# Project Reflection: Inventory Management System

As part of my data science and software development training, I developed an Inventory Management System in Python using Object-Oriented Programming (OOP) principles. This project involved reading and writing to files, working with custom classes, user input, and presenting data in tabular format using the tabulate library.  
  
Technical Skills Demonstrated  
- Object-Oriented Design: Defined a Shoe class with appropriate attributes (country, code, product, cost, quantity) and methods to encapsulate behavior.  
- File Handling: Implemented logic to read from and (optionally) update an external inventory.txt file, including exception handling for robustness.  
- User Interaction: Created a main menu loop that responds to user inputs and calls appropriate functions to manage the inventory.  
- Data Presentation: Used the tabulate module to format data in clear, user-friendly tables.  
- Data Processing:  
 - Searched the inventory by product code  
 - Calculated total value per item (cost \* quantity)  
 - Identified shoes with the highest and lowest stock for sales and restocking  
  
Learning Highlights  
- Gained hands-on experience with error handling using try-except blocks  
- Learned how to manipulate strings and convert user input to appropriate data types  
- Improved understanding of list manipulation and how to manage collections of custom objects  
- Refined debugging skills — identifying and correcting issues such as indentation errors, type mismatches, and logical bugs  
- Learned to write modular, readable code with clear function separation and documentation  
  
Challenges Overcome  
At times, I struggled with managing data types (e.g., comparing strings to integers) and indentation errors. I also had to adjust my understanding of how certain methods behave (like .append() returning None). Through consistent debugging and testing, I gained confidence in problem-solving and using Python more effectively.  
  
Future Improvements  
- Add functionality to save updated inventory back to the file  
- Implement input validation with clearer error messages  
- Use classes or external libraries (like pandas) to scale the system for larger inventories  
- Build a GUI or web interface for enhanced usability