Proposal: NLP-based Customer Support Chatbot

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Problem Statement

Many businesses face challenges in providing timely and accurate customer support. Customers often experience long wait times or inconsistent answers when interacting with support channels. This can lead to dissatisfaction, decreased loyalty, and increased operational costs. There is a need for an automated system that can understand user queries and provide instant, relevant responses.

Proposed NLP-based System

We propose to develop a **Customer Support Chatbot** that leverages natural language processing to understand user inquiries and respond appropriately. The system will allow users to ask questions about products, services, or troubleshooting issues and receive accurate, real-time answers.

Significance in Society: Automated chatbots improve efficiency in customer service, reduce wait times, and enhance user satisfaction. They also allow businesses to provide 24/7 support without increasing staffing costs.

Implementation Approach

The chatbot will be implemented in Python using the following techniques:

- **Text Preprocessing:** Tokenization, stopword removal, and lemmatization to normalize user input.
- **Intent Classification:** Using machine learning models (e.g., Naive Bayes or Logistic Regression) to determine the type of user query.
- **Response Generation:** Predefined responses mapped to intents or dynamically generated responses using a rule-based system.
- **Evaluation:** Testing chatbot accuracy and response relevance using sample queries.

We will use Python libraries such as `NLTK`, `scikit-learn`, and possibly `spaCy` for NLP tasks.

Demonstration Plan

The system will be demonstrated by allowing classmates to interact with the chatbot directly. This approach includes:

- Hosting a web-based demo using `Flask` or `Streamlit`, so users can type queries and receive responses in real time.
- Collecting feedback on the chatbot's accuracy and helpfulness from peers.
- Including screenshots and analysis of sample interactions in the final report to highlight system performance.