Indian Institute of Information Technology Surat

Lab Report on
Advanced Database Management (CS 604) Practical

Submitted by

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Lab No: 2

Aim: Write a PL/SQL code block to find total and average of 6 subjects and display the grade.

Description: The provided PL/SQL code block calculates the total and average scores of a student in six subjects and determines the corresponding grade based on a simple grading system.

- The code assumes the existence of a table named student_scores with columns for student ID and scores in each of the six subjects.
- It fetches the scores for a specified student ID, calculates the total and average, and assigns a grade (A, B, C, D, or F) based on the average score.
- The results, including the student ID, total, average, and grade, are then displayed using the DBMS_OUTPUT.PUT_LINE function.

Source Code:

With Table:

```sql
-- Table Creation
CREATE TABLE student_scores (
   student_id NUMBER,
   sub1 NUMBER,
   sub2 NUMBER,
   sub3 NUMBER,
   sub4 NUMBER,
   sub5 NUMBER,
   sub6 NUMBER
);

-- Insertion
INSERT INTO student_scores VALUES (1, 85, 92, 78, 90, 88, 95);
INSERT INTO student_scores VALUES (2, 95, 88, 76, 82, 90, 87);
INSERT INTO student_scores VALUES (3, 85, 98, 66, 72, 60, 67);
INSERT INTO student_scores VALUES (4, 55, 88, 56, 72, 70, 77);
INSERT INTO student_scores VALUES (5, 65, 78, 26, 82, 60, 77);
INSERT INTO student_scores VALUES (6, 45, 68, 16, 52, 60, 57);
INSERT INTO student_scores VALUES (7, 95, 38, 86, 82, 80, 87);
INSERT INTO student_scores VALUES (8, 65, 58, 96, 62, 70, 57);
INSERT INTO student_scores VALUES (9, 75, 98, 66, 42, 10, 87);
INSERT INTO student_scores VALUES (10, 95, 88, 86, 12, 60, 57);
```

