

Systems Analysis and Design

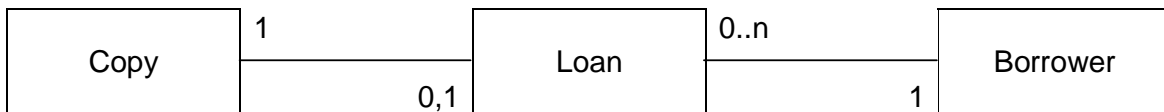
9 Class Diagrams

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A class diagram shows the kinds of objects in a system and the connections between them. Class diagrams are central to the Object Oriented Analysis and Design methodology.

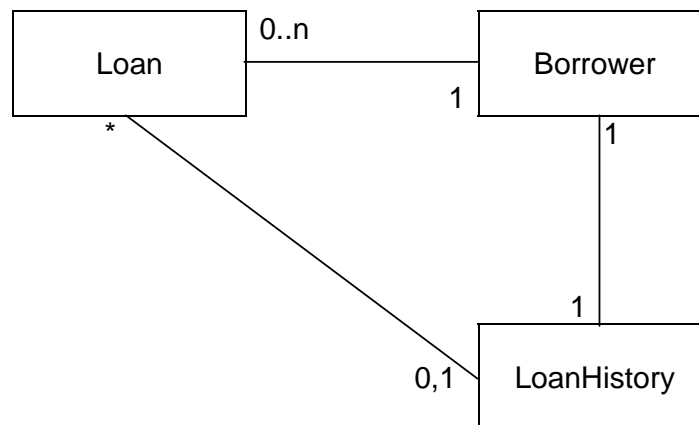
9.1 Associations

A class represents a set of similar objects. The Borrower class represents the set of all borrowers in a library, the Copy class the set of all loanable copies, and Loans the set of all loans.

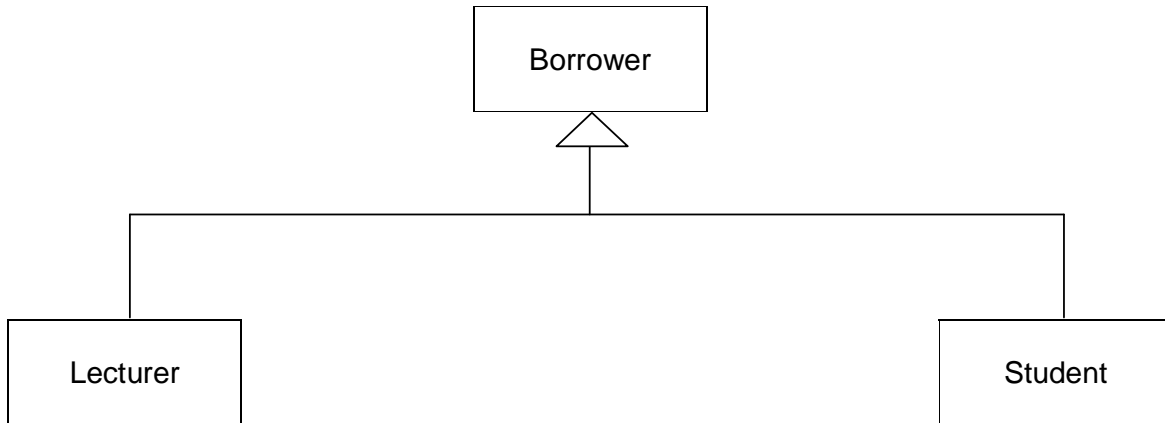


A Loan is for one Copy and one Borrower. A Copy may, or may not, be on Loan. A Borrower may have between 0 and n (whatever number n is) Loans *at any one moment in time*.

A Borrower has a LoanHistory. A LoanHistory is a collection of 0, 1 or many Loans.

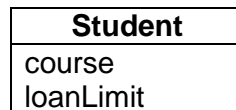


Lecturer and Student are both kinds of Borrower, each with their own set of borrowing rules. For example, a Student can borrow up to four books for up to three weeks. A Lecturer can borrow up to six books for up to six weeks.

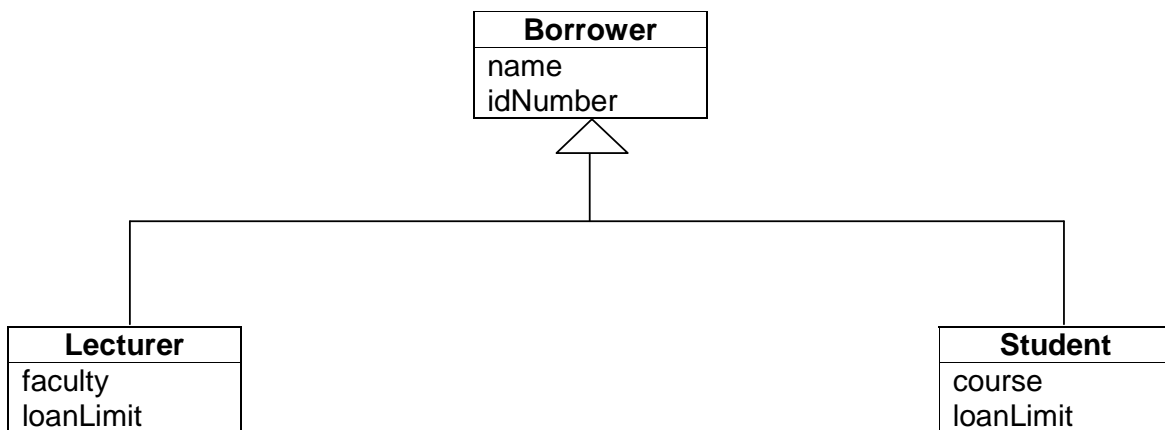


9.2 Attributes

An object has a set of attributes. Attributes? What are the attributes of your ideal partner? Attributes are derived from what an object has. For example, a student has a course and a loanLimit.

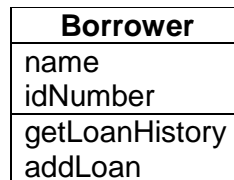


A Borrower has a name and an idNumber. A Lecturer has a name, an idNumber *and* a faculty and loanLimit. A Student has a name, an idNumber *and* a course and loanLimit.



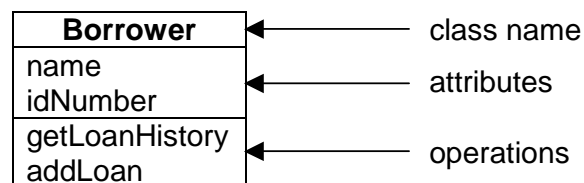
9.3 Operations

An object knows all about itself. It can tell you what its attributes are. And it can change some of them for you. A Borrower can tell you what its LoanHistory is and can add new loans to its LoanHistory.



An operation accesses attributes. Attributes are usually private and not accessible except via operations. An operation can get attributes for you and can update their values.

9.4 Class Diagram



In the early stages of analysis, class diagrams are simply named boxes together with their associations. As analysis progresses, attributes and operations are added - not necessarily all of them, just the important ones.

Notice the structure of a class diagram. The box is divided into three compartments. The class name is shown emboldened. Important attributes are shown in the middle section. The bottom section is for the operations.

Bibliography

FOWLER M *UML Distilled* 2nd Ed Addison-Wesley 2000
<http://www.agilemodeling.com/artifacts/classDiagram.htm> accessed 20 Dec 2007