**SESSION 2  DYNAMIC MEMORY MANAGEMENT & STARTUP STAGES**

**You use MOBAXTERM tool to open NEW SSH session and connect to your provided VM server myvmlab.senecacollege.ca as user student with your PORT#. Then switch to user oracle with password PSmgi30.**

Last login: Fri Jan 21 10:47:58 2022 from 10.31.12.209

[student@oracledb19c ~]$ **whoami**

student

[student@oracledb19c ~]$ **su - oracle**

Password:

Last login: Fri Jan 21 10:48:19 EST 2022 on pts/0

The Oracle base remains unchanged with value /opt/oracle/app/oracle

[oracle@oracledb19c ~]$ **cd $ORACLE\_HOME/dbs**

[oracle@oracledb19c dbs]$ **pwd**

**/opt/oracle/app/oracle/product/19.3.0/dbhome\_1/dbs**

[oracle@oracledb19c dbs]$ **ls -l sp\***

-rw-r----- 1 oracle dba 3584 Jan 21 10:50 **spfilestudent.ora**

**\* Let’s make a copy of our SPFILE, for our protection \***

[oracle@oracledb19c dbs]$ **cp spfilestudent.ora spfilestudent.ora.bak**

**\* Let’s see what is the MAX amount of memory allocated by Linux OS 🡪 2.8G \***

[oracle@oracledb19c dbs]$ **df -h**

Filesystem Size Used Avail Use% Mounted on

devtmpfs 2.8G 0 2.8G 0% /dev

tmpfs 2.8G 0 2.8G 0% /dev/shm

**tmpfs 2.8G 88M 2.7G 4% /run**

tmpfs 2.8G 0 2.8G 0% /sys/fs/cgroup

/dev/mapper/rhel-root 82G 14G 69G 17% /

/dev/sda2 1014M 319M 696M 32% /boot

/dev/sda1 1022M 5.8M 1017M 1% /boot/efi

tmpfs 570M 0 570M 0% /run/user/1002

**\* Let’s login to SQL\*PLUS command line tool as super-user SYSDBA \***

[oracle@oracledb19c dbs]$ **sqlplus / as sysdba**

SQL\*Plus: Release 19.0.0.0.0 - Production on Mon Jan 24 14:04:34 2022

Version 19.3.0.0.0

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**Connected to:**

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

Version 19.3.0.0.0

**\* Our Instance student is already running. Let’s check, which parameter file was used to start it \***

SQL> **show parameter spfile**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

spfile string **/opt/oracle/app/oracle/product/19.3.0/dbhome\_1/dbs/spfilestudent.ora**

SQL> **show parameter target**

NAME TYPE VALUE

------------------------------------ ----------- ----------------

archive\_lag\_target integer 0

db\_big\_table\_cache\_percent\_target string 0

db\_flashback\_retention\_target integer 1440

fast\_start\_io\_target integer 0

fast\_start\_mttr\_target integer 0

**memory\_max\_target big integer 0**

**memory\_target big integer 0**

parallel\_servers\_target integer 32

**pga\_aggregate\_target big integer 460M**

**sga\_target big integer 1392M**

target\_pdbs integer 0

SQL>

**\* SPFILE was used to start our Instance, that is running in the ASMM (AUTO SHARED MEMORY MGMT) mode because MEMORY\_TARGET=0 and SGA\_TARGET <> 0 \***

SQL> **alter system set memory\_max\_target=2g;**

alter system set memory\_max\_target=2g

\*

ERROR at line 1:

**ORA-02095: specified initialization parameter cannot be modified**

**\* Default Scope for SET command is BOTH, meaning that change happens promptly and will persist over the next startup. This parameter is STATIC and may be changed only with the scope of SPFILE, i.e that change will be effective only after the next startup. \***

SQL> **alter system set memory\_max\_target=2g scope=spfile;**

System altered.

SQL> **alter system set memory\_target=1512m scope=spfile;**

System altered.

**\* This parameter is DYNAMIC and may be changed with any Scope option. Here we choose to be together with its limit parameter (after the next startup) \***

SQL> **alter system set pga\_aggregate\_target=256m;**

System altered.

