Agent escalation and empathetic responses via IVR system

Overview:

This project aims to assist the IVR system with the model's intelligence by providing empathetic responses to users based on the sentiments of the users and escalates the calls to agents whenever it is needed.

Objective:

Main goal of the project is to develop a machine learning model which does sentiment analysis provide responses based on the input from the user.

Python Libraries used:

1. Torch
2. Sklearn
3. Transformers
4. Nltk
5. Speechrecognition
6. Pydub
7. Pandas , OS , CSV and Random

These are all the libraries that are needed to be installed and imported before starting the project. Flask can be installed to host in local machine.

Steps to develop the model:

1. Create a random dataset based on the scenarios the model needed to solve.
2. Use BERT tokenizer to tokenize the sentences and convert them to tensors to split the dataset for training and testing.
3. Choose suitable optimizers, create data loaders and load sequence classification from BERT.
4. Use torch to choose the device and train the model in loop for batches
5. Validate and test the model
6. Using the developed BERT model create a logic for sentiment analysis and create a new csv file storing the keywords, sentiment and query.
7. Now to setup the IVR system, load the model and create a logic for the system and based on the logics call the model and decides whether to escalate the call and finds the sentiment of callers and provides empathetic responses.
8. Create a small workspace in which this can be automated for small case.
9. Get voice input from user and convert it to text and provide the text to our model for prediction.

Setup:

Create and save the model from running the main code. This main code creates a dataset and develops a BERT model and saves the trained model in the drive content. To create a sentiment analysis model, use the saved and trained model from drive and create a logic to categorize the sentiments from the user.

Now, using flask and Twilio integrate this model to make the IVR system more responsive and faster and provide AI assistance to customer calls.

To test the models performance, create a small work space where the user input is given a WAV audio file which is converted to text, this text then sent a as a query to model which determines the sentiment trend and whether the call needed to be escalated or not.

Conclusion:

This model has the abilities to make the IVR system more quicker and responsive to users based on the sentiment finding trend and agent escalation capacity.