**Exercise 5: Triggers**

**Scenario 1: Automatically Update the Last Modified Date**

**Trigger: UpdateCustomerLastModified**

CREATE OR REPLACE TRIGGER UpdateCustomerLastModified

BEFORE UPDATE ON customers

FOR EACH ROW

BEGIN

:NEW.lastmodified := SYSDATE;

END UpdateCustomerLastModified;

/

**Scenario 2: Maintain an Audit Log for All Transactions**

**Trigger: LogTransaction**

-- Create the AuditLog table

CREATE TABLE AuditLog (

LogID NUMBER PRIMARY KEY,

TransactionID NUMBER,

AccountID NUMBER,

TransactionDate DATE,

Amount NUMBER,

TransactionType VARCHAR2(10),

LogTimestamp DATE

);

-- Create the sequence for generating LogID

CREATE SEQUENCE auditlog\_seq

START WITH 1

INCREMENT BY 1;

-- Create the trigger to log transactions

CREATE OR REPLACE TRIGGER LogTransaction

AFTER INSERT ON transactions

FOR EACH ROW

BEGIN

INSERT INTO AuditLog (

LogID,

TransactionID,

AccountID,

TransactionDate,

Amount,

TransactionType,

LogTimestamp

) VALUES (

auditlog\_seq.NEXTVAL,

:NEW.transactionid,

:NEW.accountid,

:NEW.transactiondate,

:NEW.amount,

:NEW.transactiontype,

SYSDATE

);

END LogTransaction;

/

**Scenario 3: Enforce Business Rules on Deposits and Withdrawals**

**Trigger: CheckTransactionRules**

CREATE OR REPLACE TRIGGER CheckTransactionRules

BEFORE INSERT ON transactions

FOR EACH ROW

DECLARE

v\_balance accounts.balance%TYPE;

BEGIN

-- Get the balance of the account

SELECT balance INTO v\_balance

FROM accounts

WHERE accountid = :NEW.accountid

FOR UPDATE;

-- Check if the transaction is a withdrawal and ensure it does not exceed the balance

IF :NEW.transactiontype = 'Withdrawal' THEN

IF :NEW.amount > v\_balance THEN

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

END IF;

END IF;

-- Check if the transaction is a deposit and ensure the amount is positive

IF :NEW.transactiontype = 'Deposit' THEN

IF :NEW.amount <= 0 THEN

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

END IF;

END IF;

END CheckTransactionRules;

/