Week 1: High-Level Architecture Design

Purpose and Context

The first week of the capstone project focused on establishing a high-level architectural direction before engaging in detailed design or implementation. This phase marked the conceptual initiation of the project and was intended to ensure that all subsequent work would be guided by a coherent and defensible system structure. The emphasis remained on defining *how the system should be organized*, rather than *how individual components should be built*.

Architectural Thinking and Key Decisions

The system was conceptualized as a layered architecture with well-defined responsibility boundaries across data handling, intelligence, explainability and governance, and user interaction. This approach supports modularity and long-term maintainability.

Design Philosophy and Rationale

We split up decision-making and explaining decisions in our system's design. This makes the system easier to understand and check later, without messing with the core reasoning. The setup focuses on keeping different parts separate, so changes in one area don't mess with others.

We're going for clarity and making sure things are easy to follow and can be changed later, instead of just rushing to get it done quickly.

Assumptions, Constraints, and Risks

Early assumptions included the need for scalability and independent evolution of system components. Academic timelines and evaluation constraints were acknowledged, reinforcing the importance of minimizing architectural rework in later phases. Addressing these considerations early reduces downstream risk.

Key Architectural Decisions:

- We went with a layered architecture, keeping responsibilities clear.
- We made explainability a main part of the architecture.

Next Steps:

- Decompose each architectural layer into functional components.
- Decide on mechanisms to develop actual explanation and rule-keeping systems.

Continuity and Forward Alignment

This architecture is now the foundation for the next phase, where we'll break things down further. This will keep the project consistent and on track.