

✓ 1. Objective

Build a lightweight orchestration layer using **LangGraph**, showcasing **automated reasoning and task execution** for analyzing a marketing campaign using LLM agents. Focus on **end-to-end flow**: input prompt → insights → summary/report.

✓ 2. Scope

INCLUDED:

- Build LangGraph pipeline with **4 nodes**:
 1. **Query Generator**
 2. **Search Executor**
 3. **Data Summarizer**
 4. **Insight Aggregator / Report Generator**
 - Integrate **1 external tool**:
 - Tavily API (web search)
(*optionally stub/mock if needed*)
 - Accept **one structured input**:
 - CSV file with mock sales data
 - Run **one example scenario**:
 - *Back-to-School Campaign for Walmart*
 - Generate:
 - 3–5 campaign-relevant questions
 - Web insights (via Tavily or mock)
 - CSV-based summaries
 - 1 combined output (report-style summary + recommended actions)
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✓ 3. Core Functional Requirements

Node	Function
Orchestrator (LangGraph)	Direct flow between agents
Query Generator	Take user prompt → output 3–5 key questions
Search Executor	Use Tavily to fetch top 3 results per question
Data Summarizer	Read CSV input → return 2–3 key trends (text form)
Insight Aggregator	Merge all summaries → generate 1-page brief

✓ 4. Input/Output Examples

Input Prompt:

“Plan a Back-to-School campaign for Walmart. Focus on school supplies, clothing, lunchboxes. Include regional demand, competitors, and promotions.”

Optional Input Files:

- CSV with mock sales data (e.g., lunchbox sales YoY by region)

Output Example:

- **Generated Questions**
 - What are top trends in school supplies this year?
 - **Web Summary**
 - "Target is promoting bundle offers in Northeast U.S."
 - **CSV Summary**
 - "Lunchbox sales up 12% in Southeast; eco-friendly items doubled"
 - **Final Report (1 page)**
 - Summary of findings + suggested actions
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Tech Stack

- **LangGraph** for orchestration
 - **LangChain** for agent logic and tool calling
 - **Gemini LLM** for reasoning/generation
 - **Pandas** for data summarization
 - **Tavily API** (or stub) for search
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Suggested Sprint Plan

Sprint 1 (Week 1–2): MVP Pipeline

- Set up LangGraph orchestration
- Build & test each node with sample inputs
- Integrate Tavily (or mock)
- Parse and summarize 1 CSV

Sprint 2 (Week 3–4): Integration & Output

- Connect nodes for end-to-end flow
- Polish question generation + summarization
- Output formatted brief/report
- Add error handling/logging
- Optional: mock confidence scores

