CA 2 Submission

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# Q 1. Text Classification

We found out using GridSearch that best parameters for LDA is {n\_components- 10, perplexity- 0.9}. We used CountVectorizer as it works on Probabilistic model which is also the underlying logic of LDA. We are considering that a word should come in atleast 2 documents (min\_df) and should not come in more than 90% of the documents (max\_df). We are also removing stop words in this process. With this configuration, we got 50,470 words from 2,00,000 documents/rows/questions.

We then did NMF with 10 components/topics and default 0.7 perplexity. We used TfidfVectorizer which gives better result as compared to CountVectorizer as Tfidf takes in account words in all documents. We are considering that a word should come in atleast 2 documents (min\_df) and should not come in more than 90% of the documents (max\_df). We are also removing stop words in this process. With this configuration, we got 27,884 words from 2,00,000 documents/rows/questions.

# Q 2. Supervised Learning

We have selected NMF classification data as it more accurately classified topics as compared to LDA. We found that the probability of words in a few topics were quite low based on the observations of the graphs.

We got the following accuracies:

|  |  |
| --- | --- |
| **Algorithm** | **Accuracy (%)** |
| Logistic Regression | 87% |
| Navie Bayes | 71% |
| Random Forest | 90% |
| Support Vector Classifier | 21% |

We have noticed that Random Forest has the highest accuracy with 90%.