Offensive Tweets Detection using Machine Learning

Diogo Ferreira, Luís Leira

***Abstract*—In recent years, verbal aggression on the internet has grown exponentially, due to the higher reach of social media platforms and broad use of smartphones. Twitter has implemented a ”safe search” feature to detect and remove offensive tweets and delete or suspend user accounts that successively post offensive tweets. In this report, we present an approach with document pre-processing and testing with classical machine learning classifiers to detect offensive tweets. It can be achieved an accuracy of 95.6% in our dataset. Our results outperform the current offensive tweet classifiers in the known papers.**

I. Introduction

IN 2017, Twitter implemented ”safe search” feature to detect and remove offensive tweets from searches with ”safe search” enabled [1]. This feature is also useful when the Twitter widget is embedded in a reputed website and it is of great importance to show only adequate tweets. Currently, Twitter also uses this information to suspend or delete accounts that post successive agressive tweets. In [2], the authors propose a similar approach using features generated by the unsupervised learning algorithm Doc2Vec, obtaining a final accuracy of 88.465%. In [3], the authors use a dataset with 1.6M tweets gathered over three months and can achieve an accuracy of around 91% in the classification of offensive tweets. In this report, it will be explained our approach to the problem of creating a classifier to differentiate between offensive and non-offensive tweets. We believe that it is possible to achieve better results with a more adequate pre-processing of the words in the tokens and classic machine learning classifiers well-tuned.

II. Dataset

The chosen dataset to make the analysis is part of the dataset used in the paper [2] and it can be found in Kaggle website[1]. It contains 20001 tweets human labelled as offensive and non-offensive tweets. 7822 tweets were labelled as offensive, while 12179 tweets were labelled as non-offensive.

The charts in figure 1 and figure 2 show the most frequent tokens in the non-offensive and offensive tweets, respectively. It is possible to see that the most frequent tokens are the same in both datasets, which makes it hard for the model to classify tweets into the categories correctly. Word proximity must be taken into account when considering the features to feed the machine learning algorithm, to smooth the effect of the same frequent words being in both datasets and to try to higher the general accuracy of the model. The charts in figure 3 and figure 4 show the most frequent tokens grouped sequentially in pairs (bi-gram tokens). It can be seen the similarity between the most frequent bi-gram tokens in both charts.

[1]https://www.kaggle.com/datat urks/dataset-for-detection-of-cybertrolls/home

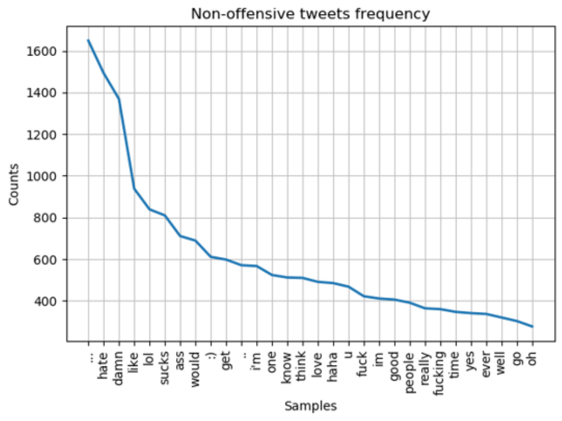

Fig. 1. Most frequent words in non-offensive tweets.

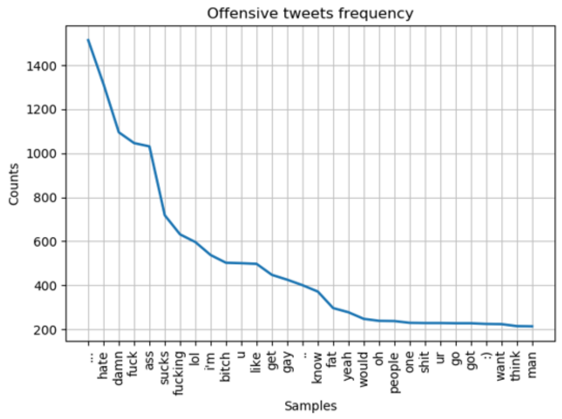

Fig. 2. Most frequent words in offensive tweets.

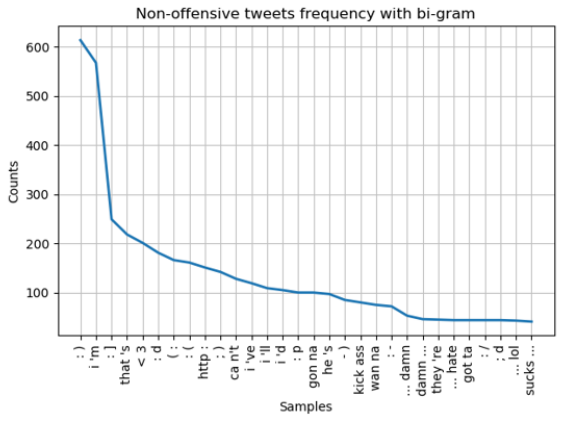

Fig. 3. Most frequent words in non-offensive tweets grouped in bi-gram.

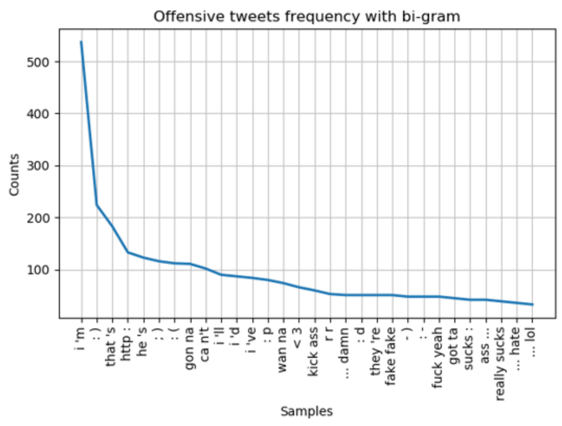

Fig. 4. Most frequent words in offensive tweets grouped in bi-gram.

In the dataset there are 17576 unique tokens. In the non-offensive tweets there are 14922 unique tokens, while in the offensive tweets there are 6486 unique tokens. If we group tokens sequentially in groups of two (bi-gram), there are 77973 unique tokens. In the non-offensive tweets there are 62609 unique tokens and in the offensive tweets there are 18458 unique tokens.

III. Data pre-processing

The pre-processing of words is done using a series of transformations applied to the words in the tweets. This step is fundamental to the normalization of words with similar meaning and remotion of unnecessary words in the tweets. First, all characters in tweets are lowercased. To each tweet is applied a tokenizer to split the tweets in words and convert the words into tokens. In this case, it was applied the TweetTokenizer, present in the NLTK library [2].

Afterwards, the punctuation is removed from the tokens, as well as the stop words (”the”, ”and”, ”of”, ...). The stop words used are from the Stopwords Corpus in NLTK library. Finally, a lemmatization algorithm is applied to the tokens, to group the inflected forms of a word for better analysis of different words with the same meaning. The algorithm used was WordNet Lemmatizer, also included in the NLTK library [3]. Instead of lemmatization, stemming could also be used, but lemmatization was chosen because of the use of a vocabulary dictionary and morphological analysis to get a better representation of the words.

IV. Feature extraction

To extract the features from the tokens in tweets two methods were used:

- N-gram counting;
- TF-IDF weighting.

The first method involves couting and selecting the top most used tokens in the tweets and use them as features. The related feature will be the number of times the tweet contains each one of the tokens. The result will be a sparse matrix that is normalized after all the countings. To include token proximity, it is tested with 1-gram and 2-gram tokens and it will be evaluated if the general results of the model improve with 2-gram tokens. N-gram groups a contiguous sequence of N tokens. We have chosen to take a word as the basic unit. For example, the tweet with the tokens ”we”, ”love” and ”ai” can be transformed into ”we love” and ”love ai” 2-gram tokens. With that, the token locality can be better represented. This behavior was achieved with the use of CountVectorizer module in Scikit-learn library [4].

The second method involves calculating the TF-IDF (term frequency – inverse document frequency) and selecting the top most used tokens in the tweets, using the weight of each token in a tweet as feature. The TF-IDF is as term-weighting scheme used to represent the importance of a token in a tweet. The importance of a term increases logarithmically with its frequency in a tweet and the weight is normalized according to all other weights in the same tweet, being unnecessary further normalization. This behaviour was achieved with the use of TfidfVectorizer module in Scikit-learn library [5].

V. Training & Testing

A. Training approach

The dataset division for the training and testing phase was 80% of data for training and cross-validation (using five-fold cross-validation) and 20% for testing.

Different classifiers and parameters were tested.

The tested classifiers were:

- Logistic Regression;
- SGD Classifier;
- Linear SVC;
- NuSVC;
- SVC;
- Gaussian Naive Bayes;
- Decision Tree;
- Random Forest;
- AdaBoost;
- XGBoost;
- Multi-layer Perceptrons.

The different parameters to test were:

- Maximum number of most used tokens to create features;
- Different n-gram parameters for N-gram counting (1-gram, 2-gram and combination);
- N-gram counting and TF-IDF weighting combination;
- Classifiers hyperparameters.

Due to the many classifiers chosen to evaluate, the number of possible parameter combinations has an exponential growth, being virtually impossible to make an optimal evaluation.

To solve that problem, the evaluation phase was subdivided in a sub-optimal 3-step phase described below.

[2]https://www.nltk.org/api/nltk.tokenize.html
[3]https://wordnet.princeton.edu/

[4]https://scikit-learn.org/stable/modules/generated/sklearn.feature_extraction.text.CountVectorizer.html
[5]https://scikit-learn.org/stable/modules/generated/sklearn.feature_extraction.text.TfidfVectorizer.html

B. *First evaluation phase*

On the first phase, the classifiers are tested using the default hyperparameters. The use of the N-gram counting and TF-IDF weighting approaches are tested separately and combined. The number of most used tokens vary between 100, 1000, 5000, 10000 and 25000. This number is used to give a maximum number of tokens used in the feature extraction. The tests are also done using 1-gram tokens, 2-gram tokens and both approaches combined (only applied to the N-gram counting). Finally, for each test, it is performed five-fold cross-validation using 80% of the dataset and is stored the confusion matrix, accuracy, precision, recall and f1-score. The most important metrics for the problem are accuracy and recall. A high recall is essential because if the classifier has many false positives, they can be detected by manual inspection. However, if the classifier produces many false negatives, they will not be analyzed and they will perturb readers.

On this phase, the best combination of parameters is chosen, along with the four classifiers with the best results.

C. *Second evaluation phase*

On the second phase, the four best classifiers from the first phase are tested with different hyperparameters. This phase is for selecting the best hyperparameters for each one of the classifiers based on the obtained results, also using five-fold cross-validation.

D. *Third evaluation phase*

On the last phase, the four best classifiers with the best hyperparameters and features will be tested with 20% of the dataset, the test data, to get the final results.

E. *First testing phase*

The extensive results of the first testing phase can be found in the Appendix A.

In this phase, some classifiers were only tested with the number of most used tokens below 5000, being removed from this analysis. NuSVC and SVC were eliminated due to the excessive memory used (due to the kernel transformations), causing a memory error (NuSVC and SVC are SVM's with polynomial kernel and Linear SVC was kept because it uses an SVM with a linear kernel). AdaBoost and XGBoost are two ensemble boosting methods that, due to the high number of features used, could not be trained in a reasonable time with a number of tokens higher than 5000.

In the figure 5 we can see the impact of choosing a different number of most used tokens to analyze. Better results are achieved when the number of tokens chosen to represent the features is higher.

However, other conclusions can be drawn from this figure. For a small number of tokens, the approaches with TF-IDF are the ones with the higher accuracy. While the performance of models that take into account bi-gram tokens improves the accuracy of the classifiers, the performance of the models that only take into account one-gram tokens seems to decrease after the 5000 most used tokens. This can happen because

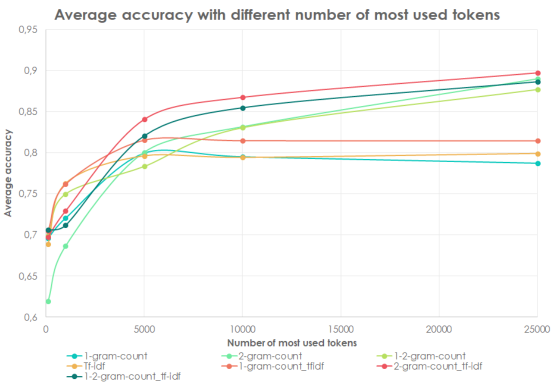

Fig. 5. Average accuracy with different number of features.

while the bi-gram tokens have 81075 unique tokens in both classes (62609 unique tokens in non-offensive tweets and 18458 unique tokens in offensive tweets), one-gram tokens only have 21408 unique tokens in both classes (14922 unique tokens in non-offensive tweets and 6486 unique tokens in offensive tweets). According to the Zipf's Law[6], 80% of the words in a document appear only once. Which means that in this case, we are only interested in the most used 20% tokens, which are 16215 tokens using bi-gram tokens, and 4281 tokens using one-gram tokens. Increasing the number of one-gram tokens after 4281 tokens may only add noise to the model, adding unnecessary tokens to characterize the classes, only overfitting on the training data. On the other hand, the accuracy of the models using bi-gram tokens as features seems to increase logarithmically with the number of tokens used.

It can also be seen that the models with TF-IDF features improve approximately 0.01 when compared with the same model without TF-IDF features.

The highest accuracy is achieved with only 2-gram features in the tokens counting and using TF-IDF.

The results for all classifiers tested with bi-gram tokens in the tokens counting and TF-IDF as feature extractors are shown in the figure 6. The classifier with higher precision and accuracy is the Logistic Regression, tied with the Linear SVC in the accuracy. The other two chosen classifiers were the ones that have the best recall, which is the Decision Tree and the Multi-layer Perceptrons.

F. *Second testing phase*

The four classifiers that are tested in this stage, as explained in the previous subsection, are Multi-layer Perceptrons, Decision Tree, Linear SVC and Logistic Regression.

The extensive results can be found the appendix B.

1) Multi-layer Perceptrons: On the Multi-layer Perceptrons classifier, the following hyperparameters were chosen:

- Activation function: ReLU (Rectified Linear Unit);
- Solver: ADAM;
- 500 epochs for training, with early stopping.

The hyperparameters chosen to vary were:

- Network configuration;

[6]https://en.wikipedia.org/wiki/Zipf's_law

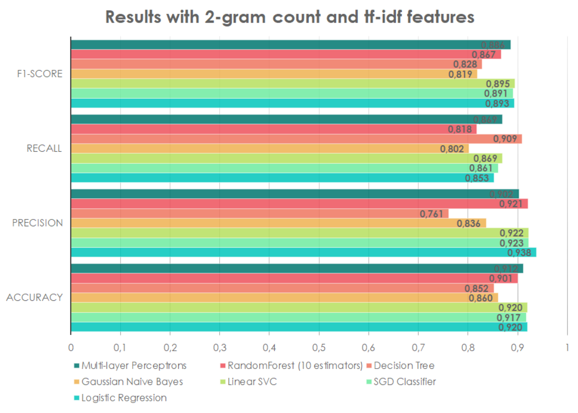

Fig. 6. Full results of all classifiers with bi-gram tokens in the tokens counting and TF-IDF features.

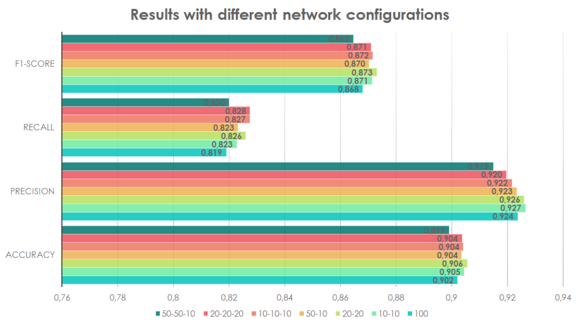

Fig. 7. Multi-layer Perceptrons results using different network configurations.

- Lambda value.

The network configuration varied among one, two and three layers, with different numbers of neurons: 100, 10x10, 20x20, 50x10, 10x10x10, 20x20x20 and 50x50x10. The lambda value chosen to regularize the activation function in each neuron varied among 0, 0.0001, 0.001, 0.01, 0.1 and 1.

The figure 7 shows the results obtained when using different network configurations. The results are similar among the different configurations, but it can be perceived a small improvement in the precision with smaller networks, with the exception of the configuration with just one layer.

In the figure 8 it can be seen the results of the classifier when tested with different lambda values. The results seem uncorrelated and the variations are too small to take any conclusion.

In the figure 9 the recall of the model is shown with different network configurations and lambda values. The recall is the chosen metric to represent because it is the most important metric to evaluate in this problem and in the previous tests showed worst results when compared with other metrics. Our goal is to maximize the recall, since the overall accuracy, F1-score and precision showed equally better results. It can be seen that the results with different network configurations and lambda values do not change dramatically among each other. However, the network with two layers and twenty neurons in each layer and a lambda value of 0.001 showed the highest recall. These parameters are the parameters chosen to calculate the final test result.

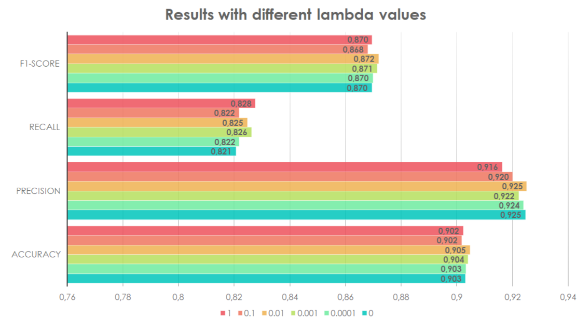

Fig. 8. Multi-layer Perceptrons results using different lambda values.

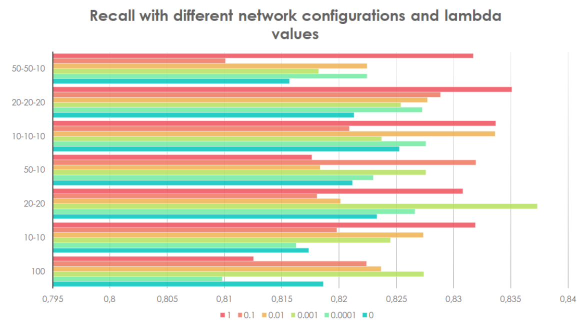

Fig. 9. Multi-layer Perceptrons recall using different network configurations and lambda values.

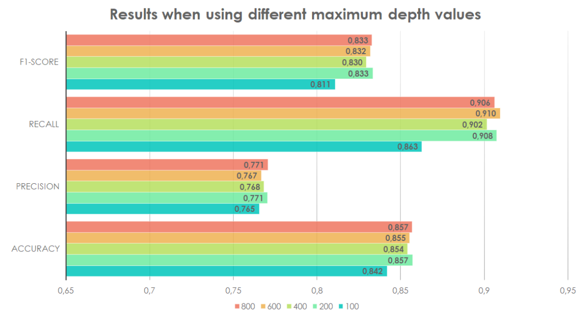

Fig. 10. Decision Tree results using different maximum depth values.

2) Decision Tree: On the Decision Tree classifier, the hyperparameters to vary were the following:

- Criterion;
- Maximum depth.

The first hyperparameters specifies the function to measure the quality of a split. While ”gini” uses the Gini impurity, ”entropy” uses the information gain. The second hyperparameter specifies the maximum depth of the tree. A few parameters were tested: 100, 200, 400, 600 and no maximum depth (more than 750 tree depth for both entropies tested, represented by 800).

The results when varying the maximum depth of the tree are presented in the figure 10. No conclusion can be taken from the results, because there is no clear trend in the data, the variations of results are minimal and seem totally random.

In the figure 11 are compared the results when using entropy and gini criterion for splitting nodes. Entropy criterion

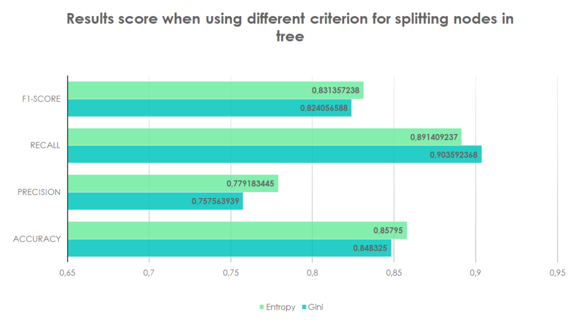

Fig. 11. Decision Tree results using different criteria for splitting nodes.

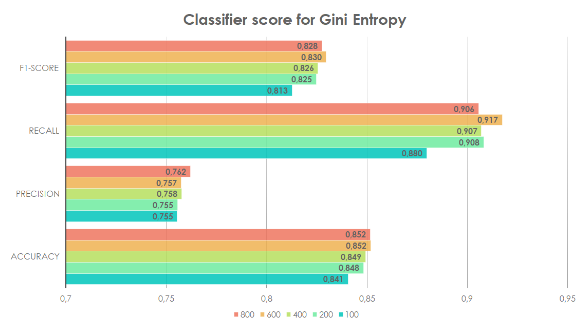

Fig. 12. Decision tree results with gini criterion and varying the maximum tree depth.

presents better results for accuracy, precision, and F1-score. However, gini criterion has a higher recall. As recall is the most important metric to evaluate, the gini criterion will be chosen for the following tests on the classifier.

With gini as a criterion decision, the figure 12 presents the results varying the maximum depth of the tree. It can be perceived a small improvement on the result with a higher tree depth. Particularly, the maximum depth chosen for the classifier is 600, because of the higher recall when compared with other tree depths.

3) Linear SVC: On the Linear SVC, the hyperparameters to vary were the following:

- Penalty;
- C.

The first hyperparameter specifies the norm used in the penalization. It was tested with ’l1’ and ’l2’ penalties. The second hyperparameter specifies the penalty parameter C of the error term. It determines the influence of the misclassification on the objective function. It was tested for the following values: 0.1, 1, 5, 10, 25, 50, 100, 500 and 1000.

In the figure 13 it is shown the accuracy for l1 and l2 penalties with different C values. The highest accuracy value achieved for the l2 penalty was with C=5 and for the l1 penalty was with C=1. For the same penalty, the difference is insignificant between the values of C, except for C=0.1 using l1 penalty. We can conclude that the l2 penalty has better accuracy compared to the l1 penalty for almost all C values. For this reason, it is clear that the classifier will produce better results when applied l2 normalization.

In the figure 14 it is shown the accuracy, precision, recall and f1-score values for different C values with l2 penalty. All

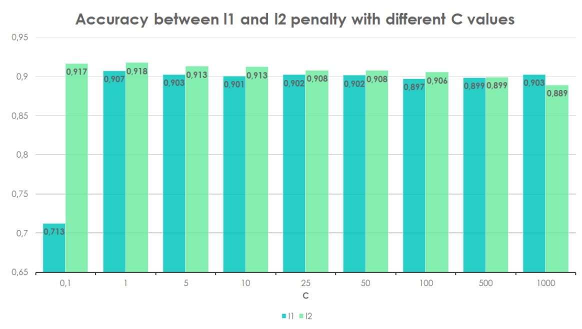

Fig. 13. Linear SVC accuracy for l1 and l2 penalty with different C values.

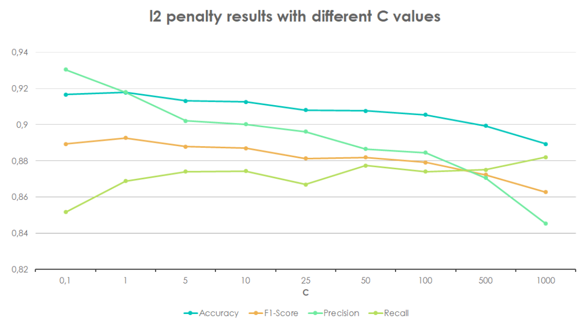

Fig. 14. Linear SVC accuracy, precision, recall and f1-score for l2 penalty with different C values.

parameters tend to decrease as C increases, with the exception of the recall. As accuracy and recall are the most important parameters in this problem, the most balanced combination must be evaluated. The highest accuracy value achieved was with C=0.1 but it has the worst recall. C=5 has the second highest accuracy result and a high recall. For this reason, we can conclude that C=5 offers the best relation between the two most important parameters referred above.

Based on the results shown, the best parameter values are l2 penalty and C=5.

4) Logistic Regression: On the Logistic Regression, the hyperparameters to vary were the following:

- Penalty;
- C.

The first hyperparameter specifies the norm used in the penalization. It was tested with ’l1’ and ’l2’ penalties. The second hyperparameter specifies the penalty parameter C of the error term. It determines the influence of the misclassification on the objective function. It was tested for the following values: 0.1, 1, 5, 10, 25, 50, 100, 500 and 1000.

In the figure 15 it is shown the accuracy for l1 and l2 penalties with different C values. The highest accuracy value achieved for the l2 penalty was with C=5 and for the l1 penalty was with C=5 and C=10. We can conclude that the l2 penalty is the best choice because it has better accuracy compared to the l1 penalty for all C values.

In the figure 16 it is shown the accuracy, precision, recall and f1-score values for different C values. As referred before, accuracy and recall are the most important parameters in this problem, so it is preferred the most balanced combination.

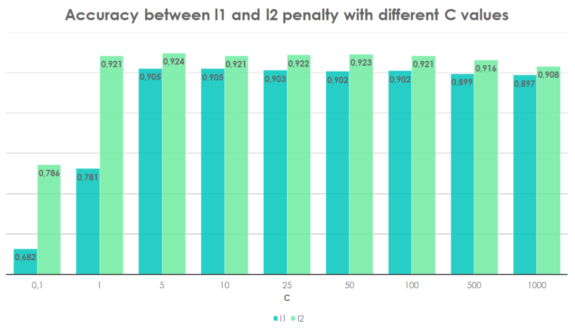

Fig. 15. Logistic Regression accuracy for l1 and l2 penalty with different C values.

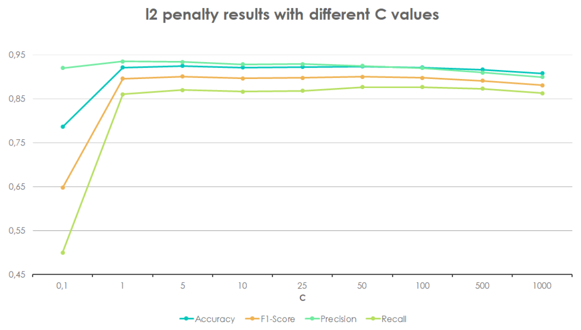

Fig. 16. Logistic Regression accuracy, precision, recall and f1-score for l2 penalty with different C values.

The highest accuracy value achieved was with C=1 but the difference is insignificant when compared to C=5. The highest recall value achieved was with C=50 or C=100. C=5 offers not only better accuracy that C=50 and C=100, but also better recall than C=1. It also has better accuracy than C=10 and C=25 and better recall that C=10, being almost the same as C=25. If we consider precision and f1-score, C=5 has the highest values overall. For this reasons, C=5 is considered the best C value, offering a balanced relation between accuracy and recall besides having the highest precision and f1-score.

Based on the results shown, the best parameter values are l2 penalty and C=5.

G. *Final results*

In this subsection are presented the results of the final tests. These tests were made with 20% of test data not used in the training phase, using the other 80% data for training.

All results have improved in the final tests, due to the large amounts of data used for training. If a larger dataset was available, it would be interesting to train the classifiers with more data to test if the results improved even more.

In the table I it is possible to see the final results. The Logistic Regression presents the highest accuracy and f1-score, followed close by Linear SVC. The Decision Tree has the worst accuracy, precision and f1-score, but it presents the best recall. However, the Logistic Regression and LinearSVC recall are not far from the Decision Tree recall. The Multi-layer perceptrons have the higher precision value, but the worst recall.

TABLE I
FINAL RESULTS OF THE FOUR BEST CLASSIFIERS

Classifier	Accuracy	Precision	Recall	F1-Score
Logistic Regression	0.956	0.940	0.946	0.943
Linear SVC	0.952	0.924	0.952	0.938
Decision Tree	0.871	0.764	0.959	0.850
Multi-layer Perceptrons	0.944	0.943	0.907	0.925

From the analysis of the results, the Multi-layer Perceptrons would not be considered to the final classifier due to the low recall. The Logistic Regression and Linear SVC are two classifiers that could be used to classify offensive tweets. While its recall is not the best when compared to the Decision Tree recall, its results are close to the best and have a much higher accuracy than both other classifiers. Overall, if the recall was crucial when dealing with classification of offensive tweets, even if that meant a lot of false positives, Decision Tree was the chosen classifier. Otherwise, if overall accuracy and f1-score results were more important than recall, Logistic Regression or Linear SVC would be the best classifiers to solve the problem.

VI. Conclusion

In this report, it was shown an approach to build an offensive tweet classifier. The final results show that it is possible to build a classifier with high accuracy (95.6%) or high recall (95.9%) using a small dataset (20001 tweets) by applying classical machine learning techniques and feature and model tuning. In the explored dataset, the token count with one-gram tokens decreases the overall accuracy if having more than 5000 tokens as features to the counter. However, using two-gram tokens improves the overall classifiers results logarithmically with an increase in the number of tokens. This result may indicate that in this specific dataset, the most used tokens used in both classes of tweets are similar, but if we use token proximity we can better differentiate both classes. In the four classifiers chosen to vary the hyperparameters, the impact of the hyperparameters variations was reduced. This may happen due to the high number of tokens used to extract features (25000 tokens) and consequently the high number of features used in the classifiers (almost 40000 features). The results can be further improved using other techniques. Using bigger n-grams and possibly joining with bi-gram tokens can help to higher the general accuracy. More labelled data can also help to differentiate between both classes. Using recurrent deep learning networks may also detect long-range dependencies not explored in this work.

References

[1] S. Shah, "Twitter safe search will now automatically hide 'sensitive' content on Android," 2017. [Online]. Available: https://www.digitaltrends.com/social-media/twitter-safety-search-replies/

[2] A. V. A. P. Shylaja S S, Abhishek Narayanan, "Document Embedding Generation for Cyber-Aggressive Comment Detection using Supervised Machine Learning Approach," *Proc. of ICON*, pp. 348–355, 2017.

[3] J. B. E. D. C. G. S. A. V. Despoina Chatzakou, Nicolas Kourtellis, “Mean Birds: Detecting Aggression and Bullying on Twitter,” *WebSci ’17 Proceedings of the 2017 ACM on Web Science Conference*, pp. 13–22, 2017.

Appendix A
First testing phase results

This appendix section contains seven pages, each one with different being tested.

