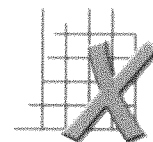## PROBLEMS

**4.1**  The following data elements comprise the conceptual-level schema for a database:

billing address
cost
credit limit
customer name
customer number
date
description
invoice number
item number
price
quantity on hand
quantity sold
shipping address
terms

**Required**

**a.** Identify three potential users and design a subschema for each. Justify your design by explaining why each user needs access to that data element.
**b.** Using any relational database product, such as Microsoft Access, create the set of tables to implement your schema. Specify the primary key(s) and foreign key(s) for each table. Learn how to enforce referential integrity, and test your model by entering sample data in each table.

**4.2**  Most DBMS packages contain a data definition language, a data manipulation language, and a data query language. For each of the following examples, indicate which language would be used and why.
**a.** A database administrator defines the logical structure of the database.
**b.** The controller requests a cost accounting report containing a list of all employees being paid for more than 10 hours overtime in a given week.
**c.** A programmer develops a program to update the fixed-assets records stored in the database.
**d.** The human resources manager requests a report noting all employees who are retiring within five years.
**e.** The inventory serial number field is extended in the inventory records to allow for recognition of additional inventory items with serial numbers containing more than 10 digits.
**f.** A user develops a program to print out all purchases made during the past two weeks.
**g.** An additional field is added to the fixed-asset records to record the estimated salvage value of each asset.

**4.3**  Ashton wants to store the following data about S&S's purchases of inventory:

item number
date of purchase
vendor number
vendor address
vendor name
purchase price
quantity purchased
employee number