

1. Introduction

This report is made based on the collective annotation released on March 28th. In order to produce relevant insights of the data, I developed a program facilitating to calculate the quantitative results where the conclusions may drive from. In this section, I briefly present an overview of what and how the results are calculated.

Raw data source: 5046_w4_0328_annotations.csv

All relevant source code includes: AnnEditor.py, AnnAnalyst.py, InterCompare.py, InterCat.py

All generated files include: ann_edited.csv, individual results (e.g. id_cnin0770.csv), summarizing.csv, overall.csv

Deployment environment: Python 3.6 and MS Excel

For complete files and code, see: https://github.com/cnin0770/5046_w5_ass1

1.1 AnnEditor (figure 1)

Given the raw .csv file that collects all individual annotation, this script draws a table with two axes of Unikeys and annotated subjects to give a better view of the data.

In addition, it also summarises the Gold column which represents the most voted annotation for each subject. See the output file in figure 2.

1.2 AnnAnalyst function (figure 3)

The Analyst function calculated the most relevant statistics such as precision and recall on the individual base (each Unikey per se). The individual result contains the desired statistics of each category as well as an overview of the performance combining all 15 categories of that individual annotator. An example can be seen in figure 4 (“Overview” on the last row).

1.3 InterCompare function (figure 5)

This function aims to compare the performance among all annotators. It produces a table with two axes of Unikey and statistics (e.g. precision and recall).

For convenience purpose, Fleiss' Kappa is calculated in Analyst function and presented in the output file of this function. See figure 6.

1.4 InterCat function (figure 9)

In order to compare the difference performance across 15 categories, this function is designed to draw a table with dimensions of key statistics for each category. The statistics are calculated combining all 55 annotators. See figure 10 for its production.

2. Analysis

2.1 Confusion Matrix

A confusion matrix gives the accumulated amounts of the annotating task. It counts 4 base parameters:

- True Positive: positive agreement between Gold class and annotated results.
- True Negative: negative agreement between Gold class and annotated results.
- False Positive: annotator gives a positive answer while Gold class disagrees.
- False Negative: annotator gives a negative answer while Gold class disagrees.

2.2 Precision, Recall and F-score

Statistical results may be drawn from the confusion matrix are (e.g. figure 4):

- Precision: higher if more correct answers were achieved against the total annotated subjects.
- Recall: higher if more correct answers were achieved against the total subjects that ought to be selected out.
- F-score: comprehensively presents the correctness rate with the balance between Precision and Recall; here I used 1 as the weight, per se, Precision and Recall are weighted equally.

2.3 Cohen's Kappa

Cohen's Kappa measures the agreement rate between the Gold class and the individual performance. It takes the accuracy rate, which represents the observed agreement, and expected agreement into account.

2.4 Fleiss' Kappa

Fleiss' Kappa gathers all annotators' performance to draw a conclusion of the agreement degree among them despite what the Gold class or the correct answers are. Thus, it can only be calculated with the results from more than 2 annotators. In this case, it is from all 55 annotators.

2.5 Quantitative analysis

2.5.1 Individual performance

Precision and Recall give a straightforward indication of how was the annotating task performed by an individual student. F-score combines them both with a weighted balance. In contrast, Cohen's Kappa presents the results in a different aspect of the agreement.

Take the example of my annotation (Unikey "cnin0770", figure 4), the best-annotated categories are Education, Health, etc. where all subjects in these categories were founded. Accordingly, the four above statistics are 100% despite the difference of actual amounts of these categories.

Transport is the most poorly categorized task with the lowest Cohen rate of 56.14%. Consistently, the F-score is also being the lowest even though its Recall is not.

This disagreement of statistics can be explained by that F-score combines both Precision and Recall. While their weights stay the same, Recall does not overtake the Precision mathematically in this particular case. This reflects the consistency between Cohen's Kappa and F-score.

The same situation can be found in another example of Unikey "aari5136" (figure 7) in categories Sports and Trade and the collective summary (figure 6). Therefore, there might be a conclusion to be observed that F-score is often consistent with Cohen's Kappa while F-score can be changed with its F weight.

2.5.2 Collective performance

Fleiss' Kappa is the best indicator to show how the agreement was achieved between annotators. According to the calculation, it is rated 68.15%.

By the digits alone, it may show a relatively and comprehensively high degree of agreement in terms of categories, subjects, and annotator numbers.

However, it does not provide a comparison or guideline to show whether this conclusion is acceptable. In practice, there might be an issue to request a range of acceptance regarding this statistic from the NLP community or task-providers.

Another way to observe the collective performance is through all the individual results presented with their statistics (figure 6) and performance across categories (figure 10). It compares the annotators against each other in an easy understanding form; although when the dataset comes much larger, this might not be the best way to gain the overall view for human evaluators. Some observation can be gained:

- deli9372 and rnic7557 occupy the top of the correctness ranking.
- Many of the results are mathematically similar, such as aaif5136, awon8465, saxu2211, yeli0406. This phenomenon may imply the commonly confused categories. However, through this report and the calculation, it is hard to direct the reader to the exact location of such annotated items.
- Sports is ranked the most correctly categorized annotation, 93%, while Resource is the least, 56.92%; F1-score shares the consistent view with Cohen's Kappa.
- In addition to above, "Other" category achieves 100% F1-score. This abnormal result is explained in next section.

