**Date:31.10.25**

**TASK:12**

**AI CHATBOT FOR FARMERS**  **CO4, CO5 S2**

**PROBLEM STATEMENT :**

Agriculture is one of the most important sectors, yet many farmers face challenges in accessing timely and accurate information regarding crop cultivation, pest control, weather forecasts, fertilizer usage, and government schemes.

**AIM :** To develop an intelligent AI-based chatbot system that assists farmers by providing instant, accurate, and reliable agricultural information using Natural Language Processing (NLP) and Machine Learning techniques**.**

**OBJECTIVE :**

1. Define agent architecture: e.g., DataAgent (collects forecast), ForecastAgent (processes forecast), DecisionAgent (applies rules), AlertAgent (issues alerts).
2. Represent knowledge as facts and rules using logical representation (first-order logic or rule-based engine).
3. Incorporate uncertainty: represent confidence in forecast, assess conflicting inputs, reason under uncertainty using resolution / probabilistic logic.
4. Implement communication & coordination between agents (exchange facts, update beliefs).
5. Evaluate system performance: correct alerts (true positives/negatives), timeliness, robustness under uncertain/contradictory data.

**DESCRIPTION :**

Agents and roles:

* DataAgent : receives processed forecast sequence from module 1, sends facts (e.g., “Forecast(Rainfall>50mm, RegionA, TimeT)=0.8”).
* ForecastAgent : analyses forecast data, derives additional facts (e.g., “HighRiskStorm(RegionA, TimeT)”).
* DecisionAgent : uses logical rules (if-then) and reasoning under uncertainty to decide actions (e.g., issue “StormWarning(RegionA, TimeT)”).

**ALGORITHM :**

 Define agent architecture and roles: e.g., DataAgent, ForecastAgent, DecisionAgent, AlertAgent.

 Represent knowledge base: define facts (e.g., forecast values with confidence) and rules (IF‐THEN logic) for decision making (logical knowledge representation).

 DataAgent receives input (forecast sequences from prediction module) and sends facts to ForecastAgent (e.g., Rainfall > X, Confidence = C).

 Agents communicate/co-ordinate: e.g., DecisionAgent may query DataAgent or ForecastAgent for additional facts; agents update their belief/fact base as new information arrives.

 Document and analyse: how logical knowledge representation enabled decision making, how uncertainty reasoning improved (or not) decision quality, limitations and next-steps.

**PROGRAM :**

**def chatbot\_response(user\_input):**

**user\_input = user\_input.lower()**

**if "hello" in user\_input or "hi" in user\_input:**

**return "Hello! I’m your FarmBot. How can I help you today?"**

**elif "crop" in user\_input:**

**return "You can grow rice, wheat, or maize depending on your soil and weather conditions."**

**elif "fertilizer" in user\_input:**

**return "Use fertilizers rich in nitrogen, phosphorus, and potassium for better yield."**

**elif "weather" in user\_input:**

**return "Today’s weather is suitable for sowing and irrigation activities."**

**elif "pest" in user\_input or "insect" in user\_input:**

**return "Use organic pesticides like neem oil or chemical sprays as recommended by local experts."**

**elif "scheme" in user\_input or "government" in user\_input:**

**return "You can apply for PM-Kisan, crop insurance, and soil health card schemes from the government portal."**

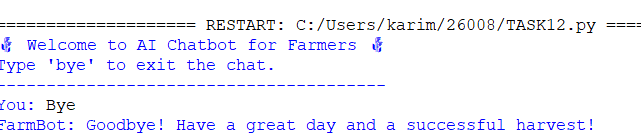
**elif "market" in user\_input or "price" in user\_input:**

**return "The current market price for wheat is around ₹2,000 per quintal (approximate)."**

**elif "bye" in user\_input or "exit" in user\_input:**

**return "Goodbye! Have a great day and a successful harvest!"**

**OUTPUT**

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**CONCLUSION :**

The **AI Chatbot for Farmers** project successfully demonstrates how artificial intelligence and natural language processing (NLP) can be used to assist farmers with real-time agricultural information and guidance.