

# Extend Your SQL Developer

Philipp



@phsalvisberg



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

29.10.2020

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

**trivadis**

# 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

2 - 4  
Releases per  
Year

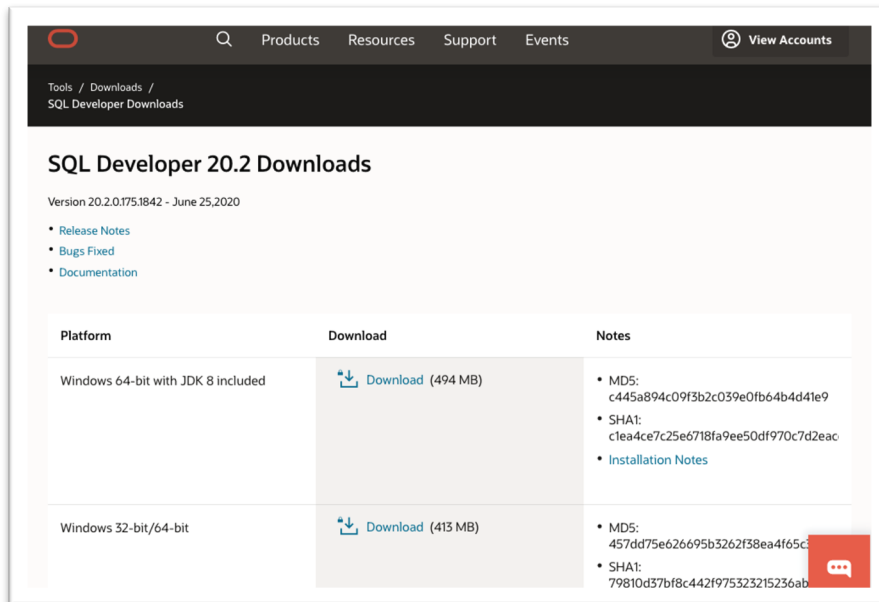


# More

trivadis

## Download

<https://www.oracle.com/tools/downloads/sqldev-downloads.html>

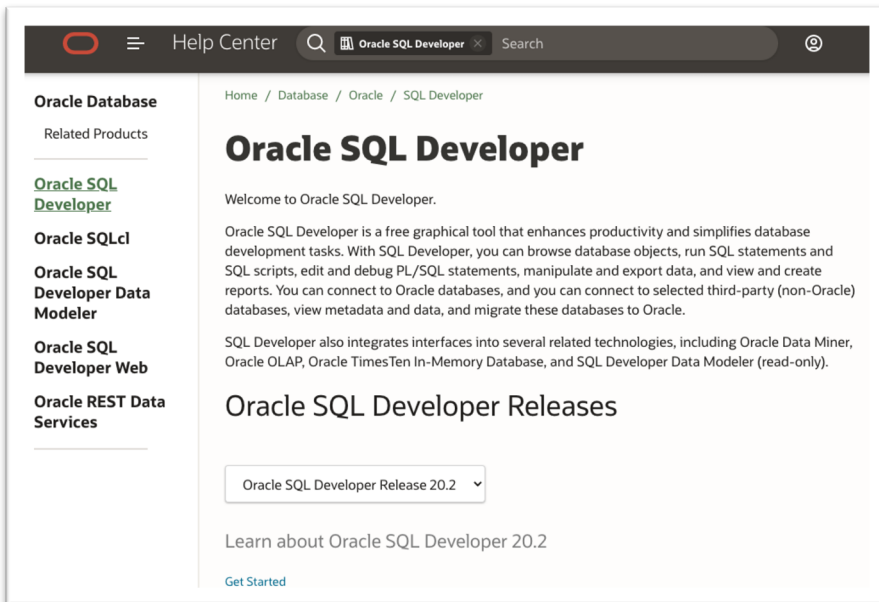


The screenshot shows the Oracle SQL Developer Downloads page. The header includes the Oracle logo, a search icon, and navigation links for Products, Resources, Support, and Events. A breadcrumb trail indicates the path: Tools / Downloads / SQL Developer Downloads. The main heading is "SQL Developer 20.2 Downloads", followed by the version "Version 20.2.0.175.1842 - June 25, 2020". There are links for Release Notes, Bugs Fixed, and Documentation. A table lists download links for Windows 64-bit and 32-bit versions, each with a download icon, a "Download" link, and the file size (494 MB and 413 MB respectively). The notes for each download include MD5 and SHA1 hashes and a link to the Installation Notes.

| Platform                           | Download                                                                                                            | Notes                                                                                                                                                                              |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Windows 64-bit with JDK 8 included |  <a href="#">Download</a> (494 MB) | <ul style="list-style-type: none"><li>MD5: c445a894c09f3b2c039e0fb64b4d41e9</li><li>SHA1: c1ea4ce7c25e6718fa9ee50df970c7d2eac</li><li><a href="#">Installation Notes</a></li></ul> |
| Windows 32-bit/64-bit              |  <a href="#">Download</a> (413 MB) | <ul style="list-style-type: none"><li>MD5: 457dd75e626695b3262f38ea4f65c</li><li>SHA1: 79810d37bf8c442f975323215236ab</li></ul>                                                    |

## Official Documentation

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



The screenshot shows the Oracle SQL Developer Official Documentation page. The header includes the Oracle logo, a menu icon, and navigation links for Help Center, Search, and Oracle SQL Developer. The main heading is "Oracle SQL Developer". The page content includes a welcome message, a description of the tool, and a list of related products: Oracle SQL Developer, Oracle SQLcl, Oracle SQL Developer Data Modeler, Oracle SQL Developer Web, and Oracle REST Data Services. There is a dropdown menu for "Oracle SQL Developer Release 20.2" and a link to "Learn about Oracle SQL Developer 20.2".

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

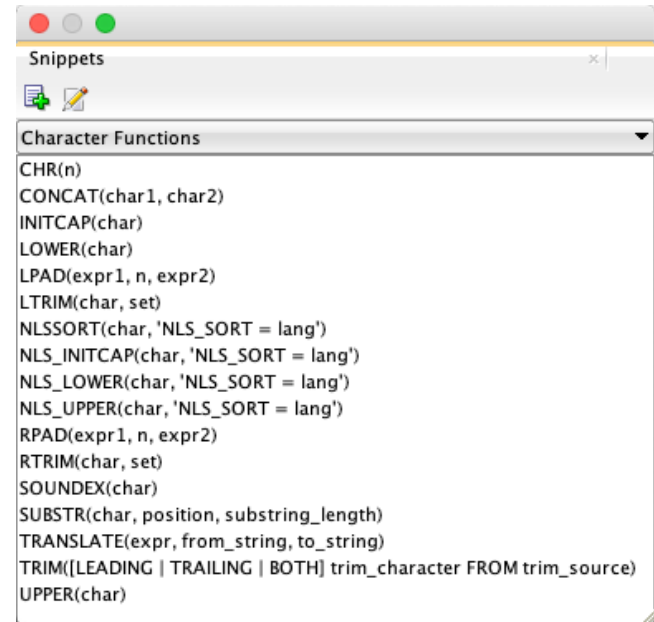
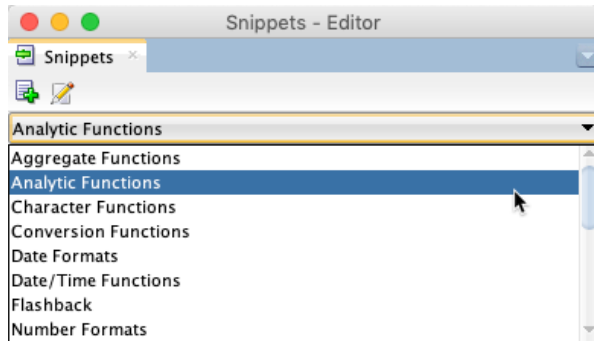
Oracle SQL Developer Release 20.2

[Learn about Oracle SQL Developer 20.2](#)