- The first page contains the results only with 1-gram counter
- The second page contains the results with 2-gram counter
- The third page contains the results with 1-gram and 2-gram counter
- The fourth page contains the results with TF-IDF
- The fifth page contains the results with 1-gram counter and TF-IDF
- The sixth page contains the results with 2-gram counter and TF-IDF
- The seventh page contain the results with 1-gram and 2-gram counter and TF-IDF

Each table contains:

- Number of iteration
- Number of features tested
- Time to train (s)
- True Positives (TP)
- True Negatives (TN)
- False Positives (FP)
- False Negatives (FN)
- Accuracy
- Precision
- Recall
- F1-Score

1-gram-count

Features Counter with 1-gram
Maximum number of tokens considered 100

Logistic Regression

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.02199	536	1620	352	692	0.67375	0.6036	0.43648	0.50662
2	100	0.02397	566	1643	349	642	0.69031	0.61858	0.46854	0.53321
3	100	0.02199	554	1616	312	718	0.67813	0.63972	0.43553	0.51824
4	100	0.02198	583	1569	311	737	0.6725	0.65213	0.44167	0.52665
5	100	0.02099	534	1623	312	731	0.67406	0.63121	0.42213	0.50592
Average		**0.02218**	**554.6**	**1614.2**	**327.2**	**704**	**0.67775**	**0.62905**	**0.44087**	**0.51813**

SGD Classifier

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.02898	602	1542	430	626	0.67	0.58333	0.49023	0.53274
2	100	0.02898	101	1949	43	1107	0.64063	0.70139	0.08361	0.14941
3	100	0.02997	383	1759	169	889	0.66938	0.69384	0.3011	0.41996
4	100	0.02698	717	1466	414	603	0.68219	0.63395	0.54318	0.58507
5	100	0.02699	501	1669	266	764	0.67813	0.65319	0.39605	0.49311
Average		**0.02838**	**460.8**	**1677**	**264.4**	**797.8**	**0.66806**	**0.65314**	**0.36283**	**0.43606**

Linear SVC

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.08294	546	1602	370	682	0.67125	0.59607	0.44463	0.50933
2	100	0.22487	600	1630	362	608	0.69688	0.6237	0.49669	0.553
3	100	0.08995	607	1589	339	665	0.68625	0.64165	0.4772	0.54734
4	100	0.12695	612	1549	331	708	0.67531	0.64899	0.46364	0.54087
5	100	0.16292	553	1596	339	712	0.67156	0.61996	0.43715	0.51275
Average		**0.13752**	**583.6**	**1593.2**	**348.2**	**675**	**0.68025**	**0.62607**	**0.46386**	**0.53266**

NuSVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	17.8208	913	1261	711	315	0.67938	0.56219	0.74349	0.64025
2	100	17.928	884	1330	662	324	0.69188	0.5718	0.73179	0.64198
3	100	18.5193	868	1324	604	404	0.685	0.58967	0.68239	0.63265
4	100	17.0989	860	1355	525	460	0.69219	0.62094	0.65152	0.63586
5	100	17.9485	785	1313	622	480	0.65563	0.55792	0.62055	0.58757
Average		**17.8631**	**862**	**1316.6**	**624.8**	**396.6**	**0.68081**	**0.58051**	**0.68595**	**0.62766**

SVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	22.9028	25	1965	7	1203	0.62188	0.78125	0.02036	0.03968
2	100	23.5646	32	1983	9	1176	0.62969	0.78049	0.02649	0.05124
3	100	23.1424	20	1924	4	1252	0.6075	0.83333	0.01572	0.03086
4	100	23.3939	22	1877	3	1298	0.59344	0.88	0.01667	0.03271
5	100	23.5384	25	1928	7	1240	0.61031	0.78125	0.01976	0.03855
Average		**23.3084**	**24.8**	**1935.4**	**6**	**1233.8**	**0.61256**	**0.81126**	**0.0198**	**0.03861**

Gaussian Naive Bayes

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.036	696	1376	596	532	0.6475	0.5387	0.56678	0.55238
2	100	0.03728	753	1371	621	455	0.66375	0.54803	0.62334	0.58327
3	100	0.03597	775	1307	621	497	0.65063	0.55516	0.60928	0.58096
4	100	0.04697	777	1319	561	543	0.655	0.58072	0.58864	0.58465
5	100	0.03498	801	1287	648	464	0.6525	0.5528	0.6332	0.59027
Average		**0.03824**	**760.4**	**1332**	**609.4**	**498.2**	**0.65388**	**0.55508**	**0.60425**	**0.57831**

Decision Tree

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.21788	965	1506	466	263	0.77219	0.67435	0.78583	0.72584
2	100	0.2959	953	1484	508	255	0.76156	0.65229	0.78891	0.71413
3	100	0.21792	968	1450	478	304	0.75563	0.66943	0.76101	0.71229
4	100	0.24215	1038	1413	467	282	0.76594	0.6897	0.78636	0.73487
5	100	0.23396	1018	1448	487	247	0.77063	0.67641	0.80474	0.73502
Average		**0.24156**	**988.4**	**1460.2**	**481.2**	**270.2**	**0.76519**	**0.67244**	**0.78537**	**0.72443**

RandomForest (10 estimators)

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.23187	969	1547	425	259	0.78625	0.69512	0.78909	0.73913
2	100	0.29983	957	1526	466	251	0.77594	0.67252	0.79222	0.72748
3	100	0.22585	956	1488	440	316	0.76375	0.68481	0.75157	0.71664
4	100	0.26184	1033	1456	424	287	0.77781	0.70899	0.78258	0.74397
5	100	0.24908	1028	1474	461	237	0.78188	0.6904	0.81265	0.74655
Average		**0.25369**	**988.6**	**1498.2**	**443.2**	**270**	**0.77713**	**0.69037**	**0.78562**	**0.73475**

AdaBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.65764	560	1595	377	668	0.67344	0.59765	0.45603	0.51732
2	100	0.7988	584	1642	350	624	0.69563	0.62527	0.48344	0.54528
3	100	0.67403	579	1608	320	693	0.68344	0.64405	0.45519	0.53339
4	100	0.79654	582	1556	324	738	0.66813	0.64238	0.44091	0.52291
5	100	0.89088	537	1625	310	728	0.67563	0.634	0.42451	0.50852
Average		**0.76358**	**568.4**	**1605.2**	**336.2**	**690.2**	**0.67925**	**0.62867**	**0.45201**	**0.52549**

XGBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	3.51061	518	1698	274	710	0.6925	0.65404	0.42182	0.51287
2	100	3.43553	535	1708	284	673	0.70094	0.65324	0.44288	0.52787
3	100	3.25992	558	1672	256	714	0.69688	0.6855	0.43868	0.535
4	100	3.31713	539	1612	268	781	0.67219	0.66791	0.40833	0.50682
5	100	3.16611	505	1688	247	760	0.68531	0.67154	0.39921	0.50074
Average		**3.33786**	**531**	**1675.6**	**265.8**	**727.6**	**0.68956**	**0.66645**	**0.42219**	**0.51666**

Multi-layer Perceptrons

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	19.8812	948	1576	396	280	0.78875	0.70536	0.77199	0.73717
2	100	18.3656	916	1549	443	292	0.77031	0.67403	0.75828	0.71367
3	100	17.8591	939	1528	400	333	0.77094	0.70127	0.73821	0.71926
4	100	18.6097	1004	1476	404	316	0.775	0.71307	0.76061	0.73607
5	100	17.5775	1014	1466	469	251	0.775	0.68375	0.80158	0.73799
Average		**18.4586**	**964.2**	**1519**	**422.4**	**294.4**	**0.776**	**0.69549**	**0.76613**	**0.72883**

Features Counter with 1-gram
Maximum 1000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.05897	691	1550	369	590	0.70031	0.65189	0.53942	0.59035
2	1000	0.05896	681	1574	352	593	0.70469	0.65924	0.53454	0.59038
3	1000	0.05697	673	1600	364	563	0.71031	0.64899	0.5445	0.59217
4	1000	0.05597	698	1608	363	531	0.72063	0.65787	0.56794	0.60961
5	1000	0.057	716	1594	333	557	0.72188	0.68255	0.56245	0.61671
Average		**0.05757**	**691.8**	**1585.2**	**356.2**	**566.8**	**0.71156**	**0.66011**	**0.54977**	**0.59984**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.14694	250	1825	94	1031	0.64844	0.72674	0.19516	0.30769
2	1000	0.14096	598	1664	300	638	0.70688	0.66592	0.48382	0.56045
3	1000	0.16596	876	1402	524	398	0.71188	0.62571	0.6876	0.6552
4	1000	0.1499	849	1502	425	424	0.73469	0.66641	0.66693	0.66667
5	1000	0.14194	928	1384	587	301	0.7225	0.61254	0.75509	0.67638
Average		**0.14914**	**700.2**	**1555.4**	**386**	**558.4**	**0.70488**	**0.65947**	**0.55772**	**0.57328**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.27684	757	1488	431	524	0.70156	0.63721	0.59094	0.6132
2	1000	0.2455	750	1522	404	524	0.71	0.64991	0.5887	0.61779
3	1000	0.15066	741	1555	409	495	0.7175	0.64435	0.59951	0.62112
4	1000	0.14991	768	1562	409	461	0.72813	0.65251	0.6249	0.6384
5	1000	0.1599	798	1539	388	475	0.73031	0.67285	0.62687	0.64904
Average		**0.19656**	**762.8**	**1533.2**	**408.2**	**495.8**	**0.7175**	**0.65136**	**0.60618**	**0.62791**

NuSVC (gamma='auto')

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	154.221	923	1340	579	358	0.70719	0.61451	0.72053	0.66331
2	1000	157.279	922	1387	577	314	0.72156	0.61508	0.74595	0.67422
3	1000	156.581	954	1367	560	319	0.72531	0.63012	0.74941	0.68461
4	1000	146.433	921	1434	537	308	0.73594	0.63169	0.74939	0.68552
5	1000	157.863	953	1385	541	321	0.73063	0.63788	0.74804	0.68858
Average		**154.476**	**934.6**	**1382.6**	**558.8**	**324**	**0.72413**	**0.62586**	**0.74266**	**0.67925**

SVC (gamma='auto')

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	150.359	0	1926	0	1274	0.60188	0	0	0
2	1000	151.311	0	1964	0	1236	0.61375	0	0	0
3	1000	149.389	0	1927	0	1273	0.60219	0	0	0
4	1000	153.179	0	1919	0	1281	0.59969	0	0	0
5	1000	142.859	0	1971	0	1229	0.61594	0	0	0
Average		**149.419**	**0**	**1941.4**	**0**	**1258.6**	**0.60669**	**0**	**0**	**0**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.33381	996	767	1204	233	0.55094	0.45273	0.81041	0.58093
2	1000	0.3438	1062	675	1244	219	0.54281	0.46054	0.82904	0.59214
3	1000	0.35333	1015	793	1171	221	0.565	0.46432	0.8212	0.59322
4	1000	0.341	1031	789	1137	243	0.56875	0.47555	0.80926	0.59907
5	1000	0.33931	1062	754	1173	211	0.5675	0.47517	0.83425	0.60547
Average		**0.34225**	**1033.2**	**755.6**	**1185.8**	**225.4**	**0.559**	**0.46566**	**0.82083**	**0.59417**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	8.72825	1117	1480	484	119	0.81156	0.69769	0.90372	0.78745
2	1000	9.09607	1150	1456	463	131	0.81438	0.71296	0.89774	0.79475
3	1000	8.95434	1165	1451	476	108	0.8175	0.70993	0.91516	0.79959
4	1000	8.12316	1171	1447	479	103	0.81813	0.7097	0.91915	0.80096
5	1000	8.39421	1136	1506	465	93	0.82563	0.70956	0.92433	0.80283
Average		**8.6592**	**1147.8**	**1468**	**473.4**	**110.8**	**0.81744**	**0.70797**	**0.91202**	**0.79711**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	2.15153	1102	1547	417	134	0.82781	0.72548	0.89159	0.8
2	1000	2.07581	1099	1583	388	130	0.83813	0.73907	0.89422	0.80928
3	1000	2.34487	1151	1508	411	130	0.83094	0.73688	0.89852	0.80971
4	1000	2.11569	1137	1533	393	137	0.83438	0.74314	0.89246	0.81098
5	1000	2.15688	1158	1520	407	115	0.83688	0.73994	0.90966	0.81607
Average		**2.16896**	**1129.4**	**1538.2**	**403.2**	**129.2**	**0.83363**	**0.7369**	**0.89729**	**0.80921**

AdaBoost

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	9.79309	533	1639	325	703	0.67875	0.62121	0.43123	0.50907
2	1000	10.4673	561	1625	294	720	0.68313	0.65614	0.43794	0.52528
3	1000	9.56953	552	1690	281	677	0.70063	0.66267	0.44915	0.5354
4	1000	10.1498	599	1648	279	674	0.70219	0.68223	0.47054	0.55695
5	1000	9.85509	623	1603	323	651	0.69563	0.65856	0.48901	0.56126
Average		**9.96696**	**573.6**	**1641**	**300.4**	**685**	**0.69206**	**0.65616**	**0.45557**	**0.53759**

XGBoost

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	30.2082	541	1660	266	733	0.68781	0.67038	0.42465	0.51994
2	1000	29.6479	543	1673	291	693	0.6925	0.65108	0.43932	0.52464
3	1000	30.1184	547	1675	252	726	0.69438	0.68461	0.42969	0.52799
4	1000	30.6257	568	1628	291	713	0.68625	0.66123	0.4434	0.53084
5	1000	29.5271	572	1705	266	657	0.71156	0.68258	0.46542	0.55346
Average		**30.0255**	**554.2**	**1668.2**	**273.2**	**704.4**	**0.6945**	**0.66998**	**0.4405**	**0.53137**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	70.3751	1102	1670	294	134	0.86625	0.7894	0.89159	0.83739
2	1000	68.2922	1111	1659	312	118	0.86563	0.78074	0.90399	0.83786
3	1000	72.6049	1143	1617	309	131	0.8625	0.78719	0.89717	0.83859
4	1000	72.6331	1134	1660	267	139	0.87313	0.80942	0.89081	0.84817
5	1000	68.2318	1143	1650	269	138	0.87281	0.80949	0.89227	0.84887
Average		**70.4274**	**1126.6**	**1651.2**	**290.2**	**132**	**0.86806**	**0.79525**	**0.89517**	**0.84217**

Features Counter with 1-gram
Maximum 5000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.1473	825	1677	295	403	0.78188	0.73661	0.67182	0.70273
2	5000	0.13331	856	1629	332	383	0.77656	0.72054	0.69088	0.7054
3	5000	0.13037	868	1619	289	424	0.77719	0.75022	0.67183	0.70886
4	5000	0.13106	851	1640	301	408	0.77844	0.73872	0.67593	0.70593
5	5000	0.12953	856	1635	290	419	0.77844	0.74695	0.67137	0.70715
Average		**0.13431**	**851.2**	**1640**	**301.4**	**407.4**	**0.7785**	**0.7386**	**0.67637**	**0.70601**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.75716	609	1819	153	619	0.75875	0.79921	0.49593	0.61206
2	5000	0.75066	806	1677	284	433	0.77594	0.73945	0.65052	0.69214
3	5000	0.72171	1028	1491	417	264	0.78719	0.71142	0.79567	0.75119
4	5000	0.71106	1119	1311	630	140	0.75938	0.63979	0.8888	0.74402
5	5000	0.71572	845	1659	266	430	0.7825	0.76058	0.66275	0.7083
Average		**0.73126**	**881.4**	**1591.4**	**350**	**377.2**	**0.77275**	**0.73009**	**0.69873**	**0.70154**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.24229	954	1621	351	274	0.80469	0.73103	0.77687	0.75326
2	5000	0.2721	982	1574	387	257	0.79875	0.71731	0.79257	0.75307
3	5000	0.23231	1055	1583	325	237	0.82438	0.76449	0.81656	0.78967
4	5000	0.20216	1001	1580	361	258	0.80656	0.73495	0.79508	0.76383
5	5000	0.22864	1000	1570	355	275	0.80313	0.73801	0.78431	0.76046
Average		**0.2355**	**998.4**	**1585.6**	**355.8**	**260.2**	**0.8075**	**0.73716**	**0.79308**	**0.76406**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.85009	569	1768	204	659	0.73031	0.73609	0.46336	0.56872
2	5000	0.8447	573	1749	212	666	0.72563	0.72994	0.46247	0.56621
3	5000	0.84712	593	1724	184	699	0.72406	0.76319	0.45898	0.57322
4	5000	0.68751	555	1719	222	704	0.71063	0.71429	0.44083	0.54519
5	5000	0.7398	562	1724	201	713	0.71438	0.73657	0.44078	0.55152
Average		**0.79385**	**570.4**	**1736.8**	**204.6**	**688.2**	**0.721**	**0.73601**	**0.45328**	**0.56097**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	27.9499	1127	1535	437	101	0.83188	0.72059	0.91775	0.80731
2	5000	27.8535	1133	1476	485	106	0.81531	0.70025	0.91445	0.79314
3	5000	27.9969	1166	1427	481	126	0.81031	0.70795	0.90248	0.79347
4	5000	29.7015	1159	1438	503	100	0.81156	0.69735	0.92057	0.79356
5	5000	29.879	1158	1455	470	117	0.81656	0.7113	0.90824	0.7978
Average		**28.6762**	**1148.6**	**1466.2**	**475.2**	**110**	**0.81713**	**0.70749**	**0.9127**	**0.79705**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	7.14557	1098	1613	359	130	0.84719	0.7536	0.89414	0.81788
2	5000	6.73899	1093	1579	382	146	0.835	0.74102	0.88216	0.80545
3	5000	6.12223	1154	1543	365	138	0.84281	0.75971	0.89319	0.82106
4	5000	6.11171	1117	1555	386	142	0.835	0.74318	0.88721	0.80883
5	5000	6.2887	1133	1597	328	142	0.85313	0.7755	0.88863	0.82822
Average		**6.48144**	**1119**	**1577.4**	**364**	**139.6**	**0.84263**	**0.7546**	**0.88907**	**0.81629**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	339.228	1088	1670	302	140	0.86188	0.78273	0.88599	0.83117
2	5000	342.048	1107	1611	350	132	0.84938	0.75978	0.89346	0.82122
3	5000	341.591	1147	1589	319	145	0.855	0.7824	0.88777	0.83176
4	5000	340.064	1122	1625	316	137	0.85844	0.78025	0.89118	0.83204
5	5000	330.394	1161	1616	309	114	0.86781	0.7898	0.91059	0.8459
Average		**338.665**	**1125**	**1622.2**	**319.2**	**133.6**	**0.8585**	**0.77899**	**0.8938**	**0.83242**

Features Counter with 1-gram
Maximum 10000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.3768	883	1650	320	347	0.79156	0.734	0.71789	0.72585
2	10000	0.36094	919	1668	277	336	0.80844	0.76839	0.73227	0.7499
3	10000	0.29784	900	1686	287	327	0.80813	0.75821	0.7335	0.74565
4	10000	0.30584	936	1654	286	324	0.80938	0.76596	0.74286	0.75423
5	10000	0.36079	927	1628	251	394	0.79844	0.78693	0.70174	0.7419
Average		**0.34044**	**913**	**1657.2**	**284.2**	**345.6**	**0.80319**	**0.7627**	**0.72565**	**0.74351**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1.26328	786	1767	203	444	0.79781	0.79474	0.63902	0.70843
2	10000	1.22358	1000	1618	327	255	0.81813	0.75358	0.79681	0.77459
3	10000	1.17833	799	1778	195	428	0.80531	0.80382	0.65118	0.7195
4	10000	1.19931	999	1596	344	261	0.81094	0.74386	0.79286	0.76758
5	10000	1.21029	1012	1545	334	309	0.79906	0.75186	0.76609	0.75891
Average		**1.21496**	**919.2**	**1660.8**	**280.6**	**339.4**	**0.80625**	**0.76957**	**0.72919**	**0.7458**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.51714	1024	1615	355	206	0.82469	0.74257	0.83252	0.78498
2	10000	0.44069	1075	1617	328	180	0.84125	0.76622	0.85657	0.80888
3	10000	0.43177	1040	1646	327	187	0.83938	0.76079	0.8476	0.80185
4	10000	0.41177	1064	1603	337	196	0.83344	0.75946	0.84444	0.7997
5	10000	0.39278	1086	1586	293	235	0.835	0.78753	0.8221	0.80444
Average		**0.43883**	**1057.8**	**1613.4**	**328**	**200.8**	**0.83475**	**0.76331**	**0.84065**	**0.79997**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	3.51132	1173	772	1198	57	0.60781	0.49473	0.95366	0.65149
2	10000	3.18565	1190	747	1198	65	0.60531	0.49832	0.94821	0.65331
3	10000	3.16419	1156	777	1196	71	0.60406	0.4915	0.94214	0.64599
4	10000	3.24714	1188	752	1188	72	0.60625	0.5	0.94286	0.65347
5	10000	3.26014	1247	742	1137	74	0.62156	0.52307	0.94398	0.67314
Average		**3.27369**	**1190.8**	**758**	**1183.4**	**67.8**	**0.609**	**0.50152**	**0.94617**	**0.65548**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	73.7806	1113	1537	433	117	0.82813	0.71992	0.90488	0.80187
2	10000	78.9599	1172	1481	464	83	0.82906	0.71638	0.93386	0.81079
3	10000	71.2503	1129	1518	455	98	0.82719	0.71275	0.92013	0.80327
4	10000	72.1887	1138	1448	492	122	0.80813	0.69816	0.90317	0.78754
5	10000	71.9099	1176	1419	460	145	0.81094	0.71883	0.89023	0.7954
Average		**73.6179**	**1145.6**	**1480.6**	**460.8**	**113**	**0.82069**	**0.71321**	**0.91046**	**0.79978**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	16.5263	1079	1636	334	151	0.84844	0.76362	0.87724	0.8165
2	10000	18.1181	1150	1600	345	105	0.85938	0.76923	0.91633	0.83636
3	10000	16.1068	1089	1639	334	138	0.8525	0.76528	0.88753	0.82189
4	10000	16.2867	1090	1576	364	170	0.83313	0.74966	0.86508	0.80324
5	10000	16.6315	1147	1586	293	174	0.85406	0.79653	0.86828	0.83086
Average		**16.7339**	**1111**	**1607.4**	**334**	**147.6**	**0.8495**	**0.76886**	**0.88289**	**0.82177**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1513.74	1107	1602	368	123	0.84656	0.75051	0.9	0.81848
2	10000	1494.92	1146	1578	367	109	0.85125	0.75744	0.91315	0.82803
3	10000	1536.73	1092	1602	371	135	0.84188	0.74641	0.88998	0.8119
4	10000	1509.66	1139	1522	418	121	0.83156	0.73154	0.90397	0.80866
5	10000	1365.54	1167	1533	346	154	0.84375	0.77132	0.88342	0.82357
Average		**1484.12**	**1130.2**	**1567.4**	**374**	**128.4**	**0.843**	**0.75144**	**0.8981**	**0.81813**

Features Counter with 1-gram
Maximum 25000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	0.48277	914	1644	301	341	0.79938	0.75226	0.72829	0.74008
2	14527	0.48217	934	1634	279	353	0.8025	0.76999	0.72572	0.7472
3	14527	0.4764	916	1667	294	323	0.80719	0.75702	0.73931	0.74806
4	14527	0.47418	937	1619	311	333	0.79875	0.7508	0.7378	0.74424
5	14527	0.47454	909	1647	311	333	0.79875	0.74508	0.73188	0.73842
Average		**0.47801**	**922**	**1642.2**	**299.2**	**336.6**	**0.80131**	**0.75503**	**0.7326**	**0.7436**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	2.43148	1164	1273	672	91	0.76156	0.63399	0.92749	0.75315
2	14527	2.64252	966	1620	293	321	0.80813	0.76728	0.75058	0.75884
3	14527	2.62539	998	1586	375	241	0.8075	0.72688	0.80549	0.76417
4	14527	2.62356	873	1676	254	397	0.79656	0.77462	0.6874	0.72841
5	14527	2.61712	1106	1346	612	136	0.76625	0.64377	0.8905	0.7473
Average		**2.58801**	**1021.4**	**1500.2**	**441.2**	**237.2**	**0.788**	**0.70931**	**0.81229**	**0.75037**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	0.43202	1109	1588	357	146	0.84281	0.75648	0.88367	0.81514
2	14527	0.64123	1093	1563	350	194	0.83	0.75745	0.84926	0.80073
3	14527	0.64534	1056	1596	365	183	0.82875	0.74314	0.8523	0.79398
4	14527	0.63466	1099	1536	394	171	0.82344	0.7361	0.86535	0.79551
5	14527	0.6754	1062	1575	383	180	0.82406	0.73495	0.85507	0.79047
Average		**0.60573**	**1083.8**	**1571.6**	**369.8**	**174.8**	**0.82981**	**0.74562**	**0.86113**	**0.79917**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	2.40816	1182	768	1177	73	0.60938	0.50106	0.94183	0.65412
2	14527	3.43885	1222	738	1175	65	0.6125	0.5098	0.94949	0.66341
3	14527	3.41835	1167	792	1169	72	0.61219	0.49957	0.94189	0.65287
4	14527	3.4054	1202	753	1177	68	0.61094	0.50525	0.94646	0.65881
5	14527	3.39767	1167	770	1188	75	0.60531	0.49554	0.93961	0.64887
Average		**3.21369**	**1188**	**764.2**	**1177.2**	**70.6**	**0.61006**	**0.50225**	**0.94386**	**0.65562**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	83.4844	1174	1475	470	81	0.82781	0.71411	0.93546	0.80993
2	14527	81.6278	1179	1427	486	108	0.81438	0.70811	0.91608	0.79878
3	14527	84.6319	1146	1470	491	93	0.8175	0.70006	0.92494	0.79694
4	14527	82.2092	1179	1441	489	91	0.81875	0.70683	0.92835	0.80259
5	14527	78.4908	1129	1464	494	113	0.81031	0.69563	0.90902	0.78813
Average		**82.0888**	**1161.4**	**1455.4**	**486**	**97.2**	**0.81775**	**0.70495**	**0.92277**	**0.79927**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	19.3091	1122	1574	371	133	0.8425	0.75151	0.89402	0.81659
2	14527	19.737	1152	1522	391	135	0.83563	0.7466	0.8951	0.81413
3	14527	20.3806	1104	1598	363	135	0.84438	0.75256	0.89104	0.81596
4	14527	18.2756	1130	1557	373	140	0.83969	0.75183	0.88976	0.815
5	14527	18.6115	1105	1560	398	137	0.83281	0.7352	0.88969	0.8051
Average		**19.2628**	**1122.6**	**1562.2**	**379.2**	**136**	**0.839**	**0.74754**	**0.89193**	**0.81336**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	985.856	1130	1548	397	125	0.83688	0.74001	0.9004	0.81237
2	14527	1101.19	1154	1488	425	133	0.82563	0.73084	0.89666	0.8053
3	14527	999.404	1112	1530	431	127	0.82563	0.72067	0.8975	0.79942
4	14527	1096.73	1162	1478	452	108	0.825	0.71995	0.91496	0.80583
5	14527	1095.62	1128	1480	478	114	0.815	0.70237	0.90821	0.79213
Average		**1055.76**	**1137.2**	**1504.8**	**436.6**	**121.4**	**0.82563**	**0.72277**	**0.90355**	**0.80301**

2-gram-count

Features	Counter with 2-gram
Maximum number of tokens considered	100

Logistic Regression

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.01199	130	1828	83	1159	0.61188	0.61033	0.10085	0.1731
2	100	0.01399	128	1856	74	1142	0.62	0.63366	0.10079	0.17391
3	100	0.01299	130	1867	81	1122	0.62406	0.61611	0.10383	0.17772
4	100	0.01299	117	1851	111	1121	0.615	0.51316	0.09451	0.15962
5	100	0.013	128	1886	70	1116	0.62938	0.64646	0.10289	0.17753
Average		**0.01299**	**126.6**	**1857.6**	**83.8**	**1132**	**0.62006**	**0.60395**	**0.10058**	**0.17238**

SGD Classifier

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.0283	138	1820	91	1151	0.61188	0.60262	0.10706	0.18182
2	100	0.03098	95	1889	41	1175	0.62	0.69853	0.0748	0.13514
3	100	0.02801	125	1865	83	1127	0.62188	0.60096	0.09984	0.17123
4	100	0.03298	105	1866	96	1133	0.61594	0.52239	0.08481	0.14593
5	100	0.02899	121	1898	58	1123	0.63094	0.67598	0.09727	0.17006
Average		**0.02985**	**116.8**	**1867.6**	**73.8**	**1141.8**	**0.62013**	**0.6201**	**0.09276**	**0.16084**

Linear SVC

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.05298	140	1823	88	1149	0.61344	0.61404	0.10861	0.18457
2	100	0.07194	140	1850	80	1130	0.62188	0.63636	0.11024	0.18792
3	100	0.06004	145	1858	90	1107	0.62594	0.61702	0.11581	0.19502
4	100	0.06198	128	1843	119	1110	0.61594	0.51822	0.10339	0.17239
5	100	0.05897	155	1870	86	1089	0.63281	0.64315	0.1246	0.20875
Average		**0.06118**	**141.6**	**1848.8**	**92.6**	**1117**	**0.622**	**0.60576**	**0.11253**	**0.18973**

NuSVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	11.6321	128	1796	115	1161	0.60125	0.52675	0.0993	0.1671
2	100	11.7656	144	1800	130	1126	0.6075	0.52555	0.11339	0.18653
3	100	11.7629	156	1831	117	1096	0.62094	0.57143	0.1246	0.20459
4	100	12.2522	148	1811	151	1090	0.61219	0.49498	0.11955	0.19258
5	100	12.2302	155	1829	127	1089	0.62	0.54965	0.1246	0.20315
Average		**11.9286**	**146.2**	**1813.4**	**128**	**1112.4**	**0.61238**	**0.53367**	**0.11629**	**0.19079**

SVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	16.9891	0	1911	0	1289	0.59719	0	0	0
2	100	17.642	0	1930	0	1270	0.60313	0	0	0
3	100	18.8584	0	1948	0	1252	0.60875	0	0	0
4	100	18.4785	0	1962	0	1238	0.61313	0	0	0
5	100	18.705	0	1956	0	1244	0.61125	0	0	0
Average		**18.1346**	**0**	**1941.4**	**0**	**1258.6**	**0.60669**	**0**	**0**	**0**

Gaussian Naive Bayes

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.03797	224	1730	181	1065	0.61063	0.55309	0.17378	0.26446
2	100	0.03698	212	1758	172	1058	0.61563	0.55208	0.16693	0.25635
3	100	0.03798	201	1771	177	1051	0.61625	0.53175	0.16054	0.24663
4	100	0.03598	198	1772	190	1040	0.61563	0.51031	0.15994	0.24354
5	100	0.03598	212	1797	159	1032	0.62781	0.57143	0.17042	0.26254
Average		**0.03698**	**209.4**	**1765.6**	**175.8**	**1049.2**	**0.61719**	**0.54373**	**0.16632**	**0.2547**

Decision Tree

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.45074	163	1805	106	1126	0.615	0.60595	0.12645	0.20924
2	100	0.39278	159	1818	112	1111	0.61781	0.58672	0.1252	0.20636
3	100	0.37001	161	1853	95	1091	0.62938	0.62891	0.12859	0.21353
4	100	0.38917	150	1841	121	1088	0.62219	0.55351	0.12116	0.19881
5	100	0.38781	175	1844	112	1069	0.63094	0.60976	0.14068	0.22861
Average		**0.3981**	**161.6**	**1832.2**	**109.2**	**1097**	**0.62306**	**0.59697**	**0.12842**	**0.21131**

RandomForest (10 estimators)

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.31905	172	1792	119	1117	0.61375	0.59107	0.13344	0.21772
2	100	0.39103	159	1822	108	1111	0.61906	0.59551	0.1252	0.2069
3	100	0.32188	164	1849	99	1088	0.62906	0.62357	0.13099	0.2165
4	100	0.31992	159	1832	130	1079	0.62219	0.55017	0.12843	0.20825
5	100	0.29207	178	1848	108	1066	0.63313	0.62238	0.14309	0.23268
Average		**0.32879**	**166.4**	**1828.6**	**112.8**	**1092.2**	**0.62344**	**0.59654**	**0.13223**	**0.21641**

AdaBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.60937	134	1821	90	1155	0.61094	0.59821	0.10396	0.17713
2	100	0.62794	131	1850	80	1139	0.61906	0.62085	0.10315	0.17691
3	100	0.61405	139	1863	85	1113	0.62563	0.62054	0.11102	0.18835
4	100	0.6444	128	1848	114	1110	0.6175	0.52893	0.10339	0.17297
5	100	0.66469	146	1879	77	1098	0.63281	0.65471	0.11736	0.19905
Average		**0.63209**	**135.6**	**1852.2**	**89.2**	**1123**	**0.62119**	**0.60465**	**0.10778**	**0.18288**

XGBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	3.17643	87	1866	45	1202	0.61031	0.65909	0.06749	0.12245
2	100	3.19626	74	1893	37	1196	0.61469	0.66667	0.05827	0.10717
3	100	3.11305	72	1912	36	1180	0.62	0.66667	0.05751	0.10588
4	100	3.17993	74	1918	44	1164	0.6225	0.62712	0.05977	0.10914
5	100	3.17177	80	1925	31	1164	0.62656	0.72072	0.06431	0.11808
Average		**3.16749**	**77.4**	**1902.8**	**38.6**	**1181.2**	**0.61881**	**0.66805**	**0.06147**	**0.11255**

