

# CEGEP VANIER COLLEGE

## CENTRE FOR CONTINUING EDUCATION

### Developing Applications using Oracle

#### 420-987-VA

Teacher: Samir Chebbine Lab 2: PL/SQL Programming

Jul 05, 2022

#### Lab 2: Database Processing using PL/SQL Programming

Create and execute all the following PL/SQL programs, Save all these PL/SQL programs in a file called *Lab2\_OraclePrograms.sql*.

#### 1. Implicit Cursor in PL/SQL: Use Implicit cursor to fetch ONLY one record from table.

PL/SQL uses *Anchored Declaration* %TYPE attribute to anchor a variable's data type. A variable gets the same data type as an existing one.

- a) **Program PL/SQL # 1:** Edit PL/SQL program using *Anchored Declaration*: Very useful when you want to cross-reference the data type used in the table.

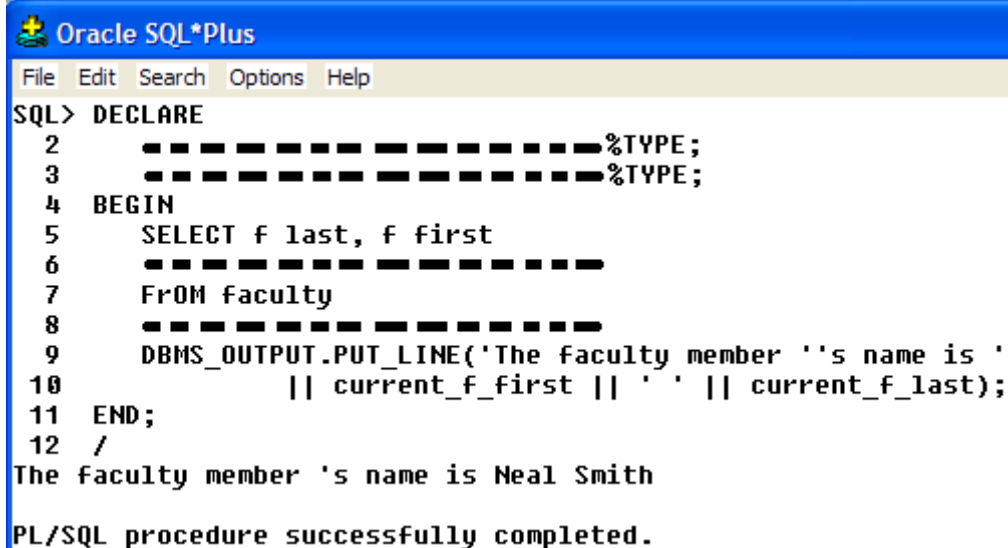
**Registration Database Narrative:** Students taking a set of courses, getting **grades** for a given **Course**, and each **Student** being supervised by one **Faculty** member.

Execute the script Registration.sql in order to read **Faculty** table using PL/SQL programming.

Complete all these following programs as explained in my **Lab 2 YouTube Video 1**.

Notice all *missing* coding statements are presented in this video with explanation.

#### Reading a row from Faculty table: With the use of *Anchored Declaration*



```

SQL> DECLARE
2     f_first VARCHAR2(50) := %TYPE;
3     f_last  VARCHAR2(50) := %TYPE;
4 BEGIN
5     SELECT f_first, f_last
6     FROM faculty
7     WHERE f_id = 1;
8     DBMS_OUTPUT.PUT_LINE('The faculty member 's name is '
9     || current_f_first || ' ' || current_f_last);
10 END;
11 /
The faculty member 's name is Neal Smith
PL/SQL procedure successfully completed.

```

```
SQL> select f_id, f_first, f_last from faculty;
```

F_ID	F_FIRST	F_LAST
1	Myra	Robertson
2	Neal	Smith
3	Lisa	Arlec
4	Paul	Fillipo
5	Paul	Denver

## IMPORTANT:

- PL/SQL supports only DML and DCL statements such as SELECT, INSERT, UPDATE, DELETE, COMMIT, ROLLBACK.
- PL/SQL does not support DDL statements such as CREATE TABLE, ALTER TABLE, DROP TABLE.
- You need to return **only one row**, when using **SELECT** in PL/SQL program.

