**Exercise 5: Triggers**

**Scenario 1: Automatically update the last modified date when a customer's record is updated.**

**Question: Write a trigger UpdateCustomerLastModified that updates the LastModified column of the Customers table to the current date whenever a customer's record is updated.**

CREATE OR REPLACE TRIGGER UpdateCustomerLastModified

BEFORE UPDATE ON Customers

FOR EACH ROW

BEGIN

:NEW.LastModified := SYSDATE;

END;

**Scenario 2: Maintain an audit log for all transactions.**

**Question: Write a trigger LogTransaction that inserts a record into an AuditLog table whenever a transaction is inserted into the Transactions table.**

CREATE TABLE AuditLog (

AuditID NUMBER PRIMARY KEY,

TransactionID NUMBER,

ChangeDate DATE,

ChangeType VARCHAR2(50)

);

CREATE SEQUENCE AuditLogSeq

START WITH 1

INCREMENT BY 1

NOCACHE

NOCYCLE;

CREATE OR REPLACE TRIGGER LogTransaction

AFTER INSERT ON Transactions

FOR EACH ROW

BEGIN

INSERT INTO AuditLog (TransactionID, AccountID, TransactionDate, Amount, TransactionType)

VALUES (:NEW.TransactionID, :NEW.AccountID, :NEW.TransactionDate, :NEW.Amount, :NEW.TransactionType);

END;

**Scenario 3: Enforce business rules on deposits and withdrawals.**

**Question: Write a trigger CheckTransactionRules that ensures withdrawals do not exceed the balance and deposits are positive before inserting a record into the Transactions table.**

CREATE OR REPLACE TRIGGER CheckTransactionRules

BEFORE INSERT ON Transactions

FOR EACH ROW

DECLARE

v\_balance NUMBER;

BEGIN

IF :NEW.TransactionType = 'Withdrawal' THEN

SELECT Balance INTO v\_balance FROM Accounts WHERE AccountID = :NEW.AccountID;

IF :NEW.Amount > v\_balance THEN

RAISE\_APPLICATION\_ERROR(-20001, 'Insufficient balance for withdrawal');

END IF;

END IF;

IF :NEW.TransactionType = 'Deposit' AND :NEW.Amount <= 0 THEN

RAISE\_APPLICATION\_ERROR(-20002, 'Deposit amount must be positive');

END IF;

END;