

Irony/Sarcasm Detection

This is an irony/sarcasm detection project working with the tweets I collected earlier this year. This will be my second qualifying exam submission.

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Methods for building twitter-specific sentiment lexicon

Using mutual information

[This page](#) has quite a bit of information regarding how the mutual information should be computed. I don't think there is any difference between multi-class mutual information and binary mutual information except that the entropy of the class labels is affected.

Using Counts

I could use a simple method based upon counts of occurrences of words both in the negative and in the positive tweets with normalization for frequency of terms

Using Feature Selection Methods

Mutual Information

The issue with using mutual information for this is that, ideally, we would want a two tailed statistical test, while mutual information is a one tailed test. To fix this, there are two different strategies that I am going to try.

Winner take all Mutual-Information

The winner take all mutual-information is the mutual information calculated for the positive class and the negative class, taking the larger of these two (negative mutual information will be multiplied by -1 to create a two tailed distribution of scores).

Proportional Mutual-Information

In proportional mutual information, the mutual information for the negative class is subtracted from the mutual information for the positive class.

Comparison of two-side MI

As mentioned in [Methods for building twitter-specific sentiment lexicon](#) there are two general ways that I tried to build a twitter specific sentiment lexicon. The first was to calculate the mutual information associated with the positive class and subtract from that the mutual information associated with the negative class. The other option was to take whichever had the higher value as the mutual information score, multiplying the negative class by -1.

However, upon inspection of the results, the winner-take-all method is producing a much more sensible list of vocabulary.

The raw files can be found here

Binary-Based

- [Winner-take-all](#)
- [Relative](#)

Count-Based

- [Winner-take-all](#)
- [Relative](#)

Determining a cutoff

There is some imbalance in how many terms are given higher mutual information for the positive class and the negative class.

For example, the 0 value for the winner take all binary setup occurs about two thirds of the way through. This imbalance would be problematic if all words were used to compute shifts in

sentiment for the sarcasm detection part. The best solution seems to be to make the threshold some number of words from the ends (e.g. we're using a ranking scheme to determine which words are associated strongly enough with each class to be representatives of that class).

My next steps are to determine how much overlap with the content of the sarcasm dataset there is.

Adding a minimum count cutoff

Commit [27dd9e4300](#) adds a cutoff to how low in frequency a given token can occur in order to be considered in the mutual information calculations. The entry is still present in the results array in the program, the mutual information is just automatically set to 0 if there are less than `x` instances of a feature.

Currently the behavior is not special for counts. E.g. when a binary feature matrix has been computed, the minimum cutoff is effectively how many tweets it occurred in. The counts do not try to emulate this and instead just count the frequency of usage including multiple usages in a single tweet.

Results dump

Cross validation character n-grams tfidf

F1-score Task A 0.6440953412784399

	precision	recall	f1-score	support				
	0	0.64831953	0.69214769	0.66951710	1923	1	0.66760247	0.62218734
0.64409534	1911							
micro avg	0.65727700	0.65727700	0.65727700	3834	macro avg	0.65796100	0.65716751	
0.65680622	3834							
weighted avg	0.65793082	0.65727700	0.65684601	3834				

Embeddings with averages

F1-score Task A 0.5545722713864307				precision	recall	f1-score		
support								
	0	0.70503597	0.62156448	0.66067416	473	1	0.51226158	0.60450161
0.55457227	311							
micro avg	0.61479592	0.61479592	0.61479592	784	macro avg	0.60864878	0.61303304	
0.60762321	784							
weighted avg	0.62856552	0.61479592	0.61858527	784				

Embeddings with sums

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F1-score Task A	0.3297644539614561			precision	recall	f1-score		
support								
	0	0.62738854	0.83298097	0.71571299	473	1	0.49358974	0.24758842
0.32976445	311							
micro avg	0.60076531	0.60076531	0.60076531	784	macro avg	0.56048914	0.54028470	
0.52273872	784							
weighted avg	0.57431274	0.60076531	0.56261351	784				

Trial data character n-grams tfidf

{ 'classify__C': 100, 'classify__gamma': 'scale', 'reduce_dim__k': 10000}F1-score Task A								
0.6191198786039454								
		precision	recall	f1-score	support			
	0	0.75458716	0.69556025	0.72387239	473	1	0.58620690	0.65594855
0.61911988	311							
micro avg	0.67984694	0.67984694	0.67984694	784	macro avg	0.67039703	0.67575440	
0.67149613	784							
weighted avg	0.68779346	0.67984694	0.68231878	784				

Trial data character n-grams with cheating to match skew in test data

Best parameters: { 'classify__C': 100, 'classify__class_weight': {0: 0.75, 1: 1.5}, 'classify__gamma': 'scale', 'reduce_dim__k': 10000}F1-score Task A								
0.6388206388206388								
		precision	recall	f1-score	support			
	0	0.81850534	0.48625793	0.61007958	473	1	0.51689861	0.83601286
0.63882064	311							
micro avg	0.62500000	0.62500000	0.62500000	784	macro avg	0.66770197	0.66113539	
0.62445011	784							
weighted avg	0.69886287	0.62500000	0.62148069	784				

