

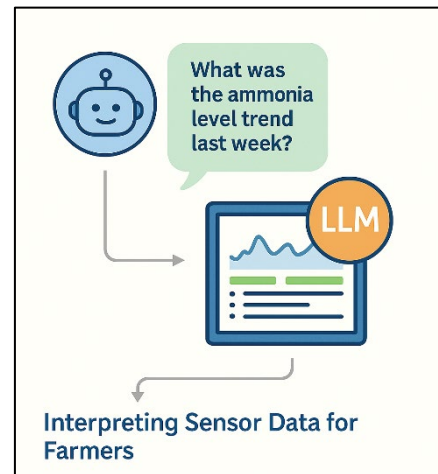
STUDENT ASSIGN - BUILDING A POULTRY FARM Q&A BOT WITH LOCAL LLMS

PROJECT INTRODUCTION

This assignment is developed under the **OBSeRveD project (Odour Based Selective Recognition of Veterinary Diseases)**—a national collaboration focused on building AI-powered tools for detecting poultry infections early through sensor-based air monitoring.

OBSeRveD aims to make **biological poultry farming** more sustainable and profitable by minimizing disease outbreaks without relying on antibiotics. One key challenge is translating raw sensor data (NH₃, VOCs, CO₂) into actionable insights that are accessible to farmers and veterinarians.

In this project, students will create a **farm Q&A bot** using **open-source Local LLMS** (e.g., Mistral, GPT4All) to answer questions like “What was the ammonia trend last week?” based on structured sensor logs. This bridges natural language processing and agri-tech, helping farmers make better decisions from complex data without needing technical expertise.



STUDENT TASKS

- Data & Prompt Engineering
 - Prepare time-series sensor data (e.g., NH₃, CO₂, VOCs) and farm logs.
 - Design prompts for typical farm-related questions.
- LLM Integration
 - Set up a local LLM using frameworks like LangChain or llama-cpp.
 - Connect the LLM to the structured data using tools such as Pandas agent, CSV loaders, or retrieval augmentation.
- Interface Development
 - Build a simple Streamlit or Gradio app that accepts questions and shows answers + context.
- Comparison & Testing
 - Optionally compare 2–3 LLMS (e.g., GPT4All vs. Mistral) on response quality.
 - Document performance differences, usability, and resource requirements.
- Documentation
 - Deliver user and technical documentation, a test set of sample questions, and improvement suggestions.

PRACTICAL INFORMATION

Student profile: For HBO/UTwente students with interest in NLP, Python, and data interfaces. Experience with pandas and basic ML/AI tools is useful. Interest in agri-tech applications is a bonus.

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