

DATABASE ADMINISTRATION

Lab 2 - Data storage management

Strona

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PART 1 - to be implemented through Oracle SQL Developer or SQL* Plus

1. Display information about the database you joined: name, creation date, and open mode using perspective v\$database. Check what other information can be extracted from it.

```
SQL> select name, created, open_mode from v$database
2 ;
```

NAME	CREATED	OPEN_MODE
ORCL	30-OCT-09	READ WRITE

2. Check the global database name against the system table global_name.

```
SQL> select * from global_name
2 ;
```

GLOBAL_NAME
ORCL

3. Display information about your database instance name using a perspective v\$instance.

```
SQL> select instance_name from v$instance
2 ;
```

INSTANCE_NAME
orcl

4. Display information about the version of the DBMS using a perspective v\$version.

```
SQL> select * from v$version
2 ;
```

BANNER
Oracle Database 11g Enterprise Edition Release 11.2.0.2.0 - Production
PL/SQL Release 11.2.0.2.0 - Production
CORE 11.2.0.2.0 Production
TNS for Linux: Version 11.2.0.2.0 - Production
NLSRTL Version 11.2.0.2.0 - Production

5. Taking advantage of a dynamic perspective V\$SGA, provide the current settings SGA (in SQL*Plus you can also use the command show SGA)

```
SQL> select * from v$sga;
```

NAME	VALUE
Fixed Size	1344840
Variable Size	352324280
Database Buffers	96468992
Redo Buffers	6008832

```
SQL> show SGA
```

Total System Global Area	456146944 bytes
Fixed Size	1344840 bytes
Variable Size	352324280 bytes
Database Buffers	96468992 bytes
Redo Buffers	6008832 bytes

6. View information about tablespaces in your database and the location of tablespace data files. Use the system tables `dba_tablespaces` and `dba_data_files` and as an alternative to these perspective tables `v$tablespace` and `v$datafile`.

```
SQL> select * from dba_tablespaces
2 ;
```

TABLESPACE_NAME	BLOCK_SIZE	INITIAL_EXTENT	NEXT_EXTENT	MIN_EXTENTS	MAX_EXTENTS	MAX_SIZE	PCT_INCREASE	MIN_EXTLEN	STATUS	CONTENTS	LOGGING	FOR							
SYSTEM	8192	65536	1	2147483645	2147483645	65536	ONLINE	PERMANENT	LOGGING	NO	LOCAL	SYSTEM	NO	MANUAL	DISABLED	NOT APPLY	NO	HOST	NO

TABLESPACE_NAME	BLOCK_SIZE	INITIAL_EXTENT	NEXT_EXTENT	MIN_EXTENTS	MAX_EXTENTS	MAX_SIZE	PCT_INCREASE	MIN_EXTLEN	STATUS	CONTENTS	LOGGING	FOR							
APEX_2614203650434107	8192	65536	1	2147483645	2147483645	65536	ONLINE	PERMANENT	LOGGING	NO	LOCAL	SYSTEM	NO	AUTO	DISABLED	NOT APPLY	NO	HOST	NO

