1. File Upload & Processing

├── File validation (size, format, security checks)

├── Data type inference and mapping

├── Schema validation and correction

└── Load into DuckDB with verified schema

2. Router Decision Making

├── Intent classification

├── Context retrieval from conversation memory

├── Tool selection

└── Parameter extraction

3. Tool Execution

├── SQL Query Tool

│ ├── Generate SQL with injection prevention

│ ├── Execute with timeout limits

│ ├── Cache results for reuse

│ └── Return structured data

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├── Data Analysis Tool

│ ├── Automatic data profiling on first load

│ ├── Statistical analysis

│ ├── Pattern detection

│ └── Insight generation

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└── Visualization Tool

├── Determine best chart type based on data

├── Generate Python code (Matplotlib/Plotly)

├── Execute in sandboxed environment

├── Return image/interactive HTML

└── Cache successful configurations

4. Response Generation

├── Combine tool outputs

├── Format results appropriately

├── Store in conversation memory

└── Return to user with explanations