

Extend Your SQL Developer

Philipp



@phsalvisberg



<https://www.salvis.com/blog>

17.11.2019

BASEL | BERN | BRUGG | BUKAREST | DÜSSELDORF | FRANKFURT A.M. | FREIBURG I.B.R. | GENÈVE
HAMBURG | KOPENHAGEN | LAUSANNE | MANNHEIM | MÜNCHEN | STUTTGART | WIEN | ZÜRICH

trivadis

Philipp

- Database centric development
- Model Driven Software Development
- Author of free SQL Developer Extensions
PL/SQL Unwrapper, PL/SQL Cop,
utPLSQL, plsscope-utils, oddgen and
Bitemp Remodeler



 @phsalvisberg

 <https://www.salvis.com/blog>

Visit Us at Our Booth on Level 3

25
YEARS
OF TRIVADIS

- Trivadis barista (good coffee from morning to night)
- Birthday cake (daily from 14:00)
- Speed-Sessions at the booth with raffle:
 - **Di 14:45:** Martin Berger *"Oracle Cloud Free Tier – einmal kurz ausprobiert..."*
 - **Mi 10:45:** Guido Schmutz *"Warum ich Apache Kafka als IT-Spezialist kennen sollte!"*
 - **Mi 14:45:** Stefan Oehrli *"PDB Sicherheit und Isolation, Herausforderungen von Oracle Container DB's"*
 - **Do 10:45:** Chris Antognini *"Welche Query-Optimizer Funktionalitäten sind nur in Autonomous Database verfügbar? "*
- Participation in our DOAG raffle
- Networking and discussions with our speakers



Agenda

trivadis

1. SQL Developer
2. Extension Types
3. User Defined Extensions
 - Reports
 - Editors
 - Navigators
 - Actions
4. Core Messages

SQL Developer

Facts

trivadis

Project Raptor
in 2005

> 5 Million
Users

Feature-richest
IDE for
Oracle Databases

Based on
JDeveloper

Limited
support for
other DBs

Extendable

Free

Quarterly
Releases

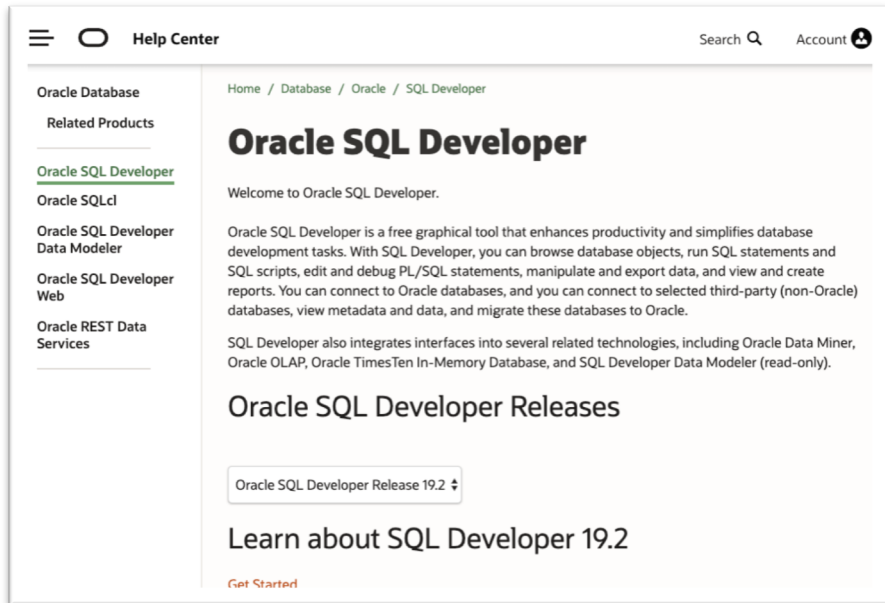


More About SQL Developer

trivadis

Official Documentation

<https://docs.oracle.com/en/database/oracle/sql-developer/>



The screenshot shows the Oracle SQL Developer Help Center. The header includes a menu icon, the text 'Help Center', a search icon, and an account icon. The left sidebar lists 'Oracle Database' and 'Related Products', with 'Oracle SQL Developer' highlighted. The main content area is titled 'Oracle SQL Developer' and includes a welcome message, a description of the tool, and a section for 'Oracle SQL Developer Releases' showing 'Oracle SQL Developer Release 19.2'. A 'Get Started' link is at the bottom.

Help Center

Search Account

Oracle Database

Related Products

Oracle SQL Developer

Oracle SQLcl

Oracle SQL Developer Data Modeler

Oracle SQL Developer Web

Oracle REST Data Services

Home / Database / Oracle / SQL Developer

Oracle SQL Developer

Welcome to Oracle SQL Developer.

Oracle SQL Developer is a free graphical tool that enhances productivity and simplifies database development tasks. With SQL Developer, you can browse database objects, run SQL statements and SQL scripts, edit and debug PL/SQL statements, manipulate and export data, and view and create reports. You can connect to Oracle databases, and you can connect to selected third-party (non-Oracle) databases, view metadata and data, and migrate these databases to Oracle.

SQL Developer also integrates interfaces into several related technologies, including Oracle Data Miner, Oracle OLAP, Oracle TimesTen In-Memory Database, and SQL Developer Data Modeler (read-only).

Oracle SQL Developer Releases

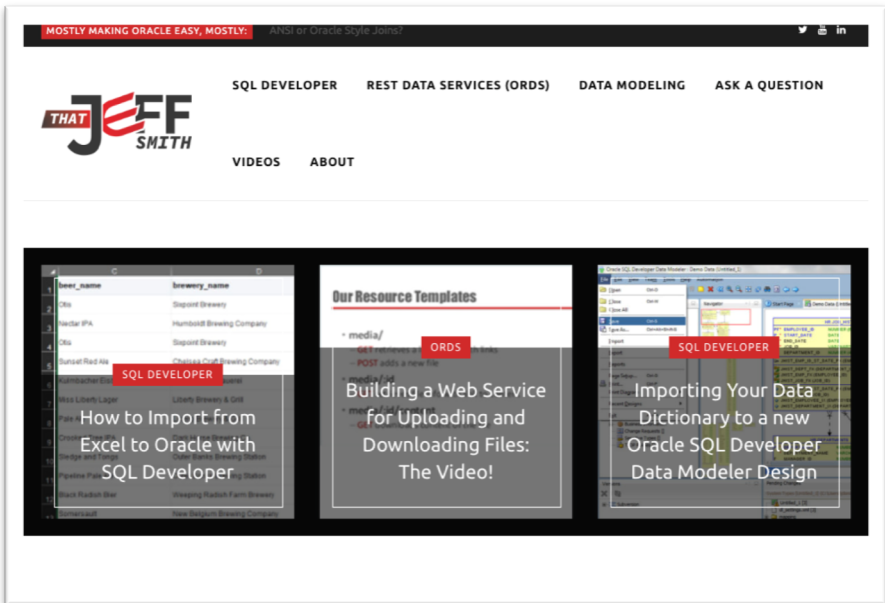
Oracle SQL Developer Release 19.2

Learn about SQL Developer 19.2

[Get Started](#)

Jeff Smith's Blog

<https://www.thatjeffsmith.com/>



The screenshot shows the homepage of Jeff Smith's blog, 'thatjeffsmith.com'. The header features the tagline 'MOSTLY MAKING ORACLE EASY, MOSTLY. (NOT BY ORACLE'S DESIGN)' and navigation links for 'SQL DEVELOPER', 'REST DATA SERVICES (ORDS)', 'DATA MODELING', and 'ASK A QUESTION'. The main content area includes a 'JEFF SMITH' logo, 'VIDEOS' and 'ABOUT' links, and a section titled 'Our Resource Templates' with three featured articles: 'How to Import from Excel to Oracle with SQL Developer', 'Building a Web Service for Uploading and Downloading Files: The Video!', and 'Importing Your Data Dictionary to a new Oracle SQL Developer Data Modeler Design'.

MOSTLY MAKING ORACLE EASY, MOSTLY. (NOT BY ORACLE'S DESIGN)

SQL DEVELOPER REST DATA SERVICES (ORDS) DATA MODELING ASK A QUESTION

JEFF SMITH

VIDEOS ABOUT

Our Resource Templates

[SQL DEVELOPER](#)

[ORDS](#)

[SQL DEVELOPER](#)

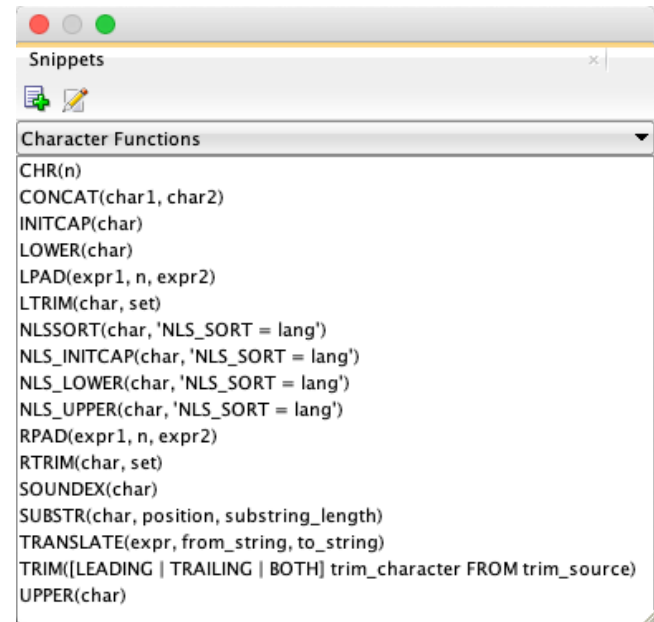
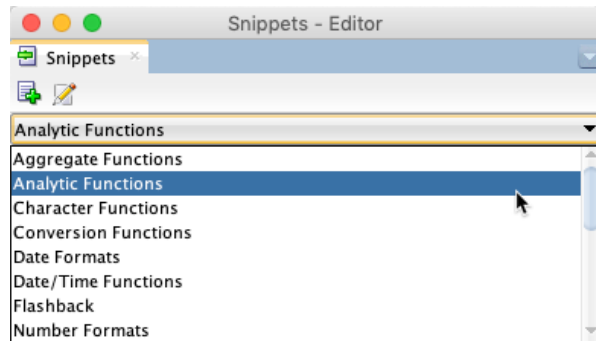
How to Import from Excel to Oracle with SQL Developer

Building a Web Service for Uploading and Downloading Files: The Video!

