

CST2550 COURSEWORK 1 REPORT

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# Introduction

In this part of the report, I am going to be explaining how I implemented the UML diagram that I have been provided into C++ programming language.

A diagram of a computer code

Description automatically generated with medium confidence

# Person

UML diagram for the library system that which allows the librarian to issue a book to the member, add a member to the library system along with their member details such as their name, email, and address. The librarian should also be able to return a book from the members. The CSV file that has been provided to us should also be displayed so that the librarian can see all the books up for display. And finally, the librarian should be able to calculate a fine for any member who hands in their books past the overdue date.

A computer screen shot of a computer

Description automatically generated

How did I implement this in C++?

A computer screen shot of a program

Description automatically generated

First, I started by declaring the class which is called “Person”. After this I started by making the public attributes of the class which is their name, address, and email address of the person. Keep in mind that all of these are strings which I have declared by using “std::string name, std:: string address, std:: string email). After creating the public attributes, I started creating the Getter and Setter methods for the name, address, and email of the person. The Getter methods begin with “getName”, “getAddress” and “getEmail”. The Setter methods start with “setName”, “setAddress” and “setEmail”. I finally ended this file by creating the private attributes towards the end which is shown in my code and in the UML diagram.

# Librarian

A screenshot of a computer program

Description automatically generated

How do I implement this in C++?

A screen shot of a computer program

Description automatically generated

In the start, I started by declaring public attributes of the librarian class, which is their staffID, name, address, email, and their salary. Then I started declaring the getter and setter methods to return the value of the staffID attribute. After I started creating the getter and setter methods to return the value of the staffs salary. The picture below shows this:

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Description automatically generated

After this, I started to create the functions to add a member, issue a book, return a book, display borrowed books, and calculate fines and display all the books from the csv file.

A screen shot of a computer code

Description automatically generated

void addMember – adds a new member to the vector of the members created. All members are stored inside the vector. The members details are their name, address, and email.

void issueBook - issues a book to a member. The books and members are the vectors. The member ID and book ID is the ID of the member and book.

void returnBook – this function handles the book return. The member ID of the member returning the book and the ID of the book being returned to the librarian.

void displayedBorrowedBooks- this function displays the list of the borrowed books by a specific member based on their member ID.

void calculateFine – this function calculates the fine of the member when they do not return a book after the overdue date.

void display\_books\_from\_csv – this function displays all the books from the csv file whenever the librarian types in the name of the csv file.

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Description automatically generated

After, I declared the private attributes for the librarian class. I did this by declaring 2 integers which is the staffID and the salary of the staff.

A screenshot of a computer program

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After creating the functions, I created a function which displays the menu of options that the librarian has when then start the library system. They have 3 choices. First choice is for the librarian to type in the name of the csv file. The second choice is to issue a book to the member depending on the book ID provided. And finally, the third choice is where the librarian should return a book from the member.

# Member

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How do I implement this in C++?

A screen shot of a computer code

Description automatically generated

First, I started by creating the member class which is derived from the person class as the member class branches from the person class in the UML diagram. This implies that the “member” class inherits the attributes and the member functions of the “person” class. Next I created the private attributes for the member class. The memberID being an integer and the booksLoaned as a vector where all the books that have been loaned will be stored in the vector. Then I created the public methods. The member class takes the memberID, name, address and email as parameters and initialises the person class with the provided name, address, and email.

I started to create the getter functions that returns the members ID and the vector of books borrowed by the member according to their memberID. After, I created a setter function for setBooksBorrowed which takes the “book” object as a parameter and adds it to the booksLoaned vector. Overall, this function indicates to the librarian that the member has borrowed a new book.

# Books

A screenshot of a computer

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How do I implement this in C++?

A screen shot of a computer program

Description automatically generated

To create the “Book” class, I started off by creating the public attributes which is the part of creating this class. First I initialise the member variables. The values inside the constructor of the Book class are the bookID, bookName, pageCount, authorFirstName, authorLastName and the bookType. After creating the public attributes, created the getter functions which allows the retrieve information about the books in the csv file.

The private attributes I created store information about the book like the ID of the book, name, page count, authors first name and last name, due date, book type and the member who has borrowed the book.

Some other functions I created was:

voidborrowBook – this function is used to borrow a book and it takes the member and a due date as parameters which is a variable or value that is passed into a function or method when it is called.

voidreturnBook – this function is used to return a book.

int calculateFine – this function calculates the fine of the member when they hand in a book pass the due date.