BSc (Hons) in Information Technology

Object Oriented Concepts – IT1050

Assignment 2

Year 1, Semester 2 **2022- November**

Topic : **Library Management System**

Group no : **MLB_01.01_12**

Campus : **Malabe**

Submission Date : **13th November 2022**

We declare that this is our own work and this Assignment does not incorporate without acknowledgment any material previously submitted by anyone else in SLIIT or any other university/Institute. And we declare that each one of us equally contributed to the completion of this Assignment.

Registration No	Name	Contact Number
IT21826368	Nanayakkara Y.D.T.D	0763066541
IT21820946	Weragala R.T.L	0762192061
IT21822612	Mendis H.R.M	0702888774
IT21823220	Vithanage H.P	0757073469

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Contents

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Requirements

1. Guests can search for books in the library.
2. Guests must pay a fee and obtain a membership
3. Members must log in to the system to reserve a book
4. Members can send inquiries.
5. Members can check and pay fines.
6. There will be receipts for every payment.
7. Members can see the payment receipt.
8. Staff can log in to the system.
9. Staff can add new books, remove books, and update book details.
10. Staff can add new members, remove members, and update member details.
11. Admin can add new staff, remove staff, and update staff details.
12. Admin can check and reply to inquiries.
13. System users can generate reports.

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Assignment 2

Identified classes

1. Guest
2. Membership
3. Payment
4. Book
5. Member
6. Inquires
7. Fine
8. Receipt
9. System users
10. Staff
11. Admin
12. Report

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CRC Cards

Class name: Guest	
Responsibilities	**Collaborations**
Search books	Book
Register	Payment, membership

Class name: Membership	
Responsibilities	**Collaborations**
Display membership details	

Class name: Payment	
Responsibilities	**Collaborations**
Display payment details	
Make payments	Guest, Fine
Manage payments	System_user
Issue receipt	receipt

Class name: Book	
Responsibilities	**Collaborations**
Display book details	
manage books	

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Class name: Member	
Responsibilities	**Collaborations**
Borrow book	book
Display member details	
Send inquiries	Inquiry
Pay fines	Fine
See payment receipts	Receipt

Class name: Inquires	
Responsibilities	**Collaborations**
Display inquiries	

Class name: Fine	
Responsibilities	**Collaborations**
Display fine	
Calculate fine	

Class name: Receipt	
Responsibilities	**Collaborations**
Generate receipt	

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Class name: System_user	
Responsibilities	**Collaborations**
Manage membership	membership
Display system user details	
Manage books	Book
manage members	Member
Generate report	report

Class name: Staff	
Responsibilities	**Collaborations**
Display staff details	

Class name: Admin	
Responsibilities	**Collaborations**
manage staff	Staff
Manage inquiries	Inquiries
Display admin details	

