



Essential PL/SQL 11g Using Application Express 4.2 Index

One	PLSQL Introduction	2
	– Procedural Language for SQL	3
	– Application Express	5
Two	Using Application Express	6
	– Introduction	7
	– Logging in	9
	– The Workspace	12
	– The Schema	13
	– Dashboard Topography	14
	– SQL Workshop	15
	– Administration	16
	– Changing the Password	18
	– About Administration	19
	– Exiting the Session	20
	– Invalid Login Credentials	21
	– Timeout and Session Expiry	22
Three	SQL Scripts	23
	– Introduction	24
	– Interface	25
	– Actions	27
	– Actions (Select Columns)	28
	– Actions (Filter)	29
	– Actions (Rows Per Page)	33
	– Actions (Format)	34
	– Actions (Sort)	35
	– Actions (Control Break)	36
	– Actions (Highlight)	37
	– Actions (Compute)	38
	– Actions (Aggregate)	40
	– Actions (Chart)	41
	– Actions (Group By)	42
	– Actions (Flashback)	43
	– Actions (Save Report)	45
	– Actions (Reset)	46
	– Actions (Help)	47
	– Actions (Download)	48
	– Actions (Download CSV)	49
	– Actions (Download HTML)	51
	– Actions (Download Email)	53
	– Actions (Subscription)	55
	– Alternative View of Scripts (View Icons)	56
	– Running Scripts	57
	– Manage Script Results	59
	– Other Options	64
	– Upload	65
	– Create	68
	– Show Quotas	69
	– Exporting SQL Scripts from Application Express	70
	– Importing SQL into Application Express	73
	– <i>Exercise One</i>	75
Four	PLSQL Structure	78
	– Basic Structure of PLSQL	79
	– The Declaration Section in PLSQL	80
	– Local Variables in PLSQL	81
	– Naming Local Variables in PLSQL	83
	– Quoted Identifier Variables	85



Essential PL/SQL 11g Using Application Express 4.2 Index

	- Variable Datatypes (varchar2)	89
	- Variable Datatypes (numbers)	90
	- Variable Datatypes (number)	91
	- Variable Datatypes (decimal)	94
	- Variable Datatypes (integer)	95
	- Variable Datatypes (pls_integer)	96
	- Variable Datatypes (binary_integer)	97
	- Variable Datatypes (natural)	98
	- Variable Datatypes (naturaln)	99
	- Variable Datatypes (positive)	100
	- Variable Datatypes (positiven)	101
	- Variable Datatypes (signtype)	102
	- Variable Datatypes (simple_integer)	103
	- Variable Datatypes (boolean)	104
	- Variable Datatypes - Constants	105
	- Running PLSQL in Application Express	107
	- Compiling PLSQL	108
	- Common Compilation Problems	109
	- Commenting PLSQL	111
	- Documenting PLSQL	113
	- <i>Exercise Two</i>	114
Five	SQL Commands	115
	- Introduction	116
	- Topography	117
	- Command Window	118
	- Autocommit	119
	- Rows	120
	- Clear Command	121
	- Find Tables	122
	- Find Tables (Rows)	124
	- Find Tables (Views)	125
	- Find Tables (Columns)	126
	- Save	128
	- Results	130
	- Explain	131
	- Describe	132
	- History	133
	- Commenting PLSQL	134
Six	Performing Simple DML in PLSQL	135
	- Introduction	136
	- Using Local Variables	137
	- Declaring Variables Using %Type	140
	- Using Bind Variables	144
	- <i>Exercise Three</i>	146
Seven	Performing Conditional Statements in PLSQL	149
	- If .. Then Statements	150
	- If .. Then Else Statements	153
	- If .. Then Elself Statements	155
	- Combining Tests	156
	- Nesting Conditions	157
	- Boolean Conditions	158
Eight	Communicating from Application Express	159
	- Messaging Using DBMS_OUTPUT	160
	- <i>Exercise Four</i>	163



