

Inventory Management System: Build a project with Cline

Phase 1: Initial Setup & Core Structure

Prompt 1: Project Foundation Create a comprehensive Streamlit inventory management system with the following structure:

1. **Main Dashboard** with sidebar navigation
2. **Core modules:** Stock monitoring, reorder management, supplier tracking
3. **Data layer:** Sample datasets for products, suppliers, sales history, and inventory levels
4. **Visualization:** Interactive charts using plotly/altair

Requirements:

- Modern, professional UI with custom CSS
- Responsive design with proper spacing
- Error handling and data validation
- Sample data generation for demonstration
- Modular code structure with separate functions for each feature

Start with the main app structure and navigation, then we'll build each module step by step.

Phase 2: Data Infrastructure

Prompt 2: Sample Data Generation Create realistic sample data for the inventory management system:

1. **Products table** (100+ items):
 - product_id, name, category, unit_cost, selling_price, current_stock, min_stock_level, max_stock_level, supplier_id, weight, dimensions
2. **Sales history** (6 months of data):
 - transaction_id, product_id, quantity_sold, sale_date, sale_price, customer_segment
3. **Suppliers table:**
 - supplier_id, name, contact_info, lead_time_days, reliability_score, payment_terms
4. **Stock movements:**
 - movement_id, product_id, movement_type (in/out), quantity, date, reason, cost
5. **Purchase orders:**
 - po_id, supplier_id, product_id, quantity_ordered, order_date, expected_delivery, status
6. **Save Data**
 - Create a data folder and save all the data as .csv file for user to check

Make the data realistic with seasonal patterns, different product categories (electronics, clothing, food, etc.), and varying demand patterns. Include some products with stockouts and overstock situations.

Phase 3: Core Features Development

Prompt 3: Stock Level Monitoring Dashboard Build an interactive stock monitoring dashboard with:

1. **Overview Cards:** Total products, low stock alerts, out of stock, overstock items
2. **Stock level visualization:**
 - Inventory levels by category (bar chart)
 - Stock status distribution (pie chart)
 - Top 20 low stock items (horizontal bar chart)
3. **Interactive filters:** Category, supplier, stock status
4. **Alert system:** Visual indicators for critical stock levels
5. **Detailed stock table:** Sortable, filterable, with action buttons
6. **Export functionality:** Download filtered data as CSV

Use color coding (red for critical, yellow for warning, green for good) and make it visually appealing with proper metrics formatting.

Prompt 4: Reorder Point Calculator Build an intelligent reorder management system:

1. **Reorder calculations:**
 - Economic Order Quantity (EOQ)
 - Reorder Point (ROP) based on lead time and demand
 - Safety stock calculations
2. **Automated recommendations:**
 - Products needing reorder
 - Suggested order quantities
 - Optimal reorder timing
3. **Interactive reorder dashboard:**
 - Products below reorder point (urgent table)
 - Reorder suggestions with cost analysis
 - Bulk order generation
4. **Cost optimization:**
 - Carrying cost analysis
 - Order cost vs holding cost balance
 - Quantity break analysis
5. **Purchase order generation:** Create PO drafts with one click

Include visual indicators for urgency levels and cost-benefit analysis.

Prompt 5: Supplier Performance Tracking Create a comprehensive supplier performance module:

1. **Performance metrics:**
 - On-time delivery rate
 - Quality score (defect rates)
 - Cost competitiveness
 - Lead time consistency

2. Supplier dashboard:

- Performance scorecards
- Delivery performance trends
- Cost analysis over time
- Reliability ratings

3. Comparative analysis:

- Supplier ranking table
- Performance comparison charts
- Cost vs quality scatter plots

4. Risk assessment:

- Supplier risk scores
- Dependency analysis
- Alternative supplier suggestions

5. Interactive features:

- Supplier detail pages
- Performance alerts
- Contract renewal reminders

Include supplier contact information and performance history visualization.

Phase 4: Advanced Features

Prompt 6: Alert System & Notifications Implement a smart alert and notification system:

1. Alert types:

- Critical stock levels
- Overdue deliveries
- Price fluctuations
- Supplier performance issues

2. Alert dashboard:

- Priority-based alert list
- Alert history
- Acknowledgment system

3. Customizable thresholds:

- User-defined alert rules
- Supplier-specific parameters

4. Visual notifications:

- Badge counters
- Color-coded alerts
- Toast notifications

5. Alert management:

- Snooze/dismiss functionality
- Escalation rules
- Alert resolution tracking

Include email notification simulation and alert analytics.

Phase 5: Polish & Enhancement

Prompt 7: UI/UX Enhancement Enhance the user interface and experience:

1. **Modern styling:**
 - Custom CSS with professional color scheme
 - Consistent typography and spacing
2. **Interactive elements:**
 - Hover effects on charts
 - Loading indicators
3. **Navigation improvements:**
 - Breadcrumb navigation
 - Quick action buttons
 - Search functionality
4. **Data visualization:**
 - Interactive plotly charts
 - Conditional formatting
 - Tooltip information

Focus on user experience and professional appearance.

Prompt 8: Testing & Documentation Add comprehensive testing and documentation:

1. **Data validation:**
 - Input validation functions
 - Error handling for edge cases
 - Data consistency checks
2. **User documentation:**
 - Feature explanation tooltips
 - Help section with user guide
 - FAQ section
3. **Code documentation:**
 - Function docstrings
 - README with setup instructions
 - Architecture documentation

Include installation instructions and deployment guidelines.