SQL> **alter system set sga\_target=1g;**

System altered.

SQL> **show parameter target**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

archive\_lag\_target integer 0

db\_big\_table\_cache\_percent\_target string 0

db\_flashback\_retention\_target integer 1440

fast\_start\_io\_target integer 0

fast\_start\_mttr\_target integer 0

**memory\_max\_target big integer 0**

**memory\_target big integer 0**

parallel\_servers\_target integer 32

**pga\_aggregate\_target big integer 256M**

**sga\_target big integer 1G**

target\_pdbs integer 0

SQL>

SQL> **show parameter buffer**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

buffer\_pool\_keep string

buffer\_pool\_recycle string

db\_block\_buffers integer 0

**log\_buffer big integer 7360K**

SQL>

SQL> **alter system set log\_buffer=10m;**

alter system set log\_buffer=10m

\*

ERROR at line 1:

**ORA-02095: specified initialization parameter cannot be modified**

**\* This parameter is STATIC and may be changed only with the scope of SPFILE \***

SQL> **alter system set log\_buffer=10m scope=spfile;**

System altered.

SQL> **SHUTDOWN IMMEDIATE;**

Database closed.

Database dismounted.

ORACLE instance shut down.

SQL>

SQL> **startup;**

ORACLE instance started.

Total System Global Area 2147481656 bytes

Fixed Size 8898616 bytes

Variable Size 1442840576 bytes

Database Buffers 687865856 bytes

Redo Buffers 7876608 bytes

Database mounted.

Database opened.

SQL> **SHOW PARAMETER TARGET**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

archive\_lag\_target integer 0

db\_big\_table\_cache\_percent\_target string 0

db\_flashback\_retention\_target integer 1440

fast\_start\_io\_target integer 0

fast\_start\_mttr\_target integer 0

**memory\_max\_target big integer 2G**

**memory\_target big integer 1520M**

parallel\_servers\_target integer 32

**pga\_aggregate\_target big integer 256M**

**sga\_target big integer 1G**

target\_pdbs integer 0

SQL>

**\* Why do we have for MEMORY\_TARGET size of 1520M, when we asked for 1512M? Because, memory chunks are allocated in units of 16M (or later of 4M) and 1520 may be divided by 16.**

**Our Instance is running now in the AMM (AUTO MEMORY MANAGEMENT) mode with**

**both principal values with a given Minimum size. Why? Parameter MEMORY\_TARGET <>0 and parameters PGA\_AGGREGATE\_TARGET <>0 and SGA\_TARGET<>0. That means that server will distribute to SGA at least 1G and to PGA at least 256M, and it will try to use 1.5G with the absolute limit of 2G. \***

SQL> **show parameter buffer**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

buffer\_pool\_keep string

buffer\_pool\_recycle string

db\_block\_buffers integer 0

**log\_buffer big integer 10M**

SQL> **SHUTDOWN IMMEDIATE;**

Database closed.

Database dismounted.

ORACLE instance shut down.

SQL> **host**

[oracle@oracledb19c dbs]$ **ls -l**

total 24

-rw-rw---- 1 oracle dba 1544 Jan 24 14:26 hc\_student.dat

-rw-r--r-- 1 oracle dba 3079 May 14 2015 init.ora

-rw-r----- 1 oracle dba 24 Mar 10 2021 lkSTUDENT

-rw-r----- 1 oracle dba 2048 Mar 10 2021 orapwstudent

-rw-r----- 1 oracle dba 3584 Jan 24 14:25 spfilestudent.ora

-rw-r----- 1 oracle dba 3584 Jan 24 14:03 spfilestudent.ora.bak

[oracle@oracledb19c dbs]$ **pwd**

/opt/oracle/app/oracle/product/19.3.0/dbhome\_1/dbs

[oracle@oracledb19c dbs]$**cd /opt/oracle/app/oracle/admin/student/pfile**

[oracle@oracledb19c pfile]$ **pwd**

**/opt/oracle/app/oracle/admin/student/pfile**

[oracle@oracledb19c pfile]$ **ls -l**

total 4

-rw-r----- 1 oracle dba 2369 Jan 17 14:11 init\_student.ora

[oracle@oracledb19c pfile]$ **exit**

exit

SQL> **host pwd**

**/opt/oracle/app/oracle/product/19.3.0/dbhome\_1/dbs**

**\* How come that we are in /dbs folder and not in /pfile? Because, when we get back to SQL, we go back to the folder where we entered SQL, and do not stay in the most recent folder \***