Essential PL/SQL 11g Using Application Express 4.2 Index

Nine	Exception Handling	166
	– Introduction	167
	– The When Clause	170
	– The When Others Clause	173
	– Raise_Application_Error	175
	– Oracle Defined Exceptions	178
	– Raising User Defined Exceptions	179
	– Pragma Exceptions in PLSQL	182
	– Grouping Exceptions in PLSQL	186
	– Alternative Way to Handle SQL Errors in PLSQL	187
	– Handling SQL Errors in PLSQL	188
	– Advanced SQLErrm	190
	– <i>Exercise Five</i>	191
Ten	Implicit Cursors	194
	– Using Implicit Cursors in PLSQL	195
	– Using Implicit Cursors to Select Records	197
	– Exceptions in PLSQL	198
	– Attributes of Implicit Cursors	200
	– SQL%FOUND	201
	– SQL%NOTFOUND	202
	– SQL%ROWCOUNT	203
Eleven	Sub-Blocking in PLSQL	204
	– Introduction	205
	– Defining	206
	– Re-Raising Exceptions in PLSQL	208
	– <i>Exercise Six</i>	211
Twelve	Explicit Cursors	216
	– Using Explicit Cursors in PLSQL	217
	– How Explicit Cursors Work	219
	– Attributes of an Explicit Cursor	222
	– Passing Parameters to Explicit Cursors	225
	– Explicit Cursors Versus Implicit Cursors	228
	– <i>Exercise Seven</i>	229
Thirteen	Using Sequences in PLSQL 11g	231
Fourteen	Loop Processing	234
	– Iterative Processing in PLSQL	235
	– Basic Looping in PLSQL	236
	– While Looping in PLSQL	240
	– For Looping in PLSQL	243
	– Using Dates in For Loops in PLSQL	247
	– Using Characters in For Loops in PLSQL	248
	– Implicit Cursor Looping in PLSQL	249
	– Explicit Cursor Looping in PLSQL	252
	– Using other Loops with Explicit Cursors	254
	– Loop Labels in PLSQL	257
	– Loop Continue and Continue When	259
	– <i>Exercise Eight</i>	263
Fifteen	PL/SQL Database Objects	269
	– PLSQL Objects	270
	– Functions	271
	– Procedures	273
	– Packages	274
	– Triggers	275



Essential PL/SQL 11g Using Application Express 4.2 Index

Sixteen	Object Browser in Application Express	276
	– Introduction	277
	– Topography	278
	– Creating Functions	281
	– Naming Functions	282
	– Arguments	284
	– Passing Arguments Using Named Notation	289
	– Passing Arguments Using Mixed Notation	290
	– Arguments using %type	291
	– Function Body	292
	– Save & Compile	296
	– Editing the Function	298
	– Dependencies	302
	– Errors	303
	– Grants	304
	– Syntax for Creating Functions	307
	– Syntax for Running Functions	310
	– Object Maintenance	312
	– Describing PLSQL Objects	316
	– Metadata (User Source)	317
	– <i>Exercise Nine</i>	318
Seventeen	Creating PLSQL Procedures in Object Browser	322
	– Introduction	323
	– Creating Procedures	324
	– Naming Procedures	325
	– Arguments	326
	– Define	327
	– Confirm	329
	– Save & Compile	330
	– Define	327
	– Syntax of Procedures in Oracle	332
	– Executing Procedures in SQL Commands	332
Eighteen	Sub-programming Techniques	334
	– Introduction	335
	– Example	336
	– Autonomous Transaction	338
	– <i>Exercise Ten</i>	340
Nineteen	Creating Packages in Object Browser	344
	– Introduction	345
	– Creating Packages in Object Browser	347
	– Arguments	349
	– Define	350
	– Defining a Specification	351
	– Object Browser	352
	– Creating the Package Body	353
	– Defining the Body	354
	– Syntax of Packages	355
	– Private Processes in PLSQL Packages	357
	– Executing Packages in Oracle	359
	– Handling Exceptions in Packages	361
	– Package with methods on database table(s)	363