Class name: Report	
Responsibilities	**Collaborations**
Display report	

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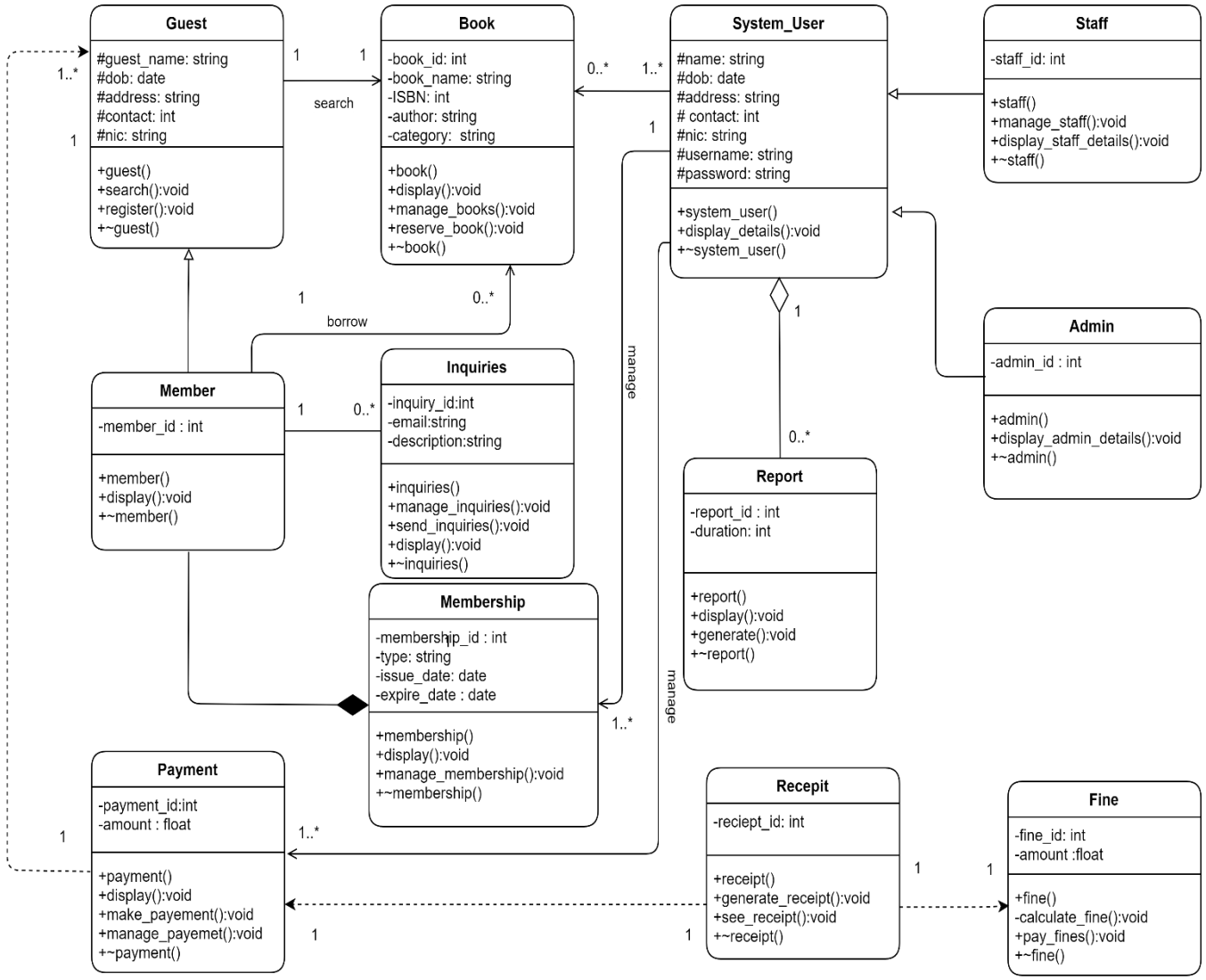
Class Diagram



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Codes

Main.cpp

```
#include <iostream>
#include"system_user.h"
#include"admin.h"
#include"staff.h"
#include"guest.h"
#include"member.h"
#include "membership.h"
#include "report.h"
#include "inquiries.h"
#include "book.h"
#include "Fine.h"
#include "Payment.h"
#include "Recipt.h"

int main()
{
    system_user * su1;
    su1 = new system_user("kamal", "10.10.2000", "no12,abc rd, xyz", 0717171717,
"200005502998");

    staff* s1;
    s1 = new staff(1);

    admin* a1;
    a1 = new admin(10);

    membership* m1;
    m1 = new membership(2, "basic", "12.12.5512", "12.12.1552", 21);

    system_user* ABC = new system_user();
    report* r1 = new report(1, 10);
    report* r2 = new report(2, 10);
    ABC->addReports(r1, r2);
    delete ABC;

    guest* g1;
    g1 = new guest("bimal", "12.07.2002", "no12,abc rd, xyz", 01122511114,
"200208984498");

    inquiries* i1;
    i1 = new inquiries(1234, "chamath@gmail.com", "something");

    book* b1;
    b1 = new book(1234,"sadapinidiya",12112111,"Chamara","romantic");

    Fine * f1;
    f1 = new Fine(1454, 10.00);
```

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```
    Payment * p1;
    p1 = new Payment(4524, 17.00);

    Receipt* r1;
    r1 = new Receipt(10);

    return 0;
}
```

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System_user.h

```
#pragma once
#define SIZE 3
#include"report.h"
class system_user
{
protected:
	char name[50];
	char dateOfBirth[12];
	char address[500];
	int contact;
	char nic[15];
private:
	report* reports[SIZE];
public:
	system_user();
	system_user(const char sname[], const char dob[],const char addr[], int no,const
char id[]);
	void display_details();
	~system_user();

	void addReports(report* r1, report* r2);
	void displayReports();