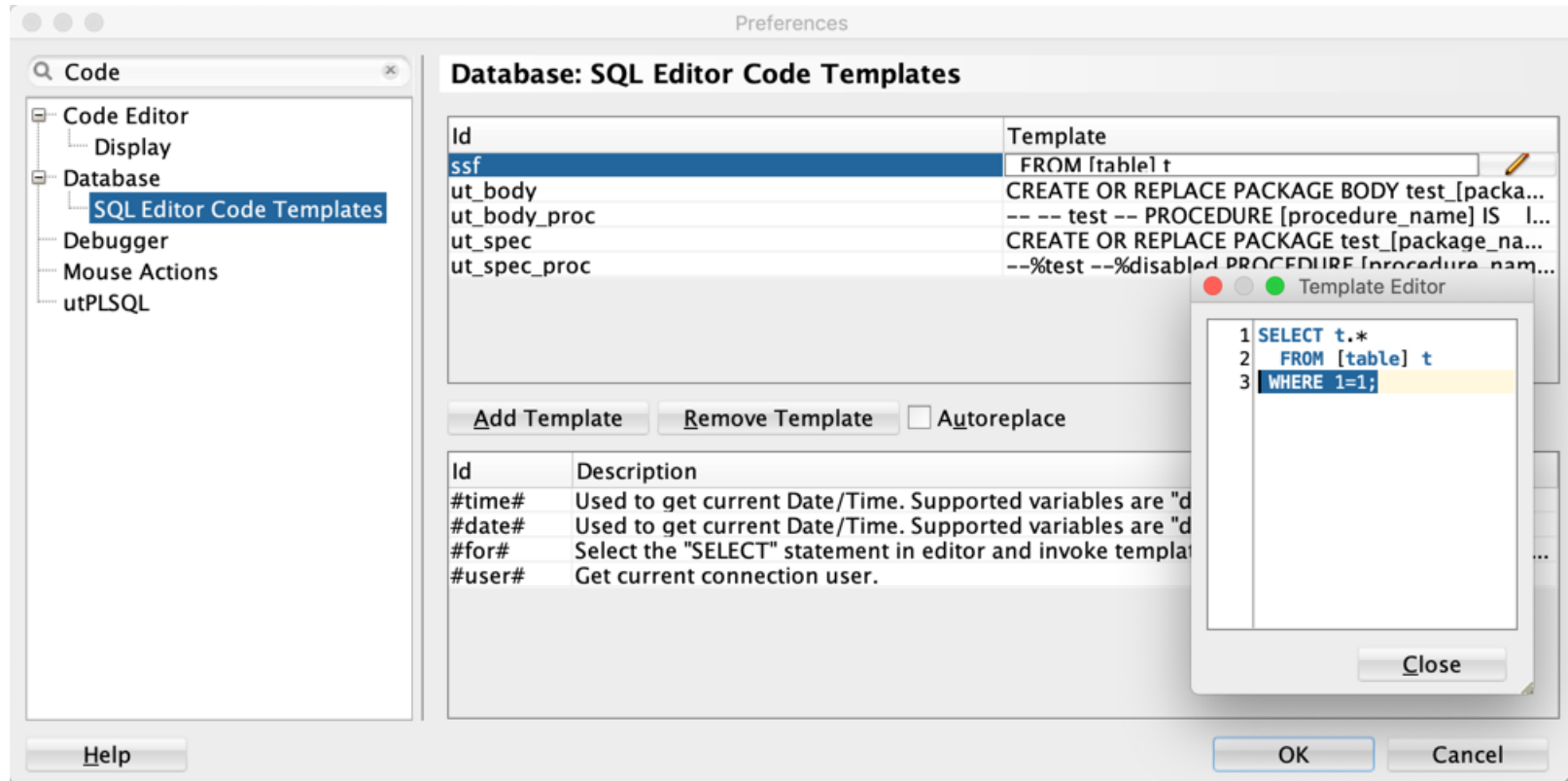
[Get Started](#)

# Extension Types

# Snippets



# Code Templates



# ESDK 2.0 Extensions (Java, OSGi Bundles)



Oracle SQL Developer : Package Body AX.APEX\_UTIL\_PKG Body@ax-odb-macphs

Connections | APEX\_UTIL\_PKG Body | Code | Errors | Profiles | Dependencies | Grants | References | Details

