CS 201 DATA STRUCTURES
ASSIGNMENT 4
SECTION D&E
Fall 2022

DUE: Friday, Dec 2nd, 2022

NOTE: Late submissions will not be accepted. Please submit your code on Google Classroom, submissions by email will not be accepted. *The code should be documented and well-written in C++. Undocumented code will be assigned a zero.*

In this Assignment, you will simulate some functionality of a library management system to process the book records efficiently.

A book record contains the following information:
a) ISSN (a unique number assigned to books)
b) Title
c) List of Author name(s)
d) #of copies available as a reference book
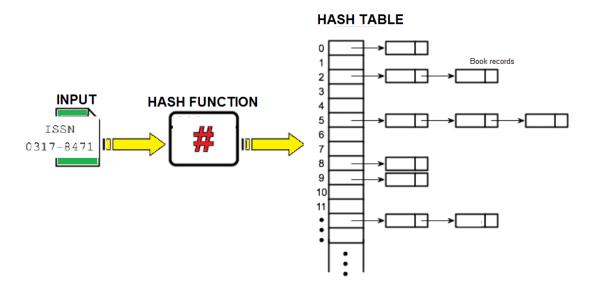e) # of copies available as an issuable book

A number of users want to access the library online and search for books. To efficiently perform the basic operations, an index is created on the book ISSN using Hashing technique.

The following functions can be performed:

1. Create a book record (C) - a new book record is created and added to the hashtable
2. Review a book record (R) -- Given an ISSN display the complete book record
3. Update a book record (U) -- Given ISSN, any field in the book record can be updated except the ISSN
4. Delete a book record (D) -- Given an ISSN delete the book record

Make sure that all your operations are performed in O(1) time on average using hashing time.

HASHTABLE: implement using STL vector
HASH FUNCTION: use a universal hash function
COLLISION RESOLUTION: use the chaining technique (implement using STL list)

HASH TABLE

The above figure gives detail about how data is stored and organized. An index is created on the Book ISSN using a hash table. The collision is resolved using chaining.