Multi-layer Perceptrons

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	8.00699	175	1805	106	1114	0.61875	0.62278	0.13576	0.22293
2	100	7.24295	163	1823	107	1107	0.62063	0.6037	0.12835	0.21169
3	100	7.40048	164	1857	91	1088	0.63156	0.64314	0.13099	0.21765
4	100	7.20576	172	1828	134	1066	0.625	0.56209	0.13893	0.2228
5	100	6.1737	181	1854	102	1063	0.63594	0.63958	0.1455	0.23707
Average		**7.20598**	**171**	**1833.4**	**108**	**1087.6**	**0.62638**	**0.61426**	**0.13591**	**0.22243**

Features	Counter with 2-gram
Maximum	1000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.04597	386	1759	195	860	0.67031	0.66437	0.30979	0.42255
2	1000	0.04399	407	1751	169	873	0.67438	0.7066	0.31797	0.43858
3	1000	0.04817	409	1731	201	859	0.66875	0.67049	0.32256	0.43557
4	1000	0.04399	389	1751	182	878	0.66875	0.68126	0.30702	0.42329
5	1000	0.05544	396	1788	180	836	0.6825	0.6875	0.32143	0.43805
Average		**0.04751**	**397.4**	**1756**	**185.4**	**861.2**	**0.67294**	**0.68204**	**0.31575**	**0.43161**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.14694	348	1797	157	898	0.67031	0.68911	0.27929	0.39749
2	1000	0.15689	389	1760	160	891	0.67156	0.70856	0.30391	0.42537
3	1000	0.1811	483	1674	258	785	0.67406	0.65182	0.38091	0.48084
4	1000	0.17994	350	1783	150	917	0.66656	0.7	0.27624	0.39615
5	1000	0.15492	362	1812	156	870	0.67938	0.69884	0.29383	0.41371
Average		**0.16396**	**386.4**	**1765.2**	**176.2**	**872.2**	**0.67238**	**0.68967**	**0.30684**	**0.42271**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.11392	429	1734	220	817	0.67594	0.66102	0.3443	0.45277
2	1000	0.13193	470	1718	202	810	0.68375	0.6994	0.36719	0.48156
3	1000	0.12393	476	1693	239	792	0.67781	0.66573	0.37539	0.48008
4	1000	0.11494	457	1690	243	810	0.67094	0.65286	0.36069	0.46467
5	1000	0.10095	453	1747	221	779	0.6875	0.67211	0.36769	0.47534
Average		**0.11713**	**457**	**1716.4**	**225**	**801.6**	**0.67919**	**0.67022**	**0.36305**	**0.47088**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.33882	480	1676	278	766	0.67375	0.63325	0.38523	0.47904
2	1000	0.35339	446	1683	237	834	0.66531	0.653	0.34844	0.45441
3	1000	0.35351	501	1640	292	767	0.66906	0.63178	0.39511	0.48617
4	1000	0.34679	486	1648	285	781	0.66688	0.63035	0.38358	0.47694
5	1000	0.35878	472	1695	273	760	0.67719	0.63356	0.38312	0.47749
Average		**0.35026**	**477**	**1668.4**	**273**	**781.6**	**0.67044**	**0.63639**	**0.3791**	**0.47481**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	62.6966	511	1709	245	735	0.69375	0.67593	0.41011	0.51049
2	1000	64.6349	558	1706	214	722	0.7075	0.7228	0.43594	0.54386
3	1000	67.4701	570	1650	282	698	0.69375	0.66901	0.44953	0.53774
4	1000	61.9714	528	1684	249	739	0.69125	0.67954	0.41673	0.51663
5	1000	65.0872	551	1704	264	681	0.70469	0.67607	0.44724	0.53835
Average		**64.372**	**543.6**	**1690.6**	**250.8**	**715**	**0.69819**	**0.68467**	**0.43191**	**0.52941**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	13.0521	529	1692	262	717	0.69406	0.66877	0.42456	0.51939
2	1000	14.4537	600	1673	247	680	0.71031	0.70838	0.46875	0.56417
3	1000	14.1507	585	1650	282	683	0.69844	0.67474	0.46136	0.54801
4	1000	12.9046	554	1653	280	713	0.68969	0.66427	0.43725	0.52737
5	1000	13.7468	549	1698	270	683	0.70219	0.67033	0.44562	0.53535
Average		**13.6616**	**563.4**	**1673.2**	**268.2**	**695.2**	**0.69894**	**0.6773**	**0.44751**	**0.53886**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	45.1527	538	1728	226	708	0.70813	0.70419	0.43178	0.53532
2	1000	55.7436	601	1702	218	679	0.71969	0.73382	0.46953	0.57265
3	1000	40.3321	621	1664	268	647	0.71406	0.69854	0.48975	0.5758
4	1000	51.319	537	1725	208	730	0.70688	0.72081	0.42384	0.5338
5	1000	50.6856	571	1737	231	661	0.72125	0.71197	0.46347	0.56146
Average		**48.6466**	**573.6**	**1711.2**	**230.2**	**685**	**0.714**	**0.71386**	**0.45567**	**0.55581**

Features	Counter with 2-gram
Maximum	5000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.1251	690	1862	122	526	0.7975	0.84975	0.56743	0.68047
2	5000	0.11386	719	1813	132	536	0.79125	0.84489	0.57291	0.68281
3	5000	0.12642	728	1783	127	562	0.78469	0.85146	0.56434	0.67879
4	5000	0.11293	700	1796	126	578	0.78	0.84746	0.54773	0.6654
5	5000	0.12184	704	1822	124	550	0.78938	0.85024	0.5614	0.67627
Average		**0.12003**	**708.2**	**1815.2**	**126.2**	**550.4**	**0.78856**	**0.84876**	**0.56276**	**0.67675**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.80067	717	1836	148	499	0.79781	0.8289	0.58964	0.68909
2	5000	0.75785	790	1748	197	465	0.79313	0.80041	0.62948	0.70473
3	5000	0.8071	737	1804	106	553	0.79406	0.87426	0.57132	0.69105
4	5000	0.75473	714	1803	119	564	0.78656	0.85714	0.55869	0.67646
5	5000	0.75504	798	1706	240	456	0.7825	0.76879	0.63636	0.69634
Average		**0.77508**	**751.2**	**1779.4**	**162**	**507.4**	**0.79081**	**0.8259**	**0.5971**	**0.69153**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.21389	818	1792	192	398	0.81563	0.8099	0.6727	0.73495
2	5000	0.20694	878	1720	225	377	0.81188	0.79601	0.6996	0.7447
3	5000	0.22308	872	1728	182	418	0.8125	0.82732	0.67597	0.74403
4	5000	0.21389	850	1738	184	428	0.80875	0.82205	0.6651	0.73529
5	5000	0.2148	830	1757	189	424	0.80844	0.81452	0.66188	0.73031
Average		**0.21452**	**849.6**	**1747**	**194.4**	**409**	**0.81144**	**0.81396**	**0.67505**	**0.73786**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.84737	662	1837	147	554	0.78094	0.81829	0.54441	0.65383
2	5000	0.74589	698	1790	155	557	0.7775	0.81829	0.55618	0.66224
3	5000	0.85344	710	1776	134	580	0.77688	0.84123	0.55039	0.66542
4	5000	0.79713	689	1780	142	589	0.77156	0.82912	0.53912	0.65339
5	5000	0.75104	663	1810	136	591	0.77281	0.82979	0.52871	0.64588
Average		**0.79897**	**684.4**	**1798.6**	**142.8**	**574.2**	**0.77594**	**0.82734**	**0.54376**	**0.65615**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	491.69	859	1734	250	357	0.81031	0.77457	0.70641	0.73892
2	5000	501.725	909	1705	240	346	0.81688	0.79112	0.7243	0.75624
3	5000	495.344	925	1686	224	365	0.81594	0.80505	0.71705	0.75851
4	5000	510.667	908	1676	246	370	0.8075	0.78683	0.71049	0.74671
5	5000	504.382	874	1727	219	380	0.81281	0.79963	0.69697	0.74478
Average		**500.762**	**895**	**1705.6**	**235.8**	**363.6**	**0.81269**	**0.79144**	**0.71105**	**0.74903**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	44.2202	838	1746	238	378	0.8075	0.77881	0.68914	0.73124
2	5000	44.9331	896	1702	243	359	0.81188	0.78665	0.71394	0.74854
3	5000	44.7935	905	1689	221	385	0.81063	0.80373	0.70155	0.74917
4	5000	44.4934	895	1687	235	383	0.80688	0.79204	0.70031	0.74336
5	5000	44.6171	868	1722	224	386	0.80938	0.79487	0.69219	0.73998
Average		**44.6115**	**880.4**	**1709.2**	**232.2**	**378.2**	**0.80925**	**0.79122**	**0.69943**	**0.74246**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	169.136	859	1740	244	357	0.81219	0.77879	0.70641	0.74084
2	5000	193.205	927	1698	247	328	0.82031	0.78961	0.73865	0.76328
3	5000	179.223	960	1668	242	330	0.82125	0.79867	0.74419	0.77047
4	5000	177.165	931	1687	235	347	0.81813	0.79846	0.72848	0.76187
5	5000	202.468	888	1695	251	366	0.80719	0.77963	0.70813	0.74216
Average		**184.239**	**913**	**1697.6**	**243.8**	**345.6**	**0.81581**	**0.78903**	**0.72517**	**0.75572**

Features	Counter with 2-gram
Maximum	10000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.29083	738	1897	83	482	0.82344	0.8989	0.60492	0.72317
2	10000	0.27284	742	1847	77	534	0.80906	0.90598	0.5815	0.70835
3	10000	0.27584	769	1840	74	517	0.81531	0.91222	0.59798	0.7224
4	10000	0.27383	739	1915	69	477	0.82938	0.9146	0.60773	0.73024
5	10000	0.27184	786	1830	75	509	0.8175	0.91289	0.60695	0.72913
Average		**0.27704**	**754.8**	**1865.8**	**75.6**	**503.8**	**0.81894**	**0.90892**	**0.59982**	**0.72266**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1.2113	755	1906	74	465	0.83156	0.91074	0.61885	0.73694
2	10000	1.15034	767	1864	60	509	0.82219	0.92745	0.6011	0.72943
3	10000	1.15434	821	1834	80	465	0.82969	0.91121	0.63841	0.7508
4	10000	1.15334	803	1873	111	413	0.83625	0.87856	0.66036	0.75399
5	10000	1.14936	909	1759	146	386	0.83375	0.86161	0.70193	0.77362
Average		**1.16374**	**811**	**1847.2**	**94.2**	**447.6**	**0.83069**	**0.89791**	**0.64413**	**0.74896**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.44374	902	1803	177	318	0.84531	0.83596	0.73934	0.78469
2	10000	0.38478	909	1751	173	367	0.83125	0.84011	0.71238	0.77099
3	10000	0.39278	946	1758	156	340	0.845	0.85844	0.73561	0.79229
4	10000	0.39078	895	1819	165	321	0.84813	0.84434	0.73602	0.78647
5	10000	0.40377	970	1748	157	325	0.84938	0.86069	0.74903	0.80099
Average		**0.40317**	**924.4**	**1775.8**	**165.6**	**334.2**	**0.84381**	**0.84791**	**0.73448**	**0.78709**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	3.26114	788	1816	164	432	0.81375	0.82773	0.6459	0.7256
2	10000	3.10523	812	1765	159	464	0.80531	0.83625	0.63636	0.72274
3	10000	3.10421	826	1774	140	460	0.8125	0.85507	0.6423	0.73357
4	10000	3.08822	777	1826	158	439	0.81344	0.83102	0.63898	0.72245
5	10000	3.13321	827	1759	146	468	0.80813	0.84995	0.63861	0.72928
Average		**3.1384**	**806**	**1788**	**153.4**	**452.6**	**0.81063**	**0.84**	**0.64043**	**0.72673**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1556.95	932	1767	213	288	0.84344	0.81397	0.76393	0.78816
2	10000	1510.64	953	1686	238	323	0.82469	0.80017	0.74687	0.7726
3	10000	1549.99	980	1696	218	306	0.83625	0.81803	0.76205	0.78905
4	10000	1527.11	936	1739	245	280	0.83594	0.79255	0.76974	0.78098
5	10000	1534.1	1007	1677	228	288	0.83875	0.81538	0.77761	0.79605
Average		**1535.76**	**961.6**	**1713**	**228.4**	**297**	**0.83581**	**0.80802**	**0.76404**	**0.78537**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	99.9769	910	1782	198	310	0.84125	0.8213	0.7459	0.78179
2	10000	98.1909	926	1718	206	350	0.82625	0.81802	0.72571	0.7691
3	10000	100.436	957	1724	190	329	0.83781	0.83435	0.74417	0.78668
4	10000	100.975	918	1771	213	298	0.84031	0.81167	0.75493	0.78228
5	10000	101.334	983	1713	192	312	0.8425	0.8366	0.75907	0.79595
Average		**100.183**	**938.8**	**1741.6**	**199.8**	**319.8**	**0.83763**	**0.82439**	**0.74596**	**0.78316**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	839.43	946	1763	217	274	0.84656	0.81341	0.77541	0.79396
2	10000	654.886	958	1693	231	318	0.82844	0.80572	0.75078	0.77728
3	10000	788.621	989	1715	199	297	0.845	0.83249	0.76905	0.79951
4	10000	575.652	947	1761	223	269	0.84625	0.8094	0.77878	0.7938
5	10000	566.873	1011	1707	198	284	0.84938	0.83623	0.78069	0.80751
Average		**685.092**	**970.2**	**1727.8**	**213.6**	**288.4**	**0.84313**	**0.81945**	**0.77094**	**0.79441**

Features	Counter with 2-gram
Maximum	25000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	0.76119	909	1932	50	309	0.88781	0.94786	0.74631	0.83509
2	25000	0.77517	903	1954	47	296	0.89281	0.95053	0.75313	0.84039
3	25000	0.76096	939	1877	51	333	0.88	0.94848	0.73821	0.83024
4	25000	0.76081	934	1865	38	363	0.87469	0.96091	0.72012	0.82327
5	25000	0.76253	982	1854	39	325	0.88625	0.9618	0.75134	0.84364
Average		**0.76413**	**933.4**	**1896.4**	**45**	**325.2**	**0.88431**	**0.95392**	**0.74182**	**0.83453**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	4.20357	948	1947	35	270	0.90469	0.96439	0.77833	0.86143
2	25000	4.12913	1013	1881	120	186	0.90438	0.89409	0.84487	0.86878
3	25000	4.16264	1000	1873	55	272	0.89781	0.94787	0.78616	0.85948
4	25000	4.14609	1003	1850	53	294	0.89156	0.94981	0.77332	0.85253
5	25000	4.14706	1031	1853	40	276	0.90125	0.96265	0.78883	0.86712
Average		**4.1577**	**999**	**1880.8**	**60.6**	**259.6**	**0.89994**	**0.94376**	**0.7943**	**0.86187**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	0.98239	1015	1886	96	203	0.90656	0.91359	0.83333	0.87162
2	25000	0.96084	1010	1907	94	189	0.91156	0.91486	0.84237	0.87712
3	25000	0.94149	1052	1839	89	220	0.90344	0.922	0.82704	0.87194
4	25000	0.93686	1054	1824	79	243	0.89938	0.93027	0.81264	0.86749
5	25000	0.97244	1088	1820	73	219	0.90875	0.93712	0.83244	0.88169
Average		**0.9588**	**1043.8**	**1855.2**	**86.2**	**214.8**	0.90594	0.92357	0.82957	0.87397

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	5.8988	973	1863	119	245	0.88625	0.89103	0.79885	0.84242
2	25000	5.8666	975	1881	120	224	0.8925	0.89041	0.81318	0.85004
3	25000	5.88115	1024	1812	116	248	0.88625	0.89825	0.80503	0.84909
4	25000	5.86405	1006	1773	130	291	0.86844	0.88556	0.77564	0.82696
5	25000	5.87119	1049	1759	134	258	0.8775	0.88673	0.8026	0.84257
Average		**5.87636**	**1005.4**	**1817.6**	**123.8**	**253.2**	**0.88219**	**0.89039**	**0.79906**	**0.84222**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	7261.92	1023	1787	195	195	0.87813	0.8399	0.8399	0.8399
2	25000	7281.09	1027	1808	193	172	0.88594	0.8418	0.85655	0.84911
3	25000	7032.34	1060	1762	166	212	0.88188	0.8646	0.83333	0.84868
4	25000	7389.63	1072	1709	194	225	0.86906	0.84676	0.82652	0.83652
5	25000	7440.51	1119	1734	159	188	0.89156	0.87559	0.85616	0.86576
Average		**7281.1**	**1060.2**	**1760**	**181.4**	**198.4**	**0.88131**	**0.85373**	**0.84249**	**0.848**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	210.28	973	1858	124	245	0.88469	0.88696	0.79885	0.8406
2	25000	205.896	965	1863	138	234	0.88375	0.87489	0.80484	0.8384
3	25000	211.757	989	1810	118	283	0.87469	0.89341	0.77752	0.83144
4	25000	210.628	1011	1775	128	286	0.87063	0.88762	0.77949	0.83005
5	25000	220.25	1058	1783	110	249	0.88781	0.90582	0.80949	0.85495
Average		**211.762**	**999.2**	**1817.8**	**123.6**	**259.4**	**0.88031**	**0.88974**	**0.79404**	**0.83909**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	491.583	1026	1830	152	192	0.8925	0.87097	0.84236	0.85643
2	25000	691.218	1024	1845	156	175	0.89656	0.8678	0.85405	0.86087
3	25000	704.255	1060	1803	125	212	0.89469	0.89451	0.83333	0.86284
4	25000	566.628	1080	1757	146	217	0.88656	0.88091	0.83269	0.85612
5	25000	548.974	1112	1776	117	195	0.9025	0.9048	0.8508	0.87697
Average		**600.532**	**1060.4**	**1802.2**	**139.2**	**198.2**	**0.89456**	**0.8838**	**0.84265**	**0.86265**

Features	Counter with 1-2-gram
Maximum number of tokens considered	100

Logistic Regression

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.022	553	1599	326	722	0.6725	0.62912	0.43373	0.51346
2	100	0.02598	554	1615	304	727	0.67781	0.64569	0.43247	0.518
3	100	0.02199	577	1599	344	680	0.68	0.62649	0.45903	0.52984
4	100	0.02199	564	1592	328	716	0.67375	0.63229	0.44063	0.51934
5	100	0.02299	543	1657	343	657	0.6875	0.61287	0.4525	0.52061
Average		**0.02299**	**558.2**	**1612.4**	**329**	**700.4**	**0.67831**	**0.62929**	**0.44367**	**0.52025**

SGD Classifier

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.02817	528	1635	290	747	0.67594	0.64548	0.41412	0.50454
2	100	0.02698	539	1664	255	742	0.68844	0.67884	0.42077	0.51952
3	100	0.028	627	1563	380	630	0.68438	0.62264	0.49881	0.55389
4	100	0.02698	464	1697	223	816	0.67531	0.6754	0.3625	0.47178
5	100	0.03098	575	1634	366	625	0.69031	0.61105	0.47917	0.53713
Average		**0.02822**	**546.6**	**1638.6**	**302.8**	**712**	**0.68288**	**0.64668**	**0.43507**	**0.51737**

Linear SVC

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.12699	589	1575	350	686	0.67625	0.62726	0.46196	0.53207
2	100	0.07347	581	1608	311	700	0.68406	0.65135	0.45355	0.53474
3	100	0.14393	606	1575	368	651	0.68156	0.62218	0.4821	0.54325
4	100	0.15791	593	1583	337	687	0.68	0.63763	0.46328	0.53665
5	100	0.14692	568	1632	368	632	0.6875	0.60684	0.47333	0.53184
Average		**0.12984**	**587.4**	**1594.6**	**346.8**	**671.2**	**0.68188**	**0.62905**	**0.46685**	**0.53571**

NuSVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	16.9306	961	1240	685	314	0.68781	0.58384	0.75373	0.65799
2	100	17.1281	919	1259	660	362	0.68063	0.58201	0.71741	0.64266
3	100	17.3267	952	1252	691	305	0.68875	0.57943	0.75736	0.65655
4	100	16.4809	957	1264	656	323	0.69406	0.5933	0.74766	0.6616
5	100	16.5833	869	1305	695	331	0.67938	0.55563	0.72417	0.6288
Average		**16.8899**	**931.6**	**1264**	**677.4**	**327**	**0.68613**	**0.57884**	**0.74006**	**0.64952**

SVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	23.141	32	1915	10	1243	0.60844	0.7619	0.0251	0.0486
2	100	23.0813	18	1911	8	1263	0.60281	0.69231	0.01405	0.02754
3	100	22.689	21	1939	4	1236	0.6125	0.84	0.01671	0.03276
4	100	21.5559	20	1917	3	1260	0.60531	0.86957	0.01563	0.0307
5	100	22.2813	30	1990	10	1170	0.63125	0.75	0.025	0.04839
Average		**22.5497**	**24.2**	**1934.4**	**7**	**1234.4**	**0.61206**	**0.78276**	**0.0193**	**0.0376**

Gaussian Naive Bayes

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.05197	771	1341	584	504	0.66	0.569	0.60471	0.58631
2	100	0.03698	770	1332	587	511	0.65688	0.56743	0.60109	0.58378
3	100	0.03598	765	1327	616	492	0.65375	0.55395	0.60859	0.57998
4	100	0.03598	862	1267	653	418	0.66531	0.56898	0.67344	0.61682
5	100	0.03596	725	1356	644	475	0.65031	0.52958	0.60417	0.56442
Average		**0.03938**	**778.6**	**1324.6**	**616.8**	**480**	**0.65725**	**0.55779**	**0.6184**	**0.58626**

Decision Tree

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.32121	1006	1493	432	269	0.78094	0.69958	0.78902	0.74161
2	100	0.21824	946	1462	457	335	0.7525	0.67427	0.73849	0.70492
3	100	0.21586	935	1507	436	322	0.76313	0.68198	0.74383	0.71157
4	100	0.21239	1014	1471	449	266	0.77656	0.6931	0.79219	0.73934
5	100	0.21488	955	1518	482	245	0.77281	0.66458	0.79583	0.72431
Average		**0.23652**	**971.2**	**1490.2**	**451.2**	**287.4**	**0.76919**	**0.6827**	**0.77187**	**0.72435**

RandomForest (10 estimators)

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.41377	1002	1533	392	273	0.79219	0.71879	0.78588	0.75084
2	100	0.23488	948	1507	412	333	0.76719	0.69706	0.74005	0.71791
3	100	0.22932	957	1515	428	300	0.7725	0.69097	0.76134	0.72445
4	100	0.22889	1031	1468	452	249	0.78094	0.69521	0.80547	0.74629
5	100	0.22691	947	1540	460	253	0.77719	0.67306	0.78917	0.72651
Average		**0.26676**	**977**	**1512.6**	**428.8**	**281.6**	**0.778**	**0.69502**	**0.77638**	**0.7332**

AdaBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.71047	542	1631	294	733	0.67906	0.64833	0.4251	0.5135
2	100	0.69902	567	1602	317	714	0.67781	0.6414	0.44262	0.52379
3	100	0.65797	571	1589	354	686	0.675	0.6173	0.45426	0.52337
4	100	0.64908	563	1618	302	717	0.68156	0.65087	0.43984	0.52494
5	100	0.65605	524	1655	345	676	0.68094	0.60299	0.43667	0.50652
Average		**0.67452**	**553.4**	**1619**	**322.4**	**705.2**	**0.67888**	**0.63218**	**0.4397**	**0.51843**

XGBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	3.54392	546	1655	270	729	0.68781	0.66912	0.42824	0.52224
2	100	3.26325	522	1672	247	759	0.68563	0.6788	0.40749	0.50927
3	100	3.2311	532	1664	279	725	0.68625	0.65598	0.42323	0.51451
4	100	3.09304	543	1685	235	737	0.69625	0.69794	0.42422	0.5277
5	100	3.11007	513	1728	272	687	0.70031	0.6535	0.4275	0.51688
Average		**3.24827**	**531.2**	**1680.8**	**260.6**	**727.4**	**0.69125**	**0.67107**	**0.42214**	**0.51812**

Multi-layer Perceptrons

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	18.6552	954	1559	366	321	0.78531	0.72273	0.74824	0.73526
2	100	17.4733	906	1527	392	375	0.76031	0.698	0.70726	0.7026
3	100	16.9162	907	1545	398	350	0.76625	0.69502	0.72156	0.70804
4	100	17.3168	1004	1495	425	276	0.78094	0.70259	0.78438	0.74123
5	100	17.2438	947	1526	474	253	0.77281	0.66643	0.78917	0.72262
Average		**17.5211**	**943.6**	**1530.4**	**411**	**315**	**0.77313**	**0.69695**	**0.75012**	**0.72195**

Features	Counter with 1-2-gram
Maximum	1000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.05796	681	1630	335	554	0.72219	0.67028	0.55142	0.60506
2	1000	0.05697	692	1563	365	580	0.70469	0.65468	0.54403	0.59425
3	1000	0.05797	707	1543	394	556	0.70313	0.64214	0.55978	0.59814
4	1000	0.07595	693	1601	332	574	0.71688	0.6761	0.54696	0.60471
5	1000	0.06496	675	1598	346	581	0.71031	0.66112	0.53742	0.59289
Average		**0.06276**	**689.6**	**1587**	**354.4**	**569**	**0.71144**	**0.66086**	**0.54792**	**0.59901**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.14592	1093	1124	841	142	0.69281	0.56515	0.88502	0.68981
2	1000	0.14693	752	1546	382	520	0.71813	0.66314	0.59119	0.6251
3	1000	0.14692	767	1501	436	496	0.70875	0.63757	0.60728	0.62206
4	1000	0.14591	885	1399	534	382	0.71375	0.62368	0.6985	0.65897
5	1000	0.1579	756	1546	398	500	0.71938	0.65511	0.60191	0.62739
Average		**0.14872**	**850.6**	**1423.2**	**518.2**	**408**	**0.71056**	**0.62893**	**0.67678**	**0.64467**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.16391	752	1601	364	483	0.73531	0.67384	0.60891	0.63973
2	1000	0.15499	764	1525	403	508	0.71531	0.65467	0.60063	0.62649
3	1000	0.15694	772	1488	449	491	0.70625	0.63227	0.61124	0.62158
4	1000	0.14692	764	1556	377	503	0.725	0.66959	0.603	0.63455
5	1000	0.1729	746	1567	377	510	0.72281	0.66429	0.59395	0.62715
Average		**0.15913**	**759.6**	**1547.4**	**394**	**499**	**0.72094**	**0.65893**	**0.60355**	**0.6299**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.3538	970	963	1002	265	0.60406	0.49189	0.78543	0.60493
2	1000	0.35329	1017	845	1083	255	0.58188	0.48429	0.79953	0.6032
3	1000	0.33385	970	933	1004	293	0.59469	0.49139	0.76801	0.59932
4	1000	0.3448	970	869	1064	297	0.57469	0.47689	0.76559	0.5877
5	1000	0.36379	977	875	1069	279	0.57875	0.47752	0.77787	0.59176
Average		**0.34991**	**980.8**	**897**	**1044.4**	**277.8**	**0.58681**	**0.48439**	**0.77928**	**0.59738**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	8.44259	1130	1493	472	105	0.81969	0.70537	0.91498	0.79662
2	1000	8.08627	1132	1480	448	140	0.81625	0.71646	0.88994	0.79383
3	1000	7.92153	1136	1429	508	127	0.80156	0.691	0.89945	0.78156
4	1000	7.92908	1158	1499	434	109	0.83031	0.72739	0.91397	0.81007
5	1000	8.3996	1146	1469	475	110	0.81719	0.70697	0.91242	0.79666
Average		**8.15581**	**1140.4**	**1474**	**467.4**	**118.2**	**0.817**	**0.70944**	**0.90615**	**0.79575**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	2.17676	1097	1569	396	138	0.83313	0.73476	0.88826	0.80425
2	1000	2.40866	1125	1577	351	147	0.84438	0.7622	0.88443	0.81878
3	1000	2.15476	1112	1532	405	151	0.82625	0.73303	0.88044	0.8
4	1000	2.23247	1116	1540	393	151	0.83	0.73956	0.88082	0.80403
5	1000	2.17121	1128	1536	408	128	0.8325	0.73438	0.89809	0.80802
Average		**2.22877**	**1115.6**	**1550.8**	**390.6**	**143**	**0.83325**	**0.74078**	**0.88641**	**0.80702**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	71.4106	1127	1631	334	108	0.86188	0.77139	0.91255	0.83605
2	1000	73.1607	1130	1623	305	142	0.86031	0.78746	0.88836	0.83487
3	1000	74.061	1129	1654	283	134	0.86969	0.79958	0.8939	0.84411
4	1000	73.4751	1115	1731	202	152	0.88938	0.84662	0.88003	0.863
5	1000	76.6121	1133	1640	304	123	0.86656	0.78845	0.90207	0.84144
Average		**73.7439**	**1126.8**	**1655.8**	**285.6**	**131.8**	**0.86956**	**0.7987**	**0.89538**	**0.8439**

Features	Counter with 1-2-gram
Maximum	5000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.13137	896	1618	308	378	0.78563	0.74419	0.7033	0.72316
2	5000	0.13958	905	1625	298	372	0.79063	0.75229	0.70869	0.72984
3	5000	0.1504	901	1602	361	336	0.78219	0.71395	0.72838	0.72109
4	5000	0.13983	877	1650	305	368	0.78969	0.74196	0.70442	0.7227
5	5000	0.13942	868	1636	304	392	0.7825	0.74061	0.68889	0.71382
Average		**0.14012**	**889.4**	**1626.2**	**315.2**	**369.2**	**0.78613**	**0.7386**	**0.70673**	**0.72212**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.72516	1122	1356	570	152	0.77438	0.66312	0.88069	0.75657
2	5000	0.7388	1061	1434	489	216	0.77969	0.68452	0.83085	0.75062
3	5000	0.74088	906	1620	343	331	0.78938	0.72538	0.73242	0.72888
4	5000	0.73543	1008	1493	462	237	0.78156	0.68571	0.80964	0.74254
5	5000	0.7382	853	1669	271	407	0.78813	0.7589	0.67698	0.7156
Average		**0.73569**	**990**	**1514.4**	**427**	**268.6**	**0.78263**	**0.70353**	**0.78612**	**0.73884**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.26237	1055	1550	376	219	0.81406	0.73725	0.8281	0.78004
2	5000	0.26167	1056	1566	357	221	0.81938	0.74735	0.82694	0.78513
3	5000	0.24561	1036	1543	420	201	0.80594	0.71154	0.83751	0.7694
4	5000	0.26251	1037	1594	361	208	0.82219	0.74177	0.83293	0.78471
5	5000	0.26199	1041	1586	354	219	0.82094	0.74624	0.82619	0.78418
Average		**0.25883**	**1045**	**1567.8**	**373.6**	**213.6**	**0.8165**	**0.73683**	**0.83033**	**0.78069**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.753	1172	737	1189	102	0.59656	0.4964	0.91994	0.64484
2	5000	0.85805	1172	692	1231	105	0.5825	0.48772	0.91778	0.63696
3	5000	0.85322	1144	744	1219	93	0.59	0.48413	0.92482	0.63556
4	5000	0.85982	1132	774	1181	113	0.59563	0.48941	0.90924	0.63631
5	5000	0.85944	1153	755	1185	107	0.59625	0.49316	0.91508	0.64091
Average		**0.83671**	**1154.6**	**740.4**	**1201**	**104**	**0.59219**	**0.49016**	**0.91737**	**0.63892**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	30.3623	1162	1450	476	112	0.81625	0.7094	0.91209	0.79808
2	5000	28.9188	1154	1474	449	123	0.82125	0.7199	0.90368	0.80139
3	5000	29.1774	1119	1441	522	118	0.8	0.6819	0.90461	0.77762
4	5000	29.3259	1136	1516	439	109	0.82875	0.72127	0.91245	0.80567
5	5000	29.3953	1165	1444	496	95	0.81531	0.70138	0.9246	0.79767
Average		**29.4359**	**1147.2**	**1465**	**476.4**	**111.4**	**0.81631**	**0.70677**	**0.91149**	**0.79609**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	6.82287	1133	1598	328	141	0.85344	0.7755	0.88932	0.82852
2	5000	6.54986	1133	1572	351	144	0.84531	0.76348	0.88724	0.82072
3	5000	7.31531	1098	1594	369	139	0.84125	0.74847	0.88763	0.81213
4	5000	7.69428	1081	1645	310	164	0.85188	0.77714	0.86827	0.82018
5	5000	6.47098	1140	1578	362	120	0.84938	0.75899	0.90476	0.82549
Average		**6.97066**	**1117**	**1597.4**	**344**	**141.6**	**0.84825**	**0.76471**	**0.88745**	**0.82141**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	299.19	1154	1554	372	120	0.84625	0.75623	0.90581	0.82429
2	5000	306.469	1142	1550	373	135	0.84125	0.7538	0.89428	0.81805
3	5000	338.4	1115	1538	425	122	0.82906	0.72403	0.90137	0.80302
4	5000	244.207	1148	1528	427	97	0.83625	0.72889	0.92209	0.81418
5	5000	244.658	1159	1575	365	101	0.85438	0.7605	0.91984	0.83261
Average		**286.585**	**1143.6**	**1549**	**392.4**	**115**	**0.84144**	**0.74469**	**0.90868**	**0.81843**

