

**COMMERCIAL
APPLICATION
DEVELOPMENT
USING
ORACLE
DEVELOPER 2000**



BPB PUBLICATIONS

IVAN BAYROSS

TABLE OF CONTENTS

1. INTRODUCTION TO MANAGING DATA	1
BASIC DATABASE CONCEPTS	4
<i>What is a database ?</i>	<i>4</i>
<i>Characteristics of a Database Management System</i>	<i>4</i>
HOW THE CONCEPT OF RDBMS CAME ABOUT	4
CHARACTERISTICS OF A RELATIONAL DBMS MODEL	5
E.F. TED CODD'S LAWS FOR A FULLY FUNCTIONAL RELATIONAL DATABASE MANAGEMENT SYSTEM	8
ORACLE 7..... THE PRODUCT PHILOSOPHY	10
<i>Introduction to Oracle Tools</i>	<i>10</i>
<i>Oracle DBA</i>	<i>11</i>
<i>SQL*Plus</i>	<i>11</i>
<i>Oracle Forms</i>	<i>11</i>
<i>Report Writer</i>	<i>11</i>
<i>Oracle Graphics</i>	<i>12</i>
2. INTERACTIVE SQL	13
INVOKING SQL*PLUS	13
DATA MANIPULATION IN DATA BASE MANAGEMENT SYSTEMS	16
THE ORACLE DATATYPES	17
TWO DIMENSION MATRIX CREATION	17
<i>Creating a table</i>	<i>18</i>
<i>Creating a table from a table</i>	<i>19</i>
INSERTION OF DATA INTO TABLES	19
<i>Inserting a single row of data into a table</i>	<i>19</i>
<i>Inserting data into a table from another table</i>	<i>20</i>
<i>Insertion of selected data into a table from another table</i>	<i>20</i>
UPDATING THE CONTENTS OF A TABLE	20
DELETION OPERATIONS	21
<i>Deletion of all rows</i>	<i>21</i>
<i>Deletion of a specified number of rows</i>	<i>21</i>
THE MANY FACES OF THE SELECT COMMAND	22
<i>Global data extract</i>	<i>22</i>
<i>The retrieval of specific columns from a table</i>	<i>22</i>
<i>Elimination of duplicates from the Select statement</i>	<i>22</i>
<i>Sorting of data in a table</i>	<i>22</i>

<i>Selecting a data set from table data</i>	23
MODIFYING THE STRUCTURE OF TABLES.....	24
<i>Adding new columns</i>	24
<i>Modifying existing columns</i>	24
<i>Restrictions on the Alter table</i>	24
REMOVING / DELETING / DROPPING TABLES.....	24
DATA CONSTRAINTS.....	25
<i>Column Level and Table Level Constraints</i>	25
<i>NULL value concepts</i>	25
<i>Primary Key concepts</i>	26
<i>Unique Key concepts</i>	27
<i>Default value concepts</i>	27
<i>The Foreign Key/References constraint</i>	27
<i>CHECK Integrity constraints</i>	28
<i>Defining different constraints on the table</i>	29
<i>Defining Integrity constraints in the ALTER TABLE command</i>	31
<i>Dropping Integrity constraints in the ALTER TABLE command</i>	32
COMPUTATIONS IN EXPRESSION LISTS USED TO SELECT DATA.....	32
<i>Arithmetic operators</i>	33
<i>Renaming Columns Used With Expression Lists</i>	33
LOGICAL OPERATORS.....	34
RANGE SEARCHING.....	34
PATTERN MATCHING.....	34
<i>The use of the like predicate</i>	35
<i>The in and not in predicates</i>	36
ORACLE FUNCTIONS.....	37
GROUPING DATA FROM TABLES IN SQL.....	42
<i>The concept of grouping</i>	42
MANIPULATING DATES IN SQL.....	43
JOINS.....	43
<i>Joining Multiple Tables (Equi Joins)</i>	43
<i>Joining A Table to Itself (Self Joins)</i>	46
CONSTRUCTING AN ENGLISH SENTENCE WITH DATA FROM TABLE COLUMNS ..	48
SUBQUERIES.....	49
USING THE UNION, INTERSECT AND MINUS CLAUSE.....	
<i>Union Clause</i>	50
<i>Intersect Clause</i>	51
<i>Mimus Clause</i>	56