3. Critiques

3.1 Human performance

In processing the data, an error occurred regarding a typo. It was eventually proved to be a lower case of the category name "error" instead of the formatted "Error" (figure 8). This took a while to find out while the fixing did not have any difficulty. The cause of this might be that the annotating task was carried out manually.

This experience in processing the data implies that human performance may introduce uncertainty that hard to predict.

3.2 Procedural flaws

It is noted that in summarizing the individual performance across all categories, False Positive always equals to False Negative (see rows "overview" in figures 4 and 7). It can be well explained in terms of math, that they added up to the same amount. However, this may lose the representativeness in some degree that two indicators always share the same number.

Another thing worth noting is that according to the Gold class, no subject is assigned to "Other" category. This causes *boundary issues* such as Recall and F-score result in error due to dividing by zero.

4. Summary

By processing the annotating data, simple and clear conclusions can be observed such as overview performance and individual performance in form of statistics.

The statistical indicators are inner-related and describe different aspects of the annotation task.

These conclusions are also affected by errors in human performance and potential systematically flaws.

5. Images and Charts

Please see following pages for the figures and the Gold class annotation (the most voted categories).

Annex: The most voted categories

Articles	GOLD
Vitamin String Quartet	Entertainment
Ellegarden	Entertainment
Fort Stewart	Error
Ange	Entertainment
Miss Sweden	Entertainment
Rockstar Toronto	Entertainment
Evile	Entertainment
St. Fintan's High School	Education
Mitsubishi Aircraft Company	Trade
MTM Records	Entertainment
The Latino Rockabilly War	Entertainment
Spectrum (TV channel)	Entertainment
Å»urrieq F.C.	Sports
Elections in Finland	Error
Today's Best Hits	Entertainment
Central Provident Fund	Finance
Future and Freedom	Social
Perkins Engines	Trade
Saint Mary's Gaels	Sports
Q-type Queens car (New York City Subway car)	Error
Sri Lanka Administrative Service	Public
Parnall	administration
The Scout Association of Hong Kong	Trade
Constituent Assembly of Lithuania	Social
WEOA	Public
Shakey's V-League	administration
73d Special Operations Squadron	Entertainment
DR Congo women's national football team	Sports
Mount Zion One Room School	Education
Advance (trade union)	Social
LNFA	Sports
Institutional Revolutionary Party	Social
Live Nation Entertainment	Entertainment
Grangenolvin G.F.C.	Sports
Great Nordic Biker War	Error
Oklahoma Constitution	Error
University of Belgrade Faculty of Philosophy	Education
KPNP	Entertainment

Legislative Assembly of the Province of Canada	Public administration
Darlinghurst Gaol	Public administration
Cornell University School of Industrial and Labor Relations	Education
NetApp	SciTech
Curry School of Education	Education
Consumers Union	Social
Minnesota Golden Gophers men's gymnastics	Sports
Edgar Award	Error
V Hits	Entertainment
Welsh Office	Public administration
Tony Blair Faith Foundation	Social
St. Louis Cardinals all-time roster	Sports
ITV Telethon	Error
452d Air Mobility Wing	Public administration
Modern Theatres	Entertainment
British Airways Flight 149	Error
Benburb F.C.	Sports
Royal Danish Academy of Fine Arts	Education
Lucy Parsons Center	Social
11th Armoured Division (United Kingdom)	Public administration
Pacific Scandal	Error
Nu Pagadi	Entertainment
Vehicle registration plates of the Northern Mariana Islands	Error
Dragonette	Entertainment
Japanese Northern China Area Army	Public administration
Goa liberation movement	Error
ZachÄ™ta	Entertainment
Anglican Church of Canada	Social
WTCT	Entertainment
KSUE	Entertainment
1954 Wisconsin Badgers football team	Sports
South London Gallery	Entertainment
University of Toronto Campus Community Police Service MÃ©daille commÃ©morative de l'expÃ©dition de Chine (1901)	Public administration
SociÃ©tÃ© Bic	Error
C.D. Municipal LimeÃ±o	Trade
KCCY	Sports
	Entertainment

Football in Argentina	Error
Puget Sound Adventist Academy	Education
Culver's	Hospitality
Air Transport Auxiliary	Transport
Institute of Financial Accountants	Finance
West Virginia Northern Community College	Education
Southern Illinois Salukis football	Sports
National Iranian Petrochemical Company	Resources
Manado United	Sports
Edinburgh Eagles (ice hockey)	Sports
Camillians	Social
Waffen-SS	Public
Bohemia Visual Music	administration
Colgate Rochester Crozer Divinity School	Entertainment
Jeannette Athletic Club	Education
The Calgary Highlanders	Sports
Office of Economic Adjustment	Public
Pinellas County Schools	administration
VVA-Podmoskovye Monino	Education
Leeds General Infirmary	Sports
The Dillinger Escape Plan	Health
Vidyasagar Evening College	Entertainment
London Buses route 258	Education
Royal Naval Reserve	Error
Church's Chicken	Public
School District 57 Prince George	administration
German Aerospace Center	Hospitality
One O'Clock Lab Band	Education
Extremity Games	SciTech
SaferNet	Entertainment
Trinidad and Tobago national rugby union team (sevens)	Sports
Jaeger-LeCoultre	Social
McGill-Queen's University Press	Trade
United Western Recorders	Education
FX Canada	Entertainment
Adjutant General of Oklahoma	Entertainment
WRTC-FM	Error
HMAS Harman	Public
Secretary General of UNASUR	administration
	Error

