Senior AI Engineer Technical Assignment

As a Senior AI Engineer at Liberate Labs, you will be responsible for architecting and implementing advanced LLM and Computer Vision driven systems. This assignment focuses on building a multi-agent, LLM-based prototype that identifies and analyzes competitors for a given input (e.g., a startup website or product query). The system should aggregate data from multiple sources, extract insights, and generate a comprehensive competitor analysis report.

Key Objectives

1. **Multi-Agent Architecture:**
    - Implement a set of autonomous "competitor analysis" agents (e.g., data retrieval, NLP processing, feature comparison, SWOT analysis) that collaborate to produce a final 360-degree competitor report.
2. **Data Integration & Consolidation:**
    - Ingest and normalize data from multiple sources (e.g., Crunchbase, LinkedIn, Reddit, Google, G2).
    - Ensure high data accuracy and automatically handle data conflicts or missing values.
3. **LLM-Driven Insights:**
    - Use a Large Language Model (LLM) to synthesize data into meaningful competitor profiles.
    - Automatically generate SWOT analyses and actionable insights.
4. **Automated Reporting:**
    - Produce a ready-to-use competitor analysis report highlighting key differentiators, feature comparisons, and strategic recommendations.

Deliverables

1. **Solution Design Document (PDF/Docx):**
    - Architectural diagram illustrating multi-agent system interactions.
    - Justification for chosen LLM, frameworks, and data handling strategies.
    - Discussion of alternative approaches and trade-offs.
2. **Prototype Code (Git Repository):**
    - Clean, well-structured code for the multi-agent system and LLM integration.
    - Automated scripts/notebooks for data ingestion and transformation.
    - Instructions for setup, including environment dependencies (e.g., `requirements.txt`).
3. **Video Demo (3-5 min):**
    - Show the system ingesting a sample input (website or query).
    - Demonstrate multi-agent collaboration and end-to-end competitor analysis generation.
    - Highlight key insights and final SWOT output.

Evaluation Criteria (Total: 100 marks)

1. **Solution Design & Justification (20 marks):**
    - Clarity and completeness of the architectural approach.
    - Sound reasoning for LLM choice and agent orchestration.
2. **Data Handling & Integration (20 marks):**
    - Robustness and accuracy of data ingestion.
    - Effective normalization and error handling.
3. **LLM-Driven Insights & Analysis (30 marks):**
    - Quality and depth of competitor features, SWOT, and strategic insights.
    - Relevance and clarity of the final 360-degree report.
4. **Implementation Quality (20 marks):**
    - Code quality, modularity, and maintainability.
    - Proper documentation and reproducibility.
5. **Presentation & Usability (10 marks):**
    - Professional, user-friendly demo.
    - Clear instructions for running and evaluating the prototype.

Deadline
Please submit all deliverables within **5 days of receiving the assignment**. For any clarification, you may reach out to the contact provided in the original communication.

Compensation
A nominal stipend (e.g., **BDT 3000–5000**) will be offered upon **successful completion and submission** of the assignment, as a gesture of appreciation for the time and effort invested.

Submission Form: Click Here

Good Luck!