CSC 454 HOMEWORK 2

1. Browse the original **init.ora** in C:\app**YourID**\admin**InstanceName**\pfile.What's the **Memory_Target** size in MB?

S:\app\sdevagup\admin\sdevagupPDBA\pfile
compatible=11.2.0.0.0
db_unique_name=sdevagupDBA
diagnostic_dest=S:\app\sdevagup
memory_target=6818889728(6819MB)

2. Copy **C:\app\YourID\product\11.2.0\db_1\database\spfileInstanceName.ora** to Word and then write down each memory component size of **SGA** in MB *(round up to a whole number).*

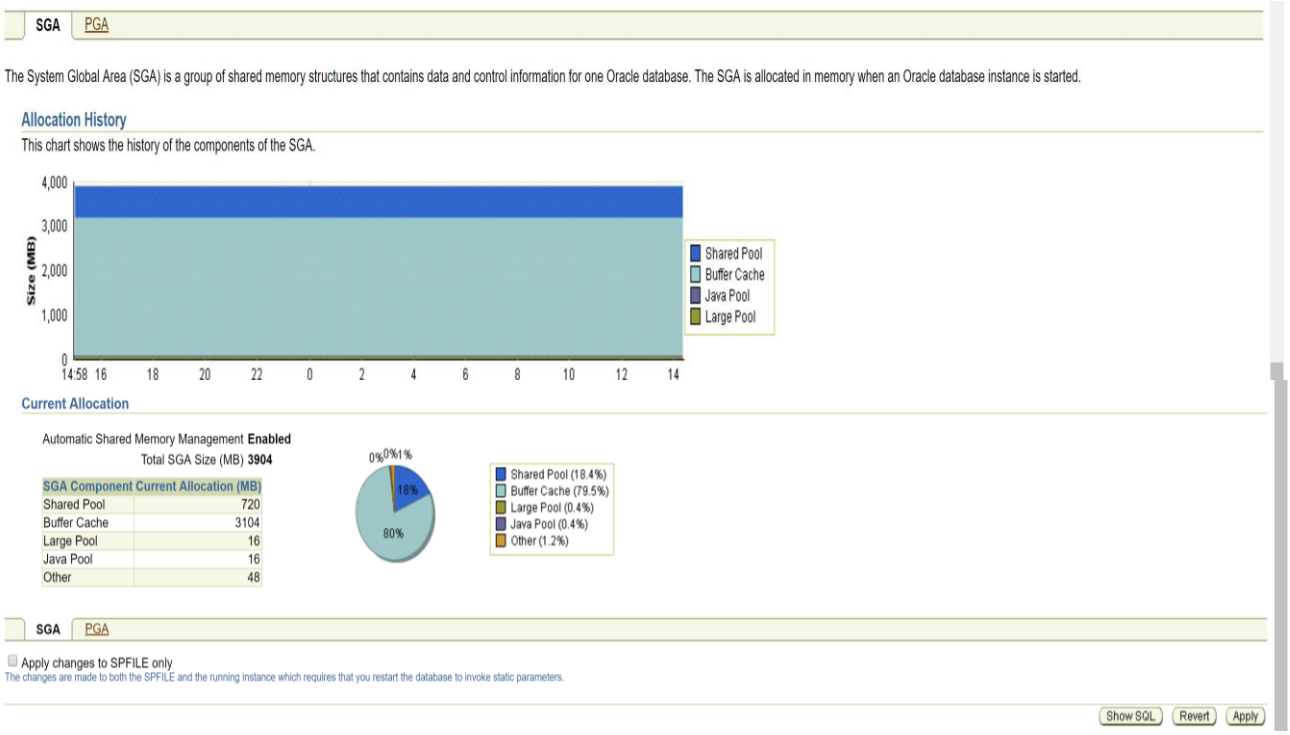
S:\app\sdevagup\product\11.2.0\dbhome_1\database\SPFILEsdevagupDBA.ora
sdevagupdba.__db_cache_size=3254779904(3255MB)
sdevagupdba.__java_pool_size=16777216(17MB)
sdevagupdba.__large_pool_size=16777216(17MB)
sdevagupdba.__oracle_base='S:\app\sdevagup'#ORACLE_BASE set from environment
sdevagupdba.__pga_aggregate_target=2734686208(2735MB)
sdevagupdba.__sga_target=4093640704(4094MB)
sdevagupdba.__shared_io_pool_size=0
sdevagupdba.__shared_pool_size=754974720(755MB)
sdevagupdba.__streams_pool_size=0
*._memory_broker_stat_interval=5
*._memory_management_tracing=31
*._PX_use_large_pool=TRUE
*.audit_file_dest='S:\app\sdevagupC C":. t\admin\sdevagupDBA\adump'
*.audit_trail='db'
*.compatible='11.2.0.0.0'
*.control_files='S:\app\sdevagup\oradata\sdevagupDBA\control01.ctl','S:\app\sdevagup\flash_recovery_are
a\sdevagupDBA\control02.ctl'
*.db_block_size=8192
*.db_domain=''
*.db_name='sdevagupDB'
*.db_recovery_file_dest='S:\app\sdevagup\flash_recovery_area'
*.db_recovery_file_dest_size=4102029312
*.db_unique_name='sdevagupDBA'
*.diagnostic_dest='S:\app\sdevagup'
*.dispatchers='(PROTOCOL=TCP) (SERVICE=sdevagupDBAXDB)'
*.local_listener='LIC C" $. STENER_sdevagupDBA'
*.memory_target=419430400(419MB)
*.open_cursors=300
*.parallel_adaptive_multi_user=FALSE
*.parallel_execution_message_size=36864
*.parallel_max_servers=20
*.pga_aggregate_target=0
*.processes=100
*.remote_login_passwordfile='EXCLUSIVE'
*.sga_target=0
*.undo_tablespace='UNDOTBS1'

