FIT3176 Advanced Database Design

Topic 6 Studio - PL/SQL Packages

Objectives for this week's activities

- Make use of OUT parameters as a replacement for using the package dbms_output
- Develop a test harness for the FBN package
- Package the topic 5 procedures and functions to create an Employee-Department Package
- Use a REFCURSOR to help retrieve data from more than one row so the output can be handed via an out parameter to the calling program

This work is the basis for the assignment 1 (PARTS B and C).

Lab Activities

Ensure **before you begin** this week's activities that you have saved all your PL/SQL code developed for the employee-department scenario we worked on last week (we will return and use this later in this week's activities).

Task 1 - Fly By Night Package Testing

Using the FBN schema/insert data files and the PL/SQL code developed in the PL/SQL Packages lecture, implement the entire system in Oracle (you may leave your employee-department tables/procedures and functions in place if you wish).

Develop a **test harness** for the FBN package - this is a single SQL file which tests the full functionality of your package. This file should begin with the commands:

```
spool ./fbn_test_pkg_output.txt
```

… and end with …

```
spool off
```

Between these two, code the SQL commands which can be used to test the package, for example to test the insert of a null phone number you could use:

```
-- null phone number
var new_custno number
exec  fbn.add_customer('Le','Minh','12 New Rd','Melbourne','3800',null,:new_custno);
print new_custno
select * from customer where cust_no = (select max(cust_no) from customer);
```

Your output must include sql commands to prove whether the package call was successful or not. You need to thoroughly test your package, ensuring that all errors raised are triggered in individual tests - to achieve this you will need to inspect the data carefully and make use of suitable parameters.

Task 2 - Employee-Department Package

Using your work from last week create a package using the procedures/functions you developed. A package consists of a package specification and a package body.

The package specification: right click package in the left panel of SQL Developer and create a new package called EMPLOYEE_PKG. This specification contains the initial definition lines from your procedures:

```
/*
   Employee table maintenance package for Oracle
   Author: Your Full Name
*/

-- Create Package specification first
-- ==========================================================
--
create or replace package EMPLOYEE_PKG
as
    procedure New_Employee (
        arg_empname IN employee.emp_name%type,
        arg_salary IN employee.emp_salary%type,
        arg_sdate IN char,
        arg_deptno IN department.dept_no%type);

    procedure get_salary (
        arg_empno IN employee.emp_no%type);

    ... ADD DELETE_EMP and MOVE_EMP here ....
end employee_pkg;
/
```

The package body: right click the created package and select "Create Body" then add your body code from the procedures you created above.

- Test your completed package from
  - the PL/SQL editor of SQL Developer, and
  - using an anonymous block in the SQL window.
- Grant execute rights to a partner and have them test your package

EXERCISE:

At this stage, based on last week's work, your package is making use of the Oracle dbms_output package to send output - this is fine at a development level but for a production system you ***must not*** use this package, output must be via OUT parameters. Modify your package from above to replace all dbms_output output with OUT parameters.

EXERCISE:

Add a procedure to your package to output a list of all employees (all details) and the *name* of the department in which they work. To complete this task, you should use a REFCURSOR so the output can be handed via an out parameter to the calling program.

EXERCISE:

As you did for the FBN package, develop a test harness for your EMPLOYEE_PKG