

## Advanced SQL 11g Index

Section	Title	Page
<b>One</b>	<b>Advanced SQL</b>	1
	– Introduction	3
<b>Two</b>	<b>Substitution in Oracle SQL 11g</b>	4
	– Introduction	5
	– Using Ampersands	6
	– Using Ampersands with Strings	7
	– Using the same value more than once	8
	– Persistent values (Using Undefine)	9
	– Advanced Substitution for Advanced Users	10
	– Preventing prompting when Ampersands are encountered	12
	– Redefining the Prompt (Set Define)	13
	– Removing the Verification (Verify off)	14
	– Defining Session Variables	15
	– Using the Accept command in SQLPlus	19
	– Within Insert Statements	24
	– Within Scripts	25
	– <i>Exercise One</i>	28
<b>Three</b>	<b>Advanced Features of SQLPlus</b>	32
	– Using the Help facility	33
	– Using the Spool Command	35
	– Using the Host Command	37
	– Changing the Prompt	38
	– Displaying the Time	39
	– Displaying all Environment Settings	40
	– Saving the Environment Settings using Store Set	41
	– Changing Environment Settings in glogin.sql	42
	– Creating HTML Pages	43
	– Renaming Columns for the Session	45
	– Formatting Columns (Varchar2)	48
	– Formatting Columns (Number)	49
	– Formatting Columns (Date)	50
	– Wrapping Columns	51
	– Justifying Column Headings	53
	– Suppressing Columns	55
	– Truncate Columns	56
	– Storing Values in Columns	57
	– Viewing Columns	58
	– Viewing All Columns	59
	– Temporarily Disabling Columns	60
	– Clearing Columns	61
	– Copying Columns with Like	62
	– Using Columns to deal with Nulls	63
	– Multi-Line Output	64
	– Using Break in the Output	65
	– Using Aliases with Break	67
	– Using Skip with Break	68
	– Using Skip Page with Break	69
	– Using Skip Row with Break	70
	– Displaying Duplicates with Break	71
	– Viewing/Clearing Breaks	72

## Advanced SQL 11g Index

Section	Title	Page
	– Using Compute with Break	73
	– Using Compute Labels with Break	75
	– Using ComputeSub-totalling with Break	79
	– Combining Computes	81
	– Setting Titles for the Output	83
	– Using Ttitle for the Output	84
	– Using SQL.PNO in the Title	86
	– Using Variables in the Title	88
	– Using Btitle	90
	– Using Repheader and Repfooter	92
	– Reviewing the Title settings	93
	– Suppressing the Title settings	94
<b>Four</b>	<b>Using the Alternative Quoting Mechanism in SQL</b>	<b>95</b>
	– Introduction	96
	– Using Alternative Quoting Mechanism	97
	– <i>Exercise Two</i>	99
<b>Five</b>	<b>Metadata in Oracle SQL 11g</b>	<b>108</b>
	– Introduction	109
	– Selecting from Dictionary	110
	– Metadata Synonyms	111
	– Metadata Comments	112
<b>Six</b>	<b>Regular Expressions in Oracle SQL 11g</b>	<b>114</b>
	– Introduction	115
	– Using REGEXP_LIKE in Where Clauses	118
	– Case Sensitivity	120
	– Line Anchors	122
	– Using the Dot (Any Character)	124
	– Counting Characters {Intervals}	127
	– Character Lists	131
	– Excluding Character Lists	135
	– Alternatives to Character Lists	136
	– Class Shorthands	139
	– Or Patterns (Alternatives)	140
	– Or Patterns with Character Lists	141
	– Using the Question Mark (Optional)	142
	– Using the Plus sign (Mandatory)	145
	– Using the Star sign (Optional)	147
	– Backreferencing	148
	– POSIX	150
	– Using POSIX in Oracle – [:upper] example	152
	– Using POSIX in Oracle – [:digit] example	153
	– Using POSIX in Oracle – character equivalents	154
	– Using Regexp_count in SQL	155
	– Using Regexp_replace in SQL	159
	– Using Regexp_instr in SQL	161
	– Using Regexp_substr in SQL	163
	– Using Regular Expressions in Oracle	165
<b>Seven</b>	<b>Ordering Records in Oracle SQL 11g</b>	<b>166</b>
	– Syntax	167
	– Ordering by Columns	168
	– Ordering by more Columns	170

