# Inventory Management System

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1. Overview
This project is an Inventory Management System designed for small-scale businesses. It allows users to add, update, view, delete products, sell products, and visualize stock data using charts.

2. Features
- SQLite database with products and sales tables
- Tkinter GUI for CRUD operations
- Category and Subcategory visualizations using Matplotlib

3. Database Structure
Products Table:
- id: INTEGER, Primary Key
- name: TEXT
- category: TEXT
- subcategory: TEXT (optional)
- price: REAL
- stock: INTEGER

Sales Table:
- id: INTEGER, Primary Key
- product_id: INTEGER, Foreign Key
- quantity: INTEGER
- total: REAL
- date: TIMESTAMP

4. Key Python Modules Used
- sqlite3, tkinter, ttk, matplotlib.pyplot

5. Functional Description
- init_db: Initializes database and tables
- Add Product: Adds new product with validation
- View Products: Displays products in a table
- Update Product: Loads existing product for editing
- Delete Product: Deletes product by ID
- Sell Product: Updates stock and records sale

6. Visualization

- Category Chart: Bar chart of stock per category
- Subcategory Chart: Pie chart showing subcategory distribution

7. GUI Layout
Main window 420x520 px, buttons for all actions, visualization, and exit.

8. Execution
- Requires Python 3.x
- Install matplotlib: pip install matplotlib
- Run: python inventory_system.py

9. Error Handling & Validation
- Input validation, stock checks, and Product ID checks

10. Future Enhancements
- Search functionality, export to CSV/Excel, authentication, improved charts, multi-warehouse support

11. Conclusion
Complete Python project combining CRUD operations, GUI, SQLite, and data visualization.