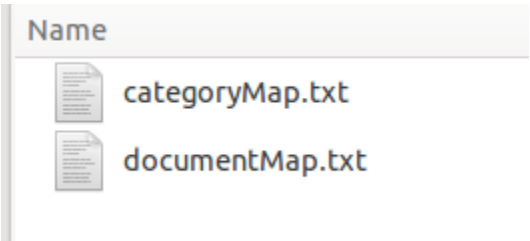


2.1.1 dictionary



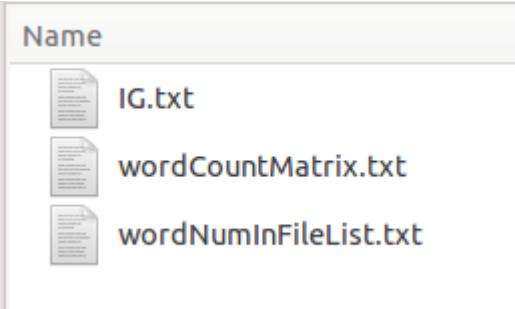
1. common_word.txt contains words that are not useful for classification process, such as “a”, “the”. User may add words they do not want to include in the classification process to this file.
2. featureWord.txt contains words our program selected for classification.
3. total_word.txt contains all the words appeared in the training documents.

2.1.2 map



These two files contain the mapping relationship between file name and indexes.

2.1.3 matrix



1. IG.txt shows the information gain of each word which use the wordCountMatrix.txt to calculate.

2. wordCountMatrix.txt contains the word appearances in each file.

2.1.4 vector

vectorMatrix.txt uses all the feature words to calculate vector for training files. And using this vector matrix, we can calculate the similarity between new file and the existing files. Thus, we are able to classify the category of the input file.

3. GETTING STARTED

3.1 Command Supported

This section provides a general walk through of the project from initiation through exit. Basically, two commands are supported to run this jar file.

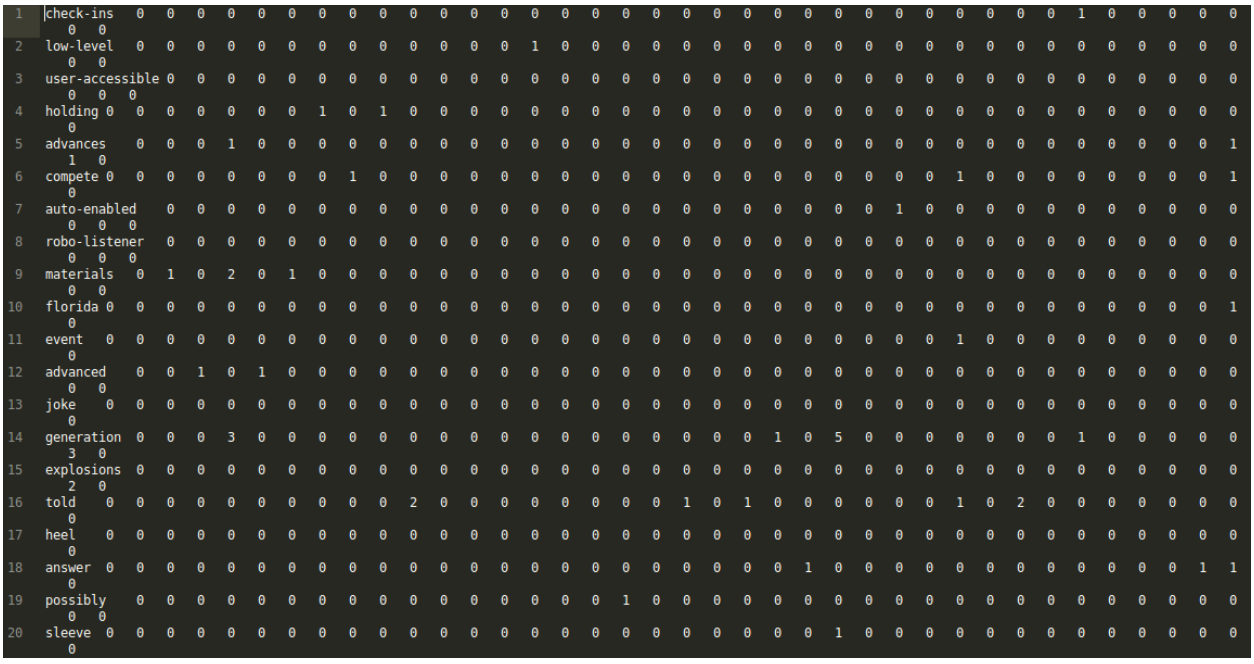
1. java -jar Classifier.jar <training data root path> <file to be classified>

<training data root path>: the folder that contains different categories.

For example: **./training_data** (which contains 6 categories)

<file to be classified>: the file needs to be classified.