11 rows selected.

```
SQL> select * from dba_data_files
2 ;
```

FILE_NAME	FILE_ID	TABLESPACE_NAME	BYTES	BLOCKS	STATUS	RELATIVE_FNO	AUT	MAXBYTES	MAXBLOCKS	INCREMENT_BY	USER_BYTES	USER_BLOCKS
/home/oracle/app/oracle/oradata/orcl/users01.dbf	4	USERS	235929600	28800	AVAILABLE	4	YES	3.4360E+10	4194302	160	234881024	28672

```

FILE_ID TABLESPACE_NAME          BYTES  BLOCKS STATUS
-----
RELATIVE_FNO AUT  MAXBYTES  MAXBLOCKS INCREMENT_BY USER_BYTES USER_BLOCKS
-----
ONLINE_
-----
/home/oracle/app/oracle/oradata/orcl/APEX_2614203650434107.dbf
  10 APEX_2614203650434107          7340032    896 AVAILABLE
  10 YES 26279936    3208    320 6291456    768
ONLINE

10 rows selected.

SQL> select * from v$tablespace
2 ;

TS# NAME          INC BIG FLA ENC
-----
0 SYSTEM          YES NO YES
1 SYSAUX          YES NO YES
2 UNDOTBS1        YES NO YES
4 USERS           YES NO YES
3 TEMP            NO NO YES
6 EXAMPLE         YES NO YES
28 APEX_1930613455248703    YES NO YES
29 APEX_2041602962184952    YES NO YES
30 APEX_2610402357158758    YES NO YES
31 APEX_2611417663389985    YES NO YES
32 APEX_2614203650434107    YES NO YES

11 rows selected.

SQL> select * from v$datafile
2 ;

FILE# CREATION_CHANGE# CREATION_    TS#  RFILE# STATUS ENABLED
-----
CHECKPOINT_CHANGE# CHECKPOIN UNRECOVERABLE_CHANGE# UNRECOVER LAST_CHANGE#
-----
LAST_TIME OFFLINE_CHANGE# ONLINE_CHANGE# ONLINE_TI  BYTES  BLOCKS
-----
CREATE_BYTES BLOCK_SIZE
-----
NAME
-----
PLUGGED_IN BLOCK1_OFFSET
-----
AUX_NAME
-----
FIRST_NONLOGGED_SCN FIRST_NON FOREIGN_DBID FOREIGN_CREATION_CHANGE# FOREIGN_C
-----
PLU PLUGIN_CHANGE# PLUGIN_RESETLOGS_CHANGE# PLUGIN_RE
-----
  1      7 13-AUG-09    0    1 SYSTEM  READ WRITE
.
.
.

FILE# CREATION_CHANGE# CREATION_    TS#  RFILE# STATUS ENABLED
-----
CHECKPOINT_CHANGE# CHECKPOIN UNRECOVERABLE_CHANGE# UNRECOVER LAST_CHANGE#
-----
LAST_TIME OFFLINE_CHANGE# ONLINE_CHANGE# ONLINE_TI  BYTES  BLOCKS
-----
CREATE_BYTES BLOCK_SIZE
-----
NAME
-----
PLUGGED_IN BLOCK1_OFFSET
-----
AUX_NAME
-----
FIRST_NONLOGGED_SCN FIRST_NON FOREIGN_DBID FOREIGN_CREATION_CHANGE# FOREIGN_C
-----
PLU PLUGIN_CHANGE# PLUGIN_RESETLOGS_CHANGE# PLUGIN_RE
-----

10 rows selected.

SQL>

```

7. View free space from each tablespace using perspective dba_free_space

```
SQL> select * from dba_free_space  
2 ;
```

TABLESPACE_NAME	FILE_ID	BLOCK_ID	BYTES	BLOCKS

RELATIVE_FNO				

SYSTEM 1	1	106984	196608	24
SYSAUX 2	2	36224	1048576	128
SYSAUX 2	2	40192	1048576	128
.				
.				
.				

TABLESPACE_NAME	FILE_ID	BLOCK_ID	BYTES	BLOCKS

RELATIVE_FNO				

USERS 4	4	3280	65536	8
USERS 4	4	3248	65536	8

392 rows selected.

8. Taking advantage of the perspective DBA_SEGMENTS, display occupied segments for space USERS, owned by one of the users (HR / SCOTT / different).

```
SQL> select segment_name from dba_segments where owner in ('HR', 'SCOTT');
```

SEGMENT_NAME

DATA_STAGING_OTN
DATA_STAGING_EVO
DATA_STAGING_PTN
DATA_STAGING_XQY
DATA_STAGING_REPOS
DEPT
EMP
SALGRADE
STAT_TABLE
REGIONS
LOCATIONS
.
.
.

SEGMENT_NAME

EMP_MANAGER_IX
EMP_NAME_IX
DEPT_LOCATION_IX
SYS_LOB0000101509C00003\$\$
SYS_LOB0000101603C00003\$\$
SYS_LOB0000101607C00003\$\$
SYS_LOB0000101611C00002\$\$
SYS_LOB0000101594C00003\$\$
SYS_LOB0000082748C00026\$\$

53 rows selected.