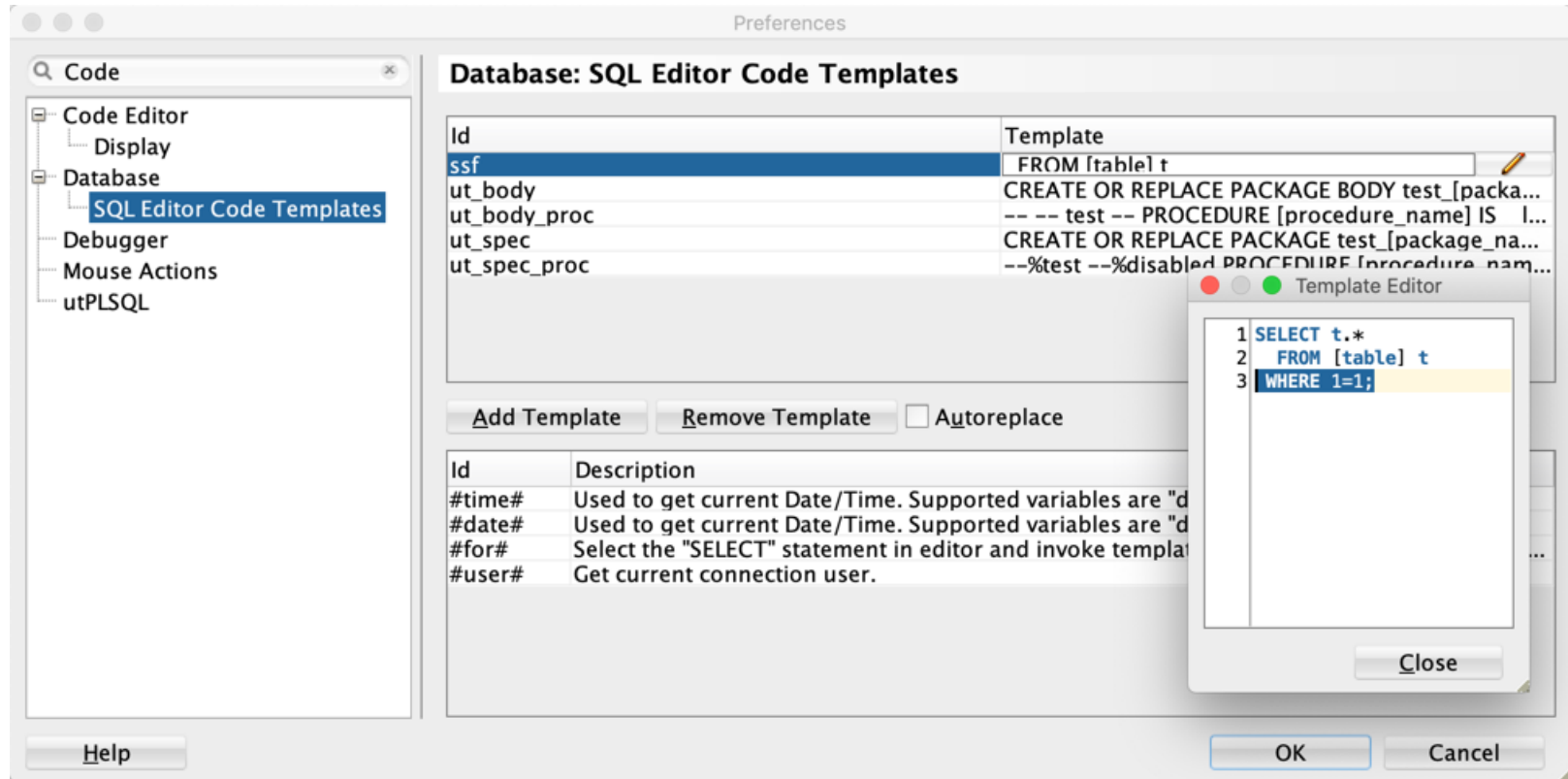
Importing Your Data Dictionary to a new Oracle SQL Developer Data Modeler Design

Extension Types

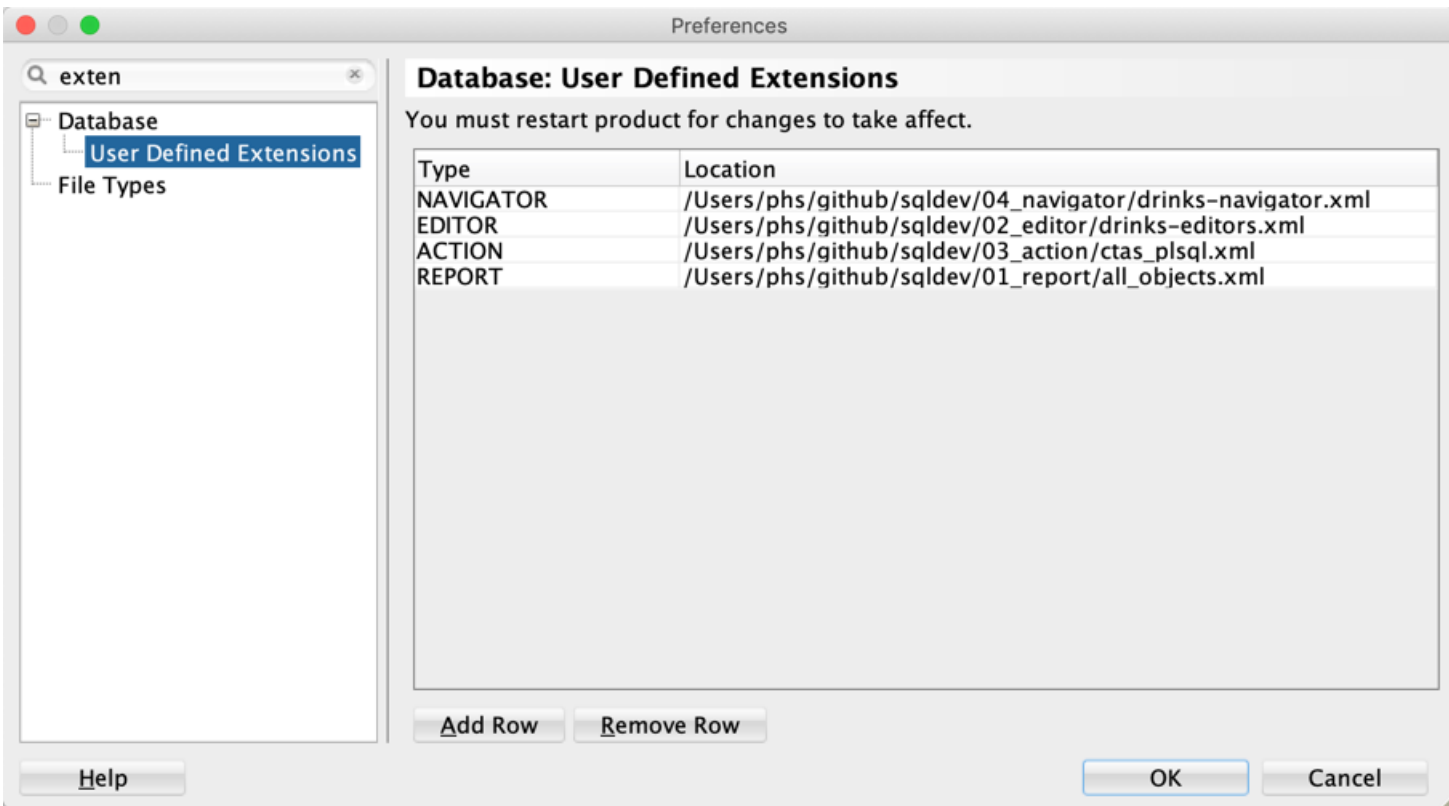
Snippets



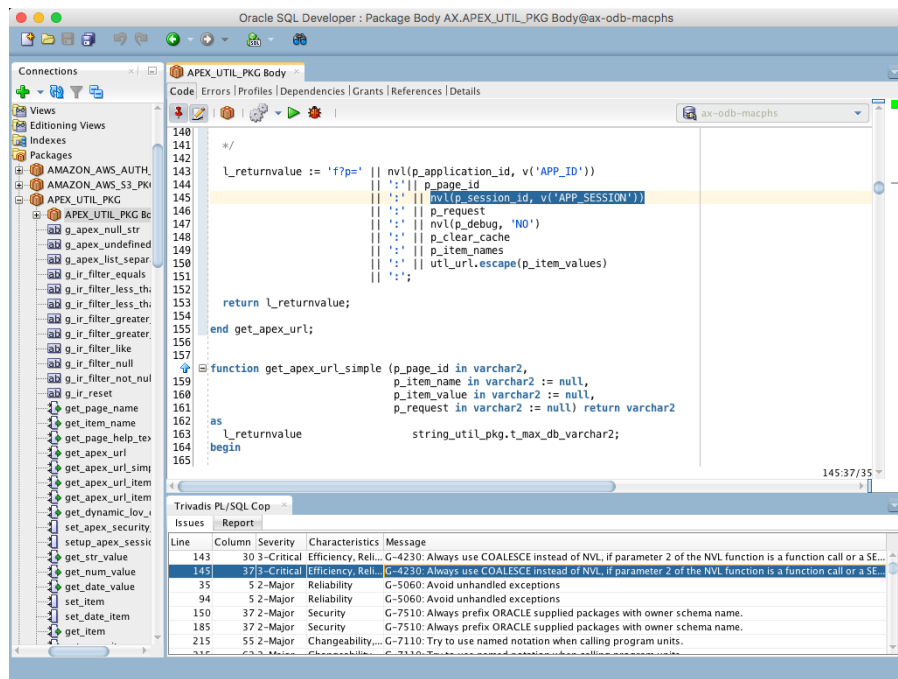
Code Templates



XML Extensions (SQL, PL/SQL, JavaScript)



ESDK 2.0 Extensions (Java, OSGi Bundles)



Oracle SQL Developer : Package Body AX.APEX_UTIL_PKG Body@ax-odb-macphs

Connections | Profiles | Dependencies | Grants | References | Details

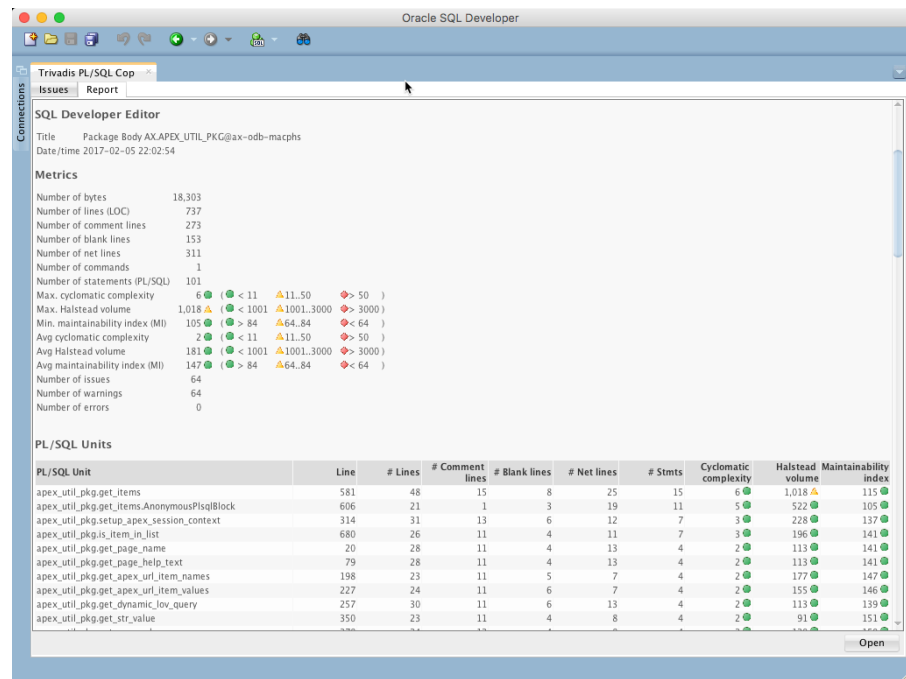
Code Errors | Profiles | Dependencies | Grants | References | Details

```
140 */
141
142
143 l_returnvalue := 'f?p=' || nvl(p_application_id, v('APP_ID'))
144 || ':' || p_page_id
145 || ':' || nvl(p_session_id, v('APP_SESSION'))
146 || ':' || p_request
147 || ':' || nvl(p_debug, 'NO')
148 || ':' || p_clear_cache
149 || ':' || p_item_names
150 || ':' || ut_url.escape(p_item_values)
151
152
153
154 return l_returnvalue;
155
156 end get_apex_url;
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000
```

Trivadis PL/SQL Cop

Issues Report

Line	Column	Severity	Characteristics	Message
143	30	3-Critical	Efficiency, Reli...	G-4230: Always use COALESCE instead of NVL, if parameter 2 of the NVL function is a function call or a SE...
145	37	3-Critical	Efficiency, Reli...	G-4230: Always use COALESCE instead of NVL, if parameter 2 of the NVL function is a function call or a SE...
35	5	2-Major	Reliability	G-5060: Avoid unhandled exceptions
94	5	2-Major	Reliability	G-5060: Avoid unhandled exceptions
150	37	2-Major	Security	G-7510: Always prefix ORACLE supplied packages with owner schema name.
185	37	2-Major	Security	G-7510: Always prefix ORACLE supplied packages with owner schema name.
215	55	2-Major	Changeability...	G-7110: Try to use named notation when calling program units.



