CST2550 Software Engineering Corsework1

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DESCRIPTION

This coursework aims to describe a small library management system using C++. The program uses object-oriented programming to design four classes (Person, Librarian, Member, and Book) that implement the functionality of the program. The coursework includes as well as makefile to compile all the necessary files, a test file which is used to test the program in different aspects, a Catch file, UML diagram followed by a use case diagram and activity diagram.

The program starts with a welcome message and a request for user input, then prints the library management system for staff usage followed by the library management system for book operation. Once the system opens the file, verification for the librarian will start after it is finished and the system will print the menu table. Afterward, the librarian will have the choice to choose which option best suits the needed case.

CONTENT

Header files, Source code files

In each of the files that have been used for the implementation of the program is defined by using header files (.h) and source code files (.cpp).

Person.h, Person.cpp

The Person.h file includes information regarding variables name, email and address, encapsulation function to help setting and storing the values. The Person.cpp file includes the main functionality of the file by inheriting a function form the header file(.h).

Member.h, Member.cpp

In the header file of Member.h, some of the inherited functions form its base class as well as included libraries from Person.h. In the header file of the Member are declared vectors and passed down a Book and Person class for accessing some of the code scripts from those files and avoiding compiling errors. Some of the vectors are inherited with pointers to book objects. In terms of Member.cpp the functions that were declared inside Member.h were put to work.

Book.h, Book.cpp

Inside the Book.h file defines all of the necessary libraries for this project which are the base of all of the files that implement the functionality of the program.

The Book.h file given to it is a child of the constructor that accepts seven variables from the private access specifier as well as another eight functions from the public access specifier. The Book.cpp opens the capacity of the functions which have been inherited from its based class.

Librarian.h, Librarian.cpp

Librarian.h includes all of the passed-down header files with libraries for example, Book.h, Person.h, Member.h.

This file holds the main options which are displayed on the menu when you access the program which is to add a member, issue a book, return a book, display all of the borrowed books from a member and if a member has delayed a book it calculates the fine.

Librarian.cpp makes the functionality of adding a member by requesting for member’s name, address and email address by verified regex validation.

Moving forward to the function of issuing a book that takes member’s name, ID the book name that the member would love to hold plus it is ID.

The return book function requires the member to verify itself plus the book checks it is details and in terms of all of the needed checking if the member returns the book on time it should not be stressed out for having a fine unless is delayed. And finally, the function whose functionality is to display all of the borrowed books by a member.

DIAGRAMS

The scope and functionalities of the system are described in the Use Case diagram. The librarian will be the primary actor in charge of what the system does in this particular circumstance.

The UML diagram serves as the project's foundation, defining the four classes used, their private characteristics, and public activities; some of these classes will have a constructor, class inheritance, and cardinality.

The Activity Diagram shows the sequence of events that the system will follow in order to achieve all of its intended functionality.

DIFFICULTIES

The difficulty I faced was displaying the right order of the files, for example, the program should start with the input for the book, file then followed by, the librarian login, menu and the options of the menu but does not do the job this way. I have checked my makefile unfortunately the test.cpp is not working correctly therefore I have it commented and I am sure that is compiling in the right order. Other difficulties with this project was the manipulation of the control flow
on how a pointer could be used to do most of the functionality of this program to point to an address and to dereference the value of the address, being honest myself still, find difficulties working with pointers. On the other hand, it was the manipulation of the vector in C++ and how to construct a constructor and insert an element with it inside the vector variable, also I learn the usage of auto data type via the Cplusplus website and the references will be attached at the end of the report.

CONCLUSION

In conclusion, developing this library management system was essential for honing one's C++, OOP (Object-Oriented Programming), and pointer-using skills. Future developments will take into account the library system as a foundation.

REFERENCE

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