ax-odb-macphs

```
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 return l_returnvalue;
154
155 end get_apex_url;
156
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

|                                 |                                           |
|---------------------------------|-------------------------------------------|
| 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 ▲ 11..50 ◆ > 50 )               |
| Max. Halstead volume            | 1,018 ▲ (● < 1001 ▲ 1001..3000 ◆ > 3000 ) |
| Min. maintainability index (MI) | 105 ● (● > 84 ▲ 64..84 ◆ < 64 )           |
| Avg cyclomatic complexity       | 2 ● (● < 11 ▲ 11..50 ◆ > 50 )             |
| Avg Halstead volume             | 181 ● (● < 1001 ▲ 1001..3000 ◆ > 3000 )   |
| Avg maintainability index (MI)  | 147 ● (● > 84 ▲ 64..84 ◆ < 64 )           |
| 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 ●                 |

Open



# 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 salary report with columns 'Name' and 'Salary'. The report lists employees and their salaries, followed by a total row. A dialog box titled 'oddgen - Emp hierarchy' is open, displaying the description 'Generates salary report of selected employees in the hierarchy.' and a 'Node identifier' field containing '7698'. The 'Include commission?' checkbox is checked. At the bottom of the dialog are three buttons: 'Generate to worksheet', 'Generate to clipboard', and 'Cancel'.

Connections Generators

ogdemo-odb-macphs

All Generators

Client Generators

Database Server Generators

Examples

PL/SQL

1:1 View

Dropall

Emp hierarchy

King

Blake

Allen

James

Martin

Turner

Ward

Clark

Miller

Jones

Ford

Smith

Scott

Adams

Hello World

PL/SQL (FTLDB)

PL/SQL (tePLSQL)

Xtend

utPLSQL

oddgen

Worksheet Query Builder

|    | Name                       | Salary |
|----|----------------------------|--------|
| 1  |                            |        |
| 2  |                            |        |
| 3  | Blake                      | 2850   |
| 4  | Allen                      | 1900   |
| 5  | James                      | 950    |
| 6  | Martin                     | 2650   |
| 7  | Turner                     | 1500   |
| 8  | Ward                       | 1750   |
| 9  |                            |        |
| 10 | Total of 6                 | 11600  |
| 11 |                            | =====  |
| 12 |                            |        |
| 13 | Salaries with commissions. |        |

oddgen - Emp hierarchy

Generates salary report of selected employees in the hierarchy.

Node identifier 7698

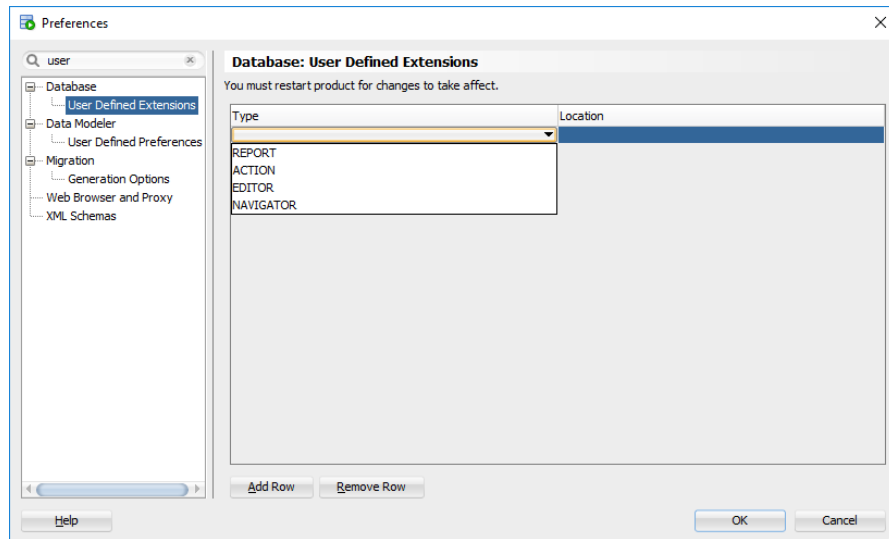
Include commission? ☒

Generate to worksheet Generate to clipboard 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

