

Exercise 6.1.3: Write the following queries in SQL. They refer to the database schema of Exercise 2.4.1:

```
Product(maker, model, type)
PC(model, speed, ram, hd, price)
Laptop(model, speed, ram, hd, screen, price)
Printer(model, color, type, price)
```

Show the result of your queries using the data from Exercise 2.4.1.

- a) Find the model number, speed, and hard-disk size for all PC's whose price is under \$1000.
- b) Do the same as (a), but rename the `speed` column `gigahertz` and the `hd` column `gigabytes`.
- c) Find the manufacturers of printers.
- d) Find the model number, memory size, and screen size for laptops costing more than \$1500.
- e) Find all the tuples in the `Printer` relation for color printers. Remember that `color` is a boolean-valued attribute.
- f) Find the model number and hard-disk size for those PC's that have a speed of 3.2 and a price less than \$2000.

Exercise 6.2.2: Write the following queries, based on the database schema

```
Product(maker, model, type)
PC(model, speed, ram, hd, price)
Laptop(model, speed, ram, hd, screen, price)
Printer(model, color, type, price)
```

of Exercise 2.4.1, and evaluate your queries using the data of that exercise.

- a) Give the manufacturer and speed of laptops with a hard disk of at least thirty gigabytes.
- b) Find the model number and price of all products (of any type) made by manufacturer *B*.
- c) Find those manufacturers that sell Laptops, but not PC's.
- ! d) Find those hard-disk sizes that occur in two or more PC's.
- ! e) Find those pairs of PC models that have both the same speed and RAM. A pair should be listed only once; e.g., list (i, j) but not (j, i) .
- !! f) Find those manufacturers of at least two different computers (PC's or laptops) with speeds of at least 3.0.

Exercise 6.3.1: Write the following queries, based on the database schema

```
Product(maker, model, type)
PC(model, speed, ram, hd, price)
Laptop(model, speed, ram, hd, screen, price)
Printer(model, color, type, price)
```

of Exercise 2.4.1. You should use at least one subquery in each of your answers and write each query in two significantly different ways (e.g., using different sets of the operators EXISTS, IN, ALL, and ANY).

- a) Find the makers of PC's with a speed of at least 3.0.
- b) Find the printers with the highest price.
- ! c) Find the laptops whose speed is slower than that of any PC.
- ! d) Find the model number of the item (PC, laptop, or printer) with the highest price.
- ! e) Find the maker of the color printer with the lowest price.
- !! f) Find the maker(s) of the PC(s) with the fastest processor among all those PC's that have the smallest amount of RAM.

Exercise 6.4.6: Write the following queries, based on the database schema

```
Product(maker, model, type)
PC(model, speed, ram, hd, price)
Laptop(model, speed, ram, hd, screen, price)
Printer(model, color, type, price)
```

of Exercise 2.4.1, and evaluate your queries using the data of that exercise.

- a) Find the average speed of PC's.
- b) Find the average speed of laptops costing over \$1000.
- c) Find the average price of PC's made by manufacturer "A."
- ! d) Find the average price of PC's and laptops made by manufacturer "D."
- e) Find, for each different speed, the average price of a PC.
- ! f) Find for each manufacturer, the average screen size of its laptops.
- ! g) Find the manufacturers that make at least three different models of PC.
- ! h) Find for each manufacturer who sells PC's the maximum price of a PC.
- ! i) Find, for each speed of PC above 2.0, the average price.
- !! j) Find the average hard disk size of a PC for all those manufacturers that make printers.