------1

What I'm talking about is the part of sentiment analysis of acceptable answers

-----2

First of all, what I'm going to talk about is the part of the research method.

I need to use pandas to read the data containing questions and answers from the Excel file where we collected the data. To improve the accuracy of the model, I wrote the clean\_text () function, which uses regular expressions to remove HTML tags, code blocks, website links and special characters, and only retains the natural language text that is meaningful for sentiment judgment.

----3

The second one is the BERT sentiment analysis model, which is also the most crucial point. I used the pipe (" Sentiment Analysis ") interface in the transformer library provided by huggingFace and called a fine-tuned BERT model to classify the text sentiment. This model outputs a label and the corresponding confidence score for each text segment. I classified emotions into three categories: positive, neutral and negative, and applied this method to the responses of Stack Overflow and Gemini respectively.

The classification results were visualized using matplotlib, and the number of emotion types was plotted as a bar chart and a pie chart. The chart clearly shows the distribution differences of each emotion in the two sources.

------4

Next, I will explain the working principle of bert, because this is the most important part of my part and I spent more time understanding it

When using Hugging Face's sentiment analysis model, the input text is first preprocessed: it's tokenized, padded/truncated, and converted into IDs. The model then performs forward propagation to generate hidden states and output logits. These logits are passed through a Softmax function to produce probabilities, and the label with the highest probability is selected as the sentiment. Finally, the pipeline returns a dictionary with the sentiment label and confidence score. For example, the sentence “This solution is very simple and very effective” is processed this way to generate a high-confidence negtive result.

------5

Then here is a part of the example of the visualization results during the analysis process. You can see the pattern of his label+ confidence score.

-----6

The chart shows that Gemini’s answers tend to be more positive, while Stack Overflow responses are more often neutral or negative. This may be due to the emotional tone of real users on Stack Overflow, who often post while facing technical frustrations. In contrast, Gemini, as an AI assistant, is designed to be polite and encouraging. AI responses offer a friendlier learning experience, especially for beginners, while Stack Overflow provides real-world problem-solving. In the future, combining AI tools with community knowledge bases is recommended for faster and deeper learning.