Database Programming with PL/SQL

5-6: Using Multiple Cursors
Practice Activities

Vocabulary

No new vocabulary for this lesson

Cursorul dept_cursor: Selecteaz toate departamentele, ordonate dup department_id.

Cursorul emp_cursor: Selecteaz angajaii dintr-un departament specific, ordonai dup last_name. Parametrul p_department_id permite filtrarea angajailor dup departamentul curent.

Bucla extern FOR: Itereaz prin fiecare departament i afieaz detaliile acestuia.

Try It / Solve It

1. Write and run a PL/SQL block which produces a listing of departments and their employees. Use the DEPARTMENTS and EMPLOYEES tables. In a cursor FOR loop, retrieve and display the department_id and department_name for each department, and display a second line containing '----------' as a separator. In a nested cursor FOR loop, retrieve and display the first_name, last_name, and salary of each employee in that department, followed by a blank line at the end of each department. Order the departments by department_id, and the employees in each department by last_name.

   You will need to declare two cursors, one to fetch and display the departments, the second to fetch and display the employees in that department, passing the department_id as a parameter. Your output should look something like this (only the first few departments are shown):

   10 Administration

   Jennifer Whalen 4400

   20 Marketing

   Pat Fay 6000

   Michael Hartstein 13000

   50 Shipping

   Curtis Davies 3400

   Randall Matos 2600

   Kevin Mourgos 5800

   Trenna Rajs 3500

   Peter Vargas 2500

```
DECLARE -- Cursor pentru departamente
  CURSOR dept_cursor IS   SELECT department_id, department_name
    FROM departments
    ORDER BY department_id;-- Cursor pentru angajaii dintr-un departament specific
  CURSOR emp_cursor(p_department_id NUMBER) IS
    SELECT first_name, last_name, salary
    FROM employees
    WHERE department_id = p_department_id
    ORDER BY last_name;
  -- Variabile pentru stocarea datelor
  v_department_id departments.department_id%TYPE;
  v_department_name departments.department_name%TYPE;
  v_first_name employees.first_name%TYPE;
  v_last_name employees.last_name%TYPE;
  v_salary employees.salary%TYPE;
BEGIN
  -- Bucl prin departamente
  FOR dept_record IN dept_cursor LOOP
    -- Afieaz departamentul
    DBMS_OUTPUT.PUT_LINE(dept_record.department_id || ' ' || dept_record.department_name);
    DBMS_OUTPUT.PUT_LINE('----------------------------');
    -- Bucl prin angajaii departamentului curent
    FOR emp_record IN emp_cursor(dept_record.department_id) LOOP
      DBMS_OUTPUT.PUT_LINE(emp_record.first_name || ' ' || emp_record.last_name || ' ' || emp_record.salary);
    END LOOP;
    -- Linie goal între departamente
    DBMS_OUTPUT.PUT_LINE('');
  END LOOP;
END;
```

Bucla imbricat FOR: Itereaz prin angajaii departamentului curent i afieaz detalii despre fiecare angajat.

Formatarea rezultatului: Separatorul i linia goal sunt folosite pentru a îmbunti lizibilitatea.

2. Write and run a PL/SQL block which produces a report listing world regions, countries in those regions, and the land area and population for each country.

   You will need two cursors: an outer loop cursor which fetches and displays rows from the REGIONS table, and an inner loop cursor which fetches and displays rows from the COUNTRIES table for countries in that region, passing the region_id as a parameter.
   Restrict your regions to those in the Americas (region_name like '%America%'). Order your output by region_name, and by country_name within each region.
   Your output should look something like this (only the first two regions are shown):

```
13 Central America
----------------------------
Belize 22966 287730
Republic of Costa Rica 51100 4075261
Republic of El Salvador 21040 6822378
Republic of Guatemala 108890 12293545
Republic of Honduras 112090 7326496
Republic of Nicaragua 129494 5570129
Republic of Panama 78200 3191319
United Mexican States 1972550 107449525

21 North America
----------------------------
Bermuda 53 65773
Canada 9984670 33098932
Greenland 2166086 56361
Territorial Collectivity of Saint Pierre and Miquelon 242 7026
United States of America 9631420 298444215
```

```sql
DECLARE
  -- Cursor pentru regiuni
  CURSOR regions_cur IS
    SELECT region_id, region_name
    FROM regions
    WHERE region_name LIKE '%America%'
    ORDER BY region_name;
  -- Cursor pentru ri dintr-o regiune specific
  CURSOR countries_cur(p_region_id NUMBER) IS
    SELECT country_name, land_area, population
    FROM countries
    WHERE region_id = p_region_id
    ORDER BY country_name;
  -- Variabile pentru stocarea datelor
  v_region_id regions.region_id%TYPE;
  v_region_name regions.region_name%TYPE;
  v_country_name countries.country_name%TYPE;
  v_land_area countries.land_area%TYPE;
  v_population countries.population%TYPE;
BEGIN
  -- Bucl prin regiuni
  FOR region_rec IN regions_cur LOOP
    -- Afieaz regiunea curent
    DBMS_OUTPUT.PUT_LINE(region_rec.region_id || ' ' || region_rec.region_name);
    DBMS_OUTPUT.PUT_LINE('----------------------------');
    -- Bucl prin rile din regiunea curent
    FOR country_rec IN countries_cur(region_rec.region_id) LOOP
      DBMS_OUTPUT.PUT_LINE(country_rec.country_name || ' ' ||
        country_rec.land_area || ' ' || country_rec.population);
    END LOOP;
    DBMS_OUTPUT.PUT_LINE('');
  END LOOP;
  -- Linie goal între regiuni
END;
/
```

