*SESSION 4 CREATING and ALTERING TABLESPACES in SQL*PLUS, plus Tablespace/Datafile Dictionary Views*

```
The Oracle base remains unchanged with value /opt/oracle
[oracle@oracloud12c ~]$ pwd
/home/oracle
[oracle@oracloud12c ~]$ cd /opt/oracle/admin/student/pfile
[oracle@oracloud12c pfile]$ ls -l
total 8
-rw-r-----. 1 oracle dba 1809 Dec 18 10:59 init.ora.6242017113352
-rw-r--r--. 1 oracle dba 1809 Dec 18 10:58 initstudent.ora
```

*** Now, when in "pfile" folder we will open SQL session, so that we can use our PFILE → "initstudent.ora" to start our DB whenever necessary ***

```
[oracle@oracloud12c pfile]$ sqlplus / as sysdba

SQL*Plus: Release 12.1.0.2.0 Production on Fri Dec 29 14:04:11 2017
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Connected to:        ← Our Instance student is running
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Advanced Analytics and Real Application
Testing options

SQL> SET PAGESIZE 120
SQL> DESC V$TABLESPACE
 Name                                      Null?    Type
 ----------------------------------------- -------- ----------------
 TS#                                                NUMBER
 NAME                                               VARCHAR2(30)
 INCLUDED_IN_DATABASE_BACKUP                        VARCHAR2(3)
 BIGFILE                                            VARCHAR2(3)
 FLASHBACK_ON                                       VARCHAR2(3)
 ENCRYPT_IN_BACKUP                                  VARCHAR2(3)
 CON_ID                                             NUMBER

SQL> SELECT ts#, name FROM V$TABLESPACE;

       TS# NAME
---------- ------------------------------
         1 SYSAUX
         0 SYSTEM
         2 UNDOTBS1
         4 USERS
         3 TEMP
         6 MGMT_ECM_DEPOT_TS
         7 MGMT_TABLESPACE
         8 MGMT_AD4J_TS
```

```
8 rows selected.
```

*** The last 3 tablespaces are used for Repository of EM Cloud Control, and we will ignore them ***

*** Let's create a NEW tablespace, with initial size of 10M and uniform size of its extents is 0.5M (or 512k). It may be auto-extended with extents of also 0.5M up to 20M. In the syntax below, BLACK font is for DEFAULT options and may be skipped. ***

```
SQL> CREATE SMALLFILE TABLESPACE  mine
     DATAFILE  '/opt/oracle/oradata/student/mine01.dbf' SIZE 10M
     AUTOEXTEND ON NEXT 512K MAXSIZE 20M
     LOGGING     EXTENT MANAGEMENT LOCAL
     UNIFORM SIZE 512K
     SEGMENT SPACE MANAGEMENT AUTO ;

Tablespace created.
```

*** Let's create a small tablespace, with initial size of 2M and uniform size of its extents is 80K. It can not auto-extend. ***

```
SQL> CREATE  TABLESPACE  joke
     DATAFILE  '/opt/oracle/oradata/student/joke01.dbf' SIZE 2M
     AUTOEXTEND OFF
     UNIFORM SIZE 80K;
Tablespace created.
```

Three methods to Change the Size of a Tablespace

1) **ADD NEW DATAFILE**

```
SQL> ALTER  TABLESPACE  joke
     ADD  DATAFILE   '/opt/oracle/oradata/student/joke02.dbf' SIZE 3M;

Tablespace altered.
```

2) **RESIZE an EXISTING DATAFILE**

```
SQL> ALTER DATABASE DATAFILE
      '/opt/oracle/oradata/student/joke01.dbf' RESIZE 5M;

Database altered.
```

3) **Turn ON the AUTOEXTEND feature for an EXISTING DATAFILE**

```
SQL> ALTER DATABASE DATAFILE '/opt/oracle/oradata/student/joke02.dbf'
     AUTOEXTEND ON NEXT 80K MAXSIZE 5M;

Database altered.
```