Trial data character n-grams mpqa skew

in test data

MI

```
Fitting 5 folds for each of 5 candidates, totalling 25 fits[Parallel(n_jobs=-1)]: Using
backend LokyBackend with 16 concurrent workers.[Parallel(n_jobs=-1)]: Done 20 out of 25 |
elapsed: 14.3s remaining: 3.6s[Parallel(n_jobs=-1)]: Done 25 out of 25 | elapsed:
14.4s finished
Grid scores on training set:
    'precision', 'predicted', average, warn_for)                precision    recall  f1-score
support
          0  0.00000000 0.00000000 0.00000000          473          1  0.39668367 1.00000000
0.56803653          311
    micro avg  0.39668367 0.39668367 0.39668367          784  macro avg  0.19834184 0.50000000
0.28401826          784
weighted avg  0.15735794 0.39668367 0.22533082          784
Best parameters:
{'C': 100, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A
0.6067415730337078
          precision    recall  f1-score    support
          0  0.87931034 0.21564482 0.34634975          473          1  0.44461078 0.95498392
0.60674157          311
    micro avg  0.50892857 0.50892857 0.50892857          784  macro avg  0.66196056 0.58531437
0.47654566          784
weighted avg  0.70687212 0.50892857 0.44964293          784
Best parameters:
{'C': 100, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A
0.6211180124223602
          precision    recall  f1-score    support
          0  0.91472868 0.24947146 0.39202658          473          1  0.45801527 0.96463023
0.62111801          311
    micro avg  0.53316327 0.53316327 0.53316327          784  macro avg  0.68637197 0.60705084
0.50657230          784
weighted avg  0.73355793 0.53316327 0.48290341          784
Best parameters:
{'C': 100, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A
0.6282722513089005
```



```

precision    recall  f1-score   support

0   0.92142857 0.27272727 0.42088091     473          1  0.46583851 0.96463023
0.62827225      311

  micro avg   0.54719388 0.54719388 0.54719388     784  macro avg   0.69363354 0.61867875
0.52457658      784

weighted avg   0.74070343 0.54719388 0.50314967     784

Best parameters:
{'C': 100, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A
0.6251319957761351

precision    recall  f1-score   support

0   0.89864865 0.28118393 0.42834138     473          1  0.46540881 0.95176849
0.62513200      311

  micro avg   0.54719388 0.54719388 0.54719388     784  macro avg   0.68202873 0.61647621
0.52673669      784

weighted avg   0.72678948 0.54719388 0.50640501     784

Best parameters:
{'C': 100, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A
0.6272439281942978

precision    recall  f1-score   support

0   0.90540541 0.28329810 0.43156200     473          1  0.46698113 0.95498392
0.62724393      311

  micro avg   0.54974490 0.54974490 0.54974490     784  macro avg   0.68619327 0.61914101
0.52940296      784

weighted avg   0.73148965 0.54974490 0.50918582     784

Best parameters:
{'C': 100, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A
0.6314677930306231

precision    recall  f1-score   support

0   0.91891892 0.28752643 0.43800322     473          1  0.47012579 0.96141479
0.63146779      311

  micro avg   0.55484694 0.55484694 0.55484694     784  macro avg   0.69452235 0.62447061
0.53473551      784

weighted avg   0.74089001 0.55484694 0.51474746     784

```

Chi2

Grid scores on training set:

Best parameters:

{'C': 100, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A

0.5821596244131456

	precision	recall	f1-score	support				
0	0.96666667	0.06131078	0.11530815	473	1	0.41114058	0.99678457	
0.58215962	311							
micro avg	0.43239796	0.43239796	0.43239796	784	macro avg	0.68890363	0.52904767	
0.34873389	784							
weighted avg	0.74629854	0.43239796	0.30050051	784				

Best parameters:

{'C': 10, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A

0.5944881889763779

	precision	recall	f1-score	support				
0	0.88607595	0.14799154	0.25362319	473	1	0.42836879	0.97106109	
0.59448819	311							
micro avg	0.47448980	0.47448980	0.47448980	784	macro avg	0.65722237	0.55952632	
0.42405569	784							
weighted avg	0.70451099	0.47448980	0.38883877	784				

Best parameters:

{'C': 10, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A

0.59765625

	precision	recall	f1-score	support				
0	0.92957746	0.13953488	0.24264706	473	1	0.42917251	0.98392283	
0.59765625	311							
micro avg	0.47448980	0.47448980	0.47448980	784	macro avg	0.67937499	0.56172886	
0.42015165	784							
weighted avg	0.73107499	0.47448980	0.38347341	784				

Best parameters:

{'C': 10, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A

0.5996093750000001

	precision	recall	f1-score	support				
0	0.94366197	0.14164905	0.24632353	473	1	0.43057504	0.98713826	
0.59960938	311							
micro avg	0.47704082	0.47704082	0.47704082	784	macro avg	0.68711850	0.56439366	
0.42296645	784							
weighted avg	0.74012876	0.47704082	0.38646626	784				

Best parameters:

{'C': 10, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A

0.5974781765276431

```

precision    recall  f1-score   support

0   0.95312500  0.12896406  0.22718808     473
1   0.42777778  0.99035370  0.59747818     311

micro avg   0.47066327  0.47066327  0.47066327     784
macro avg   0.69045139  0.55965888  0.41233313     784
weighted avg 0.74472833  0.47066327  0.37407612     784

```

Best parameters:

```
{'C': 10, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A
```

```
0.5926640926640927
```

```

precision    recall  f1-score   support

0   0.93220339  0.11627907  0.20676692     473
1   0.42344828  0.98713826  0.59266409     311

micro avg   0.46173469  0.46173469  0.46173469     784
macro avg   0.67782583  0.55170867  0.39971550     784
weighted avg 0.73038854  0.46173469  0.35984603     784

```

Best parameters:

```
{'C': 100, 'class_weight': {0: 0.7, 1: 1.5}, 'gamma': 'scale'}F1-score Task A
```

```
0.6337854500616523
```

```

precision    recall  f1-score   support

0   0.80985915  0.48625793  0.60766182     473
1   0.51400000  0.82636656  0.63378545     311

micro avg   0.62117347  0.62117347  0.62117347     784
macro avg   0.66192958  0.65631224  0.62072364     784
weighted avg 0.69249666  0.62117347  0.61802464     784

```

Sentiment feats alone

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precision    recall  f1-score   support

0   0.63468635  0.36363636  0.46236559     473
1   0.41325536  0.68167203  0.51456311     311

micro avg   0.48979592  0.48979592  0.48979592     784
macro avg   0.52397085  0.52265419  0.48846435     784
weighted avg 0.54684829  0.48979592  0.48307149     784

```

MPQA Sentiment feats + BoW

MI

Best parameters:

{'C': 1, 'gamma': 'scale'}

F1-score	Task A				precision	recall	f1-score
support							
	0	0.75666667	0.47991543	0.58732212	473	1	0.49173554 0.76527331
0.59874214	311						
micro avg	0.59311224	0.59311224	0.59311224	784	macro avg	0.62420110	0.62259437
0.59303213	784						
weighted avg	0.65157281	0.59311224	0.59185226	784			

Best parameters:

{'C': 1, 'gamma': 'scale'}

F1-score	Task A				precision	recall	f1-score
support							
	0	0.81500000	0.34460888	0.48439822	473	1	0.46917808 0.88102894
0.61229050	311						
micro avg	0.55739796	0.55739796	0.55739796	784	macro avg	0.64208904	0.61281891
0.54834436	784						
weighted avg	0.67781809	0.55739796	0.53513100	784			

Best parameters:

{'C': 1, 'gamma': 'scale'}

F1-score	Task A				precision	recall	f1-score
support							
	0	0.82412060	0.34672304	0.48809524	473	1	0.47179487 0.88745981
0.61607143	311						
micro avg	0.56122449	0.56122449	0.56122449	784	macro avg	0.64795774	0.61709143
0.55208333	784						