Features	Counter with 1-2-gram
Maximum	10000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.30283	931	1665	253	351	0.81125	0.78632	0.72621	0.75507
2	10000	0.30283	955	1709	242	294	0.8325	0.79783	0.76461	0.78087
3	10000	0.29184	938	1738	208	316	0.83625	0.8185	0.74801	0.78167
4	10000	0.30183	998	1682	237	283	0.8375	0.8081	0.77908	0.79332
5	10000	0.30483	925	1731	242	302	0.83	0.79263	0.75387	0.77277
Average		**0.30083**	**949.4**	**1705**	**236.4**	**309.2**	**0.8295**	**0.80067**	**0.75436**	**0.77674**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1.09837	1041	1534	384	241	0.80469	0.73053	0.81201	0.76912
2	10000	1.18732	1032	1588	363	217	0.81875	0.73978	0.82626	0.78064
3	10000	1.11236	888	1769	177	366	0.83031	0.8338	0.70813	0.76585
4	10000	1.09937	1007	1686	233	274	0.84156	0.8121	0.7861	0.79889
5	10000	1.11037	944	1735	238	283	0.83719	0.79865	0.76936	0.78373
Average		**1.12156**	**982.4**	**1662.4**	**279**	**276.2**	**0.8265**	**0.78297**	**0.78037**	**0.77964**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.43875	1066	1619	299	216	0.83906	0.78095	0.83151	0.80544
2	10000	0.43175	1062	1637	314	187	0.84344	0.7718	0.85028	0.80914
3	10000	0.44075	1056	1685	261	198	0.85656	0.80182	0.84211	0.82147
4	10000	0.44175	1125	1621	298	156	0.85813	0.79058	0.87822	0.8321
5	10000	0.43874	1047	1690	283	180	0.85531	0.78722	0.8533	0.81893
Average		**0.43835**	**1071.2**	**1650.4**	**291**	**187.4**	**0.8505**	**0.78648**	**0.85108**	**0.81742**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	3.13321	751	1721	197	531	0.7725	0.79219	0.5858	0.67354
2	10000	3.11222	731	1777	174	518	0.78375	0.80773	0.58527	0.67874
3	10000	3.05724	726	1761	185	528	0.77719	0.79693	0.57895	0.67067
4	10000	3.10622	790	1720	199	491	0.78438	0.79879	0.61671	0.69604
5	10000	3.10722	734	1785	188	493	0.78719	0.7961	0.59821	0.68311
Average		**3.10322**	**746.4**	**1752.8**	**188.6**	**512.2**	**0.781**	**0.79835**	**0.59299**	**0.68042**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	66.553	1149	1472	446	133	0.81906	0.72038	0.89626	0.79875
2	10000	67.7543	1127	1480	471	122	0.81469	0.70526	0.90232	0.79171
3	10000	67.1286	1148	1524	422	106	0.835	0.73121	0.91547	0.81303
4	10000	69.8101	1188	1461	458	93	0.82781	0.72175	0.9274	0.81175
5	10000	65.4916	1126	1510	463	101	0.82375	0.70862	0.91769	0.79972
Average		**67.3475**	**1147.6**	**1489.4**	**452**	**111**	**0.82406**	**0.71744**	**0.91183**	**0.80299**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	16.3466	1095	1635	283	187	0.85313	0.79463	0.85413	0.82331
2	10000	16.4446	1081	1595	356	168	0.83625	0.75226	0.86549	0.80491
3	10000	17.537	1089	1661	285	165	0.85938	0.79258	0.86842	0.82877
4	10000	17.5899	1152	1583	336	129	0.85469	0.77419	0.8993	0.83207
5	10000	17.6169	1100	1629	344	127	0.85281	0.76177	0.8965	0.82366
Average		**17.107**	**1103.4**	**1620.6**	**320.8**	**155.2**	**0.85125**	**0.77509**	**0.87677**	**0.82254**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	785.035	1109	1580	338	173	0.84031	0.76641	0.86505	0.81275
2	10000	770.652	1104	1592	359	145	0.8425	0.75461	0.88391	0.81416
3	10000	849.899	1102	1605	341	152	0.84594	0.76369	0.87879	0.8172
4	10000	756.011	1170	1599	320	111	0.86531	0.78523	0.91335	0.84446
5	10000	905.87	1089	1644	329	138	0.85406	0.76798	0.88753	0.82344
Average		**813.494**	**1114.8**	**1604**	**337.4**	**143.8**	**0.84963**	**0.76759**	**0.88573**	**0.8224**

Features	Counter with 1-2-gram
Maximum	25000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	0.81076	1086	1794	109	211	0.9	0.90879	0.83732	0.87159
2	25000	0.80985	1066	1751	129	254	0.88031	0.89205	0.80758	0.84771
3	25000	0.53326	1008	1850	115	227	0.89313	0.8976	0.81619	0.85496
4	25000	0.53541	1026	1838	121	215	0.895	0.89451	0.82675	0.8593
5	25000	0.81207	979	1863	137	221	0.88813	0.87724	0.81583	0.84542
Average		**0.70027**	**1033**	**1819.2**	**122.2**	**225.6**	**0.89131**	**0.89404**	**0.82073**	**0.8558**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	3.86904	1115	1763	140	182	0.89938	0.88845	0.85968	0.87382
2	25000	3.85059	1110	1699	181	210	0.87781	0.8598	0.84091	0.85025
3	25000	3.38471	1010	1841	124	225	0.89094	0.89065	0.81781	0.85268
4	25000	2.92808	1058	1808	151	183	0.89563	0.8751	0.85254	0.86367
5	25000	3.89666	994	1843	157	206	0.88656	0.8636	0.82833	0.8456
Average		**3.58582**	**1057.4**	**1790.8**	**150.6**	**201.2**	**0.89006**	**0.87552**	**0.83985**	**0.8572**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	1.17377	1124	1754	149	173	0.89938	0.88295	0.86662	0.87471
2	25000	1.22075	1121	1712	168	199	0.88531	0.86967	0.84924	0.85933
3	25000	1.22894	1062	1812	153	173	0.89813	0.87407	0.85992	0.86694
4	25000	0.84092	1067	1811	148	174	0.89938	0.87819	0.85979	0.86889
5	25000	1.16085	1028	1830	170	172	0.89313	0.8581	0.85667	0.85738
Average		**1.12505**	**1080.4**	**1783.8**	**157.6**	**178.2**	**0.89506**	**0.8726**	**0.85845**	**0.86545**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	5.45184	1042	1776	127	255	0.88063	0.89136	0.80339	0.84509
2	25000	6.02098	1019	1755	125	301	0.86688	0.89073	0.77197	0.82711
3	25000	6.04877	973	1831	134	262	0.87625	0.87895	0.78785	0.83091
4	25000	4.34352	1006	1799	160	235	0.87656	0.86278	0.81064	0.8359
5	25000	5.92224	922	1859	141	278	0.86906	0.86736	0.76833	0.81485
Average		**5.55747**	**992.4**	**1804**	**137.4**	**266.2**	**0.87388**	**0.87824**	**0.78844**	**0.83077**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	129.926	1166	1483	420	131	0.82781	0.73518	0.899	0.80888
2	25000	131.039	1186	1427	453	134	0.81656	0.72361	0.89848	0.80162
3	25000	137.065	1134	1557	408	101	0.84094	0.73541	0.91822	0.81671
4	25000	137.676	1125	1537	422	116	0.83188	0.72721	0.90653	0.80703
5	25000	130.613	1090	1498	502	110	0.80875	0.68467	0.90833	0.7808
Average		**133.264**	**1140.2**	**1500.4**	**441**	**118.4**	**0.82519**	**0.72122**	**0.90611**	**0.80301**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	38.0649	1112	1674	229	185	0.87063	0.82923	0.85736	0.84306
2	25000	41.2472	1103	1655	225	217	0.86188	0.83057	0.83561	0.83308
3	25000	33.6519	1045	1744	221	190	0.87156	0.82543	0.84615	0.83567
4	25000	30.9443	1078	1718	241	163	0.87375	0.81729	0.86865	0.84219
5	25000	38.9747	1033	1710	290	167	0.85719	0.7808	0.86083	0.81887
Average		**36.5766**	**1074.2**	**1700.2**	**241.2**	**184.4**	**0.867**	**0.81667**	**0.85372**	**0.83457**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	25000	634.953	1130	1746	157	167	0.89875	0.87801	0.87124	0.87461
2	25000	556.286	1132	1698	182	188	0.88438	0.86149	0.85758	0.85953
3	25000	627.663	1080	1814	151	155	0.90438	0.87734	0.87449	0.87591
4	25000	880.856	1087	1783	176	154	0.89688	0.86065	0.87591	0.86821
5	25000	657.101	1062	1786	214	138	0.89	0.83229	0.885	0.85784
Average		**671.372**	**1098.2**	**1765.4**	**176**	**160.4**	**0.89488**	**0.86196**	**0.87284**	**0.86722**

tf_idf

Features Counter with tf-idf
Maximum number of tokens considered 100

Logistic Regression

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.023	675	1502	456	567	0.68031	0.59682	0.54348	0.5689
2	100	0.02497	696	1453	468	583	0.67156	0.59794	0.54418	0.56979
3	100	0.02299	684	1574	399	543	0.70563	0.63158	0.55746	0.59221
4	100	0.02299	678	1526	460	536	0.68875	0.59578	0.55848	0.57653
5	100	0.02399	704	1467	402	627	0.67844	0.63653	0.52893	0.57776
Average		**0.02359**	**687.4**	**1504.4**	**437**	**571.2**	**0.68494**	**0.61173**	**0.5465**	**0.57704**

SGD Classifier

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.02898	1077	919	1039	165	0.62375	0.50898	0.86715	0.64145
2	100	0.02798	724	1435	486	555	0.67469	0.59835	0.56607	0.58176
3	100	0.02798	769	1448	525	458	0.69281	0.59428	0.62673	0.61008
4	100	0.02798	395	1771	215	819	0.67688	0.64754	0.32537	0.43311
5	100	0.02698	332	1740	129	999	0.6475	0.72017	0.24944	0.37054
Average		**0.02798**	**659.4**	**1462.6**	**478.8**	**599.2**	**0.66313**	**0.61386**	**0.52695**	**0.52739**

Linear SVC

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.05299	695	1498	460	547	0.68531	0.60173	0.55958	0.57989
2	100	0.05597	707	1450	471	572	0.67406	0.60017	0.55278	0.5755
3	100	0.04997	696	1564	409	531	0.70625	0.62986	0.56724	0.59691
4	100	0.05598	685	1526	460	529	0.69094	0.59825	0.56425	0.58075
5	100	0.05597	714	1456	413	617	0.67813	0.63354	0.53644	0.58096
Average		**0.05417**	**699.4**	**1498.8**	**442.6**	**559.2**	**0.68694**	**0.61271**	**0.55606**	**0.5828**

NuSVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	20.4533	778	1101	857	464	0.58719	0.47584	0.62641	0.54084
2	100	20.5253	776	1150	771	503	0.60188	0.50162	0.60672	0.54919
3	100	21.074	754	1132	841	473	0.58938	0.47273	0.61451	0.53437
4	100	21.078	705	1134	852	509	0.57469	0.45279	0.58072	0.50884
5	100	19.7534	801	1109	760	530	0.59688	0.51313	0.6018	0.55394
Average		**20.5768**	**762.8**	**1125.2**	**816.2**	**495.8**	**0.59**	**0.48322**	**0.60603**	**0.53744**

SVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	21.8025	324	1789	169	918	0.66031	0.6572	0.26087	0.37349
2	100	22.7354	311	1768	153	968	0.64969	0.67026	0.24316	0.35686
3	100	22.1379	334	1855	118	893	0.68406	0.73894	0.27221	0.39786
4	100	23.1842	298	1838	148	916	0.6675	0.66816	0.24547	0.35904
5	100	21.6684	335	1734	135	996	0.64656	0.71277	0.25169	0.37202
Average		**22.3057**	**320.4**	**1796.8**	**144.6**	**938.2**	**0.66163**	**0.68946**	**0.25468**	**0.37185**

Gaussian Naive Bayes

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.03698	953	879	1079	289	0.5725	0.469	0.76731	0.58216
2	100	0.03599	953	820	1101	326	0.55406	0.46397	0.74511	0.57186
3	100	0.03799	920	893	1080	307	0.56656	0.46	0.7498	0.57019
4	100	0.03698	921	896	1090	293	0.56781	0.45798	0.75865	0.57116
5	100	0.03603	998	815	1054	333	0.56656	0.48635	0.74981	0.59001
Average		**0.03679**	**949**	**860.6**	**1080.8**	**309.6**	**0.5655**	**0.46746**	**0.75414**	**0.57708**

Decision Tree

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.32809	973	1551	407	269	0.78875	0.70507	0.78341	0.74218
2	100	0.31285	1023	1419	502	256	0.76313	0.67082	0.79984	0.72967
3	100	0.33286	955	1528	445	272	0.77594	0.68214	0.77832	0.72707
4	100	0.31192	901	1581	405	313	0.77563	0.68989	0.74217	0.71508
5	100	0.32393	1008	1452	417	323	0.76875	0.70737	0.75733	0.73149
Average		**0.32193**	**972**	**1506.2**	**435.2**	**286.6**	**0.77444**	**0.69106**	**0.77222**	**0.7291**

RandomForest (10 estimators)

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.31607	967	1580	378	275	0.79594	0.71896	0.77858	0.74758
2	100	0.30392	1013	1499	422	266	0.785	0.70592	0.79203	0.7465
3	100	0.30791	944	1624	349	283	0.8025	0.73009	0.76936	0.74921
4	100	0.31882	916	1630	356	298	0.79563	0.72013	0.75453	0.73693
5	100	0.303	1003	1525	344	328	0.79	0.74462	0.75357	0.74907
Average		**0.30995**	**968.6**	**1571.6**	**369.8**	**290**	**0.79381**	**0.72394**	**0.76961**	**0.74586**

AdaBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	0.81594	605	1560	398	637	0.67656	0.60319	0.48712	0.53898
2	100	0.81765	620	1555	366	659	0.67969	0.6288	0.48475	0.54746
3	100	0.80626	683	1551	422	544	0.69813	0.6181	0.55664	0.58576
4	100	0.81352	690	1551	435	524	0.70031	0.61333	0.56837	0.59
5	100	0.78708	706	1450	419	625	0.67375	0.62756	0.53043	0.57492
Average		**0.80809**	**660.8**	**1533.4**	**408**	**597.8**	**0.68569**	**0.6182**	**0.52546**	**0.56742**

XGBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	3.31009	524	1675	283	718	0.68719	0.64932	0.4219	0.51147
2	100	3.35338	534	1649	272	745	0.68219	0.66253	0.41751	0.51223
3	100	3.34893	583	1703	270	644	0.71438	0.68347	0.47514	0.56058
4	100	3.34287	549	1703	283	665	0.70375	0.65986	0.45222	0.53666
5	100	3.26079	589	1612	257	742	0.68781	0.69622	0.44252	0.54111
Average		**3.32321**	**555.8**	**1668.4**	**273**	**702.8**	**0.69506**	**0.67028**	**0.44186**	**0.53241**

Multi-layer Perceptrons

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	100	18.2081	1009	1478	480	233	0.77719	0.67764	0.8124	0.73892
2	100	19.7207	1006	1448	473	273	0.76688	0.68019	0.78655	0.72951
3	100	18.5604	993	1533	440	234	0.78938	0.69295	0.80929	0.74662
4	100	18.2623	903	1552	434	311	0.76719	0.67539	0.74382	0.70796
5	100	18.9619	1022	1452	417	309	0.77313	0.71022	0.76784	0.73791
Average		**18.7427**	**986.6**	**1492.6**	**448.8**	**272**	**0.77475**	**0.68728**	**0.78398**	**0.73218**

Features Counter with tf-idf
Maximum 1000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.05798	740	1555	386	519	0.71719	0.65719	0.58777	0.62055
2	1000	0.05697	714	1562	344	580	0.71125	0.67486	0.55178	0.60714
3	1000	0.05598	679	1636	358	527	0.72344	0.65477	0.56302	0.60544
4	1000	0.05897	715	1615	301	569	0.72813	0.70374	0.55685	0.62174
5	1000	0.05599	720	1587	363	530	0.72094	0.66482	0.576	0.61723
Average		**0.05718**	**713.6**	**1591**	**350.4**	**545**	**0.72019**	**0.67108**	**0.56708**	**0.61442**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.15193	572	1718	223	687	0.71563	0.7195	0.45433	0.55696
2	1000	0.15098	1007	1280	626	287	0.71469	0.61666	0.77821	0.68808
3	1000	0.14791	807	1544	450	399	0.73469	0.642	0.66915	0.6553
4	1000	0.14991	779	1552	364	505	0.72844	0.68154	0.6067	0.64194
5	1000	0.14595	667	1642	308	583	0.72156	0.6841	0.5336	0.59955
Average		**0.14934**	**766.4**	**1547.2**	**394.2**	**492.2**	**0.723**	**0.66876**	**0.6084**	**0.62837**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.08095	803	1517	424	456	0.725	0.65444	0.63781	0.64602
2	1000	0.08403	788	1496	410	506	0.71375	0.65776	0.60896	0.63242
3	1000	0.07596	746	1565	429	460	0.72219	0.63489	0.61857	0.62663
4	1000	0.07995	796	1534	382	488	0.72813	0.67572	0.61994	0.64663
5	1000	0.07699	797	1509	441	453	0.72063	0.64378	0.6376	0.64068
Average		**0.07958**	**786**	**1524.2**	**417.2**	**472.6**	**0.72194**	**0.65332**	**0.62458**	**0.63847**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	0.34981	1031	937	1004	228	0.615	0.50663	0.8189	0.62599
2	1000	0.34151	1014	911	995	280	0.60156	0.50473	0.78362	0.61399
3	1000	0.33797	966	903	1091	240	0.58406	0.46962	0.801	0.59209
4	1000	0.34381	1035	875	1041	249	0.59688	0.49855	0.80607	0.61607
5	1000	0.3319	995	892	1058	255	0.58969	0.48466	0.796	0.60248
Average		**0.341**	**1008.2**	**903.6**	**1037.8**	**250.4**	**0.59744**	**0.49284**	**0.80112**	**0.61012**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	10.8016	1160	1521	420	99	0.83781	0.73418	0.92137	0.81719
2	1000	9.59804	1158	1539	367	136	0.84281	0.75934	0.8949	0.82157
3	1000	9.21982	1108	1570	424	98	0.83688	0.72324	0.91874	0.80935
4	1000	9.67484	1142	1525	391	142	0.83344	0.74494	0.88941	0.81079
5	1000	10.1075	1137	1527	423	113	0.8325	0.72885	0.9096	0.80925
Average		**9.88036**	**1141**	**1536.4**	**405**	**117.6**	**0.83669**	**0.73811**	**0.9068**	**0.81363**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	3.0073	1121	1654	287	138	0.86719	0.79616	0.89039	0.84064
2	1000	2.61806	1134	1647	259	160	0.86906	0.81407	0.87635	0.84406
3	1000	2.94119	1074	1719	275	132	0.87281	0.79615	0.89055	0.8407
4	1000	3.07696	1098	1645	271	186	0.85719	0.80205	0.85514	0.82774
5	1000	2.85264	1091	1670	280	159	0.86281	0.79577	0.8728	0.83251
Average		**2.89923**	**1103.6**	**1667**	**274.4**	**155**	**0.86581**	**0.80084**	**0.87705**	**0.83713**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	1000	68.372	1156	1640	301	103	0.87375	0.79341	0.91819	0.85125
2	1000	62.2541	1167	1613	293	127	0.86875	0.79932	0.90185	0.84749
3	1000	69.1973	1101	1702	292	105	0.87594	0.79038	0.91294	0.84725
4	1000	88.8474	1121	1693	223	163	0.87938	0.83408	0.87305	0.85312
5	1000	65.8576	1115	1686	264	135	0.87531	0.80856	0.892	0.84823
Average		**70.9057**	**1132**	**1666.8**	**274.6**	**126.6**	**0.87463**	**0.80515**	**0.89961**	**0.84947**

Features Counter with tf-idf
Maximum 5000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.13908	707	1670	267	556	0.74281	0.72587	0.55978	0.6321
2	5000	0.12164	714	1670	261	555	0.745	0.73231	0.56265	0.63636
3	5000	0.12018	703	1678	265	554	0.74406	0.72624	0.55927	0.63191
4	5000	0.13932	673	1675	293	559	0.73375	0.69669	0.54627	0.61237
5	5000	0.13797	723	1637	291	549	0.7375	0.71302	0.5684	0.63255
Average		**0.13164**	**704**	**1666**	**275.4**	**554.6**	**0.74063**	**0.71883**	**0.55927**	**0.62906**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.83814	773	1646	291	490	0.75594	0.7265	0.61203	0.66437
2	5000	0.78953	936	1473	458	333	0.75281	0.67145	0.73759	0.70297
3	5000	0.79056	775	1635	308	482	0.75313	0.7156	0.61655	0.66239
4	5000	0.83265	910	1475	493	322	0.74531	0.64861	0.73864	0.6907
5	5000	0.83351	704	1676	252	568	0.74375	0.7364	0.55346	0.63196
Average		**0.81688**	**819.6**	**1581**	**360.4**	**439**	**0.75019**	**0.69971**	**0.65165**	**0.67048**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.16195	970	1599	338	293	0.80281	0.74159	0.76801	0.75457
2	5000	0.15893	944	1587	344	325	0.79094	0.73292	0.74389	0.73837
3	5000	0.13745	938	1600	343	319	0.79313	0.73224	0.74622	0.73916
4	5000	0.16062	909	1593	375	323	0.78188	0.70794	0.73782	0.72258
5	5000	0.16028	972	1589	339	300	0.80031	0.74142	0.76415	0.75261
Average		**0.15584**	**946.6**	**1593.6**	**347.8**	**312**	**0.79381**	**0.73122**	**0.75202**	**0.74146**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	0.69549	677	1685	252	586	0.73813	0.72874	0.53603	0.6177
2	5000	0.69403	627	1675	256	642	0.71938	0.71008	0.49409	0.58271
3	5000	0.54595	625	1683	260	632	0.72125	0.70621	0.49722	0.58357
4	5000	0.72026	605	1675	293	627	0.7125	0.67372	0.49107	0.56808
5	5000	0.68699	665	1680	248	607	0.73281	0.72837	0.5228	0.6087
Average		**0.66855**	**639.8**	**1679.6**	**261.8**	**618.8**	**0.72481**	**0.70942**	**0.50824**	**0.59215**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	27.5234	1154	1558	379	109	0.8475	0.75277	0.9137	0.82546
2	5000	29.6504	1172	1496	435	97	0.83375	0.72931	0.92356	0.81502
3	5000	29.314	1142	1541	402	115	0.83844	0.73964	0.90851	0.81542
4	5000	26.6295	1086	1589	379	146	0.83594	0.7413	0.88149	0.80534
5	5000	28.3677	1152	1496	432	120	0.8275	0.72727	0.90566	0.80672
Average		**28.297**	**1141.2**	**1536**	**405.4**	**117.4**	**0.83663**	**0.73806**	**0.90659**	**0.81359**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	7.65345	1095	1741	196	168	0.88625	0.84818	0.86698	0.85748
2	5000	6.41261	1119	1698	233	150	0.88031	0.82766	0.8818	0.85387
3	5000	7.2592	1061	1759	184	196	0.88125	0.85221	0.84407	0.84812
4	5000	7.80157	1027	1766	202	205	0.87281	0.83564	0.8336	0.83462
5	5000	6.38233	1119	1685	243	153	0.87625	0.82159	0.87972	0.84966
Average		**7.10183**	**1084.2**	**1729.8**	**211.6**	**174.4**	**0.87938**	**0.83706**	**0.86123**	**0.84875**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	5000	237.435	1136	1590	347	127	0.85188	0.76601	0.89945	0.82739
2	5000	270.028	1136	1575	356	133	0.84719	0.76139	0.89519	0.82289
3	5000	245.534	1128	1593	350	129	0.85031	0.76319	0.89737	0.82486
4	5000	258.431	1074	1606	362	158	0.8375	0.74791	0.87175	0.8051
5	5000	270.511	1138	1586	342	134	0.85125	0.76892	0.89465	0.82703
Average		**256.388**	**1122.4**	**1590**	**351.4**	**136.2**	**0.84763**	**0.76149**	**0.89168**	**0.82145**

Features Counter with tf-idf
Maximum 10000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.28982	735	1663	261	541	0.74938	0.73795	0.57602	0.64701
2	10000	0.28484	746	1671	259	524	0.75531	0.74229	0.5874	0.65582
3	10000	0.28484	737	1701	237	525	0.76188	0.75667	0.58399	0.65921
4	10000	0.29082	729	1679	263	529	0.7525	0.73488	0.57949	0.648
5	10000	0.28583	737	1701	272	490	0.76188	0.73043	0.60065	0.65921
Average		**0.28723**	**736.8**	**1683**	**258.4**	**521.8**	**0.75619**	**0.74044**	**0.58551**	**0.65385**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1.25428	922	1596	328	354	0.78688	0.7376	0.72257	0.73001
2	10000	1.24229	767	1704	226	503	0.77219	0.77241	0.60394	0.67786
3	10000	1.24129	1043	1400	538	219	0.76344	0.65971	0.82647	0.73373
4	10000	1.2273	910	1571	371	348	0.77531	0.71038	0.72337	0.71682
5	10000	1.24629	1080	1312	661	147	0.7475	0.62033	0.8802	0.72776
Average		**1.24229**	**944.4**	**1516.6**	**424.8**	**314.2**	**0.76906**	**0.70009**	**0.75131**	**0.71724**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.3218	1035	1635	289	241	0.83438	0.78172	0.81113	0.79615
2	10000	0.29681	1059	1652	278	211	0.84719	0.79207	0.83386	0.81243
3	10000	0.30484	1031	1654	284	231	0.83906	0.78403	0.81696	0.80016
4	10000	0.30584	1021	1635	307	237	0.83	0.76883	0.81161	0.78964
5	10000	0.30582	1021	1646	327	206	0.83344	0.75742	0.83211	0.79301
Average		**0.30703**	**1033.4**	**1644.4**	**297**	**225.2**	**0.83681**	**0.77681**	**0.82113**	**0.79828**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	3.1622	1186	813	1111	90	0.62469	0.51633	0.92947	0.66387
2	10000	3.14618	1189	787	1143	81	0.6175	0.50986	0.93622	0.66019
3	10000	3.1562	1172	834	1104	90	0.62688	0.51494	0.92868	0.66252
4	10000	3.16419	1196	838	1104	62	0.63563	0.52	0.95072	0.67229
5	10000	3.15718	1152	823	1150	75	0.61719	0.50043	0.93888	0.65288
Average		**3.15719**	**1179**	**819**	**1122.4**	**79.6**	**0.62438**	**0.51231**	**0.93679**	**0.66235**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	68.268	1146	1531	393	130	0.83656	0.74464	0.89812	0.81421
2	10000	72.6115	1186	1545	385	84	0.85344	0.75493	0.93386	0.83492
3	10000	72.1628	1159	1559	379	103	0.84938	0.75358	0.91838	0.82786
4	10000	73.8308	1139	1549	393	119	0.84	0.74347	0.90541	0.81649
5	10000	72.1867	1111	1575	398	116	0.83938	0.73625	0.90546	0.81213
Average		**71.8119**	**1148.2**	**1551.8**	**389.6**	**110.4**	**0.84375**	**0.74657**	**0.91225**	**0.82112**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	18.6433	1087	1718	206	189	0.87656	0.84068	0.85188	0.84624
2	10000	17.9907	1105	1759	171	165	0.895	0.86599	0.87008	0.86803
3	10000	16.8164	1088	1727	211	174	0.87969	0.83757	0.86212	0.84967
4	10000	16.7604	1070	1737	205	188	0.87719	0.83922	0.85056	0.84485
5	10000	18.0177	1049	1737	236	178	0.87063	0.81634	0.85493	0.83519
Average		**17.6457**	**1079.8**	**1735.6**	**205.8**	**178.8**	**0.87981**	**0.83996**	**0.85791**	**0.8488**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1316.11	1133	1620	304	143	0.86031	0.78845	0.88793	0.83524
2	10000	1036.56	1156	1565	365	114	0.85031	0.76003	0.91024	0.82838
3	10000	1275.73	1133	1579	359	129	0.8475	0.75938	0.89778	0.8228
4	10000	1075.94	1118	1578	364	140	0.8425	0.75439	0.88871	0.81606
5	10000	1239.66	1109	1599	374	118	0.84625	0.74781	0.90383	0.81845
Average		**1188.8**	**1129.8**	**1588.2**	**353.2**	**128.8**	**0.84938**	**0.76201**	**0.8977**	**0.82419**