Oracle SQL Developer

Trivadis PL/SQL Cop

Issues Report

SQL Developer Editor

Title Package Body AX.APEX_UTIL_PKG@ax-odb-macphs

Date/time 2017-02-05 22:02:54

Metrics

Metric	Value	Target
Number of bytes	18,303	
Number of lines (LOC)	737	
Number of comment lines	273	
Number of blank lines	153	
Number of net lines	311	
Number of commands	1	
Number of statements (PL/SQL)	101	
Max. cyclomatic complexity	6	< 11
Max. Halstead volume	1,018	< 1001
Min. maintainability index (MI)	105	> 84
Avg cyclomatic complexity	2	< 11
Avg Halstead volume	181	< 1001
Avg maintainability index (MI)	147	> 84
Number of issues	64	
Number of warnings	64	
Number of errors	0	

PL/SQL Units

PL/SQL Unit	Line	# Lines	# Comment lines	# Blank lines	# Net lines	# Stmt	Cyclomatic complexity	Halstead volume	Maintainability index
apex_util_pkg.get_items	581	48	15	8	25	15	6	1,018	115
apex_util_pkg.get_itemsAnonymousPisqlBlock	606	21	1	3	19	11	5	522	105
apex_util_pkg.setup_apex_session_context	314	31	13	6	12	7	3	228	137
apex_util_pkg.is_item_in_list	680	26	11	4	11	7	3	196	141
apex_util_pkg.get_page_name	20	28	11	4	13	4	2	113	141
apex_util_pkg.get_page_help_text	79	28	11	4	13	4	2	113	141
apex_util_pkg.get_apex_util_item_names	198	23	11	5	7	4	2	177	147
apex_util_pkg.get_apex_util_item_values	227	24	11	6	7	4	2	155	146
apex_util_pkg.get_dynamic_lov_query	257	30	11	6	13	4	2	113	139
apex_util_pkg.get_str_value	350	23	11	4	8	4	2	91	151

oddgen – Code / Text Generators

The screenshot displays the oddgen application interface. On the left, a tree view under 'Generators' shows a hierarchy: 'All Generators' > 'Database Server Generators' > 'Examples' > 'PL/SQL' > 'Emp hierarchy' > 'King' > 'Blake'. The 'Blake' node is selected. On the right, the 'Worksheet' tab shows a table with employee names and salaries:

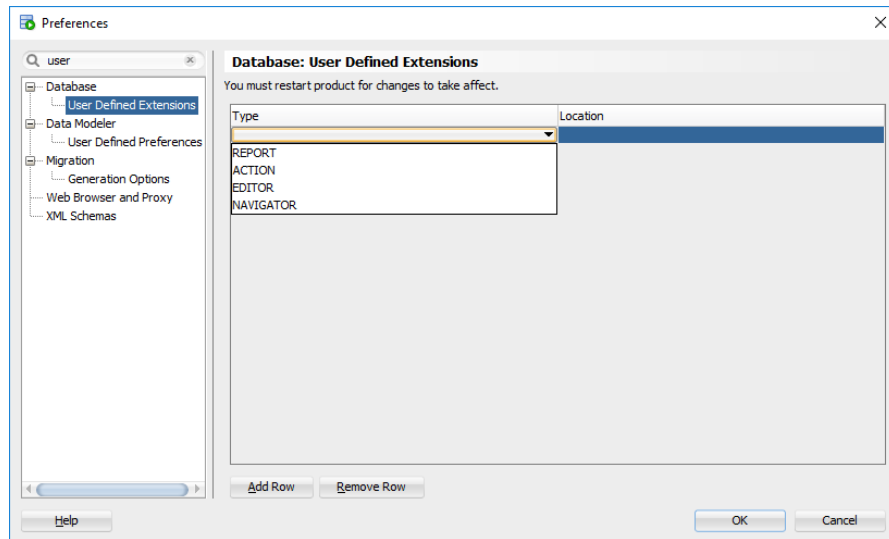
Name	Salary
Blake	2850
Allen	1900
James	950
Martin	2650
Turner	1500
Ward	1750
Total of 6	11600

Below the table, the text 'Salaries with commissions.' is displayed. A dialog box titled 'oddgen - Emp hierarchy' is open in the foreground, containing the text 'Generates salary report of selected employees in the hierarchy.' and a 'Node identifier' field with the value '7698'. The 'Include commission?' checkbox is checked. At the bottom of the dialog are three buttons: 'Generate to worksheet', 'Generate to clipboard', and 'Cancel'.

User Defined Extensions

XML Schemas of User Defined Extensions

<https://github.com/oracle/oracle-db-examples/tree/master/sqldeveloper/extension/xml/schema>



- Reports
 - displays.xsd (includes query.xsd)
- Editors
 - displays.xsd (includes query.xsd)
- Navigators
 - navigators.xsd (includes query.xsd)
- Actions
 - dialogs.xsd (includes useful comments)

Reports

Reports

trivadis

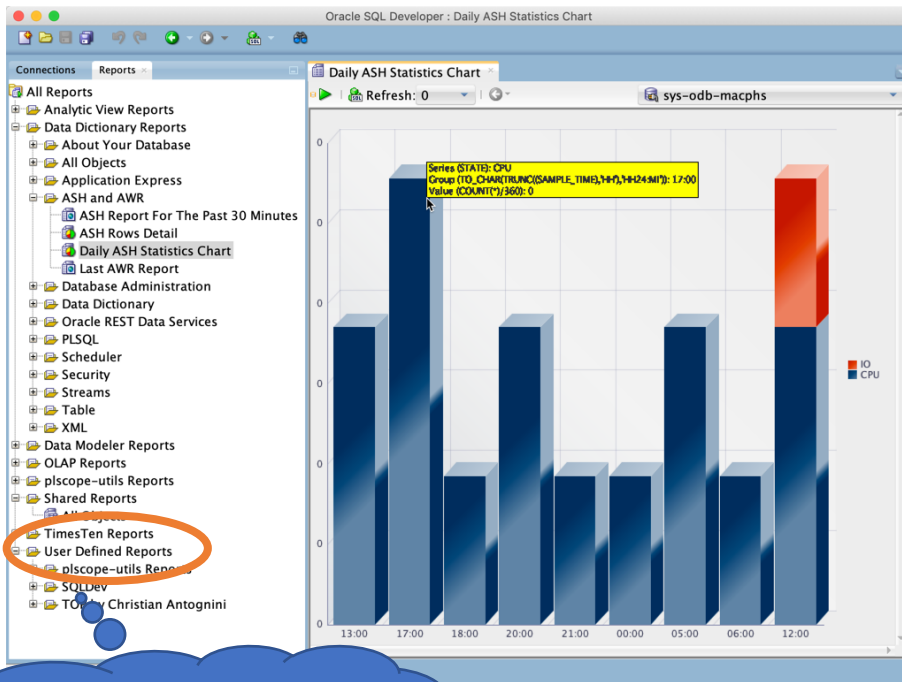
via Java

Oracle SQL Developer : Oracle Application Express Application Pages

WORKSPACE	APPLICATION_ID	PAGE_ID	PAGE_TITLE	PAGE_FUNCTION
1 TVDPDAYS	100	1	Home	Unknown
2 TVDPDAYS	100	2	Dept	Unknown
3 TVDPDAYS	100	3	Form on DEPT (2)	Unknown
4 TVDPDAYS	100	4	Emp	Unknown
5 TVDPDAYS	100	5	Form on EMP (4)	Unknown
6 TVDPDAYS	100	18	TT Hist Dept	Unknown
7 TVDPDAYS	100	19	TT Form on DEPT (18)	Unknown
8 TVDPDAYS	100	20	VT Hist Dept	Unknown
9 TVDPDAYS	100	21	VT Form on DEPT_HV (20)	Unknown
10 TVDPDAYS	100	22	VT/TT Hist Dept	Unknown
11 TVDPDAYS	100	23	VT Form on DEPT_HV (22)	Unknown
12 TVDPDAYS	100	38	TT Hist Emp	Unknown
13 TVDPDAYS	100	39	Form on EMP (38)	Unknown
14 TVDPDAYS	100		ABOUT Hist Emp	Unknown

SEQ	REGION_NAME	TEMPLATE	SOURCE_TYPE	REGION_SOURCE
1	10 Valid Time Filter	Collapsible	HTML/Text	(null)
2	20 Transaction Time Filter	Collapsible	HTML/Text	(null)
3	40 Dept	Interactive Report	Interactive Report	SELECT vt_start, vt_end,