3. Start a **SQL*Plus** session as user **SYS**, display **SGA** and convert each memory component to MB.

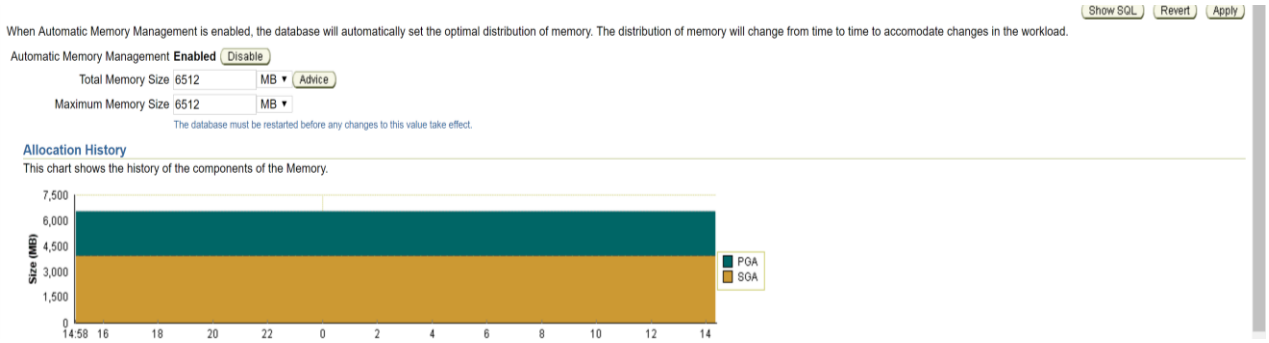
SQL> SHOW SGA

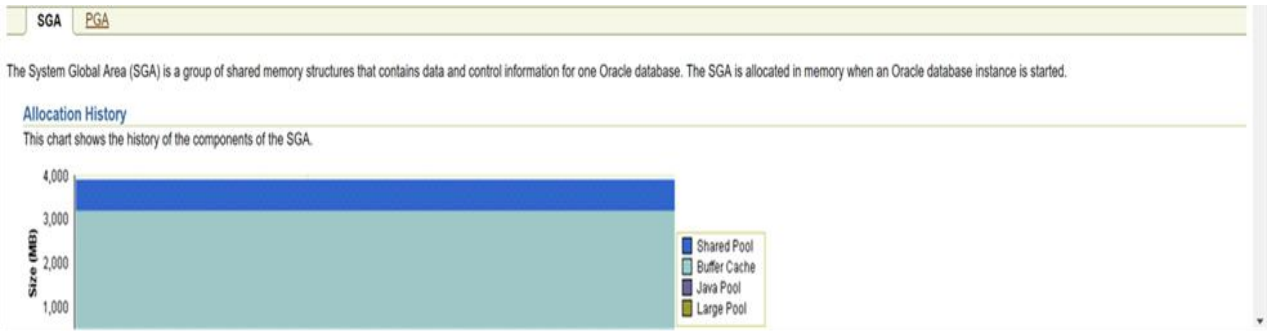
Total System Global Area 6797832192 bytes(6798MB)
Fixed Size 2188648 bytes(2.2MB)
Variable Size 3523218072 bytes(3523MB)
Database Buffers 3254779904 bytes(3255MB)
Redo Buffers 17645568 bytes(17.6MB)

