|  |
| --- |
| **import json** |

**- \*\*`json` module\*\*: Yeh file handling ke liye use hota hai taake books ka data \*\*save aur load\*\* kiya ja sake.**

### \*\*Step 2: Library Initialization\*\*

|  |
| --- |
| **library = []** |

- **Yeh \*\*empty list\*\* banayi gayi hai jo books ko store karegi.**

**- Har book ek dictionary hogi jo is list me add hogi.**

---

**### \*\*Step 3: Load Library from File (Optional)\*\***

|  |
| --- |
| **def load\_library():** |
| **global library** |
| **try:** |
| **with open("library.txt", "r") as file:** |
| **library = json.load(file)** |
| **except (FileNotFoundError, json.JSONDecodeError):** |
| **library = []** |

**- \*\*Yeh function\*\* `library.txt` se books load karega.**

**- `try-except` block ensure karega ke agar \*\*file exist nahi karti ya corrupt hai to naye data ke saath shuru ho\*\*.**

**- `json.load(file)` kaam karega agar file ka data \*\*valid JSON format me hoga\*\*.**

### \*\*Step 4: Save Library to File (Optional)\*\*

|  |
| --- |
| **def save\_library():** |
| **with open("library.txt", "w") as file:** |
| **json.dump(library, file)** |

**- Yeh function \*\*books ko JSON format me save\*\* karega taake jab program close ho to data lost na ho.**

**- `json.dump(library, file)` \*\*library list ka data file me likhta hai\*\*.**

### \*\*Step 5: Add a Book\*\*

|  |
| --- |
| **def add\_book():** |
| **title = input("Enter the book title: ")** |
| **author = input("Enter the author: ")** |
| **year = int(input("Enter the publication year: "))** |
| **genre = input("Enter the genre: ")** |
| **read\_status = input("Have you read this book? (yes/no):").strip().lower() == "yes"** |
| **book = {"title": title, "author": author, "year": year, "genre": genre, "read": read\_status}** |
| **library.append(book)** |
| **save\_library()** |
| **print("Book added successfully!")** |

**- \*\*User se inputs liye ja rahe hain\*\* book ke details ke liye.**

**- `int(input(...))` \*\*year ko integer me convert karta hai\*\*.**

**- `read\_status` ko `True` ya `False` me convert kiya gaya hai.**

**- `library.append(book)` \*\*book list me add kar raha hai\*\*.**

**- `save\_library()` call kiya taake data \*\*file me save ho jaye\*\*.**

### \*\*Step 6: Remove a Book\*\*

|  |
| --- |
| **def remove\_book():** |
| **title = input("Enter the title of the book to remove: ")** |
| **for book in library:** |
| **if book["title"].lower() == title.lower():** |
| **library.remove(book)** |
| **save\_library()** |
| **print("Book removed successfully!")** |
| **return** |
| **print("Book not found!")** |

**- \*\*User se book ka title liya jata hai\*\*.**

**- \*\*Loop check karta hai\*\* agar book list me exist karti hai.**

**- `library.remove(book)` \*\*us book ko hata deta hai agar mil jaye\*\*.**

**- `save\_library()` \*\*update ko file me store kar deta hai\*\*.**

### \*\*Step 7: Search for a Book\*\*

|  |
| --- |
| **def search\_book():** |
| **choice = input("Search by:\n1. Title\n2. Author\nEnter your choice: ")** |
| **query = input("Enter the search term: ").strip().lower()** |
| **results = [book for book in library if book["title"].lower() == query or book["author"].lower() == query]** |
| **if results:** |
| **for book in results:** |
| **print(f"{book['title']} by {book['author']} ({book['year']}) - {book['genre']} - {'Read' if book['read'] else 'Unread'}")** |
| **else:** |
| **print("No matching books found!")** |

**- User \*\*title ya author se search kar sakta hai\*\*.**

**- \*\*Loop check karega\*\* jo books match karti hain aur unko display karega.**

### \*\*Step 8: Display All Books\*\*

|  |
| --- |
| **def display\_books():** |
| **if not library:** |
| **print("Your library is empty!")** |
| **return** |
| **for book in library:** |
| **print(f"{book['title']} by {book['author']} ({book['year']}) - {book['genre']} - {'Read' if book['read'] else 'Unread'}")** |

**- \*\*Agar library empty hai to message show karega\*\*.**

**- \*\*Otherwise\*\*, saari books \*\*format me display hongi\*\*.**

**### \*\*Step 9: Display Statistics\*\***

|  |
| --- |
| **def display\_statistics():** |
| **total\_books = len(library)** |
| **read\_books = sum(1 for book in library if book["read"])** |
| **percentage\_read = (read\_books / total\_books \* 100) if total\_books > 0 else 0** |
| **print(f"Total books: {total\_books}")** |
| **print(f"Percentage read: {percentage\_read:.2f}%")** |

**- \*\*Total books count karta hai\*\*.**

**- \*\*Read books count karta hai\*\* aur percentage nikalta hai.**

**- \*\*Agar total books 0 ho to percentage 0 show karega\*\* taake divide by zero error na aaye.**

### \*\*Step 10: Menu System\*\*

|  |
| --- |
| **def main():** |
| **load\_library()** |
| **while True:** |
| **print("\nWelcome to your Personal Library Manager!")** |
| **print("1. Add a book")** |
| **print("2. Remove a book")** |
| **print("3. Search for a book")** |
| **print("4. Display all books")** |
| **print("5. Display statistics")** |
| **print("6. Exit")** |
| **choice = input("Enter your choice: ")** |
| **if choice == "1":** |
| **add\_book()** |
| **elif choice == "2":** |
| **remove\_book()** |
| **elif choice == "3":** |
| **search\_book()** |
| **elif choice == "4":** |
| **display\_books()** |
| **elif choice == "5":** |
| **display\_statistics()** |
| **elif choice == "6":** |
| **save\_library()** |
| **print("Library saved to file. Goodbye!")** |
| **Break** |
| **else:** |
| **print("Invalid choice! Please enter a number between 1 and 6.")** |

**- \*\*Loop chal raha hai jab tak user exit nahi karta\*\*.**

**- \*\*User ka input check hota hai aur relevant function call hota hai\*\*.**

**- \*\*Agar user exit kare to file save ho jaye\*\* aur program band ho.**

---