9. Display your database control file location information using perspective v\$controlfile.

```
SQL> select name from v$controlfile  
2 ;
```

NAME

/home/oracle/app/oracle/oradata/orcl/control01.ctl
/home/oracle/app/oracle/flash_recovery_area/orcl/control02.ctl

10. Provide the status and location of the redo log files using dynamic perspectives V\$LOG and V\$LOGFILE.

```
SQL> select f.member, l.status from v$logfile f, v$log l where l.group#=f.group#;
```

MEMBER

STATUS

/home/oracle/app/oracle/oradata/orcl/redo03.log
INACTIVE

/home/oracle/app/oracle/oradata/orcl/redo02.log
CURRENT

/home/oracle/app/oracle/oradata/orcl/redo01.log
INACTIVE

11. Check the results of executing the following commands:

```
SQL> select a.TABLESPACE_NAME, a.BYTES bytes_used, b.BYTES bytes_free, b.largest, round(((a.BYTES-b.BYTES)/a.BYTES)*100,2) percent_used from (select TABLESPACE_NAME, sum(BYTES) BYTES from dba_data_files group by TABLESPACE_NAME) a, (select TABLESPACE_NAME, sum(BYTES) BYTES, max(BYTES) largest from dba_free_space group by TABLESPACE_NAME) b where a.TABLESPACE_NAME=b.TABLESPACE_NAME order by ((a.BYTES-b.BYTES)/a.BYTES) desc;
```

TABLESPACE_NAME	BYTES_USED	BYTES_FREE	LARGEST	PERCENT_USED
SYSTEM	881852416	196608	196608	99.98
SYSAUX	1320157184	119603200	5242880	90.94
APEX_2614203650434107	7340032	720896	720896	90.18
EXAMPLE	85983232	11599872	8192000	86.51
USERS	235929600	46071808	37748736	80.47
APEX_2041602962184952	2097152	1048576	1048576	50
APEX_2610402357158758	2097152	1048576	1048576	50
APEX_2611417663389985	2097152	1048576	1048576	50
APEX_1930613455248703	2097152	1048576	1048576	50
UNDOTBS1	178257920	159973376	85983232	10.26

10 rows selected.

```
SQL> select OWNER, SEGMENT_NAME, SEGMENT_TYPE, TABLESPACE_NAME, BYTES from dba_segments where TABLESPACE_NAME = 'USE RS' and OWNER LIKE 'STUDENT%' order by OWNER, SEGMENT_NAME;
```

no rows selected

12. Check which users are established in the database and which user you are currently working on.

```
SQL> select username from dba_users;
```

USERNAME

SPATIAL_WFS_ADMIN_USR

DIP

IX

MDDATA

ORACLE_OCM

SPATIAL_CSW_ADMIN_USR

PM

BI

XS\$NULL

OLAPSYS

OWBSYS

.

.

.

USERNAME

PHPDEMO
XFILES
SYSMAN
SYSTEM
SYS
MGMT_VIEW
DBSNMP

51 rows selected.

SQL> select user from dual;

USER

SYS

PART 2 - to be implemented through Enterprise Manager

13. From the USERS space, check how many percent of the free space can be used before the threshold appears:

warning,
critical.

Tablespace Full Metric Thresholds

Space Used (%)

This tablespace is using the database default space used thresholds.

Warning (%) **85**

Critical (%) **97**

14. How many segments does a table space have USERS?

Previous 1-10 of 1237 Next 10			
Segment Name	Type	Size (KB)	Extents
SCOTT.SYS_LOB0000101611C00002\$\$	LOBSEGMENT	39,936	54
SCOTT.DATA_STAGING_OTN	TABLE	9,216	24
SCOTT.DATA_STAGING_EVO	TABLE	9,216	24
SCOTT.DATA_STAGING_PTN	TABLE	9,216	24
SCOTT.DATA_STAGING_XQY	TABLE	9,216	24
OE.DATA_STAGING_HOL	TABLE	8,192	23
OE.PURCHASEORDER	TABLE	8,192	23
OE1.PRODUCT_DESCRIPTIONS	TABLE	3,072	18
OE.PRODUCT_DESCRIPTIONS	TABLE	3,072	18
XFILES.SYS_LOB0000089232C00003\$\$	LOBSEGMENT	1,216	3
Previous 1-10 of 1237 Next 10			