RAF Coltishall	Public administration
Derbi	Trade
WWEG	Entertainment
Sport in Cardiff	Error
Great Lakes Airlines	Transport
KLBF	Entertainment
Revenue Act of 1936	Error
DÃœWAG	Trade
Fleet Marine Force	Public administration
Philadelphia Tapers	Sports
Kommersant	Entertainment
Midwest Communications	Entertainment
Wera Tools	Trade
44th Infantry Division (Germany)	Public administration
Embassy of the United States in Tokyo	Public administration
Saint-Louis (glass manufacturer)	Trade
1962â€“63 Illinois Fighting Illini men's basketball team	Sports
Zambia at the Paralympics	Error
Royal Astronomical Society	SciTech
China Shipbuilding Industry Corporation	Trade
Applied Underwriters Inc.	Finance
WDEK (AM)	Entertainment
WPEO	Entertainment
Taimyr Air Company	Transport
Ennahda Movement	Social
Navy Midshipmen men's lacrosse	Sports
332d Troop Carrier Squadron	Public administration
Shaye	Entertainment
Walmart	Trade
Robert Marlow	Entertainment
Muir Homes	Real estate
Eclipse Foundation	SciTech
Yankee (magazine)	Entertainment
Project 571 Outline	Error
No. 535 Squadron RAF	Public administration
North Carolina Tar Heels field hockey	Sports

Figure 1

```

 5046_w5_ass1 ~/Documents/MTM/COMP5046 Natural Language Processing/5046_w5_ass1]
 5046_w5_ass1 AnnEditor.py
 5046_w4_0328_annotation ann_edited.csv
 AnnAnalyst.py
 AnnEditor.py
 AnnMinimize.py
 id_aari5136.csv
 id_cmin0770.csv
 individual.xlsx
 InterCompare.py
 summarizing.csv
 testingF.csv
 External Libraries

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  def getfile():
    with open(infile, "r", encoding='utf-8', errors='ignore') as ann:
        ann_csv = csv.reader(ann)
        results = []
        k = 0

        for i in range(0, units + 1):
            results.append([])

            for j in range(0, lines // units + 1):
                results[i].append([])

        for row in ann_csv:
            if row[0] != results[0][k // units + 1]:
                results[0][k // units + 1] = row[0]

            if row[1] != results[k % units]:
                results[k % units + 1][0] = row[1]

            results[k % units + 1][k // units + 1] = row[2]
            k += 1

        ann.close()

    results[0].insert(1, 'GOLD')

    for k in range(1, units + 1):
        kCount = Counter(results[k])
        results[k].insert(1, kCount.most_common(1)[0][0])

    results.pop(-1)
    return results

  def givefile(results):
    if __name__ == "__main__":
        outfile = 'ann_edited.csv'
        infile = '5046_w4_0328_annotation.csv'
        print(givefile(getfile()))

```

GOLD		aar1536	aen9038	agup7545	amor0285	awan5381	awon8465	bkr16587	bson2499	ckn9525	cnj0770	csho9635	del9382	dmar3720	dram3878	erhu2694	ggsr5692	gsin6556	gtin7615
Vitamin String	Entertainment																		
Ellegarden	Entertainment																		
Fort Stewart	Error	Other	Public admin	Error	Error	Public admin	Public admin	Error	Public admin	Public admin	Public admin	Public admin	Error	Error	Error	Error	Error	Error	Public admin
Ange	Entertainment																		
Miss Sweden	Entertainment	Error	Error	Social	Social	Entertainment	Entertainment	Error	Social	Entertainment									
Rockstar Tor	Entertainment	Entertainment	Entertainment	SciTech	SciTech	Entertainment	Entertainment	Trade	Entertainment										
Evile	Entertainment																		
St. Fintan's	H Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Public admin
Mitsubishi A Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade	Trade
MTM Record	Entertainment																		
The Latino R	Entertainment	Error	Entertainment																
Spectrum (T) Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment
Åurrieq F.C. Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	
Elections in Error	Error	Error	Error	Public admin	Public admin	Social	Error	Public admin	Public admin	Social	Error	Public admin	Social	Error	Public admin	Error	Error	Error	Error
Today's Best Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment
Central Prov Finance	Public admin	Finance	Finance	Public admin	Social	Public admin	Hospitality	Public admin	Finance	Public admin	Finance	Public admin	Finance	Error	Public admin	Finance	Error	Social	
Future and F Social	Public admin	Social	Public admin	Social	Public admin	Social	Public admin	Public admin	Public admin	Public admin									
Perkins Engi-Trade	Trade	Trade	Trade	SciTech	Trade	SciTech	Other	Trade	Trade	Trade	Trade								
Saint Mary's Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	
Q-type Queue Error	Error	Error	Error	Transport	Error	Error	Transport	Error	Error	Transport	Error	Error	Error	Error	Error	Transport	Error	Error	Error
Sri Lanka Adi Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin	Public admin
Parnall	Trade	Trade	Trade	Transport	Trade	Transport	Trade	SciTech	Trade										
The Scout As Social	Education	Social																	
Constituent	Public admin																		
WEOA	Entertainment																		
Shakey's V-L Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	
73d Special (P) Public admin	SciTech	Public admin																	
DR Congo w/S Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	
Mount Zion Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	
Advance (tra Social)	Trade	Public admin	Finance	Social	Other	Public admin	Trade	Other	Social										
NFA	Sports																		
Institutional Social	Public admin	Social	Public admin	Social	Social	Social	Public admin	Public admin	Public admin										
Live Nation E Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment	Entertainment
Grangenvli Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	Sports	
Great Nordic Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	
Oklahoma C. Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	Error	
University of Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	Education	
KPNP	Entertainment																		
Legislative A: Public admin	Real estate	Public admin	Public admin																
Darlinghurst	Public admin	Real estate	Error	Public admin															