Features Counter with tf-idf
Maximum 25000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	0.48449	775	1680	244	501	0.76719	0.76055	0.60737	0.67538
2	14527	0.47966	717	1768	211	504	0.77656	0.77263	0.58722	0.66729
3	14527	0.47475	775	1671	249	505	0.76438	0.75684	0.60547	0.67274
4	14527	0.47088	763	1709	253	475	0.7725	0.75098	0.61632	0.67702
5	14527	0.48311	763	1651	271	515	0.75438	0.73791	0.59703	0.66003
Average		**0.47858**	**758.6**	**1695.8**	**245.6**	**500**	**0.767**	**0.75578**	**0.60268**	**0.67049**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	2.99356	874	1663	261	402	0.79281	0.77004	0.68495	0.72501
2	14527	2.97147	832	1727	252	389	0.79969	0.76753	0.68141	0.72191
3	14527	2.97316	1089	1385	535	191	0.77313	0.67057	0.85078	0.75
4	14527	2.98007	898	1626	336	340	0.78875	0.72771	0.72536	0.72654
5	14527	2.98073	1016	1466	456	262	0.77563	0.69022	0.79499	0.73891
Average		**2.9798**	**941.8**	**1573.4**	**368**	**316.8**	**0.786**	**0.72521**	**0.7475**	**0.73247**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	0.48627	1094	1640	284	182	0.85438	0.7939	0.85737	0.82442
2	14527	0.46657	1007	1711	268	214	0.84938	0.7898	0.82473	0.80689
3	14527	0.50737	1059	1628	292	221	0.83969	0.78386	0.82734	0.80502
4	14527	0.50532	1056	1677	285	182	0.85406	0.78747	0.85299	0.81892
5	14527	0.47598	1070	1601	321	208	0.83469	0.76923	0.83725	0.8018
Average		**0.4883**	**1057.2**	**1651.4**	**290**	**201.4**	**0.84644**	**0.78485**	**0.83994**	**0.81141**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	3.53955	1203	784	1140	73	0.62094	0.51344	0.94279	0.66482
2	14527	3.53984	1145	808	1171	76	0.61031	0.49439	0.93776	0.64744
3	14527	3.54362	1207	757	1163	73	0.61375	0.50928	0.94297	0.66137
4	14527	3.54652	1172	797	1165	66	0.61531	0.5015	0.94669	0.65566
5	14527	3.53988	1199	784	1138	79	0.61969	0.51305	0.93818	0.66335
Average		**3.54188**	**1185.2**	**786**	**1155.4**	**73.4**	**0.616**	**0.50633**	**0.94168**	**0.65853**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	98.4336	1175	1564	360	101	0.85594	0.76547	0.92085	0.836
2	14527	93.416	1113	1632	347	108	0.85781	0.76233	0.91155	0.83029
3	14527	98.7313	1153	1544	376	127	0.84281	0.75409	0.90078	0.82093
4	14527	99.6891	1123	1560	402	115	0.83844	0.73639	0.90711	0.81288
5	14527	99.7626	1163	1556	366	115	0.84969	0.76063	0.91002	0.82864
Average		**98.0065**	**1145.4**	**1571.2**	**370.2**	**113.2**	**0.84894**	**0.75578**	**0.91006**	**0.82575**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	26.7471	1104	1747	177	172	0.89094	0.86183	0.8652	0.86351
2	14527	20.5197	1027	1827	152	194	0.89188	0.87108	0.84111	0.85583
3	14527	26.8016	1063	1726	194	217	0.87156	0.84566	0.83047	0.838
4	14527	25.6454	1077	1780	182	161	0.89281	0.85544	0.86995	0.86264
5	14527	20.6433	1090	1760	162	188	0.89063	0.87061	0.8529	0.86166
Average		**24.0714**	**1072.2**	**1768**	**173.4**	**186.4**	**0.88756**	**0.86092**	**0.85193**	**0.85633**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	14527	1004.76	1166	1556	368	110	0.85063	0.7601	0.91379	0.82989
2	14527	949.124	1095	1601	378	126	0.8425	0.74338	0.89681	0.81292
3	14527	918.931	1164	1520	400	116	0.83875	0.74425	0.90938	0.81857
4	14527	1034.77	1138	1589	373	100	0.85219	0.75314	0.91922	0.82794
5	14527	1094.12	1159	1463	459	119	0.81938	0.71632	0.90689	0.80041
Average		**1000.34**	**1144.4**	**1545.8**	**395.6**	**114.2**	**0.84069**	**0.74344**	**0.90922**	**0.81795**

1-gram-count_tfidf

Features Counter with 1-gram and tf-idf
Maximum number of tokens considered 100

Logistic Regression

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.04732	661	1548	417	574	0.69031	0.61317	0.53522	0.57155
2	200	0.03898	703	1516	421	560	0.69344	0.62544	0.55661	0.58902
3	200	0.03898	651	1542	422	585	0.68531	0.60671	0.5267	0.56388
4	200	0.04799	724	1473	461	542	0.68656	0.61097	0.57188	0.59078
5	200	0.04398	658	1520	387	635	0.68063	0.62967	0.50889	0.56287
Average		**0.04345**	**679.4**	**1519.8**	**421.6**	**579.2**	**0.68725**	**0.61719**	**0.53986**	**0.57562**

SGD Classifier

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.04798	873	1289	676	362	0.67563	0.56359	0.70688	0.62716
2	200	0.04198	480	1709	228	783	0.68406	0.67797	0.38005	0.48706
3	200	0.04198	593	1618	346	643	0.69094	0.63152	0.47977	0.54529
4	200	0.04997	858	1318	616	408	0.68	0.58209	0.67773	0.62628
5	200	0.042	552	1609	298	741	0.67531	0.64941	0.42691	0.51517
Average		**0.04478**	**671.2**	**1508.6**	**432.8**	**587.4**	**0.68119**	**0.62092**	**0.53427**	**0.56019**

Linear SVC

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.10394	687	1525	440	548	0.69125	0.60958	0.55628	0.58171
2	200	0.11894	718	1520	417	545	0.69938	0.6326	0.56849	0.59883
3	200	0.11595	673	1535	429	563	0.69	0.61071	0.5445	0.57571
4	200	0.12891	700	1511	423	566	0.69094	0.62333	0.55292	0.58602
5	200	0.13095	672	1523	384	621	0.68594	0.63636	0.51972	0.57216
Average		**0.11974**	**690**	**1522.8**	**418.6**	**568.6**	**0.6915**	**0.62252**	**0.54838**	**0.58289**

NuSVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	34.966	690	1363	602	545	0.64156	0.53406	0.5587	0.5461
2	200	33.0861	688	1401	536	575	0.65281	0.56209	0.54473	0.55328
3	200	32.393	769	1395	569	467	0.67625	0.57474	0.62217	0.59751
4	200	34.7038	768	1394	540	498	0.67563	0.58716	0.60664	0.59674
5	200	33.6834	682	1468	439	611	0.67188	0.60839	0.52746	0.56504
Average		**33.7665**	**719.4**	**1404.2**	**537.2**	**539.2**	**0.66363**	**0.57329**	**0.57194**	**0.57173**

SVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	37.3452	223	1888	77	1012	0.65969	0.74333	0.18057	0.29055
2	200	36.8286	223	1846	91	1040	0.64656	0.71019	0.17656	0.28282
3	200	36.3314	193	1875	89	1043	0.64625	0.6844	0.15615	0.25428
4	200	37.9008	236	1831	103	1030	0.64594	0.69617	0.18641	0.29408
5	200	36.429	210	1830	77	1083	0.6375	0.73171	0.16241	0.26582
Average		**36.967**	**217**	**1854**	**87.4**	**1041.6**	**0.64719**	**0.71316**	**0.17242**	**0.27751**

Gaussian Naive Bayes

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.06897	879	1197	768	356	0.64875	0.5337	0.71174	0.60999
2	200	0.06996	903	1176	761	360	0.64969	0.54267	0.71496	0.61701
3	200	0.07107	894	1185	779	342	0.64969	0.53437	0.7233	0.61464
4	200	0.07096	922	1195	739	344	0.66156	0.55509	0.72828	0.63
5	200	0.07097	920	1157	750	373	0.64906	0.5509	0.71152	0.62099
Average		**0.07038**	**903.6**	**1182**	**759.4**	**355**	**0.65175**	**0.54334**	**0.71796**	**0.61853**

Decision Tree

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.85206	984	1516	449	251	0.78125	0.68667	0.79676	0.73763
2	200	0.85899	953	1530	407	310	0.77594	0.70074	0.75455	0.72665
3	200	0.81767	919	1543	421	317	0.76938	0.68582	0.74353	0.71351
4	200	0.87987	1021	1487	447	245	0.78375	0.6955	0.80648	0.74689
5	200	0.86502	951	1519	388	342	0.77188	0.71023	0.7355	0.72264
Average		**0.85472**	**965.6**	**1519**	**422.4**	**293**	**0.77644**	**0.69579**	**0.76736**	**0.72946**

RandomForest (10 estimators)

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.45514	975	1550	415	260	0.78906	0.70144	0.78947	0.74286
2	200	0.44223	966	1556	381	297	0.78813	0.71715	0.76485	0.74023
3	200	0.44175	912	1615	349	324	0.78969	0.72324	0.73786	0.73048
4	200	0.45774	983	1573	361	283	0.79875	0.7314	0.77646	0.75326
5	200	0.46735	963	1559	348	330	0.78813	0.73455	0.74478	0.73963
Average		**0.45284**	**959.8**	**1570.6**	**370.8**	**298.8**	**0.79075**	**0.72156**	**0.76268**	**0.74129**

AdaBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	1.74294	618	1552	385	645	0.67813	0.61615	0.48931	0.54545
2	200	1.75186	657	1548	417	578	0.68906	0.61173	0.53198	0.56908
3	200	1.71102	628	1572	392	608	0.6875	0.61569	0.50809	0.55674
4	200	1.83735	630	1554	380	636	0.6825	0.62376	0.49763	0.5536
5	200	1.80708	626	1555	352	667	0.68156	0.64008	0.48415	0.5513
Average		**1.77005**	**631.8**	**1556.2**	**385.2**	**626.8**	**0.68375**	**0.62148**	**0.50223**	**0.55523**

XGBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	6.44005	570	1693	272	665	0.70719	0.67696	0.46154	0.54887
2	200	6.28505	576	1616	321	687	0.685	0.64214	0.45606	0.53333
3	200	6.45513	546	1673	291	690	0.69344	0.65233	0.44175	0.52677
4	200	6.47651	556	1651	283	710	0.68969	0.66269	0.43918	0.52827
5	200	6.44989	528	1672	235	765	0.6875	0.69201	0.40835	0.51362
Average		**6.42133**	**555.2**	**1661**	**280.4**	**703.4**	**0.69256**	**0.66523**	**0.44137**	**0.53017**

Multi-layer Perceptrons

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	22.7197	973	1559	406	262	0.79125	0.70558	0.78785	0.74445
2	200	22.4378	993	1501	436	270	0.77938	0.69489	0.78622	0.73774
3	200	25.2465	1001	1502	462	235	0.78219	0.68421	0.80987	0.74176
4	200	25.1121	1001	1544	390	265	0.79531	0.71963	0.79068	0.75348
5	200	22.8087	1021	1488	419	272	0.78406	0.70903	0.78964	0.74716
Average		**23.665**	**997.8**	**1518.8**	**422.6**	**260.8**	**0.78644**	**0.70267**	**0.79285**	**0.74492**

Features Counter with 1-gram and tf-idf
Maximum 1000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.12193	776	1528	397	499	0.72	0.66155	0.60863	0.63399
2	2000	0.09735	796	1580	380	444	0.7425	0.67687	0.64194	0.65894
3	2000	0.10195	782	1550	393	475	0.72875	0.66553	0.62212	0.64309
4	2000	0.11095	784	1572	378	466	0.73625	0.6747	0.6272	0.65008
5	2000	0.09794	795	1524	405	476	0.72469	0.6625	0.62549	0.64346
Average		**0.10603**	**786.6**	**1550.8**	**390.6**	**472**	**0.73044**	**0.66823**	**0.62507**	**0.64591**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.3072	956	1356	569	319	0.7225	0.62689	0.7498	0.68286
2	2000	0.29483	739	1608	352	501	0.73344	0.67736	0.59597	0.63406
3	2000	0.26787	836	1493	450	421	0.72781	0.65008	0.66508	0.65749
4	2000	0.27284	842	1495	455	408	0.73031	0.64919	0.6736	0.66117
5	2000	0.26985	996	1311	618	275	0.72094	0.6171	0.78363	0.69047
Average		**0.28252**	**873.8**	**1452.6**	**488.8**	**384.8**	**0.727**	**0.64412**	**0.69362**	**0.66521**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.23587	840	1492	433	435	0.72875	0.65986	0.65882	0.65934
2	2000	0.22086	824	1515	445	416	0.73094	0.64933	0.66452	0.65684
3	2000	0.20488	829	1510	433	428	0.73094	0.65689	0.65951	0.6582
4	2000	0.25894	830	1541	409	420	0.74094	0.6699	0.664	0.66693
5	2000	0.22887	865	1484	445	406	0.73406	0.66031	0.68057	0.67028
Average		**0.22988**	**837.6**	**1508.4**	**433**	**421**	**0.73313**	**0.65926**	**0.66548**	**0.66232**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.86752	1044	833	1092	231	0.58656	0.48876	0.81882	0.61214
2	2000	0.70105	1012	863	1097	228	0.58594	0.47985	0.81613	0.60436
3	2000	0.67414	1010	910	1033	247	0.6	0.49437	0.8035	0.61212
4	2000	0.67696	1039	788	1162	211	0.57094	0.47206	0.8312	0.60214
5	2000	0.67061	1065	771	1158	206	0.57375	0.47908	0.83792	0.60962
Average		**0.71805**	**1034**	**833**	**1108.4**	**224.6**	**0.58344**	**0.48282**	**0.82152**	**0.60808**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	26.0069	1143	1500	425	132	0.82594	0.72895	0.89647	0.80408
2	2000	26.4209	1132	1534	426	108	0.83313	0.72657	0.9129	0.80915
3	2000	23.6885	1124	1537	406	133	0.83156	0.73464	0.89419	0.8066
4	2000	25.2438	1141	1560	390	109	0.84406	0.74526	0.9128	0.82057
5	2000	25.0356	1139	1482	447	132	0.81906	0.71816	0.89614	0.79734
Average		**25.2791**	**1135.8**	**1522.6**	**418.8**	**122.8**	**0.83075**	**0.73072**	**0.9025**	**0.80755**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	4.06024	1132	1655	270	143	0.87094	0.80742	0.88784	0.84572
2	2000	4.04713	1120	1684	276	120	0.87625	0.80229	0.90323	0.84977
3	2000	3.85778	1095	1655	288	162	0.85938	0.79176	0.87112	0.82955
4	2000	4.12551	1099	1639	311	151	0.85563	0.77943	0.8792	0.82632
5	2000	4.1991	1092	1640	289	179	0.85375	0.79073	0.85917	0.82353
Average		**4.05795**	**1107.6**	**1654.6**	**286.8**	**151**	**0.86319**	**0.79433**	**0.88011**	**0.83498**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	212.471	1143	1620	305	132	0.86344	0.78936	0.89647	0.83952
2	2000	225.015	1128	1639	321	112	0.86469	0.77847	0.90968	0.83897
3	2000	172.493	1124	1650	293	133	0.86688	0.79323	0.89419	0.84069
4	2000	177.487	1123	1670	280	127	0.87281	0.80043	0.8984	0.84659
5	2000	211.352	1125	1613	316	146	0.85563	0.78071	0.88513	0.82965
Average		**199.764**	**1128.6**	**1638.4**	**303**	**130**	**0.86469**	**0.78844**	**0.89677**	**0.83908**

Features Counter with 1-gram and tf-idf
Maximum 5000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.27946	938	1632	312	318	0.80313	0.7504	0.74682	0.7486
2	10000	0.24404	894	1674	326	306	0.8025	0.73279	0.745	0.73884
3	10000	0.2788	968	1612	284	336	0.80625	0.77316	0.74233	0.75743
4	10000	0.2426	914	1612	333	341	0.78938	0.73296	0.72829	0.73062
5	10000	0.24172	960	1641	281	318	0.81281	0.77357	0.75117	0.76221
Average		**0.25733**	**934.8**	**1634.2**	**307.2**	**323.8**	**0.80281**	**0.75258**	**0.74272**	**0.74754**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1.42961	860	1690	254	396	0.79688	0.77199	0.68471	0.72574
2	10000	1.33491	985	1543	457	215	0.79	0.68308	0.82083	0.74565
3	10000	1.41896	1062	1458	438	242	0.7875	0.708	0.81442	0.75749
4	10000	1.32328	949	1571	374	306	0.7875	0.71731	0.75618	0.73623
5	10000	1.33148	1094	1419	503	184	0.78531	0.68503	0.85603	0.76104
Average		**1.36765**	**990**	**1536.2**	**405.2**	**268.6**	**0.78944**	**0.71308**	**0.78643**	**0.74523**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.42207	1064	1579	365	192	0.82594	0.74458	0.84713	0.79255
2	10000	0.36327	1009	1623	377	191	0.8225	0.72799	0.84083	0.78036
3	10000	0.44174	1075	1570	326	229	0.82656	0.76731	0.82439	0.79482
4	10000	0.34605	1041	1567	378	214	0.815	0.73362	0.82948	0.77861
5	10000	0.38038	1065	1598	324	213	0.83219	0.76674	0.83333	0.79865
Average		**0.3907**	**1050.8**	**1587.4**	**354**	**207.8**	**0.82444**	**0.74805**	**0.83503**	**0.789**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1.64595	628	1701	243	628	0.72781	0.72101	0.5	0.5905
2	10000	1.42999	591	1760	240	609	0.73469	0.71119	0.4925	0.58198
3	10000	1.6447	644	1658	238	660	0.71938	0.73016	0.49387	0.5892
4	10000	1.64312	595	1693	252	660	0.715	0.70248	0.4741	0.56613
5	10000	1.43457	618	1691	231	660	0.72156	0.72792	0.48357	0.5811
Average		**1.55967**	**615.2**	**1700.6**	**240.8**	**643.4**	**0.72369**	**0.71855**	**0.48881**	**0.58178**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	59.9959	1169	1524	420	87	0.84156	0.73568	0.93073	0.82179
2	10000	62.9327	1099	1615	385	101	0.84813	0.74057	0.91583	0.81893
3	10000	60.8523	1195	1514	382	109	0.84656	0.75777	0.91641	0.82957
4	10000	59.6107	1128	1520	425	127	0.8275	0.72634	0.8988	0.80342
5	10000	59.401	1174	1515	407	104	0.84031	0.74257	0.91862	0.82127
Average		**60.5585**	**1153**	**1537.6**	**403.8**	**105.6**	**0.84081**	**0.74058**	**0.91608**	**0.819**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	9.19136	1122	1700	244	134	0.88188	0.82138	0.89331	0.85584
2	10000	9.6823	1068	1749	251	132	0.88031	0.8097	0.89	0.84796
3	10000	10.6377	1134	1664	232	170	0.87438	0.83016	0.86963	0.84944
4	10000	9.28639	1076	1702	243	179	0.86813	0.81577	0.85737	0.83605
5	10000	9.90902	1119	1682	240	159	0.87531	0.8234	0.87559	0.84869
Average		**9.74135**	**1103.8**	**1699.4**	**242**	**154.8**	**0.876**	**0.82008**	**0.87718**	**0.84759**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	388.83	1151	1588	356	105	0.85594	0.76377	0.9164	0.83315
2	10000	386.674	1083	1637	363	117	0.85	0.74896	0.9025	0.81859
3	10000	429.019	1172	1560	336	132	0.85375	0.77719	0.89877	0.83357
4	10000	465.172	1124	1581	364	131	0.84531	0.75538	0.89562	0.81954
5	10000	378.772	1142	1589	333	136	0.85344	0.77424	0.89358	0.82964
Average		**409.693**	**1134.4**	**1591**	**350.4**	**124.2**	**0.85169**	**0.76391**	**0.90138**	**0.8269**

Features Counter with 1-gram and tf-idf
Maximum 10000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	0.59428	974	1687	270	269	0.83156	0.78296	0.78359	0.78327
2	20000	0.60766	1026	1606	294	274	0.8225	0.77727	0.78923	0.78321
3	20000	0.56268	988	1705	272	235	0.84156	0.78413	0.80785	0.79581
4	20000	0.61765	994	1654	273	279	0.8275	0.78453	0.78083	0.78268
5	20000	0.62063	1000	1637	309	254	0.82406	0.76394	0.79745	0.78034
Average		**0.60058**	**996.4**	**1657.8**	**283.6**	**262.2**	**0.82944**	**0.77857**	**0.79179**	**0.78506**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	2.23884	1041	1582	375	202	0.81969	0.73517	0.83749	0.783
2	20000	2.30568	1054	1579	321	246	0.82281	0.76655	0.81077	0.78804
3	20000	2.22773	992	1702	275	231	0.84188	0.78295	0.81112	0.79679
4	20000	2.35967	1067	1529	398	206	0.81125	0.72833	0.83818	0.7794
5	20000	2.36065	1053	1568	378	201	0.81906	0.73585	0.83971	0.78436
Average		**2.29852**	**1041.4**	**1592**	**349.4**	**217.2**	**0.82294**	**0.74977**	**0.82745**	**0.78632**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	0.70058	1086	1638	319	157	0.85125	0.77295	0.87369	0.82024
2	20000	0.73459	1131	1572	328	169	0.84469	0.77519	0.87	0.81986
3	20000	0.7006	1077	1654	323	146	0.85344	0.76929	0.88062	0.8212
4	20000	0.74557	1106	1614	313	167	0.85	0.77942	0.86881	0.82169
5	20000	0.74957	1092	1608	338	162	0.84375	0.76364	0.87081	0.81371
Average		**0.72618**	**1098.4**	**1617.2**	**324.2**	**160.2**	**0.84863**	**0.7721**	**0.87279**	**0.81934**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	6.38535	1177	823	1134	66	0.625	0.5093	0.9469	0.66235
2	20000	6.76318	1233	747	1153	67	0.61875	0.51676	0.94846	0.66902
3	20000	6.39236	1163	814	1163	60	0.61781	0.5	0.95094	0.6554
4	20000	6.57424	1188	771	1156	85	0.61219	0.50683	0.93323	0.6569
5	20000	6.59223	1175	811	1135	79	0.62063	0.50866	0.937	0.65937
Average		**6.54147**	**1187.2**	**793.2**	**1148.2**	**71.4**	**0.61888**	**0.50831**	**0.94331**	**0.66061**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	149.142	1142	1563	394	101	0.84531	0.74349	0.91874	0.82188
2	20000	160.887	1173	1553	347	127	0.85188	0.77171	0.90231	0.83191
3	20000	153.174	1138	1598	379	85	0.855	0.75016	0.9305	0.83066
4	20000	160.706	1145	1552	375	128	0.84281	0.75329	0.89945	0.81991
5	20000	157.151	1141	1536	410	113	0.83656	0.73565	0.90989	0.81355
Average		**156.212**	**1147.8**	**1560.4**	**381**	**110.8**	**0.84631**	**0.75086**	**0.91218**	**0.82358**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	24.4061	1073	1759	198	170	0.885	0.84422	0.86323	0.85362
2	20000	25.5234	1110	1709	191	190	0.88094	0.85319	0.85385	0.85352
3	20000	23.6045	1070	1788	189	153	0.89313	0.84988	0.8749	0.86221
4	20000	26.5298	1073	1737	190	200	0.87813	0.84956	0.84289	0.84621
5	20000	25.128	1081	1697	249	173	0.86813	0.81278	0.86204	0.83669
Average		**25.0384**	**1081.4**	**1738**	**203.4**	**177.2**	**0.88106**	**0.84193**	**0.85938**	**0.85045**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	2005.34	1126	1629	328	117	0.86094	0.77442	0.90587	0.835
2	20000	1777.37	1181	1530	370	119	0.84719	0.76144	0.90846	0.82848
3	20000	2416.38	1108	1679	298	115	0.87094	0.78805	0.90597	0.84291
4	20000	2084.1	1148	1562	365	125	0.84688	0.75876	0.90181	0.82412
5	20000	2339.5	1121	1620	326	133	0.85656	0.77471	0.89394	0.83006
Average		**2124.54**	**1136.8**	**1604**	**337.4**	**121.8**	**0.8565**	**0.77147**	**0.90321**	**0.83211**

Features Counter with 1-gram and tf-idf
Maximum 25000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	29054	0.86151	1029	1631	296	244	0.83125	0.7766	0.80833	0.79215
2	29054	0.79954	1010	1676	270	244	0.83938	0.78906	0.80542	0.79716
3	29054	0.78953	1006	1665	289	240	0.83469	0.77683	0.80738	0.79181
4	29054	0.81054	969	1652	311	268	0.81906	0.75703	0.78335	0.76996
5	29054	1.14333	1062	1647	270	221	0.84656	0.7973	0.82775	0.81224
Average		**0.88089**	**1015.2**	**1654.2**	**287.2**	**243.4**	**0.83419**	**0.77937**	**0.80645**	**0.79266**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	29054	3.1868	1042	1632	295	231	0.83563	0.77936	0.81854	0.79847
2	29054	3.1582	1133	1414	532	121	0.79594	0.68048	0.90351	0.77629
3	29054	3.14921	1041	1622	332	205	0.83219	0.75819	0.83547	0.79496
4	29054	3.16921	1030	1608	355	207	0.82438	0.74368	0.83266	0.78566
5	29054	3.67592	1137	1514	403	146	0.82844	0.73831	0.8862	0.80553
Average		**3.26787**	**1076.6**	**1558**	**383.4**	**182**	**0.82331**	**0.74**	**0.85528**	**0.79218**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	29054	0.96045	1136	1578	349	137	0.84813	0.76498	0.89238	0.82379
2	29054	0.92849	1111	1634	312	143	0.85781	0.78074	0.88596	0.83003
3	29054	0.91648	1109	1604	350	137	0.84781	0.76011	0.89005	0.81996
4	29054	0.86351	1087	1609	354	150	0.8425	0.75434	0.87874	0.8118
5	29054	0.99845	1161	1597	320	122	0.86188	0.78393	0.90491	0.84009
Average		**0.93347**	**1120.8**	**1604.4**	**337**	**137.8**	**0.85163**	**0.76882**	**0.89041**	**0.82513**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	29054	9.38066	1193	814	1113	80	0.62719	0.51735	0.93716	0.66667
2	29054	9.32367	1181	815	1131	73	0.62375	0.51081	0.94179	0.66237
3	29054	9.29567	1199	793	1161	47	0.6225	0.50805	0.96228	0.665
4	29054	9.37966	1160	777	1186	77	0.60531	0.49446	0.93775	0.6475
5	29054	11.4404	1226	747	1170	57	0.61656	0.51169	0.95557	0.66649
Average		**9.76402**	**1191.8**	**789.2**	**1152.2**	**66.8**	**0.61906**	**0.50847**	**0.94691**	**0.6616**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	29054	252.357	1122	1571	356	151	0.84156	0.75913	0.88138	0.8157
2	29054	234.904	1138	1582	364	116	0.85	0.75766	0.9075	0.82583
3	29054	236.636	1139	1566	388	107	0.84531	0.74591	0.91413	0.82149
4	29054	253.431	1115	1577	386	122	0.84125	0.74284	0.90137	0.81446
5	29054	260.392	1187	1564	353	96	0.85969	0.77078	0.92518	0.84095
Average		**247.544**	**1140.2**	**1572**	**369.4**	**118.4**	**0.84756**	**0.75526**	**0.90591**	**0.82369**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	29054	33.7707	1071	1743	184	202	0.87938	0.85339	0.84132	0.84731
2	29054	31.562	1080	1748	198	174	0.88375	0.84507	0.86124	0.85308
3	29054	33.8157	1071	1770	184	175	0.88781	0.85339	0.85955	0.85646
4	29054	35.6486	1038	1765	198	199	0.87594	0.83981	0.83913	0.83947
5	29054	36.729	1130	1733	184	153	0.89469	0.85997	0.88075	0.87023
Average		**34.3052**	**1078**	**1751.8**	**189.6**	**180.6**	**0.88431**	**0.85032**	**0.8564**	**0.85331**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	29054	2781.62	1147	1541	386	126	0.84	0.74821	0.90102	0.81753
2	29054	3236.89	1143	1561	385	111	0.845	0.74804	0.91148	0.82171
3	29054	3377.94	1140	1580	374	106	0.85	0.75297	0.91493	0.82609
4	29054	3302.7	1103	1587	376	134	0.84063	0.74577	0.89167	0.81222
5	29054	3352.57	1173	1499	418	110	0.835	0.73727	0.91426	0.81628
Average		**3210.35**	**1141.2**	**1553.6**	**387.8**	**117.4**	**0.84213**	**0.74645**	**0.90667**	**0.81877**

Features Counter with 2-gram and tf-idf
Maximum number of tokens considered 100

Logistic Regression

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.03098	674	1497	478	551	0.67844	0.58507	0.5502	0.5671
2	200	0.03197	714	1526	406	554	0.7	0.6375	0.56309	0.59799
3	200	0.03097	706	1516	430	548	0.69438	0.62148	0.563	0.59079
4	200	0.02998	736	1491	455	518	0.69594	0.61797	0.58692	0.60204
5	200	0.029	707	1492	416	585	0.68719	0.62956	0.54721	0.58551
Average		**0.03058**	**707.4**	**1504.4**	**437**	**551.2**	**0.69119**	**0.61832**	**0.56209**	**0.58869**

SGD Classifier

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.04999	341	1798	177	884	0.66844	0.6583	0.27837	0.39128
2	200	0.04398	441	1720	212	827	0.67531	0.67534	0.34779	0.45914
3	200	0.04497	608	1615	331	646	0.69469	0.6475	0.48485	0.55449
4	200	0.04397	525	1677	269	729	0.68813	0.66121	0.41866	0.5127
5	200	0.04198	734	1438	470	558	0.67875	0.60963	0.56811	0.58814
Average		**0.04498**	**529.8**	**1649.6**	**291.8**	**728.8**	**0.68106**	**0.6504**	**0.41956**	**0.50115**

Linear SVC

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.10495	692	1491	484	533	0.68219	0.58844	0.5649	0.57643
2	200	0.10528	682	1542	390	586	0.695	0.63619	0.53785	0.58291
3	200	0.12594	725	1506	440	529	0.69719	0.62232	0.57815	0.59942
4	200	0.10893	743	1491	455	511	0.69813	0.6202	0.5925	0.60604
5	200	0.11294	720	1482	426	572	0.68813	0.62827	0.55728	0.59065
Average		**0.11161**	**712.4**	**1502.4**	**439**	**546.2**	**0.69213**	**0.61908**	**0.56614**	**0.59109**

NuSVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	32.2533	698	1117	858	527	0.56719	0.44859	0.5698	0.50198
2	200	31.3864	862	945	987	406	0.56469	0.4662	0.67981	0.5531
3	200	31.6461	692	1155	791	562	0.57719	0.46662	0.55183	0.50566
4	200	30.3319	726	954	992	528	0.525	0.42258	0.57895	0.48856
5	200	30.7841	779	1028	880	513	0.56469	0.46956	0.60294	0.52796
Average		**31.2804**	**751.4**	**1039.8**	**901.6**	**507.2**	**0.55975**	**0.45471**	**0.59667**	**0.51545**

SVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	38.2522	127	1920	55	1098	0.63969	0.6978	0.10367	0.18053
2	200	36.9091	161	1867	65	1107	0.63375	0.71239	0.12697	0.21553
3	200	38.1081	156	1891	55	1098	0.63969	0.73934	0.1244	0.21297
4	200	36.9199	159	1890	56	1095	0.64031	0.73953	0.12679	0.21647
5	200	37.0148	153	1857	51	1139	0.62813	0.75	0.11842	0.20455
Average		**37.4408**	**151.2**	**1885**	**56.4**	**1107.4**	**0.63631**	**0.72781**	**0.12005**	**0.20601**

Gaussian Naive Bayes

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.07194	650	1469	506	575	0.66219	0.56228	0.53061	0.54599
2	200	0.069	663	1445	487	605	0.65875	0.57652	0.52287	0.54839
3	200	0.06902	688	1422	524	566	0.65938	0.56766	0.54864	0.55799
4	200	0.07198	652	1464	482	602	0.66125	0.57496	0.51994	0.54606
5	200	0.08196	747	1369	539	545	0.66125	0.58087	0.57817	0.57952
Average		**0.07278**	**680**	**1433.8**	**507.6**	**578.6**	**0.66056**	**0.57246**	**0.54005**	**0.55559**

Decision Tree

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.65108	973	1502	473	252	0.77344	0.67289	0.79429	0.72857
2	200	0.70196	989	1529	403	279	0.78688	0.71049	0.77997	0.74361
3	200	0.66795	982	1490	456	272	0.7725	0.68289	0.78309	0.72957
4	200	0.62412	995	1506	440	259	0.78156	0.69338	0.79346	0.74005
5	200	0.74232	1010	1514	394	282	0.78875	0.71937	0.78173	0.74926
Average		**0.67749**	**989.8**	**1508.2**	**433.2**	**268.8**	**0.78063**	**0.69581**	**0.78651**	**0.73821**

Random Forest (10 estimators)

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.51899	965	1548	427	260	0.78531	0.69325	0.78776	0.73749
2	200	0.50523	985	1563	369	283	0.79625	0.72747	0.77681	0.75133
3	200	0.48708	973	1573	373	281	0.79563	0.72288	0.77592	0.74846
4	200	0.49274	977	1611	335	277	0.80875	0.74466	0.77911	0.7615
5	200	0.50661	990	1595	313	302	0.80781	0.75979	0.76625	0.76301
Average		**0.50213**	**978**	**1578**	**363.4**	**280.6**	**0.79875**	**0.72961**	**0.77717**	**0.75236**

AdaBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	1.86697	655	1563	412	570	0.69313	0.61387	0.53469	0.57155
2	200	1.74718	683	1539	393	585	0.69438	0.63476	0.53864	0.58276
3	200	1.69302	635	1565	381	619	0.6875	0.625	0.50638	0.55947
4	200	1.72883	618	1563	383	636	0.68156	0.61738	0.49282	0.54812
5	200	1.8102	700	1514	394	592	0.69188	0.63985	0.5418	0.58676
Average		**1.76924**	**658.2**	**1548.8**	**392.6**	**600.4**	**0.68969**	**0.62617**	**0.52287**	**0.56973**

XGBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	6.75036	519	1704	271	706	0.69469	0.65696	0.42367	0.51514
2	200	6.38384	571	1633	299	697	0.68875	0.65632	0.45032	0.53414
3	200	6.3438	554	1678	268	700	0.6975	0.67397	0.44179	0.53372
4	200	6.31246	552	1668	278	702	0.69375	0.66506	0.44019	0.52975
5	200	6.31702	596	1649	259	696	0.70156	0.69708	0.4613	0.55519
Average		**6.4215**	**558.4**	**1666.4**	**275**	**700.2**	**0.69525**	**0.66988**	**0.44345**	**0.53359**

Multi-layer Perceptrons

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	24.5443	979	1521	454	246	0.78125	0.68318	0.79918	0.73664
2	200	23.873	1046	1511	421	222	0.79906	0.71302	0.82492	0.7649
3	200	23.5655	966	1529	417	288	0.77969	0.69848	0.77033	0.73265
4	200	22.8958	1012	1519	427	242	0.79094	0.70327	0.80702	0.75158
5	200	23.1402	987	1559	349	305	0.79563	0.73877	0.76393	0.75114
Average		**23.6038**	**998**	**1527.8**	**413.6**	**260.6**	**0.78931**	**0.70734**	**0.79308**	**0.74738**

Features Counter with 2-gram and tf-idf
Maximum 1000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.09796	767	1558	348	527	0.72656	0.68789	0.59274	0.63678
2	2000	0.08395	792	1608	335	465	0.75	0.70275	0.63007	0.66443
3	2000	0.08195	773	1653	327	447	0.75813	0.70273	0.63361	0.66638
4	2000	0.08196	772	1603	319	506	0.74219	0.70761	0.60407	0.65175
5	2000	0.08595	765	1627	329	479	0.7475	0.69927	0.61495	0.65441
Average		**0.08635**	**773.8**	**1609.8**	**331.6**	**484.8**	**0.74488**	**0.70005**	**0.61509**	**0.65475**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.29183	760	1595	311	534	0.73594	0.70962	0.58733	0.64271
2	2000	0.26686	874	1534	409	383	0.7525	0.68122	0.69531	0.68819
3	2000	0.25885	865	1514	466	355	0.74344	0.64989	0.70902	0.67817
4	2000	0.26585	999	1369	553	279	0.74	0.64369	0.78169	0.70601
5	2000	0.25585	828	1591	365	416	0.75594	0.69405	0.66559	0.67952
Average		**0.26785**	**865.2**	**1520.6**	**420.8**	**393.4**	**0.74556**	**0.67569**	**0.68779**	**0.67892**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.16391	860	1519	387	434	0.74344	0.68966	0.66461	0.6769
2	2000	0.17488	854	1535	408	403	0.74656	0.6767	0.6794	0.67805
3	2000	0.18691	843	1574	406	377	0.75531	0.67494	0.69098	0.68287
4	2000	0.19689	834	1524	398	444	0.73688	0.67695	0.65258	0.66454
5	2000	0.19489	835	1561	395	409	0.74875	0.67886	0.67122	0.67502
Average		**0.1835**	**845.2**	**1542.6**	**398.8**	**413.4**	**0.74619**	**0.67942**	**0.67176**	**0.67548**

NuSVC (gamma='auto')

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	307.187	874	1495	411	420	0.74031	0.68016	0.67543	0.67778
2	2000	292.724	897	1516	427	360	0.75406	0.67749	0.7136	0.69508
3	2000	292.514	865	1555	425	355	0.75625	0.67054	0.70902	0.68924
4	2000	291.423	865	1500	422	413	0.73906	0.67211	0.67684	0.67446
5	2000	279.322	859	1531	425	385	0.74688	0.669	0.69051	0.67959
Average		**292.634**	**872**	**1519.4**	**422**	**386.6**	**0.74731**	**0.67386**	**0.69308**	**0.68323**

SVC (gamma='auto')

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	268.785	0	1906	0	1294	0.59563	0	0	0
2	2000	264.768	0	1943	0	1257	0.60719	0	0	0
3	2000	265.247	0	1980	0	1220	0.61875	0	0	0
4	2000	266.478	0	1922	0	1278	0.60063	0	0	0
5	2000	255.211	0	1956	0	1244	0.61125	0	0	0
Average		**264.098**	**0**	**1941.4**	**0**	**1258.6**	**0.60669**	**0**	**0**	**0**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.66462	712	1447	459	582	0.67469	0.60803	0.55023	0.57769
2	2000	0.63964	702	1506	437	555	0.69	0.61633	0.55847	0.58598
3	2000	0.70705	765	1439	541	455	0.68875	0.58576	0.62705	0.6057
4	2000	0.64062	776	1417	505	502	0.68531	0.60578	0.6072	0.60649
5	2000	0.64261	727	1488	468	517	0.69219	0.60837	0.58441	0.59615
Average		**0.65891**	**736.4**	**1459.4**	**482**	**522.2**	**0.68619**	**0.60485**	**0.58547**	**0.5944**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	16.9953	1155	1483	423	139	0.82438	0.73194	0.89258	0.80432
2	2000	16.7165	1128	1516	427	129	0.82625	0.7254	0.89737	0.80228
3	2000	18.1211	1116	1543	437	104	0.83094	0.71861	0.91475	0.8049
4	2000	17.6639	1140	1493	429	138	0.82281	0.72658	0.89202	0.80084
5	2000	16.8194	1141	1565	391	103	0.84563	0.74478	0.9172	0.82205
Average		**17.2632**	**1136**	**1520**	**421.4**	**122.6**	**0.83**	**0.72946**	**0.90279**	**0.80688**

Random Forest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	4.55939	1102	1652	254	192	0.86063	0.81268	0.85162	0.8317
2	2000	4.47645	1059	1693	250	198	0.86	0.80901	0.84248	0.82541
3	2000	4.87521	1080	1740	240	140	0.88125	0.81818	0.88525	0.85039
4	2000	4.49243	1094	1684	238	184	0.86813	0.82132	0.85603	0.83831
5	2000	4.55142	1101	1706	250	143	0.87719	0.81495	0.88505	0.84855
Average		**4.59098**	**1087.2**	**1695**	**246.4**	**171.4**	**0.86944**	**0.81523**	**0.86408**	**0.83887**

AdaBoost

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	22.3702	726	1524	382	568	0.70313	0.65523	0.56105	0.6045
2	2000	24.3346	590	1666	277	667	0.705	0.68051	0.46937	0.55556
3	2000	22.5911	728	1517	463	492	0.70156	0.61125	0.59672	0.6039
4	2000	21.3008	590	1606	316	688	0.68625	0.65121	0.46166	0.54029
5	2000	21.5977	698	1567	389	546	0.70781	0.64213	0.56109	0.59888
Average		**22.4389**	**666.4**	**1576**	**365.4**	**592.2**	**0.70075**	**0.64807**	**0.52998**	**0.58063**

XGBoost

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	57.8609	585	1650	256	709	0.69844	0.6956	0.45209	0.54801
2	2000	59.8416	599	1661	282	658	0.70625	0.67991	0.47653	0.56034
3	2000	57.5731	600	1700	280	620	0.71875	0.68182	0.4918	0.57143
4	2000	57.3793	562	1660	262	716	0.69438	0.68204	0.43975	0.53473
5	2000	57.4202	603	1668	288	641	0.70969	0.67677	0.48473	0.56487
Average		**58.015**	**589.8**	**1667.8**	**273.6**	**668.8**	**0.7055**	**0.68323**	**0.46898**	**0.55587**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	194.166	1132	1646	260	162	0.86813	0.81322	0.87481	0.84289
2	2000	217.106	1086	1646	297	171	0.85375	0.78525	0.86396	0.82273
3	2000	194.388	1113	1652	328	107	0.86406	0.77238	0.9123	0.83653
4	2000	180.798	1144	1618	304	134	0.86313	0.79006	0.89515	0.83933
5	2000	194.712	1125	1656	300	119	0.86906	0.78947	0.90434	0.84301
Average		**196.234**	**1120**	**1643.6**	**297.8**	**138.6**	**0.86363**	**0.79008**	**0.89011**	**0.8369**

Features Counter with 2-gram and tf-idf
Maximum 5000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.24328	936	1715	220	329	0.82844	0.80969	0.73992	0.77323
2	10000	0.21417	889	1737	213	361	0.82063	0.80672	0.7112	0.75595
3	10000	0.24239	953	1733	189	325	0.83938	0.8345	0.7457	0.7876
4	10000	0.24256	913	1758	184	345	0.83469	0.83227	0.72576	0.77537
5	10000	0.24388	914	1757	201	328	0.83469	0.81973	0.73591	0.77556
Average		**0.23726**	**921**	**1740**	**201.4**	**337.6**	**0.83156**	**0.82058**	**0.7317**	**0.77354**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1.42597	1055	1614	321	210	0.83406	0.76672	0.83399	0.79894
2	10000	1.32734	1029	1593	357	221	0.81938	0.74242	0.8232	0.78073
3	10000	1.43417	1010	1693	229	268	0.84469	0.81517	0.7903	0.80254
4	10000	1.43217	959	1749	193	299	0.84625	0.83247	0.76232	0.79585
5	10000	1.42698	998	1662	296	244	0.83125	0.77125	0.80354	0.78707
Average		**1.40933**	**1010.2**	**1662.2**	**279.2**	**248.4**	**0.83513**	**0.78561**	**0.80267**	**0.79303**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.36448	1104	1654	281	161	0.86188	0.79711	0.87273	0.83321
2	10000	0.32606	1067	1696	254	183	0.86344	0.80772	0.8536	0.83003
3	10000	0.34605	1077	1679	243	201	0.86125	0.81591	0.84272	0.8291
4	10000	0.35361	1067	1715	227	191	0.86938	0.82457	0.84817	0.83621
5	10000	0.36193	1053	1706	252	189	0.86219	0.8069	0.84783	0.82686
Average		**0.35042**	**1073.6**	**1690**	**251.4**	**185**	**0.86363**	**0.81044**	**0.85301**	**0.83108**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1.64961	772	1694	241	493	0.77063	0.76209	0.61028	0.67779
2	10000	1.37446	748	1720	230	502	0.77125	0.76483	0.5984	0.67145
3	10000	1.64721	787	1704	218	491	0.77844	0.78308	0.61581	0.68944
4	10000	1.64845	773	1741	201	485	0.78563	0.79363	0.61447	0.69265
5	10000	1.64249	746	1733	225	496	0.77469	0.76828	0.60064	0.6742
Average		**1.59244**	**765.2**	**1718.4**	**223**	**493.4**	**0.77613**	**0.77438**	**0.60792**	**0.68111**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	41.7946	1148	1530	405	117	0.83688	0.73921	0.90751	0.81476
2	10000	43.1443	1135	1581	369	115	0.84875	0.75465	0.908	0.82426
3	10000	42.5634	1155	1539	383	123	0.84188	0.75098	0.90376	0.82031
4	10000	43.1757	1144	1601	341	114	0.85781	0.77037	0.90938	0.83412
5	10000	42.5902	1134	1529	429	108	0.83219	0.72553	0.91304	0.80856
Average		**42.6536**	**1143.2**	**1556**	**385.4**	**115.4**	**0.8435**	**0.74815**	**0.90834**	**0.8204**

Random Forest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	12.7541	1071	1732	203	194	0.87594	0.84066	0.84664	0.84364
2	10000	13.3162	1063	1780	170	187	0.88844	0.86212	0.8504	0.85622
3	10000	13.0839	1085	1746	176	193	0.88469	0.86043	0.84898	0.85467
4	10000	11.5954	1061	1757	185	197	0.88063	0.85152	0.8434	0.84744
5	10000	12.6269	1054	1758	200	188	0.87875	0.84051	0.84863	0.84455
Average		**12.6753**	**1066.8**	**1754.6**	**186.8**	**191.8**	**0.88169**	**0.85105**	**0.84761**	**0.8493**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	450.002	1127	1573	362	138	0.84375	0.75688	0.89091	0.81845
2	10000	305.384	1110	1612	338	140	0.85063	0.76657	0.888	0.82283
3	10000	392.429	1139	1610	312	139	0.85906	0.78498	0.89124	0.83474
4	10000	273.405	1110	1647	295	148	0.86156	0.79004	0.88235	0.83365
5	10000	415.502	1101	1644	314	141	0.85781	0.77809	0.88647	0.82875
Average		**367.344**	**1117.4**	**1617.2**	**324.2**	**141.2**	**0.85456**	**0.77531**	**0.88779**	**0.82768**

Features Counter with 2-gram and tf-idf
Maximum 10000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	0.64224	972	1782	148	298	0.86063	0.86786	0.76535	0.81339
2	20000	0.62265	923	1837	128	312	0.8625	0.87821	0.74737	0.80752
3	20000	0.62195	956	1803	115	326	0.86219	0.89262	0.74571	0.81258
4	20000	0.7875	939	1809	113	339	0.85875	0.89259	0.73474	0.80601
5	20000	0.54469	954	1835	137	274	0.87156	0.87443	0.77687	0.82277
Average		**0.64381**	**948.8**	**1813.2**	**128.2**	**309.8**	**0.86313**	**0.88114**	**0.75401**	**0.81245**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	2.50537	1064	1699	231	206	0.86344	0.82162	0.8378	0.82963
2	20000	2.37564	962	1832	133	273	0.87313	0.87854	0.77895	0.82575
3	20000	2.379	952	1828	90	330	0.86875	0.91363	0.74259	0.81928
4	20000	2.51014	1032	1736	186	246	0.865	0.84729	0.80751	0.82692
5	20000	2.20374	1083	1634	338	145	0.84906	0.76214	0.88192	0.81767
Average		**2.39478**	**1018.6**	**1745.8**	**195.6**	**240**	**0.86388**	**0.84464**	**0.80975**	**0.82385**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	0.74983	1114	1749	181	156	0.89469	0.86023	0.87717	0.86862
2	20000	0.72458	1072	1788	177	163	0.89375	0.85829	0.86802	0.86312
3	20000	0.79116	1105	1745	173	177	0.89063	0.86463	0.86193	0.86328
4	20000	0.96412	1097	1750	172	181	0.88969	0.86446	0.85837	0.86141
5	20000	0.71959	1089	1797	175	139	0.90188	0.86155	0.88681	0.874
Average		**0.78986**	**1095.4**	**1765.8**	**175.6**	**163.2**	**0.89413**	**0.86183**	**0.87046**	**0.86608**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	6.64767	944	1687	243	326	0.82219	0.79528	0.74331	0.76842
2	20000	6.70417	919	1721	244	316	0.825	0.7902	0.74413	0.76647
3	20000	6.71703	953	1701	217	329	0.82938	0.81453	0.74337	0.77732
4	20000	6.87714	926	1703	219	352	0.82156	0.80873	0.72457	0.76434
5	20000	6.46832	923	1746	226	305	0.83406	0.80331	0.75163	0.77661
Average		**6.68287**	**933**	**1711.6**	**229.8**	**325.6**	**0.82644**	**0.80241**	**0.7414**	**0.77063**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	125.658	1155	1527	403	115	0.83813	0.74134	0.90945	0.81683
2	20000	116.023	1131	1595	370	104	0.85188	0.7535	0.91579	0.82675
3	20000	126.169	1155	1566	352	127	0.85031	0.76642	0.90094	0.82825
4	20000	113.904	1146	1540	382	132	0.83938	0.75	0.89671	0.81682
5	20000	117.293	1135	1580	392	93	0.84844	0.74329	0.92427	0.82396
Average		**119.809**	**1144.4**	**1561.6**	**379.8**	**114.2**	**0.84563**	**0.75091**	**0.90943**	**0.82252**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	37.153	1057	1798	132	213	0.89219	0.88898	0.83228	0.8597
2	20000	34.7602	1029	1854	111	206	0.90094	0.90263	0.8332	0.86653
3	20000	39.3083	1053	1802	116	229	0.89219	0.90077	0.82137	0.85924
4	20000	35.6396	1047	1823	99	231	0.89688	0.91361	0.81925	0.86386
5	20000	32.6304	1062	1813	159	166	0.89844	0.86978	0.86482	0.86729
Average		**35.8983**	**1049.6**	**1818**	**123.4**	**209**	**0.89613**	**0.89516**	**0.83418**	**0.86332**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	1521.43	1133	1721	209	137	0.89188	0.84426	0.89213	0.86753
2	20000	1127.55	1090	1746	219	145	0.88625	0.8327	0.88259	0.85692
3	20000	1255.74	1112	1711	207	170	0.88219	0.84306	0.86739	0.85506
4	20000	1325.19	1122	1682	240	156	0.87625	0.82379	0.87793	0.85
5	20000	1053.9	1098	1723	249	130	0.88156	0.81514	0.89414	0.85282
Average		**1256.76**	**1111**	**1716.6**	**224.8**	**147.6**	**0.88363**	**0.83179**	**0.88284**	**0.85646**

Features Counter with 2-gram and tf-idf
Maximum 25000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	1.17973	1073	1863	67	197	0.9175	0.94123	0.84488	0.89046
2	39527	1.05138	1037	1914	67	182	0.92219	0.93931	0.8507	0.89281
3	39527	1.04809	1062	1867	80	191	0.91531	0.92995	0.84757	0.88685
4	39527	1.04839	1113	1846	86	155	0.92469	0.92827	0.87776	0.90231
5	39527	1.05999	1082	1861	56	201	0.91969	0.95079	0.84334	0.89385
Average		**1.07752**	**1073.4**	**1870.2**	**71.2**	**185.2**	**0.91988**	**0.93791**	**0.85285**	**0.89325**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	4.0348	1091	1829	101	179	0.9125	0.91527	0.85906	0.88627
2	39527	4.04371	1038	1915	66	181	0.92281	0.94022	0.85152	0.89367
3	39527	4.00273	1081	1833	114	172	0.91063	0.9046	0.86273	0.88317
4	39527	4.03471	1096	1878	54	172	0.92938	0.95304	0.86435	0.90653
5	39527	4.09187	1115	1794	123	168	0.90906	0.90065	0.86906	0.88457
Average		**4.04156**	**1084.2**	**1849.8**	**91.6**	**174.4**	**0.91688**	**0.92276**	**0.86134**	**0.89084**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	1.20633	1094	1839	91	176	0.91656	0.92321	0.86142	0.89124
2	39527	1.26929	1051	1883	98	168	0.91688	0.91471	0.86218	0.88767
3	39527	1.18432	1083	1850	97	170	0.91656	0.9178	0.86433	0.89026
4	39527	1.23531	1140	1835	97	128	0.92969	0.92158	0.89905	0.91018
5	39527	1.20131	1101	1837	80	182	0.91813	0.93226	0.85814	0.89367
Average		**1.21931**	**1093.8**	**1848.8**	**92.6**	**164.8**	**0.91956**	**0.92191**	**0.86902**	**0.8946**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	24.3581	1031	1735	195	239	0.86438	0.84095	0.81181	0.82612
2	39527	87.1822	976	1770	211	243	0.85813	0.82224	0.80066	0.81131
3	39527	74.714	1010	1744	203	243	0.86063	0.83265	0.80607	0.81914
4	39527	24.581	1021	1715	217	247	0.855	0.82472	0.80521	0.81484
5	39527	23.9113	1010	1755	162	273	0.86406	0.86177	0.78722	0.82281
Average		**46.9493**	**1009.6**	**1743.8**	**197.6**	**249**	**0.86044**	**0.83647**	**0.80219**	**0.81884**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	248.533	1163	1595	335	107	0.86188	0.77637	0.91575	0.84032
2	39527	240.813	1093	1602	379	126	0.84219	0.74253	0.89664	0.81234
3	39527	252.181	1138	1563	384	115	0.84406	0.7477	0.90822	0.82018
4	39527	259.117	1165	1592	340	103	0.86156	0.77409	0.91877	0.84025
5	39527	258.686	1163	1557	360	120	0.85	0.76362	0.90647	0.82894
Average		**251.866**	**1144.4**	**1581.8**	**359.6**	**114.2**	**0.85194**	**0.76086**	**0.90917**	**0.8284**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	63.7544	1041	1823	107	229	0.895	0.90679	0.81969	0.86104
2	39527	64.9989	998	1883	98	221	0.90031	0.91058	0.8187	0.8622
3	39527	63.7473	1001	1882	65	252	0.90094	0.93902	0.79888	0.8633
4	39527	65.2817	1071	1838	94	197	0.90906	0.91931	0.84464	0.88039
5	39527	68.3099	1037	1841	76	246	0.89938	0.93172	0.80826	0.86561
Average		**65.2184**	**1029.6**	**1853.4**	**88**	**229**	**0.90094**	**0.92149**	**0.81803**	**0.86651**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	1998.7	1099	1795	135	171	0.90438	0.8906	0.86535	0.8778
2	39527	1711.62	1047	1857	124	172	0.9075	0.89411	0.8589	0.87615
3	39527	1822.29	1085	1827	120	168	0.91	0.90041	0.86592	0.88283
4	39527	1200.13	1135	1833	99	133	0.9275	0.91977	0.89511	0.90727
5	39527	1424.88	1105	1804	113	178	0.90906	0.90722	0.86126	0.88365
Average		**1631.53**	**1094.2**	**1823.2**	**118.2**	**164.4**	**0.91169**	**0.90242**	**0.86931**	**0.88554**

1-2-gram-count_tfidf

Features Counter with 1-2-gram and tf-idf
Maximum number of tokens considered 100

Logistic Regression

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.046	681	1513	432	574	0.68563	0.61186	0.54263	0.57517
2	200	0.04096	672	1545	379	604	0.69281	0.63939	0.52665	0.57757
3	200	0.03697	669	1517	441	573	0.68313	0.6027	0.53865	0.56888
4	200	0.03598	689	1516	411	584	0.68906	0.62636	0.54124	0.5807
5	200	0.04497	675	1534	419	572	0.69031	0.617	0.5413	0.57668
Average		**0.04098**	**677.2**	**1525**	**416.4**	**581.4**	**0.68819**	**0.61946**	**0.53809**	**0.5758**

SGD Classifier

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.043	873	1285	660	382	0.67438	0.56947	0.69562	0.62626
2	200	0.04298	701	1523	401	575	0.695	0.63612	0.54937	0.58957
3	200	0.04198	777	1420	538	465	0.68656	0.59087	0.6256	0.60774
4	200	0.04296	730	1465	462	543	0.68594	0.61242	0.57345	0.59229
5	200	0.04198	492	1667	286	755	0.67469	0.63239	0.39455	0.48593
Average		**0.04258**	**714.6**	**1472**	**469.4**	**544**	**0.68331**	**0.60825**	**0.56772**	**0.58036**

Linear SVC

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.09248	701	1516	429	554	0.69281	0.62035	0.55857	0.58784
2	200	0.10892	682	1533	391	594	0.69219	0.6356	0.53448	0.58067
3	200	0.11593	683	1510	448	559	0.68531	0.60389	0.54992	0.57564
4	200	0.11693	702	1493	434	571	0.68594	0.61796	0.55145	0.58281
5	200	0.12993	684	1531	422	563	0.69219	0.61844	0.54852	0.58139
Average		**0.11284**	**690.4**	**1516.6**	**424.8**	**568.2**	**0.68969**	**0.61925**	**0.54859**	**0.58167**

NuSVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	32.6692	740	1393	552	515	0.66656	0.57276	0.58964	0.58108
2	200	35.8643	726	1409	515	550	0.66719	0.58501	0.56897	0.57688
3	200	33.2531	706	1435	523	536	0.66906	0.57445	0.56844	0.57143
4	200	32.6583	768	1370	557	505	0.66813	0.57962	0.6033	0.59122
5	200	31.8468	726	1450	503	521	0.68	0.59072	0.5822	0.58643
Average		**33.2584**	**733.2**	**1411.4**	**530**	**525.4**	**0.67019**	**0.58051**	**0.58251**	**0.58141**

SVC (gamma='auto')

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	38.1962	240	1826	119	1015	0.64563	0.66852	0.19124	0.2974
2	200	37.095	220	1849	75	1056	0.64656	0.74576	0.17241	0.28008
3	200	37.034	209	1873	85	1033	0.65063	0.71088	0.16828	0.27214
4	200	36.2643	222	1848	79	1051	0.64688	0.73754	0.17439	0.28208
5	200	35.7756	203	1867	86	1044	0.64688	0.70242	0.16279	0.26432
Average		**36.873**	**218.8**	**1852.6**	**88.8**	**1039.8**	**0.64731**	**0.71303**	**0.17382**	**0.2792**

Gaussian Naive Bayes

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.07297	905	1192	753	350	0.65531	0.54584	0.72112	0.62135
2	200	0.08199	894	1223	701	382	0.66156	0.5605	0.70063	0.62278
3	200	0.06896	901	1165	793	341	0.64563	0.53188	0.72544	0.61376
4	200	0.06794	923	1143	784	350	0.64563	0.54071	0.72506	0.61946
5	200	0.06794	899	1181	772	348	0.65	0.538	0.72093	0.61618
Average		**0.07196**	**904.4**	**1180.8**	**760.6**	**354.2**	**0.65163**	**0.54339**	**0.71863**	**0.61871**

Decision Tree

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.89597	997	1506	439	258	0.78219	0.69429	0.79442	0.74099
2	200	0.86156	966	1527	397	310	0.77906	0.70873	0.75705	0.7321
3	200	0.84052	951	1525	433	291	0.77375	0.68714	0.7657	0.7243
4	200	0.82451	989	1484	443	284	0.77281	0.69064	0.7769	0.73124
5	200	0.84451	956	1523	430	291	0.77469	0.68975	0.76664	0.72617
Average		**0.85341**	**971.8**	**1513**	**428.4**	**286.8**	**0.7765**	**0.69411**	**0.77214**	**0.73096**

RandomForest (10 estimators)

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	0.47612	997	1536	409	258	0.79156	0.7091	0.79442	0.74934
2	200	0.46871	989	1549	375	287	0.79313	0.72507	0.77508	0.74924
3	200	0.44974	946	1590	368	296	0.7925	0.71994	0.76167	0.74022
4	200	0.44073	988	1554	373	285	0.79438	0.72594	0.77612	0.75019
5	200	0.44973	981	1530	423	266	0.78469	0.69872	0.78669	0.7401
Average		**0.45701**	**980.2**	**1551.8**	**389.6**	**278.4**	**0.79125**	**0.71575**	**0.7788**	**0.74582**

AdaBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	1.8978	695	1476	469	560	0.67844	0.59708	0.55378	0.57462
2	200	1.81506	664	1563	361	612	0.69594	0.6478	0.52038	0.57714
3	200	1.74099	615	1586	372	627	0.68781	0.6231	0.49517	0.55182
4	200	1.67602	658	1546	381	615	0.68875	0.6333	0.51689	0.5692
5	200	1.725	683	1534	419	564	0.69281	0.61978	0.54771	0.58152
Average		**1.77097**	**663**	**1541**	**400.4**	**595.6**	**0.68875**	**0.62421**	**0.52679**	**0.57086**

XGBoost

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	6.49545	565	1627	318	690	0.685	0.63986	0.4502	0.52853
2	200	6.49312	533	1678	246	743	0.69094	0.68421	0.41771	0.51873
3	200	6.43231	535	1695	263	707	0.69688	0.67043	0.43076	0.52451
4	200	6.08152	547	1681	246	726	0.69625	0.68979	0.42969	0.52953
5	200	6.0845	554	1687	266	693	0.70031	0.67561	0.44427	0.53604
Average		**6.31738**	**546.8**	**1673.6**	**267.8**	**711.8**	**0.69388**	**0.67198**	**0.43453**	**0.52747**

Multi-layer Perceptrons

	Feature number	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	200	25.6885	1029	1505	440	226	0.79188	0.70048	0.81992	0.75551
2	200	23.831	959	1563	361	317	0.78813	0.72652	0.75157	0.73883
3	200	23.3834	1006	1508	450	236	0.78563	0.69093	0.80998	0.74574
4	200	23.4585	971	1548	379	302	0.78719	0.71926	0.76277	0.74037
5	200	23.8078	976	1496	457	271	0.7725	0.68109	0.78268	0.72836
Average		**24.0338**	**988.2**	**1524**	**417.4**	**270.4**	**0.78506**	**0.70365**	**0.78538**	**0.74176**

Features Counter with 1-2-gram and tf-idf
Maximum 1000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.10792	748	1612	393	447	0.7375	0.65557	0.62594	0.64041
2	2000	0.10194	820	1556	375	449	0.7425	0.68619	0.64618	0.66558
3	2000	0.09995	804	1540	374	482	0.7325	0.68251	0.62519	0.6526
4	2000	0.09994	780	1554	379	487	0.72938	0.67299	0.61563	0.64303
5	2000	0.10694	805	1549	375	471	0.73563	0.6822	0.63088	0.65554
Average		**0.10334**	**791.4**	**1562.2**	**379.2**	**467.2**	**0.7355**	**0.67589**	**0.62876**	**0.65143**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.26085	620	1710	295	575	0.72813	0.6776	0.51883	0.58768
2	2000	0.25887	907	1451	480	362	0.73688	0.65393	0.71474	0.68298
3	2000	0.24986	877	1444	470	409	0.72531	0.65108	0.68196	0.66616
4	2000	0.25086	741	1595	338	526	0.73	0.68675	0.58485	0.63171
5	2000	0.25387	879	1474	450	397	0.73531	0.6614	0.68887	0.67486
Average		**0.25486**	**804.8**	**1534.8**	**406.6**	**453.8**	**0.73113**	**0.66615**	**0.63785**	**0.64868**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.22087	784	1589	416	411	0.74156	0.65333	0.65607	0.6547
2	2000	0.24784	864	1502	429	405	0.73938	0.66821	0.68085	0.67447
3	2000	0.20088	854	1520	394	432	0.74188	0.68429	0.66407	0.67403
4	2000	0.22987	828	1515	418	439	0.73219	0.66453	0.65351	0.65897
5	2000	0.22187	882	1510	414	394	0.7475	0.68056	0.69122	0.68585
Average		**0.22427**	**842.4**	**1527.2**	**414.2**	**416.2**	**0.7405**	**0.67018**	**0.66915**	**0.6696**

NuSVC (gamma='auto')

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	291.689	833	1543	462	362	0.7425	0.64324	0.69707	0.66908
2	2000	277.724	907	1448	483	362	0.73594	0.65252	0.71474	0.68221
3	2000	279.595	891	1483	431	395	0.74188	0.67398	0.69285	0.68328
4	2000	280.658	871	1483	450	396	0.73563	0.65935	0.68745	0.67311
5	2000	278.512	924	1463	461	352	0.74594	0.66715	0.72414	0.69448
Average		**281.636**	**885.2**	**1484**	**457.4**	**373.4**	**0.74038**	**0.65925**	**0.70325**	**0.68043**

SVC (gamma='auto')

