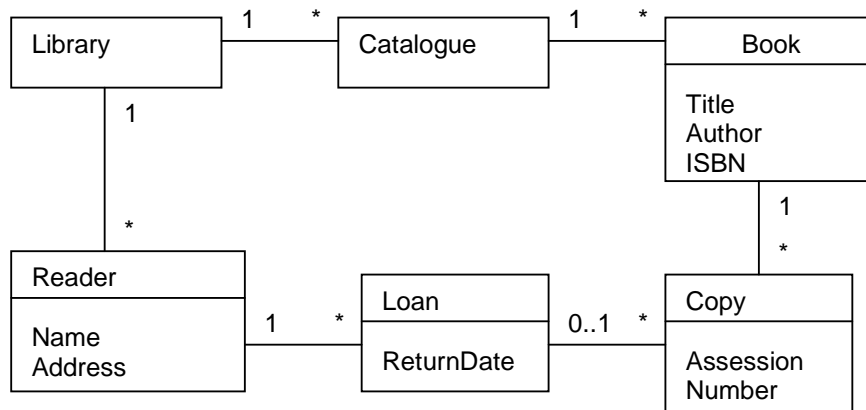


The University of Melbourne  
 Department of Computer Science and Software Engineering  
**433-254 Software Design**  
 First Semester, 2003  
**Tutorial 10**  
**Week 11**

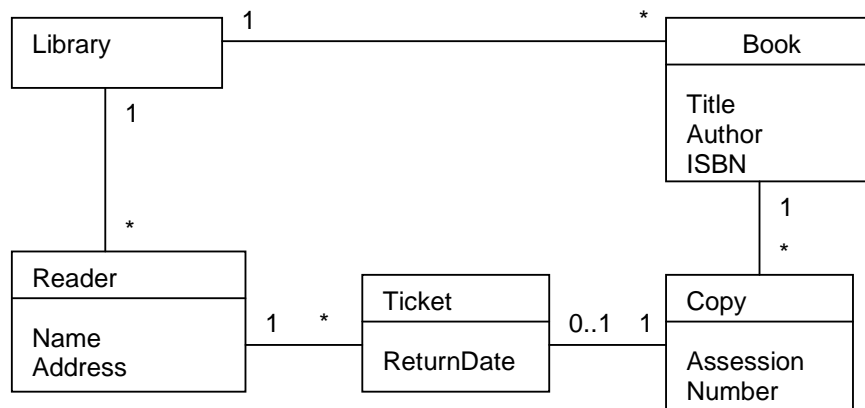
1. Draw a class diagram summarizing the following facts about a library. Discuss your design decisions, and any limitations of your model.

For each book held by the library, the catalogue contains the title, author's name and ISBN of the book. There may be multiple copies of a book in the library. Each copy of a book has a unique accession number. There are many registered readers belonging to the library, each of whom is issued with a number of tickets. The system records the name and address of each reader, and the number of tickets that they have been issued with. Readers can borrow one book for each ticket that they possess, and the system keeps a record of which books a reader has borrowed, along with the date that the book must be returned by.