Figure 2

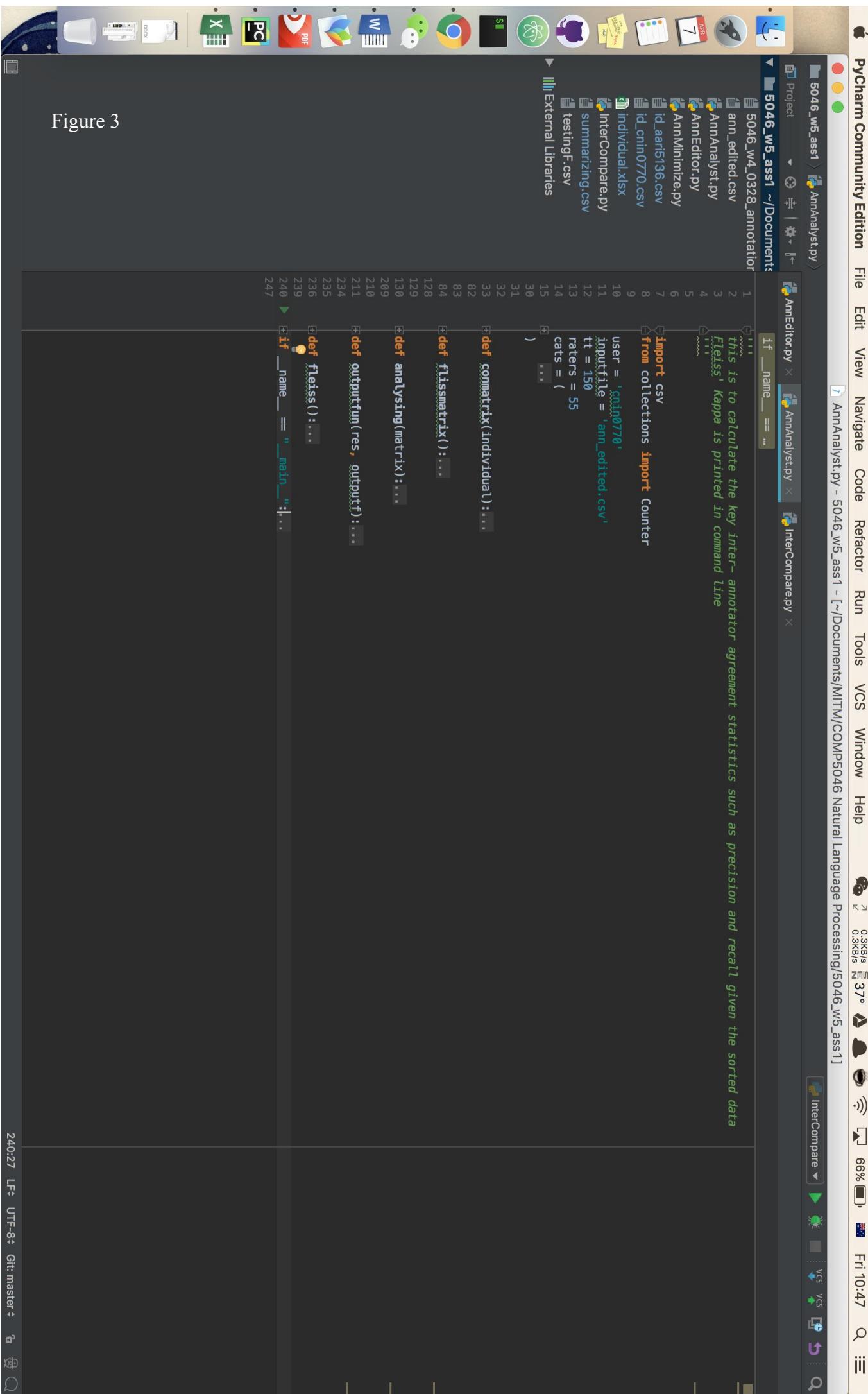


Figure 3

Figure 4

cnin0770	tp	fn	fp	tn	precision	recall	f1	accuracy	marginalFalse	marginalTrue	expectedAgreement	cohensKappa
Education	13	0	0	137	100.00%	100.00%	100.00%	100.00%	83.42%	0.75%	84.17%	100.00%
Entertainment	37	0	3	110	92.50%	100.00%	96.10%	98.00%	55.24%	6.58%	61.82%	94.76%
Finance	2	1	0	147	100.00%	66.67%	80.00%	99.33%	96.69%	0.03%	96.72%	79.67%
Health	1	0	0	149	100.00%	100.00%	100.00%	100.00%	98.67%	0.00%	98.68%	100.00%
Hospitality	2	0	0	148	100.00%	100.00%	100.00%	100.00%	97.35%	0.02%	97.37%	100.00%
Public administration	20	1	1	128	95.24%	95.24%	95.24%	98.67%	73.96%	1.96%	75.92%	94.46%
Real estate	1	0	0	149	100.00%	100.00%	100.00%	100.00%	98.67%	0.00%	98.68%	100.00%
Resources	1	0	0	149	100.00%	100.00%	100.00%	100.00%	98.67%	0.00%	98.68%	100.00%
SciTech	4	0	0	146	100.00%	100.00%	100.00%	100.00%	94.74%	0.07%	94.81%	100.00%
Social	11	0	2	137	84.62%	100.00%	91.67%	98.67%	84.64%	0.64%	85.27%	90.95%
Sports	21	1	2	126	91.30%	95.45%	93.33%	98.00%	72.25%	2.25%	74.50%	92.16%
Trade	11	0	1	138	91.67%	100.00%	95.65%	99.33%	85.25%	0.59%	85.84%	95.29%
Transport	2	1	2	145	50.00%	66.67%	57.14%	98.00%	95.39%	0.05%	95.44%	56.14%
Other	0	0	0	150	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%	100.00%	100.00%
Error	12	8	1	129	92.31%	60.00%	72.73%	94.00%	79.16%	1.16%	80.31%	69.53%
overview	138	12	12	2088	92.00%	92.00%	98.93%	87.11%	0.44%	87.56%	91.43%	

