Assignment:

Context

You have been provided with the raw specifications for an AI-driven Pricing & Revenue Optimization engine. The system utilizes multiple AI agents (e.g., *ROI Estimator, Feedback Agent, RL Environment*) to dynamically adjust pricing, analyze gaps in ROI, and simulate cash flow scenarios.

Input Data Provided:

1. **Agent Logic (CSV):** A list of 11 distinct agents, their data sources (external inputs), and their specific functional outputs.
2. **System Visual (Image):** A reference diagram illustrating the high-level flow or UI of the concept.

Objective

Your goal is to synthesize these inputs into a technical product requirements document (PRD) and a system architecture diagram that explains how these agents interact to produce a final pricing strategy.

Part 1: System Architecture & Data Flow

Deliverable: A System Architecture Diagram & Explanation.

Using the Pricing.csv as your source of truth, map the dependencies between the agents. The CSV lists agents in rows, but does not explicitly state the order of operations. You must determine the logic flow.

- **Task:** Create a flowchart showing how data moves from **"External Inputs"** (like *Confluence LLM, Cloud Pricing, Competitor Research*) through the processing agents (*Product, ROI Estimator*) and finally to the decision agents (*Experimental Plan Generator, Run Simulations*).
- **Key Question:** How does the output from the **"Competitor DeepResearch"** agent feed into the **"ROI Gap Analyzer"**? Define the data structure passed between these two points.

Part 2: The Reinforcement Learning (RL) Strategy

Deliverable: A Logic Definition Memo (1 Page).

Focus on the **"Run Simulations"** agent mentioned in the CSV. The input describes using an *"RL environment modelling for things like price sensitivity and stochastic deviations."*

1. **Define the Reward Function:** In this RL environment, what is the specific mathematical function the agent is optimizing for? (e.g., Is it pure Revenue, Customer Lifetime Value (CLTV), or a mix of Adoption Rate + Cashflow?)
2. **Define the State Space:** Based on the **"Product"** and **"Segment Research Agent"** inputs, what variables define the "state" of the market at any given time t?
3. **Simulation Loop:** Explain how the **"Scenario Builder"** interacts with the **"Cashflow Analyzer"**. If the simulation predicts a high churn rate, how should the **"Experimental Plan Generator"** react?

Part 3: Gap Analysis & Business Logic

Deliverable: A Strategic Assessment.

The **"ROI Gap Analyzer"** is designed to find the delta between *Delivered ROI* and *Proposed ROI*.

- **Scenario:** The **"Feedback Agent"** reports that a specific customer segment believes the marketing messaging (from **"Marketing Material DeepResearch"**) is accurate, but the **"Cashflow Analyzer"** shows high churn for that segment.
- **Task:** Write a hypothesis on which agent is failing. Is it a pricing issue (too expensive), a product issue (features not delivered), or a targeting issue (wrong ICP)? Use the CSV inputs to justify your answer.