Example 1: Control Structures

Q1.

DECLARE

v\_customer\_id Customers.CustomerID%TYPE;

v\_dob Customers.DOB%TYPE;

v\_age NUMBER;

v\_loan\_id Loans.LoanID%TYPE;

v\_interest\_rate Loans.InterestRate%TYPE;

CURSOR c\_customers IS

SELECT CustomerID, DOB

FROM Customers;

CURSOR c\_loans(p\_customer\_id NUMBER) IS

SELECT LoanID, InterestRate

FROM Loans

WHERE CustomerID = p\_customer\_id;

BEGIN

FOR customer\_rec IN c\_customers LOOP

-- Calculate age

v\_age := TRUNC(MONTHS\_BETWEEN(SYSDATE, customer\_rec.DOB) / 12);

-- Check if customer is above 60

IF v\_age > 60 THEN

-- Loop through customer's loans

FOR loan\_rec IN c\_loans(customer\_rec.CustomerID) LOOP

-- Apply 1% discount

v\_interest\_rate := loan\_rec.InterestRate - 1;

-- Ensure interest rate doesn't go below 0%

v\_interest\_rate := GREATEST(v\_interest\_rate, 0);

-- Update loan interest rate

UPDATE Loans

SET InterestRate = v\_interest\_rate

WHERE LoanID = loan\_rec.LoanID;

-- Log the change

DBMS\_OUTPUT.PUT\_LINE('Updated loan ' || loan\_rec.LoanID ||

' for customer ' || customer\_rec.CustomerID ||

'. New interest rate: ' || v\_interest\_rate || '%');

END LOOP;

END IF;

END LOOP;

COMMIT;

DBMS\_OUTPUT.PUT\_LINE('Process completed successfully.');

EXCEPTION

WHEN OTHERS THEN

ROLLBACK;

DBMS\_OUTPUT.PUT\_LINE('An error occurred: ' || SQLERRM);

END;

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Q2.

ALTER TABLE Customers ADD IsVIP NUMBER(1) DEFAULT 0;

DECLARE

CURSOR c\_customers IS

SELECT CustomerID, Balance

FROM Customers;

v\_vip\_threshold NUMBER := 10000; -- $10,000 threshold for VIP status

v\_updated\_count NUMBER := 0;

BEGIN

FOR customer\_rec IN c\_customers LOOP

IF customer\_rec.Balance > v\_vip\_threshold THEN

-- Update customer to VIP status

UPDATE Customers

SET IsVIP = 1

WHERE CustomerID = customer\_rec.CustomerID;

v\_updated\_count := v\_updated\_count + 1;

ELSE

-- Ensure non-VIP status for customers below threshold

UPDATE Customers

SET IsVIP = 0

WHERE CustomerID = customer\_rec.CustomerID;

END IF;

END LOOP;

COMMIT;

DBMS\_OUTPUT.PUT\_LINE('Process completed. ' || v\_updated\_count || ' customers updated to VIP status.');

EXCEPTION

WHEN OTHERS THEN

ROLLBACK;

DBMS\_OUTPUT.PUT\_LINE('An error occurred: ' || SQLERRM);

END;

/

Q3.

DECLARE

CURSOR c\_due\_loans IS

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

FROM Loans l

JOIN Customers c ON l.CustomerID = c.CustomerID

WHERE l.EndDate BETWEEN SYSDATE AND SYSDATE + 30;

v\_reminder\_count NUMBER := 0;

BEGIN

FOR loan\_rec IN c\_due\_loans LOOP

DBMS\_OUTPUT.PUT\_LINE('Reminder for Loan ID: ' || loan\_rec.LoanID);

DBMS\_OUTPUT.PUT\_LINE('Dear ' || loan\_rec.Name || ',');

DBMS\_OUTPUT.PUT\_LINE('This is a reminder that your loan of $' ||

TO\_CHAR(loan\_rec.LoanAmount, '999,999.99') ||

' is due on ' || TO\_CHAR(loan\_rec.EndDate, 'YYYY-MM-DD') || '.');

DBMS\_OUTPUT.PUT\_LINE('Please ensure timely repayment to avoid any late fees.');

DBMS\_OUTPUT.PUT\_LINE('-------------------------------------------');

v\_reminder\_count := v\_reminder\_count + 1;

END LOOP;

IF v\_reminder\_count > 0 THEN

DBMS\_OUTPUT.PUT\_LINE('Total reminders generated: ' || v\_reminder\_count);

ELSE

DBMS\_OUTPUT.PUT\_LINE('No loans are due within the next 30 days.');

END IF;

EXCEPTION

WHEN OTHERS THEN

DBMS\_OUTPUT.PUT\_LINE('An error occurred: ' || SQLERRM);

END;

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