The screenshot shows the Oracle SQL Developer interface. The left sidebar displays the 'Database' tree, with 'Application Express' and 'Active Sessions' highlighted. The main pane shows the 'Pages' tab, displaying a list of application pages. The table below is a representation of the data shown in the screenshot:

| WORKSPACE   | APPLICATION_ID | PAGE_ID | PAGE_TITLE              | PAGE_FUNCTION |
|-------------|----------------|---------|-------------------------|---------------|
| 1 TVPDPAYS  | 100            | 1       | Home                    | Unknown       |
| 2 TVPDPAYS  | 100            | 2       | Dept                    | Unknown       |
| 3 TVPDPAYS  | 100            | 3       | Form on DEPT (2)        | Unknown       |
| 4 TVPDPAYS  | 100            | 4       | Emp                     | Unknown       |
| 5 TVPDPAYS  | 100            | 5       | Form on EMP (4)         | Unknown       |
| 6 TVPDPAYS  | 100            | 18      | TT Hist Dept            | Unknown       |
| 7 TVPDPAYS  | 100            | 19      | TT Form on DEPT (18)    | Unknown       |
| 8 TVPDPAYS  | 100            | 20      | VT Hist Dept            | Unknown       |
| 9 TVPDPAYS  | 100            | 21      | VT Form on DEPT_HV (20) | Unknown       |
| 10 TVPDPAYS | 100            | 22      | VT/TT Hist Dept         | Unknown       |
| 11 TVPDPAYS | 100            | 23      | VT Form on DEPT_HV (22) | Unknown       |
| 12 TVPDPAYS | 100            | 38      | TT Hist Emp             | Unknown       |
| 13 TVPDPAYS | 100            | 39      | Form on EMP (38)        | Unknown       |
| 14 TVPDPAYS | 100            | 40      | VT Hist Emp             | Unknown       |

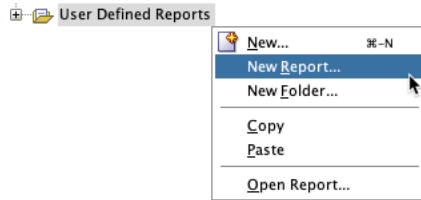
The bottom right of the screenshot features a blue cloud graphic with the text 'via XMI'.

via  
XML

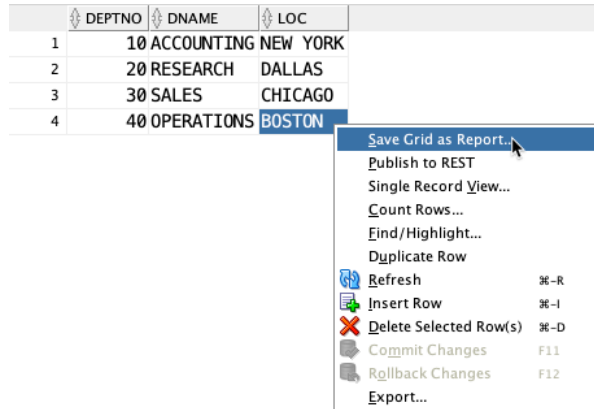
within  
SQL Developer

# Creating Reports

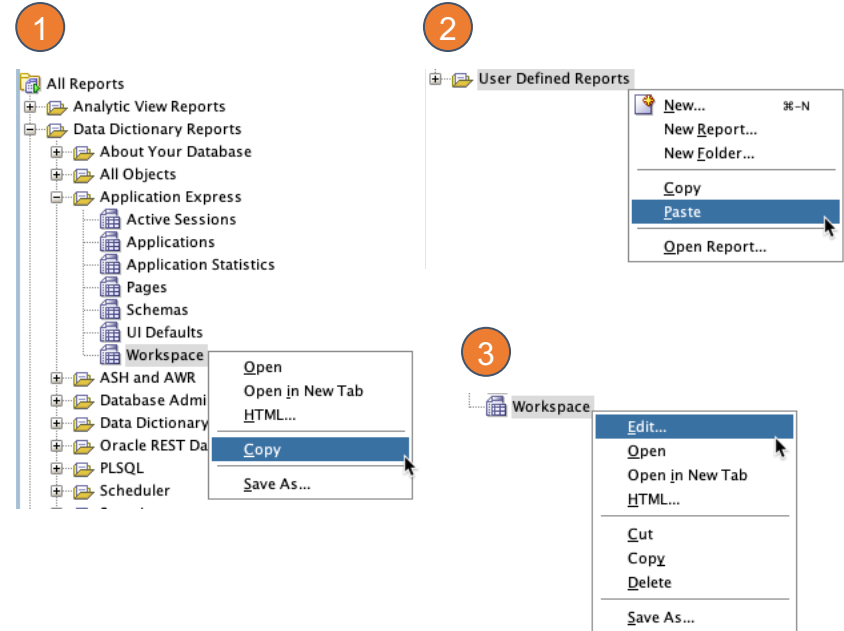
## a) From Scratch



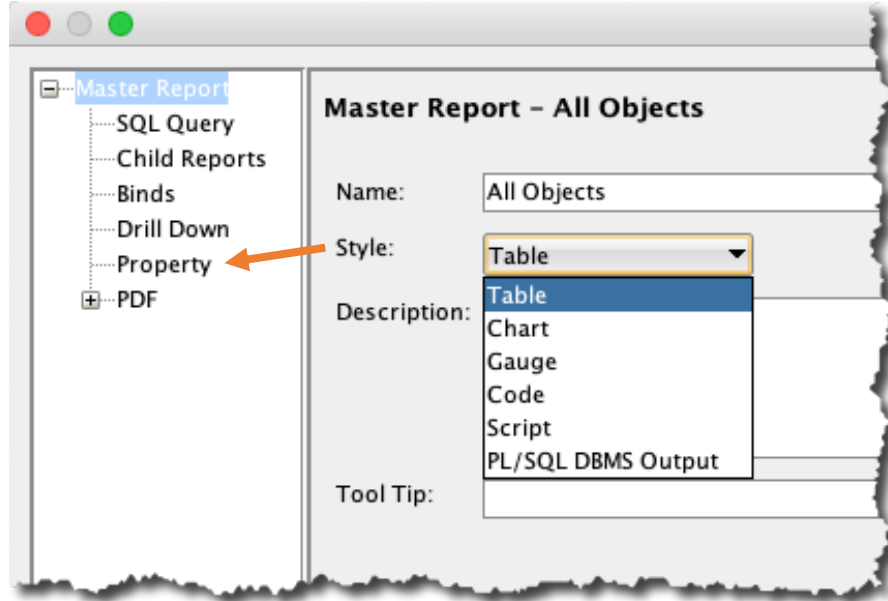
## c) From Result Table



## b) From Existing Report

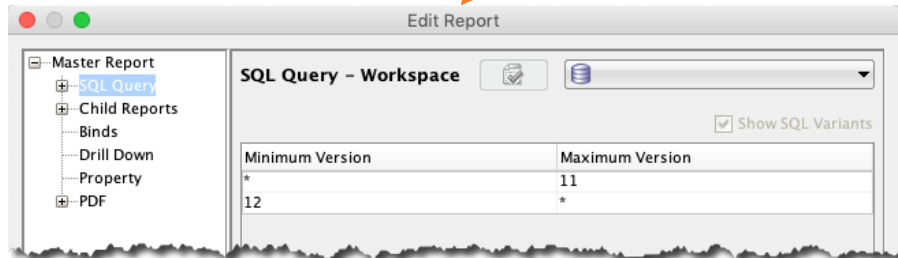
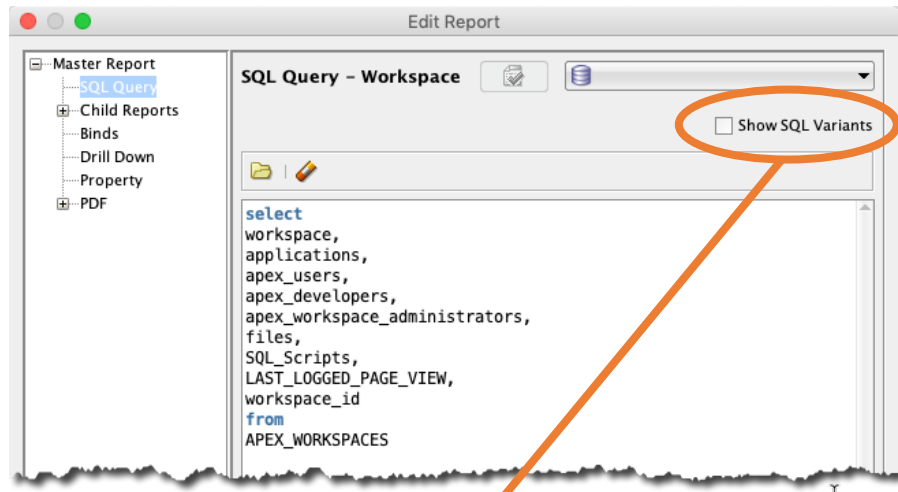


# Styles



- 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)

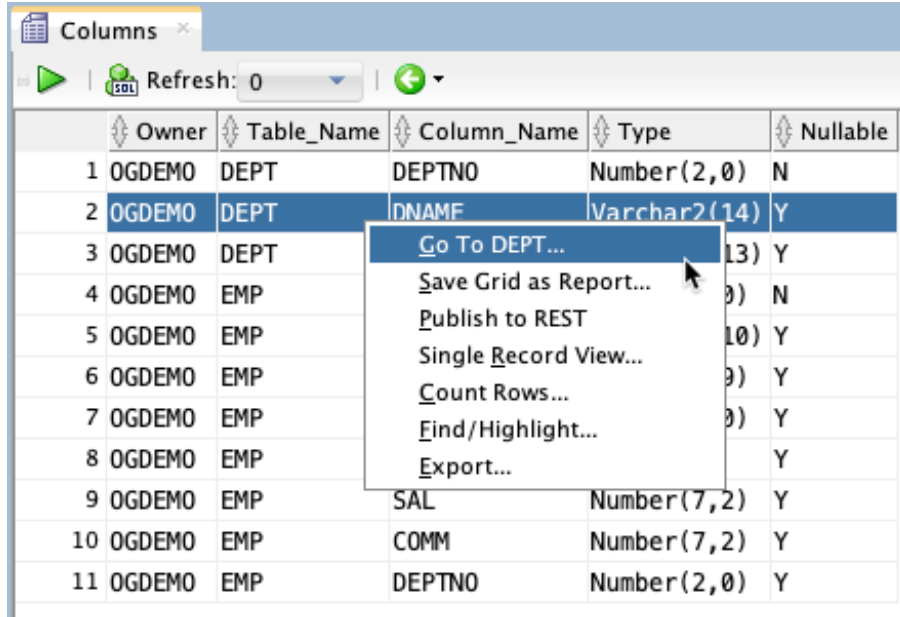
# Query



- 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 query result grid with columns: Owner, Table\_Name, Column\_Name, Type, and Nullable. The grid contains 11 rows of data. A context menu is open over the second row (OGDEMO, DEPT, DNAME, Varchar2(14), Y). The menu options are: Go To DEPT..., Save Grid as Report..., Publish to REST, Single Record View..., Count Rows..., Find/Highlight..., and Export....

|    | 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

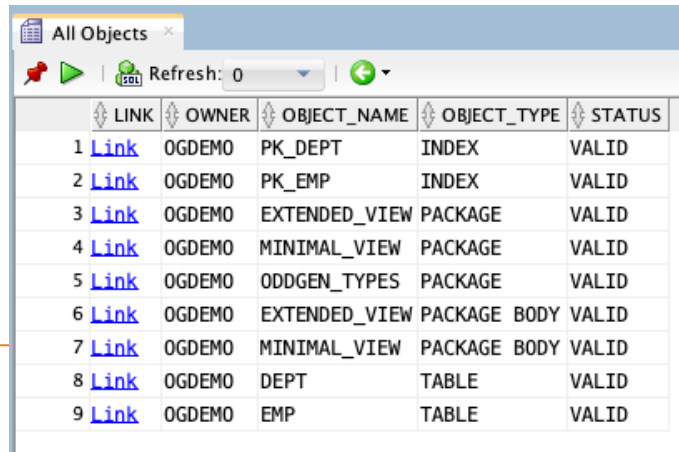