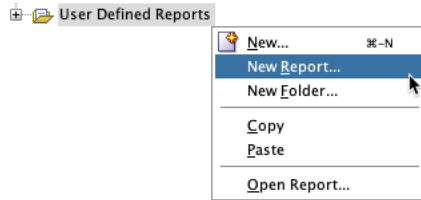
via XML



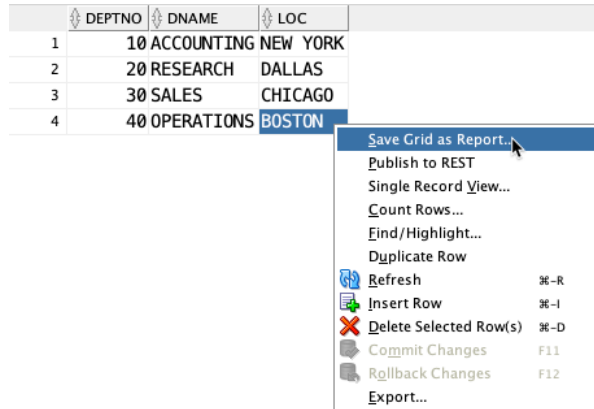
within SQL Developer

Creating Reports

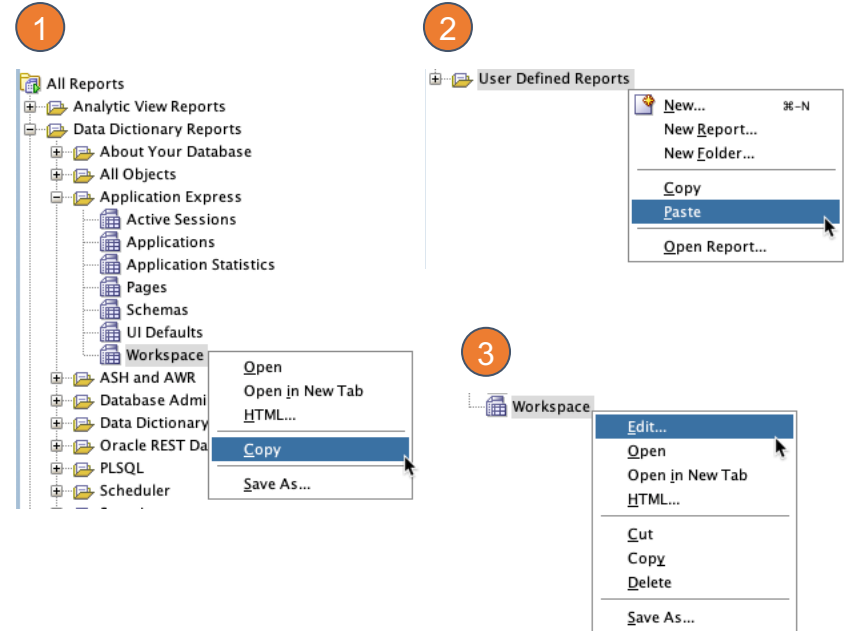
a) From Scratch



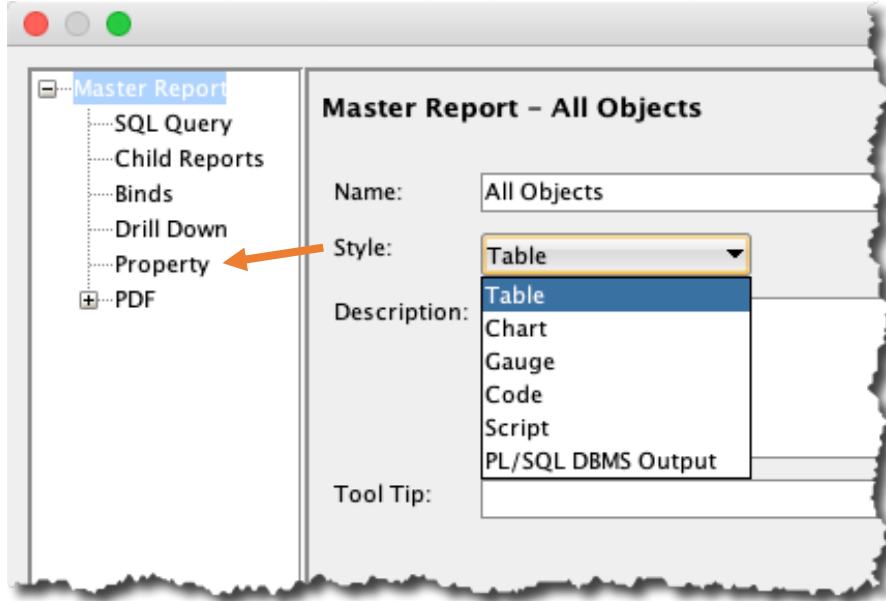
c) From Result Table



b) From Existing Report

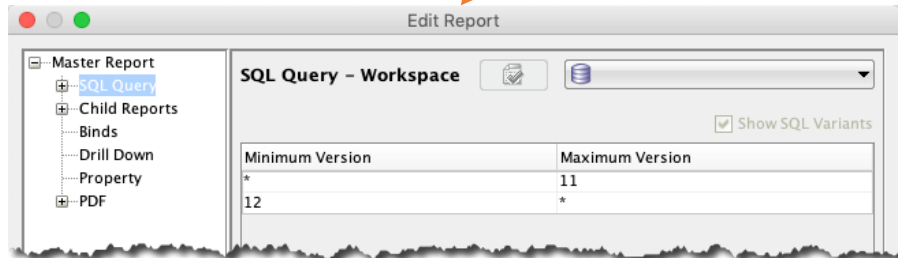
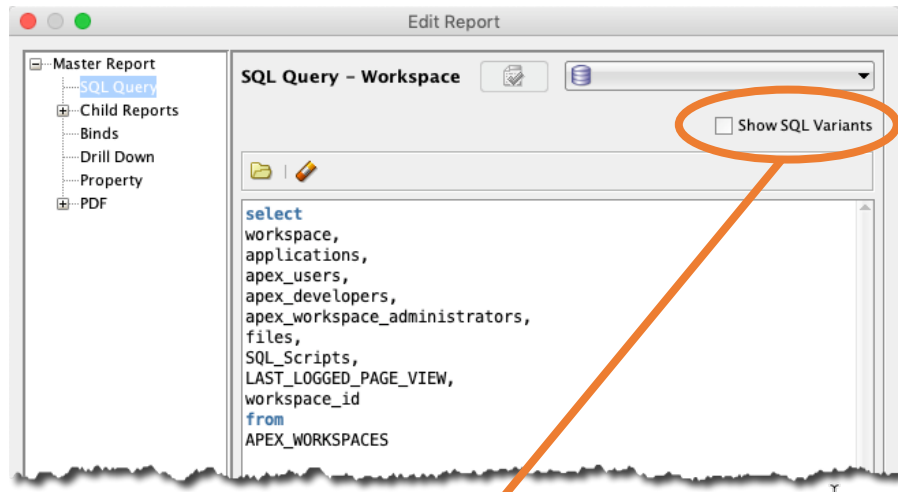


Styles



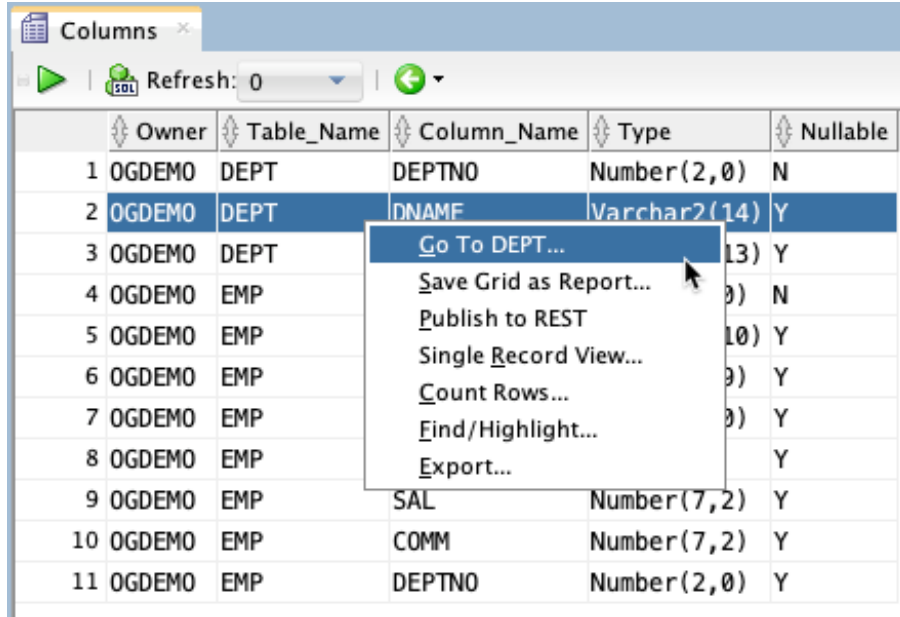
- Table (default)
- Chart (Bar, Pie, Line, Area, Combination, Scatter, Bubble, Polar, Radar, Pareto, Funnel, 3D)
- Gauge (Dial, Status Meter)
- Code (output presented as in worksheet editor, output must provide new lines)
- Script (script output as in worksheet)
- PL/SQL DBMS Output (prints dbms_output, ignores line feeds, use script with enable dbms_output)

Query



- Query is mandatory
 - SELECT statement
 - Anonymous PL/SQL Block
 - SQL*Plus Script
- Everything else is optional
- SQL Variants
 - DB version range
 - e.g. to optimize query based on available data dictionary views and columns

"Go To <ObjectName>..." Context Menu



The screenshot shows a database tool interface with a table of query results. The table has columns: Owner, Table_Name, Column_Name, Type, and Nullable. A context menu is open over the row where Owner is 'OGDEMO', Table_Name is 'DEPT', and Column_Name is 'DNAME'. The menu options are: 'Go To DEPT...', 'Save Grid as Report...', 'Publish to REST', 'Single Record View...', 'Count Rows...', 'Find/Highlight...', and 'Export...'. The 'Go To DEPT...' option is highlighted by the mouse cursor.

	Owner	Table_Name	Column_Name	Type	Nullable
1	OGDEMO	DEPT	DEPTNO	Number(2,0)	N
2	OGDEMO	DEPT	DNAME	Varchar2(14)	Y
3	OGDEMO	DEPT			
4	OGDEMO	EMP			
5	OGDEMO	EMP			
6	OGDEMO	EMP			
7	OGDEMO	EMP			
8	OGDEMO	EMP			
9	OGDEMO	EMP	SAL	Number(7,2)	Y
10	OGDEMO	EMP	COMM	Number(7,2)	Y
11	OGDEMO	EMP	DEPTNO	Number(2,0)	Y

- "Go To <ObjectName>..." is available when query has result columns named
 - sdev_link_owner
 - sdev_link_type
 - sdev_link_name
- These columns are hidden
- Opens the associated editor for the "linked" object type

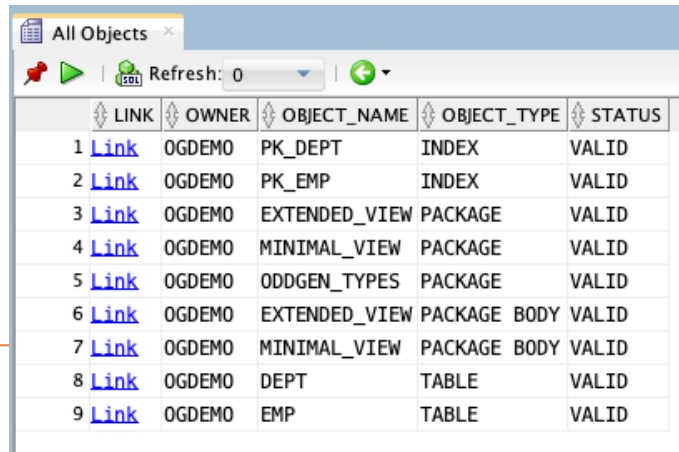
Hyperlink Column

SQLDEV:LINK

:<object_owner>:<object_type>:<object_name>

[:<line>:<col>] [:<label>]:<drill_class>

```
select 'SQLDEV:LINK:'
      || owner
      || ':'
      || object_type
      || ':'
      || object_name
      || ':Link:oracle.dbtools.raptor.controls.grid.DefaultDrillLink'
as link,
owner, object_name, object_type, status
from all_objects
where owner = :OWNER or owner is null
order by owner, object_type, object_name
```



	LINK	OWNER	OBJECT_NAME	OBJECT_TYPE	STATUS
1	Link	OGDEMO	PK_DEPT	INDEX	VALID
2	Link	OGDEMO	PK_EMP	INDEX	VALID
3	Link	OGDEMO	EXTENDED_VIEW	PACKAGE	VALID
4	Link	OGDEMO	MINIMAL_VIEW	PACKAGE	VALID
5	Link	OGDEMO	ODDGEN_TYPES	PACKAGE	VALID
6	Link	OGDEMO	EXTENDED_VIEW	PACKAGE BODY	VALID
7	Link	OGDEMO	MINIMAL_VIEW	PACKAGE BODY	VALID
8	Link	OGDEMO	DEPT	TABLE	VALID
9	Link	OGDEMO	EMP	TABLE	VALID

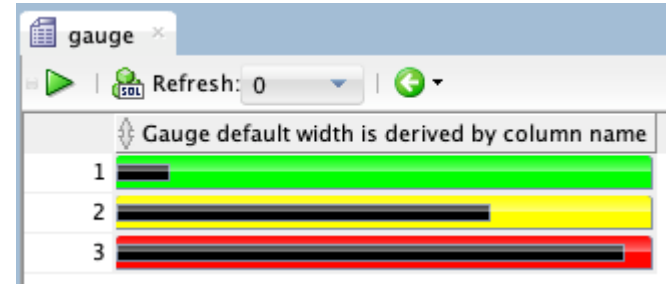
Gauge Column

SQLDEV:GAUGE

:<min>:<max>

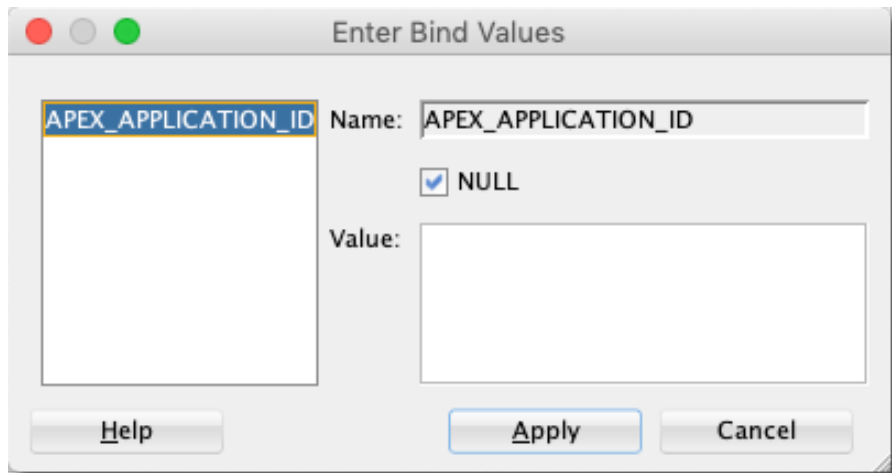
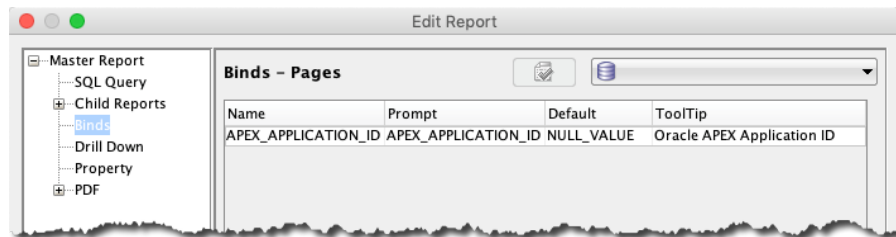
:<low_threshold>:<upper_threshold>