INDEXES	
<i>Creating an Index for a table</i>	57
<i>Dropping Indexes</i>	57
VIEWS	
<i>Creation of views</i>	58
<i>Renaming the columns of a view</i>	58
<i>Using Views (visual concept)</i>	58
<i>Selecting a data set from a view</i>	59
<i>Updateable Views</i>	59
<i>Destroying a view</i>	59
SEQUENCES	
<i>Creating Sequences</i>	60
<i>Referencing a Sequence</i>	61
<i>Altering A Sequence</i>	62
<i>Dropping A Sequence</i>	62
GRANTING PERMISSIONS	
<i>Permission on the objects created by the user</i>	63
<i>Granting permissions using GRANT statement</i>	63
<i>Object Privileges</i>	63
<i>With Grant Option</i>	64
<i>Referencing a table belonging to another user</i>	64
<i>Granting permissions to users when the grantor has been given GRANT permission</i>	64
REVOKING THE PERMISSIONS GIVEN	
<i>Revoking permissions using the REVOKE statement</i>	65
CREATION OF REPORTS IN SQL*PLUS	
<i>Formatting commands used in SQL*Plus</i>	66
SELF REVIEW EXERCISES IN SQL	
<i>Tables For Exercises</i>	69
<i>Sixty Self Review SQL Sentence Constructs For Practice</i>	70
<i>Single Table Retrieval</i>	74
3. PL/SQL	77
INTRODUCTION	77
<i>Performance</i>	77
<i>Performance Improvement</i>	77
<i>Portability</i>	74
<i>PL/SQL datatypes</i>	78
<i>What PL/SQL can do for programmers</i>	78
THE PL/SQL EXECUTION ENVIRONMENT	79
<i>PL/SQL in the Oracle RDBMS</i>	79

Using PL/SQL Blocks in the SQL*PLUS Environment	80
Running a PL/SQL block written via any editor	80
THE PL/SQL SYNTAX	81
The character set	81
Literals	81
Comments	82
Data Types	82
Variables	83
Assigning Values to Variables	83
Picking up a Variable's Parameters from a table cell	83
Declaring a constant	83
Using logical comparisons in PL/SQL	84
UNDERSTANDING THE PL/SQL BLOCK STRUCTURE	85
An identifier in the PL/SQL block	86
Displaying user Messages on the Screen	86
Conditional control in PL/SQL	86
Iterative Control	89
ORACLE TRANSACTIONS	89
Using commit	89
Using rollback	90
Using Savepoint	90
CONCURRENCY CONTROL IN ORACLE	92
LOCKS	92
Types of locks	92
Implicit locking	93
Explicit locking	93
Who can explicitly lock ?	93
Using the select...for update statement	94
Using lock table statement	95
When locks are released	96
CURSORS	96
How are SQL statements processed by Oracle ?	96
What is a cursor ?	96
Use of cursors in PL/SQL	97
Explicit Cursor	97
Why use an Explicit Cursor ?	97
Explicit Cursor Management	98
Declaring a Cursor	99
Opening a Cursor	99
Fetching a record from the Cursor	100
Closing a Cursor	101
Explicit Cursor Attributes	101
Cursor for loops	104
Implicit Cursor	107
Implicit Cursor Attributes	107

Parameterized Cursor	109
ERROR HANDLING IN PL/SQL	114
<i>Declaring Exceptions (i.e. user-defined error conditions)</i>	114
<i>Pre-determined internal PL/SQL exceptions</i>	115
4. STORED PROCEDURES	119
WHAT ARE PROCEDURES ?	119
<i>Declarative part</i>	119
<i>Executable part</i>	119
<i>Exception Handling part</i>	119
WHERE DO PROCEDURES RESIDE ?	119
HOW ORACLE CREATE A PROCEDURE ?	119
HOW ORACLE EXECUTES PROCEDURES ?	120
ADVANTAGES OF PROCEDURES	120
SYNTAX FOR CREATING STORED PROCEDURE	121
<i>Keywords and Parameters</i>	121
AN APPLICATION USING A PROCEDURE	122
DELETING A STORED PROCEDURE	125
5. STORED FUNCTIONS	126
WHAT ARE FUNCTIONS ?	126
<i>Declarative part</i>	126
<i>Executable part</i>	126
<i>Exception Handling part</i>	126
WHERE DO FUNCTIONS RESIDE ?	126
HOW ORACLE CREATES A FUNCTION ?	126
HOW ORACLE EXECUTES A FUNCTIONS ?	127
ADVANTAGES OF FUNCTIONS	127
SYNTAX FOR CREATING A STORED FUNCTION	128
<i>Keywords and Parameters</i>	128
AN APPLICATION USING A FUNCTION	129
DELETING A STORED FUNCTION	132

