

## Library Management System – Individual Report

Name: Jevaun Sanderson (2306776)

### Assigned Task:

- UI.java – Allows user interaction to manage books and patrons through a text-based interface in the terminal.
- Individual Report

### Data Structures Used:

- ArrayList – Managing the collection of Book objects.
- HashMap – Managing Patron records using their card numbers as keys.
- ArrayList – Used within each Patron to store a list of checked-out book titles.

### Challenges Faced:

- Ensuring data consistency during operations such as checkout and return.
- Handling invalid inputs and preventing runtime errors (e.g., null pointers or unavailable books).
- Providing real-time feedback for user actions in a text-only interface.

### Solutions:

- Each Book has an available flag that tracks whether it is currently loaned out.
- The HashMap offers constant-time access to patron records using card numbers.
- Input validation and user-friendly prompts were added to enhance the overall command-line experience and prevent invalid operations.

### Conclusion:

This library system does a great job of managing books and patrons simply and efficiently. It uses straightforward tools like lists and maps to keep everything organized, and the command-line interface is easy to use and understand. Overall, it delivers all the essential features you'd expect from a library system while keeping things user-friendly and practical.