

A Tale of Analysis and Design

Library Information System

1. Each patron has one unique library card for as long as they are in the system.
2. The library needs to know at least the name, address, phone number, and library card number for each patron.
3. In addition, at any particular point in time, the library may need to know or to calculate the items a patron has checked out, when they are due, and any outstanding overdue fines.
4. Children (age 12 and under) have a special restriction-they can only check out five items at a time.
5. A patron can check out books or audio/video materials.
6. Books are checked out for three weeks, unless they are current best sellers, in which case the limit is two weeks.
7. A/V materials may be checked out for two weeks.
8. The Overdue fine is ten cents per item per day, but cannot be higher than the value of the overdue item.
9. The library also has reference books and magazines, which can't be checked out.
10. A Patron can request a book or A/V item that is not currently in.
11. A Patron can renew an item once (and only once), unless there is an outstanding request for the item, in which case the patron must return it.

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LibraryCard
libraryCard Number

Patron
name address phoneNumber

Fine

Item
value

Child
age

Money

Date

ReferenceBook

Magazine

Book

AudioVideoMaterial

Best Seller

Refining Classes and Attributes

~~| LibraryCard |
|-------------------|
| libraryCardNumber |~~

Patron
name address phoneNumber libraryCardNumber age

Fine

Item
value

~~| Child |
|-------|
| age |~~

Money

Date

ReferenceBook

Magazine

Book
bestSeller

AudioVideoMaterial

~~| BestSeller |
|------------|
| |~~

Patron
name address phoneNumber libraryCardNumber age

Fine

Item
value

Money

Date

Reference Book

Magazine

Book
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Audio Video Material

Adding Attributes

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Fine

Item
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Money

Date

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Magazine

Book
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Audio Video Material

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Fine

Item
Value dueDate numTimesRenewed

Patron
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Money

Date

Reference Book

Magazine

Book
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Audio Video Material

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Fine

Item
value dueDate numTimesRenewed checkedOut loanable

Patron
name address phoneNumber libraryCardNumber age

Money

Date

ReferenceBook

Magazine

Book
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AudioVideoMaterial

Identifying Operations

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Fine

Item
value dueDate numTimesRenewed checkedOut loanable

Patron
name address phoneNumber libraryCardNumber age
itemsCheckedOut whenDue outstandingOverdueFines checkOut request

Money

Date

ReferenceBook

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Item
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Patron
name address phoneNumber libraryCardNumber age
itemsCheckedOut whenDue outstandingOverdueFines checkOut request

Money

Date

ReferenceBook

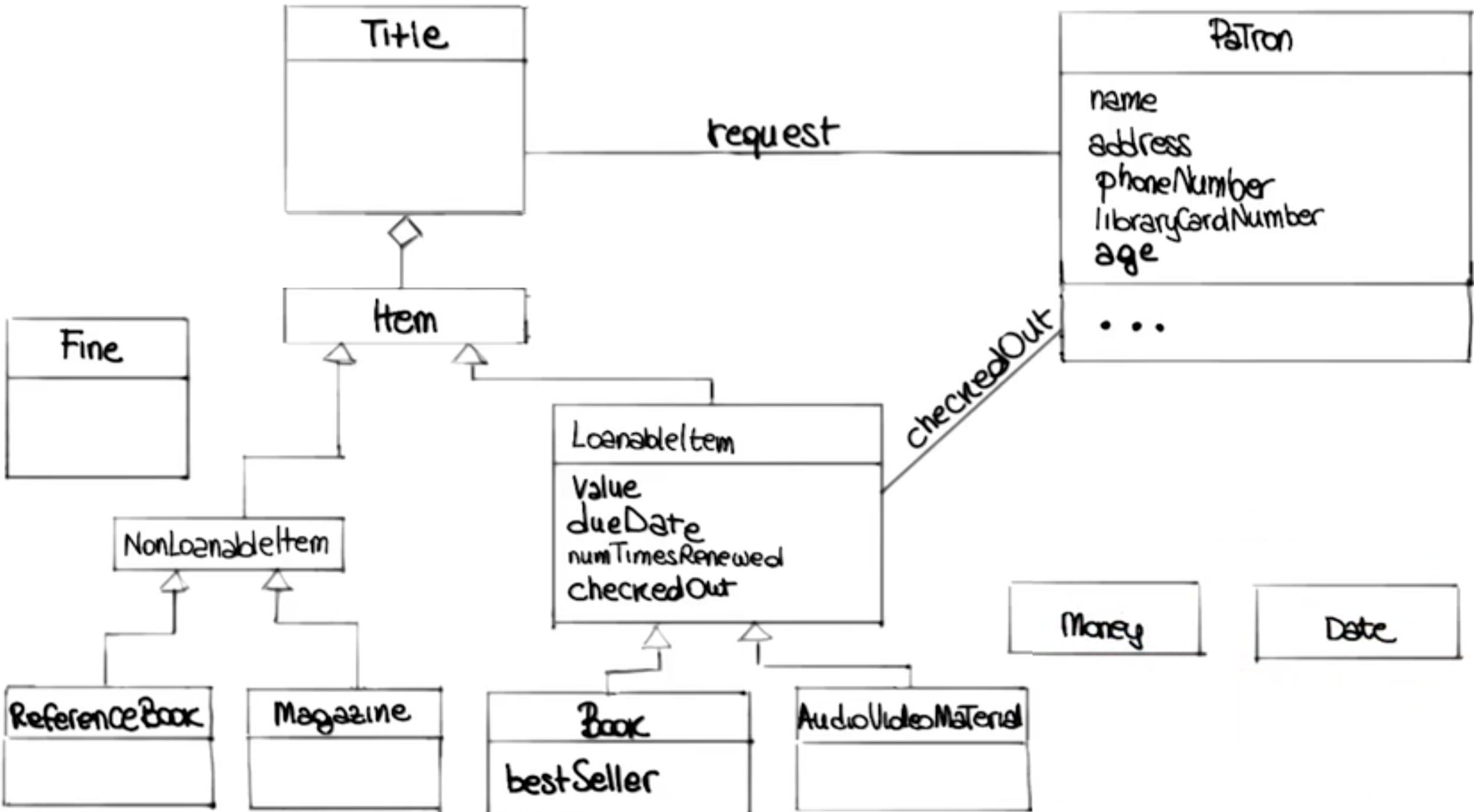
Magazine

Book
bestSeller

AudioVideoMaterial

Refining Relationships

what happens if there's than one book with the same title and somebody puts in a request?



Final Considerations

