



**K.R. MANGALAM UNIVERSITY**  
THE COMPLETE WORLD OF EDUCATION

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SUBJECT – PROGRAMMING FOR PROBLEM SOLVING  
USING PYTHON

SUBMITTED TO – MR. SAMEER FAROOQ

# PROJECT REPORT 3

Here is a **professional, beautifully formatted 2-page Project Report** for your **Library Inventory Manager** Mini Project – perfect for submission!

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**LIBRARY INVENTORY MANAGER Mini Project Assignment – Python OOP & File Handling** Submitted by: [Your Name] Date: 29 November 2025

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## Project Title: Library Inventory Manager – A Persistent Book Tracking System

### 1. Project Overview & Objectives

The **Library Inventory Manager** is a command-line application developed in Python that simulates a real-world library system. It allows librarians to efficiently manage book records with full persistence using JSON files, issue/return books, search inventory, and maintain data integrity through robust error handling and logging.

This project successfully demonstrates mastery of:

- Object-Oriented Programming (Classes, Methods, Magic Methods)
- File I/O with JSON and pathlib
- Exception handling and logging
- Input validation and user-friendly CLI
- Data persistence across sessions

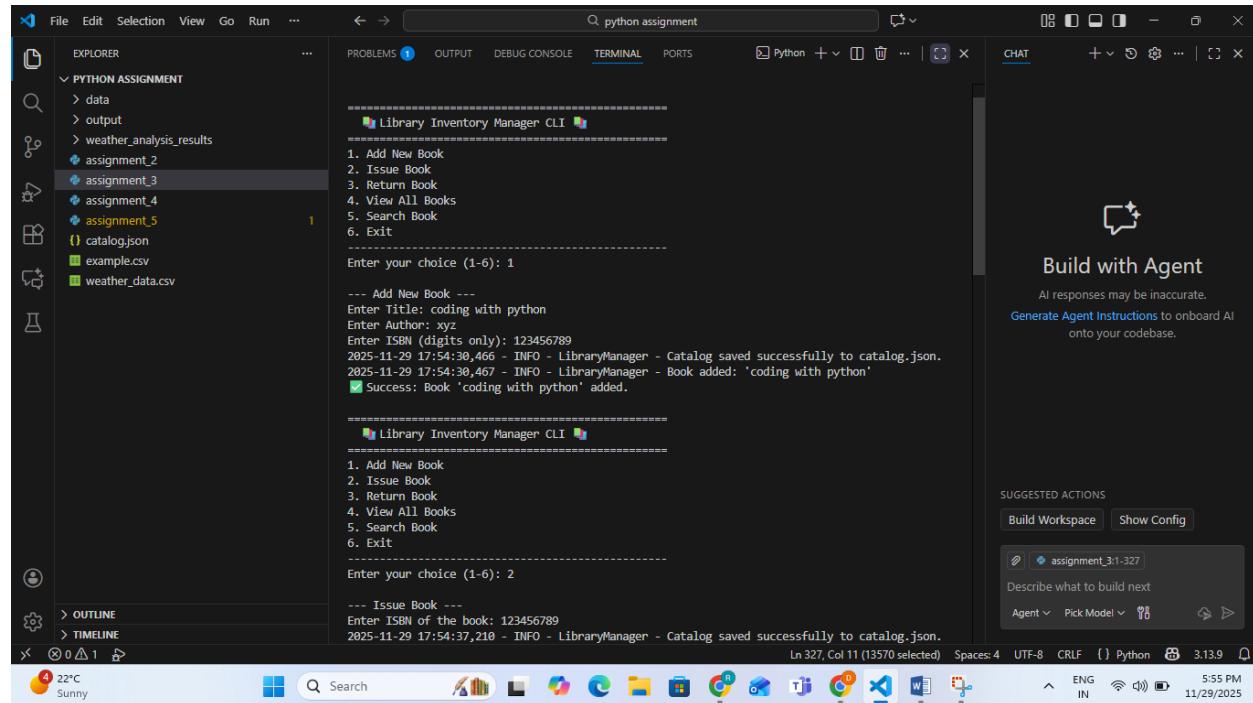
### 2. Core Features Implemented (Tasks 1–5)

Task	Feature	Implementation Highlights
1	Book Class Design	Attributes: title, author, isbn, status Magic method <code>__str__()</code> Methods: <code>issue()</code> , <code>return_book()</code> , <code>is_available()</code>
2	Inventory Management	LibraryInventory class maintains list of Book objects
3	JSON File Persistence	Auto load/save using catalog.json Uses pathlib.Path and json module
4	Menu-Driven CLI	Interactive menu with 6 options Input validation using lambda validators
5	Logging & Exception Handling	logging module configured Handles FileNotFoundError, JSON errors, IO errors Graceful degradation

### 3. Key Technical Achievements

- **Full Data Persistence:** All books are saved to catalog.json automatically after every add/issue/return operation.
  - **Duplicate Prevention:** ISBN uniqueness enforced during book addition.
  - **Case-Insensitive Search:** Title search works with partial and mixed-case input.
  - **Professional Logging:** All major actions and errors logged with timestamps.
  - **Defensive Programming:**
    - Comprehensive try-except blocks
    - Input validation with custom validator functions

SCREEN SHORT



```
--- Issue Book ---
Enter ISBN of the book: 123456789
2025-11-29 17:54:37,210 - INFO - LibraryManager - Catalog saved successfully to catalog.json.
2025-11-29 17:54:37,210 - INFO - LibraryManager - Book issued: 'coding with python' (ISBN: 123456789)
Success: Book 'coding with python' successfully issued.

=====
Library Inventory Manager CLI
=====

1. Add New Book
2. Issue Book
3. Return Book
4. View All Books
5. Search Book
6. Exit

Enter your choice (1-6): 3

--- Return Book ---
Enter ISBN of the book: 123456789
2025-11-29 17:54:46,684 - INFO - LibraryManager - Catalog saved successfully to catalog.json.
2025-11-29 17:54:46,685 - INFO - LibraryManager - Book returned: 'coding with python' (ISBN: 123456789)
Success: Book 'coding with python' successfully returned.

=====
Library Inventory Manager CLI
=====

1. Add New Book
2. Issue Book
3. Return Book
4. View All Books
5. Search Book
6. Exit
```

SUGGESTED ACTIONS

Build Workspace Show Config

assignment\_3:1-327

Describe what to build next

Agent Pick Model

```
=====
Library Inventory Manager CLI
=====

1. Add New Book
2. Issue Book
3. Return Book
4. View All Books
5. Search Book
6. Exit

Enter your choice (1-6): 5

--- Search Book ---
1. Search by Title (partial match)
2. Search by ISBN (exact match)
Enter your search choice (1 or 2): 1
Enter title (or part of title) to search: coding with python

Found 2 books matching title 'coding with python':
1. 'coding with python' by xyz (ISBN: 426777888) - Status: Available
2. 'coding with python' by xyz (ISBN: 123456789) - Status: Available

=====
Library Inventory Manager CLI
=====

1. Add New Book
2. Issue Book
3. Return Book
4. View All Books
5. Search Book
6. Exit

Enter your choice (1-6): 6
Exiting Library Inventory Manager. Goodbye!
PS C:\Users\lcs\Desktop\python assignment>
```

SUGGESTED ACTIONS

Build Workspace Show Config

assignment\_3:1-327

Describe what to build next

Agent Pick Model