

Fundamentals of Computing II – LAB

CSCE 1102- Project

Milestone 1 - Design Report

Team#: 2 (Section 2)

Members' Info:

Member Name	ID	Email
Kareem Abdellatif	900242869	kareemelramly@aucegypt.edu
Mariam Hassan	9002327848	mariam_abdo@aucegypt.edu
Radwa Ayman Abu Elfotouh	900242263	Radwaayman@aucegypt.edu
Mohammed Ahmed Al-Kaf	900243152	MohKaf10@aucegypt.edu

Github link: <https://github.com/kareemelramly/Library-Management-System>

Main classes

Class Name /Short description	Data Members	Member Functions
Book Represents a single book in the library	string id, string title, string author, string category, int totalCopies, int availableCopies, int timesBorrowed, int date	getInfo(), borrowBook(), returnBook(), isAvailable(),getID(),Book(), check_over_due(),checkName(), checkQuantity()
LibraryMember Base class for users	string username, string password, string role	Login()
Admin Inherits from LibraryMember & manages the different users	(inherits LibraryMember data)	addUser(), deleteUser(), listUsers(),passwordvalidate()
Librarian Inherits from LibraryMember	(inherits LibraryMember data)	addBook(), deleteBook(), handleTransaction(), view books(),generateReport()

& Manages books and transactions		
LibrarySystem	String modeoftheuser, vector<Book>books, map<string,LibraryMember*>users, map<string,int>frequencies, unordered_map<string,int> borrow_freq.	run(),exit(),dashboard(),exportToFile(),searchBookTitle(),searchBookCategory(),searchBookAuthor()

Selected DS

List Name	Selected DS	Reasons for selecting this DS
Book List	vector<Book>	Dynamic resizing, ordered storage, efficient iteration for displaying in UI, and effective sorting and searching
Users List	map<string, LibraryMember*>	Fast access by username (key), supports polymorphism through base class pointers
Transactions List	vector<Transaction>	Simple chronological log of all transactions, allows export to file
Borrow Frequency	unordered_map<string, int>	Fast frequency counting for reports like "most borrowed books"