Performance/Dictionary Views for Tablespaces/Datafiles

```
SQL> select  ts#, name FROM v$tablespace;

TS#        NAME
---------- ------------------------------
         1 SYSAUX
         0 SYSTEM
         2 UNDOTBS1
         4 USERS
         3 TEMP
         6 MGMT_ECM_DEPOT_TS
         7 MGMT_TABLESPACE
         8 MGMT_AD4J_TS
         9 MINE
        10 JOKE

10 rows selected.

SQL> SELECT tablespace_name, initial_extent, status, contents,
           extent_management, allocation_type
     FROM       dba_tablespaces
     WHERE      tablespace_name IN ('USERS', 'MINE', 'JOKE');

TABLESPACE_NAME                INITIAL_EXTENT STATUS    CONTENTS
EXTENT_MAN
------------------------------ -------------- --------- --------- ----
ALLOCATIO
---------
JOKE                                    81920 ONLINE    PERMANENT
LOCAL
UNIFORM

MINE                                   524288 ONLINE    PERMANENT
LOCAL
UNIFORM

USERS                                   65536 ONLINE    PERMANENT
LOCAL
SYSTEM
```

*** We can format this output better like shown below ***

```
SQL> column tablespace_name   format a15
SQL> column extent_management format a6
SQL> /

TABLESPACE_NAME INITIAL_EXTENT STATUS    CONTENTS  EXTENT ALLOCATIO
--------------- -------------- --------- --------- ------ ---------
JOKE                     81920 ONLINE    PERMANENT LOCAL  UNIFORM
MINE                    524288 ONLINE    PERMANENT LOCAL  UNIFORM
USERS                    65536 ONLINE    PERMANENT LOCAL  SYSTEM
```

→ *In the last row* ***SYSTEM*** *means* ***AUTOALLOCATE*** *option for Extent Allocation Type*

```
SQL> SELECT  file#, name, status, bytes, create_bytes
     FROM    V$DATAFILE  WHERE   ts#  IN  (4,9,10);

FILE#
----------
NAME
--------------------------------------------------------------------------------
STATUS       BYTES CREATE_BYTES
------- ---------- ------------
         6
/opt/oracle/oradata/student/users01.dbf
ONLINE     5242880            0

         8
/opt/oracle/oradata/student/mine01.dbf
ONLINE    10485760     10485760

         9
/opt/oracle/oradata/student/joke01.dbf
ONLINE     5242880      2097152

        10
/opt/oracle/oradata/student/joke02.dbf
ONLINE     3145728      3145728
```

→ *This view can show us the current and original size in bytes for data files.*

*** We can format this output better like shown below ***

```
SQL> column file# format 999
SQL> column name format a40
SQL> /

FILE# NAME                                     STATUS       BYTES
CREATE_BYTES
----- ---------------------------------------- ------- ----------
    6 /opt/oracle/oradata/student/users01.dbf  ONLINE     5242880
0
    8 /opt/oracle/oradata/student/mine01.dbf   ONLINE    10485760
10485760
    9 /opt/oracle/oradata/student/joke01.dbf   ONLINE     5242880
2097152
   10 /opt/oracle/oradata/student/joke02.dbf   ONLINE     3145728
3145728



SQL> SELECT  file_id, file_name, status, bytes,
             autoextensible,  increment_by, maxbytes
```

```
     FROM    dba_data_files
     WHERE   tablespace_name IN ('USERS', 'MINE', 'JOKE');

   FILE_ID
----------
FILE_NAME
--------------------------------------------------------------------------------
STATUS         BYTES AUT INCREMENT_BY   MAXBYTES
--------- ---------- --- ------------ ----------
         6
/opt/oracle/oradata/student/users01.dbf
AVAILABLE    5242880 YES          160 3.4360E+10

         8
/opt/oracle/oradata/student/mine01.dbf
AVAILABLE   10485760 YES           64   20971520

         9
/opt/oracle/oradata/student/joke01.dbf
AVAILABLE    5242880 NO             0          0

        10
/opt/oracle/oradata/student/joke02.dbf
AVAILABLE    3145728 YES           10    5242880
```