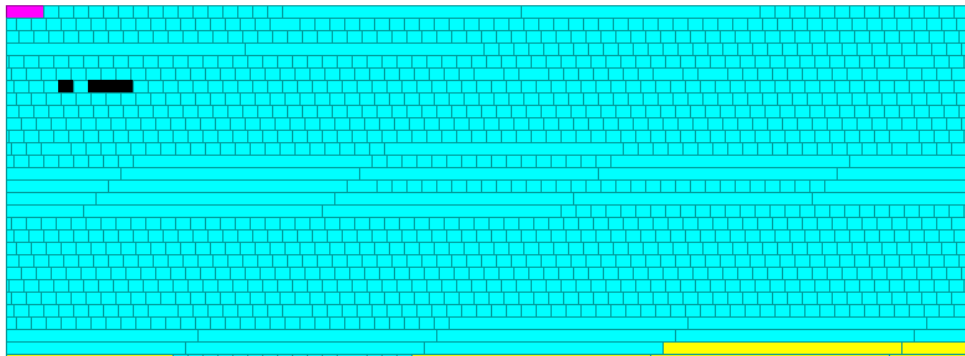
15. Which USERS space index occupies the most space?

SCOTT.SYS_LOB0000101611C00002\$\$ - 39,936 KB

16. Which segment is stored first in space USERS? (At the bottom of the page, click on the "+" sign next to the text EXTENT MAP. When the map appears, select all types at the top of the page.)

Extent Map

Clicking the Highlight Extents button for a segment in the table will cause all extents that belong to that segment to be highlighted in the Extent Map. Clicking on a used extent in the Extent Map will select the segment to which that extent belongs in the segment table.



Legend:
Header
Used
Free
Selected
Unmapped

Zoom: 75%

17. Make sure the control file is duplicated (there should be at least 2)

Multiplying the redo log files

Control File Mirror Images

Oracle strongly recommends that your database has a minimum of two control files and that they are located on separate disk disk failure, it could be restored using the intact copy of the control file from the other disk. You can specify their location in the file.

Valid	File Name	File Directory
VALID	control01.ctl	/home/oracle/app/oracle/oradata/orcl/
VALID	control02.ctl	/home/oracle/app/oracle/flash_recovery_area/orcl/

18. Choose an option Server | Storage | Redo Log Groups

Selection Mode: Single Create

Edit View Delete Actions Clear logfile Go

Select Group	Status	# of Members	Archived	Size (KB)	Sequence	First Change#
<input checked="" type="radio"/> 1	Inactive	1	No	51200	616	14082895
<input type="radio"/> 2	Current	1	No	51200	617	14092500
<input type="radio"/> 3	Inactive	1	No	51200	615	14057623

19. Select the first group and click Edit

Edit Redo Log Group: 1

Actions: Clear logfile Go Show SQL Revert Apply

Group # 1
File size **51200 KB**
Status **INACTIVE**

Redo Log Members Add

Edit Remove

Select File Name	File Directory
<input checked="" type="radio"/> redo01.log	/home/oracle/app/oracle/oradata/orcl/

Actions: Clear logfile Go Show SQL Revert Apply

[Database](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

20. Click Add, enter a new name redo01_02.log, leave the default folder. Click Apply, to save your changes.

Edit Redo Log Group: 1: Add Redo Log Member

* File Name

* File Directory

☐ Reuse File

21. Repeat for the other groups, naming each file appropriately.

Edit Redo Log Group: 2

Actions Clear logfile Go Show SQL Revert Apply

Group # 2

File size **51200 KB**

Status **CURRENT**

Redo Log Members

Edit Remove Add	
Select File Name	File Directory
<input checked="" type="radio"/> redo02.log	/home/oracle/app/oracle/oradata/orcl/
<input type="radio"/> redo02_02.log	/home/oracle/app/oracle/oradata/orcl/

