Agent escalation and empathetic responses via IVR system

Introduction:

In this project I have created a Machine learning model which can be mainly used in the field of IVR system, this model assists in the IVR field by recognizing customers sentiment and this model determines whether the call needed to be escalated to agent or not.

Key aspects:

1. The dataset for the project is created for specific cause which is customer calls and services.
2. BERT language model is used which uses Transformer architecture.
3. It provides an accuracy of 91 percentage.
4. This system converts Incoming speech to text and uses the model to categorize the sentiment of the call and decides whether to escalate the call to agent or not.

Methodologies:

!. **Model Training**:

- Utilized a pre-trained BERT model fine-tuned on a dataset of customer service interactions.
- The model classifies sentiments into positive, neutral, and negative categories.

2. **Sentiment Analysis**:

- The trained BERT model processes input text and outputs sentiment probabilities.
- A threshold is set to classify sentiments:
  - Positive: Probability > 0.6
  - Negative: Probability < 0.4
  - Neutral: $0.4 <=$ Probability $<= 0.6$

3. **Agent Escalation**:

- Text inputs are analysed for keywords indicating dissatisfaction or issues.
- Sentiment analysis results and keyword presence determine if an escalation is necessary.

4.**Empathetic Response**:

- Based on the inputs from the users using the sentiment analysis keywords it provides its own empathetic responses.

Findings:

- **Accuracy:** The model demonstrates high accuracy in sentiment classification, significantly aiding in automating initial customer response.
- **Efficiency:** Automated sentiment analysis and escalation prediction reduce response time, improving overall customer service efficiency.
- Using a model trained using BERT provides us with a great portability option for model and it is easy to use anywhere.

Recommendations:

- Implement the model using twilio or IVR oriented platforms to make it more real-time and more responsive.
- Flask can be used for local hosting and test the model locally integrating twilio features.
- The size of dataset can be increased with new cases to improve the accuracy and adaptability of the model.

Conclusion:

Overall, this model is best suited for Interactive voice response systems and can enhance customer service operations by providing timely and accurate initial responses. This model can take carry of the initial conversions of the call and can be integrated to escalate the based on the models intelligence.