**Problem 1**

This was basically a sentence classification problem which can be solved using NLP techniques and machine learning models. The steps which I followed are as follows:

1. **Data Cleaning**

This step comprised of the following substeps:

* Lowering
* Tokenization
* Stemming
* Stopwords Removal
* Pruning

**2.** **Text Featurization**

This is mainly conversion of the sentences into word vectors using different NLP text preprocessing techniques like BOW, Count Vectorizer and TF-IDF. I have used combined word2vec and TF-IDF.

**3.** **Applying Machine Learning Models:**

The machine learning models which I applied on the dataset are :

* Multinomial Naive Bayes - (0.67)
* SVM - (0.68)
* Logistic Regression - (0.76)
* Random Forest - (0.74)
* MLP - (0.67)

**Problem 2**

This problem was mainly the extraction of a Noun Phrase from a sentence.

**Approach:**

**Firstly,** I wrote a chunk grammar for the noun phrase by using its english definition (mentioned in the code).

**Secondly,** I tokenized the sentences using nltk and built the parse tree with help of grammar and tokenized sentences.

**Thirdly,**  i wrote a snippet for extracting the noun phrases from the parsed tree.