**Documentation of Integration of Model :**

**Chatbot for Simulated Price Negotiation**

This documentation outlines the design of a negotiation chatbot intended to replicate the price negotiation stage between a customer and a supplier, utilizing an amalgamation of pre-trained models and tailored logic. The chatbot includes functionalities such as sentiment analysis and adaptive pricing that respond to user inputs.

**1. Overview:**

The chatbot follows a fundamental conversational structure wherein the user (representing the customer) negotiates the price of a product with the chatbot (serving as the supplier). The user has the ability to propose an offer, and the chatbot can either accept, decline, or make a counteroffer. The ultimate decision relies on a defined price range, discount principles, and reaction analysis to mimic a human-like negotiation interaction.

**2. Model Integration and Requirements:**

* **Conversation Flow:** The negotiation begins with a predetermined actual price for a product. The chatbot kick-starts the dialogue by soliciting an offer from the user, then responds with a counteroffer or additional discounts depending on the discussion flow.
* **Pricing Logic:** The negotiation is managed using a discount mechanism. The chatbot produces a counteroffer within a specified price range, with dynamic adjustments to discounts. Based on the user's positive or negative reactions, the chatbot modifies the discount accordingly.
* **User Interaction:** The user inputs their offer, which the chatbot evaluates to either accept, reject, or counteroffer, guided by a pre-established discount logic. The chatbot monitors sentiment to adjust its approach, simulating a more authentic negotiation.
* **Reaction Analysis:** Reaction analysis is executed using the TextBlob library to enhance the negotiation process. Positive feedback results in a moderate discount, whereas negative sentiments trigger a larger discount, allowing for greater flexibility in negotiations.
* # Give a higher discount if the user is unhappy
* if answer == "negative":
* discount += 5
* *# Normal discount increase*
* else:
* discount += 3

**3. Key Components in Code**

The main functions that constitute the chatbot are as follows:

* **get\_user\_input(prompt) Function:** This function captures user input during negotiations, serving as the link between the chatbot and the user.
* def get\_user\_input(prompt):

return input(prompt)

* **analyze\_reaction(text) Function:** This function applies the TextBlob library to assess the reaction of the user's input. It classifies the sentiment as positive, neutral, or negative, informing the chatbot's response during negotiation.
* from textblob import TextBlob
* def analyze\_sentiment(text):
* blob = TextBlob(text)
* sentiment = blob.sentiment.polarity
* if sentiment > 0.1:
* return "positive"
* elif sentiment < -0.1:
* return "negative"
* else:

return "neutral"

* **negotiate\_price(actual\_price, discount) Function:** This key function orchestrates the negotiation process. It prompts the user for an offer, suggests a counteroffer, and adjusts discounts depending on the sentiment analysis derived from user responses. The negotiation persists until an agreement is finalized.
* def negotiate\_price(actual\_price, discount):
* while True:
* user\_offer = float(get\_user\_input(f"The actual price is ${actual\_price}. How much would you like to offer? "))
* counter\_offer = max(actual\_price \* (1 - discount / 100), user\_offer + 2)
* print(f"Supplier's counter-offer: ${counter\_offer:.2f} (after {discount}% discount)")
* response = get\_user\_input("Do you accept this offer? (yes/no) ")
* reaction = analyze\_raection (response)
* print(f"User's sentiment: {reaction}")
* if response.lower() == 'yes':
* print("Done deal!")
* break

**4. Model Integration**

* **Conversation Handling:** The conversation itself is managed using standard Python input/output commands (get\_user\_input). For more sophisticated conversational dynamics, language models like Gemini could be deployed to enrich the responses. The get\_user\_input function could be substituted with API calls to a conversational model (e.g., gemini) for a more natural interaction.
* **Reaction Analysis Integration:** Sentiment analysis employs TextBlob, which offers a straightforward method to evaluate the user's mood and modify negotiation dynamics. Sentiment scores help dictate the chatbot's behavior in response to feedback categorized as positive, neutral, or negative.
  + If the sentiment is **positive** (polarity > 0.1), the chatbot slightly increases the discount (adds 2%).
  + If the sentiment is **negative** (polarity < -0.1), the chatbot significantly raises the discount (adds 3%).

**5. Potential Enhancements**

* **Integration with Language Models (e.g., Gemini models):** Utilizing an Gemini API to replace simple text inputs with more intricate conversational capabilities would facilitate richer and varied dialogue in response to user inputs.
* pip install python-gemini-api
* pip install git+https://github.com/dsdanielpark/Gemini-API.git
* pip install textblob
* from gemini import Gemini
* from textblob import TextBlob

In this framework, the chatbot\_response function could be woven into the negotiation loop to generate more nuanced replies.

* **Advanced Reaction Analysis:** To enhance performance and a deeper understanding of user tone and intent, more sophisticated models such as VADER or customized sentiment analysis frameworks from platforms like Hugging Face could be considered.

**6. Running the Chatbot**

To initiate the negotiation process, simply call the negotiate\_price() function, providing an actual price and a starting discount:

negotiate\_price(1800, 10) # Start with an actual price of $1800 and a 10% discount.

what is your name ?vinay teja

Hello! vinay teja welcome

The actual price is $1800. How much would you like to offer? 1200

Supplier's counter-offer: $1620.00 (after 10% discount)

Do you accept this offer? (yes/no) sorry

User's reaction: negative

Discount increased to 15%.Let's continue negotiating.

The actual price is $1800. How much would you like to offer? 1250

Supplier's counter-offer: $1530.00 (after 15% discount)

Do you accept this offer? (yes/no) no

User's reaction: neutral

Discount increased to 18%.Let's continue negotiating.

The actual price is $1800. How much would you like to offer? 1300

Supplier's counter-offer: $1476.00 (after 18% discount)

Do you accept this offer? (yes/no) no

User's reaction: neutral

Discount increased to 21%.Let's continue negotiating.

The actual price is $1800. How much would you like to offer? 1300

Supplier's counter-offer: $1422.00 (after 21% discount)

Do you accept this offer? (yes/no) yes

User's reaction: neutral

Done deal!

The chatbot will then engage in negotiation with the user, dynamically adjusting prices and sentiment throughout the interaction.