API Flowchart

1. API Initialization
- Load environment variables
- Initialize DB connection
- Register routes

2. Request Intake
- Endpoint: /report/{report_type}
- Input model: common, required, optional, multi-entry fields
- Validation with Pydantic

3. Query Builder
- Load base query template
- Inject WHERE clauses
- Handle multi-entry fields
- Parameterized queries

4. Database Execution
- Use pyodbc or SQLAlchemy
- Fetch results

5. Output Customization
- Field selection
- Output format: JSON, CSV, Excel

6. Response Delivery
- 200 with data
- 400/422 for input issues
- 500 for internal errors

7. Logging & Monitoring
- Structured logs
- Optional Prometheus/Grafana

8. Testing & Documentation
Testing:
- Unit tests for input, query, output
- Integration tests with mock DB
- Edge cases and error handling
- Tools: pytest, TestClient

Documentation:
- FastAPI /docs and /redoc
- Markdown developer notes
- Field definitions, query logic
- Deployment instructions