PDS Lab Section 11

Lab Day 12 – February 24, 2021

The top two lines of your programs must contain the following information:
//Roll No.: <Type in your roll no.>
//Name: <Type in your name>

You have to give different names to your C files and upload them in Moodle. Please read the instructions given below.
Document your programs meaningfully using appropriately named variable and sufficient amount of comments as suggested in an earlier email. There will be marks for documentation.

Write a C program to build the following software:

Personal Library Software: A person can own up to a few dozens of books. To keep track of the books owned by individuals, a program with the following functions is needed.

main: In this function define a structure called **book**, and a suitable array of **book** structures, called **bookArray** of size 100 to keep track of the books. The members of the **book** structure are name of the book (20 characters), year of publication (integer), date of purchase (10 Characters) , price (integer), and publisher (10 Characters), and **accessNo** (int). The other members of the book structure are **isIssued** an integer variable used to keep record whether book issued out, and **friendName** a string of 20 characters that keeps track of to whom the book is issued. A global variable **nbook** would be used to keep track of how many books the user owns.

This function should in an infinite loop, display the following menu, and then prompt the user to enter a number between 1 and 7.

1. Enter Book
2. Search Book
3. Issue Book
4. Return Book
5. Store Book
6. Read Book
7. Exit

Depending on the user input, carry out the following:

1. Call the function enterBooks
2. Call the function searchBook
3. Call the function issueBook
4. Call the function returnBook
5. Call the function storeBook
6. Call the function readBook
7. Exit

enterBooks: The details of all the books such as name of the book (20 characters), year of publication (integer), date of purchase (10 Characters) , price (integer), and publisher (10 Characters) would be entered. A book should be assigned a unique 3 digit **accessNo**, by the computer. Increment the global variable **nBook** each time a new book is successfully entered. Display the book details.

searchBook: It should be possible to search a book based on its author name, book title, or access number. It should prompt the user and get the author name, book title, or access number as the case may be. You should perform a binary search based on a sorted array of structure, obtained by calling an appropriate

sorting function. Then display the details of the book, or if no book matches the description, display a suitable message. It may happen that an author(s) with same first name has multiple books, in this case, the details of all books authored by him should be displayed.

sort-by-name: This function should sort the **bookArray** based on the first name of the author and display the details of the books in sorted order.

sort-by-title: This function should sort the **bookArray** based on the first name of the title of the book and display the details of the books in sorted order.

sort-by-access: This function should sort the **bookArray** based on the access number of the book and display the details of the books in sorted order.

issueBook: This function would prompt the user to enter the friend's name and access number of book and would set the appropriate fields of the corresponding book structure.

returnBook: This function would prompt the user to enter the friend's name and access number of book and would set the appropriate fields of the corresponding book structure.

storeBooks: This function will store the **bookArray** in a file called **bookDB.txt** and if successful, and display the contents of the file.

readBook: This function will try to read a file called **bookDB.txt** and if successful, initialize the **bookArray** based on the contents of the file. Display the contents of **bookArray**.

Name your C program file as LD12_1_<roll_no>.c. **[60 Marks]**

Submit your .c file in Moodle against the assignment submission link for Lab Day 11.