1. Synonym expansion:

We add synonyms of query terms to the original query. It was done by using WordNet to perform synonym expansion for a given query by retrieving top words from the synsets of each word in the query.

1. Pseudo Feedback expansion:

We use relevant documents given to refine and expand the original query weight to improve the relevance of search results.

The function pseudo\_feedback applies the Rocchio algorithm to the query to improve its accuracy by using the relevant documents. The Rocchio algorithm involves multiplying the original query vector by a constant alpha, adding a vector composed of the average of the relevant documents' vectors weighted by a constant beta.

However, the recall and precision were not improved. Thus, we comment out the this method in our final submission.