



Essential PLSQL for Oracle 26ai *Computing Limited*

Section	Title	Page
One	PL/SQL Introduction	2
	- What is PLSQL used for ?	3
	- Notes about the Course	5
Two	PL/SQL Coding Structure	6
	- The Begin and End of PLSQL	7
	- Declaring Variables in PLSQL	8
	- Local Variables in PLSQL	8
	- Naming Local Variables in PLSQL	11
	- Using Quoted Identifier Variables (QIV)	13
	- Declaring Varchar2 in PLSQL	17
	- Declaring Numbers in PLSQL	18
	- Declaring Decimals in PLSQL	22
	- Declaring Integers in PLSQL	23
	- Declaring PLSQL_Integer in PLSQL	24
	- Declaring Binary_Integer in PLSQL	25
	- Declaring Natural in PLSQL	26
	- Declaring Naturaln in PLSQL	27
	- Declaring Positive in PLSQL	28
	- Declaring Positiven in PLSQL	29
	- Declaring Signtype in PLSQL	30
	- Declaring Simple_Integer in PLSQL	31
	- Declaring Boolean in PLSQL	32
	- Declaring Constants in PLSQL	33
	- How to run a PLSQL program in SQLPlus	35
	- Compiling PLSQL in SQL*Plus	37
	- PLSQL Compilation Checklist	40
	- Commenting PLSQL Scripts	42
	- Suggested documentation within PLSQL	44
Three	The Oracle SQLPlus and SQLcl Interfaces	45
	- How to logon	46
	- What do I need to login	47
	- The initial details shown in SQL Plus	51
	- ORA-01017 Error when logging into SQLPlus	52
	- ORA-12154 Error when logging into SQLPlus	53
	- How do I exit a session	54
	- Using Dos commands	55
	- SQLPlus Function Keys	56
	- Using the Line Editor	57
	- Using the Buffer Editor	58
	- Environment Settings	59
	- Saving and Reading SQL	60
	- Spooling Results to a file	61
	- Changing Passwords / Clearing the Screen in SQL	62
	- Exercise One	63
Four	Performing Simple DML in PLSQL	65
	- Using PLSQL to issue SQL statements	66
	- SQL statements and PLSQL local variables	67

Essential PLSQL for Oracle 26ai

Section	Title	Page
	- Declaring Variables Using %Type	70
	- Using Substitution Values in PLSQL (Ampersands)	74
	- <i>Exercise Two</i>	77
Five	Performing Conditional Statements in PLSQL	79
	- If .. Then Decision Statements	80
	- If .. Then Else Decision Statements	83
	- If .. Then Elsif Decision Statements	85
	- Multiple Conditions in PLSQL	86
	- Nesting If statements in PLSQL	87
	- Testing Booleans in PLSQL conditions	88
Six	Messaging with PLSQL	89
	- How to use the DBMS_OUTPUT package	90
	- Enabling and Disabling Messaging	93
	- <i>Exercise Three</i>	95
Seven	Exception Handling	97
	- The Exception clause in PLSQL	98
	- Using When within Exceptions	101
	- Using Others within Exceptions	104
	- Killing a PLSQL process with Raise_Application_Error	106
	- Testing for Oracle Defined Exceptions	110
	- Raising Developer Defined Exceptions	111
	- Assigning Pragma Exceptions in PLSQL	114
	- Grouping Exceptions in PLSQL	119
	- Alternative Way to Handle SQL Errors in PLSQL	118
	- Advanced techniques using SQLErrm	122
	- <i>Exercise Four</i>	123
Eight	Implicit Cursors	126
	- Using Implicit Cursors in PLSQL	127
	- Using Implicit Cursors to Select Records	129
	- Exception Handling in Implicit Cursors	130
	- Attributes of Implicit Cursors	132
	- Example of SQL%FOUND	133
	- Example of SQL%NOTFOUND	134
	- Example of SQL%ROWCOUNT	135
Nine	Sub-Blocking in PLSQL	136
	- PLSQL blocks within PLSQL blocks	137
	- Defining a Sub-Block	138
	- Re-Raising Exceptions in Sub-Blocks	140
	- <i>Exercise Five</i>	143
Ten	Explicit Cursors	147
	- Using Explicit Cursors in PLSQL	148
	- How Explicit Cursors Work	150
	- Attributes of an Explicit Cursor	153
	- Passing Parameters to Explicit Cursors	156
	- Explicit Cursors Versus Implicit Cursors	159
	- <i>Exercise Six</i>	160
Eleven	Using Sequences in PLSQL	163