```

weighted avg  0.68435874 0.56122449 0.53886130      784
Best parameters:
{'C': 1, 'gamma': 'scale'}
F1-score Task A 0.6155555555555555      precision    recall  f1-score
support
          0  0.82564103 0.34038055 0.48203593      473          1  0.47028862 0.89067524
0.61555556      311
    micro avg  0.55867347 0.55867347 0.55867347      784  macro avg  0.64796483 0.61552790
0.54879574      784
weighted avg  0.68467853 0.55867347 0.53500098      784
Best parameters:
{'C': 1, 'gamma': 'scale'}
F1-score Task A 0.6145374449339207      precision    recall  f1-score
support
          0  0.82887701 0.32769556 0.46969697      473          1  0.46733668 0.89710611
0.61453744      311
    micro avg  0.55357143 0.55357143 0.55357143      784  macro avg  0.64810684 0.61240083
0.54211721      784
weighted avg  0.68545986 0.55357143 0.52715282      784
Best parameters:
{'C': 1, 'gamma': 'scale'}
F1-score Task A 0.6106870229007634      precision    recall  f1-score
support
          0  0.82584270 0.31078224 0.45161290      473          1  0.46204620 0.90032154
0.61068702      311
    micro avg  0.54464286 0.54464286 0.54464286      784  macro avg  0.64394445 0.60555189
0.53114996      784
weighted avg  0.68153057 0.54464286 0.51471501      784
Best parameters:
{'C': 10, 'gamma': 'scale'}
F1-score Task A 0.6352941176470589      precision    recall  f1-score
support
          0  0.79393939 0.55391121 0.65255293      473          1  0.53524229 0.78135048
0.63529412      311
    micro avg  0.64413265 0.64413265 0.64413265      784  macro avg  0.66459084 0.66763084
0.64392352      784
weighted avg  0.69131848 0.64413265 0.64570664      784
Best parameters:
{'C': 10, 'gamma': 'scale'}

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F1-score Task A 0.639386189258312	precision	recall	f1-score	
support				
0 0.80511182 0.53276956 0.64122137	473	1	0.53078556 0.80385852	
0.63938619 311				
micro avg 0.64030612 0.64030612 0.64030612	784	macro avg	0.66794869 0.66831404	
0.64030378 784				
weighted avg 0.69629107 0.64030612 0.64049339	784			
Best parameters:				
{ 'C': 10, 'gamma': 'scale' }				
F1-score Task A 0.645				
precision recall f1-score support				
0 0.82033898 0.51162791 0.63020833	473	1	0.52760736 0.82958199	
0.64500000 311				
micro avg 0.63775510 0.63775510 0.63775510	784	macro avg	0.67397317 0.67060495	
0.63760417 784				
weighted avg 0.70421713 0.63775510 0.63607595	784			

Chi2

Best parameters:				
{ 'C': 10, 'gamma': 'scale' }				
F1-score Task A 0.6114352392065344	precision	recall	f1-score	
support				
0 0.79411765 0.39957717 0.53164557	473	1	0.47985348 0.84244373	
0.61143524 311				
micro avg 0.57525510 0.57525510 0.57525510	784	macro avg	0.63698556 0.62101045	
0.57154040 784				
weighted avg 0.66945418 0.57525510 0.56329683	784			
Best parameters:				
{ 'C': 10, 'gamma': 'scale' }				
F1-score Task A 0.6084425036390102	precision	recall	f1-score	
support				
0 0.75000000 0.64693446 0.69466515	473	1	0.55585106 0.67202572	
0.60844250 311				
micro avg 0.65688776 0.65688776 0.65688776	784	macro avg	0.65292553 0.65948009	
0.65155383 784				
weighted avg 0.67298429 0.65688776 0.66046204	784			

Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A	0.5892857142857142	precision	recall	f1-score
support				
0	0.73286052 0.65539112 0.69196429	473	1	0.54847645 0.63665595
0.58928571	311			
micro avg	0.64795918 0.64795918 0.64795918	784	macro avg	0.64066849 0.64602353
0.64062500	784			
weighted avg	0.65971837 0.64795918 0.65123337	784		

Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A	0.5991058122205664	precision	recall	f1-score
support				
0	0.74056604 0.66384778 0.70011148	473	1	0.55833333 0.64630225
0.59910581	311			
micro avg	0.65688776 0.65688776 0.65688776	784	macro avg	0.64944969 0.65507502
0.64960865	784			
weighted avg	0.66827730 0.65688776 0.66004418	784		

Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A	0.6240928882438316	precision	recall	f1-score
support				
0	0.76354680 0.65539112 0.70534699	473	1	0.56878307 0.69131833
0.62409289	311			
micro avg	0.66964286 0.66964286 0.66964286	784	macro avg	0.66616493 0.67335472
0.66471994	784			
weighted avg	0.68628721 0.66964286 0.67311481	784		

Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A	0.6195965417867435	precision	recall	f1-score
support				
0	0.76059850 0.64482030 0.69794050	473	1	0.56135770 0.69131833
0.61959654	311			
micro avg	0.66326531 0.66326531 0.66326531	784	macro avg	0.66097810 0.66806931
0.65876852	784			
weighted avg	0.68156293 0.66326531 0.66686273	784		

Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A	0.6218978102189782	precision	recall	f1-score
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```

support
      0  0.76097561 0.65961945 0.70668177      473      1  0.56951872 0.68488746
0.62189781      311
      micro avg  0.66964286 0.66964286 0.66964286      784  macro avg  0.66524716 0.67225346
0.66428979      784
weighted avg  0.68502779 0.66964286 0.67304936      784
Best parameters:
{'C': 10, 'gamma': 'scale'}
F1-score Task A 0.6440677966101694      precision      recall  f1-score
support
      0  0.80487805 0.55813953 0.65917603      473      1  0.54166667 0.79421222
0.64406780      311
      micro avg  0.65178571 0.65178571 0.65178571      784  macro avg  0.67327236 0.67617588
0.65162191      784
weighted avg  0.70046639 0.65178571 0.65318284      784
Best parameters:
{'C': 10, 'gamma': 'scale'}
F1-score Task A 0.644918444165621      precision      recall  f1-score
support
      0  0.81879195 0.51585624 0.63294423      473      1  0.52880658 0.82636656
0.64491844      311
      micro avg  0.63903061 0.63903061 0.63903061      784  macro avg  0.67379927 0.67111140
0.63893134      784
weighted avg  0.70375949 0.63903061 0.63769420      784

```

CoreNLP Sentiment feats + BOW

MI