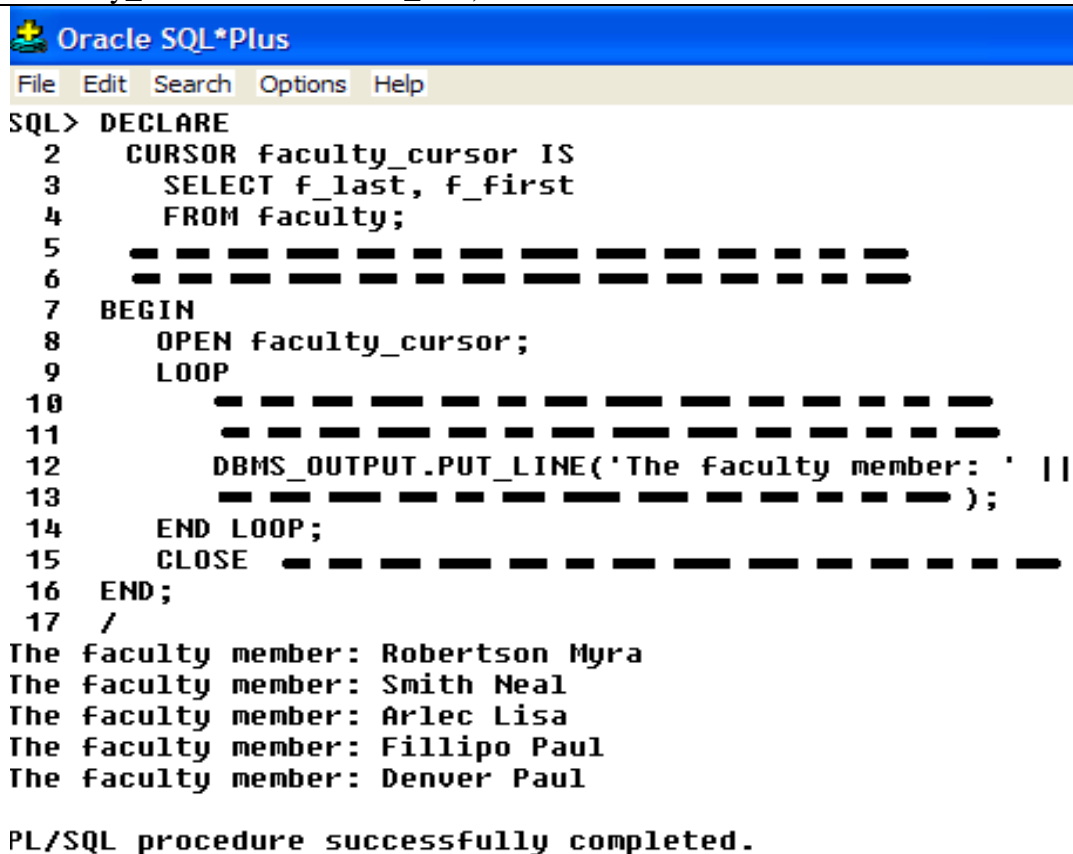
## 2. Explicit Cursor: Retrieval of more than one row using SELECT in a given PL/SQL program.

### a) Four Steps for creating and using explicit cursor:

- *Declare cursor:*  
**CURSOR** faculty\_cursor **IS**  
    SELECT f\_id, f\_last, f\_first  
    FROM faculty;
- *Open cursor:* **OPEN** faculty\_cursor;
- *Fetch data rows*  
**Alternative 1:** **FETCH** faculty\_cursor INTO listvariables;  
    /\* listvariables are is declared with TYPE declaration attribute\*/  
**Alternative 2:** **FETCH** faculty\_cursor INTO current\_row;  
    /\* current\_row is declared with ROWTYPE declaration attribute\*/
- *Close cursor:* **CLOSE** faculty\_cursor;

