**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.

**Trigger:**

SQL> CREATE OR REPLACE TRIGGER UpdateCustomerLastModified

2 BEFORE UPDATE ON Customers

3 FOR EACH ROW

4 BEGIN

5 :NEW.LastModified := SYSDATE;

6 END;

7 /

**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:**

SQL> CREATE TABLE AuditLog (

2 AuditID NUMBER PRIMARY KEY,

3 TransactionID NUMBER,

4 ActionDate DATE,

5 Action VARCHAR2(50),

6 FOREIGN KEY (TransactionID) REFERENCES Transactions(TransactionID)

7 );

**Create Sequence:**SQL> CREATE SEQUENCE AuditLog\_seq

2 START WITH 1

3 INCREMENT BY 1;

**Trigger:**

SQL> CREATE OR REPLACE TRIGGER LogTransaction

2 AFTER INSERT ON Transactions

3 FOR EACH ROW

4 BEGIN

5 INSERT INTO AuditLog (AuditID, TransactionID, ActionDate, Action)

6 VALUES (AuditLog\_seq.NEXTVAL, :NEW.TransactionID, SYSDATE, 'Transaction Inserted');

7 END;

8 /

**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.

**Trigger:**

SQL> CREATE OR REPLACE TRIGGER CheckTransactionRules

2 BEFORE INSERT ON Transactions

3 FOR EACH ROW

4 DECLARE

5 v\_balance NUMBER;

6 BEGIN

7 -- Get the current balance of the account

8 SELECT Balance INTO v\_balance

9 FROM Accounts

10 WHERE AccountID = :NEW.AccountID;

11

12 -- Check if the transaction is a withdrawal and exceeds the balance

13 IF :NEW.TransactionType = 'Withdrawal' AND :NEW.Amount > v\_balance THEN

14 RAISE\_APPLICATION\_ERROR(-20001, 'Withdrawal amount exceeds account balance.');

15 END IF;

16

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

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

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

20 END IF;

21 END;

22 /