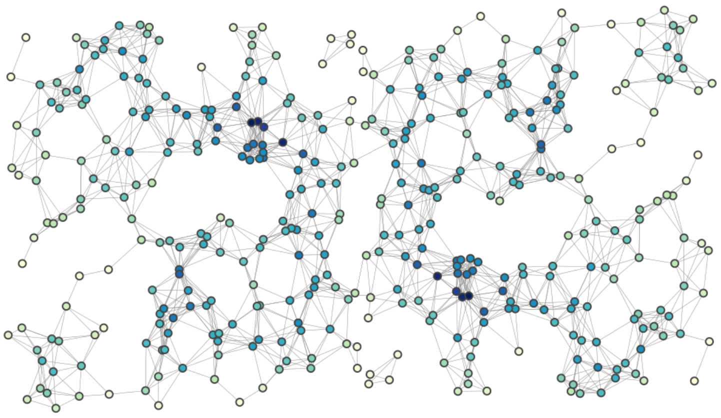

Old Dominion University

CS 432 Web Science

Assignment Ten

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1 Use knnestimate() to compute nearest neighbors

For this I worked from the interactive prompt after only slight modifications to the PCI code it was just the following commands to generate the tables.

```
>>> import clusters
>>> import numpredict
>>> from tabulate import tabulate
>>> from collections import OrderedDict
>>> blognames, words, data = clusters.readfile(filename)
>>> f_measure_table = OrderedDict()
>>> for k in [1, 2, 5, 10, 20]:
...     numpredict.knnestimate(data, data[blognames.index('F-Measure')], k=k)
...
>>> tabulate(f_measure_table, headers='keys', tablefmt='latex')
```

Table 1: http://f-measure.blogspot.com/

k = 1	k = 2	k = 5	k = 10	k = 20
Laganas rock!	Laganas rock!	Laganas rock!	Laganas rock!	Laganas rock!
	Banging Windows	Banging Windows	Banging Windows	Banging Windows
		The Travels of Dave	The Travels of Dave	The Travels of Dave
		Design Your World	Design Your World	Design Your World
		Myths.. MyThoughts..	Myths.. MyThoughts..	Myths.. MyThoughts..
			The Wizard and I.	The Wizard and I.
			Girl Informer	Girl Informer
			SOPHIE PATTERSON	SOPHIE PATTERSON
			RED PAPER ONLINE	RED PAPER ONLINE
			Kaleidoscope	Kaleidoscope
				Star's Adventures at Camp Half Blood
				Dream, sports, and Travel Blogs
				What's in my head...
				The Fat Lady
				The Original Runaway Heart
				Brent and Paulette's Excellent RV Adventure's
				Serendipity
				The Pink Lady of Hollywood
				poetic illusions
				All Feet are the Same!

The results seem alright for F-Measure but I am not so sure about for the Web Science blog.

Table 2: http://ws-dl.blogspot.com/

k = 1	k = 2	k = 5	k = 10	k = 20
Girl Informer	Girl Informer	Girl Informer	Girl Informer	Girl Informer
	Design Your World	Design Your World	Design Your World	Design Your World
		The Wizard and I.	The Wizard and I.	The Wizard and I.
		mayur	mayur	mayur
		RED PAPER ONLINE	RED PAPER ONLINE	RED PAPER ONLINE
			Kaleidoscope	Kaleidoscope
			Random Thoughts	Random Thoughts
			Myths.. MyThoughts..	Myths.. MyThoughts..
			SOPHIE PATTERSON	SOPHIE PATTERSON
			The Fat Lady	The Fat Lady
				poetic illusions
				The Travels of Dave
				Rhiannon's A2 Media Coursework
				Banging Windows
				NOSTALGIA
				What's in my head...
				the silhouette of a dream.
				Babe in Old Town
				Damon @ Awahono School
				The Original Runaway Heart

