

CSE 314
Online (B1)
Time: 40 minutes

A bookstore stores books of three writers (A, B, C), five books of each writer. There is a book catalog which contains the number of books are available to borrow and the number of books borrowed. For example, if 2 books of a writer A and 4 books of writer B are borrowed, then the catalog contains entries like (A, 3, 2), (B, 1, 4) and (C, 5, 0). The catalog is updated by a librarian if any borrower either borrow or return a book.

Each borrower can randomly want to borrow or return a random writer's book. If the book is available, then the borrower can borrow the book and send a message to the librarian (e.g., the message will be "A, 1" for returning, and "A, -1" for borrowing). The librarian will update the catalog according to the message. The borrower can return any book of any random writer, i.e., the book is not required to be borrowed earlier by the same borrower. Assume that there are 10 borrowers (with ID from 1 to 10) and each borrower will get 5 chances to either borrow or return books.

You have to implement the catalog as an array of structures, a borrower and the librarian as two Processes. Write the necessary program to implement the bookstore maintaining proper IPC communications.

N.B.: Always print the status of the processes to trace their work and also the catalog.