Figure 5

The screenshot shows the PyCharm Community Edition interface. The top menu bar includes File, Edit, View, Navigate, Code, Refactor, Run, Tools, VCS, Window, and Help. The toolbar at the top has icons for various applications like Word, Excel, PDF, and Google Chrome. The main window displays a Python file named 'InterCompare.py' with the following code:

```
nameList()

from AnnAnalyst import analysing
from AnnAnalyst import commatrix
import csv
from AnnAnalyst import fleiss
heading = (
    id_cnn0770.csv
    individual.xlsx
    InterCompare.py
    summarizing.csv
    testingF.csv
)
file = ('Fleiss\\ Kappa:', fleiss())
+def nameList():...
+def summarizing():...
+def keyList():...
+def outf(fname):...
if __name__ == "__main__":
    print("Hello, world!")
```

The status bar at the bottom shows the time as 25:16, encoding as UTF-8, and the git status as 'Git: master'. The bottom right corner shows the date as Fri 10:53.

summarizing

Search Sheet

Share

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	Unkey	TruePositive	FalseNegative	FalsePositive	TrueNegative	Precision	Recall	F1 Score	Accuracy	MarginalFalsePositives	MarginalTruePositives	ExpectedAger	Cohen'sKappa									
2	de19382	144	6	6	2094	96.00%	96.00%	96.00%	99.47%	87.11%	0.44%	87.56%	95.71%									
3	mic7557	144	6	6	2094	96.00%	96.00%	96.00%	99.47%	87.11%	0.44%	87.56%	95.71%									
4	cni0770	138	12	12	2088	92.00%	92.00%	92.00%	98.93%	87.11%	0.44%	87.56%	91.43%									
5	roc0389	138	12	12	2088	92.00%	92.00%	92.00%	98.93%	87.11%	0.44%	87.56%	91.43%									
6	jw05553	137	13	13	2087	91.33%	91.33%	91.33%	98.84%	87.11%	0.44%	87.56%	90.71%									
7	kleef563	137	13	13	2087	91.33%	91.33%	91.33%	98.84%	87.11%	0.44%	87.56%	90.71%									
8	mva1494	136	14	2086	90.67%	90.67%	90.67%	98.76%	87.11%	0.44%	87.56%	90.00%										
9	xdal3399	135	15	2085	90.00%	90.00%	90.00%	98.67%	87.11%	0.44%	87.56%	89.29%										
10	yvua4245	133	17	2083	88.67%	88.67%	88.67%	98.49%	87.11%	0.44%	87.56%	87.86%										
11	amor0285	132	18	2082	88.00%	88.00%	88.00%	98.40%	87.11%	0.44%	87.56%	87.14%										
12	gtim7615	132	18	2082	88.00%	88.00%	88.00%	98.40%	87.11%	0.44%	87.56%	87.14%										
13	pkurn9303	132	18	2082	88.00%	88.00%	88.00%	98.40%	87.11%	0.44%	87.56%	87.14%										
14	dram13878	131	19	2081	87.33%	87.33%	87.33%	98.31%	87.11%	0.44%	87.56%	86.43%										
15	mazra291	131	19	2081	87.33%	87.33%	87.33%	98.31%	87.11%	0.44%	87.56%	86.43%										
16	nvet1748	131	19	2081	87.33%	87.33%	87.33%	98.31%	87.11%	0.44%	87.56%	86.43%										
17	afen9038	129	21	2079	86.00%	86.00%	86.00%	98.13%	87.11%	0.44%	87.56%	85.00%										
18	jeas0041	129	21	2079	86.00%	86.00%	86.00%	98.13%	87.11%	0.44%	87.56%	85.00%										
19	tjin0016	129	21	2079	86.00%	86.00%	86.00%	98.13%	87.11%	0.44%	87.56%	85.00%										
20	gsin656	128	22	2078	85.33%	85.33%	85.33%	98.04%	87.11%	0.44%	87.56%	84.29%										
21	mno9684	128	22	2078	85.33%	85.33%	85.33%	98.04%	87.11%	0.44%	87.56%	84.29%										
22	bkr6587	127	23	2077	84.67%	84.67%	84.67%	97.96%	87.11%	0.44%	87.56%	83.57%										
23	jlo8749	127	23	2077	84.67%	84.67%	84.67%	97.96%	87.11%	0.44%	87.56%	83.57%										
24	xguo8788	127	23	2077	84.67%	84.67%	84.67%	97.96%	87.11%	0.44%	87.56%	83.57%										
25	nmoo7852	126	24	2076	84.00%	84.00%	84.00%	97.87%	87.11%	0.44%	87.56%	82.86%										
26	ckn19525	125	25	2075	83.33%	83.33%	83.33%	97.78%	87.11%	0.44%	87.56%	82.14%										
27	imal6870	125	25	2075	83.33%	83.33%	83.33%	97.78%	87.11%	0.44%	87.56%	82.14%										
28	ylve6312	125	25	2075	83.33%	83.33%	83.33%	97.78%	87.11%	0.44%	87.56%	82.14%										
29	aarif136	124	26	2074	82.67%	82.67%	82.67%	97.69%	87.11%	0.44%	87.56%	81.43%										
30	awon8465	124	26	2074	82.67%	82.67%	82.67%	97.69%	87.11%	0.44%	87.56%	81.43%										
31	saxu2211	124	26	2074	82.67%	82.67%	82.67%	97.69%	87.11%	0.44%	87.56%	81.43%										
32	yellow0406	124	26	2074	82.67%	82.67%	82.67%	97.69%	87.11%	0.44%	87.56%	81.43%										
33	erhu2694	123	27	2073	82.00%	82.00%	82.00%	97.60%	87.11%	0.44%	87.56%	80.71%										
34	dmat33720	122	28	2072	81.33%	81.33%	81.33%	97.51%	87.11%	0.44%	87.56%	80.00%										
35	ishi4785	122	28	2072	81.33%	81.33%	81.33%	97.51%	87.11%	0.44%	87.56%	80.00%										
36	agut7545	121	29	2071	80.67%	80.67%	80.67%	97.42%	87.11%	0.44%	87.56%	79.29%										
37	gyuata018	121	29	2071	80.67%	80.67%	80.67%	97.42%	87.11%	0.44%	87.56%	79.29%										
38	hche7818	120	30	2070	80.00%	80.00%	80.00%	97.33%	87.11%	0.44%	87.56%	78.57%										
39	king7184	120	30	2070	80.00%	80.00%	80.00%	97.33%	87.11%	0.44%	87.56%	78.57%										
40	sime2302	120	30	2070	80.00%	80.00%	80.00%	97.33%	87.11%	0.44%	87.56%	78.57%										
41	ygo07195	120	30	2070	80.00%	80.00%	80.00%	97.33%	87.11%	0.44%	87.56%	78.57%										
42	gpan2286	119	31	2069	79.33%	79.33%	79.33%	97.24%	87.11%	0.44%	87.56%	77.86%										
43	iche3329	119	31	2069	79.33%	79.33%	79.33%	97.24%	87.11%	0.44%	87.56%	77.86%										
44	ggre5692	117	33	2067	78.00%	78.00%	78.00%	97.07%	87.11%	0.44%	87.56%	76.43%										
45	bson1299	116	34	2066	77.33%	77.33%	77.33%	96.98%	87.11%	0.44%	87.56%	75.71%										
46	jdon3970	116	34	2066	77.33%	77.33%	77.33%	96.98%	87.11%	0.44%	87.56%	75.71%										

