

Experiment 4: PL/SQL Conditional Control Statements

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Course: BE-CSE (AI&ML)

Subject: Database Management System

1. Aim of the Session

To design and implement PL/SQL programs utilizing conditional control statements such as IF–ELSE, ELSIF, ELSIF ladder, and CASE constructs in order to control the flow of execution based on logical conditions and to analyze decision-making capabilities in PL/SQL blocks.

2. Software Requirements

- Database: PostgreSQL
- Database Administration Tool: pgAdmin

3. Objective of the Session

To implement control structures in PL/SQL (IF-ELSE, ELSE-IF, ELSE-IF LADDER, CASE STATEMENTS in PL-SQL BLOCK) to handle procedural logic within the database environment.

4. Practical / Experiment Steps

The work was carried out through the following activities:

1. Program Structure Definition: Designed basic PL/SQL blocks (anonymous blocks using DO statements) consisting of declaration and execution sections.
2. Variable Declaration: Declared required variables (Integer, Varchar) in the DECLARE section to store input values for testing conditions.
3. Logic Implementation: Wrote executable statements using IF-THEN-ELSE, ELSIF, and CASE constructs to perform logical operations.
4. Output Display: Used the RAISE NOTICE procedure to display results and formatted messages to the console.
5. Execution and Verification: Executed the code in the pgAdmin Query Tool and verified the outputs against expected logical results.

5. Procedure of the Practical

1. Environment Initialization: Opened pgAdmin and connected to the PostgreSQL server.
2. Session Configuration: Ensured the "Messages" tab was visible to view RAISE NOTICE outputs.
3. Program Preparation: Formatted the block using DO \$\$... END\$\$; syntax.
4. Variable Setup: Assigned test values to variables (e.g., marks, numbers, or day IDs) in the declaration section.
5. Logic Execution: Implemented conditional branches to evaluate the declared variables.
6. Output Handling: Added notification triggers for each logic branch.
7. Result Verification: Ran the scripts and documented the performance of each conditional construct.

6. I/O Analysis (Input / Output Analysis)

Query 1: IF–ELSE (Check Positive/Non-Positive)

DO \$\$

DECLARE

 num INTEGER := -5;

BEGIN

 IF num > 0 THEN

 RAISE NOTICE 'The number % is positive.', num;

 ELSE

 RAISE NOTICE 'The number % is non-positive.', num;

 END IF;

END \$\$;

Query 2 & 3: ELSIF Ladder (Student Grading & Performance)

DO \$\$

DECLARE

marks INTEGER := 85;

BEGIN

IF marks >= 90 THEN

RAISE NOTICE 'Grade: A+ | Status: Excellent';

ELSIF marks >= 80 THEN

RAISE NOTICE 'Grade: A | Status: Very Good';

ELSIF marks >= 60 THEN

RAISE NOTICE 'Grade: B | Status: Satisfactory';

ELSE

RAISE NOTICE 'Grade: F | Status: Needs Improvement';

END IF;

END \$\$;

Query 4: CASE Statement (Day of the Week)

DO \$\$

DECLARE

day_num INTEGER := 3;

day_name VARCHAR(20);

BEGIN

day_name := CASE day_num

WHEN 1 THEN 'Monday'

WHEN 2 THEN 'Tuesday'

WHEN 3 THEN 'Wednesday'

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WHEN 4 THEN 'Thursday'

WHEN 5 THEN 'Friday'

WHEN 6 THEN 'Saturday'

WHEN 7 THEN 'Sunday'

ELSE 'Invalid Day Number'

END;

RAISE NOTICE 'Input Number: %, Day Name: %', day_num, day_name;

END $$;
```

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1: Master@Maiden:~/Kargil/DBMS/practicals/Experiment4 x +
[Master@Maiden Experiment4]$ psql -f exp4.sql
psql:exp4.sql:10: NOTICE:  The number -5 is non-positive.
DO
psql:exp4.sql:24: NOTICE:  Grade: A | Status: Very Good
DO
psql:exp4.sql:41: NOTICE:  Input Number: 3, Day Name: Wednesday
DO
[Master@Maiden Experiment4]$
```

7. Learning Outcome

- Understood the implementation of conditional branching in PostgreSQL's PL/pgSQL.
- Learned the syntax differences between Oracle and PostgreSQL (e.g., using RAISE NOTICE instead of DBMS_OUTPUT).
- Gained proficiency in using ELSIF ladders for multi-condition evaluations.
- Mastered the CASE statement for handling discrete value mappings efficiently.
- Developed the ability to debug and verify procedural logic within a database administration tool.

