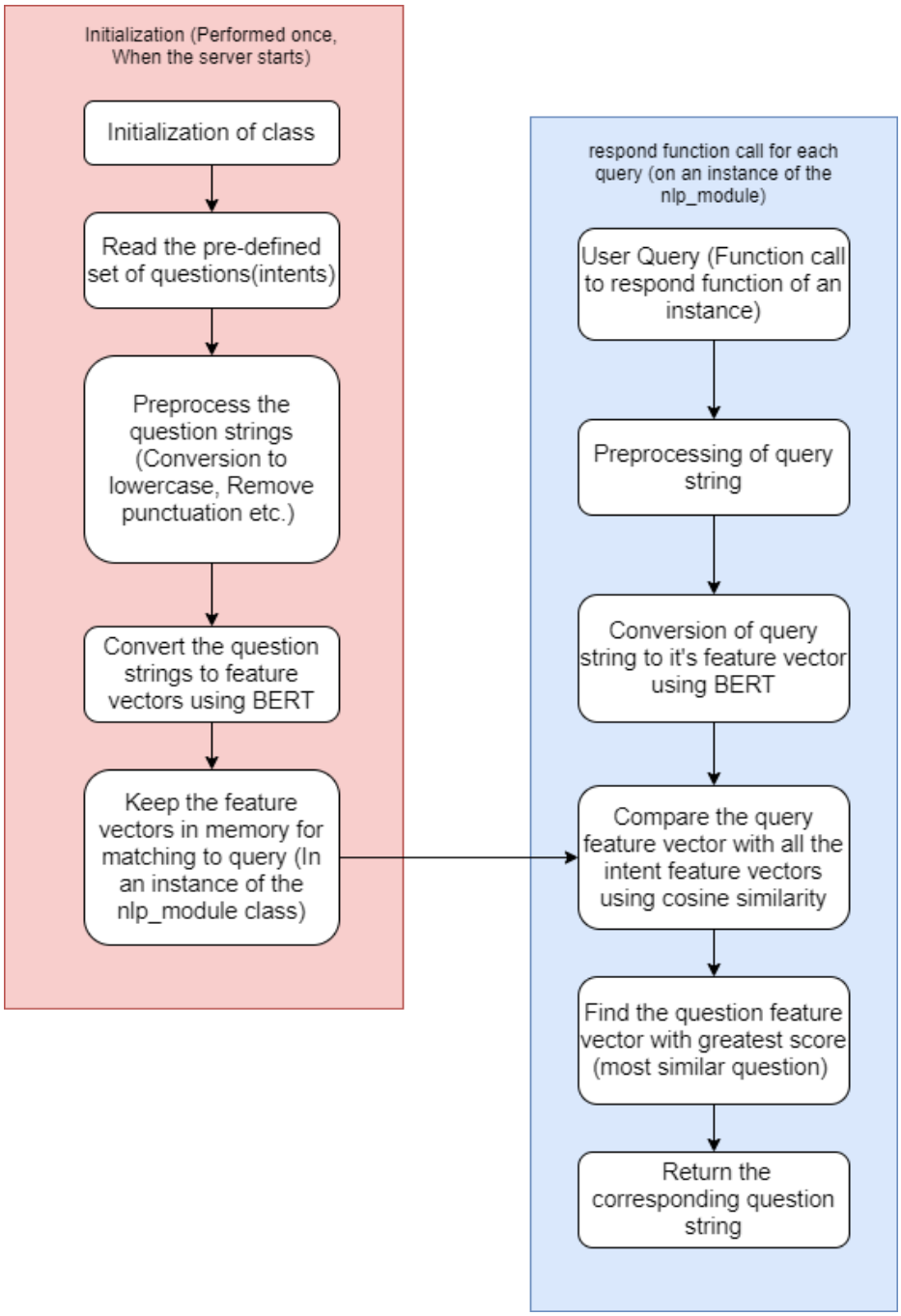
NLP Engine- Module Level Documentation

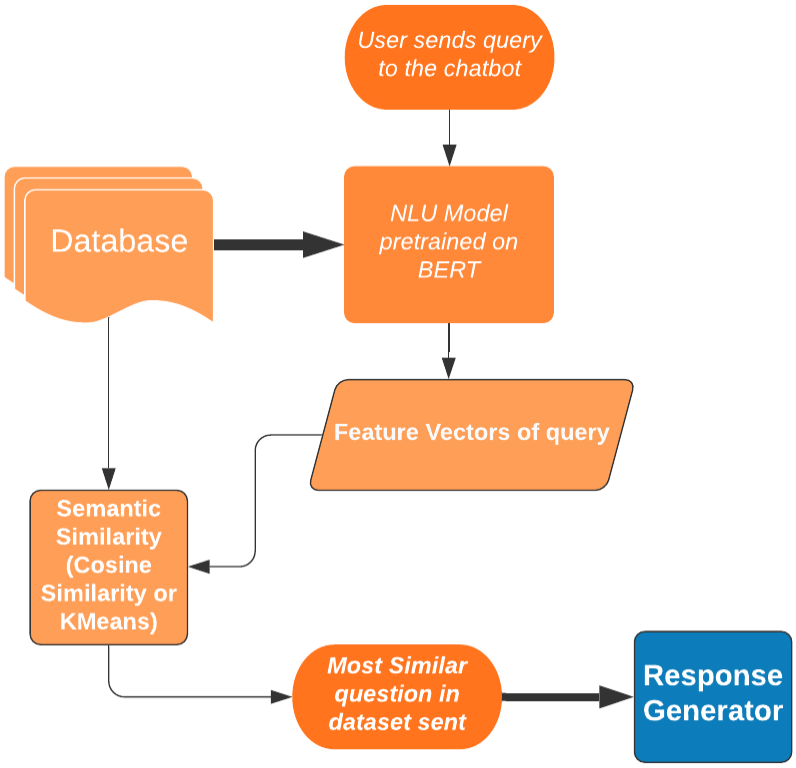
Purpose of the NLP Engine:

The NLP Engine is the core component of a Chatbot. It fills the gap between human communication and computer understanding. In this project, we have created an AI chatbot which depends on the NLP Engine for understanding the user input and matching it to a query. Here, the NLP Engine will automatically manipulate the inputted text(by computing feature vectors) so that it can be understood by the computer.

How does the NLP Engine work?



How is it structured? (what are its components) Diagram of system / module Technology, language, tools used



The flow of information in the following order:

1. NLP Engine receives user text from the backend.
2. This user text is passed through BERT model to get the feature vector of the sentence
3. This feature vector is compared with the feature vectors of the questions and the best matching question is found.

Components of NLP Engine:

1. Formatter : Converts questions and queries to lowercase and removes punctuation
2. BERT Embedder : Encodes the questions and queries to a n-dimensional feature vector
3. Semantic Similarity Finder : Computes semantic similarity between user query and predefined queries using the feature vectors obtained from BERT Embedder. Cosine Similarity is used to check for spatial similarity of vectors.

Tools: Python IDE, Scipy, Sentence Transformer

Languages: Python

Technology Needed:

- Due to the limited dataset available, an entire Deep Learning model can’t be trained simply on this dataset. So, a pre-trained language model, BERT is used to generate feature vectors. BERT has been trained on a large text corpus and hence is good at few-shot learning tasks like this.

- The Sentence-Transformer model provided by UKPLab wraps the BERT Model and then acts as an embedder to provide feature vector representation of questions.