**NLP-Based Chatbot Implementation**

A Project Report

submitted in partial fulfillment of the requirements

of

AICTE Internship on AI: Transformative Learning

with

TechSaksham – A joint CSR initiative of Microsoft & SAP

by

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#### **ABSTRACT**

This project implements a chatbot using Natural Language Processing (NLP) techniques to understand user intents and provide appropriate responses. The chatbot leverages **nltk** for tokenization, **scikit-learn** for vectorization and similarity calculations, and **Streamlit** for an interactive web interface. The chatbot is designed to handle various user intents such as greetings, farewells, jokes, and FAQs, with responses defined in a **JSON** file. Conversation history is logged in a CSV file, allowing users to review previous interactions. This project demonstrates how basic NLP and machine learning can be integrated to create an efficient and user-friendly assistant.

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**CHAPTER 1**

**Introduction**

**Problem Statement**

In a world where instant communication is key, there is a need for an NLP-based chatbot that can automate answering frequently asked questions efficiently. This reduces the burden on human resources and improves response times.

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### Motivation

This project was chosen to simplify the process of responding to repetitive queries, thereby improving productivity and reducing manual effort. Chatbots can be used in various domains such as customer service, education, and information retrieval.

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### Objectives

1. Develop a chatbot that understands user inputs.
2. Provide appropriate responses based on predefined intents.
3. Log conversation history for review and analysis.

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### Scope of the Project

The chatbot handles predefined intents such as greetings, farewells, jokes, and FAQs. It uses basic NLP and machine learning techniques for pattern recognition. The chatbot is limited to the intents defined in the intents.json file and does not support real-time data retrieval.

**CHAPTER 2**

**Literature Survey**

Existing chatbot technologies use rule-based approaches and NLP. Rule-based bots follow predefined scripts, while NLP-based bots leverage machine learning to improve flexibility and response accuracy. Tools like nltk and libraries like scikit-learn enable effective text processing and similarity detection.

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### Gaps Identified

* Rule-based bots lack adaptability.
* NLP-based bots can be improved by integrating more advanced models and real-time data sources**.**

**CHAPTER 3**

**Proposed Methodology**

**System Design**

1. **Input**: User message.
2. **Processing**: Tokenize input, vectorize, and calculate similarity.
3. **Output**: Return appropriate response based on matched intent.

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### Requirement Specification

#### **Hardware Requirements**

* Standard PC or Laptop

#### **Software Requirements**

* Python 3.x
* Libraries: nltk, scikit-learn, streamlit

**CHAPTER 4**

**Implementation and Result**

**Snapshots of Results**

1. Chatbot Interface in Streamlit
   * The chatbot interface allows users to input text and receive responses.
2. Conversation History
   * Shows logged interactions saved in chat\_log.csv.

**GitHub Link for Code:**

[**https://github.com/Shaik-Sam/Implementation-of-Chatbot-using-NLP**](https://github.com/Shaik-Sam/Implementation-of-Chatbot-using-NLP)

### Test Results

Sample chatbot responses are attached in the test results CSV file.

**CHAPTER 5**

**Discussion and Conclusion**

**Future Work**

1. Integrate real-time data APIs (e.g., weather, news).
2. Enhance the chatbot with deep learning models for better accuracy.

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### Conclusion

This project successfully demonstrates an NLP-based chatbot capable of handling predefined user intents. It provides a solid foundation for further development and real-world applications.

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