Edit Redo Log Group: 3

Actions Clear logfile Go Show SQL Revert Apply

Group # 3

File size **51200 KB**

Status **INACTIVE**

Redo Log Members

Edit Remove Add	
Select File Name	File Directory
<input checked="" type="radio"/> redo03.log	/home/oracle/app/oracle/oradata/orcl/
<input type="radio"/> redo03_02.log	/home/oracle/app/oracle/oradata/orcl/

Actions Clear logfile Go Show SQL Revert Apply

22. Select a link Server | Storage | Tablespaces and option Create

Create Tablespace

Show SQL Cancel OK

<div>General Storage</div> <div>* Name <input type="text"/></div>		
Extent Management <input checked="" type="radio"/> Locally Managed <input type="radio"/> Dictionary Managed	Type <input checked="" type="radio"/> Permanent <input type="checkbox"/> Set as default permanent tablespace <input type="checkbox"/> Encryption Encryption Options <input type="radio"/> Temporary <input type="checkbox"/> Set as default temporary tablespace <input type="radio"/> Undo Undo Retention Guarantee <input type="radio"/> Yes <input checked="" type="radio"/> No	Status <input checked="" type="radio"/> Read Write <input type="radio"/> Read Only <input type="radio"/> Offline
Datafiles <input type="checkbox"/> Use bigfile tablespace Tablespace can have only one datafile with no practical size limit.		

23. Enter a name FSDATA and check the options Locally Managed | Permanent | Read Write. Click Add, to add a file for the space.

<div>* Name <input type="text" value="FSDATA"/></div>		
Extent Management <input checked="" type="radio"/> Locally Managed <input type="radio"/> Dictionary Managed	Type <input checked="" type="radio"/> Permanent <input type="checkbox"/> Set as default permanent tablespace <input type="checkbox"/> Encryption Encryption Options <input type="radio"/> Temporary <input type="checkbox"/> Set as default temporary tablespace <input type="radio"/> Undo Undo Retention Guarantee <input type="radio"/> Yes <input checked="" type="radio"/> No	Status <input checked="" type="radio"/> Read Write <input type="radio"/> Read Only <input type="radio"/> Offline
Datafiles <input type="checkbox"/> Use bigfile tablespace Tablespace can have only one datafile with no practical size limit.		

Add

24. Enter the following options:

file name: flowers_data.dbf

file directory: domyślnie

file size: 100 MB

Automatically extend datafile: Yes

increment: 100 MB

Maximum file size: 1 GB

Add Datafile

* File Name

* File Directory

Tablespace **FSDATA**

File Size **MB**

☐ Reuse Existing File

Storage

☒ Automatically extend datafile when full (AUTOEXTEND)

Increment **MB**

Maximum File Size ☐ Unlimited

☒ Value **GB**

TIP Changes made on this page will NOT take effect until you click "OK" button on the Tablespace page.