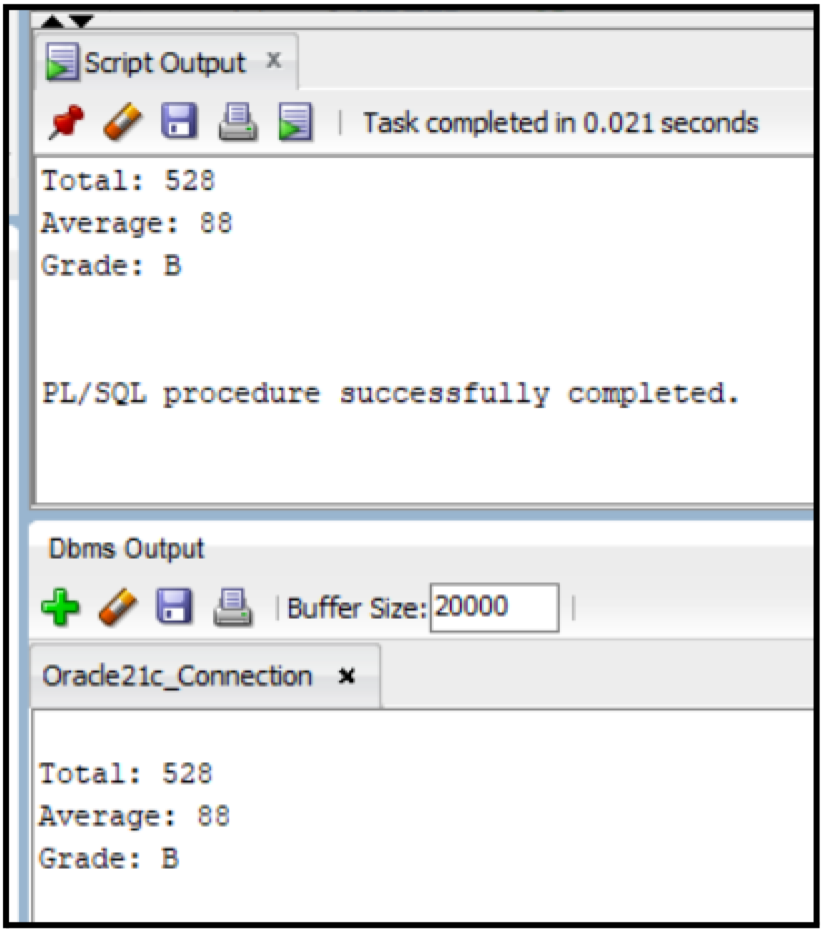
```
-- PL/SQL block to calculate total, average, and display grade
DECLARE
    v_student_id student_scores.student_id%TYPE;
    v_sub1 student_scores.sub1%TYPE;
    v_sub2 student_scores.sub2%TYPE;
    v_sub3 student_scores.sub3%TYPE;
    v_sub4 student_scores.sub4%TYPE;
    v_sub5 student_scores.sub5%TYPE;
    v_sub6 student_scores.sub6%TYPE;
    v_total NUMBER;
    v_average NUMBER;
    v_grade VARCHAR2(2);
BEGIN
    SELECT student_id, sub1, sub2, sub3, sub4, sub5, sub6
    INTO v_student_id, v_sub1, v_sub2, v_sub3, v_sub4, v_sub5, v_sub6
    FROM student_scores
    WHERE student_id = 1;


    -- Calculate total and average
    v_total := v_sub1 + v_sub2 + v_sub3 + v_sub4 + v_sub5 + v_sub6;
    v_average := v_total / 6;

    -- Grade Determination
    IF v_average >= 90 THEN
        v_grade := 'A';
    ELSIF v_average >= 80 THEN
        v_grade := 'B';
    ELSIF v_average >= 70 THEN
        v_grade := 'C';
    ELSIF v_average >= 60 THEN
        v_grade := 'D';
    ELSE
        v_grade := 'F';
    END IF;

    -- Results
    DBMS_OUTPUT.PUT_LINE('Student ID: ' || v_student_id);
    DBMS_OUTPUT.PUT_LINE('Total: ' || v_total);
    DBMS_OUTPUT.PUT_LINE('Average: ' || v_average);
    DBMS_OUTPUT.PUT_LINE('Grade: ' || v_grade);
```

```
END;
/
```

Without_Table:

```
SET SERVEROUTPUT ON;

DECLARE
   subject1 NUMBER := 85;
   subject2 NUMBER := 92;
   subject3 NUMBER := 78;
   subject4 NUMBER := 90;
   subject5 NUMBER := 88;
   subject6 NUMBER := 95;
   total NUMBER;
   average NUMBER;
   grade VARCHAR2(2);

BEGIN
   total := subject1 + subject2 + subject3 + subject4 + subject5 + subject6;
   average := total / 6;

   IF average >= 90 THEN
      grade := 'A';
   ELSIF average >= 80 THEN
      grade := 'B';
   ELSIF average >= 70 THEN
      grade := 'C';
   ELSIF average >= 60 THEN
      grade := 'D';
   ELSE
      grade := 'F';
   END IF;

   DBMS_OUTPUT.PUT_LINE('Total: ' || total);
   DBMS_OUTPUT.PUT_LINE('Average: ' || average);
   DBMS_OUTPUT.PUT_LINE('Grade: ' || grade);
END;
/
```

Output:



```
Total: 528
Average: 88
Grade: B


PL/SQL procedure successfully completed.
```

```
Total: 528
Average: 88
Grade: B
```

Conclusion:

- The code is structured in a modular manner using a PL/SQL block for better understanding.
- The code is designed for execution in interactive environments.
- Utilized DECLARE and BEGIN sections to define variables and execute procedural logic.
- Applied the DBMS_OUTPUT.PUT_LINE function for displaying total marks, average marks, and the corresponding grade.