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	266.963	0	2005	0	1195	0.62656	0	0	0
2	2000	255.383	0	1931	0	1269	0.60344	0	0	0
3	2000	256.068	0	1914	0	1286	0.59813	0	0	0
4	2000	256.603	0	1933	0	1267	0.60406	0	0	0
5	2000	256.311	0	1924	0	1276	0.60125	0	0	0
Average		**258.266**	**0**	**1941.4**	**0**	**1258.6**	**0.60669**	**0**	**0**	**0**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	0.6686	958	876	1129	237	0.57313	0.45903	0.80167	0.58379
2	2000	0.63963	989	952	979	280	0.60656	0.50254	0.77935	0.61106
3	2000	0.64363	1048	870	1044	238	0.59938	0.50096	0.81493	0.62049
4	2000	0.64163	1016	921	1012	251	0.60531	0.50099	0.80189	0.61669
5	2000	0.63962	1011	910	1014	265	0.60031	0.49926	0.79232	0.61254
Average		**0.64662**	**1004.4**	**905.8**	**1035.6**	**254.2**	**0.59694**	**0.49255**	**0.79803**	**0.60891**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	22.764	1067	1594	411	128	0.83156	0.72192	0.89289	0.79835
2	2000	23.9493	1139	1520	411	130	0.83094	0.73484	0.89756	0.80809
3	2000	23.0188	1165	1496	418	121	0.83156	0.73594	0.90591	0.81213
4	2000	22.2823	1139	1525	408	128	0.8325	0.73626	0.89897	0.80952
5	2000	20.927	1146	1515	409	130	0.83156	0.73698	0.89812	0.80961
Average		**22.5883**	**1131.2**	**1530**	**411.4**	**127.4**	**0.83163**	**0.73319**	**0.89869**	**0.80754**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	3.6679	1026	1707	298	169	0.85406	0.77492	0.85858	0.81461
2	2000	3.49299	1106	1662	269	163	0.865	0.80436	0.87155	0.83661
3	2000	3.74686	1118	1630	284	168	0.85875	0.79743	0.86936	0.83185
4	2000	3.51699	1084	1635	298	183	0.84969	0.78437	0.85556	0.81842
5	2000	3.59794	1114	1636	288	162	0.85938	0.79458	0.87304	0.83196
Average		**3.60454**	**1089.6**	**1654**	**287.4**	**169**	**0.85738**	**0.79113**	**0.86562**	**0.82669**

AdaBoost

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	22.3802	722	1520	485	473	0.70063	0.59818	0.60418	0.60117
2	2000	21.9604	661	1607	324	608	0.70875	0.67107	0.52088	0.58651
3	2000	22.0304	665	1578	336	621	0.70094	0.66434	0.51711	0.58155
4	2000	22.0334	617	1571	362	650	0.68375	0.63023	0.48698	0.54942
5	2000	21.9924	789	1474	450	487	0.70719	0.6368	0.61834	0.62744
Average		**22.0794**	**690.8**	**1550**	**391.4**	**567.8**	**0.70025**	**0.64012**	**0.5495**	**0.58922**

XGBoost

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	58.2497	585	1732	273	610	0.72406	0.68182	0.48954	0.5699
2	2000	57.752	630	1673	258	639	0.71969	0.70946	0.49645	0.58414
3	2000	57.4372	588	1645	269	698	0.69781	0.68611	0.45723	0.54876
4	2000	57.789	527	1677	256	740	0.68875	0.67305	0.41594	0.51415
5	2000	58.0208	591	1632	292	685	0.69469	0.66931	0.46317	0.54748
Average		**57.8497**	**584.2**	**1671.8**	**269.6**	**674.4**	**0.705**	**0.68395**	**0.46447**	**0.55289**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	2000	208.103	1055	1729	276	140	0.87	0.79264	0.88285	0.83531
2	2000	166.255	1147	1650	281	122	0.87406	0.80322	0.90386	0.85057
3	2000	152.448	1129	1677	237	157	0.87688	0.8265	0.87792	0.85143
4	2000	180.686	1125	1647	286	142	0.86625	0.79731	0.88792	0.84018
5	2000	155.819	1155	1629	295	121	0.87	0.79655	0.90517	0.8474
Average		**172.662**	**1122.2**	**1666.4**	**275**	**136.4**	**0.87144**	**0.80324**	**0.89154**	**0.84498**

Features Counter with 1-2-gram and tf-idf
Maximum 5000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.27022	939	1621	334	306	0.8	0.73763	0.75422	0.74583
2	10000	0.24974	956	1630	305	309	0.80813	0.75813	0.75573	0.75693
3	10000	0.24729	938	1651	305	306	0.80906	0.75463	0.75402	0.75432
4	10000	0.2828	940	1622	322	316	0.80063	0.74485	0.74841	0.74662
5	10000	0.24578	950	1605	312	333	0.79844	0.75277	0.74045	0.74656
Average		**0.25917**	**944.6**	**1625.8**	**315.6**	**314**	**0.80325**	**0.7496**	**0.75057**	**0.75005**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1.40143	988	1579	376	257	0.80219	0.72434	0.79357	0.75738
2	10000	1.34309	1117	1370	565	148	0.77719	0.66409	0.883	0.75806
3	10000	1.29762	1033	1526	430	211	0.79969	0.70608	0.83039	0.76321
4	10000	1.39008	848	1693	251	408	0.79406	0.77161	0.67516	0.72017
5	10000	1.29917	994	1568	349	289	0.80063	0.74013	0.77475	0.75704
Average		**1.34628**	**996**	**1547.2**	**394.2**	**262.6**	**0.79475**	**0.72125**	**0.79137**	**0.75117**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	0.44158	1089	1571	384	156	0.83125	0.73931	0.8747	0.80132
2	10000	0.44763	1093	1569	366	172	0.83188	0.74914	0.86403	0.8025
3	10000	0.33101	1079	1611	345	165	0.84063	0.75772	0.86736	0.80885
4	10000	0.44719	1071	1576	368	185	0.82719	0.74427	0.85271	0.79481
5	10000	0.39435	1108	1596	321	175	0.845	0.77537	0.8636	0.81711
Average		**0.41235**	**1088**	**1584.6**	**356.8**	**170.6**	**0.83519**	**0.75316**	**0.86448**	**0.80492**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	1.65295	949	1474	481	296	0.75719	0.66364	0.76225	0.70953
2	10000	1.64778	974	1442	493	291	0.755	0.66394	0.76996	0.71303
3	10000	1.39797	923	1491	465	321	0.75438	0.66499	0.74196	0.70137
4	10000	1.63746	977	1414	530	279	0.74719	0.64831	0.77787	0.7072
5	10000	1.42765	1045	1403	514	238	0.765	0.6703	0.8145	0.7354
Average		**1.55277**	**973.6**	**1444.8**	**496.6**	**285**	**0.75575**	**0.66223**	**0.77331**	**0.71331**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	59.537	1121	1542	413	124	0.83219	0.73077	0.9004	0.80677
2	10000	63.3021	1145	1548	387	120	0.84156	0.74739	0.90514	0.81873
3	10000	60.0853	1132	1536	420	112	0.83375	0.72938	0.90997	0.80973
4	10000	60.3947	1130	1536	408	126	0.83313	0.73472	0.89968	0.80888
5	10000	62.0795	1173	1533	384	110	0.84563	0.75337	0.91426	0.82606
Average		**61.0797**	**1140.2**	**1539**	**402.4**	**118.4**	**0.83725**	**0.73913**	**0.90589**	**0.81403**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	9.32504	1094	1706	249	151	0.875	0.81459	0.87871	0.84544
2	10000	9.52285	1110	1690	245	155	0.875	0.81919	0.87747	0.84733
3	10000	10.2243	1088	1728	228	156	0.88	0.82675	0.8746	0.85
4	10000	10.7489	1087	1702	242	169	0.87156	0.81791	0.86545	0.84101
5	10000	10.0919	1111	1702	215	172	0.87906	0.83786	0.86594	0.85167
Average		**9.98259**	**1098**	**1705.6**	**235.8**	**160.6**	**0.87613**	**0.82326**	**0.87243**	**0.84709**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	10000	395.041	1114	1569	386	131	0.83844	0.74267	0.89478	0.81166
2	10000	459.154	1127	1582	353	138	0.84656	0.76149	0.89091	0.82113
3	10000	378.663	1109	1609	347	135	0.84938	0.76168	0.89148	0.82148
4	10000	489.748	1117	1560	384	139	0.83656	0.74417	0.88933	0.8103
5	10000	437.207	1156	1550	367	127	0.84563	0.75903	0.90101	0.82395
Average		**431.963**	**1124.6**	**1574**	**367.4**	**134**	**0.84331**	**0.75381**	**0.8935**	**0.8177**

Features Counter with 1-2-gram and tf-idf
Maximum 10000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	0.64863	1029	1688	240	243	0.84906	0.81087	0.80896	0.80992
2	20000	0.59366	1014	1692	233	261	0.84563	0.81315	0.79529	0.80412
3	20000	0.70496	996	1726	250	228	0.85063	0.79936	0.81373	0.80648
4	20000	0.72825	1033	1699	235	233	0.85375	0.81467	0.81596	0.81531
5	20000	0.76355	1037	1724	220	219	0.86281	0.82498	0.82564	0.82531
Average		**0.68781**	**1021.8**	**1705.8**	**235.6**	**236.8**	**0.85238**	**0.81261**	**0.81191**	**0.81223**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	2.31268	1102	1608	320	170	0.84688	0.77496	0.86635	0.81811
2	20000	2.17376	1068	1627	298	207	0.84219	0.78184	0.83765	0.80878
3	20000	2.4023	1037	1673	303	187	0.84688	0.77388	0.84722	0.80889
4	20000	2.46507	946	1777	157	320	0.85094	0.85766	0.74724	0.79865
5	20000	2.3323	1024	1732	212	232	0.86125	0.82848	0.81529	0.82183
Average		**2.33722**	**1035.4**	**1683.4**	**258**	**223.2**	**0.84963**	**0.80337**	**0.82275**	**0.81125**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	0.78055	1137	1647	281	135	0.87	0.80183	0.89387	0.84535
2	20000	0.74557	1111	1651	274	164	0.86313	0.80217	0.87137	0.83534
3	20000	0.86749	1087	1692	284	137	0.86844	0.79285	0.88807	0.83776
4	20000	0.81107	1121	1683	251	145	0.87625	0.81706	0.88547	0.84989
5	20000	0.82391	1122	1690	254	134	0.87875	0.81541	0.89331	0.85258
Average		**0.80572**	**1115.6**	**1672.6**	**268.8**	**143**	**0.87131**	**0.80586**	**0.88642**	**0.84419**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	9.0998	925	1694	234	347	0.81844	0.7981	0.7272	0.761
2	20000	10.1112	892	1696	229	383	0.80875	0.79572	0.69961	0.74457
3	20000	7.57925	876	1726	250	348	0.81313	0.77798	0.71569	0.74553
4	20000	6.84001	899	1676	258	367	0.80469	0.77701	0.71011	0.74206
5	20000	6.60794	880	1727	217	376	0.81469	0.80219	0.70064	0.74798
Average		**8.04764**	**894.4**	**1703.8**	**237.6**	**364.2**	**0.81194**	**0.7902**	**0.71065**	**0.74823**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	145.716	1162	1527	401	110	0.84031	0.74344	0.91352	0.81975
2	20000	151.455	1162	1571	354	113	0.85406	0.76649	0.91137	0.83268
3	20000	156.756	1105	1590	386	119	0.84219	0.74111	0.90278	0.814
4	20000	164.212	1156	1538	396	110	0.84188	0.74485	0.91311	0.82044
5	20000	170.732	1138	1561	383	118	0.84344	0.74819	0.90605	0.81959
Average		**157.774**	**1144.6**	**1557.4**	**384**	**114**	**0.84438**	**0.74882**	**0.90937**	**0.82129**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	26.8896	1104	1721	207	168	0.88281	0.84211	0.86792	0.85482
2	20000	24.6759	1072	1752	173	203	0.8825	0.86104	0.84078	0.85079
3	20000	25.6428	1082	1784	192	142	0.89563	0.84929	0.88399	0.86629
4	20000	28.7441	1096	1741	193	170	0.88656	0.85027	0.86572	0.85793
5	20000	27.7863	1081	1752	192	175	0.88531	0.84918	0.86067	0.85488
Average		**26.7477**	**1087**	**1750**	**191.4**	**171.6**	**0.88656**	**0.85038**	**0.86382**	**0.85694**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	20000	1324.95	1151	1607	321	121	0.86188	0.78193	0.90487	0.83892
2	20000	1171.7	1115	1683	242	160	0.87438	0.82167	0.87451	0.84726
3	20000	1353.47	1104	1658	318	120	0.86313	0.77637	0.90196	0.83447
4	20000	1283.41	1115	1670	264	151	0.87031	0.80856	0.88073	0.8431
5	20000	1388.68	1135	1652	292	121	0.87094	0.79537	0.90366	0.84607
Average		**1304.44**	**1124**	**1654**	**287.4**	**134.6**	**0.86813**	**0.79678**	**0.89315**	**0.84196**

Features Counter with 1-2-gram and tf-idf
Maximum 25000

Logistic Regression

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	1.54163	1076	1821	122	181	0.90531	0.89816	0.85601	0.87658
2	39527	1.12935	1114	1800	149	137	0.91063	0.88203	0.89049	0.88624
3	39527	1.16637	1091	1787	125	197	0.89938	0.8972	0.84705	0.87141
4	39527	1.10337	1052	1844	131	173	0.905	0.88926	0.85878	0.87375
5	39527	1.13423	1069	1810	118	203	0.89969	0.90059	0.84041	0.86946
Average		**1.21499**	**1080.4**	**1812.4**	**129**	**178.2**	**0.904**	**0.89345**	**0.85855**	**0.87549**

SGD Classifier

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	4.36326	1085	1809	134	172	0.90438	0.89007	0.86317	0.87641
2	39527	3.98374	1126	1780	169	125	0.90813	0.8695	0.90008	0.88452
3	39527	3.99973	1118	1726	186	170	0.88875	0.85736	0.86801	0.86265
4	39527	3.93575	1032	1875	100	193	0.90844	0.91166	0.84245	0.87569
5	39527	4.03571	1074	1787	141	198	0.89406	0.88395	0.84434	0.86369
Average		**4.06364**	**1087**	**1795.4**	**146**	**171.6**	**0.90075**	**0.88251**	**0.86361**	**0.87259**

Linear SVC

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	1.47018	1096	1804	139	161	0.90625	0.88745	0.87192	0.87961
2	39527	1.32926	1130	1790	159	121	0.9125	0.87665	0.90328	0.88976
3	39527	1.35823	1111	1779	133	177	0.90313	0.89309	0.86258	0.87757
4	39527	1.44218	1063	1816	159	162	0.89969	0.86989	0.86776	0.86882
5	39527	1.39021	1075	1802	126	197	0.89906	0.89509	0.84513	0.86939
Average		**1.39801**	**1095**	**1798.2**	**143.2**	**163.6**	**0.90413**	**0.88443**	**0.87013**	**0.87703**

Gaussian Naive Bayes

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	16.7425	984	1775	168	273	0.86219	0.85417	0.78282	0.81694
2	39527	40.6188	1009	1773	176	242	0.86938	0.85148	0.80655	0.82841
3	39527	27.8601	987	1746	166	301	0.85406	0.85603	0.7663	0.80868
4	39527	27.8511	959	1815	160	266	0.86688	0.85702	0.78286	0.81826
5	39527	18.7093	994	1765	163	278	0.86219	0.85912	0.78145	0.81844
Average		**26.3564**	**986.6**	**1774.8**	**166.6**	**272**	**0.86294**	**0.85556**	**0.784**	**0.81815**

Decision Tree

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	301.818	1131	1575	368	126	0.84563	0.7545	0.89976	0.82075
2	39527	294.212	1171	1537	412	80	0.84625	0.73973	0.93605	0.82639
3	39527	293.426	1146	1556	356	142	0.84438	0.76298	0.88975	0.82151
4	39527	295.392	1114	1612	363	111	0.85188	0.75423	0.90939	0.82457
5	39527	268.351	1102	1550	378	170	0.82875	0.74459	0.86635	0.80087
Average		**290.64**	**1132.8**	**1566**	**375.4**	**125.8**	**0.84338**	**0.75121**	**0.90026**	**0.81882**

RandomForest (10 estimators)

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	49.39	1062	1789	154	195	0.89094	0.87336	0.84487	0.85888
2	39527	44.3944	1081	1802	147	170	0.90094	0.88029	0.86411	0.87213
3	39527	45.562	1046	1765	147	242	0.87844	0.87678	0.81211	0.84321
4	39527	44.5655	1013	1841	134	212	0.89188	0.88317	0.82694	0.85413
5	39527	46.9956	1025	1800	128	247	0.88281	0.88899	0.80582	0.84536
Average		**46.1815**	**1045.4**	**1799.4**	**142**	**213.2**	**0.889**	**0.88052**	**0.83077**	**0.85474**

Multi-layer Perceptrons

	Feature r	Time to t	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	1460.14	1084	1809	134	173	0.90406	0.88998	0.86237	0.87596
2	39527	1462.69	1131	1798	151	120	0.91531	0.88222	0.90408	0.89301
3	39527	2378.18	1102	1767	145	186	0.89656	0.88372	0.85559	0.86943
4	39527	1790	1065	1796	179	160	0.89406	0.85611	0.86939	0.8627
5	39527	1596.41	1079	1792	136	193	0.89719	0.88807	0.84827	0.86771
Average		**1737.48**	**1092.2**	**1792.4**	**149**	**166.4**	**0.90144**	**0.88002**	**0.86794**	**0.87376**

Appendix B
Second testing phase results

This appendix contains four pages, each one with the testing results with the changing of the hyperparameters of a classifier: Logistic Regression, Linear SVC, Decision Tree and Multi-layer Perceptrons, respectively.

Each table contains:

- Number of iteration
- Number of features tested
- Time to train (s)
- True Positives (TP)
- True Negatives (TN)
- False Positives (FP)
- False Negatives (FN)
- Accuracy
- Precision
- Recall
- F1-Score

Logistic Regression

[illegible]

Linear SVC

Features Counter with 2-gram and tf-idf
Maximum 25000

penalty l2
C 0.1
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	1.1658	1105	1868	71	156	0.9291	0.9396	0.8763	0.9069
2	39527	1.1676	1028	1885	100	187	0.9103	0.9113	0.8461	0.8775
3	39527	1.1716	1060	1888	64	188	0.9213	0.9431	0.8494	0.8938
4	39527	1.1612	1102	1813	78	207	0.9109	0.9339	0.8419	0.8855
5	39527	1.1753	1064	1853	87	196	0.9116	0.9244	0.8444	0.8826
Average		**1.1683**	**1071.8**	**1861.4**	**80**	**186.8**	**0.9166**	**0.9305**	**0.8516**	**0.8893**

penalty l1
C 0.1
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	1.1206	557	1763	215	665	0.725	0.7215	0.4558	0.5587
2	39527	1.1211	602	1711	238	649	0.7228	0.7167	0.4812	0.5758
3	39527	1.1042	585	1671	260	684	0.705	0.6923	0.461	0.5535
4	39527	1.1071	588	1645	256	711	0.6978	0.6967	0.4527	0.5488
5	39527	1.1187	578	1700	248	674	0.7119	0.6998	0.4617	0.5563
Average		**1.1143**	**582**	**1698**	**243.4**	**676.6**	**0.7125**	**0.7054**	**0.4625**	**0.5586**

penalty l2
C 1.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	1.5113	1107	1852	90	151	0.9247	0.9248	0.88	0.9018
2	39527	1.5326	1079	1830	107	184	0.9091	0.9098	0.8543	0.8812
3	39527	1.5094	1090	1844	99	167	0.9169	0.9167	0.8671	0.8913
4	39527	1.5287	1115	1856	87	142	0.9284	0.9276	0.887	0.9069
5	39527	1.5553	1076	1837	105	182	0.9103	0.9111	0.8553	0.8823
Average		**1.5275**	**1093.4**	**1843.8**	**97.6**	**165.2**	**0.9179**	**0.918**	**0.8688**	**0.8927**

penalty l1
C 1.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	1.5561	1156	1764	122	158	0.9125	0.9045	0.8798	0.892
2	39527	1.572	1114	1780	149	157	0.9044	0.882	0.8765	0.8792
3	39527	1.6059	1095	1812	149	144	0.9084	0.8802	0.8838	0.882
4	39527	1.6513	1080	1821	156	143	0.9066	0.8738	0.8831	0.8784
5	39527	1.5898	1085	1811	143	161	0.905	0.8836	0.8708	0.8771
Average		**1.5949**	**1106**	**1797.6**	**143.8**	**152.6**	**0.9074**	**0.8848**	**0.8788**	**0.8817**

penalty l2
C 5.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	2.9123	1094	1844	105	157	0.9181	0.9124	0.8745	0.8931
2	39527	2.8902	1085	1833	109	173	0.9119	0.9087	0.8625	0.885
3	39527	2.6948	1105	1822	122	151	0.9147	0.9006	0.8798	0.8901
4	39527	2.5437	1080	1826	132	162	0.9078	0.8911	0.8699	0.8798
5	39527	2.6018	1137	1785	130	148	0.9131	0.8974	0.8848	0.8911
Average		**2.7286**	**1100.2**	**1821.8**	**119.6**	**158.4**	**0.9131**	**0.902**	**0.8741**	**0.8878**

penalty l1
C 5.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	3.2385	1102	1777	156	165	0.8997	0.876	0.8698	0.8729
2	39527	3.2507	1105	1783	155	157	0.9025	0.877	0.8756	0.8763
3	39527	3.3027	1114	1778	160	150	0.9031	0.8744	0.8813	0.8779
4	39527	3.1715	1083	1772	155	190	0.8922	0.8748	0.8507	0.8626
5	39527	3.2262	1088	1842	131	139	0.9156	0.8925	0.8867	0.8896
Average		**3.2379**	**1098.4**	**1790**	**151.4**	**160.2**	**0.9026**	**0.8789**	**0.8728**	**0.8758**

penalty l2
C 10.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	2.9058	1158	1788	119	135	0.9206	0.9068	0.8956	0.9012
2	39527	2.8951	1101	1823	118	158	0.9138	0.9032	0.8745	0.8886
3	39527	2.9073	1103	1827	123	147	0.9156	0.8997	0.8824	0.891
4	39527	2.9121	1077	1801	119	203	0.8994	0.9005	0.8414	0.87
5	39527	2.8841	1063	1859	130	148	0.9131	0.891	0.8778	0.8844
Average		**2.9009**	**1100.4**	**1819.6**	**121.8**	**158.2**	**0.9125**	**0.9002**	**0.8743**	**0.887**

penalty l1
C 10.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	3.2605	1106	1782	153	159	0.9025	0.8785	0.8743	0.8764
2	39527	3.1291	1068	1815	148	169	0.9009	0.8783	0.8634	0.8708
3	39527	3.3873	1080	1780	180	171	0.8903	0.8582	0.8642	0.8612
4	39527	3.3731	1092	1793	145	170	0.9016	0.8828	0.8653	0.8739
5	39527	3.1047	1143	1761	170	126	0.9075	0.8705	0.9007	0.8854
Average		**3.2509**	**1099.6**	**1782.2**	**159.2**	**159**	**0.9006**	**0.8736**	**0.8736**	**0.8735**

penalty l2
C 25.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	2.8735	1086	1818	115	181	0.9075	0.9042	0.8571	0.8801
2	39527	2.9539	1085	1818	126	171	0.9072	0.896	0.8639	0.8796
3	39527	2.9275	1057	1863	127	153	0.9125	0.8927	0.8736	0.883
4	39527	2.9301	1127	1788	133	152	0.9109	0.8944	0.8812	0.8878
5	39527	2.9158	1100	1788	131	181	0.9025	0.8936	0.8587	0.8758
Average		**2.9202**	**1091**	**1815**	**126.4**	**167.6**	**0.9081**	**0.8962**	**0.8669**	**0.8813**

penalty l1
C 25.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	3.4849	1061	1796	180	163	0.8928	0.855	0.8668	0.8609
2	39527	3.5206	1135	1758	146	161	0.9041	0.886	0.8758	0.8809
3	39527	3.4418	1141	1752	159	148	0.9041	0.8777	0.8852	0.8814
4	39527	3.3934	1096	1803	142	159	0.9059	0.8853	0.8733	0.8793
5	39527	3.4627	1087	1810	161	142	0.9053	0.871	0.8845	0.8777
Average		**3.4607**	**1104**	**1783.8**	**157.6**	**154.6**	**0.9024**	**0.875**	**0.8771**	**0.876**

penalty l2
C 50.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	2.9943	1078	1813	144	165	0.9034	0.8822	0.8673	0.8746
2	39527	2.992	1131	1793	125	151	0.9138	0.9005	0.8822	0.8913
3	39527	3.0079	1075	1832	138	155	0.9084	0.8862	0.874	0.8801
4	39527	2.9921	1160	1765	149	147	0.9078	0.886	0.8867	0.8863
5	39527	2.9669	1088	1808	151	153	0.905	0.8781	0.8767	0.8774
Average		**2.9907**	**1104.4**	**1800.2**	**141.2**	**154.2**	**0.9077**	**0.8866**	**0.8774**	**0.8819**

penalty l1
C 50.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	3.3963	1112	1771	147	170	0.9009	0.8832	0.8674	0.8752
2	39527	3.6163	1090	1799	157	154	0.9028	0.8741	0.8762	0.8752
3	39527	3.7339	1112	1780	139	169	0.9041	0.889	0.8680	0.8788
4	39527	3.7184	1085	1834	143	138	0.9122	0.8836	0.8872	0.8854
5	39527	3.8079	1073	1769	168	191	0.8878	0.8645	0.8488	0.8566
Average		**3.6545**	**1094.4**	**1790.6**	**150.8**	**164.2**	**0.9016**	**0.8789**	**0.8697**	**0.8742**

penalty l2
C 100.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	3.0081	1093	1814	138	155	0.9084	0.8879	0.8758	0.8818
2	39527	3.0333	1088	1815	142	155	0.9072	0.8846	0.8753	0.8799
3	39527	2.5054	1122	1745	141	192	0.8959	0.8884	0.8539	0.8708
4	39527	2.1423	1090	1805	163	152	0.9047	0.8769	0.8776	0.8773
5	39527	2.1543	1106	1810	144	140	0.9113	0.8848	0.8876	0.8862
Average		**2.5687**	**1099.8**	**1797.8**	**143.6**	**158.8**	**0.9055**	**0.8845**	**0.874**	**0.8792**

penalty l1
C 100.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	4.0448	1062	1777	182	179	0.8872	0.8537	0.8558	0.8547
2	39527	4.1278	1107	1789	159	145	0.905	0.8744	0.8842	0.8793
3	39527	4.1005	1101	1768	156	175	0.8966	0.8759	0.8629	0.8693
4	39527	3.9069	1101	1762	151	186	0.8947	0.8794	0.8555	0.8673
5	39527	2.8878	1066	1826	137	171	0.9038	0.8861	0.8618	0.8738
Average		**3.6136**	**1087.4**	**1784.4**	**157**	**171.2**	**0.8974**	**0.8739**	**0.864**	**0.8689**

penalty l2
C 500.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	3.2393	1100	1790	133	177	0.9031	0.8921	0.8614	0.8765
2	39527	3.2055	1087	1802	159	152	0.9028	0.8724	0.8773	0.8748
3	39527	3.2276	1061	1803	221	115	0.895	0.8276	0.9022	0.8633
4	39527	3.1774	1100	1792	159	149	0.9038	0.8737	0.8807	0.8772
5	39527	3.1576	1154	1701	147	198	0.8922	0.887	0.8536	0.87
Average		**3.2015**	**1100.4**	**1777.6**	**163.8**	**158.2**	**0.8994**	**0.8706**	**0.875**	**0.8724**

penalty l1
C 500.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	5.3722	1113	1788	140	159	0.9066	0.8883	0.875	0.8816
2	39527	5.3023	1095	1781	145	179	0.8988	0.8831	0.8595	0.8711
3	39527	3.9014	1081	1827	156	136	0.9088	0.8739	0.8882	0.881
4	39527	3.8285	1135	1718	171	176	0.8916	0.8691	0.8658	0.8674
5	39527	3.479	1025	1814	167	194	0.8872	0.8599	0.8409	0.8503
Average		**4.3767**	**1089.8**	**1785.6**	**155.8**	**168.8**	**0.8986**	**0.8748**	**0.8659**	**0.8703**

penalty l2
C 1000.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	3.3539	1135	1721	183	161	0.8925	0.8612	0.8758	0.8684
2	39527	3.295	1066	1831	139	164	0.9053	0.8846	0.8667	0.8756
3	39527	3.2679	1101	1760	177	162	0.8941	0.8615	0.8717	0.8666
4	39527	3.2277	1121	1702	257	120	0.8822	0.8135	0.9033	0.8561
5	39527	3.2118	1128	1665	272	135	0.8728	0.8057	0.8931	0.8472
Average		**3.2713**	**1110.2**	**1735.8**	**205.6**	**148.4**	**0.8894**	**0.8453**	**0.8821**	**0.8628**

penalty l1
C 1000.0
loss squared_hinge

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	5.8172	1103	1756	166	175	0.8934	0.8692	0.8631	0.8661
2	39527	5.8903	1130	1787	147	136	0.9116	0.8849	0.8926	0.8887
3	39527	5.9812	1077	1840	153	131	0.9144	0.8756	0.899	0.8871
4	39527	5.9317	1097	1784	167	152	0.9003	0.8679	0.8783	0.8731
5	39527	5.9576	1106	1751	147	196	0.8928	0.8827	0.8495	0.8658
Average		**5.9116**	**1102.6**	**1785.4**	**156**	**158**	**0.9025**	**0.876**	**0.8765**	**0.8762**

Decision Tree

Features Counter with 2-gram and tf-idf
Maximum 25000

criterion gini
max_dept 100

	Feature number	Time to train	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	429.4031811	1114	1594	381	111	0.84625	0.74515	0.90939	0.81912
2	39527	419.2259033	1080	1590	346	184	0.83438	0.75736	0.85443	0.80297
3	39527	260.6240873	1153	1613	324	110	0.86438	0.78064	0.91291	0.84161
4	39527	93.09207344	1103	1563	388	146	0.83313	0.73977	0.88311	0.80511
5	39527	102.1296356	1084	1555	353	208	0.82469	0.75435	0.83901	0.79443
Average		**260.8949761**	**1106.8**	**1583**	**358.4**	**151.8**	**0.84056**	**0.75545**	**0.87977**	**0.81265**

criterion gini
max_dept 200

	Feature number	Time to train	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	137.3900383	1162	1540	378	120	0.84438	0.75455	0.9064	0.82353
2	39527	132.9106324	1134	1547	400	119	0.83781	0.73924	0.90503	0.81378
3	39527	132.3292778	1172	1568	351	109	0.85625	0.76953	0.91491	0.83595
4	39527	114.8673561	1128	1611	356	105	0.85594	0.76011	0.91484	0.83033
5	39527	132.3715451	1119	1591	365	125	0.84688	0.75404	0.89952	0.82038
Average		**129.9737699**	**1143**	**1571.4**	**370**	**115.6**	**0.84825**	**0.75549**	**0.90814**	**0.82479**

criterion gini
max_dept 400

	Feature number	Time to train	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	132.86023	1132	1573	364	131	0.84531	0.75668	0.89628	0.82059
2	39527	133.6318045	1125	1598	365	112	0.85094	0.75503	0.90946	0.82508
3	39527	138.7623982	1162	1547	370	121	0.84656	0.75849	0.90569	0.82558
4	39527	160.9456882	1153	1585	357	105	0.85563	0.76358	0.91653	0.83309
5	39527	150.1404922	1136	1578	370	116	0.84813	0.75432	0.90735	0.82379
Average		**143.2681226**	**1141.6**	**1576.2**	**365.2**	**117**	**0.84931**	**0.75762**	**0.90706**	**0.82562**

criterion gini
max_dept 600

	Feature number	Time to train	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	158.0925345	1122	1600	381	97	0.85063	0.74651	0.92043	0.82439
2	39527	151.3102052	1150	1584	377	89	0.85438	0.75311	0.92817	0.83153
3	39527	157.8437214	1180	1529	369	122	0.84656	0.76178	0.9063	0.82778
4	39527	157.46083	1121	1583	372	124	0.845	0.75084	0.9004	0.81885
5	39527	154.000463	1200	1562	350	88	0.86313	0.77419	0.93168	0.84567
Average		**155.7415508**	**1154.6**	**1571.6**	**369.8**	**104**	**0.85194**	**0.75729**	**0.91739**	**0.82964**

criterion gini
max_dept MAX (~800)

