- **Approach 1: Using raw Natural Language Processing by Python's NLTK Library**

  *Process:*

  In this process, I thought of using the bag of words and word vectorisation technique to get a context of the captured phrases and train a model based on that. The above techniques would help in judging what parameters were considered to extract the phrase and thus train the model to decide on how to pick the phrases for the evaluation dataset.

  *Shortcomings:*

  This method failed miserably as the bag of words and word vectorisation is not very good at grabbing the actual grammatical context of words in a sentence and thus it was not able to pick out phrases from the sentences.

- **Approach 2: Using Spacy to get sentence context and then train model based on it**

  *Process:*

  In this process, the sentence is classified and analysed by Spacy based on NLP techniques. This provides us with crucial data for each word in the sentence like what part of speech it is, what parent or child element it pertains to, etc. This classification was first pre-processed into numerical form(classes) then coupled with supervised learning to train the model. Thus, the model could somewhat predict the extracted phrase from the evaluation sentences based on the information provided during training.

  *Shortcomings:*

  Even if the model could predict phrases from sentences to some extent, it still was not that refined. This was because the training data did not have a specific pattern which confined within the boundaries of data provided by Spacy for each word as a separate entity. Also, it failed to predict the cases where the phrase was 'Not Found' in the sentences. Thus, this model was scrapped as well.

- **Approach 3: Using Spacy to get sentence predicate and retrieve phrase from it**

  *Process:*

  This process is solely based on my observation that most of the phrases/intents of setting reminders from users have been in the predicate part of the sentence. So I decided to capture the predicate part instead of searching for the phrase.

  In this process, the sentence is classified and analysed by Spacy based on NLP techniques as done in earlier method. This also provides us with 'noun chunks' of the

sentence which are similar to clauses in English grammar. Now the chunks obtained are tested for containing the object of the sentence so that it could be labelled as the predicate of the sentence. If not found then the label ‘Not Found’ is generated.

*Shortcomings:*

This solves most of the problems but there is no such condition governing the sentences that states the phrase to be present necessarily in the predicate of the sentence. However, since this is giving the best performance of the three approaches, I decided to stick to it.