## Advanced SQL 11g Index

Section	Title	Page
	- Dealing with Nulls	171
	- Using Column position when Sorting	173
	- Using Expressions when Sorting	174
	- Using Aliased Columns	175
	- Using Alternative Sorts	176
	- <i>Exercise Three</i>	178
<b>Eight</b>	<b>Aggregating Values in Oracle SQL 11g</b>	<b>187</b>
	- Introduction	188
	- Using Distinct with other Aggregates	189
	- Using Group By	190
	- Using Group By with Aliases	193
	- Using Group By with Many Columns	194
	- Using Having with Group By	196
	- Using Rollup to 'Sum' the Group By	198
	- Using Partial Rollup with several non-aggregates	200
	- Using Full Partial Rollup with several non-aggregates	201
	- Getting the Total to the Top	202
	- Using Cube with Group By	203
	- Using Grouping Sets with Group By	205
	- Using Grouping ID with Grouping Sets	207
	- Using Group ID with Group By	209
	- Nesting Group Functions	211
	- <i>Exercise Four</i>	214
<b>Nine</b>	<b>Joining Tables in an SQL Statement</b>	<b>218</b>
	- Ansi SQL:1999 Natural Join	219
	- Ansi SQL:1999 Cross Join	220
	- Ansi SQL:1999 Join Using	221
	- Ansi SQL:1999 Join On	222
	- Ansi SQL:1999 Join On with Multiple Tables	223
	- Ansi SQL:1999 Preventing Ambiguous Columns	224
	- Ansi SQL:1999 Non-equi Joins	225
	- Ansi SQL:1999 Self Joined Tables	227
	- Ansi SQL:1999 Self Joined Tables vs Tree Walking	228
	- Ansi SQL:1999 Inner Joins	229
	- Ansi SQL:1999 Outer Joins	230
	- Ansi SQL:1999 Full Outer Joins	231
	- Ansi SQL:1999 Left and Right Outer Joins	232
	- Ansi SQL:1999 Alternative to Where Clause	234
	- Ansi SQL:1999 Using Or with 'And'	235
	- Ansi SQL:1999 Using 'And' with 'Where'	236
	- Ansi SQL:1986	237
	- Ansi SQL:1986 Outer Joins	238
	- Creating Data Sets	240
	- Union	241
	- Union All	244
	- Intersect	246
	- Minus	247
	- Tree Walking	248
	- Tree Walking Syntax	249
	- Use of Level	252
	- Use of Ncycle (ORA-01436)	253

## Advanced SQL 11g Index

Section	Title	Page
	– Use of Connect_by_iscycle	255
	– Advanced Ordering of Tree Walks using Siblings	256
	– Output of Tree Walks using Sys_connect_by_path	257
	– Limiting Records using Connect_by_isleaf	258
	– Showing the Root using Connect_by_root	260
<b>Ten</b>	<b>Sub-Queries in Oracle SQL 11g</b>	<b>262</b>
	– Introduction	263
	– Using Equals	264
	– In	267
	– Exists	269
	– Any	271
	– Some	272
	– All	273
	– Correlated Queries	274
	– Correlated Updates and Deletes	275
	– Inline Views	276
	– Inline Views Example	277
	– Sub-Queries in a Select Statement	278
	– Sub-Query Factoring (Using With)	279
	– Sub-Query Factoring Example with Aliases	281
	– Sub-Query Factoring Example with Joins	282
	– <i>Exercise Five</i>	283
<b>Eleven</b>	<b>Advanced SQL Query Functions/Techniques</b>	<b>285</b>
	– Introduction	286
	– Pivot	287
	– Adding a Total to a Pivot	292
	– Changing the Pivot Headings of the X Axis	293
	– Rotating the Axis of the Pivot	295
	– Unpivot	296
	– Unpivot and Null values	299
	– Using First_Value/Last_Value in SQL	300
	– Ignoring Nulls with First/Last_Value	302
	– Window Specification	303
	– Breakdown of Window Specification	304
	– Window Specification – The Arguments	306
	– Window Specification – The Query Partition	307
	– Window Specification – The Order By	309
	– Window Specification – The Windowing	311
	– Window Specification – Rows between	313
	– Window Specification – Shortcuts	317
	– Difference between Range and Rows	318
	– Using Lead and Lag in SQL	321
	– Using Rank Function in SQL	325
	– Using Ntile Function in SQL	332
	– Using Width_Bucket Function in SQL	334
	– Using Listagg Function in SQL	337
	– Using Case Function in SQL	339
	– Using Nested Case Function in SQL	341
	– Using Case Function in Order By	342
	– Using Searched Case Function in SQL	343
	– Using Searched Case Function with Sub-queries	345

