

# **Indian Institute of Information Technology Surat**



## **Lab Report on Advanced Database Management (CS 604) Practical**

**Submitted by**

**[RAHUL KUMAR SINGH] (UI21CS44)**

**Course Faculty**

**Mr. Rishi Sharma**

**Department of Computer Science and Engineering  
Indian Institute of Information Technology Surat  
Gujarat-394190, India**

**Jan-2024**

## Lab No: 3

**Aim:** Write a PL/SQL (MySQL Procedure) code block to perform specific tasks on tables Teacher, Class and Pay\_scale.

**Description:** Consider the following table to write PL/SQL code as specified under

- Teacher (t\_no, f\_name, l\_name, salary, supervisor, joining\_date, birth\_date, title)
- Class (class\_no, t\_no, room\_no)
- Pay\_scale (Min\_limit, Max\_limit, grade)

1. Accept a range of salary and print the details of teachers from the teacher table.
2. By using cursor - Calculate the bonus amount to be given to a teacher depending on the following conditions:
  - a) if salary < 10000 then bonus is 10% of the salary.
  - b) if the salary is between 10000 and 20000 then bonus is 20% of the salary.
  - c) if the salary is between 20000 and 25000 then bonus is 25% of the salary.
  - d) if the salary exceeds 25000 then the bonus is 30% of the salary.
3. Using a simple LOOP structure, list the first 10 records of the 'teachers' table.
4. Accept the room number and display the teacher details like t\_no, f\_name, l\_name, birth\_date, title from table Teacher.

## Source Code:

### Teacher Table:

```
CREATE TABLE Teacher (  
  t_no INT PRIMARY KEY,  
  f_name VARCHAR(50) NOT NULL,  
  l_name VARCHAR(50) NOT NULL,  
  salary DECIMAL(10, 2) NOT NULL,  
  supervisor INT,  
  joining_date DATE NOT NULL,  
  birth_date DATE NOT NULL,  
  title VARCHAR(50) NOT NULL  
);
```

### Class Table:

```
CREATE TABLE Class (  
  class_no INT PRIMARY KEY,  
  t_no INT,  
  room_no INT,  
  FOREIGN KEY (t_no) REFERENCES Teacher(t_no),  
  UNIQUE KEY unique_teacher_class (t_no, room_no)  
);
```

### Pay\_scale Table:

```
CREATE TABLE Pay_scale (  
  Min_limit DECIMAL(10, 2) NOT NULL,  
  Max_limit DECIMAL(10, 2) NOT NULL,  
  grade VARCHAR(10) PRIMARY KEY  
);
```

**Task 1:**

```
DELIMITER //
CREATE PROCEDURE GetTeachersBySalaryRange(
    IN minSalary DECIMAL(10, 2),
    IN maxSalary DECIMAL(10, 2)
)
BEGIN
    SELECT *
    FROM Teacher
    WHERE salary BETWEEN minSalary AND maxSalary;
END //
DELIMITER ;
```

**Task 2:**

```
DELIMITER //
CREATE PROCEDURE CalculateTeacherBonus()
BEGIN
    DECLARE done INT DEFAULT FALSE;
    DECLARE t_no_var INT;
    DECLARE salary_var DECIMAL(10, 2);
    DECLARE bonus_var DECIMAL(10, 2);
    DECLARE teacher_cursor CURSOR FOR
        SELECT t_no, salary
        FROM Teacher;
    DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = TRUE;
    OPEN teacher_cursor;
    teacher_loop: LOOP
        FETCH teacher_cursor INTO t_no_var, salary_var;
        IF done THEN
            LEAVE teacher_loop;
        END IF;
        IF salary_var < 10000 THEN
            SET bonus_var = salary_var * 0.10;
        ELSEIF salary_var BETWEEN 10000 AND 20000 THEN
            SET bonus_var = salary_var * 0.20;
        ELSEIF salary_var BETWEEN 20000 AND 25000 THEN
            SET bonus_var = salary_var * 0.25;
        ELSE
            SET bonus_var = salary_var * 0.30;
        END IF;
        SELECT t_no_var AS Teacher_ID, salary_var AS Salary, bonus_var AS Bonus;
    END LOOP;
    CLOSE teacher_cursor;
END //
DELIMITER ;
```