# Hyperlink Column

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 | <a href="#">Link</a> | OGDEMO | PK_DEPT       | INDEX        | VALID  |
| 2 | <a href="#">Link</a> | OGDEMO | PK_EMP        | INDEX        | VALID  |
| 3 | <a href="#">Link</a> | OGDEMO | EXTENDED_VIEW | PACKAGE      | VALID  |
| 4 | <a href="#">Link</a> | OGDEMO | MINIMAL_VIEW  | PACKAGE      | VALID  |
| 5 | <a href="#">Link</a> | OGDEMO | ODDGEN_TYPES  | PACKAGE      | VALID  |
| 6 | <a href="#">Link</a> | OGDEMO | EXTENDED_VIEW | PACKAGE BODY | VALID  |
| 7 | <a href="#">Link</a> | OGDEMO | MINIMAL_VIEW  | PACKAGE BODY | VALID  |
| 8 | <a href="#">Link</a> | OGDEMO | DEPT          | TABLE        | VALID  |
| 9 | <a href="#">Link</a> | OGDEMO | EMP           | TABLE        | VALID  |

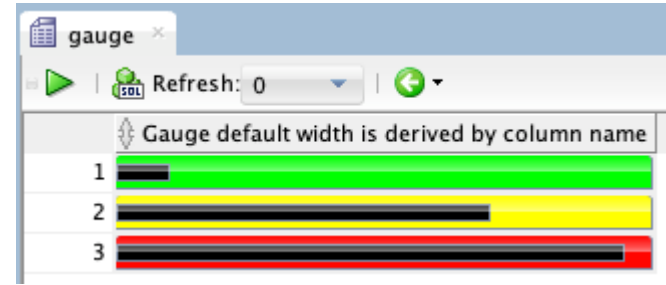
# Gauge Column

SQLDEV:GAUGE

:<min>:<max>

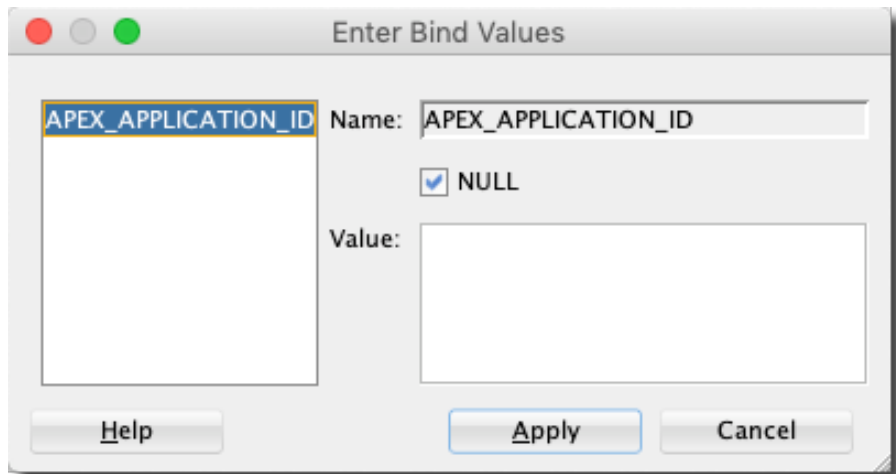
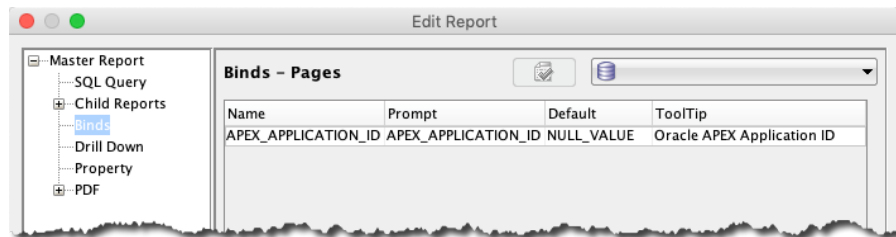
:<low\_threshold>:<upper\_threshold>

:<value>



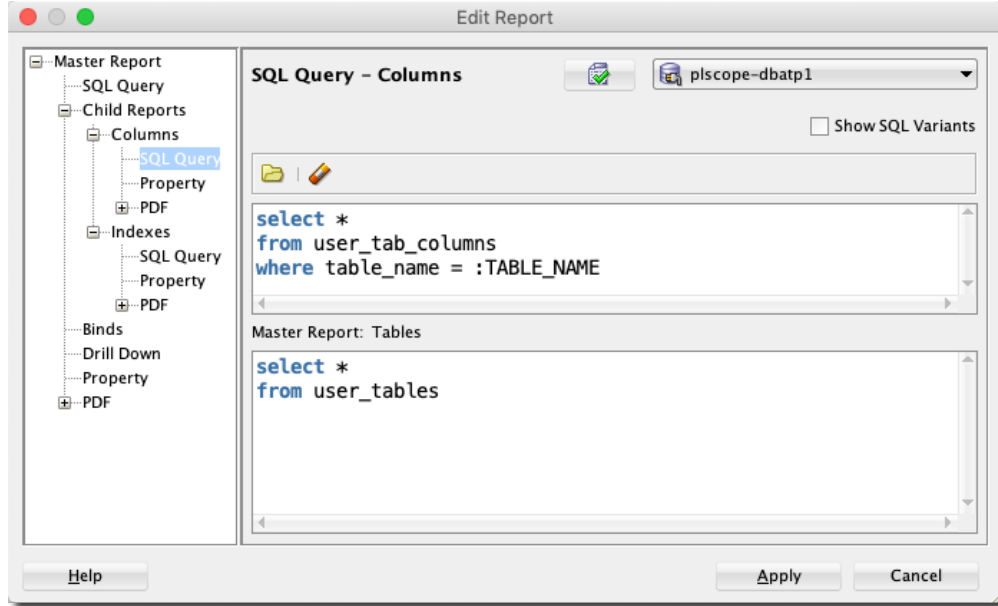
```
select 'SQLDEV:GAUGE:0:100:0:0:0:'  
      || value as "Gauge default width is derived by column name"  
from (  
  select 10 as value from dual  
  union all  
  select 70 as value from dual  
  union all  
  select 95 as value from dual  
)
```

# Binds



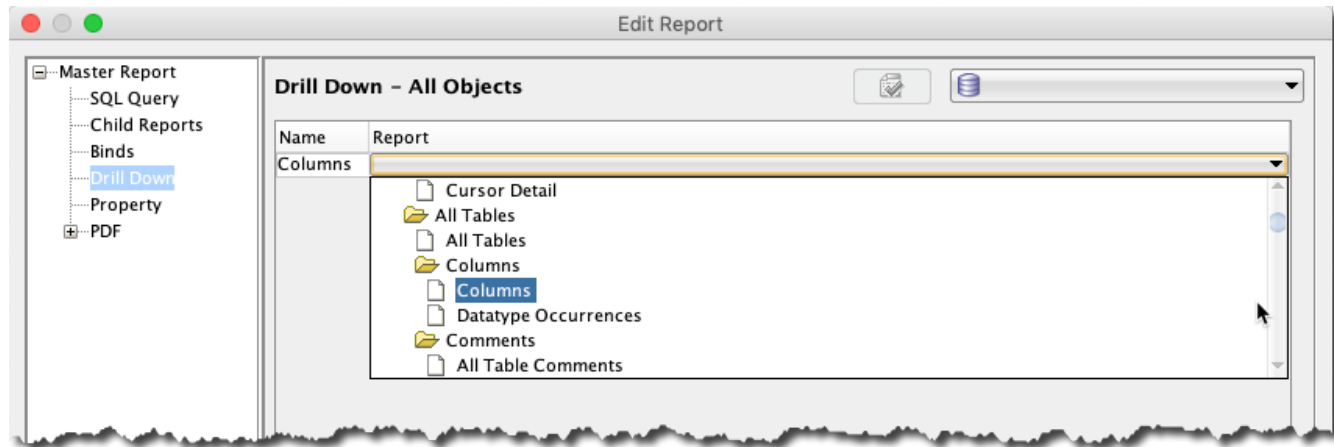
- Bind are identifiers prefixed with a colon
  - e.g. :APEX\_APPLICATION\_ID
- Properties for each bind used in the query
  - Name
  - Prompt
  - Default value
  - Tool tip
- "Enter Bind Values" Dialog
  - Before every execution

# Child Reports



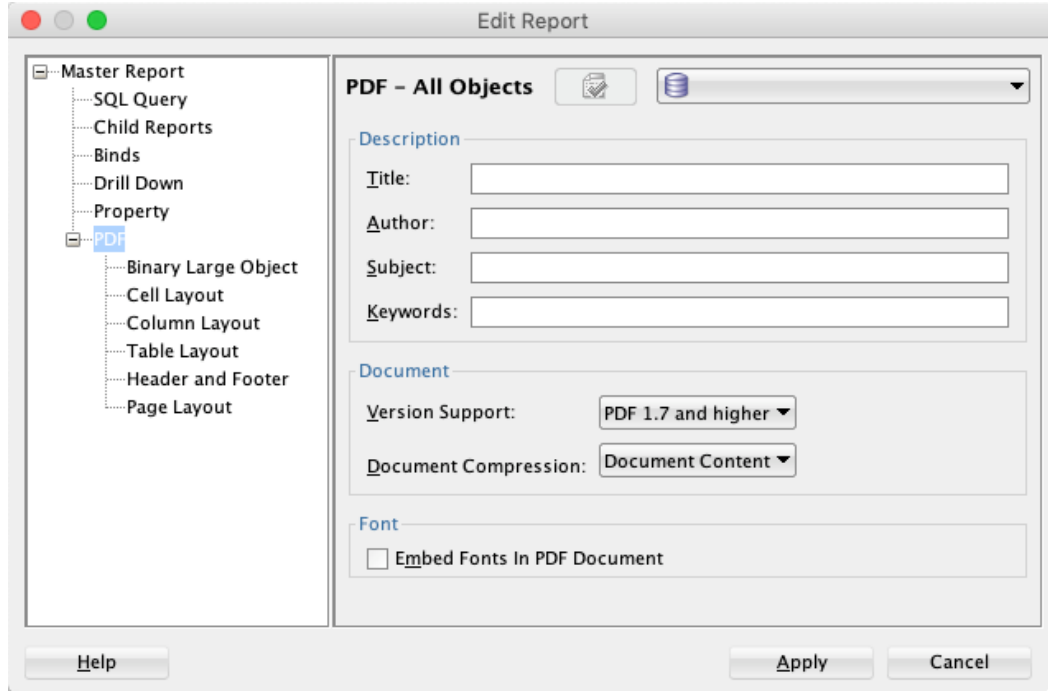
- Executed per selected parent row
- Each child report is shown in an own tab
- Parent row columns are binds
- Binds are case sensitive (upper case)

# Drill Down Reports



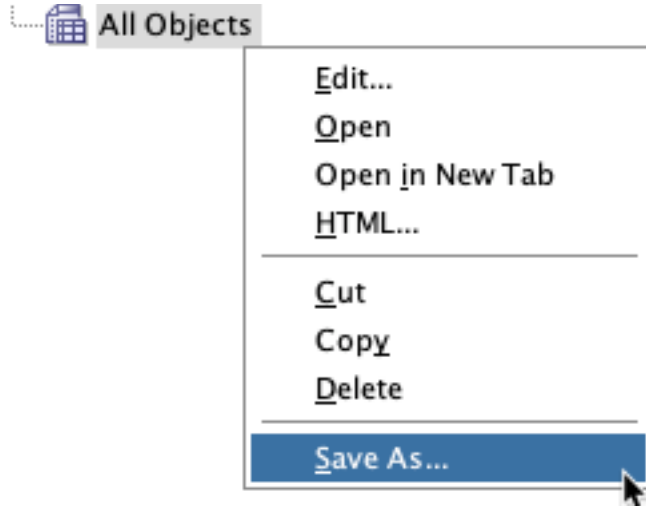
- Similar to child report
- Opens a report via context menu
- Current result row columns are passed as binds to drill down report

# PDF Settings



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

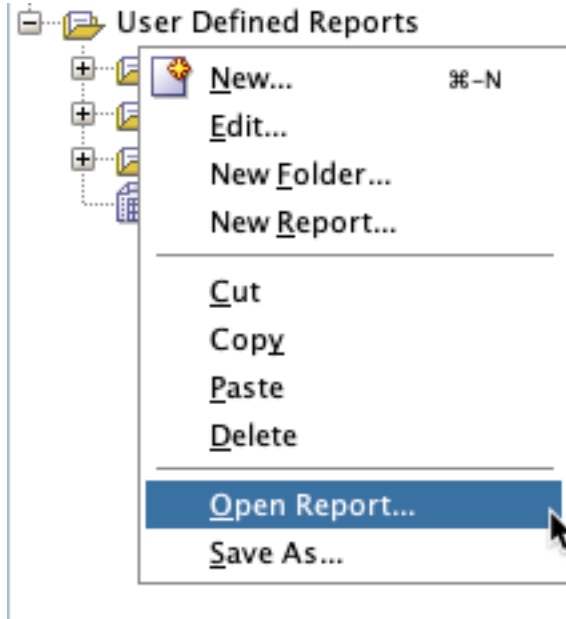
# Exporting Reports



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

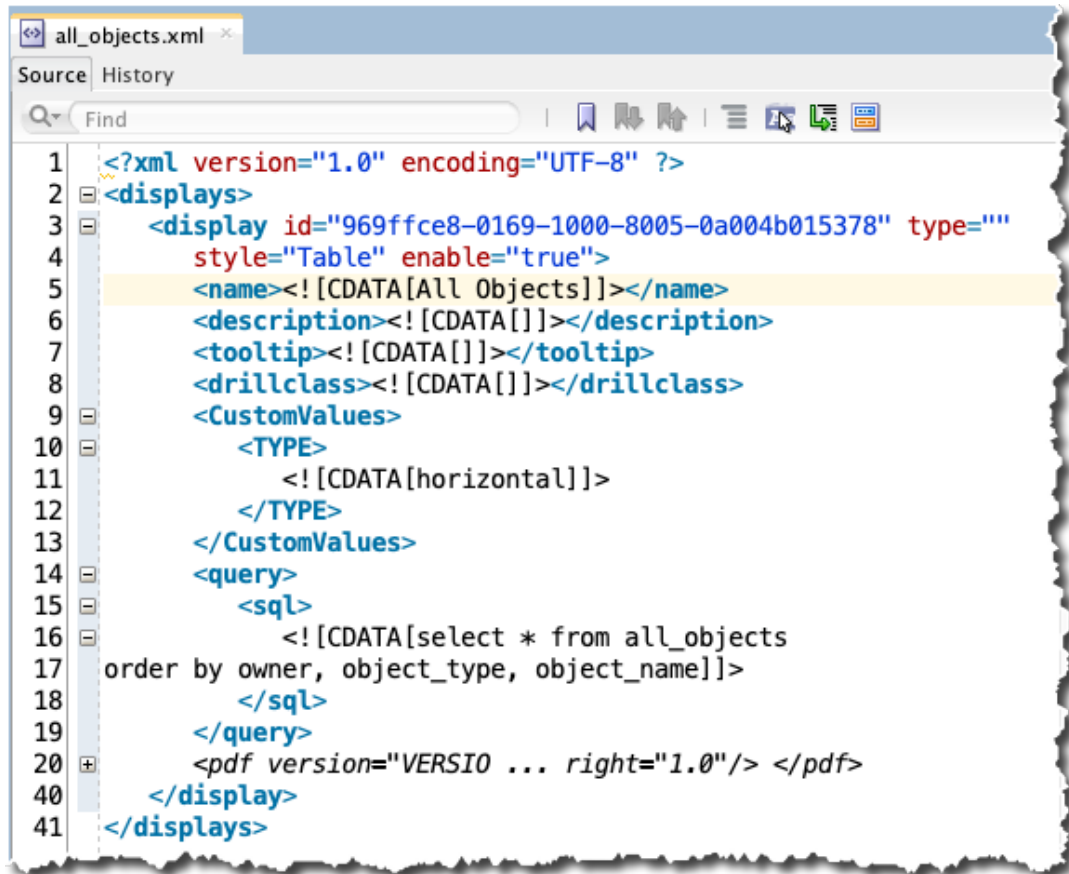


# Import Reports



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

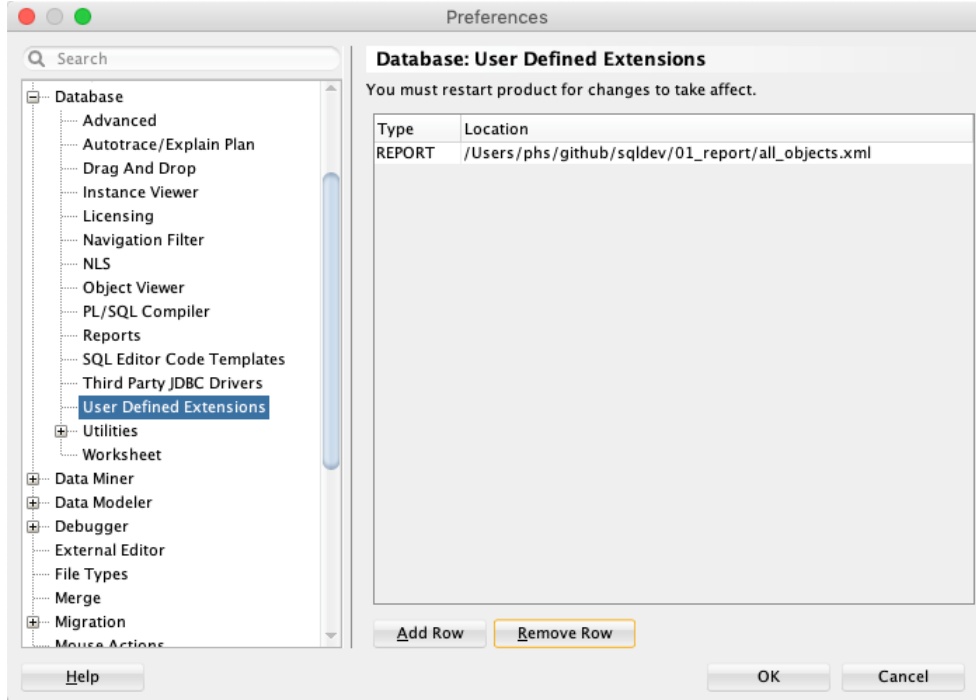
# XML Source – Example



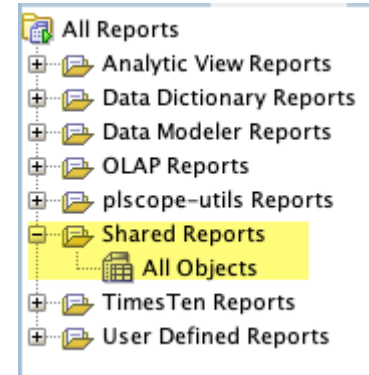
```
1 <?xml version="1.0" encoding="UTF-8" ?>
2 <displays>
3   <display id="969ffce8-0169-1000-8005-0a004b015378" type=""
4     style="Table" enable="true">
5     <name><![CDATA[All Objects]]></name>
6     <description><![CDATA[]]></description>
7     <tooltip><![CDATA[]]></tooltip>
8     <drillclass><![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