2 Rerun A9, Q2 using LIBSVM

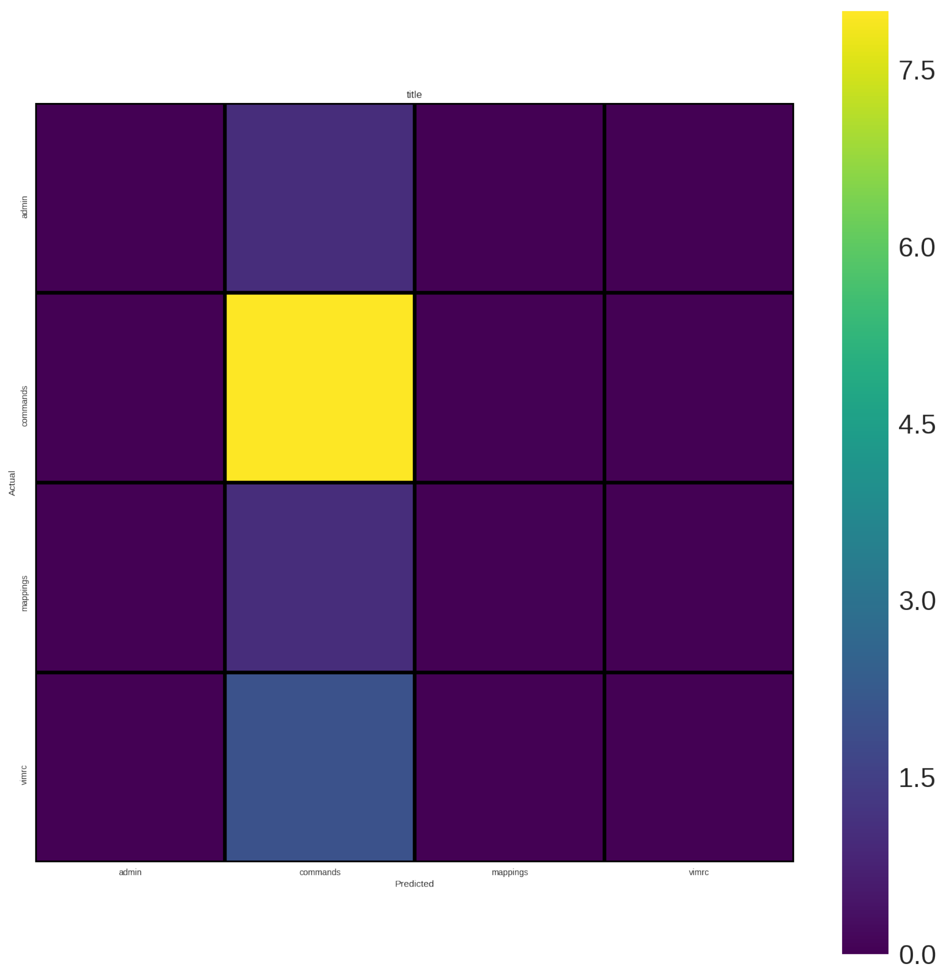
I again made use of the hy code for dictionary manipulations. I used scikit-learn packages SVM library to access the Python LIBSVM bindings. From it I used the SVC classifier since it supports multi-class classification in a "one-against-one" approach and `LinearSVC` uses a one against the rest method.

This approach required more massaging of the data to get it into a form that `SVC` wanted, and that could also show the requested data but it greatly simplified it overall. Since `SVC` wants parallel vectors as input, both numeric I used the sklearn.preprocessing.LableEncoder to translate the labels back and forth and the preprocessing data standardization functions to normalize the data.

In all the program is not really much different, it follows the same pattern. For cross validation I split the dictionary using into a larger dictionary containing all of the needed training and testing pairs and pass each to the classifier. I had to visit the parentheses mine they hide behind MIT for the `hy` code on this one though. From each result I generate and save a confusion matrix class like for assignment nine. The heatmap of a single run is shown in figure 2 on page 4.

Table 3: Accuracy

Category	Percent Correct
admin	68%
commands	45%
off-topic	73%
plugins	84%
vimrc	80%
mappings	85%


title
Actual
admin
commands
mappings
vimrc
Predicted
admin
commands
mappings
vimrc
7.5
6.0
4.5
3.0
1.5
0.0

```
(defn remove-keys [dictionary keys &optional [inverse None]]
  "Remove given keys from a dictionary"
  (if-not inverse
    (dict-comp k (get dictionary k) [k (.keys dictionary)] (not-in k keys))
    (dict-comp k (get dictionary k) [k (.keys dictionary)] (in k keys))))

(defn chunks [dictionary percentage]
  "Split dictionary into even dictionary chunks"
  (setv chunk-size (int (* (len dictionary) percentage)))
  (setv i (iter (.keys dictionary)))
  (for (xs (range 0 (len (.keys dictionary)) chunk-size))
    (yield (dict-comp k (get dictionary k) [k (islice i chunk-size)]))))

(defn k-fold [dictionary &optional [k 0.1]]
  "Given a dictionary return a list of the k-fold dictionaries"
  (setv acc [])
  (for (chunk (chunks dictionary k))
    (.append acc chunk)) acc)

(defn k-combinations [dictionary &optional [k 0.1]]
  "Get k-fold of dictionary then create list of all possible combinations"
  (setv acc [])
  (for (fold (k-fold dictionary :k k))
    (.append acc
      {"validation" fold "training" (remove-keys dictionary (.keys fold))})) acc)
```

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