### Task 3:

```
DELIMITER //
CREATE PROCEDURE ListFirst10Teachers()
BEGIN
    DECLARE counter INT DEFAULT 0;
    DECLARE t_no_var INT;
    DECLARE f_name_var VARCHAR(50);
    DECLARE l_name_var VARCHAR(50);
    DECLARE salary_var DECIMAL(10, 2);
    DECLARE supervisor_var INT;
    DECLARE joining_date_var DATE;
    DECLARE birth_date_var DATE;
    DECLARE title_var VARCHAR(50);
    DECLARE teacher_cursor CURSOR FOR
        SELECT t_no, f_name, l_name, salary, supervisor, joining_date, birth_date, title
        FROM Teacher;
    OPEN teacher_cursor;
    teacher_loop: LOOP
        FETCH teacher_cursor INTO t_no_var, f_name_var, l_name_var, salary_var, supervisor_var,
        joining_date_var, birth_date_var, title_var;
        IF counter >= 10 OR t_no_var IS NULL THEN
            LEAVE teacher_loop;
        END IF;
        SET counter = counter + 1;
        SELECT t_no_var AS Teacher_ID, f_name_var AS First_Name, l_name_var AS Last_Name, salary_var
        AS Salary,
        supervisor_var AS Supervisor, joining_date_var AS Joining_Date, birth_date_var AS Birth_Date,
        title_var AS Title;
    END LOOP;
    CLOSE teacher_cursor;
END //
DELIMITER ;
```

### Task 4:

```
DELIMITER //
CREATE PROCEDURE GetTeachersByRoomNumber(IN roomNumber INT)
BEGIN
    SELECT t.t_no, t.f_name, t.l_name, t.birth_date, t.title
    FROM Teacher t
    JOIN Class c ON t.t_no = c.t_no
    WHERE c.room_no = roomNumber;
END //
DELIMITER ;
```

## Output:

### Task 1:

```
mysql> CALL GetTeachersBySalaryRange(100000,200000);
+-----+-----+-----+-----+-----+-----+-----+-----+
| t_no | f_name | l_name | salary | supervisor | joining_date | birth_date | title |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 0 | accusamus | voluptatem | 184162.00 | 0 | 2008-07-13 | 1993-03-21 | Neque sed in officia nisi velit placeat nulla. |
| 2 | ipsam | magnam | 194450.00 | 0 | 1998-11-20 | 1992-06-13 | Debitis enim consequatur error. |
| 6 | eligendi | omnis | 108521.00 | 1 | 2020-07-20 | 1994-03-21 | Ex porro corrupti sint. |
| 5527 | qui | qui | 104527.00 | 0 | 2007-12-26 | 1979-07-17 | Et nemo itaque minima asperiores vel quia quis. |
| 45571 | cum | nihil | 149521.00 | 1 | 1985-11-02 | 2021-12-25 | Itaque minima repellat odit tempore corrupti nisi |
+-----+-----+-----+-----+-----+-----+-----+-----+
```

## Task 2:

```
mysql> CALL CalculateTeacherBonus();
+-----+-----+-----+
| Teacher_ID | Salary   | Bonus   |
+-----+-----+-----+
|          0 | 184162.00 | 55248.60 |
+-----+-----+-----+
1 row in set (0.00 sec)

+-----+-----+-----+
| Teacher_ID | Salary   | Bonus   |
+-----+-----+-----+
|          1 | 239637.00 | 71891.10 |
+-----+-----+-----+
1 row in set (0.00 sec)

+-----+-----+-----+
| Teacher_ID | Salary   | Bonus   |
+-----+-----+-----+
|          2 | 194450.00 | 58335.00 |
+-----+-----+-----+
1 row in set (0.00 sec)

+-----+-----+-----+
| Teacher_ID | Salary   | Bonus   |
+-----+-----+-----+
|          3 | 731563.00 | 219468.90 |
+-----+-----+-----+
1 row in set (0.00 sec)

+-----+-----+-----+
| Teacher_ID | Salary   | Bonus   |
+-----+-----+-----+
|          5 | 661912.00 | 198573.60 |
+-----+-----+-----+
1 row in set (0.00 sec)
```

