

Module 4M21: Software Engineering and Design

OBJECT ORIENTED DESIGN

Examples Paper 2

Straightforward questions are marked †

*Tripos standard (but not necessarily Tripos length) questions are marked **

A company sells books via a web-based portal. Part of the software that implements this service is shown in Figure 1. Questions below refer to this diagram.

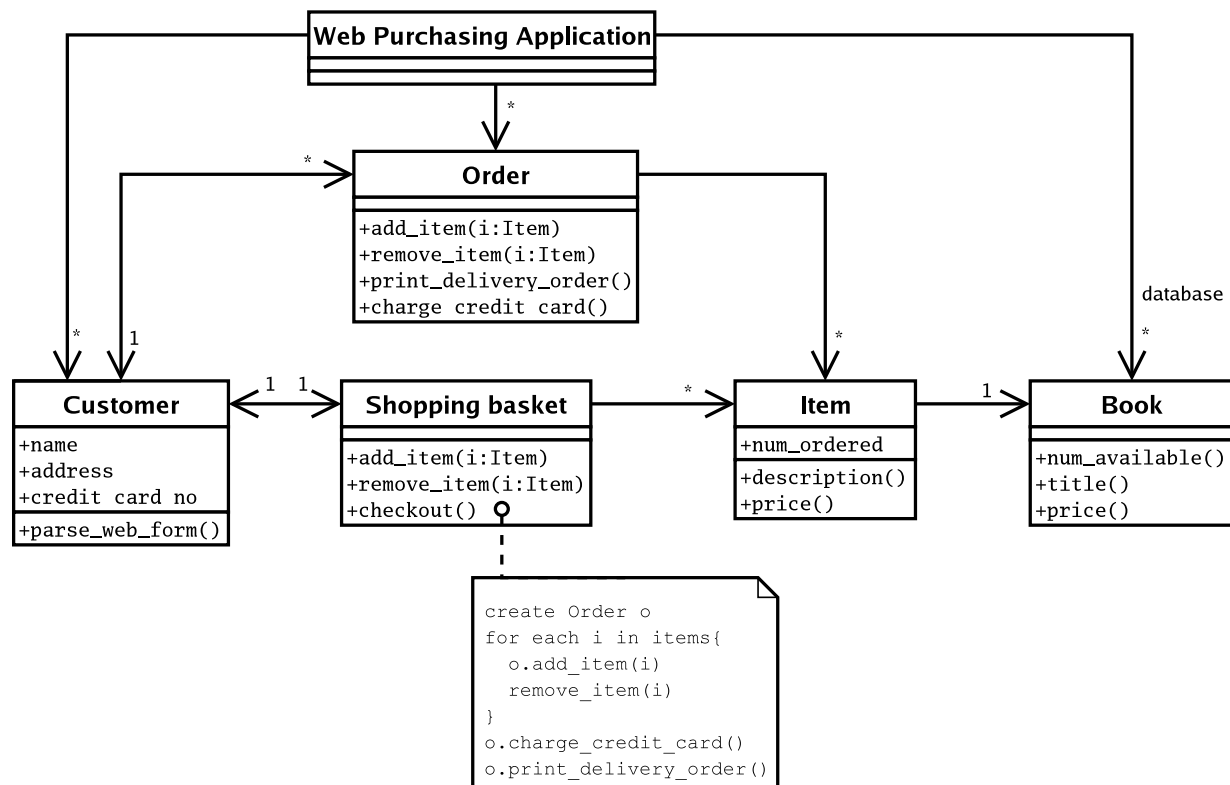


Figure 1: UML showing web based book selling software

1. Describe the classes and relationships shown in the UML diagram.
2. A customer has two books in their shopping basket. Draw a sequence diagram which shows the customer checking out and confirming the order.
3. The company wishes to expand their range to include CDs and videos in addition to books. Draw a UML diagram which shows how the software must be changed to implement this.
- 4.* Show how the decorator pattern could be used to provide a gift wrapping service (at £1 per item).
- 5.* Show how the composite pattern could be used to provide particular sets of books (or CDs etc) at a discount (for example, customers who purchase all three books in “The Lord of the Rings” would obtain a 10% discount).
- 6.* The company wishes to expand their sales to include corporate customers who will be billed monthly (rather than be charged by credit card). Show what changes are necessary to the system to implement this change.