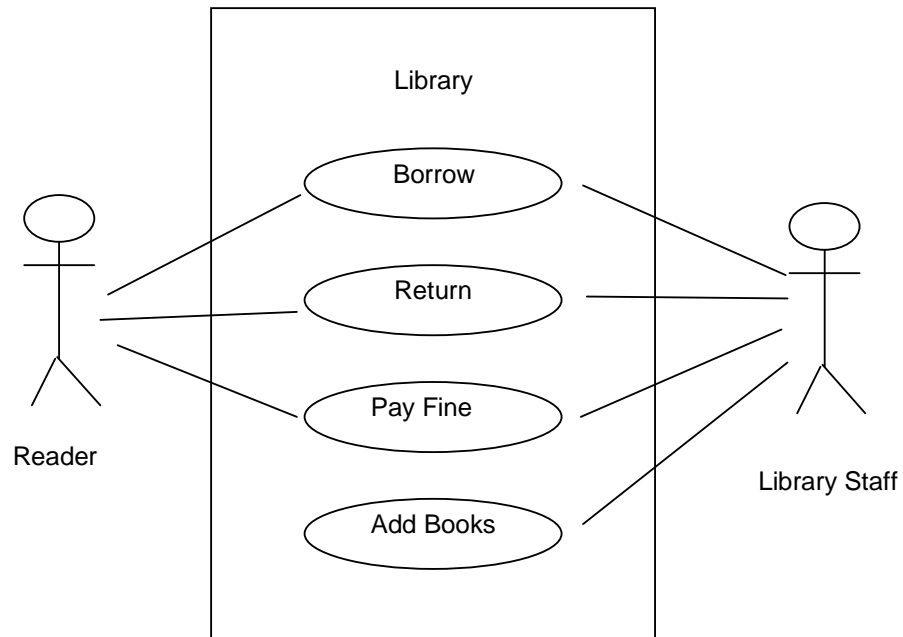
Solution 1



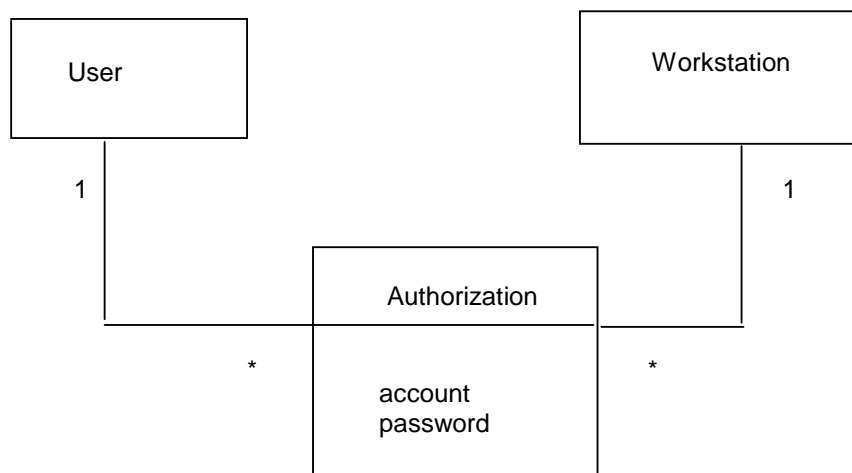
Solution 2



2. In the library described in question 1, readers can borrow, return and renew books from the library by forwarding a ticket to the library staff at the library desk. Readers have an option of purchasing additional tickets from the library. Any book that is not returned by the due date is subject to a fine of \$1 per day. Library staff is responsible for collecting fines, adding new books to the library. Draw a use-case diagram for the library. [THIS IS JUST A REVIEW QUESTION, You can SKIP IT].



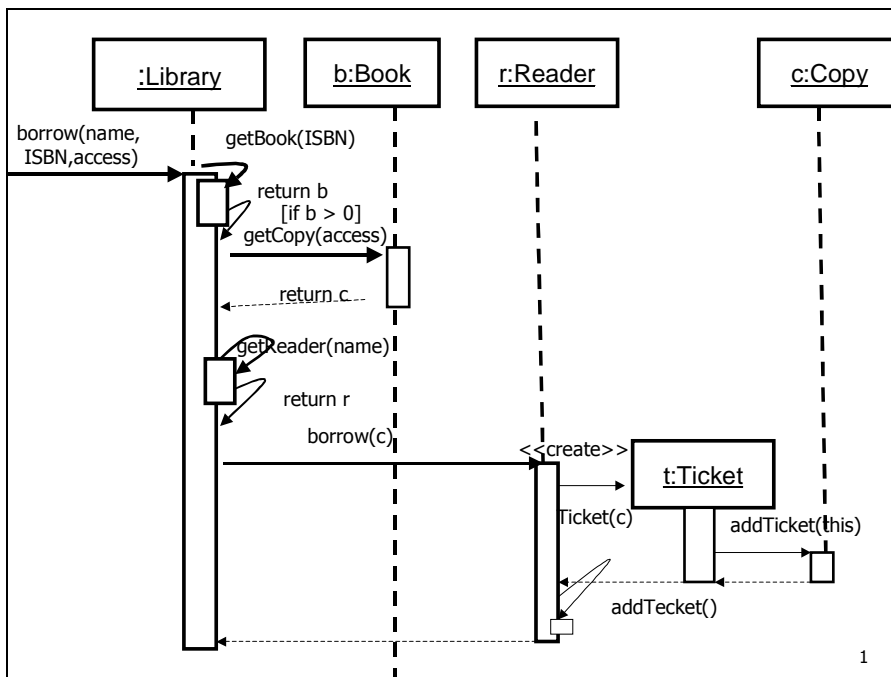
3. Users of a network are authorized to use certain workstations. For each such machine, they are issued with an account and password. Draw a class diagram describing this situation, and discuss any assumptions that you make.