## Task 3:

```
mysql> CALL ListFirst10Teachers();
+-----+-----+-----+-----+-----+-----+-----+
| Teacher_ID | First_Name | Last_Name | Salary   | Supervisor | Joining_Date | Birth_Date | Title |
+-----+-----+-----+-----+-----+-----+-----+
|          0 | accusamus | voluptatem | 184162.00 |          0 | 2008-07-13 | 1993-03-21 | Neque sed in officia nisi velit placeat nulla. |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.01 sec)

+-----+-----+-----+-----+-----+-----+-----+
| Teacher_ID | First_Name | Last_Name | Salary   | Supervisor | Joining_Date | Birth_Date | Title |
+-----+-----+-----+-----+-----+-----+-----+
|          1 | consequatur | beatae | 239637.00 |          1 | 1985-10-10 | 1972-06-21 | Beatae tempore deleniti doloribus qui. |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.01 sec)

+-----+-----+-----+-----+-----+-----+-----+
| Teacher_ID | First_Name | Last_Name | Salary   | Supervisor | Joining_Date | Birth_Date | Title |
+-----+-----+-----+-----+-----+-----+-----+
|          2 | ipsam | magnam | 194450.00 |          0 | 1998-11-20 | 1992-06-13 | Debitis enim consequatur error. |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.01 sec)

+-----+-----+-----+-----+-----+-----+-----+
| Teacher_ID | First_Name | Last_Name | Salary   | Supervisor | Joining_Date | Birth_Date | Title |
+-----+-----+-----+-----+-----+-----+-----+
|          3 | ut | saepe | 731563.00 |          0 | 1991-04-19 | 1991-07-17 | Autem et dolores accusantium. |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.01 sec)

+-----+-----+-----+-----+-----+-----+-----+
| Teacher_ID | First_Name | Last_Name | Salary   | Supervisor | Joining_Date | Birth_Date | Title |
+-----+-----+-----+-----+-----+-----+-----+
|          5 | totam | ab | 661912.00 |          1 | 2013-11-16 | 1986-03-30 | Ut aperiam qui iusto velit unde similique illo imp |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.02 sec)

+-----+-----+-----+-----+-----+-----+-----+
| Teacher_ID | First_Name | Last_Name | Salary   | Supervisor | Joining_Date | Birth_Date | Title |
+-----+-----+-----+-----+-----+-----+-----+
|          6 | eligendi | omnis | 108521.00 |          1 | 2020-07-20 | 1994-03-21 | Ex porro corrupti sint. |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.02 sec)

+-----+-----+-----+-----+-----+-----+-----+
| Teacher_ID | First_Name | Last_Name | Salary   | Supervisor | Joining_Date | Birth_Date | Title |
+-----+-----+-----+-----+-----+-----+-----+
|          7 | cupiditate | eligendi | 505168.00 |          1 | 1972-11-23 | 1988-10-22 | Enim vero et dolorem consectetur voluptatem. |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.02 sec)
```

```

+-----+-----+-----+-----+-----+-----+-----+-----+
| Teacher_ID | First_Name | Last_Name | Salary | Supervisor | Joining_Date | Birth_Date | Title |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 9 | rerum | eum | 48555.00 | 1 | 2010-05-08 | 1972-12-17 | Odit alias nisi qui adipisci numquam veritatis. |
+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.02 sec)

+-----+-----+-----+-----+-----+-----+-----+-----+
| Teacher_ID | First_Name | Last_Name | Salary | Supervisor | Joining_Date | Birth_Date | Title |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 19 | fugiat | iste | 54421.00 | 1 | 1995-07-13 | 1973-06-25 | Labore culpa ex fugiat minus sit non quo. |
+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.02 sec)

+-----+-----+-----+-----+-----+-----+-----+-----+
| Teacher_ID | First_Name | Last_Name | Salary | Supervisor | Joining_Date | Birth_Date | Title |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 23 | laboriosam | tempore | 937334.00 | 0 | 1981-12-17 | 1976-02-25 | Laborum alias dolorem vel aut itaque. |
+-----+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.02 sec)

Query OK, 0 rows affected (0.03 sec)

```

#### Task 4:

```

mysql> CALL GetTeachersByRoomNumber(0);
+-----+-----+-----+-----+-----+-----+-----+-----+
| t_no | f_name | l_name | birth_date | title |
+-----+-----+-----+-----+-----+-----+-----+-----+
| 19 | fugiat | iste | 1973-06-25 | Labore culpa ex fugiat minus sit non quo. |
| 30 | et | ipsa | 2020-12-27 | Atque delectus eum ducimus. |
| 770 | tempore | consequatur | 2015-10-30 | Nihil suscipit recusandae asperiores a ipsam id in |
| 908145 | et | qui | 2008-08-03 | Occaecati quae sapiente ad placeat earum sed autem |
+-----+-----+-----+-----+-----+-----+-----+-----+

```

## Conclusion:

- GetTeachersBySalaryRange: Accepts a salary range and retrieves details of teachers from the Teacher table within that range.
- CalculateTeacherBonus: Uses a cursor to calculate the bonus amount for teachers based on salary conditions, considering different bonus percentages for specific salary ranges.
- ListFirst10Teachers: Utilizes a simple LOOP structure to list the first 10 records from the Teacher table.
- GetTeachersByRoomNumber: Accepts a room number and displays specific details (t\_no, f\_name, l\_name, birth\_date, title) of teachers associated with that room from the Teacher table.
- The code is structured in a modular manner using a MySQL Procedure 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 output for all the procedures.