```

Best parameters:
{'C': 100, 'gamma': 'scale'}

```


F1-score Task A	0.5388127853881278	precision	recall	f1-score
support				
0	0.69406393 0.64270613 0.66739846	473	1	0.51156069 0.56913183
0.53881279	311			
micro avg	0.61352041 0.61352041 0.61352041	784	macro avg	0.60281231 0.60591898
0.60310562	784			
weighted avg	0.62166787 0.61352041 0.61639062	784		
Best parameters:				
{ 'C': 100, 'gamma': 'scale' }				
F1-score Task A	0.5680119581464873	precision	recall	f1-score
support				
0	0.71596244 0.64482030 0.67853170	473	1	0.53072626 0.61093248
0.56801196	311			
micro avg	0.63137755 0.63137755 0.63137755	784	macro avg	0.62334435 0.62787639
0.62327183	784			
weighted avg	0.64248227 0.63137755 0.63469032	784		
Best parameters:				
{ 'C': 100, 'gamma': 'scale' }				
F1-score Task A	0.5727272727272729	precision	recall	f1-score
support				
0	0.71954023 0.66173362 0.68942731	473	1	0.54154728 0.60771704
0.57272727	311			
micro avg	0.64030612 0.64030612 0.64030612	784	macro avg	0.63054375 0.63472533
0.63107729	784			
weighted avg	0.64893333 0.64030612 0.64313431	784		
Best parameters:				
{ 'C': 100, 'gamma': 'scale' }				
F1-score Task A	0.6156111929307806	precision	recall	f1-score
support				
0	0.75480769 0.66384778 0.70641170	473	1	0.56793478 0.67202572
0.61561119	311			
micro avg	0.66709184 0.66709184 0.66709184	784	macro avg	0.66137124 0.66793675
0.66101145	784			
weighted avg	0.68067826 0.66709184 0.67039262	784		
Best parameters:				
{ 'C': 100, 'gamma': 'scale' }				
F1-score Task A	0.6056971514242879	precision	recall	f1-score
support				
0	0.74532710 0.67441860 0.70810211	473	1	0.56741573 0.64951768

0.60569715	311						
micro avg	0.66454082	0.66454082	0.66454082	784	macro avg	0.65637142	0.66196814
0.65689963	784						
weighted avg	0.67475257	0.66454082	0.66747973	784			
Best parameters:							
{ 'C': 100, 'gamma': 'scale' }							
F1-score Task A	0.6217008797653958			precision	recall	f1-score	
support							
	0	0.76029056	0.66384778	0.70880361	473	1	0.57142857 0.68167203
0.62170088	311						
micro avg	0.67091837	0.67091837	0.67091837	784	macro avg	0.66585956	0.67275990
0.66525225	784						
weighted avg	0.68537209	0.67091837	0.67425138	784			
Best parameters:							
{ 'C': 100, 'gamma': 'scale' }							
F1-score Task A	0.6133333333333333			precision	recall	f1-score	
support							
	0	0.75238095	0.66807611	0.70772676	473	1	0.56868132 0.66559486
0.61333333	311						
micro avg	0.66709184	0.66709184	0.66709184	784	macro avg	0.66053114	0.66683548
0.66053005	784						
weighted avg	0.67951031	0.66709184	0.67028243	784			
F1-score Task A	0.6105263157894737			precision	recall	f1-score	
support							
	0	0.74883721	0.68076110	0.71317829	473	1	0.57344633 0.65273312
0.61052632	311						
micro avg	0.66964286	0.66964286	0.66964286	784	macro avg	0.66114177	0.66674711
0.66185231	784						
weighted avg	0.67926251	0.66964286	0.67245793	784			
Best parameters:							
{ 'C': 100, 'gamma': 'scale' }							
F1-score Task A	0.6240713224368498			precision	recall	f1-score	
support							
	0	0.76066351	0.67864693	0.71731844	473	1	0.58011050 0.67524116
0.62407132	311						
micro avg	0.67729592	0.67729592	0.67729592	784	macro avg	0.67038700	0.67694405
0.67069488	784						
weighted avg	0.68904108	0.67729592	0.68032883	784			

Chi2

Best parameters:									
{ 'C': 100, 'gamma': 'scale' }									
F1-score Task A	0.5799457994579946				precision		recall	f1-score	
support									
	0	0.72829132	0.54968288	0.62650602	473		1	0.50117096	0.68810289
0.57994580	311								
micro avg	0.60459184	0.60459184	0.60459184		784	macro avg	0.61473114	0.61889288	
0.60322591	784								
weighted avg	0.63819638	0.60459184	0.60803634		784				
Best parameters:									
{ 'C': 100, 'gamma': 'scale' }									
F1-score Task A	0.5900151285930408				precision		recall	f1-score	
support									
	0	0.73271889	0.67230444	0.70121279	473		1	0.55714286	0.62700965
0.59001513	311								
micro avg	0.65433673	0.65433673	0.65433673		784	macro avg	0.64493088	0.64965704	
0.64561396	784								
weighted avg	0.66307075	0.65433673	0.65710249		784				
Best parameters:									
{ 'C': 100, 'gamma': 'scale' }									
F1-score Task A	0.6184012066365008				precision		recall	f1-score	
support									
	0	0.75462963	0.68921776	0.72044199	473		1	0.58238636	0.65916399
0.61840121	311								
micro avg	0.67729592	0.67729592	0.67729592		784	macro avg	0.66850800	0.67419087	
0.66942160	784								
weighted avg	0.68630354	0.67729592	0.67996408		784				
Best parameters:									
{ 'C': 100, 'gamma': 'scale' }									
F1-score Task A	0.5988023952095808				precision		recall	f1-score	
support									
	0	0.74004684	0.66807611	0.70222222	473		1	0.56022409	0.64308682
0.59880240	311								
micro avg	0.65816327	0.65816327	0.65816327		784	macro avg	0.65013546	0.65558146	

