**Exercise 7: Packages**

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

CREATE OR REPLACE PACKAGE CustomerManagement AS

PROCEDURE AddNewCustomer (

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 AddNewCustomer (

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);

COMMIT;

END;

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;

COMMIT;

END;

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;

EXCEPTION

WHEN NO\_DATA\_FOUND THEN

RETURN 0;

END;

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);

COMMIT;

END;

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;

COMMIT;

END;

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;

EXCEPTION

WHEN NO\_DATA\_FOUND THEN

RETURN 0;

END;

END EmployeeManagement;

/

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

CREATE OR REPLACE PACKAGE AccountOperations AS

PROCEDURE OpenNewAccount (

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 OpenNewAccount (

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);

COMMIT;

END;

PROCEDURE CloseAccount (

p\_account\_id IN NUMBER

) IS

BEGIN

DELETE FROM Accounts WHERE AccountID = p\_account\_id;

COMMIT;

END;

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;

EXCEPTION

WHEN NO\_DATA\_FOUND THEN

RETURN 0;

END;

END AccountOperations;

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