:<value>



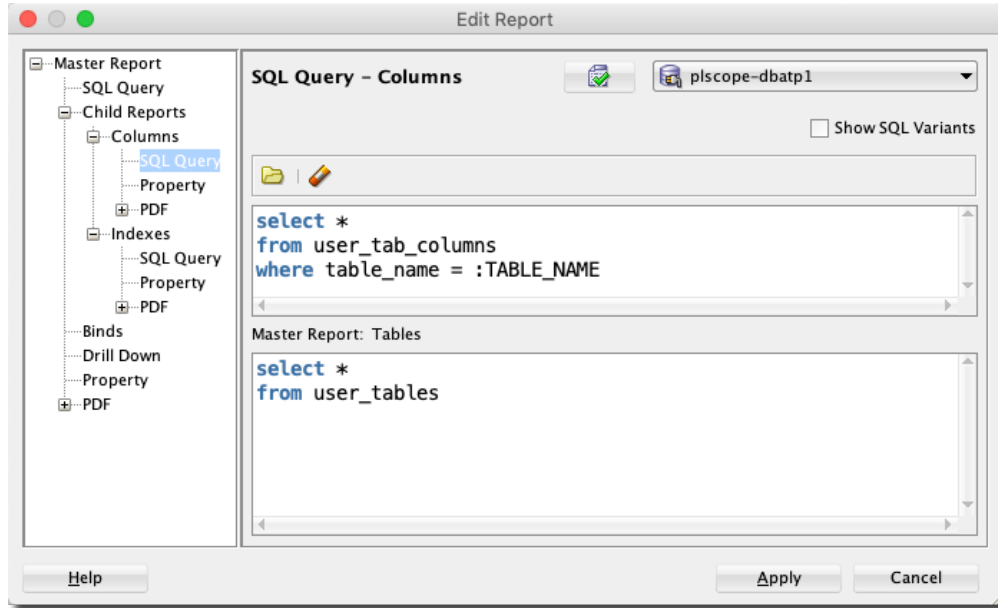
```
select 'SQLDEV:GAUGE:0:100:0:0:'  
      || value as "Gauge default width is derived by column name"  
from (  
  select 10 as value from dual  
  union all  
  select 70 as value from dual  
  union all  
  select 95 as value from dual  
)
```

Binds



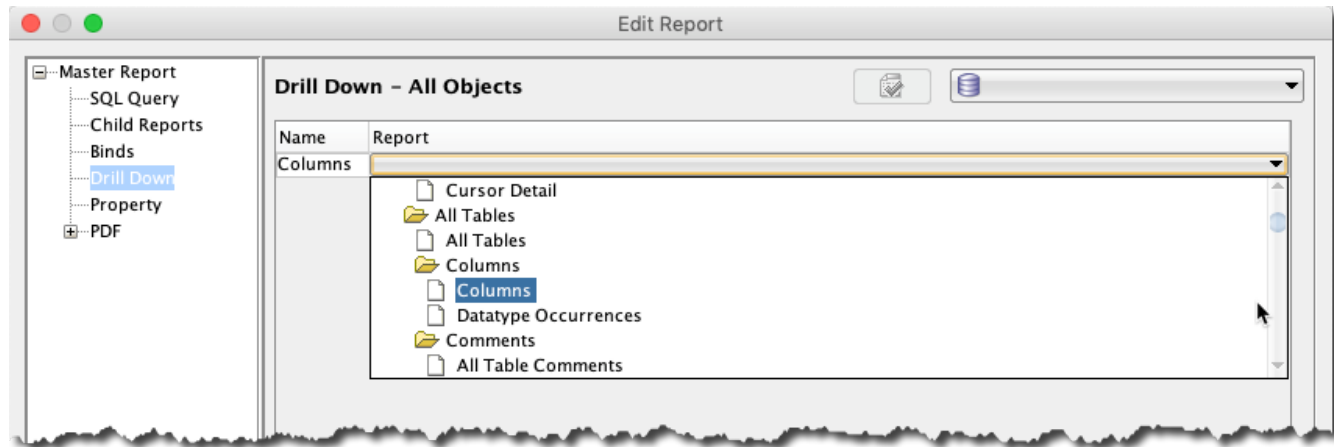
- Bind are identifiers prefixed with a colon
 - e.g. :APEX_APPLICATION_ID
- Properties for each bind used in the query
 - Name
 - Prompt
 - Default value
 - Tool tip
- "Enter Bind Values" Dialog
 - Before every execution

Child Reports



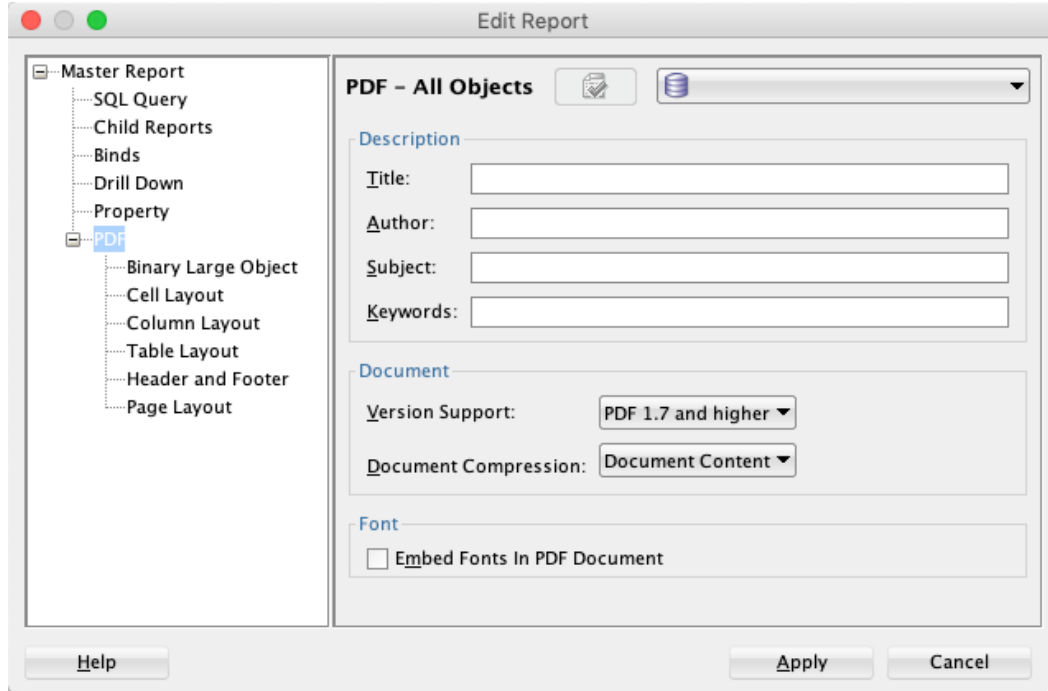
- Executed per selected parent row
- Each child report is shown in an own tab
- Parent row columns are binds
- Binds are case sensitive (upper case)

Drill Down Reports



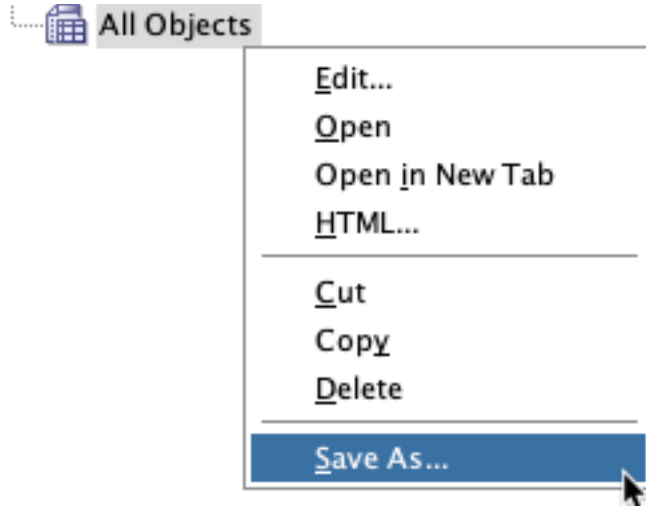
- Similar to child report
- Opens a report via context menu
- Current result row columns are passed as binds to drill down report

PDF Settings



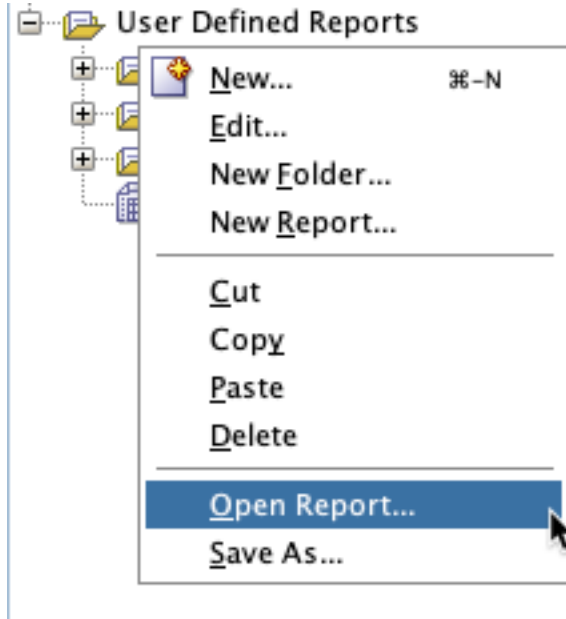
- Configure PDF Layout
- Grid result can be exported
 - CSV, Delimited, JSON, XML
 - Insert, Loader
 - Excel, HTML
 - PDF, Text

Exporting Reports



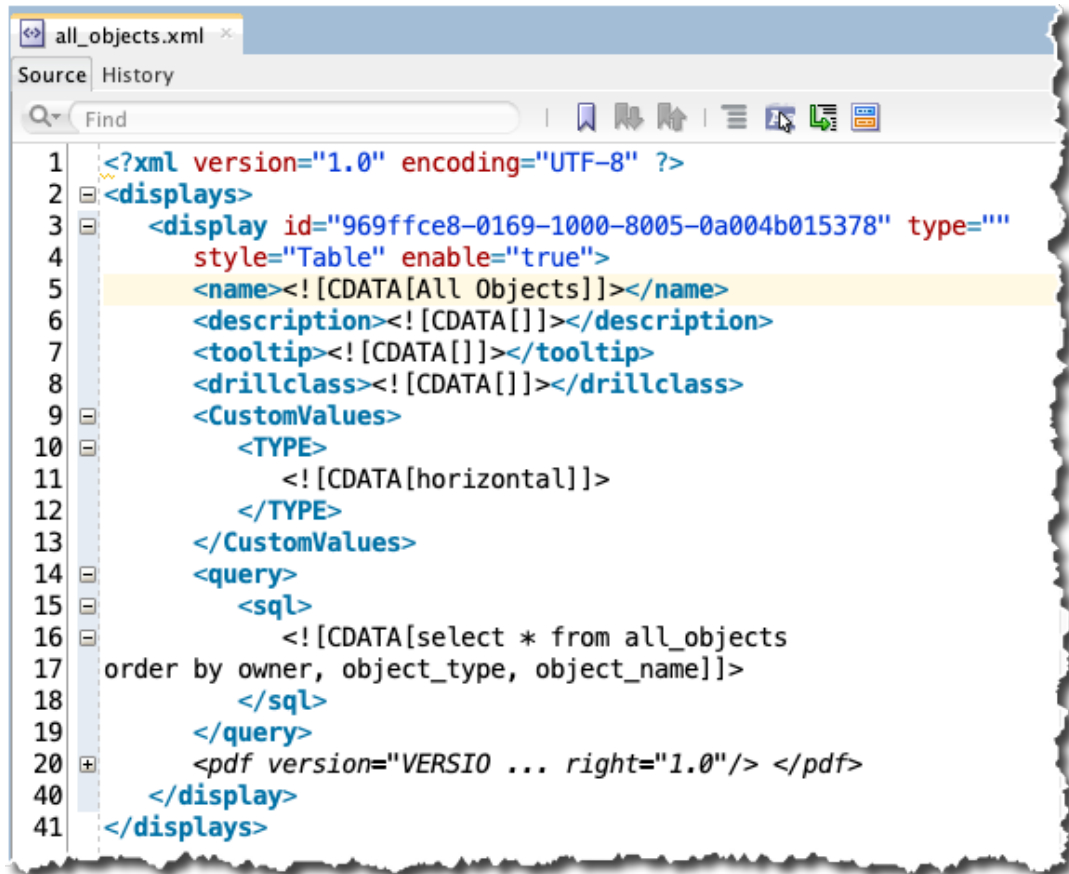
- Context Menu in Reports Window
- XML Format
- Single Report
- Group of Reports (Folder)

