**NLP Lab 9**

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**Topic: Cross Validation**

**General observation** : The accuracy increased after cross validation as using folds ensures that the whole data is trained and tested on. The minimum accuracy with cross validation was higher than the accuracy that was achieved with 1 fold.

I performed both 5 fold and 10 fold cross validations on both bigrams and POS features. For 10 fold POS gave better mean accuracy whereas for 5 fold bigrams gave higher accuracy.

1. **For bigrams :** The mean accuracy for 5 folds and 10 folds was the same but the range of accuracies was higher in 10 fold, this could be because of the additional number of fold implying that the test sets are smaller in 10 fold compared to 5 fold. But the overall mean accuracy is the same because the whole data is trained and tested on. So essentially all records participate in training and testing at some point. The accuracy increased from 72.5% to 73.95% on 5 folds and 73.91% on 10 folds
2. **1 fold accuracy**

The accuracy was 0.725

Text

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1. **with 5 fold cross validation :**

max accuracy: 0.751

min accuracy: 0.727

mean accuracy : 0.7395

Graphical user interface, text, application, email

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1. **with 10 fold cross validation:**

max accuracy: 0.767

min accuracy: 0.720

mean accuracy : 0.7391

Text

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1. **For POS features :** The mean accuracy for 10 folds was greater than 5 fold but the range of accuracies was higher in 10 fold just like the bigram features. The mean accuracy of 5 fold is lower than bigram feature set where as the mean for 10 fold is greater than 10 fold of bigram features.
2. **1 fold accuracy**

The accuracy was 0.721

Text

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1. **with 5 fold cross validation :**

max accuracy: 0.754

min accuracy: 0.723

mean accuracy : 0.7389

Graphical user interface, text

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1. **with 10 fold cross validation :**

max accuracy: 0.759

min accuracy: 0.722

mean accuracy : 0.740

Graphical user interface, text, application

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