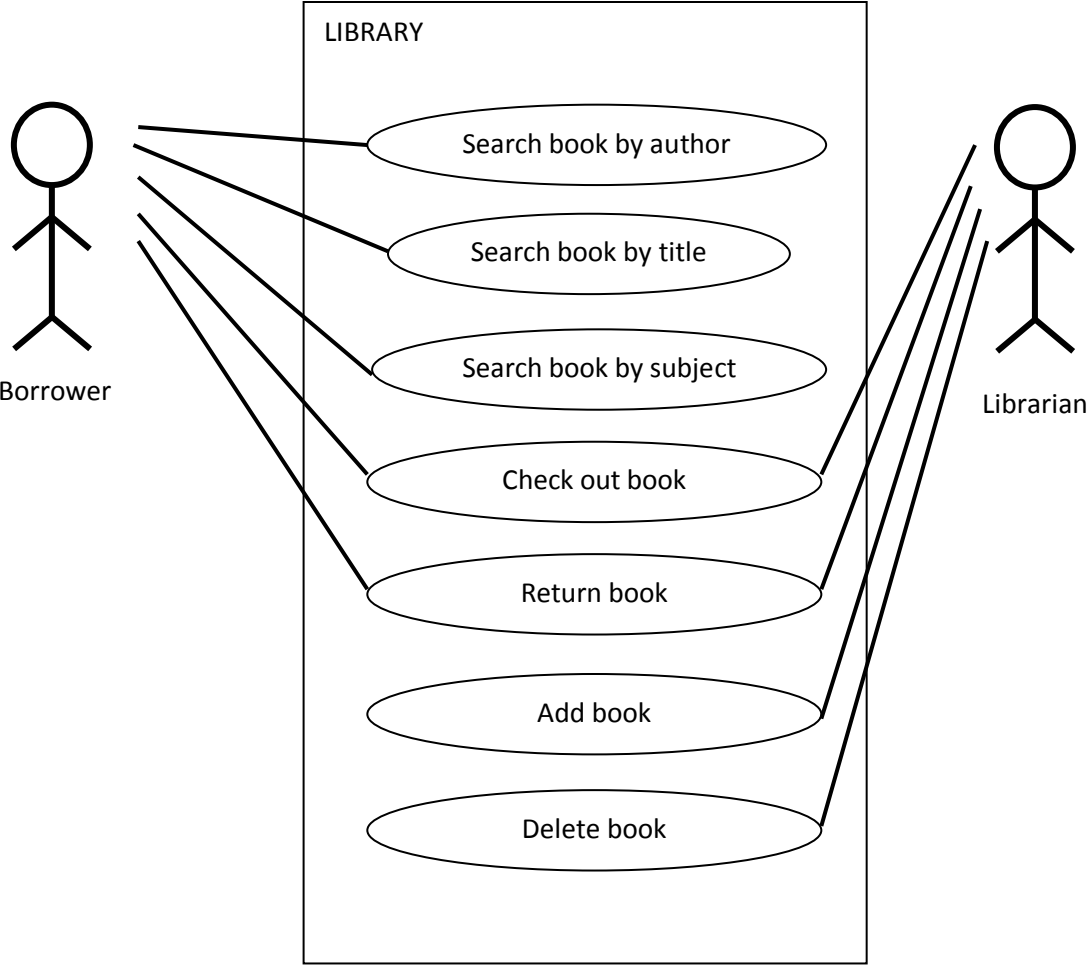


Ekrem Kocaguneli

