Exercise 7: Packages

**Scenario 1: Group all customer-related procedures and functions into a package.**

CREATE OR REPLACE PACKAGE CustomerManagement AS

PROCEDURE AddCustomer(p\_customer\_id IN NUMBER, p\_name IN VARCHAR2, p\_dob IN DATE, p\_balance IN NUMBER);

PROCEDURE UpdateCustomer(p\_customer\_id IN NUMBER, p\_name IN VARCHAR2, p\_dob IN DATE, p\_balance IN NUMBER);

FUNCTION GetCustomerBalance(p\_customer\_id IN NUMBER) RETURN NUMBER;

END CustomerManagement;

CREATE OR REPLACE PACKAGE BODY CustomerManagement AS

PROCEDURE AddCustomer(p\_customer\_id IN NUMBER, p\_name IN VARCHAR2, p\_dob IN DATE, p\_balance IN NUMBER) IS

BEGIN

INSERT INTO Customers (CustomerID, Name, DOB, Balance, LastModified)

VALUES (p\_customer\_id, p\_name, p\_dob, p\_balance, SYSDATE);

END AddCustomer;

PROCEDURE UpdateCustomer(p\_customer\_id IN NUMBER, p\_name IN VARCHAR2, p\_dob IN DATE, p\_balance IN NUMBER) IS

BEGIN

UPDATE Customers

SET Name = p\_name, DOB = p\_dob, Balance = p\_balance, LastModified = SYSDATE

WHERE CustomerID = p\_customer\_id;

END UpdateCustomer;

FUNCTION GetCustomerBalance(p\_customer\_id IN NUMBER) RETURN NUMBER IS

v\_balance NUMBER;

BEGIN

SELECT Balance INTO v\_balance

FROM Customers

WHERE CustomerID = p\_customer\_id;

RETURN v\_balance;

END GetCustomerBalance;

END CustomerManagement;

**Scenario 2: Create a package to manage employee data.**

CREATE OR REPLACE PACKAGE EmployeeManagement AS

PROCEDURE HireEmployee(p\_employee\_id IN NUMBER, p\_name IN VARCHAR2, p\_position IN VARCHAR2, p\_salary IN NUMBER, p\_department IN VARCHAR2, p\_hire\_date IN DATE);

PROCEDURE UpdateEmployee(p\_employee\_id IN NUMBER, p\_name IN VARCHAR2, p\_position IN VARCHAR2, p\_salary IN NUMBER, p\_department IN VARCHAR2);

FUNCTION CalculateAnnualSalary(p\_employee\_id IN NUMBER) RETURN NUMBER;

END EmployeeManagement;

CREATE OR REPLACE PACKAGE BODY EmployeeManagement AS

PROCEDURE HireEmployee(p\_employee\_id IN NUMBER, p\_name IN VARCHAR2, p\_position IN VARCHAR2, p\_salary IN NUMBER, p\_department IN VARCHAR2, p\_hire\_date IN DATE) IS

BEGIN

INSERT INTO Employees (EmployeeID, Name, Position, Salary, Department, HireDate)

VALUES (p\_employee\_id, p\_name, p\_position, p\_salary, p\_department, p\_hire\_date);

END HireEmployee;

PROCEDURE UpdateEmployee(p\_employee\_id IN NUMBER, p\_name IN VARCHAR2, p\_position IN VARCHAR2, p\_salary IN NUMBER, p\_department IN VARCHAR2) IS

BEGIN

UPDATE Employees

SET Name = p\_name, Position = p\_position, Salary = p\_salary, Department = p\_department

WHERE EmployeeID = p\_employee\_id;

END UpdateEmployee;

FUNCTION CalculateAnnualSalary(p\_employee\_id IN NUMBER) RETURN NUMBER IS

v\_salary NUMBER;

BEGIN

SELECT Salary INTO v\_salary

FROM Employees

WHERE EmployeeID = p\_employee\_id;

RETURN v\_salary \* 12;

END CalculateAnnualSalary;

END EmployeeManagement;

**Scenario 3: Group all account-related operations into a package.**

CREATE OR REPLACE PACKAGE AccountOperations AS

PROCEDURE OpenAccount(p\_account\_id IN NUMBER, p\_customer\_id IN NUMBER, p\_account\_type IN VARCHAR2, p\_balance IN NUMBER);

PROCEDURE CloseAccount(p\_account\_id IN NUMBER);

FUNCTION GetTotalBalance(p\_customer\_id IN NUMBER) RETURN NUMBER;

END AccountOperations;

CREATE OR REPLACE PACKAGE BODY AccountOperations AS

PROCEDURE OpenAccount(p\_account\_id IN NUMBER, p\_customer\_id IN NUMBER, p\_account\_type IN VARCHAR2, p\_balance IN NUMBER) IS

BEGIN

INSERT INTO Accounts (AccountID, CustomerID, AccountType, Balance, LastModified)

VALUES (p\_account\_id, p\_customer\_id, p\_account\_type, p\_balance, SYSDATE);

END OpenAccount;

PROCEDURE CloseAccount(p\_account\_id IN NUMBER) IS

BEGIN

DELETE FROM Accounts

WHERE AccountID = p\_account\_id;

END CloseAccount;

FUNCTION GetTotalBalance(p\_customer\_id IN NUMBER) RETURN NUMBER IS

v\_total\_balance NUMBER;

BEGIN

SELECT SUM(Balance) INTO v\_total\_balance

FROM Accounts

WHERE CustomerID = p\_customer\_id;

RETURN v\_total\_balance;

END GetTotalBalance;

END AccountOperations;