Dependency Analysis of flask_app.py

Core Web Framework

The `flask_app.py` file demonstrates a well-structured Flask web application. Flask serves as the central web framework, providing routing, templating, and HTTP response handling for the graduate school data analysis interface.

Database Integration

psycopg functions as the PostgreSQL database adapter. It enables secure database connections and parameterized SQL queries, which are critical for preventing SQL injection attacks.

Local Modules

The application imports three critical local modules:

- config.py – Provides centralized database configuration management.
- query_data.py – Contains the GradCafeQueryAnalyzer class, which executes analytical queries.
- load_data.py – Provides the GradCafeDataLoader class for data ingestion operations.

Standard Library Dependencies

Several Python standard library modules support system integration:

- os – Handles file system interactions.
- subprocess – Executes background data pipeline processes.
- threading – Manages concurrent operations.
- datetime – Provides time and date management for scheduling and data handling.

Architectural Overview

The dependency graph reveals a clean separation of concerns. The flask_app.py file acts as the main orchestrator, coordinating between:

- The web interface,
- Database operations,
- Data processing components.

This modular architecture ensures maintainability and enables independent testing of each component, while presenting a unified web-based interface for the Grad Café data analysis system.