Chapter VI

User-Defined Queries

This chapter describes object-based user-defined queries in Oracle™. The queries will vary based on the hierarchy of the object model. We will show different categories of queries along the object-oriented relationships of inheritance, association, and aggregation.

These queries can be performed as ad hoc queries or implemented as methods. User-defined methods are methods whereby users define algorithms or the processes to be carried out by the methods. Since these methods involve operations specified by the users, they are called user-defined methods. As an example, we will use the case study of the authorship of the course manual in Chapter III as a working example for this chapter. Some queries discussed here are based on the DDL specified in Figure 3.36.

User-Defined Queries in Inheritance Hierarchies

In this section, different queries along inheritance hierarchies will be described. User-defined queries along inheritance hierarchies can be divided into two categories: subclass queries and superclass queries. Note that because there are two ways of implementing inheritance, using the shared ID between the
primary key and foreign key or using the “under” keyword, we will show user-defined queries for both techniques in the following sections.

**Subclass Query**

User-defined queries in an inheritance hierarchy are queries that involve attributes of the class where the methods reside and attributes of their superclasses. Since a number of classes (at least two) are involved, a join operation to link all of these classes becomes necessary. The general format for the representation of user-defined queries in an inheritance hierarchy is as follows.

In the From clause, a list of tables is produced. These tables include all intermediate tables between a subclass (table\_1) and a super-class (table\_n). The *inheritance join expression* can be a join predicate to join all tables listed if the shared ID technique is used. Alternatively, if the latest Oracle™ is used, then it can be a *treat* expression to cast the selection from one class type to another within the inheritance hierarchy.

A subclass query is a query that retrieves information from the subclass(es), where the selection predicates are originated at the superclass. Figure 6.2 shows the flow of a query in a subclass query.

The query representation for a subclass query is shown in Figure 6.3, while Figure 6.4 shows the example of a subclass query and the results.

The subclass-query representation (see Figure 6.3) is applicable if we implement the superclass and subclass as two different tables. If we use the under features provided by Oracle™ 9 and above, we can use the treat keyword in the query. The general syntax of such a type of query is as follows.

```
SELECT <function or expression>
FROM <table\_1, table\_2, ..., table\_k, ..., table\_n>
WHERE <inheritance join expression>
AND <table\_k.OID = &input_OID>
```

![Figure 6.1. User-defined inheritance query representation](image-url)