Mini Project Report: Library Inventory Manager

Course: Programming for Problem Solving using Python

Assignment Title: Library Management System using OOP

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1. Introduction

The Library Inventory Manager is a Python-based command-line application designed to help manage books in a campus library.

It uses Object-Oriented Programming (OOP), JSON persistence, exception handling, and modular program structure.

2. Objectives

- Apply OOP principles through Book and LibraryInventory classes.

- Implement encapsulation, class methods, and magic methods.

- Manage persistent data storage using JSON.

- Build a menu-driven CLI interface.

- Use exception handling and logging for robust functionality.

- Organize the project into a proper Python package structure.

3. Features Implemented

a. Book Class

Includes attributes (title, author, isbn, status) and methods to issue, return, and serialize book data.

b. Inventory Manager

Maintains a list of Book objects and supports operations such as add, search, display, issue, and return.

c. File Handling with JSON

Catalog is saved and loaded automatically. Missing or corrupt files are handled safely using try-except blocks.

d. CLI Interface

A clean, user-friendly menu allows staff to manage books with simple numeric choices.

e. Logging & Error Handling

The logging module records INFO and ERROR events for tracking system activity.

f. Project Packaging

The project follows the required structure with book.py, inventory.py, main.py, README.md, and requirements.txt.

4. Conclusion

The Library Inventory Manager successfully demonstrates Python OOP, file handling, robust programming practices, and modular design.

It is reliable, extendable, and suitable for small-scale library operations.