

<u>Model Name</u>	<u>Features used</u>	<u>F1 score</u>	<u>Micro-averaged precision</u>	<u>Reason for justifying performance</u>
OneVRest Logistic Regression	CountVectorised bag of words	47%	66%	Best performing model in terms of overall prediction and precision. Performs better than random forest classifier because logistic regression is more forgiving to the scale of input features and can handle high-dimensional feature vector better than random forest classifier
OneVRest Logistic Regression	CountVectorised bag of words + other dataframe 'df' with other features	32%	55%	Performs worse than the same model with just the vectorized bag of words. Reasons are- overfitting(due to increased number of features and small dataset)
Binary Relevance with Gaussian Naïve Bayes wrapper	CountVectorised bag of words	27%	50%	Reasons for sub-par performance- assumption that features are independent. Not sensitive to an imbalanced dataset

Binary Relevance with Gaussian Naïve Bayes wrapper	CountVectorised bag of words + other dataframe 'df' with other features	42%	28%	<p>Has better f1 score than the same model with lesser features because it overfits which is probably leading to higher recall (model is able to correctly classify most of the positive instances in the training set and also, it's not classifying many negative instances as positive leading to high f1 score). This is misleading.</p> <p>This can be confirmed with the low precision(28%).</p>
RandomForest Classifier(ensemble method)	CountVectorised bag of words	24%	70%	<p>Low f1 score because of class imbalance.</p> <p>Models such as random forest can lead to high recall resulting in</p>
RandomForest Classifier(ensemble method)	CountVectorised bag of words + other dataframe 'df' with other features	36%	60%	<p>Model is overfitting the noise in the data leading to higher recall and lower precision as compared to the previous model with only</p>

				vectorised bag of words.
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