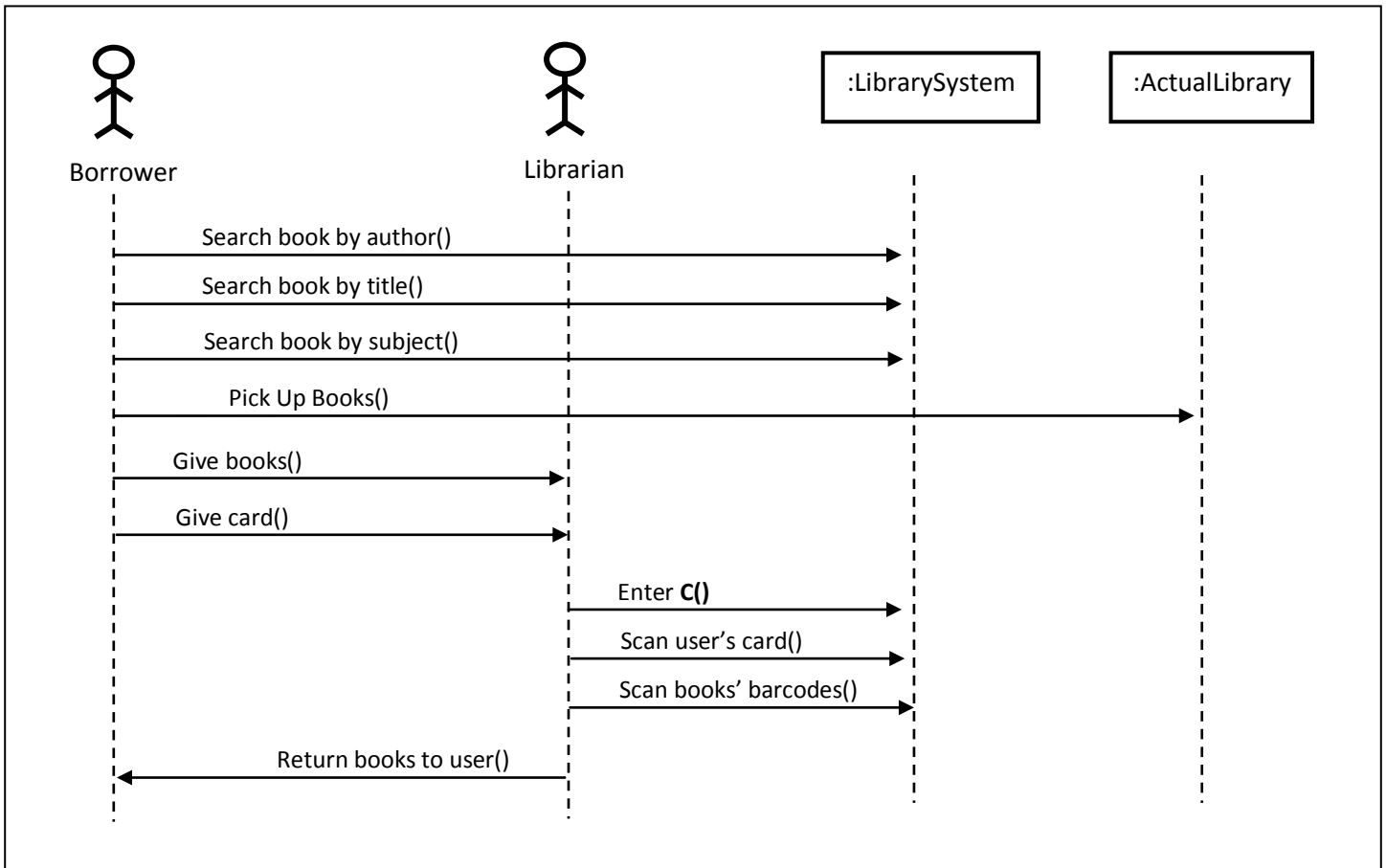
CS-736 HW#1

a) Draw a use case diagram of this system.