## Advanced SQL 11g Index

Section	Title	Page
	– Using Sample in SQL	346
	– <i>Exercise Six</i>	348
<b>Twelve</b>	<b>Materialized Views</b>	351
	– Introduction	352
	– Syntax for Creating Materialized Views	353
	– Refreshing Materialized Views	355
	– Building Materialized Views	361
	– Access Keys	363
	– Materialized View Logs	364
	– Refresh Groups	365
	– Creating Refresh Groups	366
	– Deleting Refresh Groups	369
	– Amending Refresh Groups	370
	– Amending Refresh Group Members	371
	– Refresh Group Metadata	372
	– Removing Materialized Views	373
<b>Thirteen</b>	<b>Advanced DDL on Tables</b>	374
	– Introduction	375
	– Making Tables Read Only	376
	– Making Tables Writeable	377
	– Truncating Tables	378
	– Setting Columns as Unused	379
	– USER_UNUSED_COL_TABS	380
	– Removing Unused Columns	381
	– Function Based Indexes	382
	– Referencing Other Users Tables	383
	– Database Privileges	384
	– Synonyms	385
<b>Fourteen</b>	<b>Virtual Columns</b>	386
	– Introduction	387
	– Creating with new Table	388
	– Specifying Datatype and Size	389
	– Additional Syntax	390
	– Adding to Existing Table	391
	– Using the Virtual Columns in SQL	392
	– Using the Virtual Columns with Functions	394
	– Limitations of Virtual Columns (ORA-54012)	395
	– Limitations of Virtual Columns (ORA-54013)	397
	– Viewing Virtual Columns in USER_TAB_COLS	398
	– Dropping Virtual Columns	399
<b>Fifteen</b>	<b>Populating Tables Using Merge and Multiple Inserts</b>	400
	– Merge	401
	– Merge Into	403
	– Using Where with Merge Into	405
	– Using Delete Where with Merge Into	406
	– Multiple Table Inserts	407
	– Unconditional Multiple Inserts (Insert All)	408
	– Conditional First Multiple Inserts (Insert First)	410
	– Conditional All Multiple Inserts (Insert First)	411
	– Pivoting Multiple Inserts	412

## Advanced SQL 11g Index

Section	Title	Page	
<b>Sixteen</b>	<b>TCL – Transaction Control Language</b>	413	
	– Introduction	414	
	– Commit	415	
	– Rollback	416	
	– Savepoints	417	
	– Autocommit in SQLPLUS	418	
	– Exitcommit in SQLPLUS	420	
	– For Update in SQL	422	
	– For Update in SQL using 'where'	423	
	– For Update in SQL naming Columns	424	
	– <i>Exercise Seven</i>	425	
	<b>Seventeen</b>	<b>Flashback</b>	429
		– Introduction	430
– Flashback Query		431	
– Using the Dbms_Flashback package		435	
– Using Time Flashbacks		436	
– Disabling Flashbacks		440	
– Using SCN Flashbacks		441	
– Implicit Flashback using AS OF		443	
– Flashback using Versions Between		445	
– Using the Flashback_transaction_query View		450	
– <i>Exercise Eight</i>		453	
<b>Eighteen</b>	<b>Exporting and Importing Data into Oracle Databases</b>	455	
	– Introduction	456	
	– Exporting	457	
	– EXP-00091: Exporting questionable statistics	465	
	– Exporting using the Command Line	466	
	– Exporting using a Parameter File	467	
	– Naming Tables using a Parameter File	468	
	– Command Line Options	469	
	– Importing	470	
	– Importing using the Command Line	477	
	– Importing using a Parameter File	478	
– Command Line Options	479		
<b>Nineteen</b>	<b>Oracle Directories</b>	480	
	– Introduction	481	
	– Creating Directories	482	
<b>Twenty</b>	<b>Exporting with Data Pump</b>	484	
	– Introduction	485	
	– Exporting using Expdp	486	
	– Replacing Existing Files	488	
	– Exporting Specific Tables using Expdp	489	
	– Exporting Subsets of Data Using Expdp	492	
	– Using Expdp with a Parameter File	493	
	– Importing using Impdp	494	
	– <i>Exercise Nine</i>	495	
<b>Twenty One</b>	<b>External Tables</b>	496	
	– Introduction	497	
	– Syntax	498	
	– Create Directories	499	