SQL> **exit**

Disconnected from Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production

Version 19.3.0.0.0

[oracle@oracledb19c dbs]$**cd /opt/oracle/app/oracle/admin/student/pfile**

[oracle@oracledb19c pfile]$ **ls -l**

total 4

-rw-r----- 1 oracle dba 2369 Jan 17 14:11 init\_student.ora

[oracle@oracledb19c pfile]$ **cat init\***

##############################################################################

# Copyright (c) 1991, 2013 by Oracle Corporation

##############################################################################

###########################################

# Cache and I/O

###########################################

db\_block\_size=8192

###########################################

# Cursors and Library Cache

###########################################

open\_cursors=300

###########################################

# Database Identification

###########################################

db\_domain="dcm.senecacollege.ca"

db\_name="student"

###########################################

# File Configuration

###########################################

control\_files=("/opt/oracle/app/oracle/oradata/STUDENT/control01.ctl", "/opt/oracle/app/oracle/recovery\_area/STUDENT/control02.ctl")

db\_recovery\_file\_dest="/opt/oracle/app/oracle/recovery\_area"

**db\_recovery\_file\_dest\_size=4096m**

###########################################

# Miscellaneous

###########################################

compatible=19.0.0

diagnostic\_dest=/opt/oracle/app/oracle

###########################################

# NLS

###########################################

nls\_language="AMERICAN"

nls\_territory="AMERICA"

###########################################

# Network Registration

###########################################

local\_listener=LISTENER\_STUDENT

###########################################

# Processes and Sessions

###########################################

processes=320

###########################################

# SGA Memory

###########################################

**sga\_target=1200m**

###########################################

# Security and Auditing

###########################################

audit\_file\_dest="/opt/oracle/app/oracle/admin/student/adump"

audit\_trail=db

remote\_login\_passwordfile=EXCLUSIVE

###########################################

# Shared Server

###########################################

dispatchers="(PROTOCOL=TCP) (SERVICE=studentXDB)"

###########################################

# Sort, Hash Joins, Bitmap Indexes

###########################################

**pga\_aggregate\_target=200m**

###########################################

# System Managed Undo and Rollback Segments

###########################################

undo\_tablespace=UNDOTBS1

**\* We will login to SQL from here, our PFILE sits in this folder (look above) \***

[oracle@oracledb19c pfile]$ **sqlplus / as sysdba**

SQL\*Plus: Release 19.0.0.0.0 - Production on Mon Jan 24 14:32:16 2022

Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle. All rights reserved.

Connected to an idle instance. ** Our Instance is NOT running, we need to open it**

SQL> **STARTUP PFILE=init\_student.ora;**

ORACLE instance started.

Total System Global Area 1258290752 bytes

Fixed Size 8896064 bytes

Variable Size 318767104 bytes

Database Buffers 922746880 bytes

Redo Buffers 7880704 bytes

Database mounted.

Database opened.

SQL> **SELECT name, open\_mode FROM V$DATABASE;**

NAME OPEN\_MODE

--------- ---------------- ** Our Database student is OPEN to WRITE**

STUDENT READ WRITE

**Now, EM DB Express tool will run only if your both LISTENER and INSTANCE are running, and if your Express PORT was set once before (check Session #1).**

**I will launch my Express tool by opening in Chrome**

**https://myvmlab.senecacollege.ca:8552/em**

SQL> **SHOW PARAMETER TARGET**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

archive\_lag\_target integer 0

db\_big\_table\_cache\_percent\_target string 0

db\_flashback\_retention\_target integer 1440

fast\_start\_io\_target integer 0

fast\_start\_mttr\_target integer 0

**memory\_max\_target big integer 0**

**memory\_target big integer 0**

parallel\_servers\_target integer 32

**pga\_aggregate\_target big integer 200M**

**sga\_target big integer 1200M**

target\_pdbs integer 0

SQL>

SQL> **SHOW PARAMETER POOL**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