Essential PL/SQL 11g Using Application Express 4.2 Index

		- <i>Exercise Eleven</i>	368
Twenty	DML Triggers in Oracle		370
		- Oracle Triggers Introduction	371
		- DML Triggers Introduction	372
		- DML Triggers Timing Points	374
		- Creating Triggers in Object Browser	375
		- Define	376
		- DML Triggers Suggested Naming Conventions	377
		- Firing Point for Triggers	378
		- Triggering Options	379
		- For Each Row	380
		- When Conditions	381
		- DML Triggers When Conditions Examples	382
		- ORA-04077: When clause cannot be used with table	383
		- Declaration Area	384
		- Referencing Values within Triggers	386
		- Checking the Event which fired the DML Trigger	389
		- Mutating DML Triggers in Oracle	391
		- Advanced DML Trigger Settings	395
		- Syntax of DML Triggers in PLSQL	396
		- Using the Follows syntax to dictate Trigger Firing	397
		- ORA-25022: cannot reference a trigger of different type	401
		- Referencing Values within Triggers	402
		- Using the Disable syntax when Compiling Triggers	403
		- Enabling/Disabling Triggers in an Oracle Database	404
		- Metadata for Triggers (User_Triggers)	406
		- <i>Exercise Twelve</i>	407
Twenty One	Rowtypes in PLSQL		414
		- Using %Rowtype in PLSQL	415
		- Declaring a Variable as a %Rowtype	416
		- Referencing a %Rowtype Variable	417
		- Populating a Variable which is a %Rowtype	418
		- Passing a %Rowtype between Processes	421
		- Declaring a Cursor %Rowtype	423
Twenty Two	Advanced Cursors in Oracle 11g		426
		- For Update with Explicit Cursors	427
		- Where Current of Explicit Cursors	428
		- Example of Updating with Explicit Cursors	429
		- Using Nowait with Explicit Cursors	430
		- Using Skip Locked with Explicit Cursors	431
		- Using Wait with an Explicit Cursor	432
		- Using Rowid with Explicit Cursors	433
		- Using Returning Into in PLSQL	434
		- Using Rowtype for DML	437
Twenty Three	Savepoints in PLSQL		439
		- Using Savepoints in a PLSQL process	440
		- Example of Savepoints in PLSQL process	441



Essential PL/SQL 11g Using *Computing Limited* Application Express 4.2 Index

Twenty Four	Case Statements and Case Expressions	442
	– Introduction	443
	– Using Searched Case in PLSQL	444
	– Using Case in PLSQL	445
	– Using Nested Case in PLSQL	446
	– Using Case Expressions in PLSQL	448
	– Using Nullif in PLSQL	452
	– Using Coalesce in PLSQL	453
	– <i>Exercise Thirteen</i>	454
Twenty Five	File I/O	457
	– Reading and Writing Files in PLSQL	458
	– Accessing the File System using Directories	459
	– Creating Directories	460
	– Simple Write using UTL_FILE.PUT_LINE	462
	– Simple Read Using UTL_FILE.GET_LINE	463
	– Additional Functions in the UTL_FILE Package	464
	– Using UTL_FILE.PUTF in PLSQL	465
	– UTL_FILE Exceptions	467
	– Using UTL_FILE to perform Operating System Commands	469
	– Using UTL_FILE.Fcopy in PLSQL	470
	– Using UTL_FILE.Fgetattr in PLSQL	471
	– Using UTL_FILE.Fremove in PLSQL	472
	– Using UTL_FILE.Frename in PLSQL	473
Twenty Six	Dynamic SQL	474
	– Introduction to Dynamic SQL	475
	– Native Dynamic SQL (NDS) with Execute Immediate	476
	– NDS Error Handling	479
	– NDS with Inputs	480
	– NDS with Output	482
	– Dynamic Cursors and Sys_Refcursor	483
	– NDS with Outputs	485
	– Introduction to DBMS_SQL	486
	– DBMS_SQL Example	487
	– <i>Exercise Thirteen</i>	488
Appendices :		
Appendix PL1	– SQL Functions	
Appendix PL2	– SQL Line Editor Commands	
Appendix PL3	– SQL Environment Settings	
Appendix PL4	– SQL Column Formats	
Appendix PL5	– SQL Number Formats	
Appendix PL6	– SQL Date Formats	
Appendix PL7	– Compute Formats	
Appendix PL8	– System Exceptions	

Delegate Questionnaire