Library Management System in Python

```
In [ ]:
 1  Library Management System Project
 2
 3  This project implements a library management system in Python. It allows
 4  users to perform various operations such as adding books, removing books,
 5  displaying all books, searching for books by title, updating book details,
 6  borrowing books, and returning books.
 7
 8  The project is implemented using object-oriented programming principles.
 9  It consists of two main classes:`Book` and`Library`.The `Book` class repre
10  a book with attributes like title, author, publication year, and availabil
11  The `Library` class represents the library and provides methods to add, re
12  display, search, update, borrow, and return books.
13
14  To interact with the library management system, the program displays a men
15  to the user. Users can enter the corresponding numbers to select an option
16  Each option triggers the relevant functionality, allowing users to manage
17  library effectively.
18
19  Feel free to customize the code or add more features to suit your requirem
20
21  Enjoy managing your library!
22
```

In [2]:

```python
class Book:
    def __init__(self, title, author, publication_year):
        self.title = title
        self.author = author
        self.publication_year = publication_year
        self.is_available = True


class Library:
    def __init__(self):
        self.books = []

    def add_book(self, book):
        self.books.append(book)
        print("Book added successfully!")

    def remove_book(self, book):
        if book in self.books:
            self.books.remove(book)
            print("Book removed successfully!")
        else:
            print("Book not found in the library.")

    def display_books(self):
        if self.books:
            print("Library Books:")
            for book in self.books:
                availability = "Available" if book.is_available else "Borr
                print(f"Title: {book.title}, Author: {book.author}, Public
        else:
            print("No books in the library.")

    def search_book_by_title(self, title):
        found_books = []
        for book in self.books:
            if book.title.lower() == title.lower():
                found_books.append(book)

        if found_books:
            print("Matching Books:")
            for book in found_books:
                availability = "Available" if book.is_available else "Borr
                print(f"Title: {book.title}, Author: {book.author}, Public
        else:
            print("No books found with the given title.")

    def update_book_details(self, book, new_title, new_author, new_publica
        if book in self.books:
            book.title = new_title
            book.author = new_author
            book.publication_year = new_publication_year
            print("Book details updated successfully!")
        else:
            print("Book not found in the library.")

    def borrow_book(self, book):
        if book in self.books:
```

```python
58                 if book.is_available:
59                     book.is_available = False
60                     print("Book borrowed successfully!")
61                 else:
62                     print("The book is already borrowed.")
63             else:
64                 print("Book not found in the library.")
65
66        def return_book(self, book):
67             if book in self.books:
68                 if not book.is_available:
69                     book.is_available = True
70                     print("Book returned successfully!")
71                 else:
72                     print("The book is already available in the library.")
73             else:
74                 print("Book not found in the library.")
75
76
77    # Function to display menu options
78    def display_menu():
79         print("Library Management System Menu:")
80         print("1. Add a Book")
81         print("2. Remove a Book")
82         print("3. Display all Books")
83         print("4. Search Book by Title")
84         print("5. Update Book Details")
85         print("6. Borrow a Book")
86         print("7. Return a Book")
87         print("8. Quit")
88
89
90    # Create a library object
91    library = Library()
92
93    while True:
94         display_menu()
95         choice = input("Enter your choice (1-8): ")
96
97         if choice == '1':
98             title = input("Enter the book title: ")
99             author = input("Enter the author name: ")
100            publication_year = input("Enter the publication year: ")
101            book = Book(title, author, publication_year)
102            library.add_book(book)
103
104        elif choice == '2':
105            if library.books:
106                print("Select a book to remove:")
107                for index, book in enumerate(library.books):
108                    print(f"{index + 1}. Title: {book.title}, Author: {book.au
109                book_number = input("Enter the book number to remove: ")
110                if book_number.isdigit() and 1 <= int(book_number) <= len(libr
111                    book_to_remove = library.books[int(book_number) - 1]
112                    library.remove_book(book_to_remove)
113                else:
114                    print("Invalid book number.")
```

```python
115             else:
116                 print("No books in the library.")