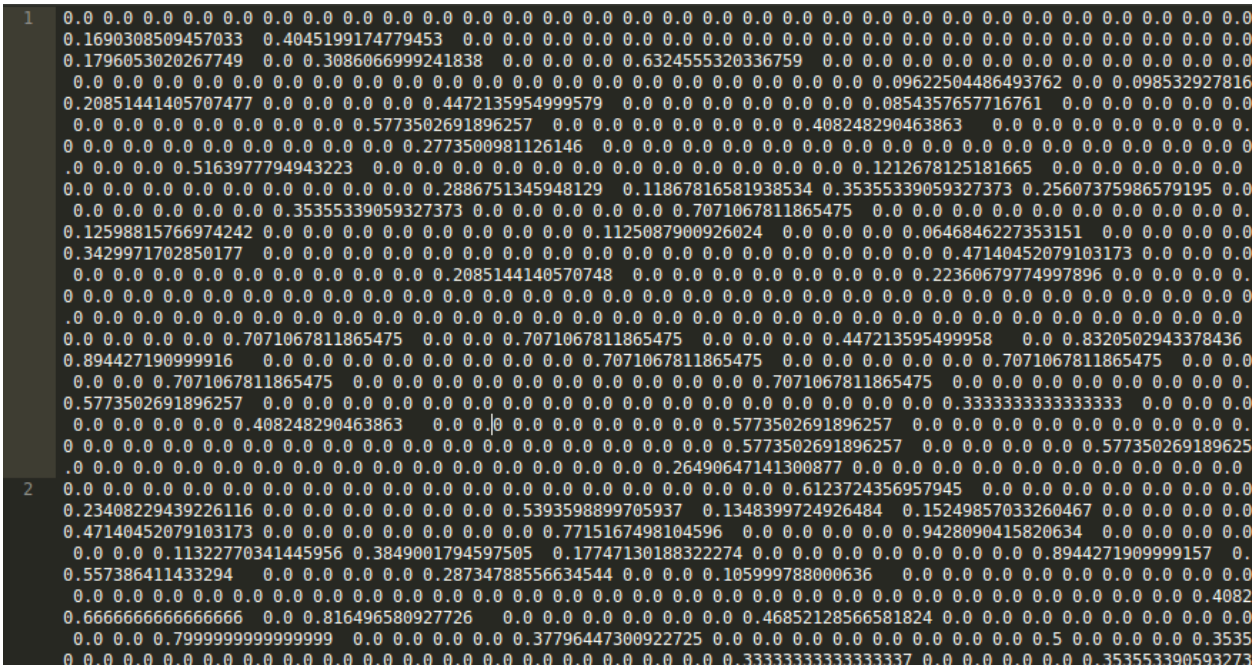
The program will first generate the word count matrix and then calculate the information gain for each word.



Information Gain:

```
genuine 0.03778375487808083
wide    0.03597375665014857
editions    0.03058558014956847
accurate    0.06093434385759999
wider   0.06274434208553203
antenna 0.03058558014956847
departure   0.03778375487808083
cooperate   0.03058558014956847
electronics 0.03778375487808083
digitizing  0.03058558014956847
founder 0.03597375665014879
ticket  0.03058558014956847
bigwig  0.03058558014956847
hoops   0.03058558014956847
individually    0.06274434208553226
ones    0.04089409243740505
deals   0.03058558014956847
founded 0.03058558014956847
cold    0.03778375487808083
car 0.06093434385759999
calls   0.04169782192449212
zero    0.028208044533669874
etiquette   0.03058558014956847
reportedly  0.03058558014956847
former  0.06665840913194354
ammo    0.03058558014956847
heat-tolerant   0.03058558014956847
collection  0.03597375665014857
painless    0.03058558014956847
formed  0.03058558014956847
exposes 0.03058558014956847
lines   0.03597375665014857
enhance 0.03058558014956847
shifts  0.03058558014956847
combo   0.03058558014956847
spotting    0.03058558014956847
browser-based   0.03058558014956847
incidentally    0.03058558014956847
measure 0.03058558014956847
puny    0.03058558014956847
```

Then, the program will work out the vector matrix for comparison.



2. java -jar Classifier.jar <file to be classified>

If user do not define the training data set, the program will use the default training set for classification.

3.2 Starting Program

In console, we can run the program through command easily.

In this example, we have a training data set – training_data and a file test.txt for testing purpose.

Case 1: NO argument provided

```
zfang6@zfang6-Inspiron:~/Documents/Cityu/CS3343/Project/Acumen-V5/Release$ java -jar Classifier.jar
Please input at least 1 argument
 [file to be classified]
```

Case 2: Only one file provided

java -jar Classifier.jar test.txt

```
zfang6@zfang6-Inspiron:~/Documents/Cityu/CS3343/Project/Acumen-V5/Release$ java -jar Classifier.jar training_data/computer/All-graphene_computer_chip.t
xt
Belongs to computer
```

The program correctly classify the document as computer category.

Case 3: Training data set and file provided

java -jar Classifier.jar training_data/ test.txt

```
zfang6@zfang6-Inspiron:~/Documents/Cityu/CS3343/Project/Acumen-V5/Release$ java -jar Classifier.jar training_data/ training_data/computer/All-graphene_
computer_chip.txt
Belongs to computer
```

The program correctly classify the document as computer category.