6. DATABASE TRIGGERS	133
INTRODUCTION.....	133
USE OF DATABASE TRIGGERS.....	133
<i>Database Triggers vs. Procedures</i>	133
<i>Database Triggers vs. SQL*Forms</i>	133
<i>Database Triggers vs. Declarative integrity constraints</i>	134
HOW TO APPLY DATABASE TRIGGERS.....	134
TYPES OF TRIGGERS.....	135
<i>Row Triggers</i>	135
<i>Statement Triggers</i>	135
<i>Before VS. After Triggers</i>	135
<i>Before Triggers</i>	135
<i>After Triggers</i>	136
<i>Combinations</i>	136
SYNTAX FOR CREATING TRIGGER.....	137
<i>Keywords and Parameters</i>	137
DELETING A TRIGGER.....	138
AN APPLICATION USING DATABASE TRIGGERS.....	139
RAISE_APPLICATION_ERROR PROCEDURE.....	143
7. WORKING WITH FORMS	145
BASIC CONCEPTS.....	145
APPLICATION DEVELOPMENT IN FORMS.....	145
<i>Forms</i>	145
<i>Menu</i>	146
<i>Library</i>	146
FORM MODULE.....	146
<i>Blocks</i>	146
<i>Items</i>	146
<i>Canvas-view</i>	147
<i>Windows</i>	149
USING THE FORMS DESIGNER.....	151
<i>Parts of Forms Designer Window</i>	151
<i>Tools Available with the Forms Designer</i>	152
CREATING A FORM.....	153
GENERATING AND RUNNING A FORM.....	158
<i>Data Retrieval and Manipulation Operations</i>	158
	159

USING THE LAYOUT EDITOR.....	160
<i>Positioning and Sizing an Item</i>	160
<i>Setting the Properties of the Items</i>	161
<i>Placing Push buttons on the Form</i>	161
CONSTRAINTS DEFINED AT THE TIME OF CREATION OF A BLOCK	163
8. MASTER FORM.....	164
PRODUCT MASTER DATA ENTRY SCREEN	164
TRIGGERS	165
<i>Interface Events</i>	166
<i>Internal Processing Events</i>	166
<i>The sequence of trigger execution</i>	166
<i>Writing Triggers</i>	166
THE BEHAVIOR OF AN ORACLE FORM IN A COMMERCIAL APPLICATION	168
<i>Form Behavior While Viewing Data</i>	169
<i>Form Behavior While Updating Data [Primary Key problems]</i>	169
<i>Form Behavior While Deleting Data</i>	169
<i>Form Behavior While Inserting Data</i>	169
<i>The Forms Mode Of Operation</i>	169
DATA NAVIGATION VIA AN ORACLE FORM.....	169
<i>Multiple Rows Being Retrieved From The Table</i>	169
<i>A Single Row Being Retrieved From The Table</i>	170
PROCEDURES.....	174
<i>Writing Procedures</i>	174
VALIDATIONS.....	178
<i>Table Data Input / Output Validations</i>	178
INCLUDING SEARCH FUNCTION IN THE MASTER FORM.....	184
9. PROPERTY CLASS AND VISUAL ATTRIBUTES.....	185
MAINTAINING STANDARDS IN FORMS.....	185
<i>Standards In A Commercial Application</i>	185
<i>Setting Standards in Oracle Forms</i>	185
PROPERTY CLASS	186
<i>Creating Property Class object</i>	187
VISUAL ATTRIBUTES	193
<i>Setting the visual attributes of an object</i>	193
<i>Creating Named Visual Attributes and applying the same on the objects</i>	194

10. LIBRARIES AND ALERTS	198
LIBRARY FILE FORMATS	198
<i>.PLL</i>	198
<i>.PLX</i>	198
<i>.PLD</i>	198
CREATING AND ATTACHING A LIBRARY TO A MODULE	199
<i>Creating a Library</i>	199
<i>Attaching a Library to Another Module</i>	199
HANDS ON	202
ALERTS	205
<i>Creating an Alert</i>	205
<i>Displaying an Alert</i>	207
DISPLAYING CONTEXT SENSITIVE HELP	223
<i>Display Context Sensitive Help on the message line at runtime</i>	223
<i>Displaying balloon Help</i>	223
11. MASTER DETAIL FORM	225
CREATING A MASTER-DETAIL FORM	226
<i>The Relation Object</i>	228
RUNNING A MASTER DETAIL FORM	230
<i>Data Retrieval and Manipulation Operations</i>	230
MASTER DETAIL DATA ENTRY SCREEN	242
<i>Relation Object and its Properties</i>	242
<i>Master Deletes Property</i>	242
<i>Setting the properties of the relation object</i>	242
<i>Creating a Display Item</i>	248
WORKING WITH LOV OBJECTS	249
<i>Creating A List of Values</i>	250
USING A RADIO BUTTON GROUP	253
CREATING AND USING A LIST ITEM	262
<i>Poplist</i>	262
<i>Text List</i>	262
<i>Combo List</i>	262
<i>Creating A List Item</i>	262
INCLUDING SEARCH FUNCTION IN THE MASTER DETAIL FORM	263
CROSS TABLE UPDATES	266
<i>Cross table updation in Insert Mode</i>	303
<i>Cross table updation in Modify Mode</i>	303
<i>Cross table updation in Delete Mode</i>	303