Figure 6A

Ready

summarizing

99%

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
24 xguo8788	127	23	23	2077	84.67%	84.67%	84.67%	97.96%	87.11%	0.44%	87.56%	83.57%									
25 nmo07852	126	24	24	2076	84.00%	84.00%	84.00%	97.87%	87.11%	0.44%	87.56%	82.85%									
26 ckn19525	125	25	25	2075	83.33%	83.33%	83.33%	97.78%	87.11%	0.44%	87.56%	82.14%									
27 imal8870	125	25	2075	83.33%	83.33%	83.33%	97.78%	87.11%	0.44%	87.56%	82.14%										
28 yivee312	125	25	2075	83.33%	83.33%	83.33%	97.78%	87.11%	0.44%	87.56%	82.14%										
29 aar15136	124	26	2074	82.67%	82.67%	82.67%	97.69%	87.11%	0.44%	87.56%	81.43%										
30 awon8465	124	26	2074	82.67%	82.67%	82.67%	97.69%	87.11%	0.44%	87.56%	81.43%										
31 sakur211	124	26	2074	82.67%	82.67%	82.67%	97.69%	87.11%	0.44%	87.56%	81.43%										
32 yel10406	124	26	2074	82.67%	82.67%	82.67%	97.69%	87.11%	0.44%	87.56%	81.43%										
33 erhuh2694	123	27	2073	82.00%	82.00%	82.00%	97.60%	87.11%	0.44%	87.56%	80.71%										
34 dmat3720	122	28	2072	81.33%	81.33%	81.33%	97.51%	87.11%	0.44%	87.56%	80.00%										
35 Ish14785	122	28	2072	81.33%	81.33%	81.33%	97.51%	87.11%	0.44%	87.56%	80.00%										
36 agup7545	121	29	2071	80.67%	80.67%	80.67%	97.42%	87.11%	0.44%	87.56%	79.29%										
37 gyua0818	121	29	2071	80.67%	80.67%	80.67%	97.42%	87.11%	0.44%	87.56%	79.29%										
38 hche7818	120	30	2070	80.00%	80.00%	80.00%	97.33%	87.11%	0.44%	87.56%	78.57%										
39 king1784	120	30	2070	80.00%	80.00%	80.00%	97.33%	87.11%	0.44%	87.56%	78.57%										
40 sihe2302	120	30	2070	80.00%	80.00%	80.00%	97.33%	87.11%	0.44%	87.56%	78.57%										
41 yga07195	120	30	2070	80.00%	80.00%	80.00%	97.33%	87.11%	0.44%	87.56%	78.57%										
42 gpan2286	119	31	2069	79.33%	79.33%	79.33%	97.24%	87.11%	0.44%	87.56%	77.85%										
43 Icheli329	119	31	2069	79.33%	79.33%	79.33%	97.24%	87.11%	0.44%	87.56%	77.85%										
44 ggret592	117	33	2067	78.00%	78.00%	78.00%	97.07%	87.11%	0.44%	87.56%	76.43%										
45 bson2499	116	34	2066	77.33%	77.33%	77.33%	96.98%	87.11%	0.44%	87.56%	75.71%										
46 jd0n3970	116	34	2066	77.33%	77.33%	77.33%	96.98%	87.11%	0.44%	87.56%	75.71%										
47 hwani1865	115	35	2065	76.67%	76.67%	76.67%	96.89%	87.11%	0.44%	87.56%	75.00%										
48 lhen2020	110	40	2060	73.33%	73.33%	73.33%	96.44%	87.11%	0.44%	87.56%	71.43%										
49 nlui5602	108	42	2058	72.00%	72.00%	72.00%	96.27%	87.11%	0.44%	87.56%	70.00%										
50 csho9835	106	44	2056	70.67%	70.67%	70.67%	96.09%	87.11%	0.44%	87.56%	68.57%										
51 hhus3747	105	45	2055	70.00%	70.00%	70.00%	96.00%	87.11%	0.44%	87.56%	67.85%										
52 rgen8070	102	48	2052	68.00%	68.00%	68.00%	95.73%	87.11%	0.44%	87.56%	65.71%										
53 awan5381	100	50	2050	66.67%	66.67%	66.67%	95.56%	87.11%	0.44%	87.56%	64.29%										
54 sper3495	96	54	2046	64.00%	64.00%	64.00%	95.20%	87.11%	0.44%	87.56%	61.43%										
55 xzha4355	96	54	2046	64.00%	64.00%	64.00%	95.20%	87.11%	0.44%	87.56%	61.43%										
56 yguo3624	89	61	2039	59.33%	59.33%	59.33%	94.58%	87.11%	0.44%	87.56%	56.43%										
57 Fleiss' kappa	68.15%																				
58																					
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68																					
69																					

