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**Case Study**



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## Objectives

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**The case study helps you to consolidate the knowledge you have gained and decide upon the most appropriate programming construct.**

At the end of this lesson, you should be able to do the following:

- Fully utilize your knowledge and create an integrated database solution using stored procedures, functions, packages, and triggers.

## Preliminary Tasks

- 1 Create base tables according to Database Design
- 2 Populate tables with test data
- 3 DBA GRANTS relevant privileges
- 4 DBA runs set-up scripts, for example *catproc.sql*
- 5 Create your own useful scripts, for documentation and development

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## Following Development Guidelines

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**In practice, you perform preliminary tasks before actually creating the procedural constructs.**

### Preliminary Tasks

- 1 Create the base tables in accordance with the principles of relational database design.
- 2 Populate the tables with test data.
- 3 Obtain the appropriate access privileges for the data manager, the developer, and the end user.
- 4 Run all the necessary set-up scripts by running *catproc.sql* within the *sys* schema.
- 5 Develop useful scripts for documentation and development.
  - List procedures, functions, packages, and triggers.
  - Recreate procedures, functions, packages, and triggers.
  - List the text for a given procedure, function, package, and trigger.
  - List direct and indirect dependencies upon a given table.
  - Recompile invalid, dependent objects automatically (by writing a script file that highlights invalid objects, and issue the appropriate syntax to recompile these objects).

## **Developing a Complete Application**

- 1 Use application base features, for example**
  - declarative constraints
  - roles
  - views
  - snapshots
- 2 Use triggers to augment the functionality of the Oracle base product**
- 3 Use packages to implement data manipulation and query routines**

## **Following Development Guidelines**

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**Adhere to a strategy for developing a database-level application using the procedural capabilities.**

### **Developing a complete application**

- 1 Implement as many features of the application as possible with declarative integrity constraints, roles, views, snapshots, and other base product features.
- 2 Create triggers to augment the capabilities of the Oracle base product.
- 3 Create packages of procedures and functions to implement data manipulation and query routines.

#### **Note:**

- Create each construct, wherever possible, within a script file.
- Create each procedural construct one-by-one before incorporating it into a package.

## Naming Convention Guidelines

Use naming conventions for procedural constructs, identifiers and filenames.

For example

Procedure hire\_emp

Function get\_sal

Variable v\_empno

Filename c\_add\_inventory

## Following Development Guidelines

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This is a possible naming convention that could be used for procedural constructs, identifiers, and operating system filenames.

CATEGORY	OBJECT	NAMING CONVENTION	EXAMPLE
Procedural Construct	Procedure	<i>verb_noun</i>	hire_emp
	Function	<i>verb_noun</i>	get_sal
	Package	<i>noun_package</i>	emp_package
	Trigger	<i>verb_noun</i>	audit_emp
Identifier	Variable	<i>v_name</i>	v_empno
	Global variable	<i>g_name</i>	g_comm_rate
	Constant	<i>name_constant</i>	explanation_constant
	Cursor	<i>cursor_name</i>	cursor_emp
	Exception	<i>e_name</i>	e_invalid_employee
	SQL*Plus substitution parameter	<i>p_name</i>	&p_empno
Filename	Script file with the CREATE syntax	<i>c_name</i>	c_add_inventory
	Run file that invokes the construct and displays results	<i>r_name</i>	r_add_inventory

**Note:** Before you write actual code, first decide how you are going to implement each of the routines, with a declarative constraint, procedure, function, Oracle supplied package, or trigger. Be sure to test each routine fully before going on to the next one.

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Most of the following questions ask you to create a construct/routine. You need to decide if the implementation of the question should be with a declarative constraint (C), procedure (P), function (F), or trigger (T). Tick your choice.

In the case of procedures and functions, you need additionally to decide if they will be public or private parts of a package.

- 1 Create a routine to place a new order into the ORD table.  
C, P, F, T ?

**Note:** There is a sequence number generator called ORDID that should be used for the order number.

- 2 Ensure that the customer on the order is a valid customer from the CUSTOMER table.  
C, P, F, T ?

- 3 Create a routine to add a line item into the ITEM table.  
C, P, F, T ?

**Note:** You will need to distinguish between a new order or adding a line item to an existing order.

- 4 Create a routine to retrieve the item total for a given line item.  
C, P, F, T ?

- 5 Create a routine to retrieve the quantity ordered for a given line item.  
C, P, F, T ?

- 6 Create a routine to change the actual price for a given line item.  
C, P, F, T ?

- 7 Ensure that the actual price for a product is never less than the current minimum price for that product.  
C, P, F, T ?

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- 8 Create a routine to change the quantity for a given line item.  
C, P, F, T ?
- 9 Create a routine so that, if there is a change in price or quantity, the item total for that line item reflects the new value.  
C, P, F, T ?
- 10 Maintain the order total automatically whenever an operation is performed that affects the order total.  
C, P, F, T ?
- 11 Create a routine to update the shipping date, when the order is shipped.  
C, P, F, T ?
- 12 Ensure that the shipping date is not before the order date.  
C, P, F, T ?
- 13 Ensure that once an order has been shipped, that it cannot be changed.  
C, P, F, T ?
- 14 Create a routine to add a new price for a product.  
C, P, F, T ?
- 15 Ensure that if the product already exists, and there has been a price change, that the end date has the correct value in it for the previous price.  
C, P, F, T ?
- 16 Ensure that the standard price for the product is not less than the minimum price.  
C, P, F, T ?
- 17 Create a routine to get the price of a product. Ensure that the product already exists.  
C, P, F, T ?



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- 18 Create a routine to add a customer to the CUSTOMER table  
C, P, F, T ?
  - 19 Ensure that the sales representative is actually a salesman.  
C, P, F, T ?
  - 20 Increment the commission of the salesman by 4% of the total value of the order. This should be done at the time the goods are shipped.  
C, P, F, T ?
  - 21 Create a routine that finds out how many orders have not yet been shipped.  
C, P, F, T ?
- Note:** You will need to create a table to hold the information, or use a table called DUMMY.
- 22 Use an Oracle-supplied package to have this routine invoked every 24 hours. Check that it will work, by forcing the job to run.

