PL/SQL

Introductie

About PL/SQL

PL/SQL:

- Stands for "Procedural Language extension to SQL"
- Is Oracle Corporation's standard data access language for relational databases
- Seamlessly integrates procedural constructs with SQL

About PL/SQL

PL/SQL:

- Provides a block structure for executable units of code. Maintenance of code is made easier with such a well-defined structure.

- Provides procedural constructs such as:
  - Variables, constants, and data types
  - Control structures such as conditional statements and loops
  - Reusable program units that are written once and executed many times

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Modularizing Development with PL/SQL Blocks

- PL/SQL is a block-structured language. The PL/SQL code block helps modularize code by using:
  - Anonymous blocks
  - Procedures and functions
  - Packages
  - Database triggers
- The benefits of using modular program constructs are:
  - Easy maintenance
  - Improved data security and integrity
  - Improved performance
  - Improved code clarity

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PL/SQL Block Structure

- `DECLARE` (**optional**)
  - Variables, cursors, user-defined exceptions
- `BEGIN` (**mandatory**)
  - SQL statements
  - PL/SQL statements
- `EXCEPTION` (**optional**)
  - Actions to perform when errors occur
- `END;` (**mandatory**)

Block Types

Anonymous	Procedure	Function

```
[DECLARE]


BEGIN
   --statements


[EXCEPTION]


END;
```

```
PROCEDURE name
IS


BEGIN
   --statements


 [EXCEPTION]


END;
```

```
FUNCTION name
RETURN datatype
IS
BEGIN
   --statements
   RETURN value;
[EXCEPTION]


END;
```

Anonymous Blocks: Overview

Anonymous blocks:

- Form the basic PL/SQL block structure

- Initiate PL/SQL processing tasks from applications

- Can be nested within the executable section of any PL/SQL block

```
[DECLARE          -- Declaration Section (Optional)
  variable declarations; ... ]
BEGIN             -- Executable Section (Mandatory)
  SQL or PL/SQL statements;
[EXCEPTION        -- Exception Section (Optional)
  WHEN exception THEN statements; ]
END;              -- End of Block (Mandatory)
```

Voorbeeld anoniem block

```
DECLARE
        v_dept NUMBER(2);
BEGIN

        SELECT department_id
        INTO v_dept
        FROM employees
        WHERE employee_id = 101;


        DBMS_OUTPUT.PUT_LINE('Het departement is ' || v_dept);
END;
/
```

- Afdrukken op scherm: DBMS_OUTPUT: ingebouwde package met procedures, o.a. PUT_LINE
- in SQL*Plus SET SERVEROUTPUT ON FORMAT WRAPPED opnemen → best in LOGIN.SQL
- LOGIN.SQL is een script dat telkens bij het opstarten van SQL*Plus wordt uitgevoerd en waar bepaalde settings kunnen opgenomen worden

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SQL*Plus

- Vooraf Oracle XE installeren volgens installatieprocedure op BB
- Human Resources (HR) schema