global\_context\_pool\_size string

**java\_pool\_size big integer 0**

**large\_pool\_size big integer 0**

olap\_page\_pool\_size big integer 0

shared\_pool\_reserved\_size big integer 9856614

**shared\_pool\_size big integer 0**

streams\_pool\_size big integer 0

SQL> **SHOW PARAMETER DB\_CACHE**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

db\_cache\_advice string ON

**db\_cache\_size big integer 0**

**\* Our PFILE is using ASMM option (AUTO SGA MEMORY MGMT) -- SGA and PGA targets are set to values <>0 and MEMORY\_TARGET=0. Server will use up to 1200m for the whole SGA dynamically and up to 200m for PGA. Also, all SGA regions are set to 0 (it means that NO minimal values are set for them). The real values for each SGA region and PGA can be seen only via DB Express. In my case these values were:**

**Total Pga-> 184m Shared Pool-> 288m Buffer Cache-> 800m Java Pool not set \***

SQL> **SHOW PARAMETER LOG\_BUFFER**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

**log\_buffer big integer 7360K**

SQL>

**\* Let’s manually and dynamically change some SGA values \***

SQL> **ALTER SYSTEM SET DB\_CACHE\_SIZE=315m;**

System altered.

SQL> **ALTER SYSTEM SET SHARED\_POOL\_SIZE=200m;**

System altered.

SQL> **ALTER SYSTEM SET LARGE\_POOL\_SIZE = 24m;**

System altered.

SQL> **ALTER SYSTEM SET JAVA\_POOL\_SIZE=64M;**

System altered.

SQL> **SHOW PARAMETER POOL**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

buffer\_pool\_keep string

buffer\_pool\_recycle string

**java\_pool\_size big integer 64M**

**large\_pool\_size big integer 32M**

memoptimize\_pool\_size big integer 0

olap\_page\_pool\_size big integer 0

shared\_pool\_reserved\_size big integer 15099494

**shared\_pool\_size big integer 208M**

streams\_pool\_size big integer 0

SQL>

SQL> SHOW PARAMETER DB\_CACHE

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

db\_cache\_advice string ON

**db\_cache\_size big integer 320M**

**\* Why do we have for SHARED\_POOL\_SIZE value of 208M, when we asked for 200M? Also, why do we have for DB\_CACHE\_SIZE value of 320M, when we asked for 315M? Because, memory chunks are allocated firstly in units of 16M, and 208 and 320 can be divided by 16.**

**The real values for each SGA region and Total PGA can be seen only via DB Express. In my case these values were:**

**Total Pga-> 174m Shared Pool-> 288m Buffer Cache-> 736m Java Pool-> 64m \***

SQL> **ALTER SYSTEM SET SGA\_TARGET=0;**

System altered.

**\* By setting SGA\_TARGET to 0, we are turning OFF the ASMM option and switch to MANUAL MEMORY MGMT. Now, SHOW parameter will give us the REAL (ACTIVE) Memory region values. \***

SQL> **SHOW PARAMETER TARGET**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

archive\_lag\_target integer 0

db\_big\_table\_cache\_percent\_target string 0

db\_flashback\_retention\_target integer 1440

fast\_start\_io\_target integer 0

fast\_start\_mttr\_target integer 0

memory\_max\_target big integer 0

memory\_target big integer 0

parallel\_servers\_target integer 32

**pga\_aggregate\_target big integer 200M**

**sga\_target big integer 0**

target\_pdbs integer 0

SQL>

SQL> **SHOW PARAMETER POOL**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

\_unified\_pga\_pool\_size big integer 0

buffer\_pool\_keep string

buffer\_pool\_recycle string

java\_pool\_size big integer 64M

large\_pool\_size big integer 32M

memoptimize\_pool\_size big integer 0

olap\_page\_pool\_size big integer 0

shared\_pool\_reserved\_size big integer 15099494

**shared\_pool\_size big integer 288M**

streams\_pool\_size big integer 0

SQL>

SQL> **SHOW PARAMETER DB\_CACHE**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

db\_cache\_advice string ON

**db\_cache\_size big integer 736M**

SQL> **SHOW PARAMETER SGA**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

allow\_group\_access\_to\_sga boolean FALSE

lock\_sga boolean FALSE

pre\_page\_sga boolean TRUE

sga\_max\_size big integer 1200M

sga\_min\_size big integer 0

sga\_target big integer 0

unified\_audit\_sga\_queue\_size integer 1048576

SQL>

SQL> **ALTER SYSTEM SET SHARED\_POOL\_SIZE=440M;**

ALTER SYSTEM SET SHARED\_POOL\_SIZE=440M

\*

ERROR at line 1:

ORA-02097: parameter cannot be modified because specified value is invalid

**ORA-04033: Insufficient memory to grow pool**

SQL> **SHOW PARAMETER POOL**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

\_unified\_pga\_pool\_size big integer 0

buffer\_pool\_keep string

buffer\_pool\_recycle string

java\_pool\_size big integer 64M

large\_pool\_size big integer 32M

memoptimize\_pool\_size big integer 0

olap\_page\_pool\_size big integer 0

shared\_pool\_reserved\_size big integer 15099494

**shared\_pool\_size big integer 288M**

streams\_pool\_size big integer 0

SQL>

SQL> **ALTER SYSTEM SET DB\_CACHE\_SIZE=600m;**

System altered.

SQL> **ALTER SYSTEM SET SHARED\_POOL\_SIZE=440M;**

ALTER SYSTEM SET SHARED\_POOL\_SIZE=440M

\*

ERROR at line 1:

ORA-02097: parameter cannot be modified because specified value is invalid

**ORA-04033: Insufficient memory to grow pool**

SQL> **SHOW PARAMETER POOL**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

\_unified\_pga\_pool\_size big integer 0

buffer\_pool\_keep string

buffer\_pool\_recycle string

java\_pool\_size big integer 64M

large\_pool\_size big integer 32M

memoptimize\_pool\_size big integer 0

olap\_page\_pool\_size big integer 0

shared\_pool\_reserved\_size big integer 15099494

**shared\_pool\_size big integer 416M**

streams\_pool\_size big integer 0

**\*** **Although, we got ORA-2097 error, the SET command did not fail. It performed as much as it could, so, instead expanding to 440M, it stopped at 416M.**

**Sometimes, when we need to expand one region, in order to succeed we need to shrink some other region. This is shown below, where we need to shrink Buffer Cache in order to expand Shared Pool** **\***

SQL> **ALTER SYSTEM SET DB\_CACHE\_SIZE=512M;**

System altered.

SQL> **ALTER SYSTEM SET SHARED\_POOL\_SIZE=440M;**

System altered.

SQL> **SHOW PARAMETER POOL**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

\_unified\_pga\_pool\_size big integer 0

buffer\_pool\_keep string

buffer\_pool\_recycle string

java\_pool\_size big integer 64M

large\_pool\_size big integer 32M

memoptimize\_pool\_size big integer 0

olap\_page\_pool\_size big integer 0

shared\_pool\_reserved\_size big integer 15099494

**shared\_pool\_size big integer 448M 🡨multiple of 16**

streams\_pool\_size big integer 0

SQL>

SQL> **SHOW PARAMETER DB\_CACHE**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

db\_cache\_advice string ON

**db\_cache\_size big integer 512M**

SQL>

SQL> **shutdown immediate;**

Database closed.

Database dismounted.

ORACLE instance shut down.

SQL>

**\* Let’s learn about STARTUP stages -- going from NOMOUNT to MOUNT and finally OPEN stage and see what Performance/Dictionary views may be used. We will use PFILE to see these stages \***

SQL> **STARTUP PFILE=init\_student.ora NOMOUNT;**

ORACLE instance started.