Import Reports



- Read "Open" as "Import"
- Report is copied
 - into "User Defined Reports" folder
 - `${ide.pref.dir}/UserReports.xml`
 - Visible in all SQL Developer installations

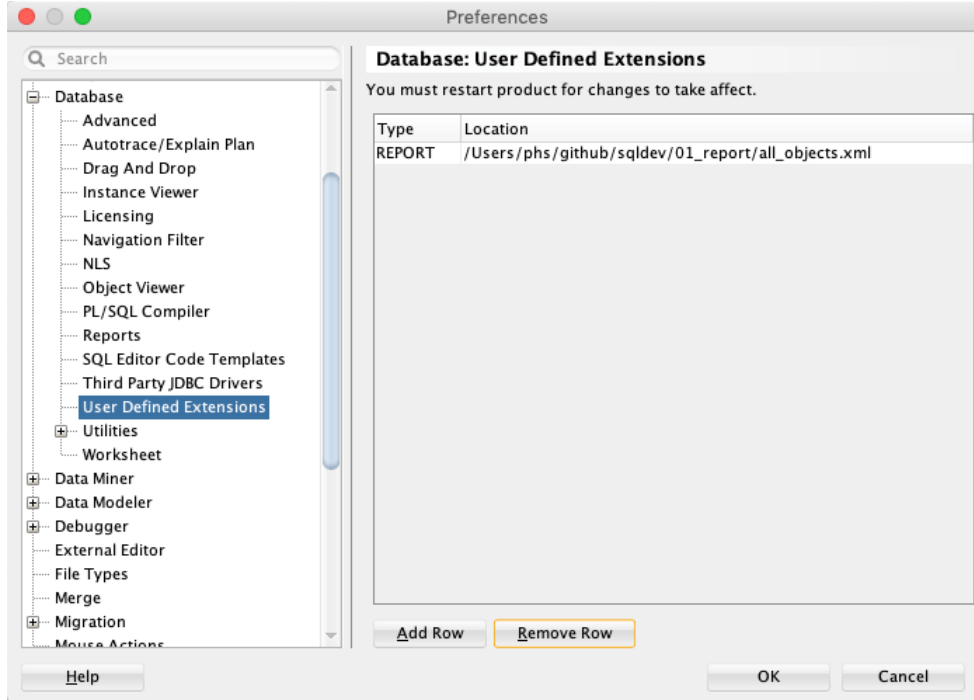
XML Source – Example



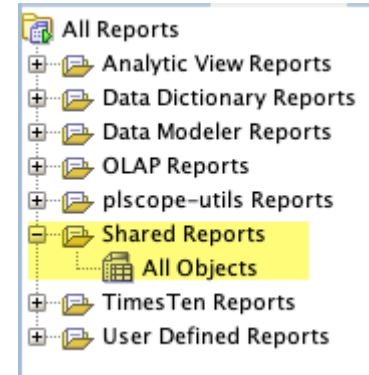
```
1 <?xml version="1.0" encoding="UTF-8" ?>
2 <displays>
3   <display id="969ffce8-0169-1000-8005-0a004b015378" type=""
4     style="Table" enable="true">
5     <name><![CDATA[All Objects]]></name>
6     <description><![CDATA[]]></description>
7     <tooltip><![CDATA[]]></tooltip>
8     <drillclass><![CDATA[]]></drillclass>
9     <CustomValues>
10      <TYPE>
11        <![CDATA[horizontal]]>
12      </TYPE>
13    </CustomValues>
14    <query>
15      <sql>
16        <![CDATA[select * from all_objects
17 order by owner, object_type, object_name]]>
18      </sql>
19    </query>
20    <pdf version="VERSI0 ... right="1.0"/> </pdf>
40  </display>
41 </displays>
```

- Formatted
- PDF node is collapsed
- Modify in
 - XML editor
 - SQL Developer (open, export)
- Configuration item for VCS

Installing Reports (XML Extension)



- Database Preferences
 - User Defined Extensions
 - XML file is referenced
- SQL Developer must be restarted
- Shared Reports



Editors

Object Type Details

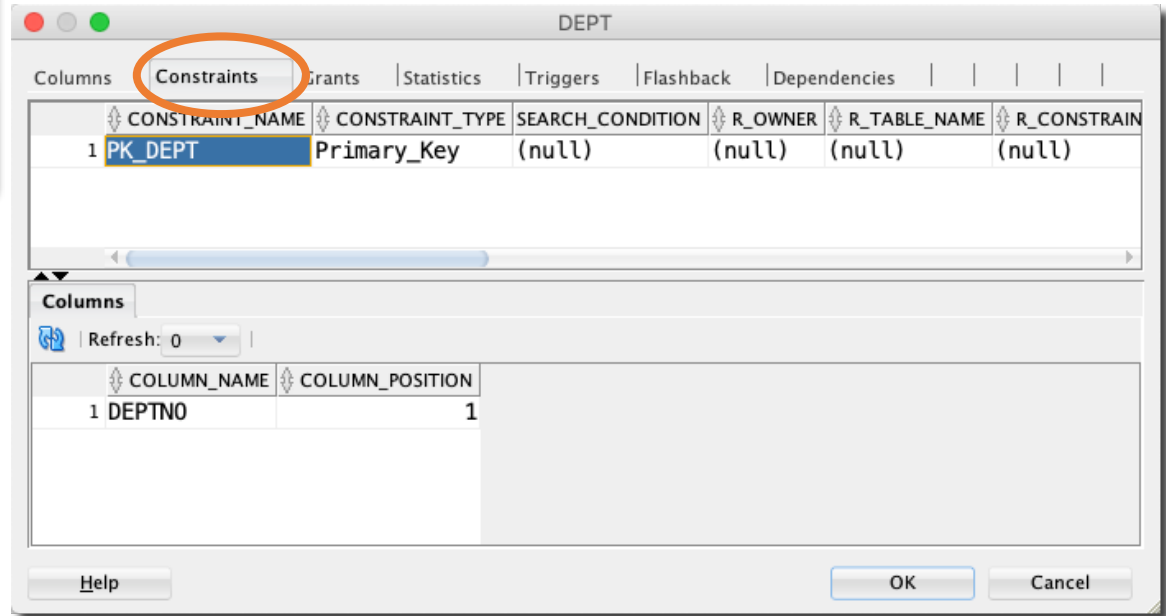
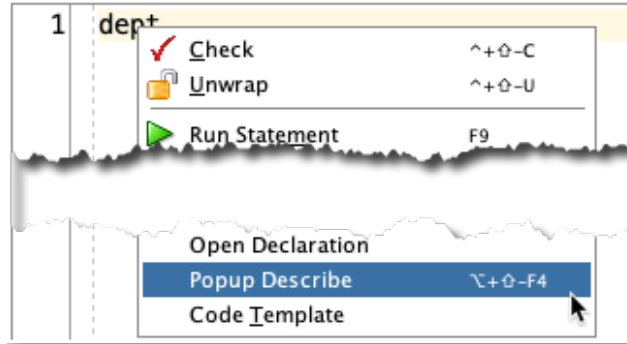
The screenshot displays the Oracle SQL Developer interface. On the left, the 'Connections' pane shows a tree view of database objects under the connection 'plscope-odb-macphs'. The 'DEPT' table is selected. The main window shows the 'DEPT' table details, with the 'Constraints' tab selected. The 'Constraints' tab is circled in orange. The 'Columns' tab is also visible, showing the table's structure. The 'Flashback' tab is also circled in orange. The 'Columns' tab shows the table's structure with the following columns:

COLUMN_NAME	COLUMN_POSITION
DEPTNO	1

The 'Constraints' tab shows the following constraints:

CONSTRAINT_NAME	CONSTRAINT_TYPE	SEARCH_CONDITION	R_OWNER	R_TABLE_NAME	R_C
PK_DEPT	Primary_Key	(null)	(null)	(null)	(null)

Popup Describe



Reports vs. Editors

Reports

```
<?xml version="1.0" encoding="UTF-8" ?>
<displays>
  <display
    id="969ffce8-0169-1000-8005-0a004b015378"
    type=""
    style="Table"
    enable="true"

  >
  ...
</display>
</displays>
```

Editors

```
<?xml version="1.0" encoding="UTF-8" ?>
<displays>
  <display

    type="editor"
    style="Table"
    enable="true"
    objectType="TABLE,VIEW,PACKAGE,PACKAGE BODY"

  >
  ...
</display>
</displays>
```

Object Types (Excerpt)

- DATABASE LINK
- DIRECTORY
- FUNCTION *)
- INDEX
- JOB
- MATERIALIZED VIEW
- MATERIALIZED VIEW LOG
- OPERATOR
- PACKAGE *)
- PACKAGE BODY *)
- PROCEDURE *)
- QUEUE
- RECYCLEBIN
- SYNONYM
- TABLE
- TRIGGER *)
- TYPE *)
- TYPE BODY *)
- VIEW

*) Popup Describe only, see also <https://github.com/oracle/oracle-db-examples/blob/master/sqldeveloper/extension/java/DumpObjectTypesAction/README.md>

Binds

The following bind variables can be used in SQL statements of an editor:

- :OBJECT_OWNER
- :OBJECT_TYPE
- :OBJECT_NAME

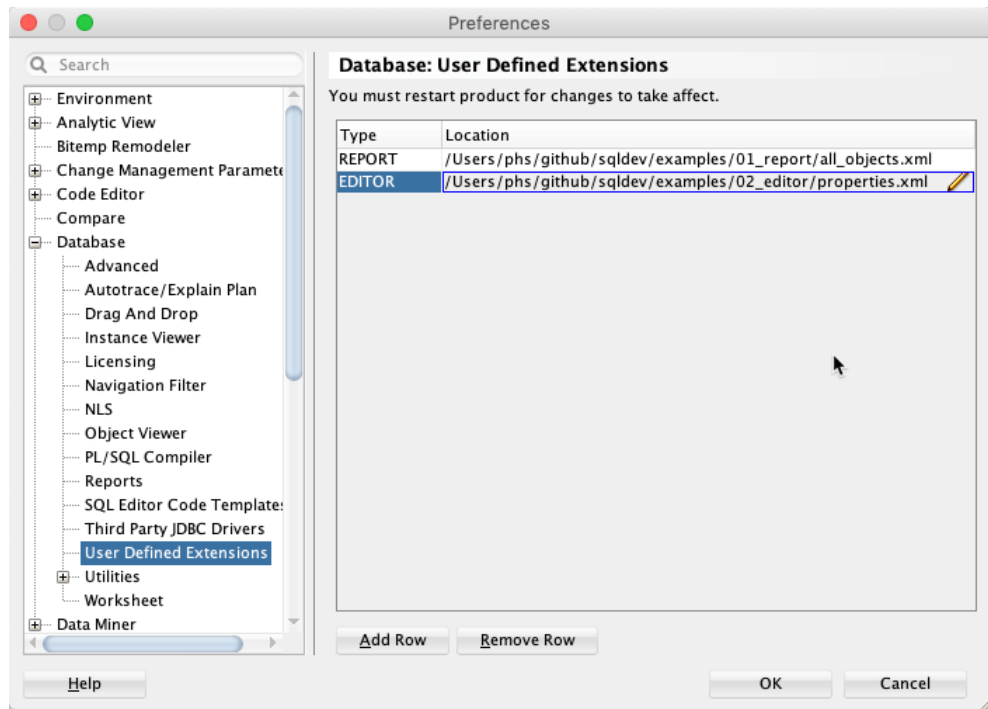


DBA-Views
optimization



```
select * from sys.all_objects
where owner = :OBJECT_OWNER
      and (object_type = :OBJECT_TYPE OR :OBJECT_TYPE IS NULL)
      and (object_name = :OBJECT_NAME OR :OBJECT_NAME IS NULL)
order by owner, object_type, object_name
```

Installing Editors (XML Extension)



- Database Preferences
 - User Defined Extensions
 - XML file is referenced
- SQL Developer must be restarted

Name	Value
1 OWNER	SCOTT
2 OBJECT_NAME	EMP
3 SUBOBJECT_NAME	(null)
4 OBJECT_ID	78662
5 DATA_OBJECT_ID	78662
6 OBJECT_TYPE	TABLE
7 CREATED	24.01.2019 22:34:48
8 LAST_DDL_TIME	24.01.2019 22:34:48
9 TIMESTAMP	2019-01-24:22:34:48
10 STATUS	VALID
11 TEMPORARY	N
12 GENERATED	N
13 SECONDARY	N
14 NAMESPACE	1
15 EDITION_NAME	(null)
16 SHARING	NONE
17 EDITIONABLE	(null)
18 ORACLE_MAINTAINED	N
19 APPLICATION	N
20 DEFAULT_COLLATION	USING_NLS_COMP
21 DUPLICATED	N
22 SHARDED	N
23 CREATED_APPID	(null)
24 CREATED_VSNID	(null)
25 MODIFIED_APPID	(null)
26 MODIFIED_VSNID	(null)

Demo



Connections Reports

plscope-odb-macphs

Worksheet Query Builder

1 dd_util

Preferences

user def

Database

- User Defined Extension
- Data Miner
 - Node Settings
 - Transforms
 - Filter Columns
 - Data Modeler
 - Model
 - Physical
 - Oracle
 - User Defined Preference
 - Migration
 - Generation Options
 - Web Browser and Proxy
 - XML Schemas

Database: User Defined Extensions

You must restart product for changes to take affect.