198
198
198
198
198
199
199
199
202
205
205
207
223
223
223
225
226
228
230
230
242
242
242
242
248
249
250
253
262
262
262
262
263
DETAIL FORM 266
303
303
303
303

12. PARAMETER PASSING IN FORMS.....309
 SPECIFYING THE PARAMETER LIST IN THE CALLING FORM.....309
 Creating a Parameter List.....309
 Adding Parameter to the Parameter List.....310
 Types of Parameters.....310
 TEXT_PARAMETER.....310
 DATA_PARAMETER.....310
 Specifying the parameters in the called form.....311
 Using the parameters in the called form.....312
 DIFFERENCES BETWEEN GLOBAL VARIABLES / PARAMETER VARIABLES.....313

13. USING MULTIPLE CANVASES ON A FORM.....321
 WORKING WITH CANVAS VIEWS.....321
 Types of Canvas Views.....321
 Creating a Stacked Canvas.....323
 Displaying a Stacked Canvas.....324

14. WORKING WITH MENUS.....328
 USING THE DEFAULT MENU.....328
 USING THE CUSTOM MENU.....329
 Creating A Menu Module.....330
 To Assign a Command to a Menu Item.....333
 ATTACHING A MENU MODULE TO A FORM.....337
 OPENING A FORM THROUGH THE MENU.....338
 Invoking Other Products From Oracle Forms Or Menus.....338
 CHECKED, ENABLED AND DISPLAYED PROPERTY OF MENU ITEMS.....347
 Checked Property.....347
 Enabled Property.....347
 Displayed Property.....347
 Getting the Value of the Menu Property.....347
 Setting the Properties of the menu item.....348

15. TOOLBARS.....351
 BASIC CONCEPTS.....351
 CREATING A TOOLBAR.....351

YASHSVI ACADEMY OF COMMERCE
 Count on First 20 Seats & Other Deserving Students
 Girls & Financially Weaker Students
 Rs. 10,000/-
 of NORTH Region
0-1

CA FOUNDATION RESULTS 2020 & 2021

Power of Super-30/40/50 Batch & Expert Teachers.
 Highest Success Ratio (और भी हई टार के साथ)

ICAI	2800	Other (1)	37%	48	38883
ICAI	500	Other (2)	62%	250	87084
ICAI	10	Other (3)	87%	10	38883

Feb. 2020
 No. of Students
 Students Passed
 No. of Ranks

Yashvi Academy

Power of Super-30/40/50 Batch & Expert Teachers.
 Highest Success Ratio (और भी हई टार के साथ)

AIR 27	PALAK JAIN	327 Marks	327
AIR 28	Prashant	327 Marks	327
AIR 29	SIMRAN	331 Marks	331
AIR 30	SHRUTI	331 Marks	331
AIR 31	SHRUTI	331 Marks	331
AIR 32	SHRUTI	331 Marks	331
AIR 33	SIMRAN	331 Marks	331
AIR 34	SHRUTI	331 Marks	331
AIR 35	SHRUTI	331 Marks	331
AIR 36	SHRUTI	331 Marks	331
AIR 37	KOMAL	327 Marks	327
AIR 38	SHRUTI	326 Marks	326
AIR 39	SHRUTI	326 Marks	326
AIR 40	SHRUTI	326 Marks	326
AIR 41	SHRUTI	326 Marks	326
AIR 42	SHRUTI	326 Marks	326
AIR 43	SHRUTI	326 Marks	326
AIR 44	SHRUTI	326 Marks	326
AIR 45	SHRUTI	326 Marks	326
AIR 46	SHRUTI	326 Marks	326
AIR 47	SHRUTI	326 Marks	326
AIR 48	SHRUTI	326 Marks	326
AIR 49	SHRUTI	326 Marks	326
AIR 50	SHRUTI	326 Marks	326

