Homework 1, 4354 Spring2016, due on Feb 8 in clas

Use Case Scenarios:

* You have been contracted to develop a computer system for a university library.
* The library holds many types of documents for students, faculty and staffs of the university to borrow.
* The type of documents that a library manages range from books, journals, conference proceedings, video and audio tapes.
* Some of the documents such as journals are for short-term loan only (i.e 3 working days).
* Other documents such as books may be borrowed for up to six months for a student and a year for a faculty or a staff member.
* The maximum items that a faculty or staff member can borrow are 12 while it is only 6 for students.
* It is essential that the system keeps track of the number of copies of books and (copies of) journals and when books and journals are borrowed and returned.
* The system should produce a reminder when a book borrowed by a user is overdue.
* A user should be able to extend the loan if the borrowed item is a book and others have not reserved it.
* The system should allow users to search for a document based on a particular title or by a particular author.
* Any user can search for documents held in the library.
* To be able to borrow anything from the library, the user must be registered.

Step 1: Identify Objects

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| **Noun List** | | | |
| ~~computer system~~ | borrowed item | documents | library |
| students | ~~short term loan~~ | books | search |
| faculty | ~~3 working days~~ | journals | ~~title~~ |
| staff | *~~long term loan~~* | ~~# of copies of books~~ | ~~author~~ |
| user | ~~six months~~ | ~~# of copies of journals~~ | ~~reminder~~ |
|  | ~~year~~ | conference proceedings | ~~overdue~~ |
|  | ~~maximum, items~~ | audio tape |  |
|  | ~~12, 6~~ | video tape |  |

|  |  |
| --- | --- |
| Verb list to identify responsibilities | |
| Hold document | Borrow document |
| Manage document | Tracks number of copies |
| Return document | Produce reminder |
| Extend a document loan | Reserve a document |
| Search for a document | Register user |

Step 2: Create a Conceptual Model

Conceptual Object Model

Step 3: Identify Responsibilities

|  |  |
| --- | --- |
| Verb list to identify responsibilities | |
| Hold document | Borrow document |
| Manage document | Tracks number of copies |
| Return document | Produce reminder |
| Extend a document loan | Reserve a document |
| Search for a document | Register user |

Step 4: Assign Responsibilites in Conceptual Model

An object should be responsible for itself. This helps to determine the responsibilities of objects. Not just what has to happen but whose job it is. We don’t care who initiates the actions but where the responsibility lies for performing them. Responsibilies should be well distributed.

Conceptual Object Model



1. Draw a class diagram representing objects that the library system should manage based on the above described functionalities. For each type of document that the library manages, the system must be able to record authors of published document in the appropriate order, title of document, date of publication, and publisher. Different type of documents has different properties. For example, a journal must have a volume and a number while a book must have an ISBN number. A conference proceeding can be considered as a type of book with additional properties like conference location and conference date.