* We can format this output better like shown below *

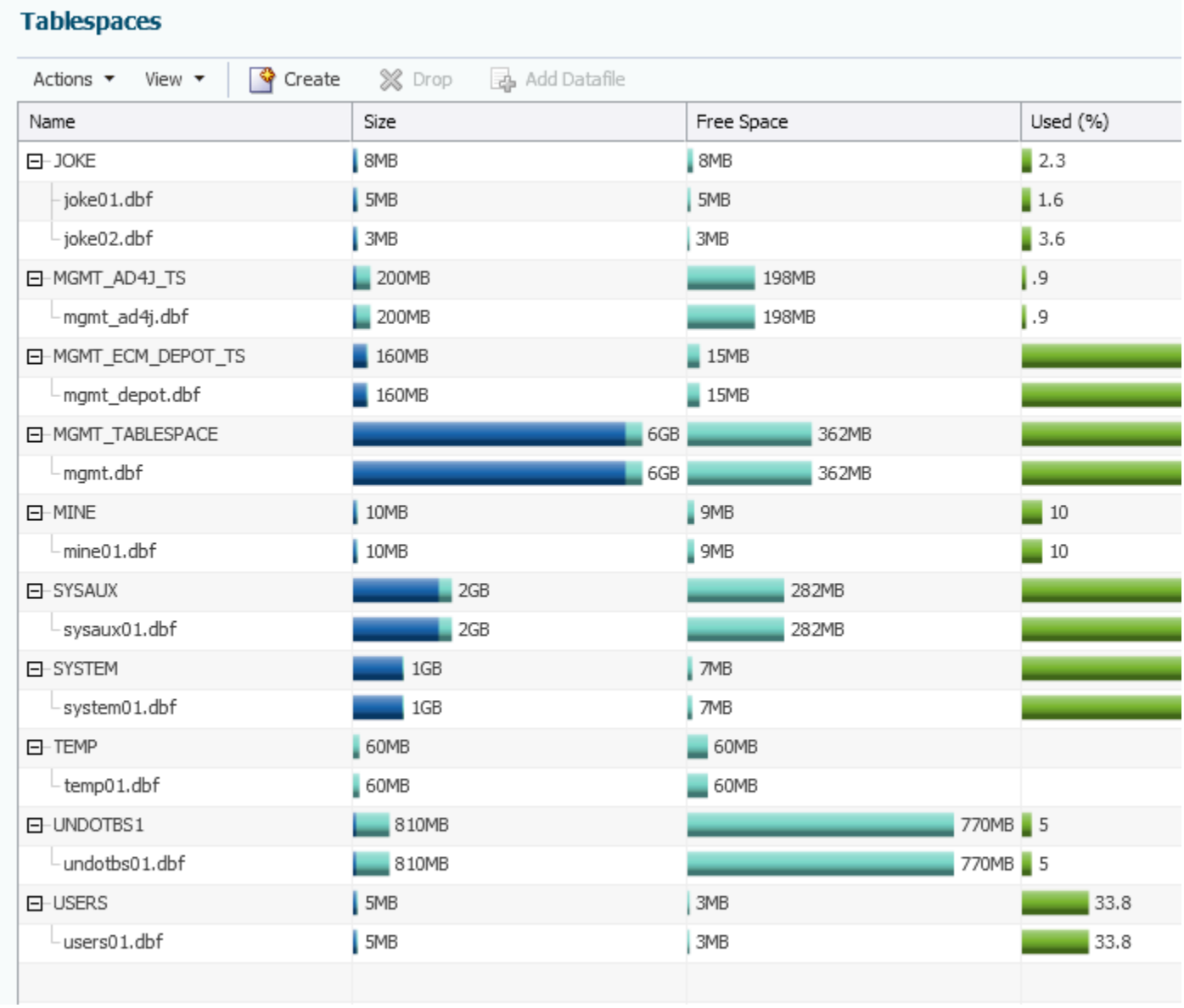
```
SQL> column file_id format 999
SQL> column file_name format a40
SQL> /

FILE_ID FILE_NAME                                STATUS         BYTES
------- ---------------------------------------- --------- ----------
AUT INCREMENT_BY   MAXBYTES
--- ------------ ----------
      6 /opt/oracle/oradata/student/users01.dbf  AVAILABLE    5242880
YES          160 3.4360E+10

      8 /opt/oracle/oradata/student/mine01.dbf   AVAILABLE   10485760
YES           64   20971520

      9 /opt/oracle/oradata/student/joke01.dbf   AVAILABLE    5242880
NO             0          0

     10 /opt/oracle/oradata/student/joke02.dbf   AVAILABLE    3145728
YES           10    5242880
```

➔ *This view can show us 3 AUTOEXTEND components for data files*

If we open our **DB EXPRESS tool** with **http://myvmlab.senecacollege.ca:xxxx/em** where xxxx is your Express Port# (one less than one posted on BB)

Then we go **Storage → Tablespaces → expand all Tablespaces** → we get

something similar to the image shown below. It is easy to see how much of space is used for each tablespace.




```
SQL> EXIT
Disconnected from Oracle Database 12c Enterprise Edition Release
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With the Partitioning, OLAP, Advanced Analytics and Real Application
Testing options
[oracle@oracloud12c pfile]$ exit
Logout
```