Cursorul regions_cur: Selecteaz toate regiunile din tabelul REGIONS care conin 'America' în region_name i le ordoneaz.
Cursorul countries_cur: Preia rile din regiunea curent, filtrate dup region_id, i le ordoneaz dup country_name.
Bucla extern: Itereaz prin fiecare regiune i afieaz detaliile acesteia.
Bucla intern: Itereaz prin rile din regiunea curent i afieaz detaliile despre fiecare ar.
Separator i format: Este utilizat separatorul ---pentru o ieire clar i borganizat.

3. Modify your block from question 2 to display the names of official spoken languages in each country. You will need three cursors and three loops. The first two cursors should fetch and display regions and countries, as in question 2. The innermost loop should accept a country_id as a parameter, and fetch and display the name of each official language, using a join of the SPOKEN_LANGUAGES table and the LANGUAGES table.

   Within each country, the languages should be ordered by language_name. Test your block, restricting regions to those in the Americas.

Your output should look something like this (only the first two regions are shown):

```
13 Central America

---------------------------

Belize 22966 287730

--- English

Republic of Costa Rica 51100 4075261

--- Spanish

Republic of El Salvador 21040 6822378

Republic of Guatemala 108890 12293545

Republic of Honduras 112090 7326496

Republic of Nicaragua 129494 5570129

--- Spanish

Republic of Panama 78200 3191319

--- Spanish

United Mexican States 1972550 107449525

    21 North America

---------------------------

Bermuda 53 65773

--- English

Canada 9984670 33098932

--- English

--- French

Greenland 2166086 56361

Territorial Collectivity of Saint Pierre and Miquelon 242 7026

--- French

United States of America 9631420 298444215

--- English
```

```sql
DECLARE
  -- Cursor pentru regiuni
  CURSOR regions_cur IS
    SELECT region_id, region_name
    FROM regions
    WHERE region_name LIKE '%America%'
    ORDER BY region_name;
  -- Cursor pentru ri dintr-o regiune specific
  CURSOR countries_cur(p_region_id NUMBER) IS
    SELECT country_id, country_name, land_area, population
    FROM countries
    WHERE region_id = p_region_id
    ORDER BY country_name;
  -- Cursor pentru limbile oficiale ale unei ri
  CURSOR languages_cur(p_country_id NUMBER) IS
    SELECT l.language_name
    FROM spoken_languages sl
    JOIN languages l ON sl.language_id = l.language_id
    WHERE sl.country_id = p_country_id
    ORDER BY l.language_name;
  -- Variabile pentru stocarea datelor
  v_region_id regions.region_id%TYPE;
  v_region_name regions.region_name%TYPE;
  v_country_id countries.country_id%TYPE;
  v_country_name countries.country_name%TYPE;
  v_land_area countries.land_area%TYPE;
  v_population countries.population%TYPE;
  v_language_name languages.language_name%TYPE;
BEGIN
  -- Bucl prin regiuni
  FOR region_rec IN regions_cur LOOP
    -- Afieaz regiunea curent
    DBMS_OUTPUT.PUT_LINE(region_rec.region_id || ' ' || region_rec.region_name);
    DBMS_OUTPUT.PUT_LINE('---------------------------');
    -- Bucl prin rile din regiunea curent
    FOR country_rec IN countries_cur(region_rec.region_id) LOOP
      DBMS_OUTPUT.PUT_LINE(country_rec.country_name || ' ' || country_rec.land_area || ' ' || country_rec.population)
      -- Bucl prin limbile oficiale ale rii curente
      FOR lang_rec IN languages_cur(country_rec.country_id) LOOP
        DBMS_OUTPUT.PUT_LINE('--- ' || lang_rec.language_name)
      END LOOP;

    END LOOP;
    -- nie goal între regiuni
    DBMS_OUTPUT.PUT_LINE('');

  END LOOP;
END;
/
```

Cursorul regions_cur: Selecteaz toate regiunile care conin 'America' în region_name, ordonându-le alfabetic.
Cursorul countries_cur: Selecteaz rile din regiunea curent, filtrate dup region_id, i le ordoneaz dup country_name.
Cursorul languages_cur: Selecteaz limbile oficiale ale unei ri, utilizând o alturare între tabelele SPOKEN_LANGUAGES i LANGUAGES, i le ordoneaz dup language_name.
Bucla extern: Itereaz prin fiecare regiune i afieaz detaliile acesteia.

Bucla interioar 1: Itereaz prin rile din regiunea curent i afieaz detalii despre fiecare ar.
Bucla interioar 2: Itereaz prin limbile oficiale ale fiecrei ri i le afieaz.
Separator i formatare: Separatorul --------------------------- i indentarea limbilor cu --- sunt folosite pentru lizibilitate.