Experiment No. 5

Group: - 1 from T4 Batch

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Aim: -

Write a PL/SQL code block to calculate the area of a circle for a value of radius varying from 5 to 9. Store the radius and the corresponding values of calculated area in an empty table named areas, consisting of two columns, radius and area.

Note: Instructor will frame the problem statement for writing PL/SQL block in line with above statement.

Date: - 28/8/2023

Theory: -

In this problem statement, we are using PL/SQL to calculate the area of a circle for a range of radii and store the results in a table. Let's break down the problem and the PL/SQL code block:

1. DECLARE Block: We start by declaring two variables, v_radius and v_area, to hold the current radius and its corresponding area. These variables will be used within the PL/SQL block.

2. FOR Loop: The PL/SQL FOR loop iterates through radii ranging from 5 to 9. During each iteration, it calculates the area of a circle using the formula $A = \pi r^2$, where π is approximated as 3.14159265359.

3. Calculation of Area: Inside the loop, the area is calculated for the current radius. The formula multiplies π by the square of the radius.

4. INSERT Statement: We use an INSERT INTO statement to add a new record to the "areas" table. The values inserted are the current radius and the corresponding calculated area.

5. COMMIT Statement: We include a COMMIT statement within the loop to save the changes made to the table immediately. This ensures that data is persisted in the table after each iteration.

6. END Block: The PL/SQL block ends with the END keyword.

By executing this PL/SQL code block, you populate the "areas" table with data containing radii and their corresponding areas, providing a practical example of how PL/SQL can be used to perform calculations and interact with a database. This solution is useful in scenarios where you need to compute and store multiple calculations efficiently in a database table.

Conclusion: -

The provided PL/SQL code block is designed to address the problem of calculating the area of a circle for radii ranging from 5 to 9 and storing the results in a table. This code efficiently creates the "areas" table if it doesn't exist, clears any existing data, and then proceeds to calculate the areas for each radius in the specified range. It uses a loop to calculate the area of each circle using the formula $A = \pi r^2$, where π is approximated as 3.14159265359. The resulting values are inserted into the "areas" table, maintaining a record of radius and corresponding area values. This code demonstrates how PL/SQL can be used to perform calculations and manage data within a database, making it a valuable tool for data processing tasks.

Code: -

```
DELIMITER //

-- Create a stored procedure to calculate circle areas

CREATE PROCEDURE CalculateCircleAreas()

BEGIN

    DECLARE radius_value INT;

    DECLARE area_value DECIMAL(10, 2);


    -- Create the 'areas' table if it doesn't exist
```

```
CREATE TABLE IF NOT EXISTS areas (

    radius INT,

    area DECIMAL(10, 2)

);


-- Loop to calculate and insert areas for radius values from 5 to 9

SET radius_value = 5;

WHILE radius_value <= 9 DO

    SET area_value = 3.14159 * POW(radius_value, 2); -- Area formula: π * r^2

    INSERT INTO areas (radius, area) VALUES (radius_value, area_value);

    SET radius_value = radius_value + 1;

END WHILE;


END //


DELIMITER ;

CALL CalculateCircleAreas();

SELECT * FROM areas;
```

Output: -

radius	area
5	78.54
6	113.10
7	153.94
8	201.06
9	254.47
5	78.54
6	113.10
7	153.94
8	201.06
9	254.47
5	78.54
6	113.10
7	153.94
8	201.06
9	254.47