CP4130 Progress Report
NLP-Based Customer Support Chatbot

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Project Overview

I have continued with my original proposal of building an NLP-based Customer Support Chatbot. The goal of this project is to develop a system that can understand user queries, classify their intent, and generate appropriate responses in real time. The chatbot is designed to simulate a simplified automated customer support assistant using core natural language processing techniques covered in this course.

Work Completed So Far

1. Project Planning and System Design

I began by clearly defining the scope of the chatbot and determining what functionality it should support. The system will follow an intent-based architecture, where user input is processed, classified, and mapped to a predefined response.

The following has been completed:

- Finalized the system objective and feature set
- Selected Python as the development language
- Identified key NLP libraries (`NLTK`, `scikit-learn`, `spaCy`)
- Designed the overall system pipeline (preprocessing, classification, response generation)
- Planned dataset structure for training intent classification

This planning phase ensures the implementation will remain structured and scalable as development progresses.

2. Repository and Environment Setup

I have begun setting up the technical foundation of the project.

- Created a dedicated project directory
- Initialized a Git repository

- Planned folder structure for data, models, and source code
- Began configuring a Python virtual environment

The goal is to build the system in a modular way rather than as a single script, allowing for easier debugging, expansion, and evaluation.

3. Dataset Preparation Planning

I have outlined the structure of the dataset that will be used to train the intent classification model. The chatbot will initially support a limited set of common customer service intents (e.g., product inquiries, troubleshooting, account-related questions).

The focus is to first build a working baseline model before increasing complexity.

Current Stage

At this point, the planning and setup phase is largely complete.

The next steps are:

- Finalize and construct the intent-labeled dataset
- Implement text preprocessing (tokenization, stopword removal, lemmatization)
- Convert text data into numerical features (e.g., TF-IDF or bag-of-words)
- Build and train a baseline intent classification model
- Evaluate initial classification accuracy

Next Phase of Development

After the baseline model is trained, I plan to refine the system by improving preprocessing and experimenting with alternative classifiers if necessary. Once the classification component is stable, I will integrate the response generation module and connect the system to a simple web interface (e.g., Flask or Streamlit) for interactive testing.

If time permits, I may explore enhancements such as sentiment analysis or improved response handling.

Where the Project Is Headed

By the final submission, I plan to demonstrate:

- A working NLP-based chatbot capable of classifying user intents
- An interactive interface allowing users to test the system

Overall, the conceptual foundation is complete, and I am transitioning into full implementation and model development.