4. Invoke Oracle Enterprise Manger (OEM), enter **sys** as the username, connect as **SYSDBA**, and then click **Login.** Click **"Server"** tab and then click "**Memory Advisors**" link. Take a screen print of the current allocation of **Automatic Shared Memory Management.**

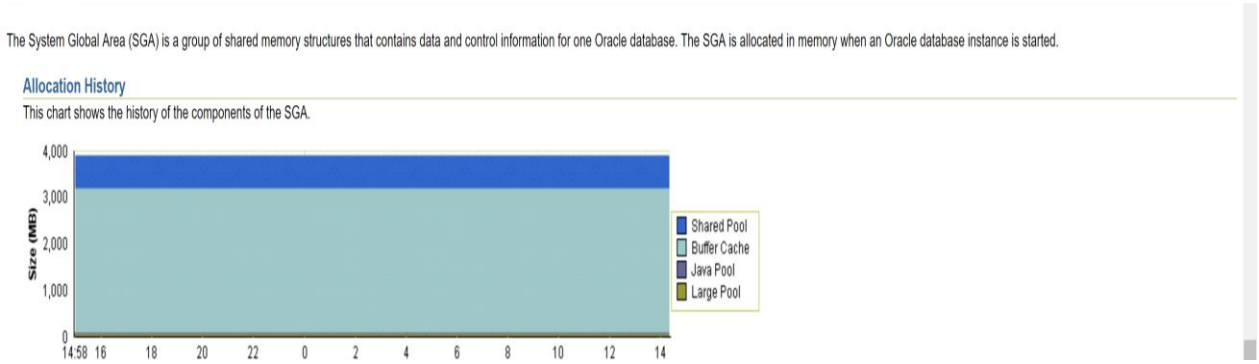


5. On the Memory Advisors page, check that **Automatic Memory Management** is enabled. Write down the Total Memory Size, Maximum Memory Size, and current SGA & PGA allocation or print screen. Close OEM.


Show SQL
Revert
Apply
When Automatic Memory Management is enabled, the database will automatically set the optimal distribution of memory. The distribution of memory will change from time to time to accomodate changes in the workload.
Automatic Memory Management Enabled
Disable
Total Memory Size 6512
MB
Advice
Maximum Memory Size 6512
MB
The database must be restarted before any changes to this value take effect.
Allocation History
This chart shows the history of the components of the Memory.
Size (MB)
7,500
6,000
4,500
3,000
1,500
0
14:58 16 18 20 22 0 2 4 6 8 10 12 14
PGA
SGA


SGA
PGA
The System Global Area (SGA) is a group of shared memory structures that contains data and control information for one Oracle database. The SGA is allocated in memory when an Oracle database instance is started.
Allocation History
This chart shows the history of the components of the SGA.
Size (MB)
4,000
3,000
2,000
1,000
Shared Pool
Buffer Cache
Java Pool
Large Pool