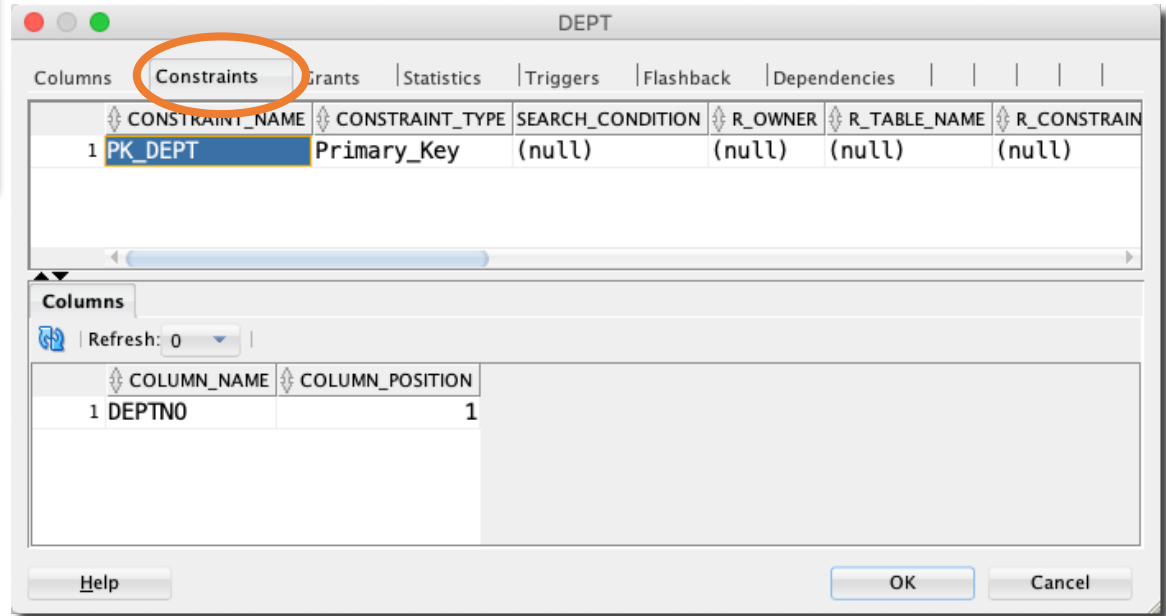
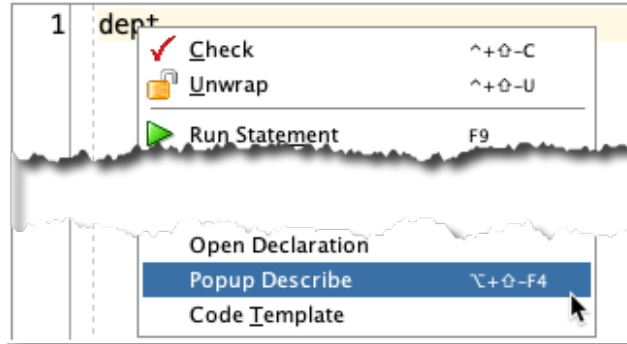
The screenshot displays the Oracle SQL Developer interface. On the left, the 'Connections' pane shows a tree view with 'plscope-odb-macphs' selected, containing folders for 'Tables (Filtered)', 'Views', 'Indexes', 'PL/Scope', 'Drinks', 'Packages', 'Procedures', and 'Functions'. The 'Tables (Filtered)' folder is expanded, listing several tables including 'DEPT'. The main window shows the 'DEPT' table selected, with the 'Constraints' tab active. The 'Constraints' tab is circled in orange, along with the 'Statistics' and 'Flashback' tabs. The 'Constraints' table shows a primary key constraint named 'PK\_DEPT' on the 'DEPTNO' column. Below the constraints, the 'Columns' tab is active, showing the 'DEPTNO' column at position 1. The 'Columns' tab is also circled in orange.

