Project Abstract: Development of an AI-Powered Customer Service Chatbot

**Team Members:**

K. Sreya Tulasi-2320090037

K. Joshitha Satya-2320030096

N. Hasika-230030087

Problem Statement:

To develop a chatbot application specifically designed for customer service that automates common customer inquiries, resolves issues in real time, and enhances overall customer engagement. The chatbot should be capable of handling high volumes of customer interactions, providing 24/7 support, and improving operational efficiency by reducing the need for human agents in routine tasks.

Explanation:

With the growing demands of customer service in the digital era, companies need efficient solutions to address customer inquiries and issues at scale. Manual customer service responses are often slow, expensive, and prone to human error. A chatbot powered by AI and natural language processing (NLP) can serve as a valuable tool, offering instant responses to common customer queries, improving customer satisfaction, and increasing business productivity. The chatbot developed in this project is designed to provide real-time support for customers, capable of understanding and responding to natural language queries, offering personalized assistance, and handing over complex queries to human agents when necessary.

Algorithm:

**Step 1: Understanding Customer Query**

* **Tools Used:** Natural Language Processing (NLP)
* **Objective:** Accurately interpret customer inquiries based on text inputs.
* **Process:**
  + The chatbot receives a customer query, processes the text using NLP, and identifies the intent and key entities.
  + Based on predefined rules and machine learning models, the chatbot determines the appropriate response.

**Step 2: Providing Automated Response**

* **Tools Used:** AI/ML models, Predefined Knowledge Base
* **Objective:** Generate relevant responses based on the customer’s query.
* **Process:**
  + The chatbot generates a response from a predefined knowledge base or via machine learning algorithms.
  + If the query is routine (e.g., FAQs, order status), the chatbot responds immediately. For complex inquiries, it escalates the issue to a human agent.

**Step 3: User Interface Implementation**

* **Tools Used:** Web Framework (e.g., React, Flask), Messaging API
* **Objective:** Create an interactive interface for customers to engage with the chatbot.
* **Process:**
  + Customers interact with the chatbot via a web-based or messaging interface.
  + The chatbot processes inputs and displays relevant responses on the same platform.

Implementation:

The chatbot application is implemented using the following technologies:

* **Python/JavaScript:** Programming languages used to build the chatbot backend and front-end.
* **NLP Libraries (e.g., spaCy, NLTK):** For processing customer queries.
* **Machine Learning Models:** For improving chatbot accuracy over time.
* **Web Framework:** For building an interactive user interface.
* **Messaging APIs:** To enable real-time communication with users.

The chatbot improves customer service by providing instant responses, handling common inquiries, and improving business efficiency. It enhances customer satisfaction by delivering faster resolutions and offers scalability for handling large volumes of interactions.