Library Inventory Manager – Mini Project

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Python Code:

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# Library Inventory Manager - OOP + JSON
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import json, logging
from pathlib import Path

logging.basicConfig(filename="library.log", level=logging.INFO)

class Book:
    def __init__(self, title, author, isbn, status="available"):
        self.title = title
        self.author = author
        self.isbn = isbn
        self.status = status

    def __str__(self):
        return f"{self.title} - {self.author} ({self.isbn}) [{self.status}]"

    def to_dict(self):
        return {"title": self.title, "author": self.author, "isbn": self.isbn, "status": self.status}

    def issue(self):
        if self.status == "available":
            self.status = "issued"
            return True
        return False

    def return_book(self):
        if self.status == "issued":
            self.status = "available"
            return True
        return False


class LibraryInventory:
    def __init__(self, file_path="catalog.json"):
        self.file_path = Path(file_path)
        self.books = []
        self.load_books()

    def add_book(self, book):
        self.books.append(book)
        logging.info(f"Book added: {book.title}")
        self.save_books()

    def search_by_title(self, title):
        return [b for b in self.books if title.lower() in b.title.lower()]

    def search_by_isbn(self, isbn):
        for b in self.books:
            if b.isbn == isbn:
                return b
        return None

    def display_all(self):
        return "\n".join(str(book) for book in self.books)

    def save_books(self):
        data = [b.to_dict() for b in self.books]
        with open(self.file_path, "w") as f:
            json.dump(data, f, indent=4)

    def load_books(self):
        try:
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            if self.file_path.exists():
                data = json.load(open(self.file_path))
                self.books = [Book(**item) for item in data]
        except:
            logging.error("Error loading JSON file")


def menu():
    inv = LibraryInventory()
    while True:
        print("\n1. Add Book\n2. Issue Book\n3. Return Book\n4. Search\n5. View All\n6. Exit")
        ch = input("Enter choice: ")

        if ch == "1":
            t = input("Title: ")
            a = input("Author: ")
            i = input("ISBN: ")
            inv.add_book(Book(t, a, i))
            print("Book added.")

        elif ch == "2":
            i = input("Enter ISBN: ")
            b = inv.search_by_isbn(i)
            if b and b.issue():
                print("Issued")
                inv.save_books()
            else:
                print("Not available")

        elif ch == "3":
            i = input("Enter ISBN: ")
            b = inv.search_by_isbn(i)
            if b and b.return_book():
                print("Returned")
                inv.save_books()
            else:
                print("Cannot return")

        elif ch == "4":
            t = input("Enter title keyword: ")
            res = inv.search_by_title(t)
            for r in res:
                print(r)

        elif ch == "5":
            print(inv.display_all())

        elif ch == "6":
            break

menu()
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