7

Advanced Explicit Cursor Concepts

Objectives

After completing this lesson, you should be able to do the following:

- Write a cursor that uses parameters
- Determine when a `FOR UPDATE` clause in a cursor is required
- Determine when to use the `WHERE CURRENT OF` clause
- Write a cursor that uses a subquery

Cursors with Parameters

Syntax:

```
CURSOR cursor_name
  [(parameter_name datatype, ...)]
IS
  select_statement;
```

- Pass parameter values to a cursor when the cursor is opened and the query is executed.
- Open an explicit cursor several times with a different active set each time.

```
OPEN  cursor_name(parameter_value,.....) ;
```

Cursors with Parameters

Pass the department number and job title to the `WHERE` clause, in the cursor `SELECT` statement.

```
DECLARE
  CURSOR emp_cursor
  (p_deptno NUMBER, p_job VARCHAR2) IS
     SELECT employee_id, last_name
     FROM   employees
     WHERE  department_id = p_deptno
     AND    job_id = p_job;
BEGIN
  OPEN emp_cursor (80, 'SA_REP');
  . . .
  CLOSE emp_cursor;
  OPEN emp_cursor (60, 'IT_PROG');
  . . .
END;
```

The FOR UPDATE Clause

Syntax:

```
SELECT ...
FROM           ...
FOR UPDATE [OF column_reference][NOWAIT];
```

- Use explicit locking to deny access for the duration of a transaction.
- Lock the rows *before* the update or delete.

The FOR UPDATE Clause

Retrieve the employees who work in department 80 and update their salary.

```
DECLARE
  CURSOR emp_cursor IS
    SELECT employee_id, last_name, department_name
    FROM   employees,departments
    WHERE  employees.department_id =
           departments.department_id
    AND employees.department_id = 80
    FOR UPDATE OF salary NOWAIT;
```

The WHERE CURRENT OF Clause

Syntax:

```
WHERE CURRENT OF cursor ;
```

- Use cursors to update or delete the current row.
- Include the FOR UPDATE clause in the cursor query to lock the rows first.
- Use the WHERE CURRENT OF clause to reference the current row from an explicit cursor.

The WHERE CURRENT OF Clause

```
DECLARE
CURSOR sal_cursor IS
 SELECT e.department_id, employee_id, last_name, salary
 FROM   employees e, departments d
 WHERE  d.department_id = e.department_id
  and   d.department_id = 60
 FOR UPDATE OF salary NOWAIT;
 BEGIN
 FOR emp_record IN sal_cursor
LOOP
  IF emp_record.salary < 5000 THEN
       UPDATE employees
       SET    salary = emp_record.salary * 1.10
       WHERE CURRENT OF sal_cursor;
  END IF;
END LOOP;
END;
/
```

Cursors with Subqueries

Example:

```
DECLARE
  CURSOR my_cursor IS
    SELECT t1.department_id, t1.department_name,
           t2.staff
    FROM   departments t1, (SELECT department_id,
                                   COUNT(*) AS STAFF
                            FROM employees
                            GROUP BY department_id) t2
    WHERE t1.department_id = t2.department_id
    AND   t2.staff >= 3;
...
```

Summary

In this lesson, you should have learned to:

- Return different active sets using cursors with parameters.
- Define cursors with subqueries and correlated subqueries.
- Manipulate explicit cursors with commands using the:
  - `FOR UPDATE` clause
  - `WHERE CURRENT OF` clause

Practice 7 Overview

This practice covers the following topics:

- Declaring and using explicit cursors with parameters
- Using a `FOR UPDATE` cursor