To, IITD-AIA Foundation of Smart Manufacturing

Subject: Weekly Progress Report for Week 5

Dear sir, Following is the required progress report to the best of my knowledge considering relevant topics to be covered.

What's happening this week:

- EDA-Pre-Processing the data i.e., scrapped out from site.
- Tokenization and stemming of messages/questions.

My understanding of INTP23-ML-01: CHATBOT for FSM

Scope: In the Chatbot for Site, I will try to scrape out all important info from website and according to the questions of users , it will provide best possible and accurate answers and it should follow the upcoming check points analyze user queries and understand user messages, provide answers to the messages of the user accurately, provide all information about the updated activities and save their time from searching on website and google search the information, provide answers accurately as much as possible, i.e., instead of providing irrelevant information, its' better to admit that bot is not able to understand the question.

Solution: In this, concept of deep learning either Pytorch or TensorFlow will be used along with some other libraries like Beautiful Soup, and one for scrapping the data on the website or using NLP and deep learning technique of transformer for question answering would increase efficiency of Chatbot. Using data of SQUAD, ROBUSTA model would be my preference.

Approach: Rule-based approach will be used for most common questions like hi, hello, bye. And web-scraping the data in order to give website related answers. For, questions/queries of users; we will use transformer (ROBUSTA model) and SQUAD dataset for pre-training and web-scrapped data of IAFSM site for fine-tuning.

WEEKLY PROGRESS:

This week, I learned the concept of Deep-Learning in order to understand architecture and model of Transformer. Also, I applied the Robusta model using SQUAD dataset for pre-training, where I provided the test context about IAFSM and asked some questions related to context.

Now Day-wise.

July 3(Monday)
I started with learning Deep Learning concepts where I learnt about Neural Networks, activation Function, Loss Function, Cost Function, Forward, Back Propagation, etc. Also, I started generating context about IAFSM to start with the project model implication on the dataset.

July 4(Tuesday)
I almost completed with basics of Deep Learning Process like Gradient Descent, Mini batch Gradient Descent, Optimization functions like sigmoid, Relu, Its types like PRelu, Soft Max, soft Plus function etc.

July 5(Wednesday)
I completed with Deep Learning Process like attention model, Transformer, Bidirectional LSTM, encoder, decoder. How all these concepts ae interrelated o develop a attention model and used in transformer. In encoder there is bidirectional LSTM and input/ context is sent to decoder through neural network.

July 6(Thursday)

I learnt about BERT, how it has two steps for getting output, first is Pre-Training which includes further two steps MLM (Masked Language Model) and NSP (Next Sentence Prediction). Then there is Fine tuning model, it uses model weights for pre-training phase, how BERT will understand answer/language/sentiment. There will be supervised Learning and hyper parameter training for getting good accuracy.

July7(Friday)

the small model implementation is done with respect to model.

July 8(Saturday)

Yes, using ROBUSTA, I implemented concept of Transformer using SQUAD dataset and I provided small context of IAFSM and asked questions. I provided small and short answer but correct.

July 9(Sunday)

I tried with fine tuning the model, and increased the epochs from one (1) to three (3). And, also increased the test context by adding more information to it and asked some other questions like “Tell me something about Internship?”, “what is IAFSM??”, etc.