```

0.65051231      784
weighted avg  0.66871409 0.65816327 0.66119727      784
Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.6133333333333333      precision      recall      f1-score
support
      0  0.75238095 0.66807611 0.70772676      473      1  0.56868132 0.66559486
0.61333333      311
      micro avg  0.66709184 0.66709184 0.66709184      784      macro avg  0.66053114 0.66683548
0.66053005      784
weighted avg  0.67951031 0.66709184 0.67028243      784
Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.6332842415316642      precision      recall      f1-score
support
      0  0.76923077 0.67653277 0.71991001      473      1  0.58423913 0.69131833
0.63328424      311
      micro avg  0.68239796 0.68239796 0.68239796      784      macro avg  0.67673495 0.68392555
0.67659713      784
weighted avg  0.69584761 0.68239796 0.68554698      784
Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.6117647058823529      precision      recall      f1-score
support
      0  0.75180723 0.65961945 0.70270270      473      1  0.56368564 0.66881029
0.61176471      311
      micro avg  0.66326531 0.66326531 0.66326531      784      macro avg  0.65774643 0.66421487
0.65723370      784
weighted avg  0.67718246 0.66326531 0.66662908      784
F1-score Task A 0.6172106824925816      precision      recall      f1-score
support
      0  0.75534442 0.67230444 0.71140940      473      1  0.57300275 0.66881029
0.61721068      311
      micro avg  0.67091837 0.67091837 0.67091837      784      macro avg  0.66417359 0.67055736
0.66431004      784
weighted avg  0.68301246 0.67091837 0.67404230      784
Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.6140089418777943      precision      recall      f1-score

```

support								
	0	0.75235849	0.67441860	0.71125975	473		1	0.57222222 0.66237942
0.61400894		311						
	micro avg	0.66964286	0.66964286	0.66964286	784	macro avg	0.66229036	0.66839901
0.66263435		784						
weighted avg	0.68090137	0.66964286	0.67268195		784			

Twitter Sentiment feats + BOW

Mutual Information

Best parameters:
{'C': 10, 'gamma': 'scale'}

F1-score Task A	0.5710186513629842		precision		recall		f1-score	
support								
	0	0.71859296	0.60465116	0.65671642	473		1	0.51554404 0.63987138
0.57101865		311						
	micro avg	0.61862245	0.61862245	0.61862245	784	macro avg	0.61706850	0.62226127
0.61386753		784						
weighted avg	0.63804677	0.61862245	0.62272151		784			

Best parameters:
{'C': 10, 'gamma': 'scale'}

F1-score Task A	0.5918653576437587		precision		recall		f1-score	
support								
	0	0.73821990	0.59619450	0.65964912	473		1	0.52487562 0.67845659
0.59186536		311						
	micro avg	0.62882653	0.62882653	0.62882653	784	macro avg	0.63154776	0.63732555
0.62575724		784						
weighted avg	0.65358971	0.62882653	0.63276041		784			

Best parameters:
{'C': 10, 'gamma': 'scale'}

F1-score Task A	0.5963431786216595	precision	recall	f1-score
support				
0	0.74218750 0.60253700 0.66511085	473	1	0.53000000 0.68167203
0.59634318	311			
micro avg	0.63392857 0.63392857 0.63392857	784	macro avg	0.63609375 0.64210451
0.63072702	784			
weighted avg	0.65801618 0.63392857 0.63783184	784		
Best parameters:				
{ 'C': 10, 'gamma': 'scale' }				
F1-score Task A	0.6134800550206327	precision	recall	f1-score
support				
0	0.76086957 0.59196617 0.66587396	473	1	0.53605769 0.71704180
0.61348006	311			
micro avg	0.64158163 0.64158163 0.64158163	784	macro avg	0.64846363 0.65450399
0.63967701	784			
weighted avg	0.67169037 0.64158163 0.64509015	784		
Best parameters:				
{ 'C': 10, 'gamma': 'scale' }				
F1-score Task A	0.6253443526170799	precision	recall	f1-score
support				
0	0.77235772 0.60253700 0.67695962	473	1	0.54698795 0.72990354
0.62534435	311			
micro avg	0.65306122 0.65306122 0.65306122	784	macro avg	0.65967284 0.66622027
0.65115199	784			
weighted avg	0.68295721 0.65306122 0.65648469	784		
Best parameters:				
{ 'C': 10, 'gamma': 'scale' }				
F1-score Task A	0.6233062330623307	precision	recall	f1-score
support				
0	0.77310924 0.58350951 0.66506024	473	1	0.53864169 0.73954984
0.62330623	311			
micro avg	0.64540816 0.64540816 0.64540816	784	macro avg	0.65587546 0.66152968
0.64418324	784			
weighted avg	0.68009979 0.64540816 0.64849711	784		
Best parameters:				
{ 'C': 10, 'gamma': 'scale' }				
F1-score Task A	0.6228187919463087	precision	recall	f1-score
support				
0	0.77428571 0.57293869 0.65856622	473	1	0.53456221 0.74598071

```

0.62281879      311
    micro avg  0.64158163 0.64158163 0.64158163      784  macro avg  0.65442396 0.65945970
0.64069251      784
weighted avg  0.67919131 0.64158163 0.64438580      784
Best parameters:
{'C': 10, 'gamma': 'scale'}
F1-score Task A 0.6251655629139073      precision      recall  f1-score
support
          0  0.77941176 0.56025370 0.65190652      473          1  0.53153153 0.75884244
0.62516556      311
    micro avg  0.63903061 0.63903061 0.63903061      784  macro avg  0.65547165 0.65954807
0.63853604      784
weighted avg  0.68108172 0.63903061 0.64129882      784
Best parameters:
{'C': 10, 'gamma': 'scale'}
F1-score Task A 0.6276041666666666      precision      recall  f1-score
support
          0  0.78593272 0.54334038 0.64250000      473          1  0.52735230 0.77491961
0.62760417      311
    micro avg  0.63520408 0.63520408 0.63520408      784  macro avg  0.65664251 0.65913000
0.63505208      784
weighted avg  0.68335809 0.63520408 0.63659107      784

```

Chi-squared

```

Best parameters:
{'C': 10, 'gamma': 'scale'}
F1-score Task A 0.6
      precision      recall  f1-score  support
          0  0.76140351 0.45877378 0.57255937      473          1  0.48697395 0.78135048
0.60000000      311
    micro avg  0.58673469 0.58673469 0.58673469      784  macro avg  0.62418873 0.62006213
0.58627968      784
weighted avg  0.65254178 0.58673469 0.58344462      784
Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.5842349304482226      precision      recall  f1-score

```