};
```

System_user.cpp

```
#include "system_user.h"
#include <cstring>
#include<iostream>
using namespace std;

system_user::system_user(const char sname[], const char dob[], const char addr[], int no,
const char id[])
{
	strcpy_s(name, sname);
	strcpy_s(dateOfBirth, dob);
	strcpy_s(address, addr);
	contact = no;
	strcpy_s(nic, id);
}

void system_user::display_details()
{
	cout << "name: " << name << endl;
	cout << "date of birth: " << dateOfBirth << endl;
	cout << "address: " << address << endl;
	cout << "contact: " << contact << endl;
	cout << "nic: " << nic << endl;
```

```
}

system_user::~system_user()
{

}

void system_user::addReports(report* r1, report* r2)
{
	reports[0] = r1;
	reports[1] = r2;
}

void system_user::displayReports()
{
}
```

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Staff.h

```
#include "system_user.h"
class staff : public system_user
{
private:
	int staffID;
public:
	staff();
	staff(int id);
	void manage_staff();
	void display_staff_details();
	~staff();
};
```

Staff.cpp

```
#include "staff.h"
#include<iostream>
using namespace std;
staff::staff(int id){
	staffID = id;
}

void staff::manage_staff()
{
}

void staff::display_staff_details()
{
	cout << "Staff ID: " << staffID << endl;
	cout << "name: " << name << endl;
	cout << "date of birth: " << dateOfBirth << endl;
	cout << "address: " << address << endl;
	cout << "contact: " << contact << endl;
	cout << "nic: " << nic <<"\n" << endl;
}

staff::~staff()
{

}
```

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Admin.h

```
#pragma once
#include "system_user.h"
class admin : public system_user
{
private:
	int adminID;
public:
	admin();
	admin(int id);
	void display_admin_details();
	~admin();
};
```

Admin.cpp

```
#include "admin.h"
#include <iostream>
using namespace std;

admin::admin(int id)
{
	adminID = id;
}

void admin::display_admin_details()
{
	cout << "Admin ID: " <<adminID << endl;
	cout << "name: " << name << endl;
	cout << "date of birth: " << dateOfBirth << endl;
	cout << "address: " << address << endl;
	cout << "contact: " << contact << endl;
	cout << "nic: " << nic <<"\n"<< endl;
}

admin::~admin()
{
}
```

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Guest.h

```
#include"book.h"
class guest
{
protected:
	char name[50];
	char DOB[12];
	char address[500];
	int contact;
	char nic[15];

private:
	book* bk;
public:
	guest(const char gname[], const char dob[], const char addr[], int no, const char
id[]);
	void search();
	void Register();
	~guest();


};
```

Guest.cpp

```
#include "guest.h"
#include<cstring>

guest::guest(const char gname[], const char dob[], const char addr[], int no, const char
id[])
{
	strcpy_s(name, gname);
	strcpy_s(DOB, dob);
	strcpy_s(address, addr);
	contact = no;
	strcpy_s(nic, id);
}

void guest::search()
{
}

void guest::Register()
{
}

guest::~guest()
{
}
```

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member.h

```
#include "guest.h"
class member : public guest
{
private:
	int member_id;
public:
	member();
	void setMember_id(int id);
	void display();
	~member();
};
```

member.cpp

```
#include "member.h"
#include<iostream>
using namespace std;
void member::setMember_id(int id)
{
	member_id = id;
}

void member::display()
{
	cout << "member ID: " << member_id << endl;
	cout << "name: " << name << endl;
	cout << "date of birth: " << DOB << endl;
	cout << "address: " << address << endl;
	cout << "contact: " << contact << endl;
	cout << "nic: " << nic <<"\n" << endl;
}

member::~member()
{
}
```

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Membership.h

```
#include"member.h"
#define SIZE 5
class membership
{
private:
	int membership_id;
	char type[20];
	char issue_date[12];
	char expire_date[12];

	member* setmember[SIZE];
public:
	membership(int mid, const char mtype[], const char i_date[], const char e_date[],
int member_id);
	void display();
	void manage_membership();
	~membership();


};
```

Membership.cpp

```
#include "membership.h"
#include<cstring>
#include<iostream>
using namespace std;


membership::membership(int mid, const char mtype[], const char i_date[], const char
e_date[], int member_id)
	{
	membership_id = mid;
	strcpy_s(type, mtype);
	strcpy_s(issue_date, i_date);
	strcpy_s(expire_date, e_date);

	setmember[0] = new member();

