

**Queensland University of Technology**

**Assignment 2**

Member Name: Khee Hong Loke (N6950736)

Zheng Yu Ng (N7069197)

Unit: INN600 Advanced Reading/INB305

Advanced Object Oriented Programming in C++

Due Date: 17th October 2010

Table of Contents

Statement of Completeness 3

Implemented Functional and Non-Functional Requirements 3

Friend 3

Exception Handling 3

Classes 4

Design of I/O Files 4

Screenshots 5

Member Registration 5

Remove Member 5

Reset Password 5

Add Book 6

Remove Book 6

Add Existing Book Copies 6

Remove Existing Book Copies 6

Search Book 7

Member Login 7

Member Login 7

Borrow Book 8

Return Book 8

View currently item checked out 8

# Statement of Completeness

## Implemented Functional and Non-Functional Requirements

|  |  |
| --- | --- |
| Functional and Non-Functional Requirement | Complete? |
| Create a catalogue for the library | Yes |
| Display the catalogue | Yes |
| Add a new item to the catalogue | Yes |
| Add some new copies of an existing item to the catalogue | Yes |
| Remove an item from the catalogue | Yes |
| Remove some copies from the catalogue | Yes |
| Load the catalogue from a disk file. | Yes |
| Save the catalogue to a disk file. | Yes |
| Register a staff member or student with the system | Yes |
| Remove a member from the system | Yes |
| Allow a member to change their information | Yes |
| Load member information from disk file | Yes |
| Save member information to disk file | Yes |
| Allow a library staff to reset password | Yes |
| Allow members to search book by title | Yes |
| Allow members to borrow items | Yes |
| Allow members to return books | Yes |
| Allow members to view items currently checked out | Yes |
| Allow the library staff members to list the overdue items | Yes |
| Display the top ten most frequently borrowed books | Yes |
| Template class (ArrayList) | Yes |
| Template function | Yes |
| Operator overloading | Yes |
| Friend | Yes |
| Exception handling | Yes |
| Design by contract | Yes |

## Friend

“Friend” is being used in the classes Member, LeasedBook and CatalogueBook. All three of these classes used the friend clause to declare the class FileIO as friend. This is because the FileIO class needs access to empty constructors of these classes, which are declared as private. These three classes are normally not allowed to be instantiated as empty objects because this is an unsafe operation and should only be done under controlled environments if absolutely necessary, therefore they are declared private. The reason that FileIO needs access to this empty constructor is because the FileIO class is responsible for extracting data from files, and during that process, an empty object needs to first be created and fill it with data from the files.

## Exception Handling

Exception handling is done throughout the class TextInterface because it is mainly used for the user interface. In the getIntInput() method, an exception is thrown when the input is not a valid number. The thrown exception carries a string which is the correct error message for the error. This exception is caught and the error message will be displayed to the user in the correct format.

## Classes

Below is list of all classes in the project:

* TextInterface
* ArrayList
* FileIO
* Library
* Member
  + Staff
  + Student
* Book
* CatalogueBook
* LeasedBook

# Design of I/O Files

The structure used to store both catalogue.txt and members.txt is by wrapping relevant information around tags that represent that information. For example, all information about a member is wrapped around the “==begin\_member==” and “==end\_member==” tags, and similarly, all book information are wrapped around “==begin\_book==” and “==end\_book==”. A single information takes one line for easy extracting and therefore the I/O files are long rather than wide.

# Screenshots

|  |
| --- |
| Member Registration |
|  |

|  |
| --- |
| Remove Member |
|  |

|  |
| --- |
| Reset Password |
|  |

|  |
| --- |
| Add Book |
|  |

|  |
| --- |
| Remove Book |
|  |

|  |
| --- |
| Add Existing Book Copies |
|  |

|  |
| --- |
| Remove Existing Book Copies |
|  |

|  |
| --- |
| Search Book |
|  |

|  |
| --- |
| Member Login |
|  |

|  |
| --- |
| Member Login |
|  |

|  |
| --- |
| Borrow Book |
|  |

|  |
| --- |
| Return Book |
|  |

|  |
| --- |
| View currently item checked out |
|  |