Figure 6B.

Ready

summarizing

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99%

x summarizing

Q Search Sheet

Share ▾

aari5136	tp	fn	fp	tn	precision	recall	f1	accuracy	marginalFals	marginalTrue	expectedAgr	cohensKappa
Health	1	0	0	149	100.00%	100.00%	100.00%	98.67%	0.00%	98.68%	100.00%	
Hospitality	0	2	0	148	100.00%	100.00%	100.00%	100.00%	0.00%	100.00%	100.00%	
Real estate	1	0	0	149	100.00%	100.00%	100.00%	98.67%	0.00%	98.68%	100.00%	
Resources	0	1	0	149	100.00%	100.00%	100.00%	100.00%	0.00%	100.00%	100.00%	
Other	0	0	2	148	100.00%	100.00%	100.00%	100.00%	0.00%	100.00%	100.00%	
SciTech	4	0	1	145	80.00%	100.00%	88.89%	99.33%	94.09%	0.09%	94.18%	88.55%
Education	11	2	1	136	91.67%	84.62%	88.00%	98.00%	84.03%	0.69%	84.72%	86.91%
Entertainme	31	6	1	112	96.88%	83.78%	89.86%	95.33%	59.26%	5.26%	64.52%	86.85%
Public admin	19	2	3	126	86.36%	90.48%	88.37%	96.67%	73.39%	2.05%	75.44%	86.43%
Sports	18	4	1	127	94.74%	81.82%	87.80%	96.67%	74.52%	1.86%	76.38%	85.89%
Trade	11	0	4	135	73.33%	100.00%	84.62%	97.33%	83.40%	0.73%	84.13%	83.19%
overview	124	26	26	2074	82.67%	82.67%	82.67%	97.69%	87.11%	0.44%	87.56%	81.43%
Finance	2	1	0	147	100.00%	66.67%	80.00%	99.33%	96.69%	0.03%	96.72%	79.67%
Transport	2	1	0	147	100.00%	66.67%	80.00%	99.33%	96.69%	0.03%	96.72%	79.67%
Error	19	1	10	120	65.52%	95.00%	77.55%	92.67%	69.91%	2.58%	72.49%	73.34%
Social	5	6	3	136	62.50%	45.45%	52.63%	94.00%	87.72%	0.39%	88.12%	49.51%