Total System Global Area 1258290752 bytes

Fixed Size 8896064 bytes

Variable Size 318767104 bytes

Database Buffers 922746880 bytes

Redo Buffers 7880704 bytes

SQL> **show parameter sga**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

allow\_group\_access\_to\_sga boolean FALSE

lock\_sga boolean FALSE

pre\_page\_sga boolean TRUE

sga\_max\_size big integer 1200M

sga\_min\_size big integer 0

**sga\_target big integer 1200M**

unified\_audit\_sga\_queue\_size integer 1048576

SQL>

SQL> **show parameter POOL**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

buffer\_pool\_keep string

buffer\_pool\_recycle string

**java\_pool\_size big integer 0**

**large\_pool\_size big integer 0**

memoptimize\_pool\_size big integer 0

olap\_page\_pool\_size big integer 0

shared\_pool\_reserved\_size big integer 15099494

**shared\_pool\_size big integer 0**

streams\_pool\_size big integer 0

SQL>

SQL> **SHOW PARAMETER DB\_CACHE**

NAME TYPE VALUE

------------------------------------ ----------- ---------------------

db\_cache\_advice string ON

**db\_cache\_size big integer 0**

SQL>

SQL> **SELECT instance\_name, status FROM V$INSTANCE;**

INSTANCE\_NAME STATUS

---------------- ------------

student STARTED

SQL> **SELECT \* FROM V$TABLESPACE;**

SELECT \* FROM V$TABLESPACE

\*

ERROR at line 1:

**ORA-01507: database not mounted**

**\*** **In the NOMOUNT phase (when Instance is STARTED), we can only see Views related to our Instance, but not the ones related to our Database** **\***

SQL> **ALTER DATABASE MOUNT;**

Database altered.

SQL> **SELECT instance\_name, status FROM V$INSTANCE;**

INSTANCE\_NAME STATUS

---------------- ------------

student MOUNTED

SQL> **SELECT name, open\_mode FROM V$DATABASE;**

NAME OPEN\_MODE

--------- --------------------

STUDENT MOUNTED

SQL> **SELECT \* FROM V$TABLESPACE;**

TS# NAME INC BIG FLA ENC CON\_ID

---------- ------------------------------ --- --- --- --- ----------

1 SYSAUX YES NO YES 0

0 SYSTEM YES NO YES 0

2 UNDOTBS1 YES NO YES 0

4 USERS YES NO YES 0

3 TEMP NO NO YES 0

SQL> **DESC dba\_objects**

ERROR:

ORA-01219: database or pluggable database not open: queries allowed on fixed tables or views only

**\*** **In the MOUNT phase we can NOT see Views related to our Data Dictionary, meaning DBA\_ views. We must open Database for that.** **\***

SQL> **ALTER DATABASE OPEN;**

Database altered.

SQL> **DESC dba\_objects**

Name Null? Type

----------------------------------------- -------- ------------------

OWNER VARCHAR2(128)

OBJECT\_NAME VARCHAR2(128)

SUBOBJECT\_NAME VARCHAR2(128)

OBJECT\_ID NUMBER

DATA\_OBJECT\_ID NUMBER

OBJECT\_TYPE VARCHAR2(23)

CREATED DATE

LAST\_DDL\_TIME DATE

TIMESTAMP VARCHAR2(19)

STATUS VARCHAR2(7)

TEMPORARY VARCHAR2(1)

GENERATED VARCHAR2(1)

SECONDARY VARCHAR2(1)

NAMESPACE NUMBER

EDITION\_NAME VARCHAR2(128)

SHARING VARCHAR2(18)

EDITIONABLE VARCHAR2(1)

ORACLE\_MAINTAINED VARCHAR2(1)

APPLICATION VARCHAR2(1)

DEFAULT\_COLLATION VARCHAR2(100)

DUPLICATED VARCHAR2(1)

SHARDED VARCHAR2(1)

CREATED\_APPID NUMBER

CREATED\_VSNID NUMBER

MODIFIED\_APPID NUMBER

MODIFIED\_VSNID NUMBER

SQL> **SELECT instance\_name, status FROM V$INSTANCE;**

INSTANCE\_NAME STATUS

---------------- ------------

student OPEN

SQL> **SELECT name, open\_mode FROM V$DATABASE;**

NAME OPEN\_MODE

--------- --------------------

STUDENT READ WRITE

SQL> **EXIT**

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Version 19.3.0.0.0

[oracle@oracledb19c pfile]$ **exit**

logout

[student@oracledb19c ~]$ **exit**

logout

Session stopped

- Press <return> to exit tab

- Press R to restart session

- **Press S to save terminal output to file**