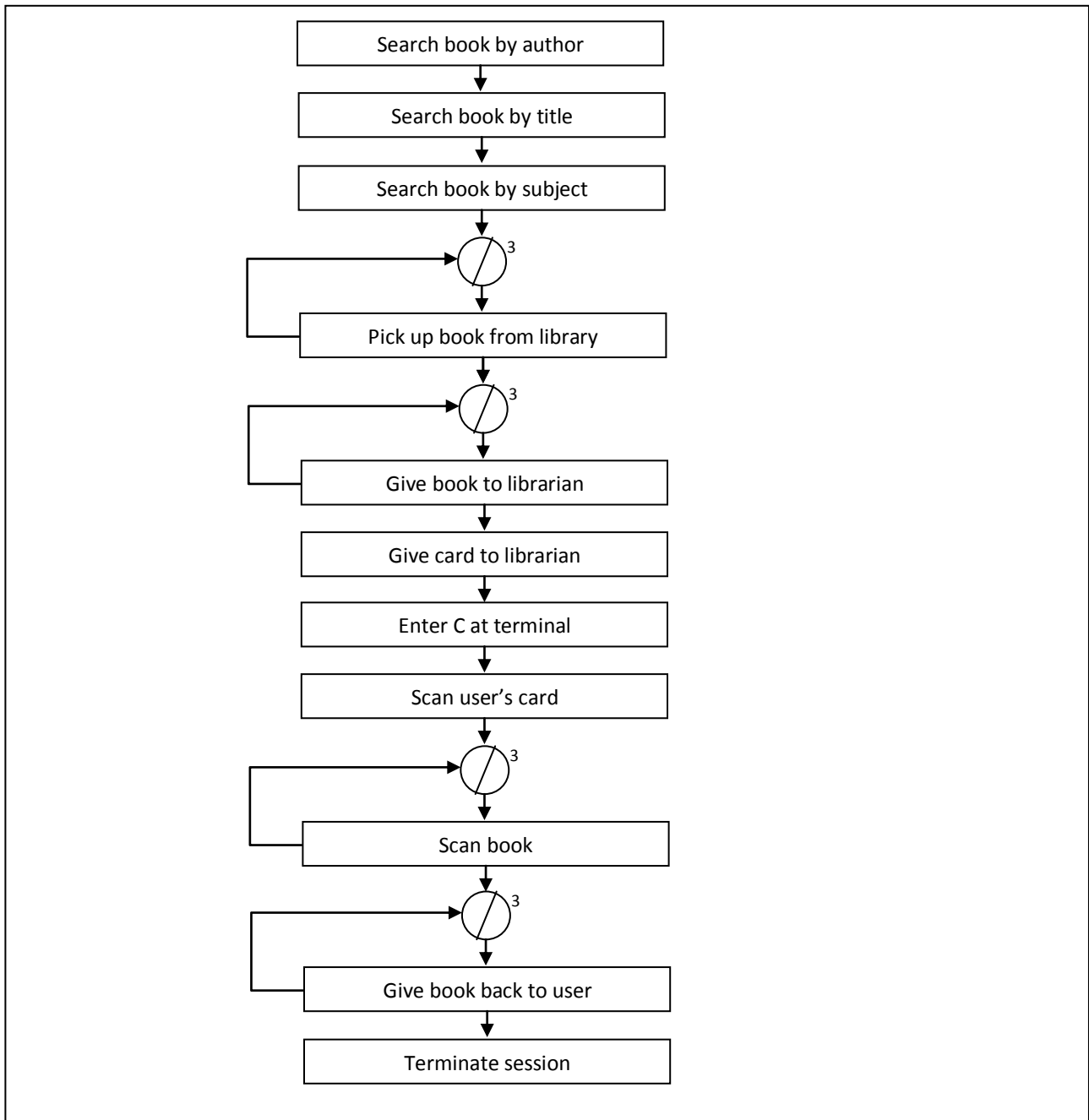


b) Write a scenario for checking out books and a UML sequence diagram for this scenario. Assume that borrowers typically checkout no more than three books.

1. Borrower searches one book by title, one book by title and one book by subject.
2. Borrower picks up the three books from the library.
3. Borrower gives the books and his/her card to the librarian.
4. Librarian enters C at the terminal
5. Librarian scans user's card
6. Librarian scans barcodes of 3 books.
7. Librarian gives 3 books back to the user



c) Draw a software execution graph for checking out books scenario. Assign software resource requirements for each step in a software execution graph. Assuming the values for the computer resource requirements given in the tables below, estimate the total elapsed time.



Below is a table showing the estimated computer resources. Please note that there are some certain assumptions in the scenario like the user's searching for 3 books by 3 different means. Those assumptions were due to make a comprehensive scenario.

Processing steps	CPU Kinstr	Disk Physical I/O	Delay Unit
Search book by author	700	2	1
Search book by title	700	2	3
Search book by subject	700	2	2
Pick up book from library	0	0	10
Pick up book from library	0	0	10
Pick up book from library	0	0	10
Give book to librarian	0	0	1
Give book to librarian	0	0	1
Give book to librarian	0	0	1
Give card to librarian	0	0	4
Enter C at terminal	200	2	1
Scan user's card	600	2	4
Scan book	700	1	4
Scan book	700	1	4
Scan book	700	1	4
Give book back to user	0	0	1
Give book back to user	0	0	1
Give book back to user	0	0	1
Total	5000	13	63

Assuming that the above table is showing more or less the correct estimates, the total elapsed time calculation is given below:

$$5000*0.0001 + 13*0.02 + 63*1 = 63.76$$