Figure 7

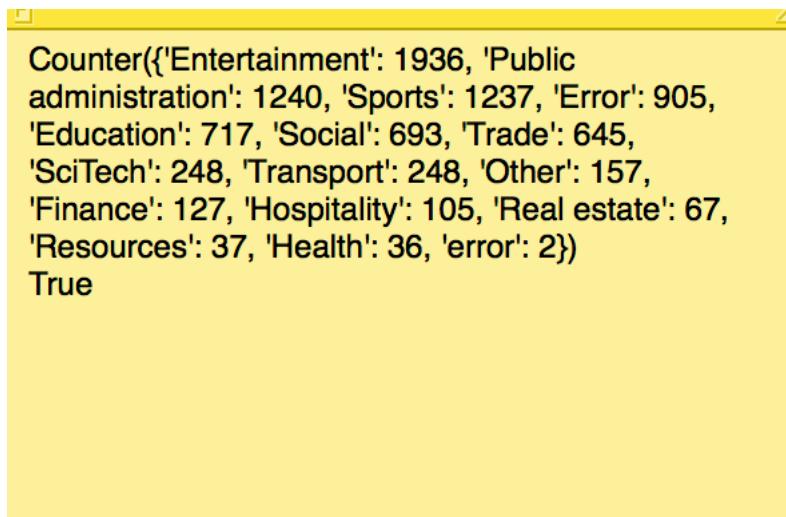


Figure 8

overall	precision	recall	f1	cohen
Education	89.20%	87.83%	88.51%	87.43%
Entertainme	96.63%	90.17%	93.29%	91.19%
Finance	80.65%	60.61%	69.20%	68.67%
Health	94.29%	60.00%	73.33%	73.19%
Hospitality	89.32%	83.64%	86.38%	86.21%
Public admin	77.11%	81.39%	79.19%	75.70%
Real estate	65.15%	78.18%	71.07%	70.86%
Resources	72.22%	47.27%	57.14%	56.92%
SciTech	67.21%	74.55%	70.69%	69.84%
Social	63.64%	71.74%	67.44%	64.70%
Sports	93.91%	94.30%	94.10%	93.09%
Trade	80.91%	84.79%	82.81%	81.41%
Transport	54.69%	81.21%	65.37%	64.52%
Other	100.00%	100.00%	100.00%	100.00%
Error	75.76%	61.09%	67.64%	63.27%

Figure 10

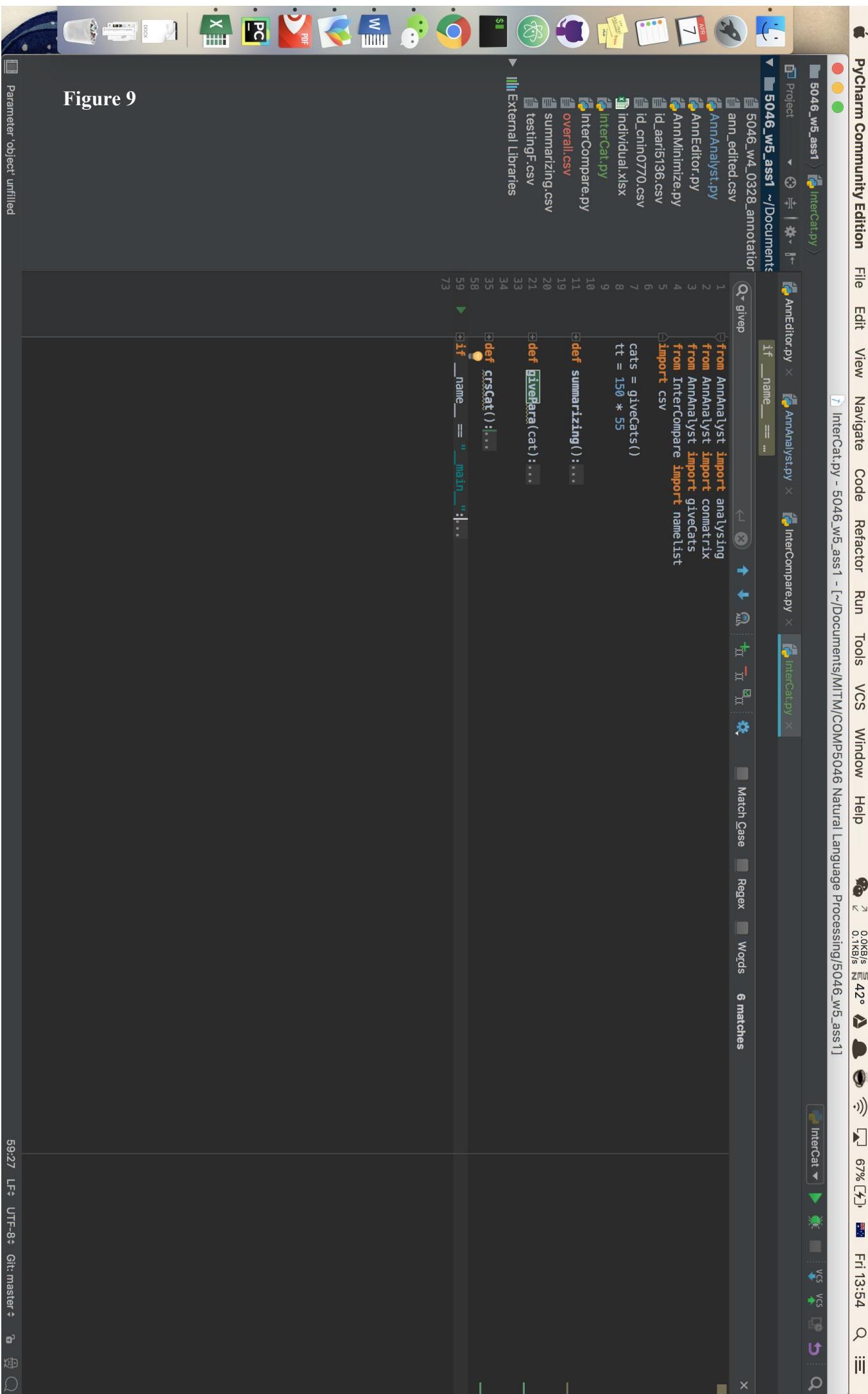


Figure 9