### Alternative 2:

**FETCH** faculty\_cursor INTO current\_row;



```
SQL> DECLARE
2   CURSOR faculty_cursor IS
3   SELECT f_last, f_first
4   FROM faculty;
5   -----
6   -----
7   BEGIN
8   OPEN faculty_cursor;
9   LOOP
10  -----
11  -----
12  DBMS_OUTPUT.PUT_LINE('The faculty member: ' ||
13  ----- );
14  END LOOP;
15  CLOSE -----
16  END;
17  /
The faculty member: Robertson Myra
The faculty member: Smith Neal
The faculty member: Arlec Lisa
The faculty member: Fillipo Paul
The faculty member: Denver Paul

PL/SQL procedure successfully completed.
```

3. Execute the script file *Registration.sql* for creating tables of Registration System.

- a) Edit PL/SQL program using *an implicit cursor* to display the course number MIS 441 as shown in Figure 1. Use *Anchored Declaration* %TYPE.

```
14 /  
The Course is Database Management with credits 3 and max enrollment is 12  
PL/SQL procedure successfully completed.
```

Figure 1

- b) Edit PL/SQL program to calculate the number of records within *faculty* table, and display the output as shown in Figure 2.

```
18 /  
The Number of records within faculty table is: 5  
  
PL/SQL procedure successfully completed.  
  
SQL> |
```

Figure 2

- c) Write a PL/SQL program to calculate the number of records within *student* table, who's considered as being registered as *Expert* (*s\_class* = 'EX'), and display the output as shown in Figure 3. Use %ROWTYPE variable to display explicit cursor values.

```
20 /  
The Expert students of Vanier College are:  
Sanchez Jim, who's S_class is EX  
White Peter, who's S_class is EX  
  
PL/SQL procedure successfully completed.  
  
SQL>
```

Figure 3

- d) Re-Write the same program of (c) taking into account to display all students registered as *JR* (*Junior*) and *SR* (*Senior*). You have to consider only the (*R*) of *s\_class* field as *search* value in *WHERE* clause statement within the *student* table. Display the output of Figure 4.

```
20 /  
The Junior and Senior students of Vanier College are:  
Graham Bill, who's S_class is JR  
Phelp David, who's S_class is JR  
Lewis Sheila, who's S_class is SR  
James Thomas, who's S_class is JR  
  
PL/SQL procedure successfully completed.  
  
SQL>
```

Figure 4

#### 4. Answer the following questions:

1. Write the appropriate statement to declare an anchored variable which has the same data type as hos\_num\_surgery (number of surgeries / year) field in the following Hospital table.

```
Hospital  
hos_id NUMBER(6)  
hos_Name VARCHAR2(30)  
hos_addr VARCHAR2 (30)  
hos_num_surgery NUMBER (8)
```

2. Write the appropriate statement to declare an anchored variable which has the same data type as hos\_Name field in the above Hospital table.
3. Write the appropriate statement to declare an anchored variable which has the same data type as hos\_Name field in the above Hospital table.
4. Write the appropriate statement (s) that uses an implicit cursor in order to search for a given hospital where hos\_id = 555
5. Write the appropriate statement to declare an explicit cursor which stores the fields (hos\_id, hos\_Name, hos\_num\_surgery) in the above Hospital table.
6. Write the appropriate statement (s) to open the declared cursor in (5) and skip through all records stored in it to display the values of fields (hos\_id, hos\_Name, hos\_num\_surgery).
7. Write the appropriate statement to close the declared cursor in (5).
8. Give an example of two tables (Parent & Child tables) which has 1:M relationship, declare explicit cursor for each table including at least three fields for each table.
9. True or false and why:
  - a. You cannot use implicit cursor to fetch multiple records from table.
  - b. Explicit cursor is declared only in BEGIN block.
  - c. Explicit cursor could be used to fetch one record from table.
  - d. Implicit cursor is used to fetch only one record from table.
  - e. Anchored variables that uses %TYPE could be used within explicit cursor.
  - f. The following is a valid statement

```
Hospital row hospital_cursor%ROWTYPE;
```

10. True or false and why:

- a. Foreign key values are unique within a given table.
- b. Foreign keys are referential fields linked to fields in parent tables.
- c. You need to enter table records after establishing table relationship.
- d. Enforcing Data Integrity is about to set only entity integrity.
- e. Foreign keys are fields added usually into parent tables.
- f. Many to Many relationship is implemented as two tables within a given database