# Excel Insights App - Agentic Pipeline Design

## 1. Overview

The Excel Insights App is a Streamlit-based application designed to allow users to upload one or more Excel files, specify table configurations (header rows, unit rows, etc.), and automatically derive insights. The application leverages an agentic workflow powered by LangGraph and GPT-5 to generate, execute, and iteratively refine data visualizations.

## 2. Technology Stack

The application uses the following stack:

* Streamlit - UI for uploading files, managing configs, and displaying dashboards
* Polars / Pandas - For efficient tabular data parsing and manipulation
* LangGraph - To orchestrate the agentic pipeline with modular nodes
* OpenAI GPT-5 - LLM used for planning, code generation, and plot editing
* Plotly - For modern interactive data visualizations
* Git + GitHub - For version control and collaboration
* Poetry - For dependency management and packaging

## 3. Agentic Pipeline Design

The application workflow is structured into nodes using LangGraph:

* Guardrail - Ensures objectives are safe and non-malicious, normalizes vague queries
* Planner - Generates structured visualization plans per grid slot based on the objective
* Code Generator - Converts plans into executable Python (Plotly) code
* Code Executor - Executes the generated code and renders plots safely
* Editor - Enables user-driven edits, refinements, and rollback of plots
* Optional: Memory/Versioning Node - Keeps track of past versions for undo/compare
* Optional: Explainer Node - Produces textual insights alongside plots

## 4. Usage Workflow

1. Upload one or more Excel files in the File Uploads tab.

2. Specify table structure rows (name, header, unit, data).

3. Save or import configs for consistency across sessions.

4. Move to Objective tab to specify the analysis goal and dashboard layout.

5. Payload is generated with objective, grid size, and table samples.

6. LangGraph pipeline runs: Guardrail → Planner → Code Generator → Executor → Editor.

7. Dashboard is displayed with plots arranged per grid.

8. User can refine each plot using the Editor (chat-like interface).

9. Insights and dashboards can be exported.