Topics

Composite Keys vs Surrogate Keys
PL / SQL Blocks
Stored Procedures

Objectives

After covering this material, students should be able to

- Describe the pros and cons of Natural Keys and Surrogate Keys
- Write and execute PL/SQL statements in an environment such as SQL Developer
- Understand, create and execute Anonymous Blocks of code
- Understand the purpose of the Executable Section, Declarative Section and the Exception Section
- Understand, create and execute Stored Procedures
- Understand how Anonymous Blocks differ from Stored Procedures
- Understand the purpose of and how to use the SELECT INTO clause

References

Lecture Material

Week 1 Lecture PowerPoint slides & Week 1 Lecture Support document (includes reading list)

These questions are based directly on the lecture material.
These questions should be attempted before you attend next week's tutorial.
The answers are at the end of this document.

If you have queries / problems / comments about the questions and/or answers, then ask your tutor in your tutorial next week.

During next week's tutorial your will be asked to discuss questions from the Tutorial Discussion Questions and Lab Work document.

Tutorial Questions

1. **What is the difference between a Composite value Primary Key and a Surrogate value Primary Key?**

   A Composite Primary Key is when two or more fields is combined to create a unique Primary Key, hence the word 'Composite'. A Surrogate Primary Key is when we create a new field and assign them the role of identifying rows.

2. **An Anonymous Block is an un-stored block. It is not named.**
   A Stored Procedure Block is named block. It is stored in the database.

   a. **Which Block is written for use-once purposes?**
      ⇨ Anonymous Block

   b. **Which Block is written for re-use?**
      ⇨ Stored Procedure Block

   c. **Can an Anonymous Blocks have parameters?**
      ⇨ No

d. Can an Anonymous Block call a Stored Procedure?

⇨ Yes

e. Can a Stored Procedure call an Anonymous Block?

⇨ No

f. Can an Anonymous Block call an Anonymous Block?

⇨ No

g. Can a Stored Procedure call a Stored Procedure?

⇨ Yes

3. **What is the purpose of having an Exception section?**

   The Exception is used when an expected error occurs within the PL/SQL code. It allows the programmer to create messages that would be crucial in the debugging process.

4. **Should an Anonymous Block contain this code? If not, why not?**

```
SELECT empname, salary FROM EMPLOYEE WHERE empid = 1;
```

   No, the above code will produce an error as ORACLE don't know what to do with the selected data, and it can not assume that we just want to show the data.

5. **Should a Stored Procedure contain this code? If not, why not?**

```
SELECT empname, salary FROM EMPLOYEE WHERE empid = 1;
```

   No, the above code will produce an error as ORACLE don't know what to do with the selected data, and it cannot assume that we just want to show the data. It does not really matter if the container of this code is a Stored Procedure or Anonymous Block. The result stays the same.

6. **Should an Anonymous Block contain this code? If not, why not?**

```
SELECT MAX(SALARY) FROM EMPLOYEE;
```

   No, the above code will produce an error as ORACLE don't know what to do with the selected data, and it cannot assume that we just want to show the data.

7. **Should a Stored Procedure contain this code? If not, why not?**

```
SELECT MAX(SALARY) FROM EMPLOYEE;
```

   No, the above code will produce an error as ORACLE don't know what to do with the selected data, and it cannot assume that we just want to show the data. It does not really matter if the container of this code is a Stored Procedure or Anonymous Block. The result stays the same.

8. **Should an Anonymous Block contain this code? If not, why not?**

```
SELECT empid, empname, salary FROM EMPLOYEE;
```

   No, the above code will produce an error as ORACLE don't know what to do with the selected data, and it cannot assume that we just want to show the data.

9. **Should a Stored Procedure contain this code? If not, why not?**

```
SELECT empid, empname, salary FROM EMPLOYEE;
```

   No, the above code will produce an error as ORACLE don't know what to do with the selected data, and it cannot assume that we just want to show the data. It does not really matter if the container of this code is a Stored Procedure or Anonymous Block. The result stays the same.

10. What modifications need to be made to the SQL in question 4 above in order for it to display employee 1 details?

We must specifies what we are going to do with the selected data by first creating a variable to store the selected data and then maybe we can use dbms_output to display that variable. The following picture will illustrate this:

```
SET SERVEROUTPUT ON

DECLARE
    vEmpid NUMBER;
    vFirstname VARCHAR(20);

BEGIN
    SELECT EMID, EMPNAME
    INTO vEmpid, vFirstname
    FROM EMPLOYEE
    WHERE EMID = 99;
    dbms_output.put_line('Employee: ' || vEmpid || ' ' || vfirstname);
EXCEPTION
    WHEN NO_DATA_FOUND THEN
        dbms_output.put_line('Sorry');
        dbms_output.put_line('Try Again');
END;
```

Picture 1: Select Command

11. What is the EXACT output when this anonymous block is executed?

```
DECLARE
  vNum1     INTEGER :=4;
  vNum2     INTEGER :=6;
  vTotal    INTEGER := 0;
  vAvg      NUMBER;
BEGIN
  vTotal := vNum1 + vNum2;
  vAvg := vTotal / 0;
  dbms_output.put_line ('The average is: ' || vAvg);
  dbms_output.put_line ('The sum is: ' ||
  vTotal); dbms_output.put_line ('Finished');
EXCEPTION
  WHEN ZERO_DIVIDE THEN
       dbms_output.put_line ('Error! You tried to divide by zero');
END;
```

It will display an error as we are trying to divide some numeric value with zero, the exact text will be "Error! You tried to divide by zero".

Lab Tasks

1. Download the document named INF20010_SQL_Developer_Quick_Guide from Blackboard

2. It is vitally important that you complete step 1 in this document.

3. Read and complete any other tasks in the document.

4. Download the document named INF20010_PLSQL_Quick_Guide from Blackboard

5. Read and complete any other tasks in the document.

NOTE: You must finish the tasks in these documents **prior to your next lab.**
Otherwise you will fall a long way behind very quickly.