117
118         elif choice == '3':
119             library.display_books()
120
121         elif choice == '4':
122             search_title = input("Enter the book title to search: ")
123             library.search_book_by_title(search_title)
124
125         elif choice == '5':
126             if library.books:
127                 print("Select a book to update:")
128                 for index, book in enumerate(library.books):
129                     print(f"{index + 1}. Title: {book.title}, Author: {book.au
130                 book_number = input("Enter the book number to update: ")
131                 if book_number.isdigit() and 1 <= int(book_number) <= len(libr
132                     book_to_update = library.books[int(book_number) - 1]
133                     new_title = input("Enter the new title: ")
134                     new_author = input("Enter the new author: ")
135                     new_publication_year = input("Enter the new publication ye
136                     library.update_book_details(book_to_update, new_title, new
137                 else:
138                     print("Invalid book number.")
139             else:
140                 print("No books in the library.")
141
142         elif choice == '6':
143             if library.books:
144                 print("Select a book to borrow:")
145                 for index, book in enumerate(library.books):
146                     if book.is_available:
147                         print(f"{index + 1}. Title: {book.title}, Author: {boo
148                 book_number = input("Enter the book number to borrow: ")
149                 if book_number.isdigit() and 1 <= int(book_number) <= len(libr
150                     book_to_borrow = library.books[int(book_number) - 1]
151                     library.borrow_book(book_to_borrow)
152                 else:
153                     print("Invalid book number.")
154             else:
155                 print("No books in the library.")
156
157         elif choice == '7':
158             if library.books:
159                 print("Select a book to return:")
160                 for index, book in enumerate(library.books):
161                     if not book.is_available:
162                         print(f"{index + 1}. Title: {book.title}, Author: {boo
163                 book_number = input("Enter the book number to return: ")
164                 if book_number.isdigit() and 1 <= int(book_number) <= len(libr
165                     book_to_return = library.books[int(book_number) - 1]
166                     library.return_book(book_to_return)
167                 else:
168                     print("Invalid book number.")
169             else:
170                 print("No books in the library.")
171
```

```
172        elif choice == '8':
173            print("Exiting the program...")
174            break
175
176        else:
177            print("Invalid choice. Please try again.")
178
```

```
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 1
Enter the book title: learn english
Enter the author name: veronika
Enter the publication year: 2023
Book added successfully!
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 1
Enter the book title: Urdu shayri
Enter the author name: Galib
Enter the publication year: 2022
Book added successfully!
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 2
Select a book to remove:
1. Title: learn english , Author: veronika, Publication Year: 2023
2. Title: Urdu shayri , Author: Galib, Publication Year: 2022
Enter the book number to remove: 2
Book removed successfully!
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 3
Library Books:
Title: learn english , Author: veronika, Publication Year: 2023, Availabilit
y: Available
Library Management System Menu:
```

```
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 1
Enter the book title: Urdu Shayri
Enter the author name: Galib
Enter the publication year: 2022
Book added successfully!
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 3
Library Books:
Title: learn english , Author: veronika, Publication Year: 2023, Availabilit
y: Available
Title: Urdu Shayri, Author: Galib, Publication Year: 2022, Availability: Avai
lable
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 4
Enter the book title to search: learn english
No books found with the given title.
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 4
Enter the book title to search: learn english
Matching Books:
Title: learn english , Author: veronika, Publication Year: 2023, Availabilit
y: Available
Library Management System Menu:
1. Add a Book
2. Remove a Book
```

```
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 5
Select a book to update:
1. Title: learn english , Author: veronika, Publication Year: 2023
2. Title: Urdu Shayri, Author: Galib, Publication Year: 2022
Enter the book number to update: 1
Enter the new title: Learn English
Enter the new author: Veronika
Enter the new publication year: 2020
Book details updated successfully!
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 6
Select a book to borrow:
1. Title: Learn English, Author: Veronika, Publication Year: 2020
2. Title: Urdu Shayri, Author: Galib, Publication Year: 2022
Enter the book number to borrow: 2
Book borrowed successfully!
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 3
Library Books:
Title: Learn English, Author: Veronika, Publication Year: 2020, Availability:
Available
Title: Urdu Shayri, Author: Galib, Publication Year: 2022, Availability: Borr
owed
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 7
Select a book to return:
2. Title: Urdu Shayri, Author: Galib, Publication Year: 2022
```

```
Enter the book number to return: 2
Book returned successfully!
Library Management System Menu:
1. Add a Book
2. Remove a Book
3. Display all Books
4. Search Book by Title
5. Update Book Details
6. Borrow a Book
7. Return a Book
8. Quit
Enter your choice (1-8): 8
Exiting the program...
```