Type	Location
NAVIGATOR	/Users/phs/github/sqldev/examples/030_navigator/soft-drink...
EDITOR	/Users/phs/github/sqldev/examples/020_editor/drinks-editor...
EDITOR	/Users/phs/github/sqldev/examples/020_editor/ashtop.xml
EDITOR	/Users/phs/github/sqldev/examples/020_editor/properties.xml
ACTION	/Users/phs/github/sqldev/examples/040_action/ctas_javascrrip...
REPORT	/Users/phs/github/sqldev/examples/010_report/tpt.xml
REPORT	/Users/phs/github/sqldev/examples/010_report/ashtop.xml

Add Row Remove Row

Help OK Cancel

Tables (Filtered)

- DBMSPCC_BLOCKS
- DBMSPCC_RUNS
- DBMSPCC_UNITS
- DEPT
- DEPTSAL
- DEPTSAL_ERR
- EMP
 - EMPNO
 - ENAME
 - JOB
 - MGR
 - HIREDATE
 - SAL
 - COMM
 - DEPTNO

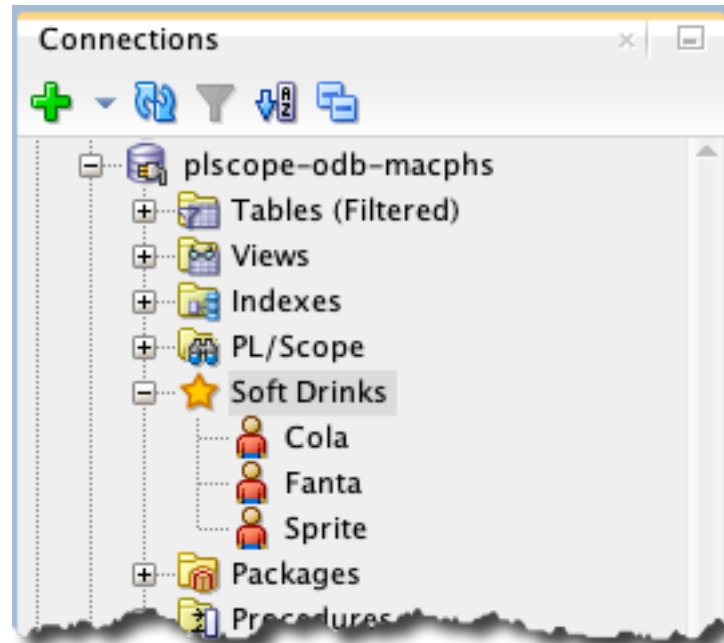
Views

- PLSCOPE_COL_USAGE
- PLSCOPE_IDENTIFIERS
- PLSCOPE_INS_LINEAGE
- PLSCOPE_NAMING
- PLSCOPE_STATEMENTS
- PLSCOPE_TAB_USAGE

Line 1 Column 6 | Insert | Modified | Unix/Mac: L

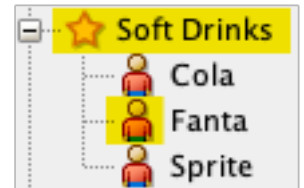
Navigators

Navigator by Example (1)



Navigator by Example (2)

```
1 <navigator RESOURCE_FILE="oracle.dbtools.raptor.navigator.OracleNavigatorResource">
2   <objectType connType="Oracle" id="soft-drinks" weight="203">
3     <folder>
4       <icon RSKEY="OracleIcons.FAVORITES"></icon>
5       <label RSKEY="Soft Drinks"/>
6       <queries>
7         <query>
8           <sql constrained="true">
9             <![CDATA[ SELECT 'Co ... S type FROM dual ]]>
19          </sql>
20        </query>
21      </queries>
22    </folder>
23    <node>
24      <icon RSKEY="OracleIcons.USER" />
25    </node>
26  </objectType>
27 </navigator>
```



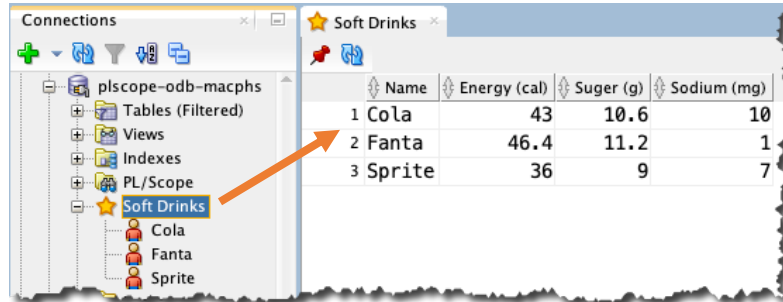
Navigator by Example (3)

```
7      <query>
8      <sql constrained="true">
9      <![CDATA[
10 SELECT 'Cola' AS name, 'soft-drinks' AS type
11     FROM dual
12 UNION ALL
13 SELECT 'Fanta' AS name, 'soft-drinks' AS type
14     FROM dual
15 UNION ALL
16 SELECT 'Sprite' AS name, 'soft-drinks' AS type
17     FROM dual
18     ]]>
19      </sql>
20 </query>
```



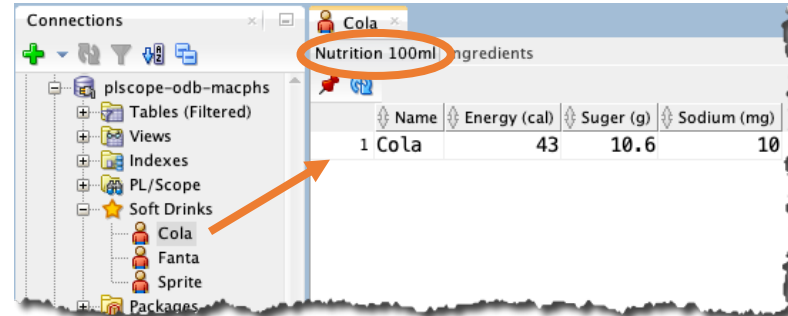
Editors

soft-drinks_FOLDER

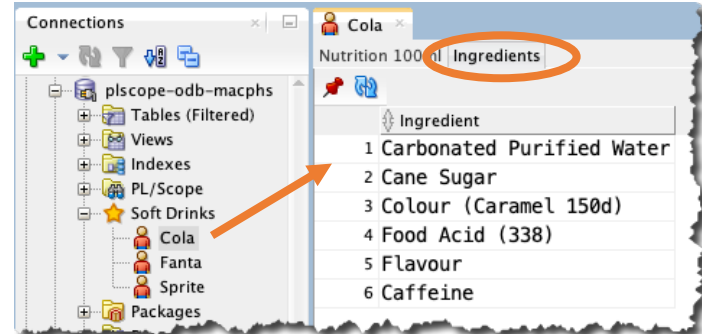


	Name	Energy (cal)	Sugar (g)	Sodium (mg)
1	Cola	43	10.6	10
2	Fanta	46.4	11.2	1
3	Sprite	36	9	7

soft-drinks

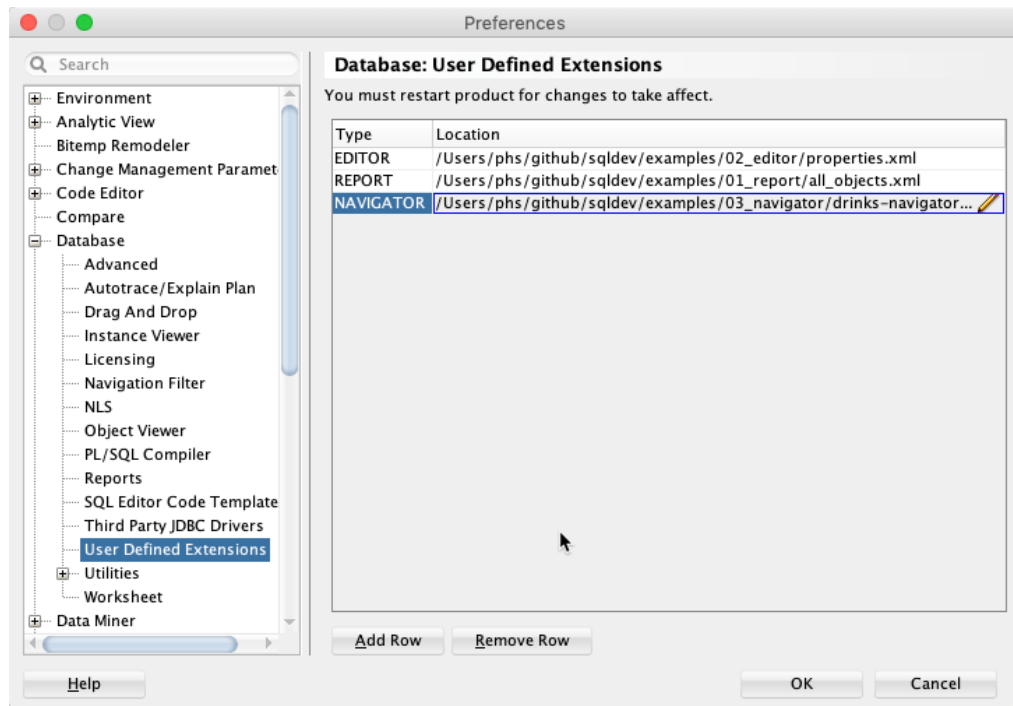


	Name	Energy (cal)	Sugar (g)	Sodium (mg)
1	Cola	43	10.6	10



	Ingredient
1	Carbonated Purified Water
2	Cane Sugar
3	Colour (Caramel 150d)
4	Food Acid (338)
5	Flavour
6	Caffeine

Installing Editors (XML Extension)



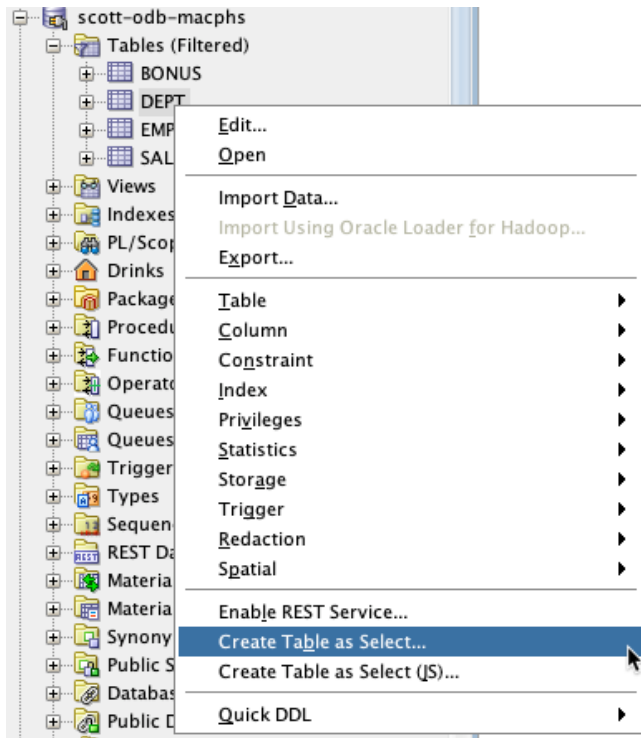
- Database Preferences
 - User Defined Extensions
 - XML file is referenced
- SQL Developer must be restarted



