



Apex Institute of Technology

Computer Science & Engineering

Experiment 4

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Subject Name: Database
Management System

Subject Code: 24CSH-298

AIM: 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.

OBJECTIVES:

- Implement control structures in PL/SQL (IF-ELSE, ELSE-IF, ELSE-IF LADDER, CASE STATEMENTS in PL-SQL BLOCK).

SOFTWARE REQUIREMENTS:

- Oracle FreeSQL

PRACTICAL/EXPERIMENT STEPS:

1. Different conditional control structures such as IF-ELSE, IF-ELSIF-ELSE, ELSIF ladder, and CASE statements were identified and studied.
2. For each problem statement, variables were declared in the DECLARE section to store input values such as numbers, marks, and day numbers.
3. Logical conditions were applied inside the BEGIN and END block using appropriate conditional statements.



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4. Based on the evaluated conditions, corresponding output messages were displayed using DBMS_OUTPUT.PUT_LINE.
5. Each PL/SQL block was executed independently to observe and analyze decision-making behavior.
6. The outputs were verified to ensure correctness of logic and flow control.

PROCEDURE:

1. Start the Oracle FreeSQL environment.
2. A PL/SQL block was written to demonstrate the IF-ELSE statement, where a number NUM was checked to determine whether it is positive or non-positive.

```
1  -- IF-ELSE Statement
2  DECLARE
3  NUM NUMBER := -8;
4  BEGIN
5  | IF NUM > 0 THEN
6  | | DBMS_OUTPUT.PUT_LINE(NUM || ' is positive.');
7  | ELSE
8  | | DBMS_OUTPUT.PUT_LINE(NUM || ' is non-positive.');
9  | END IF;
10 END;
```

3. Another PL/SQL block was written using the IF-ELSIF-ELSE statement to evaluate a student's grade based on the marks obtained.

```
14 -- IF-ELSIF-ELSE Statement
15 DECLARE
16 MARKS INTEGER := 93;
17 BEGIN
18 | IF MARKS >= 90 THEN
19 | | DBMS_OUTPUT.PUT_LINE('Grade: A');
20 | ELSIF MARKS >= 75 THEN
21 | | DBMS_OUTPUT.PUT_LINE('Grade: B');
22 | ELSIF MARKS >= 50 THEN
23 | | DBMS_OUTPUT.PUT_LINE('Grade: C');
24 | ELSE
25 | | DBMS_OUTPUT.PUT_LINE('Grade: Fail');
26 | END IF;
27 END;
```

4. A separate PL/SQL block implementing an ELSIF ladder was executed to determine the performance status of a student based on different mark ranges.



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```
~~
31  -- ELSIF Ladder
32  DECLARE
33  MARKS INTEGER := 96;
34  BEGIN
35      IF marks >= 85 THEN
36          DBMS_OUTPUT.PUT_LINE('Performance: Excellent');
37      ELSIF marks >= 70 THEN
38          DBMS_OUTPUT.PUT_LINE('Performance: Very Good');
39      ELSIF marks >= 50 THEN
40          DBMS_OUTPUT.PUT_LINE('Performance: Good');
41      ELSE
42          DBMS_OUTPUT.PUT_LINE('Performance: Needs Improvement');
43      END IF;
44  END;
```

5. A PL/SQL block using the CASE statement was written to display the name of the day corresponding to a given day number.

```
48  -- CASE Statement
49  DECLARE
50  DAY_NO INTEGER := 6;
51  DAY VARCHAR2(10);
52  BEGIN
53      DAY := CASE DAY_NO
54          WHEN 1 THEN 'Monday'
55          WHEN 2 THEN 'Tuesday'
56          WHEN 3 THEN 'Wednesday'
57          WHEN 4 THEN 'Thursday'
58          WHEN 5 THEN 'Friday'
59          WHEN 6 THEN 'Saturday'
60          WHEN 7 THEN 'Sunday'
61          ELSE 'Invalid Day Number'
62      END;
63
64      DBMS_OUTPUT.PUT_LINE('Day: ' || DAY);
65  END;
```

6. All PL/SQL blocks were executed in the Free SQL environment, and the output for each block was observed.
7. The results obtained were verified to confirm the correct functioning of conditional control statements.

CODE:

```
-- IF-ELSE Statement
DECLARE
NUM NUMBER := -8;
BEGIN
    IF NUM > 0 THEN
        DBMS_OUTPUT.PUT_LINE(NUM || ' is positive.');
    ELSE
        DBMS_OUTPUT.PUT_LINE(NUM || ' is non-positive.');
    END IF;
END;

/
-- IF-ELSIF-ELSE Statement
```



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```
DECLARE
MARKS INTEGER := 93;
BEGIN
    IF MARKS >= 90 THEN
        DBMS_OUTPUT.PUT_LINE('Grade: A');
    ELSIF MARKS >= 75 THEN
        DBMS_OUTPUT.PUT_LINE('Grade: B');
    ELSIF MARKS >= 50 THEN
        DBMS_OUTPUT.PUT_LINE('Grade: C');
    ELSE
        DBMS_OUTPUT.PUT_LINE('Grade: Fail');
    END IF;
END;

/
-- ELSIF Ladder
DECLARE
MARKS INTEGER := 96;
BEGIN
    IF marks >= 85 THEN
        DBMS_OUTPUT.PUT_LINE('Performance: Excellent');
    ELSIF marks >= 70 THEN
        DBMS_OUTPUT.PUT_LINE('Performance: Very Good');
    ELSIF marks >= 50 THEN
        DBMS_OUTPUT.PUT_LINE('Performance: Good');
    ELSE
        DBMS_OUTPUT.PUT_LINE('Performance: Needs Improvement');
    END IF;
END;

/
-- CASE Statement
DECLARE
DAY_NO INTEGER := 6;
DAY VARCHAR2(10);
BEGIN
    DAY := CASE DAY_NO
        WHEN 1 THEN 'Monday'
        WHEN 2 THEN 'Tuesday'
        WHEN 3 THEN 'Wednesday'
        WHEN 4 THEN 'Thursday'
        WHEN 5 THEN 'Friday'
        WHEN 6 THEN 'Saturday'
        WHEN 7 THEN 'Sunday'
        ELSE 'Invalid Day Number'
    END;

    DBMS_OUTPUT.PUT_LINE('Day: ' || DAY);
END;
```

I/O ANALYSIS:

1. IF-ELSE Statement

Displays whether the given number is positive or non-positive.



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-8 is non-positive.

PL/SQL procedure successfully completed.

Elapsed: 00:00:00.006

2. IF-ELSIF-ELSE Statement

Displays the grade of the student based on the marks obtained.

Grade: A

PL/SQL procedure successfully completed.

Elapsed: 00:00:00.004

3. ELSIF Ladder

Displays the performance status of the student according to the marks range.

Performance: Excellent

PL/SQL procedure successfully completed.

Elapsed: 00:00:00.005

4. CASE Statement

Displays the name of the day corresponding to the given day number or an invalid message

Day: Saturday

PL/SQL procedure successfully completed.

Elapsed: 00:00:00.005

LEARNING OUTCOMES:

1. Understood the use of conditional control statements such as IF-ELSE, ELSIF ladder, and CASE in PL/SQL.
2. Gained the ability to implement decision-making logic to control program flow based on given conditions.
3. Learned to execute and analyze PL/SQL programs.