**PL/SQL Programming**

**Exercise 1: Control Structures**

**Scenario 1:** The bank wants to apply a discount to loan interest rates for customers above 60 years old.

**Question:** Write a PL/SQL block that loops through all customers, checks their age, and if they are above 60, apply a 1% discount to their current loan interest rates.

**PL/SQL Procedure:**

DELIMITER //

CREATE PROCEDURE ApplyInterestDiscount()

BEGIN

DECLARE done INT DEFAULT 0;

DECLARE v\_customer\_id INT;

DECLARE v\_interest\_rate DECIMAL(10, 2);

DECLARE cur CURSOR FOR

SELECT c.CustomerID, l.InterestRate

FROM Customers c

JOIN Loans l ON c.CustomerID = l.CustomerID

WHERE TIMESTAMPDIFF(YEAR, c.DOB, CURDATE()) > 60;

DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = 1;

OPEN cur;

read\_loop: LOOP

FETCH cur INTO v\_customer\_id, v\_interest\_rate;

IF done THEN

LEAVE read\_loop;

END IF;

SET v\_interest\_rate = v\_interest\_rate \* 0.99; -- Apply 1% discount

UPDATE Loans

SET InterestRate = v\_interest\_rate

WHERE CustomerID = v\_customer\_id;

END LOOP;

CLOSE cur;

END //

DELIMITER ;

**Example Execution:**

mysql -u username -p

USE your\_database\_name;

CALL ApplyInterestDiscount();

**Scenario 2:** A customer can be promoted to VIP status based on their balance.

**Question:** Write a PL/SQL block that iterates through all customers and sets a flag IsVIP to TRUE for those with a balance over $10,000.

First, ensure the Customers table has an IsVIP column:

ALTER TABLE Customers ADD COLUMN IsVIP BOOLEAN DEFAULT FALSE;

**PL/SQL Procedure:**

DELIMITER //

CREATE PROCEDURE PromoteVIPCustomers()

BEGIN

DECLARE done INT DEFAULT 0;

DECLARE v\_customer\_id INT;

DECLARE cur CURSOR FOR

SELECT CustomerID

FROM Customers

WHERE Balance > 10000;

DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = 1;

OPEN cur;

read\_loop: LOOP

FETCH cur INTO v\_customer\_id;

IF done THEN

LEAVE read\_loop;

END IF;

UPDATE Customers

SET IsVIP = TRUE

WHERE CustomerID = v\_customer\_id;

END LOOP;

CLOSE cur;

END //

DELIMITER ;

CALL PromoteVIPCustomers();

**Example Execution:**

mysql -u your\_username -p

USE your\_database\_name;

CALL PromoteVIPCustomers();

**Scenario 3:** The bank wants to send reminders to customers whose loans are due within the next 30 days.

**Question:** Write a PL/SQL block that fetches all loans due in the next 30 days and prints a reminder message for each customer.

**PL/SQL Procedure:**

DELIMITER //

CREATE PROCEDURE SendLoanReminders()

BEGIN

DECLARE done INT DEFAULT 0;

DECLARE v\_customer\_id INT;

DECLARE v\_end\_date DATE;

DECLARE v\_name VARCHAR(100);

DECLARE cur CURSOR FOR

SELECT l.CustomerID, l.EndDate, c.Name

FROM Loans l

JOIN Customers c ON l.CustomerID = c.CustomerID

WHERE l.EndDate BETWEEN CURDATE() AND DATE\_ADD(CURDATE(), INTERVAL 30 DAY);

DECLARE CONTINUE HANDLER FOR NOT FOUND SET done = 1;

OPEN cur;

read\_loop: LOOP

FETCH cur INTO v\_customer\_id, v\_end\_date, v\_name;

IF done THEN

LEAVE read\_loop;

END IF;

SELECT CONCAT('Reminder: Loan for customer ', v\_name, ' (ID: ', v\_customer\_id, ') is due on ', v\_end\_date) AS ReminderMessage;

END LOOP;

CLOSE cur;

END //

DELIMITER ;

**Example Execution:**

mysql -u username -p

USE your\_database\_name;

CALL SendLoanReminders();