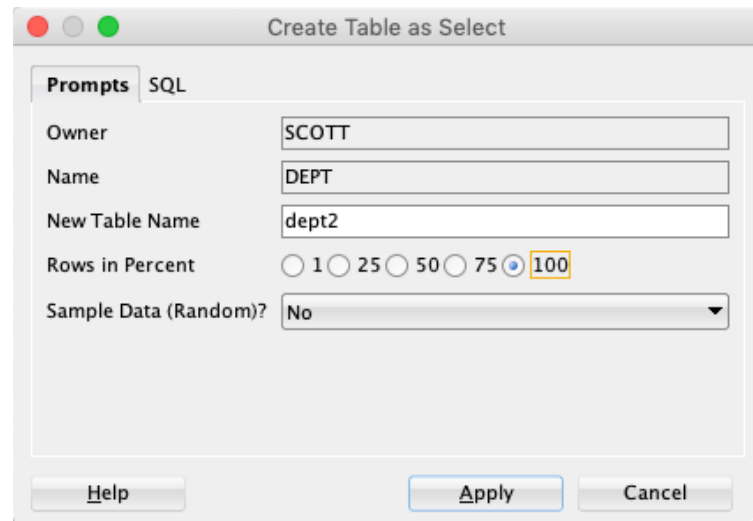
Actions

Action by Example (1)

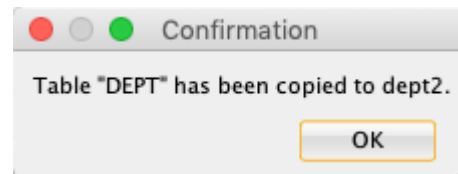
1



2



3



Action by Example (2)

```
<items>
  <item type="TABLE" reloadparent="true">
    <title>Create Table as Select...</title>
    <prompt>
      <label>New Table Name</label>
    </prompt>
    <prompt type="radio">
      <label>Rows in Percent</label>
      <value><![CDATA[STATIC:1:25:50:75:100]]></value>
    </prompt>
    <prompt>
      <label>Sample Data (Random)?</label>
      <value><![CDATA[STATIC:No:Yes]]></value>
    </prompt>
  ...
```



Only one type!

Action by Example (3a – PL/SQL)

```
<sql>
  <![CDATA[
declare
  l_sql varchar2(32767) := 'create table #0# as select * from ' ||
                           '"#OBJECT_OWNER#"."#OBJECT_NAME#"';
  l_count integer;
begin
  if '#1#' != '100' then
    if '#2#' = 'No' then
      select count(*) * #1# / 100 into l_count
      from "#OBJECT_OWNER#"."#OBJECT_NAME#";
      l_sql := l_sql || ' where rownum <= ' || l_count;
    else
      l_sql := l_sql || ' sample(#1#)';
    end if;
  end if;
  execute immediate l_sql;
end;
  ]]>
</sql>
```

Action by Example (3b – JavaScript)

```
<script>
  <![CDATA[
var tab = '' + OBJECT_OWNER + '."' + OBJECT_NAME + '';
var sql = 'create table ' + prompt0 + ' as select * from ' + tab;
if (prompt1 != '100') {
  if (prompt2 == 'No') {
    var sqlCount = 'select to_char(count(*) * to_number(:percent) / 100) AS col from ' + tab;
    var map = new java.util.HashMap();
    map.put('percent', prompt1);
    var count = dbutil.executeReturnOneCol(sqlCount, map);
    sql = sql + ' where rownum <= ' + count;
  } else {
    sql = sql + ' sample(' + prompt1 + ')';
  }
}
dbutil.execute(sql);
  ]]>
</script>
```

Action by Example (4)

```
...
<help>Copy a table. Completely or a chosen subset in percent.</help>
<confirmation>
  <title>Confirmation</title>
  <prompt>Table "#OBJECT_NAME#" has been copied to #0#.</prompt>
</confirmation>
</item>
</items>
```

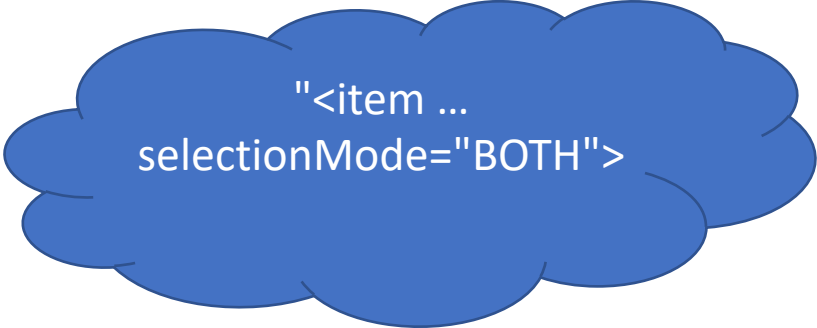
Object Types (Excerpt)

- APEX[_FOLDER]
- COLUMN
- CONNECTION
- DATABASE LINK[_FOLDER]
- DIRECTORY[_FOLDER]
- FUNCTION[_FOLDER]
- INDEX
- JAVA[_FOLDER]
- JOBS[_FOLDER]
- MATERIALIZED VIEW[_FOLDER]
- MATERIALIZED VIEW LOG[_FOLDER]
- PACKAGE[_FOLDER]
- PACKAGE_BODY
- PROCEDURE[_FOLDER]
- PUBLIC DATABASE LINK
- PUBLIC SYNONYM[_FOLDER]
- RECYCLEBIN
- SEQUENCE[_FOLDER]
- SYNONYM[_FOLDER]
- TABLE[_FOLDER]
- TYPE[_FOLDER]
- USER[_FOLDER]
- VIEW[_FOLDER]
- XDB
- XDB_SUBFOLDER
- XML SCHEMA

see also <https://github.com/oracle/oracle-db-examples/blob/master/sqldeveloper/extension/java/DumpObjectTypesAction/README.md>

PL/SQL & SQL Placeholders

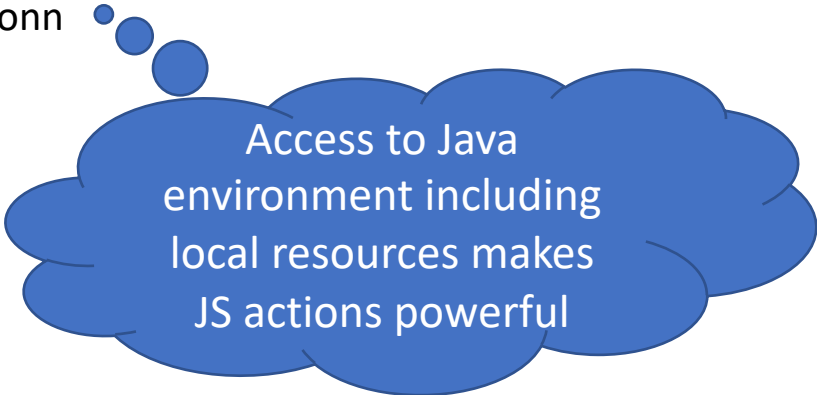
- #COLUMN_NAME#
 - #CHILD_NAME#
 - #CONN_TYPE#
 - #OBJECT_FOLDER_TYPE#
 - #OBJECT_ID#
 - #OBJECT_NAME#
 - #OBJECT_NAMES#
 - #OBJECT_OWNER#
 - #OBJECT_OWNERS#
 - #OBJECT_TYPE#
- #0#
 - #1#
 - #2#
 - ...
 - #<n>#



"<item ...
selectionMode="BOTH">

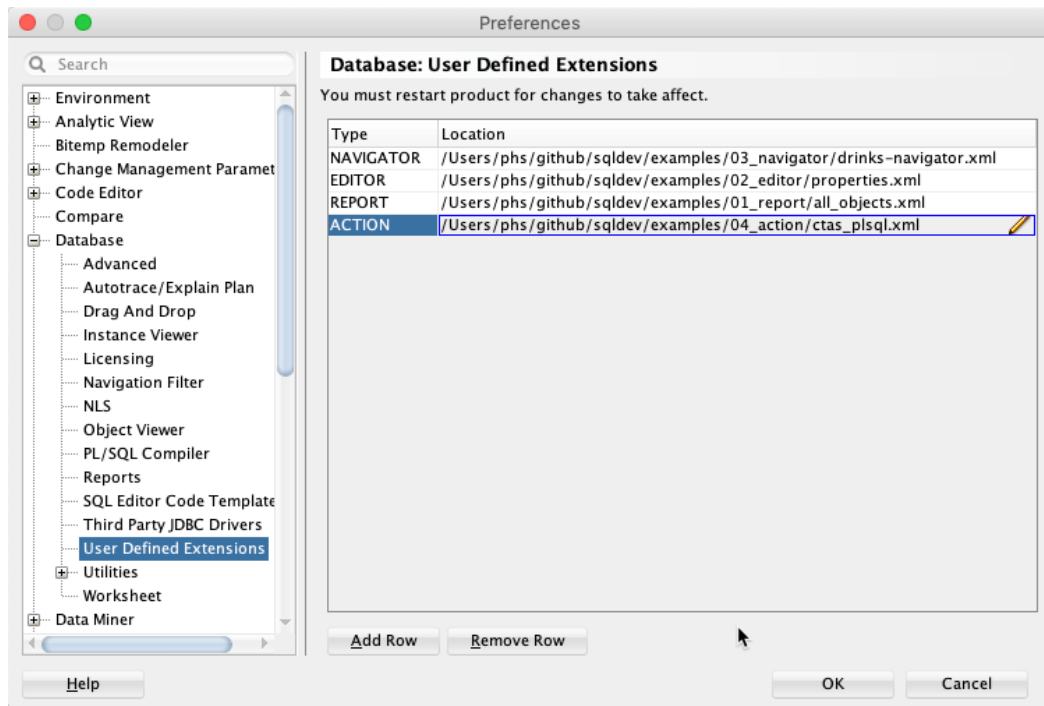
JavaScript Variables

- COLUMN_NAME
- CHILD_NAME
- CONN_TYPE
- OBJECT_FOLDER_TYPE
- OBJECT_ID
- OBJECT_NAME
- OBJECT_NAMES
- OBJECT_OWNER
- OBJECT_OWNERS
- OBJECT_TYPE
- prompt0
- prompt1
- prompt2
- ...
- prompt<n>
- dbutil
- conn

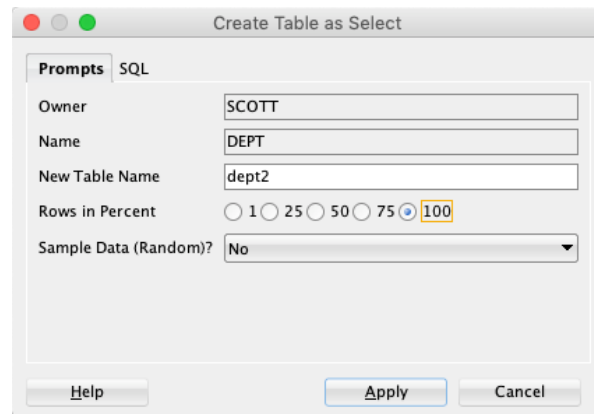


Access to Java
environment including
local resources makes
JS actions powerful

Installing Actions (XML Extension)



- Database Preferences
 - User Defined Extensions
 - XML file is referenced
- SQL Developer must be restarted



Core Messages

Everyone Can Write Extensions

- Start with Reports.
- Editors are basically Reports.
- Navigators and Actions are powerful, but not that simple to master.
- Look for examples and links to related resources, e.g. in <https://github.com/PhilippSalvisberg/sqldev>.
- Ask for help in the [SQL Developer Space](#).





Making a **WORLD** possible
in which **intelligent IT**
facilitates **LIFE and WORK** as a
matter of course.