```

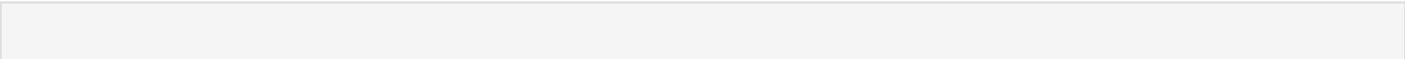
support
      0  0.72767857 0.68921776 0.70792617      473      1  0.56250000 0.60771704
0.58423493      311
      micro avg  0.65688776 0.65688776 0.65688776      784  macro avg  0.64508929 0.64846740
0.64608055      784
weighted avg  0.66215493 0.65688776 0.65885987      784
Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.6183431952662721      precision      recall  f1-score
support
      0  0.75656325 0.67019027 0.71076233      473      1  0.57260274 0.67202572
0.61834320      311
      micro avg  0.67091837 0.67091837 0.67091837      784  macro avg  0.66458299 0.67110800
0.66455276      784
weighted avg  0.68358912 0.67091837 0.67410117      784
Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.623688155922039      precision      recall  f1-score
support
      0  0.75934579 0.68710359 0.72142064      473      1  0.58426966 0.66881029
0.62368816      311
      micro avg  0.67984694 0.67984694 0.67984694      784  macro avg  0.67180773 0.67795694
0.67255440      784
weighted avg  0.68989595 0.67984694 0.68265176      784
Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.624813153961136      precision      recall  f1-score
support
      0  0.76056338 0.68498943 0.72080089      473      1  0.58379888 0.67202572
0.62481315      311
      micro avg  0.67984694 0.67984694 0.67984694      784  macro avg  0.67218113 0.67850758
0.67280702      784
weighted avg  0.69044379 0.67984694 0.68272412      784
Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.6340740740740741      precision      recall  f1-score
support
      0  0.76904762 0.68287526 0.72340426      473      1  0.58791209 0.68810289
0.63407407      311

```


micro avg	0.68494898	0.68494898	0.68494898	784	macro avg	0.67847985	0.68548908
	0.67873916		784				
weighted avg	0.69719411	0.68494898	0.68796843	784			
Best parameters:							
{ 'C': 100, 'gamma': 'scale' }							
F1-score Task A	0.609720176730486			precision	recall	f1-score	
support							
	0	0.75000000	0.65961945	0.70191226	473	1	0.56250000 0.66559486
	0.60972018		311				
micro avg	0.66198980	0.66198980	0.66198980	784	macro avg	0.65625000	0.66260715
	0.65581622		784				
weighted avg	0.67562181	0.66198980	0.66534117	784			
Best parameters:							
{ 'C': 100, 'gamma': 'scale' }							
F1-score Task A	0.6244477172312224			precision	recall	f1-score	
support							
	0	0.76201923	0.67019027	0.71316085	473	1	0.57608696 0.68167203
	0.62444772		311				
micro avg	0.67474490	0.67474490	0.67474490	784	macro avg	0.66905309	0.67593115
	0.66880429		784				
weighted avg	0.68826293	0.67474490	0.67796980	784			
Best parameters:							
{ 'C': 10, 'gamma': 'scale' }							
F1-score Task A	0.6311688311688313			precision	recall	f1-score	
support							
	0	0.79076923	0.54334038	0.64411028	473	1	0.52941176 0.78135048
	0.63116883		311				
micro avg	0.63775510	0.63775510	0.63775510	784	macro avg	0.66009050	0.66234543
	0.63763955		784				
weighted avg	0.68709299	0.63775510	0.63897662	784			

Bow alone

Mutual Information



Best parameters:

{'C': 0.01, 'gamma': 'scale'}

F1-score Task A	0.6146788990825688	precision	recall	f1-score
support				
0	0.80717489 0.38054968 0.51724138	473	1	0.47771836 0.86173633
0.61467890	311			
micro avg	0.57142857 0.57142857 0.57142857	784	macro avg	0.64244662 0.62114301
0.56596014	784			
weighted avg	0.67648486 0.57142857 0.55589325	784		

Best parameters:

{'C': 0.1, 'gamma': 'scale'}

F1-score Task A	0.6074766355140188	precision	recall	f1-score
support				
0	0.78661088 0.39746300 0.52808989	473	1	0.47706422 0.83601286
0.60747664	311			
micro avg	0.57142857 0.57142857 0.57142857	784	macro avg	0.63183755 0.61673793
0.56778326	784			
weighted avg	0.66381877 0.57142857 0.55958131	784		

Best parameters:

{'C': 10, 'gamma': 'scale'}

F1-score Task A	0.6084507042253521	precision	recall	f1-score
support				
0	0.75324675 0.61310782 0.67599068	473	1	0.54135338 0.69453376
0.60845070	311			
micro avg	0.64540816 0.64540816 0.64540816	784	macro avg	0.64730007 0.65382079
0.64222069	784			
weighted avg	0.66919211 0.64540816 0.64919867	784		

Best parameters:

{'C': 10, 'gamma': 'scale'}

F1-score Task A	0.6022727272727273	precision	recall	f1-score
support				
0	0.74680307 0.61733615 0.67592593	473	1	0.53944020 0.68167203
0.60227273	311			
micro avg	0.64285714 0.64285714 0.64285714	784	macro avg	0.64312164 0.64950409
0.63909933	784			
weighted avg	0.66454561 0.64285714 0.64670890	784		

Best parameters:

{'C': 10, 'gamma': 'scale'}

F1-score Task A	0.5991316931982634	precision	recall	f1-score
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support
      0  0.74257426 0.63424947 0.68415051      473      1  0.54473684 0.66559486
0.59913169      311
      micro avg  0.64668367 0.64668367 0.64668367      784  macro avg  0.64365555 0.64992216
0.64164110      784
weighted avg  0.66409538 0.64668367 0.65042494      784
Best parameters:
{'C': 10, 'gamma': 'scale'}
F1-score Task A 0.6080691642651297      precision      recall  f1-score
support
      0  0.75062344 0.63636364 0.68878719      473      1  0.55091384 0.67845659
0.60806916      311
      micro avg  0.65306122 0.65306122 0.65306122      784  macro avg  0.65076864 0.65741011
0.64842817      784
weighted avg  0.67140190 0.65306122 0.65676766      784
Best parameters:
{'C': 1, 'gamma': 'scale'}
F1-score Task A 0.6242038216560509      precision      recall  f1-score
support
      0  0.78709677 0.51585624 0.62324393      473      1  0.51687764 0.78778135
0.62420382      311
      micro avg  0.62372449 0.62372449 0.62372449      784  macro avg  0.65198721 0.65181879
0.62372388      784
weighted avg  0.67990525 0.62372449 0.62362471      784
Best parameters:
{'C': 1, 'gamma': 'scale'}
F1-score Task A 0.6221662468513853      precision      recall  f1-score
support
      0  0.78737542 0.50105708 0.61240310      473      1  0.51138716 0.79421222
0.62216625      311
      micro avg  0.61734694 0.61734694 0.61734694      784  macro avg  0.64938129 0.64763465
0.61728467      784
weighted avg  0.67789538 0.61734694 0.61627598      784
Best parameters:
{'C': 1, 'gamma': 'scale'}
F1-score Task A 0.6262376237623762      precision      recall  f1-score
support
      0  0.79790941 0.48414376 0.60263158      473      1  0.50905433 0.81350482
0.62623762      311