| CONSTRAINT_NAME | CONSTRAINT_TYPE | SEARCH_CONDITION | R_OWNER | R_TABLE_NAME | R_C    |
|-----------------|-----------------|------------------|---------|--------------|--------|
| 1 PK_DEPT       | Primary_Key     | (null)           | (null)  | (null)       | (null) |

| COLUMN_NAME | COLUMN_POSITION |
|-------------|-----------------|
| 1 DEPTNO    | 1               |

# 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

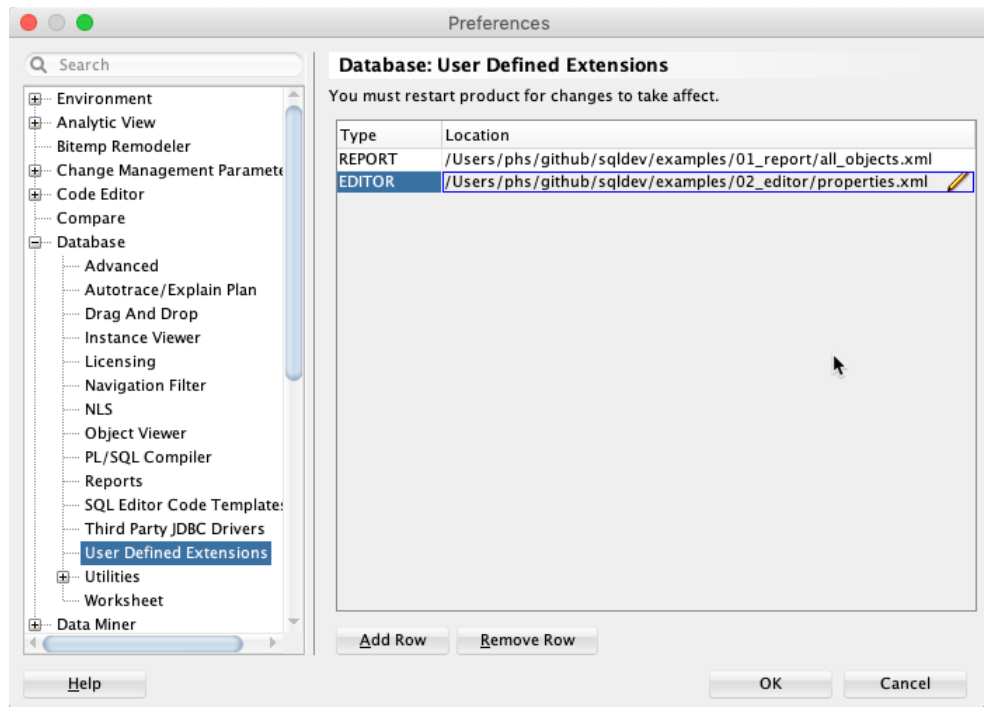


DBA-Views  
optimization



```
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)

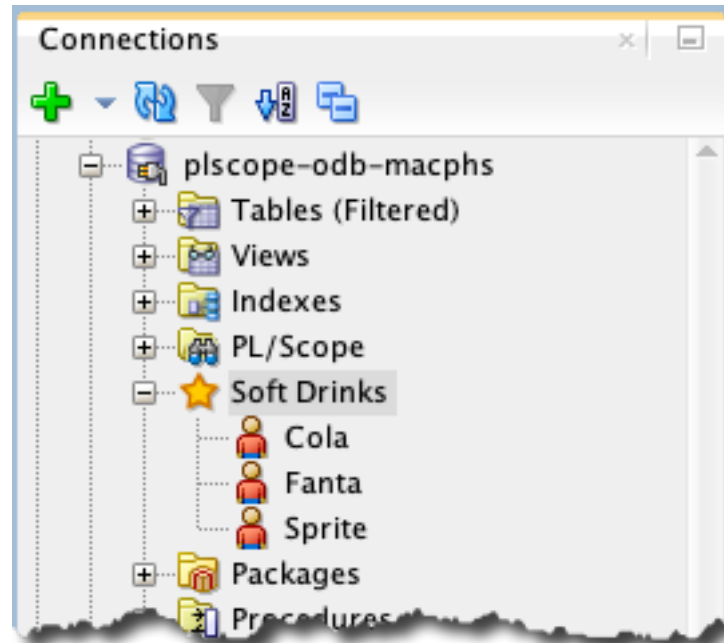


- Database Preferences
  - User Defined Extensions
  - XML file is referenced
- SQL Developer must be restarted

| 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)              |

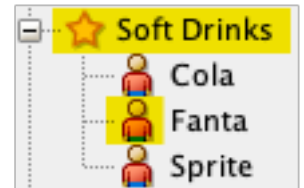
# Navigators

# 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>
```



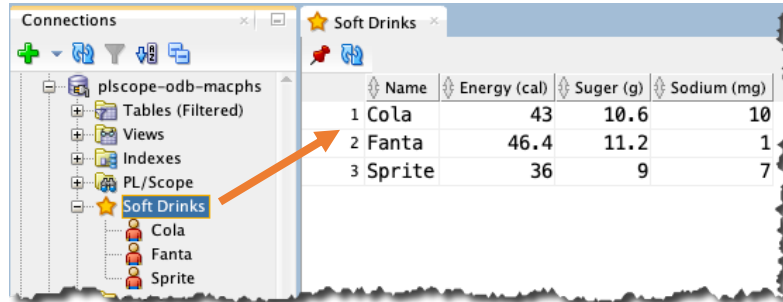
# Navigator by Example (3)

```
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>
```



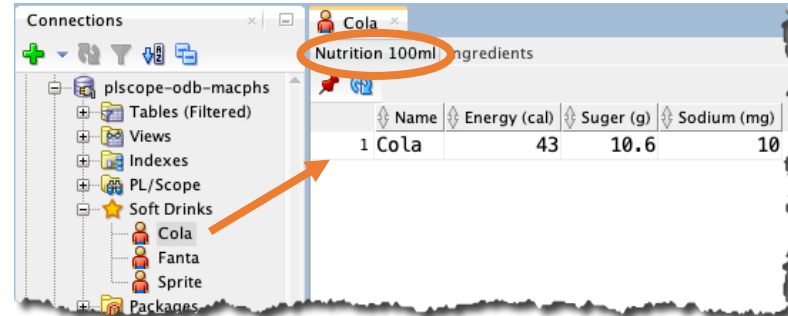
# Editors

soft-drinks\_FOLDER

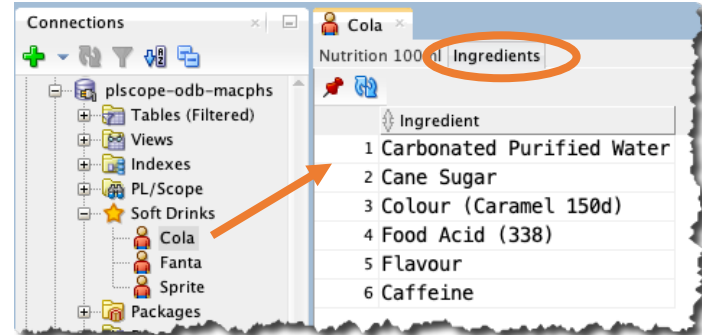


|   | Name   | Energy (cal) | Sugar (g) | Sodium (mg) |
|---|--------|--------------|-----------|-------------|
| 1 | Cola   | 43           | 10.6      | 10          |
| 2 | Fanta  | 46.4         | 11.2      | 1           |
| 3 | Sprite | 36           | 9         | 7           |

soft-drinks

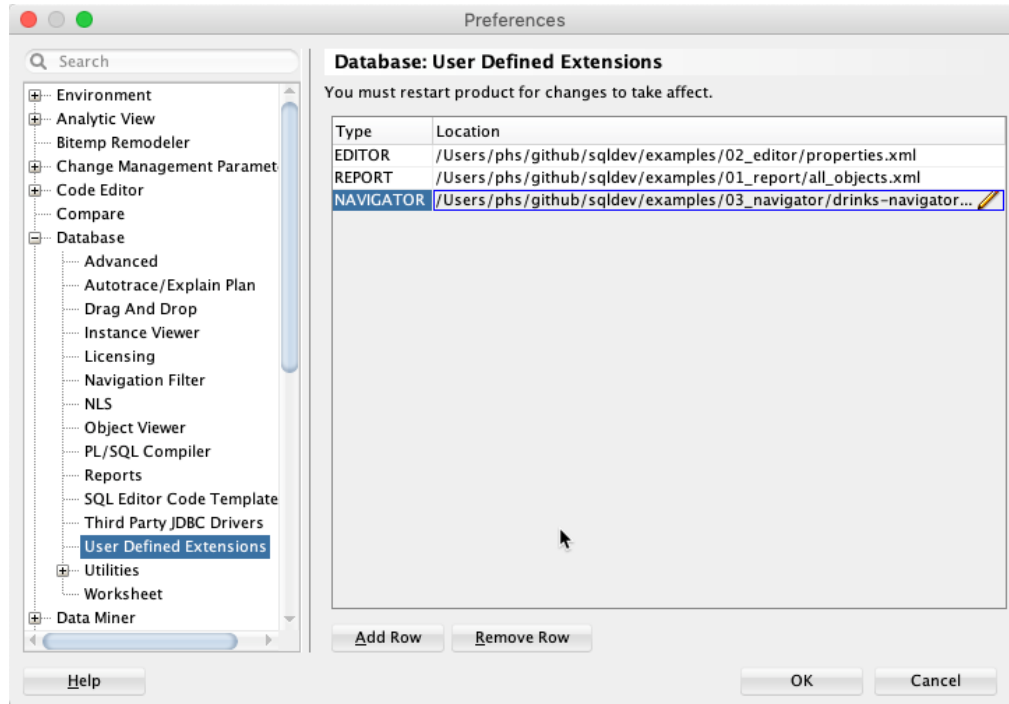


|   | Name | Energy (cal) | Sugar (g) | Sodium (mg) |
|---|------|--------------|-----------|-------------|
| 1 | Cola | 43           | 10.6      | 10          |

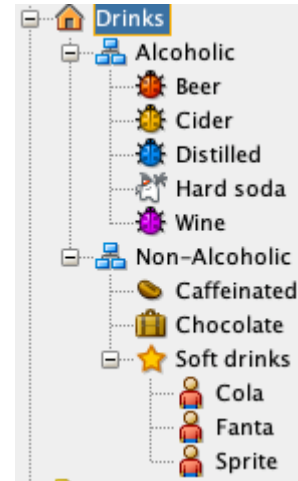


|   | Ingredient                |
|---|---------------------------|
| 1 | Carbonated Purified Water |
| 2 | Cane Sugar                |
| 3 | Colour (Caramel 150d)     |
| 4 | Food Acid (338)           |
| 5 | Flavour                   |
| 6 | Caffeine                  |