## Advanced SQL 11g Index

Section	Title	Page
	- Viewing Existing Directories	500
	- Creating External Tables with Comma Separated File	501
	- Creating External Tables	502
	- Access Parameters	504
	- Access Parameters (Comma Separated)	505
	- Access Parameters (Tab Separated)	506
	- Access Parameters – Defining Fields	507
	- Access Parameters (Missing Field Values are Null)	509
	- Access Parameters (Reject Rows With all Null Fields)	510
	- Access Parameters – (Load When)	511
	- Access Parameters – (Skip)	513
	- Access Parameters – (Audit Tables)	514
	- Access Parameters – (Logfile)	515
	- Access Parameters – (Badfile)	518
	- Access Parameters – (Discardfile)	520
	- Access Parameters – (Reject Limit)	521
	- Access Parameters for Fixed Length Files	522
	- Using Load When with Position	528
	- Using Alter Table with External Tables	529
	- Metadata for External Tables	530
	- Using Oracle Datapump	531
	- Losing the External File	533
<b>Twenty Two</b>	<b>Advanced Date Datatypes</b>	<b>534</b>
	- Introduction	535
	- Database Timezone	536
	- Date Datatypes	538
	- Timestamp	542
	- Extract	547
	- To_Timestamp	548
	- Timestamp with Time Zone	550
	- Time Zone and Extract	553
	- TZ Offset	554
	- Timezones and UTC	555
	- To_Timestamp_TZ	557
	- From_TZ	558
	- Timestamp with Local Time Zone	559
	- Intervals	560
	- Assigning Year Intervals	563
	- Assigning values to Day Intervals	565
	- Using Intervals	567
	- Intervals and Extract	573
	- <i>Exercise Ten</i>	574
<b>Twenty Three</b>	<b>Object Orientated Programming</b>	<b>577</b>
	- Introduction	578
	- Definition of Objects	579

## Advanced SQL 11g Index

Section	Title	Page
Twenty Four	Row Objects	583
	- Introduction	584
	- Creating	585
	- Metadata	586
	- Data	587
	- Indexes	588
	- Views	590
	- Removing	591
	- OIDs	593
Twenty Five	Column Objects	600
	- Introduction	601
	- Describing	602
	- Inserting Into	605
	- Selecting From	607
	- Updating	612
	- Object Views	613
Twenty Six	Collections	615
	- Introduction	616
	- Varying Arrays	617
	- Defining a single element	618
	- Inserting	619
	- Selecting	621
	- Updating	623
	- Deleting	624
	- Defining using an Abstract datatype	625
	- Inserting an Abstract datatype	626
	- Selecting an Abstract datatype	627
	- Nested Tables	628
	- Defining	629
	- Inserting	633
	- Selecting	636
- Updating	639	
- Deleting	640	
- <i>Exercise Eleven</i>	641	
Twenty Seven	DBMS_METADATA	646
	- Generating Database Object Scripts	647
	- List of Object Types	648
	- Example of Using Dbms_Metadata	649
Twenty Eight	SQL Loader	651
	- Introduction	652
	- Invoking SQLLDR	653
	- Integrated Control Files	654
	- Commenting in Control Files	657
	- Optionally Enclosed By ""	658
	- Badfile	659
	- Dealing with Dates and Time in the Control File	661



## Advanced SQL 11g Index

Section	Title	Page
	- Setting Datatypes in the Control File	665
	- Using the Filler Datatype	667
	- Inserting Values Not Found in the Data	668
	- Trailing Nullcolls	669
	- Using Functions in Control Files	670
	- Using Functions with Filler in Control Files	671
	- Using Nullif in Control Files	672
	- Using Defaultif in Control Files	673
	- Variations in Data	675
	- Working with Multi-Line Records Using Continueif	677
	- Preserve Blanks	679
	- Skipping Records	680
	- Selecting Records with a 'When' Clause	681
	- Using Discard Files with When Clause	683
	- Working with Fixed Length Values	684
	- Using When with Fixed Length Values	686
	- Loading more than One Set of Data	689
	- Using External Infiles	690
	- Running SQLLDR	691
	- SQLLDR Switches	692
	- SQLLDR Switches – Specifying Files	693
	- SQLLDR Switches – Specifying Load Numbers	695
	- SQLLDR Switches – Long Commands in DOS	696
	- SQLLDR Parameter File	697
	- <i>Exercise Twelve</i>	698
<b>Appendices</b>		
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	

### Delegate Questionnaire