	Feature number	Time to train	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	153.7395298	1180	1556	346	118	0.855	0.77326	0.90909	0.83569
2	39527	166.029485	1138	1540	393	129	0.83688	0.74331	0.89818	0.81344
3	39527	147.8999882	1119	1617	343	121	0.855	0.76539	0.90242	0.82828
4	39527	187.4034297	1122	1614	346	118	0.855	0.76431	0.90484	0.82866
5	39527	122.3378849	1140	1599	353	108	0.85594	0.76356	0.91346	0.83181
Average		**155.4820635**	**1139.8**	**1585.2**	**356.2**	**118.8**	**0.85156**	**0.76197**	**0.9056**	**0.82758**

criterion entropy
max_dept 100

	Feature number	Time to train	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	91.57152629	1066	1651	298	185	0.84906	0.78152	0.85212	0.8153
2	39527	92.02545428	994	1659	346	201	0.82906	0.74179	0.8318	0.78422
3	39527	88.18855762	1079	1629	305	187	0.84625	0.77962	0.85229	0.81434
4	39527	94.66225863	1064	1597	311	228	0.83156	0.77382	0.82353	0.7979
5	39527	85.87591124	1120	1632	279	169	0.86	0.80057	0.86889	0.83333
Average		**90.46474161**	**1064.6**	**1633.6**	**307.8**	**194**	**0.84319**	**0.77547**	**0.84573**	**0.80902**

criterion entropy
max_dept 200

	Feature number	Time to train	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	103.6855941	1165	1614	306	115	0.86844	0.79198	0.91016	0.84696
2	39527	106.8156304	1133	1639	324	104	0.86625	0.77763	0.91593	0.84113
3	39527	103.9283895	1110	1654	297	139	0.86375	0.78891	0.88871	0.83584
4	39527	108.5672193	1149	1621	320	110	0.86563	0.78216	0.91263	0.84238
5	39527	104.0673733	1150	1621	311	118	0.86594	0.78713	0.90694	0.8428
Average		**105.4128413**	**1141.4**	**1629.8**	**311.6**	**117.2**	**0.866**	**0.78556**	**0.90687**	**0.84182**

criterion entropy
max_dept 400

	Feature number	Time to train	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	107.7346308	1152	1583	342	123	0.85469	0.77108	0.90353	0.83207
2	39527	107.9468927	1112	1669	302	117	0.86906	0.78642	0.9048	0.84147
3	39527	102.2973237	1124	1626	306	144	0.85938	0.78601	0.88644	0.83321
4	39527	109.0716522	1119	1615	326	140	0.85438	0.77439	0.8888	0.82766
5	39527	101.5984204	1133	1614	324	129	0.85844	0.77763	0.89778	0.83339
Average		**105.729784**	**1128**	**1621.4**	**320**	**130.6**	**0.85919**	**0.77911**	**0.89627**	**0.83356**

criterion entropy
max_dept 600

	Feature number	Time to train	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	114.749965	1122	1605	325	148	0.85219	0.7754	0.88346	0.82591
2	39527	105.3174195	1110	1657	317	116	0.86469	0.77786	0.90538	0.83679
3	39527	107.0216668	1161	1595	317	127	0.86125	0.78552	0.9014	0.83948
4	39527	106.5190003	1142	1631	321	106	0.86656	0.78059	0.91506	0.84249
5	39527	110.5286832	1139	1581	358	122	0.85	0.76086	0.90325	0.82596
Average		**108.8273469**	**1134.8**	**1613.8**	**327.6**	**123.8**	**0.85894**	**0.77604**	**0.90171**	**0.83413**

criterion entropy
max_dept MAX(~800)

	Feature number	Time to train	TP	TN	FP	FN	Accuracy	Precision	Recall	F1-Score
1	39527	108.3459818	1150	1608	307	135	0.86188	0.78929	0.89494	0.8388
2	39527	105.8573973	1132	1628	320	120	0.8625	0.77961	0.90415	0.83728
3	39527	108.5925591	1160	1617	312	111	0.86781	0.78804	0.91267	0.84579
4	39527	107.6706195	1127	1637	316	120	0.86375	0.78101	0.90377	0.83792
5	39527	107.1375256	1135	1605	357	103	0.85625	0.76072	0.9168	0.8315
Average		**107.5208167**	**1140.8**	**1619**	**322.4**	**117.8**	**0.86244**	**0.77974**	**0.90647**	**0.83826**

Features Counter with 2-gram and tf-idf
Maximum 25000

Hidden la 1 100
Lambda 0

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	124.295	1040	1867	85	208	0.90844	0.92444	0.83333	0.87653
2	39527	122.024	1055	1848	62	235	0.90719	0.94449	0.81783	0.87661
3	39527	181.204	1028	1828	100	244	0.8925	0.91135	0.80818	0.85667
4	39527	132.488	982	1898	77	243	0.9	0.92729	0.80163	0.85989
5	39527	131.984	1047	1878	64	211	0.91406	0.94239	0.83227	0.88392
Average		**138.399**	**1030.4**	**1863.8**	**77.6**	**228.2**	**0.90444**	**0.92999**	**0.81865**	**0.87072**

Hidden la 2 10-10
Lambda 0

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	31.3023	1030	1853	64	253	0.90094	0.9415	0.80281	0.86664
2	39527	45.4446	1052	1834	79	235	0.90188	0.93015	0.8174	0.87014
3	39527	41.3254	1018	1897	97	188	0.91094	0.913	0.84411	0.87721
4	39527	33.2879	1026	1884	57	233	0.90938	0.94737	0.81493	0.87617
5	39527	47.3388	1016	1859	83	242	0.89844	0.92448	0.80763	0.86211
Average		**39.7398**	**1028.4**	**1865.4**	**76**	**230.2**	**0.90431**	**0.9313**	**0.81738**	**0.87045**

Hidden la 2 20-20
Lambda 0

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	51.8932	1031	1858	91	220	0.90281	0.91889	0.82414	0.86894
2	39527	43.9151	1059	1840	100	201	0.90594	0.91372	0.84048	0.87557
3	39527	68.1066	1005	1911	71	213	0.91125	0.93401	0.82512	0.8762
4	39527	57.5193	1014	1852	95	239	0.89563	0.91434	0.80926	0.85859
5	39527	41.7202	1072	1816	73	239	0.9025	0.93624	0.8177	0.87296
Average		**52.6309**	**1036.2**	**1855.4**	**86**	**222.4**	**0.90363**	**0.92344**	**0.82334**	**0.87045**

Hidden la 2 50-10
Lambda 0

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	104.306	1035	1890	73	202	0.91406	0.93412	0.8367	0.88273
2	39527	127.052	1056	1823	92	229	0.89969	0.91986	0.82179	0.86806
3	39527	76.5998	1046	1844	93	217	0.90313	0.91835	0.82819	0.87094
4	39527	87.4002	1055	1831	72	242	0.90188	0.93611	0.81342	0.87046
5	39527	76.3532	976	1906	83	235	0.90063	0.92162	0.80595	0.85991
Average		**94.3422**	**1033.6**	**1858.8**	**82.6**	**225**	**0.90388**	**0.92601**	**0.82121**	**0.87042**

Hidden la 3 10-10-10
Lambda 0

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	56.4106	1070	1830	87	213	0.90625	0.92481	0.83398	0.87705
2	39527	51.4812	1015	1820	96	269	0.88594	0.91359	0.7905	0.8476
3	39527	43.9232	1034	1863	92	211	0.90531	0.91829	0.83052	0.87221
4	39527	40.9836	1046	1900	69	185	0.92063	0.93812	0.84972	0.89173
5	39527	40.9946	1027	1862	88	223	0.90281	0.92108	0.8216	0.8685
Average		**46.7586**	**1038.4**	**1855**	**86.4**	**220.2**	**0.90419**	**0.92318**	**0.82526**	**0.87142**

Hidden la 3 20-20-20
Lambda 0

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	61.7864	1050	1831	100	219	0.90031	0.91304	0.82742	0.86813
2	39527	48.1574	1033	1858	91	218	0.90344	0.91904	0.82574	0.86989
3	39527	48.1626	1062	1842	82	214	0.9075	0.92832	0.83229	0.87769
4	39527	51.4333	997	1867	82	254	0.895	0.924	0.79696	0.85579
5	39527	51.9032	1027	1875	79	219	0.90688	0.92857	0.82424	0.8733
Average		**52.2886**	**1033.8**	**1854.6**	**86.8**	**224.8**	**0.90263**	**0.9226**	**0.82133**	**0.86896**

Hidden la 3 50-50-10
Lambda 0

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	72.443	1017	1868	83	232	0.90156	0.92455	0.81425	0.8659
2	39527	71.661	1027	1844	90	239	0.89719	0.91943	0.81122	0.86194
3	39527	99.7325	1023	1853	92	232	0.89875	0.91749	0.81514	0.86329
4	39527	110.224	1039	1837	84	240	0.89875	0.9252	0.81235	0.86511
5	39527	92.8972	1027	1871	85	217	0.90563	0.92356	0.82556	0.87182
Average		**89.3915**	**1026.6**	**1854.6**	**86.8**	**232**	**0.90038**	**0.92204**	**0.8157**	**0.86561**

Hidden la 1 100
Lambda 0.0001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	141.345	1027	1829	70	274	0.8925	0.93619	0.78939	0.85655
2	39527	125.174	1008	1840	81	271	0.89	0.92562	0.78812	0.85135
3	39527	132.567	993	1920	92	195	0.91031	0.91521	0.83586	0.87374
4	39527	141.265	1025	1858	77	240	0.90094	0.93013	0.81028	0.86608
5	39527	190.514	1040	1854	86	220	0.90438	0.92362	0.8254	0.87175
Average		**146.173**	**1018.6**	**1860.2**	**81.2**	**240**	**0.89963**	**0.92615**	**0.80981**	**0.86389**

Hidden la 2 10-10
Lambda 0.0001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	47.2454	1009	1870	99	222	0.89969	0.91065	0.81966	0.86276
2	39527	37.3033	1021	1853	82	244	0.89813	0.92566	0.80711	0.86233
3	39527	57.3507	1054	1835	93	218	0.90281	0.91892	0.82862	0.87143
4	39527	33.3037	1001	1911	43	245	0.91	0.95881	0.80337	0.87424
5	39527	41.3584	1052	1846	75	227	0.90563	0.93345	0.82252	0.87448
Average		**43.3123**	**1027.4**	**1863**	**78.4**	**231.2**	**0.90325**	**0.9295**	**0.81626**	**0.86905**

Hidden la 2 20-20
Lambda 0.0001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	46.6622	1044	1903	64	189	0.92094	0.94224	0.84672	0.89193
2	39527	52.2032	1061	1845	89	205	0.90813	0.92261	0.83807	0.87831
3	39527	52.2553	1032	1850	73	245	0.90063	0.93394	0.80814	0.8665
4	39527	62.9963	1072	1823	95	210	0.90469	0.91859	0.83619	0.87546
5	39527	54.9212	993	1863	102	242	0.8925	0.90685	0.80405	0.85236
Average		**53.8076**	**1040.4**	**1856.8**	**84.6**	**218.2**	**0.90538**	**0.92485**	**0.82663**	**0.87291**

Hidden la 2 50-10
Lambda 0.0001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	138.081	1056	1822	93	229	0.89938	0.91906	0.82179	0.86771
2	39527	88.2348	1034	1857	84	225	0.90344	0.92487	0.82129	0.87
3	39527	87.4629	1046	1852	82	220	0.90563	0.9273	0.82622	0.87385
4	39527	110.27	1062	1842	93	203	0.9075	0.91948	0.83953	0.87769
5	39527	82.8793	982	1891	91	236	0.89781	0.91519	0.80624	0.85727
Average		**101.386**	**1036**	**1852.8**	**88.6**	**222.6**	**0.90275**	**0.92118**	**0.82301**	**0.8693**

Hidden la 3 10-10-10
Lambda 0.0001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	48.5603	1017	1888	91	204	0.90781	0.91787	0.83292	0.87334
2	39527	40.8369	1069	1835	84	212	0.9075	0.92715	0.8345	0.87839
3	39527	41.3303	1065	1846	73	216	0.90969	0.93585	0.83138	0.88053
4	39527	43.6258	1067	1839	83	211	0.90813	0.92783	0.8349	0.87891
5	39527	41.915	991	1914	54	241	0.90781	0.94833	0.80438	0.87044
Average		**43.2537**	**1041.8**	**1864.4**	**77**	**216.8**	**0.90819**	**0.9314**	**0.82762**	**0.87632**

Hidden la 3 20-20-20
Lambda 0.0001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	55.9009	1082	1831	87	200	0.91031	0.92558	0.84399	0.8829
2	39527	51.2956	1051	1835	93	221	0.90188	0.91871	0.82626	0.87003
3	39527	55.6401	1043	1870	100	187	0.91031	0.91251	0.84797	0.87906
4	39527	85.7647	1030	1838	88	244	0.89625	0.92129	0.80848	0.8612
5	39527	75.7356	1000	1853	112	235	0.89156	0.89928	0.80972	0.85215
Average		**64.8674**	**1041.2**	**1845.4**	**96**	**217.4**	**0.90206**	**0.91547**	**0.82728**	**0.86907**

Hidden la 3 50-50-10
Lambda 0.0001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	99.2924	1040	1827	91	242	0.89594	0.91954	0.81123	0.862
2	39527	110.832	1041	1822	78	259	0.89469	0.93029	0.80077	0.86069
3	39527	89.2352	1012	1885	96	207	0.90531	0.91336	0.83019	0.86979
4	39527	83.5481	1026	1856	97	221	0.90063	0.91362	0.82277	0.86582
5	39527	109.594	1055	1866	89	190	0.91281	0.9222	0.84739	0.88321
Average		**98.5004**	**1034.8**	**1851.2**	**90.2**	**223.8**	**0.90188**	**0.9198**	**0.82247**	**0.8683**

Hidden la 1 100
Lambda 0.001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	157.338	1017	1879	88	216	0.905	0.92036	0.82482	0.86997
2	39527	181.795	1012	1883	92	213	0.90469	0.91667	0.82612	0.86904
3	39527	124.816	1067	1831	83	219	0.90563	0.92783	0.8297	0.87603
4	39527	207.328	1069	1840	87	204	0.90906	0.92474	0.83975	0.8802
5	39527	198.643	1042	1834	90	234	0.89875	0.92049	0.81661	0.86545
Average		**173.984**	**1041.4**	**1853.4**	**88**	**217.2**	**0.90463**	**0.92202**	**0.8274**	**0.87214**

Hidden la 2 10-10
Lambda 0.001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	39.2869	1052	1849	93	206	0.90656	0.91878	0.83625	0.87557
2	39527	67.5198	1051	1848	102	199	0.90594	0.91154	0.8408	0.87474
3	39527	57.3843	1073	1822	92	213	0.90469	0.92103	0.83437	0.87556
4	39527	35.2569	992	1884	63	261	0.89875	0.94028	0.7917	0.85962
5	39527	37.3502	1021	1869	85	225	0.90313	0.92315	0.81942	0.8682
Average		**47.3596**	**1037.8**	**1854.4**	**87**	**220.8**	**0.90381**	**0.92295**	**0.82451**	**0.87074**

Hidden la 2 20-20
Lambda 0.001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	52.2217	1060	1846	74	220	0.90813	0.93474	0.82813	0.87821
2	39527	43.9388	1023	1890	72	215	0.91031	0.93425	0.82633	0.87698
3	39527	102.855	1047	1878	90	185	0.91406	0.92084	0.84984	0.88392
4	39527	41.4468	1066	1858	83	193	0.91375	0.92776	0.8467	0.88538
5	39527	67.5074	1073	1823	93	211	0.905	0.92024	0.83567	0.87592
Average		**61.5939**	**1053.8**	**1859**	**82.4**	**204.8**	**0.91025**	**0.92757**	**0.83733**	**0.88008**

Hidden la 2 50-10
Lambda 0.001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	77.5083	1049	1819	94	238	0.89625	0.91776	0.81507	0.86337
2	39527	83.0859	1012	1899	79	210	0.90969	0.92759	0.82815	0.87505
3	39527	93.7446	1050	1838	91	221	0.9025	0.92025	0.82612	0.87065
4	39527	93.9325	1076	1836	89	199	0.91	0.92361	0.84392	0.88197
5	39527	429.336	1021	1856	106	217	0.89906	0.90594	0.82472	0.86342
Average		**155.521**	**1041.6**	**1849.6**	**91.8**	**217**	**0.9035**	**0.91903**	**0.8276**	**0.87089**

Hidden la 3 10-10-10
Lambda 0.001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	44.2705	1075	1727	207	191	0.87563	0.83853	0.84913	0.8438
2	39527	43.734	993	1898	30	279	0.90344	0.97067	0.78066	0.86536
3	39527	51.1014	1022	1869	101	208	0.90344	0.91006	0.83089	0.86868
4	39527	43.7188	1043	1860	65	232	0.90719	0.94134	0.81804	0.87537
5	39527	46.082	1050	1840	110	200	0.90313	0.90517	0.84	0.87137
Average		**45.7814**	**1036.6**	**1838.8**	**102.6**	**222**	**0.89856**	**0.91316**	**0.82375**	**0.86491**

Hidden la 3 20-20-20
Lambda 0.001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	55.3274	1036	1855	87	222	0.90344	0.92253	0.82353	0.87022
2	39527	55.452	994	1918	76	212	0.91	0.92897	0.82421	0.87346
3	39527	86.4208	1084	1830	86	200	0.91063	0.9265	0.84424	0.88346
4	39527	55.3094	1071	1814	82	233	0.90156	0.92888	0.82132	0.87179
5	39527	74.8733	1010	1869	90	231	0.89969	0.91818	0.81386	0.86288
Average		**65.4766**	**1039**	**1857.2**	**84.2**	**219.6**	**0.90506**	**0.92501**	**0.82543**	**0.87236**

Hidden la 3 50-50-10
Lambda 0.001

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	83.4201	1037	1845	91	227	0.90063	0.91933	0.82041	0.86706
2	39527	99.7058	1054	1847	87	212	0.90656	0.92375	0.83254	0.87578
3	39527	72.1986	994	1872	68	266	0.89563	0.93597	0.78889	0.85616
4	39527	137.035	997	1910	81	212	0.90844	0.92486	0.82465	0.87188
5	39527	83.096	1067	1825	81	227	0.90375	0.92944	0.82457	0.87387
Average		**95.091**	**1029.8**	**1859.8**	**81.6**	**228.8**	**0.903**	**0.92667**	**0.81821**	**0.86895**

Hidden la 1 100
Lambda 0.01

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	222.769	1040	1839	79	242	0.89969	0.9294	0.81123	0.86631
2	39527	157.952	1027	1882	73	218	0.90906	0.93364	0.8249	0.87591
3	39527	116.587	1025	1860	76	239	0.90156	0.93097	0.81092	0.86681
4	39527	158.116	1066	1835	91	208	0.90656	0.92135	0.83673	0.87701
5	39527	149.722	1025	1876	96	203	0.90656	0.91436	0.83469	0.87271
Average		**161.029**	**1036.6**	**1858.4**	**83**	**222**	**0.90469**	**0.92594**	**0.8237**	**0.87175**

Hidden la 2 10-10
Lambda 0.01

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	41.3294	1003	1876	81	240	0.89969	0.92528	0.80692	0.86205
2	39527	53.3309	1064	1854	73	209	0.91188	0.9358	0.83582	0.88299
3	39527	39.3109	1055	1858	88	199	0.91031	0.92301	0.84131	0.88027
4	39527	39.3609	1053	1844	83	220	0.90531	0.92694	0.82718	0.87422
5	39527	41.2912	1032	1847	103	218	0.89969	0.90925	0.8256	0.86541
Average		**42.9247**	**1041.4**	**1855.8**	**85.6**	**217.2**	**0.90538**	**0.92405**	**0.82737**	**0.87299**

Hidden la 2 20-20
Lambda 0.01

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	55.2229	1042	1851	82	225	0.90406	0.92705	0.82242	0.8716
2	39527	58.4069	1053	1847	78	222	0.90625	0.93103	0.82588	0.87531
3	39527	65.3936	1017	1872	71	240	0.90281	0.93474	0.80907	0.86738
4	39527	55.8733	1030	1856	82	232	0.90188	0.92626	0.81616	0.86773
5	39527	52.2465	1019	1883	85	213	0.90688	0.92301	0.82711	0.87243
Average		**57.4286**	**1032.2**	**1861.8**	**79.6**	**226.4**	**0.90438**	**0.92842**	**0.82013**	**0.87089**

Hidden la 2 50-10
Lambda 0.01

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	82.6987	1088	1816	78	218	0.9075	0.9331	0.83308	0.88026
2	39527	88.3962	1014	1878	83	225	0.90375	0.92434	0.8184	0.86815
3	39527	82.1567	1041	1869	67	223	0.90938	0.93953	0.82358	0.87774
4	39527	76.6635	999	1902	68	231	0.90656	0.93627	0.8122	0.86983
5	39527	77.9273	1009	1869	77	245	0.89938	0.9291	0.80463	0.86239
Average		**81.5685**	**1030.2**	**1866.8**	**74.6**	**228.4**	**0.90531**	**0.93247**	**0.81838**	**0.87167**

Hidden la 3 10-10-10
Lambda 0.01

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	48.9837	1062	1851	46	241	0.91031	0.95848	0.81504	0.88096
2	39527	61.5524	1030	1895	90	185	0.91406	0.91964	0.84774	0.88223
3	39527	49.003	1032	1887	101	180	0.91219	0.91086	0.85149	0.88017
4	39527	43.4693	1076	1790	98	236	0.89563	0.91652	0.82012	0.86565
5	39527	59.4495	1043	1869	80	208	0.91	0.92876	0.83373	0.87869
Average		**52.4916**	**1048.6**	**1858.4**	**83**	**210**	**0.90844**	**0.92685**	**0.83362**	**0.87754**

Hidden la 3 20-20-20
Lambda 0.01

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	54.691	1072	1823	78	227	0.90469	0.93217	0.82525	0.87546
2	39527	79.2253	1066	1855	97	182	0.91281	0.9166	0.85417	0.88428
3	39527	54.7959	1052	1870	76	202	0.91313	0.93262	0.83892	0.88329
4	39527	119.453	979	1893	96	232	0.8975	0.9107	0.80842	0.85652
5	39527	55.1904	1040	1838	81	241	0.89938	0.92774	0.81187	0.86595
Average		**72.6711**	**1041.8**	**1855.8**	**85.6**	**216.8**	**0.9055**	**0.92397**	**0.82772**	**0.8731**

Hidden la 3 50-50-10
Lambda 0.01

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	94.1817	1043	1813	128	216	0.8925	0.89069	0.82844	0.85844
2	39527	111.272	1012	1864	101	223	0.89875	0.90925	0.81943	0.86201
3	39527	122.043	1052	1835	64	249	0.90219	0.94265	0.80861	0.8705
4	39527	88.8885	1045	1833	96	226	0.89938	0.91586	0.82219	0.8665
5	39527	82.2702	1023	1878	95	204	0.90656	0.91503	0.83374	0.87249
Average		**99.7311**	**1035**	**1844.6**	**96.8**	**223.6**	**0.89988**	**0.9147**	**0.82248**	**0.86599**

Hidden la 1 100
Lambda 0.1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	149.349	1078	1822	90	210	0.90625	0.92295	0.83696	0.87785
2	39527	132.581	1006	1896	82	216	0.90688	0.92463	0.82324	0.871
3	39527	174.201	1000	1874	78	248	0.89813	0.92764	0.80128	0.85985
4	39527	165.084	1096	1834	83	187	0.91563	0.9296	0.85425	0.89033
5	39527	125.615	997	1874	74	255	0.89719	0.93091	0.79633	0.85837
Average		**149.366**	**1035.4**	**1860**	**81.4**	**223.2**	**0.90481**	**0.92715**	**0.82241**	**0.87148**

Hidden la 2 10-10
Lambda 0.1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	39.2895	1028	1863	91	218	0.90344	0.91868	0.82504	0.86934
2	39527	35.3768	1030	1866	75	229	0.905	0.93213	0.81811	0.8714
3	39527	45.308	1035	1845	79	241	0.9	0.92908	0.81113	0.86611
4	39527	37.5308	1032	1870	99	199	0.90688	0.91247	0.83834	0.87384
5	39527	33.2905	1033	1860	59	248	0.90406	0.94597	0.8064	0.87063
Average		**38.1591**	**1031.6**	**1860.8**	**80.6**	**227**	**0.90388**	**0.92767**	**0.8198**	**0.87026**

Hidden la 2 20-20
Lambda 0.1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	55.6846	1010	1843	84	263	0.89156	0.92322	0.7934	0.8534
2	39527	58.8452	1002	1882	92	224	0.90125	0.9159	0.81729	0.86379
3	39527	65.2311	1037	1861	84	218	0.90563	0.92507	0.82629	0.8729
4	39527	85.7114	1040	1858	81	221	0.90563	0.92774	0.82474	0.87322
5	39527	58.1267	1059	1861	61	219	0.9125	0.94554	0.82864	0.88324
Average		**64.7198**	**1029.6**	**1861**	**80.4**	**229**	**0.90331**	**0.92749**	**0.81807**	**0.86931**

Hidden la 2 50-10
Lambda 0.1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	120.5	1049	1844	95	212	0.90406	0.91696	0.83188	0.87235
2	39527	87.1921	1024	1870	82	224	0.90438	0.92586	0.82051	0.87001
3	39527	126.318	1109	1809	95	187	0.91188	0.9211	0.85571	0.8872
4	39527	77.3122	1052	1841	105	202	0.90406	0.90925	0.83892	0.87267
5	39527	104.243	1003	1887	79	231	0.90313	0.92699	0.8128	0.86615
Average		**103.113**	**1047.4**	**1850.2**	**91.2**	**211.2**	**0.9055**	**0.92003**	**0.83196**	**0.87367**

Hidden la 3 10-10-10
Lambda 0.1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	38.9087	1043	1839	80	238	0.90063	0.92876	0.81421	0.86772
2	39527	80.9741	1015	1841	106	238	0.8925	0.90544	0.81006	0.8551
3	39527	56.8994	1030	1869	109	192	0.90594	0.9043	0.84288	0.87251
4	39527	41.1125	1048	1852	64	236	0.90625	0.94245	0.8162	0.87479
5	39527	46.5915	1029	1858	89	224	0.90219	0.92039	0.82123	0.86799
Average		**52.8972**	**1033**	**1851.8**	**89.6**	**225.6**	**0.9015**	**0.92027**	**0.82091**	**0.86762**

Hidden la 3 20-20-20
Lambda 0.1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	52.5536	1039	1857	79	225	0.905	0.92934	0.82199	0.87238
2	39527	55.1911	1045	1820	114	221	0.89531	0.90164	0.82543	0.86186
3	39527	54.9755	1043	1866	85	206	0.90906	0.92465	0.83507	0.87758
4	39527	54.9288	1031	1866	83	220	0.90531	0.92549	0.82414	0.87188
5	39527	72.3558	1058	1843	94	205	0.90656	0.9184	0.83769	0.87619
Average		**58.001**	**1043.2**	**1850.4**	**91**	**215.4**	**0.90425**	**0.9199**	**0.82886**	**0.87198**

Hidden la 3 50-50-10
Lambda 0.1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	121.603	947	1807	158	288	0.86063	0.85701	0.7668	0.8094
2	39527	104.749	1032	1841	100	227	0.89781	0.91166	0.8197	0.86324
3	39527	88.947	1039	1828	121	212	0.89594	0.89569	0.83054	0.86188
4	39527	93.7559	1014	1828	99	259	0.88813	0.91105	0.79654	0.84996
5	39527	83.413	1067	1828	97	208	0.90469	0.91667	0.83686	0.87495
Average		**98.4937**	**1019.8**	**1826.4**	**115**	**238.8**	**0.88944**	**0.89842**	**0.81009**	**0.85189**

Hidden la 1 100
Lambda 1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	404.848	1027	1846	102	225	0.89781	0.90965	0.82029	0.86266
2	39527	685.056	1015	1860	74	251	0.89844	0.93205	0.80174	0.862
3	39527	561.681	1001	1853	109	237	0.89188	0.9018	0.80856	0.85264
4	39527	454.842	1040	1826	117	217	0.89563	0.89888	0.82737	0.86164
5	39527	231.63	1030	1821	99	250	0.89094	0.91231	0.80469	0.85513
Average		**467.612**	**1022.6**	**1841.2**	**100.2**	**236**	**0.89494**	**0.91094**	**0.81253**	**0.85881**

Hidden la 2 10-10
Lambda 1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	81.5523	1079	1818	85	218	0.90531	0.92698	0.83192	0.87688
2	39527	69.4894	1008	1909	75	208	0.91156	0.93075	0.82895	0.8769
3	39527	55.4233	1059	1842	103	196	0.90656	0.91136	0.84382	0.87629
4	39527	59.415	1057	1825	88	230	0.90063	0.92314	0.82129	0.86924
5	39527	69.4729	1032	1879	83	206	0.90969	0.92556	0.8336	0.87718
Average		**67.0706**	**1047**	**1854.6**	**86.8**	**211.6**	**0.90675**	**0.92356**	**0.83192**	**0.8753**

Hidden la 2 20-20
Lambda 1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	72.0025	1002	1885	99	214	0.90219	0.91008	0.82401	0.86491
2	39527	99.1237	1089	1825	96	190	0.91063	0.91899	0.85145	0.88393
3	39527	85.1028	1019	1893	76	212	0.91	0.93059	0.82778	0.87618
4	39527	89.8399	1057	1834	89	220	0.90344	0.92234	0.82772	0.87247
5	39527	64.8533	1062	1842	68	228	0.9075	0.93982	0.82326	0.87769
Average		**82.1844**	**1045.8**	**1855.8**	**85.6**	**212.8**	**0.90675**	**0.92436**	**0.83084**	**0.87504**

Hidden la 2 50-10
Lambda 1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	130.429	1052	1829	82	237	0.90031	0.92769	0.81614	0.86835
2	39527	121.754	997	1849	95	259	0.88938	0.913	0.79379	0.84923
3	39527	163.571	1028	1858	80	234	0.90188	0.9278	0.81458	0.86751
4	39527	136.201	1038	1850	110	202	0.9025	0.90418	0.8371	0.86935
5	39527	171.009	1030	1883	71	216	0.91031	0.93551	0.82665	0.87772
Average		**144.593**	**1029**	**1853.8**	**87.6**	**229.6**	**0.90088**	**0.92164**	**0.81765**	**0.86643**

Hidden la 3 10-10-10
Lambda 1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	56.9999	1059	1819	85	237	0.89938	0.9257	0.81713	0.86803
2	39527	46.008	1029	1876	104	191	0.90781	0.90821	0.84344	0.87463
3	39527	48.4206	1056	1821	110	213	0.89906	0.90566	0.83215	0.86735
4	39527	73.6999	1031	1877	98	194	0.90875	0.9132	0.84163	0.87596
5	39527	76.4827	1070	1827	90	213	0.90531	0.92241	0.83398	0.87597
Average		**60.3222**	**1049**	**1844**	**97.4**	**209.6**	**0.90406**	**0.91504**	**0.83367**	**0.87239**

Hidden la 3 20-20-20
Lambda 1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	55.2941	1034	1836	100	230	0.89688	0.91182	0.81804	0.86239
2	39527	62.0959	1045	1849	123	183	0.90438	0.89469	0.85098	0.87229
3	39527	124.048	1077	1825	99	199	0.90688	0.91582	0.84404	0.87847
4	39527	74.1141	1075	1838	80	207	0.91031	0.93074	0.83853	0.88223
5	39527	68.7157	1024	1844	113	219	0.89625	0.90062	0.82381	0.8605
Average		**76.8535**	**1051**	**1838.4**	**103**	**207.6**	**0.90294**	**0.91074**	**0.83508**	**0.87118**

Hidden la 3 50-50-10
Lambda 1

	Feature	Time to t	TP	TN	FP	FN	Accurac	Precisio	Recall	F1-Score
1	39527	110.238	1039	1851	73	237	0.90313	0.93435	0.81426	0.87018
2	39527	197.158	1060	1831	99	210	0.90344	0.91458	0.83465	0.87279
3	39527	109.769	1010	1850	142	198	0.89375	0.87674	0.83609	0.85593
4	39527	141.624	1061	1856	99	184	0.91156	0.91466	0.85221	0.88233
5	39527	120.319	1063	1787	119	231	0.89063	0.89932	0.82148	0.85864
Average		**135.822**	**1046.6**	**1835**	**106.4**	**212**	**0.9005**	**0.90793**	**0.83174**	**0.86798**