16. WORKING WITH REPORTS	361
FEATURES	362
<i>Basic Concepts</i>	363
DEFINING A DATA MODEL FOR A REPORT	363
<i>Queries</i>	363
<i>Groups</i>	364
<i>Columns</i>	364
<i>Parameters</i>	364
<i>Data Links</i>	364
SPECIFY THE LAYOUT FOR A REPORT	365
<i>Repeating Frames</i>	365
<i>Frames</i>	365
<i>Fields</i>	365
<i>Boilerplate</i>	365
<i>Anchors</i>	365
SPECIFY A RUNTIME PARAMETER FORM FOR A REPORT	366
<i>Fields</i>	366
<i>Boilerplate</i>	366
USE THE ORACLE REPORTS INTERFACE.....	367
<i>Property Sheets</i>	367
<i>Object Navigator</i>	367
<i>Editors</i>	368
<i>Palettes and Toolbars</i>	368
CREATING A DEFAULT TABULAR REPORT.....	369
<i>Creating a new Report Definition</i>	371
<i>Connecting to the Database</i>	371
<i>Specifying the Data for the Report</i>	372
<i>Specify a Default Layout for the Report</i>	377
<i>Save and run the Report</i>	378
CREATING COMPUTED COLUMNS	380
<i>Summaries columns</i>	380
<i>Formula columns</i>	380
<i>Create a Formula using the Formula Column Tool</i>	381
<i>Create serial nos. field using Summary Column Tool</i>	383
<i>Create a Report Summary using Summary Column Tool</i>	385
CREATING USER PARAMETERS	388
ARRANGING THE LAYOUT.....	394
<i>Change Layout Settings</i>	394
<i>Fill Color Tool</i>	394
<i>Line Color Tool</i>	394
<i>Text Color Tool</i>	395

17. CREATING A BREAK REPORT.....	403
<i>Creating a new Report Definition.....</i>	<i>405</i>
<i>Creating a Break Group.....</i>	<i>406</i>
<i>Creating summary column.....</i>	<i>409</i>
<i>Specifying default layout.....</i>	<i>410</i>
<i>About Repeating Frames.....</i>	<i>412</i>
<i>Arranging The Layout.....</i>	<i>413</i>
18. MASTER/DETAIL REPORT.....	417
CONCEPTS.....	417
<i>Data Link Object.....</i>	<i>417</i>
<i>Data Relationships.....</i>	<i>418</i>
<i>Layout.....</i>	<i>418</i>
CREATING A MASTER/DETAIL REPORT.....	418
<i>Creating the report definition.....</i>	<i>420</i>
<i>Queries Object.....</i>	<i>421</i>
<i>Data Link Object.....</i>	<i>422</i>
<i>Creating Formula And Summary Columns.....</i>	<i>424</i>
<i>Formula Column.....</i>	<i>424</i>
<i>Default Layout.....</i>	<i>425</i>
<i>Arranging the Layout.....</i>	<i>427</i>
<i>Accepting Parameter Values.....</i>	<i>431</i>
19. CREATING A MATRIX REPORT.....	436
MATRIX DATA MODEL.....	437
<i>Number Of Queries.....</i>	<i>437</i>
<i>Group Structure.....</i>	<i>437</i>
<i>Summaries and Product Order.....</i>	<i>438</i>
<i>Matrix Layout.....</i>	<i>439</i>
<i>Matrix / Cross Product Object.....</i>	<i>439</i>
<i>Creating Query.....</i>	<i>442</i>
<i>Creating groups.....</i>	<i>443</i>
<i>Creating Default Layout.....</i>	<i>444</i>
<i>Creating Summary columns.....</i>	<i>446</i>
<i>Adding Zeroes in place of non-existent values.....</i>	<i>448</i>
<i>Adding a Grid.....</i>	<i>451</i>
<i>Creating User Parameters.....</i>	<i>452</i>

20. WORKING WITH GRAPHS	454
INTRODUCTION.....	454
<i>Functionality of Oracle Graphics</i>	<i>454</i>
<i>Working with Charts</i>	<i>455</i>
DISPLAY	455
LAYOUT	455
QUERIES	455
<i>Chart Properties</i>	<i>456</i>
<i>Chart Types</i>	<i>456</i>
<i>Chart Templates</i>	<i>457</i>
USING THE GRAPHICS DESIGNER.....	458
<i>Tools Available with the Graphics Designer</i>	<i>458</i>
CREATING A GRAPH.....	459
PASSING PARAMETERS IN ORACLE GRAPHICS	468
21. DRILL DOWN CHARTS.....	473