



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

NAME – DRISHTI

ROLL NO. – 2501730232

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!

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

## 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 __str__() Methods: issue(), return_book(), is_available()
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

The screenshot shows a Visual Studio Code editor with a Python project named 'python assignment'. The Explorer pane on the left shows a file structure with folders 'data', 'output', and 'weather\_analysis\_results', and files 'assignment\_2', 'assignment\_3', 'assignment\_4', 'assignment\_5', 'catalog.json', 'example.csv', and 'weather\_data.csv'. The main editor window displays the 'Library Inventory Manager CLI' program. The terminal output shows the program's menu, the user's choice to 'Add New Book', and the successful addition of a book titled 'coding with python' with ISBN 123456789. The status bar at the bottom indicates the current line and column (Ln 327, Col 11) and the file encoding (UTF-8).

```
python assignment

=====
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): 1

--- Add New Book ---
Enter Title: coding with python
Enter Author: xyz
Enter ISBN (digits only): 123456789
2025-11-29 17:54:30,466 - INFO - LibraryManager - Catalog saved successfully to catalog.json.
2025-11-29 17:54:30,467 - INFO - LibraryManager - Book added: 'coding with python'
[Success] Book 'coding with python' added.

=====
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): 2

--- Issue Book ---
Enter ISBN of the book: 123456789
2025-11-29 17:54:37,218 - INFO - LibraryManager - Catalog saved successfully to catalog.json.
```

File Edit Selection View Go Run ... python assignment

EXPLORER

- PYTHON ASSIGNMENT
  - data
  - output
  - weather\_analysis\_results
  - assignment\_2
  - assignment\_3
  - assignment\_4
  - assignment\_5
  - catalog.json
  - example.csv
  - weather\_data.csv

TERMINAL

```
--- 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
```

Ln 327, Col 11 (13570 selected) Spaces: 4 UTF-8 CRLF {} Python 3.13.9

22°C Sunny

Search

Build with Agent

AI responses may be inaccurate.

Generate Agent Instructions to onboard AI onto your codebase.

SUGGESTED ACTIONS

Build Workspace Show Config

assignment\_3:1-327

Describe what to build next

Agent Pick Model

File Edit Selection View Go Run ... python assignment

EXPLORER

- PYTHON ASSIGNMENT
  - data
  - output
  - weather\_analysis\_results
  - assignment\_2
  - assignment\_3
  - assignment\_4
  - assignment\_5
  - catalog.json
  - example.csv
  - weather\_data.csv

TERMINAL

```
=====
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>
```

Ln 327, Col 11 (13570 selected) Spaces: 4 UTF-8 CRLF {} Python 3.13.9

22°C Sunny

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