Documentation

Target assessment level:

The target assessment level of this project is 3.

Specification:

What does the program do?

The program is a Library System allowing users to borrow and return books, view their borrowed books, and view all borrowed books in the system. The program takes multiple user inputs such as which task the user wants to achieve in the system (borrowing, returning, viewing, etc), usernames, and book names and organises it into lists (which is attached to each key inside the dictionary) and keys inside a dictionary that can be accessed by the user. The program is also capable of manipulating values inside the dictionary and lists such as adding or removing values and printing values at any given state.

Input format

The program takes 3 main types of user inputs.

Firstly, the user inputs an integer between 1 and 5 to tell the program what the user wants to do (it can be to borrow books, return books, viewing, etc). This is the main input that must be done always if the user is using the system.

The next two user inputs are optional but are required for some functions.

If the user wants to borrow and return books, the program will ask for the user's username and book's title. This is so that the program can use the username to store the books' name under the username inside the dictionary.

If the user wants to view their currently borrowed books, then the program will ask for the username to access the data stored under it at that time.

If the user wants to view all borrowed books in the entire system, then the program will not ask for any additional information as it is not required.

Correctness:

Typical test case

Each function will be tested individually (after each test, the next one will be started in a fresh, new execution of the program and thus the program will not retain any previous information put into it from previous tests):

1. Borrowing function:

```
Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Ahan
Enter the title of the book to be borrowed: Harry Potter: The Deathly Hallows
Ahan has successfully borrowed "Harry Potter: The Deathly Hallows"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Ahan
Enter the title of the book to be borrowed: The Twelfth Night
Ahan has successfully borrowed "The Twelfth Night"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Ahan
Enter the title of the book to be borrowed: One Million Digits of Pi
Ahan has successfully borrowed "One Million Digits of Pi"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 3
Enter your username: Ahan
Books currently borrowed by Ahan: ['Harry Potter: The Deathly Hallows', 'The Twelfth Night', 'One Million Digits of Pi']
```

As you can see, the borrowing works by adding the books to be borrowed into a list under the variable of “Ahan” inside the dictionary as a key-value pair (that is why when viewing all books under the variable “Ahan”, it printed the books that were previously under the username of “Ahan”). You can also add any other username, but it will add those books into another list under the other username.

2. Returning function:

```
Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Ahan
Enter the title of the book to be borrowed: 1984
Ahan has successfully borrowed "1984"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Ahan
Enter the title of the book to be borrowed: The Twelfth Night
Ahan has successfully borrowed "The Twelfth Night"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Ahan
Enter the title of the book to be borrowed: Hamlet
Ahan has successfully borrowed "Hamlet"!
Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 2
Enter your username: Ahan
Enter the title of the book to be returned: Hamlet
Ahan has successfully returned "Hamlet"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 2
Enter your username: Ahan
Enter the title of the book to be returned: The Twelfth Night
Ahan has successfully returned "The Twelfth Night"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 3
Enter your username: Ahan
Books currently borrowed by Ahan: ['1984']
```

As you can see, the returning function works by removing the books to be returned from the user's list of borrowed books (that is why only 1984 is shows as borrowed although the user also borrowed "The Twelfth Night" and "Hamlet").

3. Viewing user's list of borrowed books function:

```
Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Ahan
Enter the title of the book to be borrowed: Artemis Fowl
Ahan has successfully borrowed "Artemis Fowl"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Bob
Enter the title of the book to be borrowed: Five Night at Freddy's: The Twisted Ones
Bob has successfully borrowed "Five Night at Freddy's: The Twisted Ones"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Bob
Enter the title of the book to be borrowed: Fahreinheit 451
Bob has successfully borrowed "Fahreinheit 451"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 3
Enter your username: Ahan
Books currently borrowed by Ahan: ['Artemis Fowl']

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 3
Enter your username: Bob
Books currently borrowed by Bob: ["Five Night at Freddy's: The Twisted Ones", 'Fahreinheit 451']
```

As you can see, the viewing each individual user's list function works by printing each user's lsit of borrowed books and it works for multiple users as well.

4. Viewing the entire system function:

```
Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Ahan
Enter the title of the book to be borrowed: The Silver Sword
Ahan has successfully borrowed "The Silver Sword"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Bob
Enter the title of the book to be borrowed: 1984
Bob has successfully borrowed "1984"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Bob
Enter the title of the book to be borrowed: The Oxford Dictionary
Bob has successfully borrowed "The Oxford Dictionary"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 1
Enter your username: Tim
Enter the title of the book to be borrowed: The Da Vinci Code
Tim has successfully borrowed "The Da Vinci Code"!

Welcome to the Library System! What would you like to do?
1. Borrow a book
2. Return a book
3. View borrowed books
4. View all borrowed books in the library
5. Exit
Enter your choice (1-5): 4
All borrowed books in the library:
- Ahan has borrowed: ['The Silver Sword']
- Bob has borrowed: ['1984', 'The Oxford Dictionary']
- Tim has borrowed: ['The Da Vinci Code']
```

As you can see, the function thats prints all users and their lists of borrowed books does work correctly and it prints it for all users that are borrowing at that time.

Resource handling:

No files were used or opened in the program and thus no resource handling is necessary.