Oracle 11g – PL SQL

Interacting with Oracle Server

Invoke SQL Statements in PL/SQL

- Extract a row of data from the database by using the SELECT command.
- Make changes to rows in the database by using DML commands.
- Control a transaction with the COMMIT, ROLLBACK, or SAVEPOINT command.
- Determine DML outcome with implicit cursor attributes.

SELECT Statements in PL/SQL

Retrieve data from the database with a SELECT statement.
Syntax:

```
SELECT  select_list
INTO    variable_name[, variable_name]...
FROM    table
[WHERE          condition];
```

SELECT Statements in PL/SQL

- The `INTO` clause is required.
- Queries must return one and only one row.

Example:

```
DECLARE
  v_dep_id              NUMBER(4);
  v_loc_id          NUMBER(4);
BEGIN
  SELECT            dep_id, loc_id
  INTO              v_dep_id, v_loc_id
  FROM              dep
  WHERE             dep_name = 'Mktg';
  ...
END;
/
```

Retrieving Data in PL/SQL

Retrieve the hire date and the salary for the specified employee.

Example:

```
DECLARE
  v_join_date   empl.join_date%TYPE;
  v_salary      empl.sal%TYPE;
BEGIN
  SELECT   join_date, sal
  INTO     v_join_date, v_salary
  FROM     empl
  WHERE    empl_id = 1001;
  ...
END;
/
```

Retrieving Data in PL/SQL

Return the sum of the salaries for all employees in the specified department.

Example:

```
SET SERVEROUTPUT ON
DECLARE
  v_sum_salary   NUMBER(10,2);
  v_dep_id     NUMBER NOT NULL := 12;
BEGIN
  SELECT      SUM(sal)  -- group function
  INTO        v_sum_salary
  FROM        empl
  WHERE       dep_id = v_dep_id;
  DBMS_OUTPUT.PUT_LINE ('The sum of salary is ' ||
                        TO_CHAR(v_sum_salary));
END;
/
```

Manipulating Data Using PL/SQL

Make changes to database tables by using DML commands:

- `INSERT`
- `UPDATE`
- `DELETE`

Inserting Data

Add new employee information to the `EMPLOYEES` table.

Example:

```
BEGIN
  INSERT INTO empl
  (e_id, f_name, l_name, mail,
   join_date, job, salary)
  VALUES
   (seq1.NEXTVAL, ‘Swetalina', ‘Nayak', ‘lisa@yahoo.com',sysdate,
‘Jr.Physician', 8000);
END;
/
```

Updating Data

Increase the salary of all employees who are stock clerks.

Example:

```
DECLARE
  v_sal_inc          empl.salary%TYPE := 800;
BEGIN
  UPDATE             empl
  SET                salary = salary + v_sal_inc
  WHERE              job = 'EDUCATOR';
END;
/
```

Deleting Data

Delete rows that belong to department 10 from the `EMPLOYEES` table.

Example:

```
DECLARE
  v_dep_ID    empl.dep_id%TYPE := 10;
BEGIN
  DELETE FROM    empl
  WHERE          dep_id = v_dep_ID;
END;
/
```

Naming Conventions

- Use a naming convention to avoid ambiguity in the `WHERE` clause.
- Database columns and identifiers should have distinct names.
- Syntax errors can arise because PL/SQL checks the database first for a column in the table.
- The names of database table columns take precedence over the names of local variables.

Transaction Control Statements

- Initiate a transaction with the first DML command to follow a `COMMIT` or `ROLLBACK`.

- Use `COMMIT` and `ROLLBACK` SQL statements to terminate a transaction explicitly.