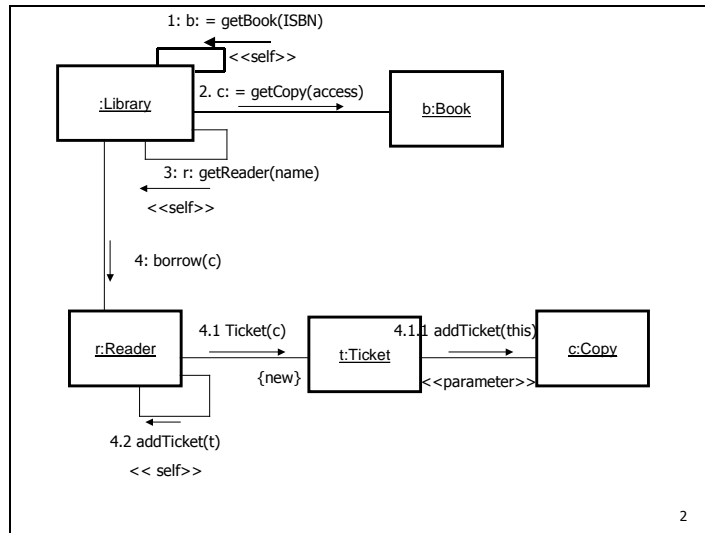
4. For the library system (described above) draw the sequence and collaboration diagrams for the success cases following scenarios.
- Borrow a book
  - Return a book
  - If you think you need more practice, draw the sequence diagrams for the other scenarios as well.

Sample Solution

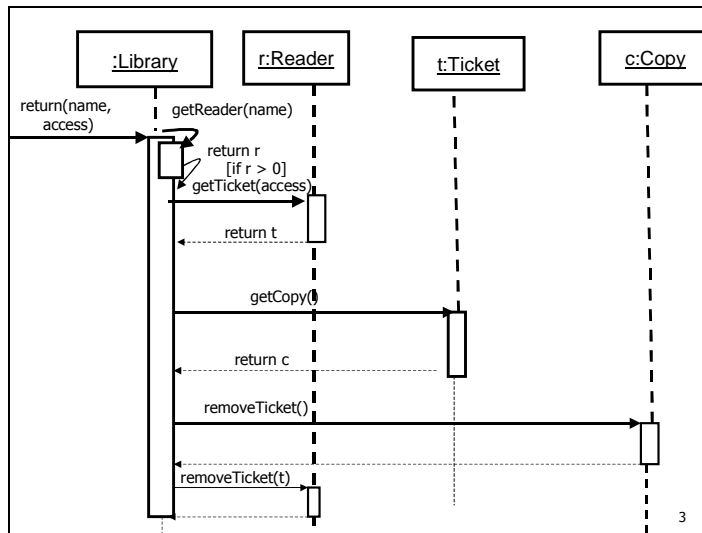
Sequence Diagram - Borrow Book



Collaboration Diagram - Borrow Book



### Sequence Diagram - Return Book



## Collaboration Diagram - Return Book