Essential PLSQL for Oracle 26ai

Section	Title	Page
Twelve	Looping in PLSQL	166
	- Repetitive Processing in PLSQL	167
	- Basic Looping in PLSQL	168
	- While Looping in PLSQL	172
	- For Looping in PLSQL	175
	- Looping Dates in PLSQL	179
	- Using Characters in For Loops in PLSQL	180
	- Implicit Cursor For Looping in PLSQL	181
	- Explicit Cursor For Looping in PLSQL	183
	- Using other Loops with Explicit Cursors	186
	- Loop Labels in PLSQL	189
	- Loop Continue and Continue When	191
	- <i>Exercise Seven</i>	195
Thirteen	PL/SQL Database Objects	201
	- List of PLSQL Objects	202
	- Compiling PLSQL Objects	203
	- Metadata For PLSQL Objects	204
	- Re-Compiling PLSQL Objects	205
	- Dropping PLSQL Objects from a Database	207
	- Passing Parameters to PLSQL	208
	- Passing Parameters using Positional Notation	209
	- Passing Parameters Using Named Notation	211
	- Using Mixed Notation in SQL	212
	- User_Source Metadata	214
	- Describing PLSQL Objects in SQL*PLUS	215
Fourteen	Programmer Defined Functions	216
	- Syntax of Functions in Oracle	217
	- Suggested Naming Convention of Functions in Oracle	220
	- Function Example in PLSQL	221
	- Running Functions in SQL and PLSQL	223
	- Running Functions in Oracle	224
	- <i>Exercise Eight</i>	225
Fifteen	Programmer Defined Procedures	229
	- Syntax of Procedures in Oracle	230
	- Example of Procedures in Oracle	232
	- Executing Procedures in Oracle within SQL Plus	233
	- Executing Procedures in Oracle within PLSQL	234
Sixteen	Sub-programming Techniques	235
	- Declaring PLSQL within PLSQL	236
	- Example of a sub-program	237
	- <i>Exercise Nine</i>	239
Seventeen	Autonomous Transactions in PLSQL	242
	- Selective Committing in PLSQL processing	243
	- Example of an Autonomous Transaction	245
	- Using Autonomous Transactions in Triggers	252
Eighteen	Packaging Programmer Defined Programs	255
	- Packaging PLSQL in Oracle	256
	- Syntax of Packages in Oracle	258

Essential PLSQL for Oracle 26ai

Section	Title	Page
	- Compiling of Packages in Oracle	261
	- Private Processes in PLSQL Packages	262
	- Executing Packages in Oracle	264
	- Handling Exceptions in Packages in PLSQL	265
	- <i>Exercise Ten</i>	267
Nineteen	DML Triggers in Oracle	268
	- Types of Oracle Triggers	269
	- What are DML Triggers	270
	- DML Triggers Timing Points	272
	- DML Triggers When Conditions	273
	- DML Triggers When Conditions Examples	274
	- DML Triggers Suggested Naming Conventions	276
	- Syntax of DML Triggers in PLSQL	278
	- Referencing Values within Triggers	279
	- Checking the Event which fired the DML Trigger	283
	- Using the Follows syntax to dictate Trigger Firing	285
	- ORA-25022: cannot reference a trigger of different type	289
	- Using the Disable syntax when Compiling Triggers	290
	- Enabling/Disabling Triggers in an Oracle Database	291
	- Metadata for Triggers (User_Triggers)	293
	- Mutating DML Triggers in Oracle	294
	- <i>Exercise Eleven</i>	298
Twenty	Rowtypes in PLSQL	305
	- Using %Rowtype in PLSQL	306
	- Declaring a Variable as a %Rowtype	307
	- Referencing a %Rowtype Variable	308
	- Populating a Variable which is a %Rowtype	309
	- Passing a %Rowtype between Processes	312
	- Declaring a Cursor %Rowtype	314
Twenty One	Advanced Cursors	317
	- For Update with Explicit Cursors	318
	- Where Current Of Explicit Cursors	319
	- Example of Updating with Explicit Cursors	320
	- Using Nowait with Explicit Cursors	321
	- Using Skip Locked with Explicit Cursors	322
	- Using Wait with an Explicit Cursor	323
	- Using Rowid with Explicit Cursors	324
	- Using Returning Into in PLSQL	325
	- Using Rowtype for DML	328
Twenty Two	Savepoints in PLSQL	330
	- Marking progress in a PLSQL process	331
	- Example of Savepoints in a PLSQL process	332
Twenty Three	Case Statements and Case Expressions	333
	- Alternative Conditional Testing	334
	- Using Searched Case in PLSQL	335
	- Using Case in PLSQL	336
	- Using Nested Case in PLSQL	337
	- Using Case Expressions in PLSQL	339

Essential PLSQL for Oracle 26ai

Section	Title	Page
	- Dangling Predicates	343
	- Dangling Predicates with multiple choice	344
	- Using Nullif in PLSQL	348
	- Using Coalesce in PLSQL	349
	- <i>Exercise Twelve</i>	350
Twenty Four	File I/O	353
	- Reading and Writing from the Operating System	354
	- Accessing the File System using Oracle Directories	355
	- Creating Oracle Directories	356
	- Simple Write using UTL_FILE.PUT_LINE	358
	- Simple Read Using UTL_FILE.GET_LINE	359
	- Additional Functions in the UTL_FILE Package	360
	- Using UTL_FILE.PUTF in PLSQL	361
	- UTL_FILE Exceptions	363
	- Using UTL_FILE to perform Operating System Commands	365
	- Using UTL_FILE.Fcopy in PLSQL	366
	- Using UTL_FILE.Fgetattr in PLSQL	367
	- Using UTL_FILE.Fremove in PLSQL	368
	- Using UTL_FILE.Frename in PLSQL	369
Twenty Five	Dynamic SQL	370
	- Introduction to Dynamic SQL	371
	- Native Dynamic SQL (NDS) with Execute Immediate	372
	- NDS Error Handling	375
	- NDS with Inputs	376
	- NDS with Output	378
	- Dynamic Cursors and Sys_Refcursor	379
	- NDS with Outputs	381
	- Introduction to DBMS_SQL	382
	- DBMS_SQL Example	383
	- <i>Exercise Thirteen</i>	384

Appendices

- Appendix S1 – SQL Functions**
- Appendix S2 – SQL Line Editor Commands**
- Appendix S3 – SQL Environment Settings**
- Appendix S4 – SQL Number Formats**
- Appendix S5 – SQL Date Formats**

Delegate Questionnaire