# Installing Editors (XML Extension)



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

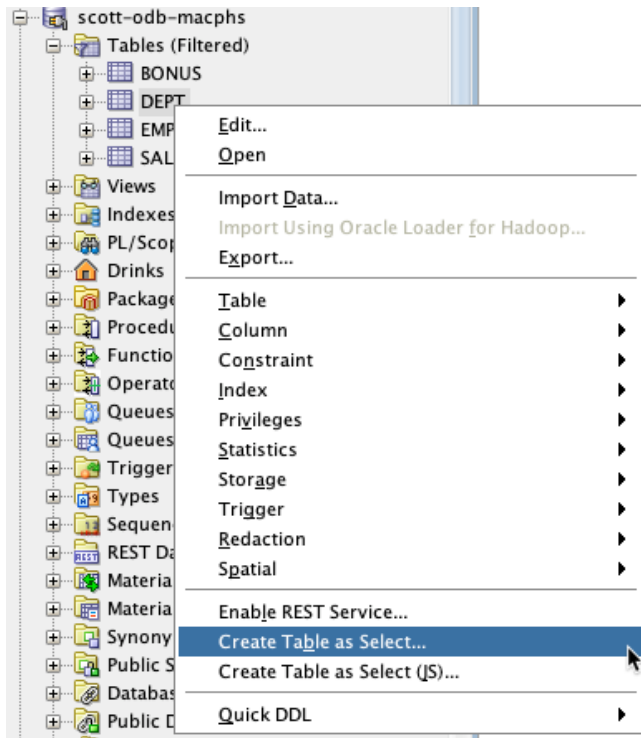




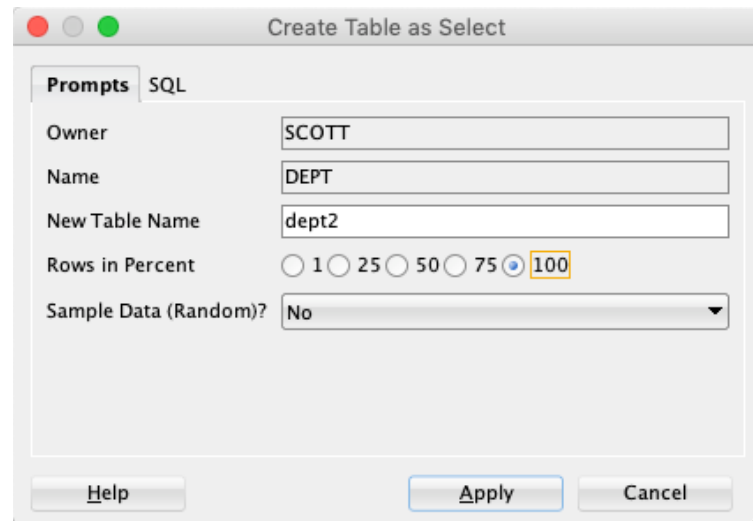
# Actions

# Action by Example (1)

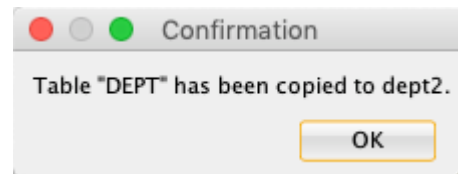
1



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>
    ...
  </item>
</items>
```



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>
```

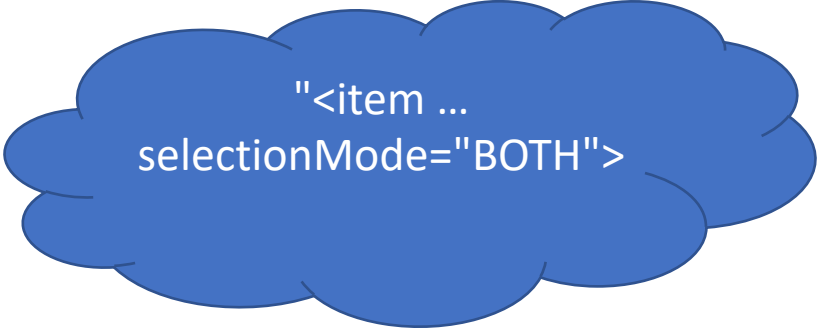
# Object Types (Excerpt)

- 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>#

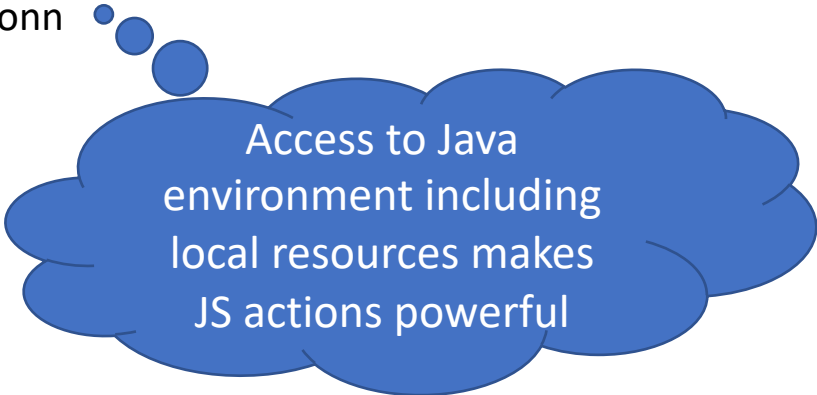


"<item ...  
selectionMode="BOTH">



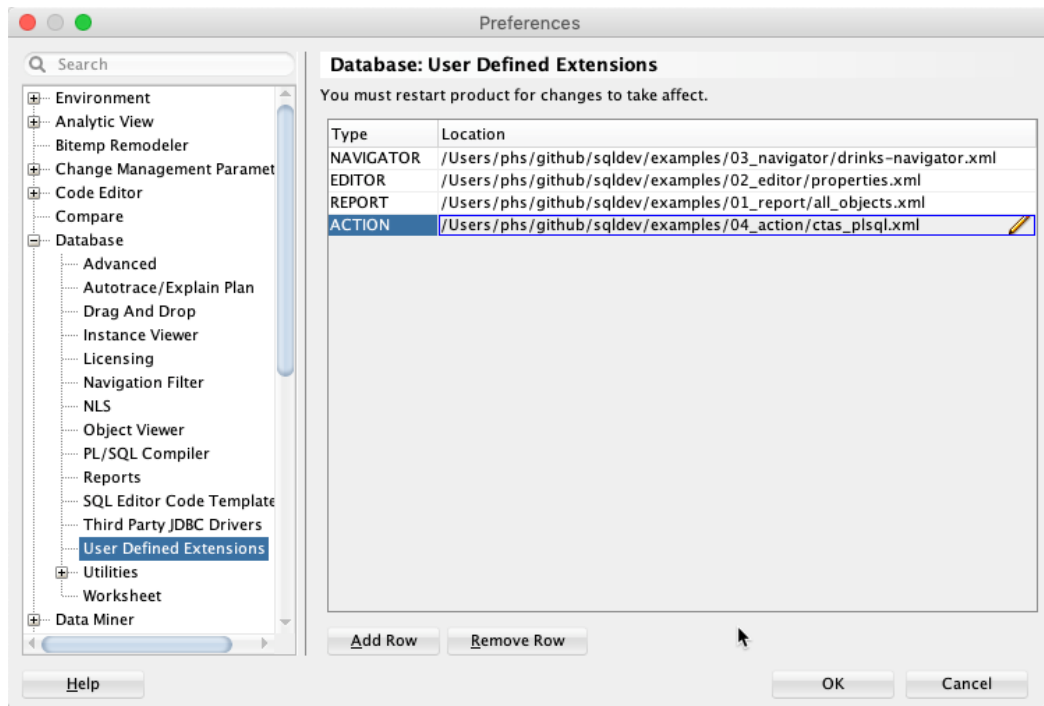
# JavaScript Variables

- 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

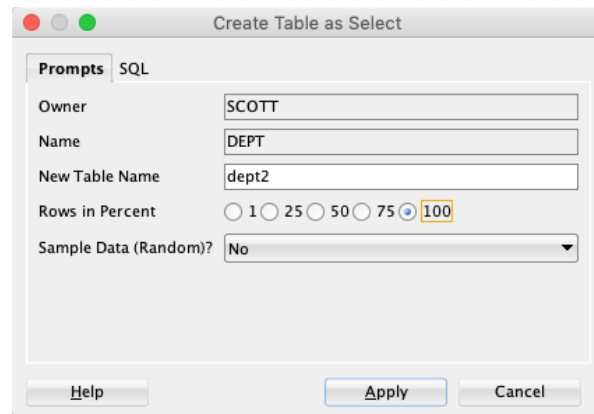


Access to Java  
environment including  
local resources makes  
JS actions powerful

# 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.**