and 09:44. SQL uses the FROM clause to identify the $n$-ary relation the query is applied to, the WHERE clause to specify the condition of the selection operation, and the SELECT clause to specify the projection operation that is to be applied. (Beware: SQL uses SELECT to represent a projection, rather than a selection operation. This is an unfortunate example of conflicting terminology.)

Example 13 shows how SQL queries can be made involving more than one table.

**EXAMPLE 13**

The SQL statement

```sql
SELECT Professor, Time
FROM Teaching_assignments, Class_schedule
WHERE Department='Mathematics'
```

is used to find the projection $P_{1,5}$ of the 5-tuples in the database (shown in Table 7), which is the join $J_2$ of the Teaching_assignments and Class_schedule databases in Tables 5 and 6, respectively, which satisfy the condition: Department = Mathematics. The output would consist of the single 2-tuple (Rosen, 3:00 P.M.). The SQL FROM clause is used here to find the join of two different databases.

We have only touched on the basic concepts of relational databases in this section. More information can be found in [AhU195].

**Exercises**

1. List the triples in the relation $\{(a, b, c) | a, b, c$ are integers with $0 < a < b < c < 5\}$.
2. Which 4-tuples are in the relation $\{(a, b, c, d) | a, b, c, d$ are positive integers with $abcd = 6\}$?
3. List the 5-tuples in the relation in Table 8.
4. Assuming that no new $n$-tuples are added, find all the primary keys for the relations displayed in a) Table 3. b) Table 5. c) Table 6. d) Table 8.
5. Assuming that no new $n$-tuples are added, find a composite key with two fields containing the Airline field for the database in Table 8.
6. Assuming that no new $n$-tuples are added, find a composite key with two fields containing the Professor field for the database in Table 7.
7. The 3-tuples in a 3-ary relation represent the following attributes of a student database: student ID number, name, phone number.
   a) Is student ID number likely to be a primary key?
   b) Is name likely to be a primary key?
   c) Is phone number likely to be a primary key?
8. The 4-tuples in a 4-ary relation represent these attributes of published books: title, ISBN, publication date, number of pages.
   a) What is a likely primary key for this relation?
   b) Under what conditions would (title, publication date) be a composite key?
   c) Under what conditions would (title, number of pages) be a composite key?