	}

void membership::display()
{
	cout << "membership ID: " << membership_id << endl;
	cout << "type: " << type << endl;
	cout << "issue date: " << issue_date << endl;
	cout << "expire date: " << expire_date << endl;
	cout << "member id" << membership_id << endl;

}
membership::~membership()
{

}
```

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Report.h

```
class report
{
private:
	int report_id;
	int duration;
public:
	report(int id, int days);
	void display();
	void generate();
	~report();
};
```

Report.cpp

```
#include "report.h"
#include<iostream>
using namespace std;
report::report(int id, int days)
{
	report_id = id;
	duration = days;
}

void report::display()
{
}

void report::generate()
{
}

report::~report()
{
}
```

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Receipt.h

```
#pragma once
#include "Payment.h"
#include "Fine.h"

class Receipt
{
private:
	int receipt_id;

public:
	Receipt(int rreceipt_id);
	void generate_receipt(Payment* p, Fine* f);
	void see_receipt();
	~Receipt();
};
```

Receipt.cpp

```
#include "Receipt.h"

Receipt::Receipt(int rrecipt_id)
{
	receipt_id = rrecipt_id;
}

void Receipt::generate_receipt(Payment* p, Fine* f)
{

	//write your code
}


void Receipt::see_receipt()
{
	//write your code
}

Receipt::~Receipt()
{
	//write your code
}
```

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Fine.h

```
#pragma once
class Fine
{
private:
	int fine_id;
	float amount;
public:
	Fine(int ffine_id, float aamount);
	void calculate_fine();
	void pay_fine();
	~Fine();
};
```

Fine.cpp

```
#include "Fine.h"

Fine::Fine(int ffine_id, float aamount)
{
	fine_id = ffine_id;
	amount = aamount;
}

void Fine::calculate_fine()
{
	//write your code
}

void Fine::pay_fine()
{
	//write your code
}

Fine::~Fine()
{
	//write your code
}
```

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Payment.h

```h
#pragma once
class Payment
{
private:
	int payment_id;
	float amount;
public:
	Payment(int payment_id, float amount);
	void display();
	void make_payment();
	void manage_payment();
	~Payment();
};
```

Payment.cpp

```cpp
#include "Payment.h"


Payment::Payment(int ppayment_id, float aamount)
{
	payment_id = ppayment_id;
	amount = aamount;

}

void Payment::display()
{
	//write your code
}

void Payment::make_payment()
{
	//write your code
}

void Payment::manage_payment()
{
	//write your code
}

Payment::~Payment()
{
	//write your code
}
```

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Inquiries.h

```
#pragma once
#include "member.h"

	class inquiries
	{
	private:
		int inquiry_id;
		char email[20];
		char description[100];

		member* m;

	public:
		inquiries(int i_id, const char iemail[], const char idescription[]);
		void manage_inquiries();
		void send_inquiries();
		void display();
		~inquiries();

};
```

Inquiries.cpp

```
#include "inquiries.h"
#include "cstring"


inquiries::inquiries(int i_id, const char iemail[], const char idescription[])
{
	inquiry_id = i_id;
	strcpy(email,iemail);
	strcpy(description,idescription);
}

void inquiries::manage_inquiries()
{
	//write your code
}

void inquiries::send_inquiries()
{
	//write your code
}

void inquiries::display()
{
	//write your code
}
```

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```
inquiries::~inquiries()
{
	//write your code
}
```

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Book.h

```
#pragma once
class book
{
private:
	int book_id;
	char book_name[30];
	int ISBN;
	char author[30];
	char category[30];
public:
	book(int b_id, const char b_name[], int isbn, const char bauthor[], const char
bcategory[]);
	void display();
	void manage_books();
	void reserve_book();
	~book();
};
```

Book.cpp

```
#include "book.h"
#include "cstring"

book::book(int b_id, const char b_name[], int isbn, const char bauthor[], const char
bcategory[])
{
	book_id = b_id;
	strcpy(book_name,b_name);
	ISBN = isbn;
	strcpy(author,bauthor);
	strcpy(category,bcategory);

}

void book::display()
{
	// write your code
}

void book::manage_books()
{
	// write your code
}

void book::reserve_book()
{
	// write your code
}

book::~book()
{
	// write your code
}
```

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Individual Contribution

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IT21826368	Nanayakkara Y.D.T.D	Payment, receipt, fine
IT21820946	Weragala R.T.L	Book, report, inquires
IT21822612	Mendis H.R.M	System_user, staff, admin
IT21823220	Vithanage H.P	Guest, Member, Membership