25. Click Continue and finally OK.

Edit View Delete Actions Add Datafile Go											
Select	Name	Allocated Size(MB)	Space Used(MB)	Allocated Space Used(%)	Auto Extend	Allocated Free Space(MB)	Status	Datafiles	Type	Extent Management	Se
<input checked="" type="radio"/>	APEX_1930613455248703	2.0	1.0	<div><div></div></div> 50.0	YES	1.0	✓	1	PERMANENT	LOCAL	AU
<input type="radio"/>	APEX_2041602962184952	2.0	1.0	<div><div></div></div> 50.0	YES	1.0	✓	1	PERMANENT	LOCAL	AU
<input type="radio"/>	APEX_2610402357158758	2.0	1.0	<div><div></div></div> 50.0	YES	1.0	✓	1	PERMANENT	LOCAL	AU
<input type="radio"/>	APEX_2611417663389985	2.0	1.0	<div><div></div></div> 50.0	YES	1.0	✓	1	PERMANENT	LOCAL	AU
<input type="radio"/>	APEX_2614203650434107	7.0	6.3	<div><div></div></div> 90.2	YES	0.7	✓	1	PERMANENT	LOCAL	AU
<input type="radio"/>	EXAMPLE	82.0	70.9	<div><div></div></div> 86.5	YES	11.1	✓	1	PERMANENT	LOCAL	AU
<input type="radio"/>	FSDATA	100.0	1.0	<div><div></div></div> 1.0	YES	99.0	✓	1	PERMANENT	LOCAL	AU
<input type="radio"/>	SYSAUX	1,259.0	1,144.9	<div><div></div></div> 90.9	YES	114.1	✓	1	PERMANENT	LOCAL	AU
<input type="radio"/>	SYSTEM	841.0	840.8	<div><div></div></div> 100.0	YES	0.2	✓	1	PERMANENT	LOCAL	MA
<input type="radio"/>	TEMP	158.0	1.0	<div><div></div></div> 0.6	YES	157.0	✓	1	TEMPORARY	LOCAL	MA
<input type="radio"/>	UNDOTBS1	170.0	9.3	<div><div></div></div> 5.5	YES	160.7	✓	1	UNDO	LOCAL	MA
<input type="radio"/>	USERS	225.0	181.1	<div><div></div></div> 80.5	YES	43.9	✓	1	PERMANENT	LOCAL	AU
Edit View Delete Actions Add Datafile Go											
Total Allocated Size (GB) 2.78 ✓ Online ✗ Offline 🔒 Read Only											

26. Create a second tablespace named FSINDX and file name flowers_indx.dbf The remaining parameters are similar to the previous one. Use as a tool to create this space SQL*Plus and the appropriate commands SQL.

```
SQL> create tablespace FSINDEX datafile 'flowers_idx.dbf' size 100m autoextend on next 100m maxsize 1g extent management local;
```

Tablespace created.

Select	Name	Allocated Size(MB)	Space Used(MB)	Allocated Space Used(%)	Auto Extend	Free Space(MB)	Status	Datafiles	Type	Extent Management	S
<input checked="" type="radio"/>	APEX_1930613455248703	2.0	1.0	<div><div></div></div> 50.0	YES	1.0	✓	1	PERMANENT	LOCAL	A
<input type="radio"/>	APEX_2041602962184952	2.0	1.0	<div><div></div></div> 50.0	YES	1.0	✓	1	PERMANENT	LOCAL	A
<input type="radio"/>	APEX_2610402357158758	2.0	1.0	<div><div></div></div> 50.0	YES	1.0	✓	1	PERMANENT	LOCAL	A
<input type="radio"/>	APEX_2611417663389985	2.0	1.0	<div><div></div></div> 50.0	YES	1.0	✓	1	PERMANENT	LOCAL	A
<input type="radio"/>	APEX_2614203650434107	7.0	6.3	<div><div></div></div> 90.2	YES	0.7	✓	1	PERMANENT	LOCAL	A
<input type="radio"/>	EXAMPLE	82.0	70.9	<div><div></div></div> 86.5	YES	11.1	✓	1	PERMANENT	LOCAL	A
<input type="radio"/>	FSDATA	100.0	1.0	<div><div></div></div> 1.0	YES	99.0	✓	1	PERMANENT	LOCAL	A
<input type="radio"/>	FSINDEX	100.0	1.0	<div><div></div></div> 1.0	YES	99.0	✓	1	PERMANENT	LOCAL	A
<input type="radio"/>	SYSAUX	1,259.0	1,144.9	<div><div></div></div> 90.9	YES	114.1	✓	1	PERMANENT	LOCAL	A
<input type="radio"/>	SYSTEM	841.0	840.8	<div><div></div></div> 100.0	YES	0.2	✓	1	PERMANENT	LOCAL	M
<input type="radio"/>	TEMP	158.0	1.0	<div><div></div></div> 0.6	YES	157.0	✓	1	TEMPORARY	LOCAL	M
<input type="radio"/>	UNDOTBS1	170.0	9.4	<div><div></div></div> 5.5	YES	160.6	✓	1	UNDO	LOCAL	M
<input type="radio"/>	USERS	225.0	181.1	<div><div></div></div> 80.5	YES	43.9	✓	1	PERMANENT	LOCAL	A

Edit View Delete Actions Add Datafile