Problem Statemen: 1312

Chatbot to respond to text queries pertaining to various Acts, Rules, and Regulations applicable to Mining industries

Problem Description

A Chatbot is a computer program that uses Artificial Intelligence (AI) and Natural Language Processing (NLP) to understand customer questions and automate responses to them, imitating human conversation. As of now, various Acts, Rules and Regulations, DGMS Circulars, CoI Proceedings, etc. are applicable to Mining industries. These are some of the Acts and Rules: The Coal Mines Act, 1952 Indian Explosives Act, 1884 Colliery Control Order, 2000 Colliery Control Rules, 2004 The Coal Mines Regulations, 2017 The Payment of Wages (Mines) Rules, 1956 Additionally, land-related laws i.e. CBA, LA, RandR related queries can also be incorporated to develop Robust Management Information System. Hence it is proposed to make a chatbot available 24/7 for stakeholders and customers which can answer all their queries regarding the rules, acts, and circulars.

Problem Definition

A LLM chatbot has to be created which is capable of taking in queries and questions and generating a response imitating human conversation.

Data Collection

Data related to mining industry can be easily scrapped from official government websites like PRS legislative research(https://prsindia.org/) and Ministry of Mines (https://mines.gov.in/). Data can also be collected from information dumps like wikipedia regarding mining related terms and tasks.

Data Preprocessing

Data that has been collected is preprocessed to eliminate any spelling mistakes, formatting mistakes and unwanted symbols and characters. This processed data can then be converted into a large text corpus that will be used to train the chatbot.

Model Training

There are various pre-trained architectures like LangChain, BLOOM and GPT that can be used as the base architecture of the chatbot AI. The large corpus collected is fed into the model for training. The model trains by creating word vector space.

Chatbot response

When a user inputs a question for the chatbot, it converts that input data into a word vector and compares it with the internal representation of it's training data. It finds words and information that are related to the question asked and converts the response into a human dialogue.

Workflow architecture