**Exercise 7: Packages**

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

**Question:** Create a package CustomerManagement with procedures for adding a new customer, updating customer details, and a function to get customer balance

CREATE OR REPLACE PACKAGE CustomerManagement AS

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

PROCEDURE UpdateCustomerDetails(p\_customer\_id NUMBER, p\_name VARCHAR2, p\_dob DATE);

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

END CustomerManagement;

/

CREATE OR REPLACE PACKAGE BODY CustomerManagement AS

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

BEGIN

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

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

END AddNewCustomer;

PROCEDURE UpdateCustomerDetails(p\_customer\_id NUMBER, p\_name VARCHAR2, p\_dob DATE) IS

BEGIN

UPDATE Customers

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

WHERE CustomerID = p\_customer\_id;

END UpdateCustomerDetails;

FUNCTION GetCustomerBalance(p\_customer\_id 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.**

**Question:** Write a package EmployeeManagement with procedures to hire new employees, update employee details, and a function to calculate annual salary.

CREATE OR REPLACE PACKAGE EmployeeManagement AS

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

PROCEDURE UpdateEmployeeDetails(p\_employee\_id NUMBER, p\_position VARCHAR2, p\_salary NUMBER);

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

END EmployeeManagement;

/

CREATE OR REPLACE PACKAGE BODY EmployeeManagement AS

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

BEGIN

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

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

END HireEmployee;

PROCEDURE UpdateEmployeeDetails(p\_employee\_id NUMBER, p\_position VARCHAR2, p\_salary NUMBER) IS

BEGIN

UPDATE Employees

SET Position = p\_position, Salary = p\_salary

WHERE EmployeeID = p\_employee\_id;

END UpdateEmployeeDetails;

FUNCTION CalculateAnnualSalary(p\_employee\_id 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.**

**Question:** Create a package AccountOperations with procedures for opening a new account, closing an account, and a function to get the total balance of a customer across all accounts

CREATE OR REPLACE PACKAGE AccountOperations AS

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

PROCEDURE CloseAccount(p\_account\_id NUMBER);

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

END AccountOperations;

/

CREATE OR REPLACE PACKAGE BODY AccountOperations AS

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

BEGIN

DELETE FROM Accounts

WHERE AccountID = p\_account\_id;

END CloseAccount;

FUNCTION GetTotalBalance(p\_customer\_id 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;

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