```

micro avg	0.61479592	0.61479592	0.61479592	784	macro avg	0.65348187	0.64882429
0.61443460				784			
weighted avg	0.68332531	0.61479592	0.61199571	784			

Chi2

Best parameters:							
{ 'C': 0.1, 'gamma': 'scale' }							
F1-score Task A	0.616822429906542			precision		recall	f1-score
support							
	0	0.80334728	0.40591966	0.53932584	473	1	0.48440367 0.84887460
0.61682243		311					
micro avg	0.58163265	0.58163265	0.58163265	784	macro avg	0.64387548	0.62739713
0.57807414		784					
weighted avg	0.67682756	0.58163265	0.57006747	784			
Best parameters:							
{ 'C': 0.1, 'gamma': 'scale' }							
F1-score Task A	0.6134259259259259			precision		recall	f1-score
support							
	0	0.80086580	0.39112051	0.52556818	473	1	0.47920434 0.85209003
0.61342593		311					
micro avg	0.57397959	0.57397959	0.57397959	784	macro avg	0.64003507	0.62160527
0.56949705		784					
weighted avg	0.67326795	0.57397959	0.56041991	784			
Best parameters:							
{ 'C': 10, 'gamma': 'scale' }							
F1-score Task A	0.6005830903790088			precision		recall	f1-score
support							
	0	0.74327628	0.64270613	0.68934240	473	1	0.54933333 0.66237942
0.60058309		311					
micro avg	0.65051020	0.65051020	0.65051020	784	macro avg	0.64630481	0.65254278
0.64496275		784					
weighted avg	0.66634228	0.65051020	0.65413303	784			
Best parameters:							
{ 'C': 10, 'gamma': 'scale' }							
F1-score Task A	0.6051873198847262			precision		recall	f1-score
support							

0	0.74812968	0.63424947	0.68649886	473	1	0.54830287	0.67524116
0.60518732	311						
micro avg	0.65051020	0.65051020	0.65051020	784	macro avg	0.64821627	0.65474531
0.64584309	784						
weighted avg	0.66886165	0.65051020	0.65424390	784			
Best parameters:							
{ 'C': 10, 'gamma': 'scale' }							
F1-score Task A	0.5979971387696709			precision	recall	f1-score	
support							
0	0.74242424	0.62156448	0.67663982	473	1	0.53865979	0.67202572
0.59799714	311						
micro avg	0.64158163	0.64158163	0.64158163	784	macro avg	0.64054202	0.64679510
0.63731848	784						
weighted avg	0.66159421	0.64158163	0.64544355	784			
Best parameters:							
{ 'C': 10, 'gamma': 'scale' }							
F1-score Task A	0.6189111747851003			precision	recall	f1-score	
support							
0	0.76070529	0.63847780	0.69425287	473	1	0.55813953	0.69453376
0.61891117	311						
micro avg	0.66071429	0.66071429	0.66071429	784	macro avg	0.65942241	0.66650578
0.65658202	784						
weighted avg	0.68035076	0.66071429	0.66436605	784			
Best parameters:							
{ 'C': 10, 'gamma': 'scale' }							
F1-score Task A	0.6221590909090909			precision	recall	f1-score	
support							
0	0.76470588	0.63213531	0.69212963	473	1	0.55725191	0.70418006
0.62215909	311						
micro avg	0.66071429	0.66071429	0.66071429	784	macro avg	0.66097890	0.66815769
0.65714436	784						
weighted avg	0.68241228	0.66071429	0.66437346	784			
Best parameters:							
{ 'C': 1, 'gamma': 'scale' }							
F1-score Task A	0.628498727735369			precision	recall	f1-score	
support							
0	0.79288026	0.51797040	0.62659847	473	1	0.52000000	0.79421222
0.62849873	311						
micro avg	0.62755102	0.62755102	0.62755102	784	macro avg	0.65644013	0.65609131

```

0.62754860      784
weighted avg  0.68463312 0.62755102 0.62735227      784
Best parameters:
{'C': 1, 'gamma': 'scale'}
F1-score Task A 0.6236024844720497      precision      recall      f1-score
support
      0  0.79310345 0.48625793 0.60288336      473      1  0.50809717 0.80707395
0.62360248      311
      micro avg  0.61352041 0.61352041 0.61352041      784      macro avg  0.65060031 0.64666594
0.61324292      784
weighted avg  0.68004611 0.61352041 0.61110230      784

```

Combined

Chi2

```

Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.5663716814159292      precision      recall      f1-score
support
      0  0.71462830 0.63002114 0.66966292      473      1  0.52316076 0.61736334
0.56637168      311
      micro avg  0.62500000 0.62500000 0.62500000      784      macro avg  0.61889453 0.62369224
0.61801730      784
weighted avg  0.63867625 0.62500000 0.62868897      784
Best parameters:
{'C': 100, 'gamma': 'scale'}
F1-score Task A 0.5753012048192772      precision      recall      f1-score
support
      0  0.72157773 0.65750529 0.68805310      473      1  0.54107649 0.61414791
0.57530120      311
      micro avg  0.64030612 0.64030612 0.64030612      784      macro avg  0.63132711 0.63582660
0.63167715      784
weighted avg  0.64997583 0.64030612 0.64332626      784

```

Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A	0.5954198473282442	precision	recall	f1-score
support				
0	0.73636364 0.68498943 0.70974808	473	1	0.56686047 0.62700965
0.59541985	311			
micro avg	0.66198980 0.66198980 0.66198980	784	macro avg	0.65161205 0.65599954
0.65258397	784			
weighted avg	0.66912450 0.66198980 0.66439594	784		

Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A	0.600609756097561	precision	recall	f1-score
support				
0	0.74031891 0.68710359 0.71271930	473	1	0.57101449 0.63344051
0.60060976	311			
micro avg	0.66581633 0.66581633 0.66581633	784	macro avg	0.65566670 0.66027205
0.65666453	784			
weighted avg	0.67315861 0.66581633 0.66824727	784		

Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A	0.6255639097744361	precision	recall	f1-score
support				
0	0.76046512 0.69133192 0.72425249	473	1	0.58757062 0.66881029
0.62556391	311			
micro avg	0.68239796 0.68239796 0.68239796	784	macro avg	0.67401787 0.68007111
0.67490820	784			
weighted avg	0.69188069 0.68239796 0.68510434	784		

Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A	0.6216216216216217	precision	recall	f1-score
support				
0	0.75757576 0.68710359 0.72062084	473	1	0.58309859 0.66559486
0.62162162	311			
micro avg	0.67857143 0.67857143 0.67857143	784	macro avg	0.67033717 0.67634922
0.67112123	784			
weighted avg	0.68836351 0.67857143 0.68134947	784		

Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A	0.6077844311377245	precision	recall	f1-score
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{'C': 100, 'gamma': 'scale'}

F1-score Task A 0.6066066066066067

precision

recall

f1-score

support

0	0.74592075	0.67653277	0.70953437	473	1	0.56901408	0.64951768
0.60660661	311						

micro avg	0.66581633	0.66581633	0.66581633	784	macro avg	0.65746742	0.66302523
0.65807049	784						

weighted avg	0.67574476	0.66581633	0.66870461	784			
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Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A 0.6059701492537314

precision

recall

f1-score

support

0	0.74588235	0.67019027	0.70601336	473	1	0.56545961	0.65273312
0.60597015	311						

micro avg	0.66326531	0.66326531	0.66326531	784	macro avg	0.65567098	0.66146170
0.65599176	784						

weighted avg	0.67431160	0.66326531	0.66632785	784			
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Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A 0.608955223880597

precision

recall

f1-score

support

0	0.74823529	0.67230444	0.70824053	473	1	0.56824513	0.65594855
0.60895522	311						

micro avg	0.66581633	0.66581633	0.66581633	784	macro avg	0.65824021	0.66412650
0.65859788	784						

weighted avg	0.67683613	0.66581633	0.66885567	784			
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Best parameters:

{'C': 100, 'gamma': 'scale'}

F1-score Task A 0.6063348416289592

precision

recall

f1-score

support

0	0.74537037	0.68076110	0.71160221	473	1	0.57102273	0.64630225
0.60633484	311						

micro avg	0.66709184	0.66709184	0.66709184	784	macro avg	0.65819655	0.66353168
0.65896853	784						

weighted avg	0.67620951	0.66709184	0.66984436	784			
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Todo: Coding

1. Implement sentiment value creator with `fit()` and `transform()`.
2. Integrate coreNlpSentimentAnalyzer code into `fit()` and `transform()` framework
3. Add FeatureUnion component to pipeline
4. Dig up MPQA feature creation in git repo
5. Implement MPQA estimator

Log

Fixed issue where the server would not work with the sentiment analysis annotator enabled by upgrading to corenlp v 3.9.2

F-score for positive class analysis

Bag of Words alone

Count	Matthews Correlation	Chi-Squared
100	0.61468	1682
500	0.60748	1343
1000	0.60845	10058
2000	0.60227	519
3000	0.59915	9800
5000	0.60807	1891
10000	0.62426	2216
12000	0.62217	2850
15000	0.62629	2360

MPQA + BOW

Count	Matthews Correlation	Chi-Squared
100	0.59876	1435
500	0.61229	8443
1000	0.61605	92857

at	Mutua	Chi-
Informa	Chi-	squared
2000	0.615559	1058
3000	0.614567	40929
5000	0.610687	95965
10000	0.635292	18978
12000	0.639384	40678
15000	0.645644	9184

CoreNLP + BOW

at	Mutua	Chi-
Informa	Chi-	squared
100	0.538817	99457
500	0.568052	00151
1000	0.572767	84012
2000	0.615651	988024
3000	0.605697	33333
5000	0.621763	32842
10000	0.613363	17647
12000	0.610526	72106
15000	0.624067	140089

Twitter Sentiment Queues + BOW

at	Mutua	Chi-
Informa	Chi-	squared
100	0.571051	99457

eat	Mutua	Chi-
Informa	in	squared
500	0.591855	0.00151
1000	0.596341	0.0012
2000	0.613459	0.0024
3000	0.625341	0.00333
5000	0.6	0.0032842
10000	0.613361	0.00317647
12000	0.625162	0.0044477
15000	0.627663	0.00611688

Macro f-score analysis

General sentiment features (MPQA)

Feature Count	Macro F1	Macro Precision	Macro Recall	Macro F2
100	0.59305	0.57154	0.61456	0.59305
500	0.54839	0.51555	0.58134	0.54839
1000	0.55208	0.54063	0.56352	0.55208
2000	0.54886	0.54961	0.54811	0.54886
3000	0.54212	0.54672	0.53742	0.54212
5000	0.53115	0.55877	0.50234	0.53115
10000	0.64392	0.6429	0.64494	0.64392
12000	0.64031	0.65162	0.62902	0.64031
15000	0.63766	0.63893	0.63639	0.63766

CoreNLP Sentiment features

Feature Count	Macro F1	Macro Precision	Macro Recall	Macro F2
100	0.60316	0.60323	0.60309	0.60316
500	0.62327	0.64561	0.60092	0.62327
1000	0.63108	0.6942	0.57166	0.63108

Count	Mean	Chi-Squared
200	0.661001	15051
300	0.65696	6053
500	0.65525	7660
1000	0.66056	5723
1200	0.66185	6431
1500	0.67069	6263

Twitter Sentiment Features

Count	Mean	Chi-Squared
100	0.61385	78628
500	0.62576	4608
1000	0.63076	6455
2000	0.63968	7255
3000	0.65115	7281
5000	0.64418	7874
10000	0.64069	5582
12000	0.63856	6880
15000	0.63505	3764

Bow alone

Count	Mean	Chi-Squared
100	0.56595	7807

Feature	Mutual Information	Chi-Squared
500	0.567736950	
1000	0.642264496	
2000	0.639164584	
3000	0.641663732	
5000	0.648465658	
10000	0.6233725714	
12000	0.617292755	
15000	0.614461324	

Precision and Recall for top performers (macro f-score)

MI features

Model	Positive Precision	Positive Recall
BOW only	0.5000	0.5000
Generic Sentiment Features + BOW	0.6984	0.5713
Syntactic Sentiment Features + BoW	0.6685	0.5000
Twitter Sentiment Features + BoW	0.6925	0.5000

Chi squared features

Model	Positive Precision	Positive Recall
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BOW only	500.00	0.50	0.33	169453
Generic Sentiment Fea	100.00	0.50	0.50	568289
+ BOW				
Syntactic Sentiment Fea	500.00	0.50	0.33	132
+ BoW				
Twitter Sentiment Fea	500.00	0.50	0.33	81
+ BoW				