Smart Inventory Planning Assistant for Small Shops!!

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Introduction

Small retail shops often struggle with managing inventory efficiently due to manual tracking and lack of planning tools. This can result in frequent stock shortages or unnecessary overstocking. Proper inventory planning is essential to reduce losses and improve business efficiency .

Overview

The Smart Inventory Planning Assistant helps small shop owners decide what items to restock and when. It uses a Planner Pattern and a local open-source LLM to analyze stock and sales data and explain decisions. The system works both offline and online, making it simple and cost-effective.

Objectives

- To design a smart inventory planning system for small shops

- To apply the Agentic AI Planner Pattern for decision-making

- To analyze stock levels and sales data for restocking decisions

- To use a local open-source LLM to explain inventory decisions

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Inputs and Outputs

Inputs

- Product list
- Current stock quantity
- Minimum stock threshold
- Daily or weekly sales data

Example:
Rice – Stock: 20, Min: 40
Sugar – Stock: 10, Min: 25
Oil – Stock: 15, Min: 30

Outputs

Level 1 – Immediate Attention (Low Stock)
Sugar → Reorder 30 units

Rice → Reorder 50 units
Explanation: Stock is below minimum level and recent sales are high.

Level 2 – Monitor Stock
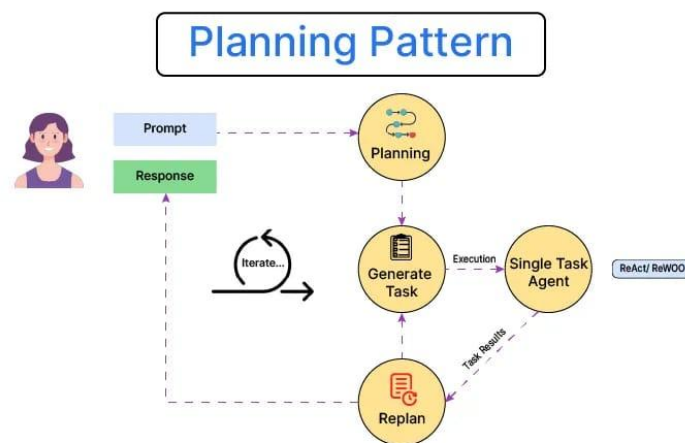Oil → Stock sufficient, no reorder required

Level 3 – Stable Items
Items with steady stock and low sales – No action required.

Design Overview

The system is designed using a Planner Pattern where inventory decisions are made step-by-step. It reads inventory and sales data, compares current stock with minimum thresholds, and plans restocking actions accordingly. A local open-source LLM is used to generate simple explanations for each decision. The final results are displayed to the user through a simple web interface.

Technical Stack

- **Language: Python**

- **Backend: Flask**

- **Database: SQLite**

- **Frontend: HTML, CSS, JavaScript**

- **LLM: Ollama (LLaMA / Mistral – Open Source)**

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5. Planner Pattern Explanation

The Planner Pattern ensures decisions are made logically and transparently:

1. Read inventory and sales data

2. Compare stock with minimum threshold

3.   Plan reorder quantities

4.   Explain decisions using LLM

This approach improves clarity and reliability of inventory decisions.

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7. Roles and Responsibilities

Member 1: Backend development, planner logic, database integration
Member 2: Frontend development, LLM prompt design, documentation

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8. Conclusion

The **Smart Inventory Planning Assistant for Small Shops** demonstrates how **Agentic AI using a Planner Pattern and a local LLM** can solve real-world inventory problems. The system is simple, cost-effective, offline-capable, and ideal for academic learning as well as small business use.

Source Code

GitHub repo links

Prakruthi BR: https://github.com/prakruthidevanga/Agentic_AI_Projects

Bhumika R: https://github.com/Bhumikaravi/Agentic_AI_Project