SGA: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Allocation History
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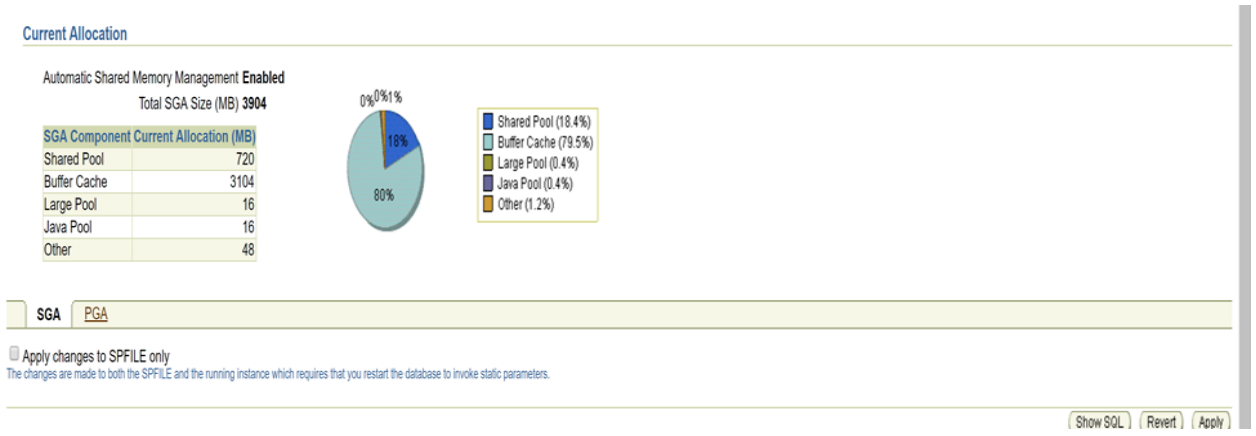
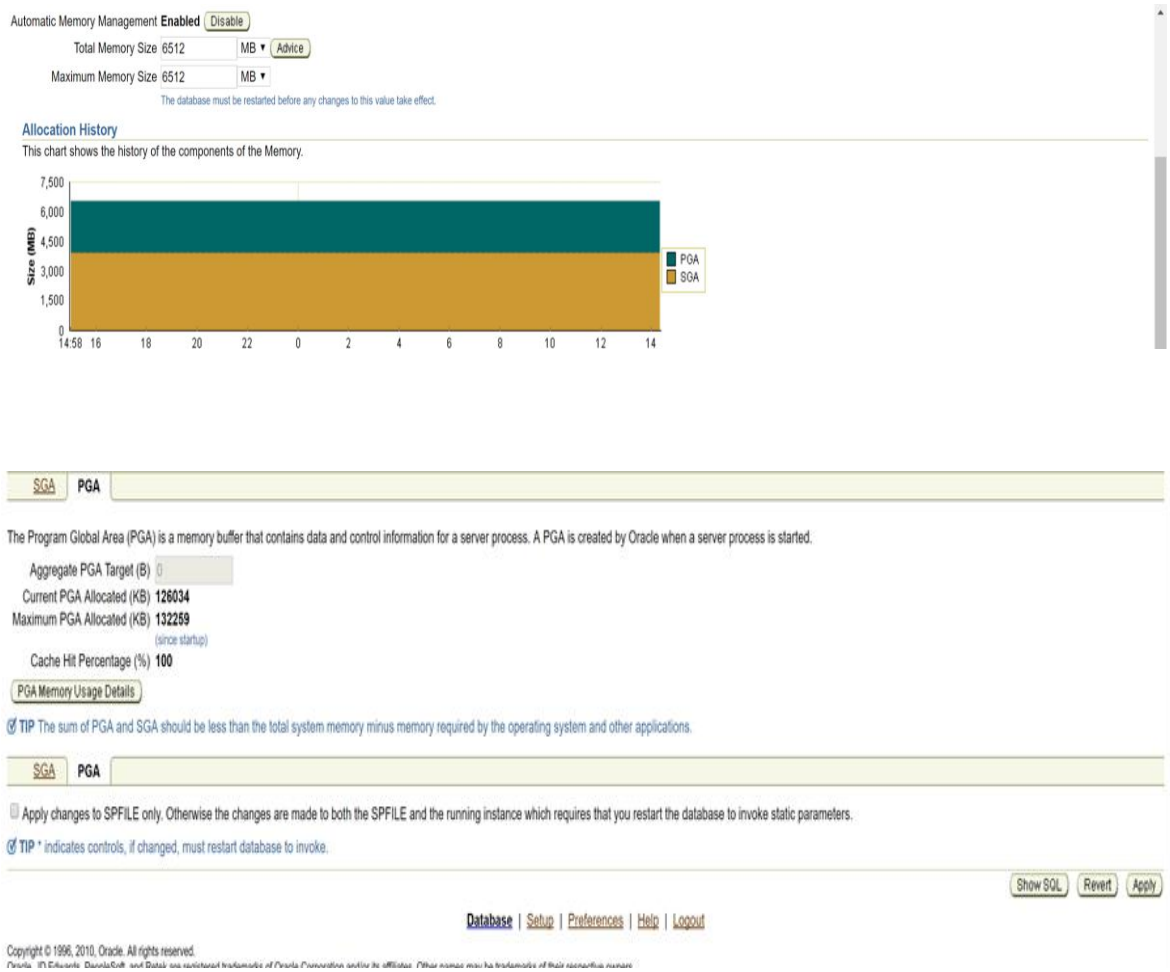
Size (MB)
4,000
3,000
2,000
1,000
0
14:58 16 18 20 22 0 2 4 6 8 10 12 14
Shared Pool
Buffer Cache
Java Pool
Large Pool


Current Allocation
Automatic Shared Memory Management Enabled
Total SGA Size (MB) 3904
SGA Component Current Allocation (MB)
Shared Pool 720
Buffer Cache 3104
Large Pool 16
Java Pool 16
Other 48
0%
0%
1%
18%
80%
Shared Pool (18.4%)
Buffer Cache (79.5%)
Large Pool (0.4%)
Java Pool (0.4%)
Other (1.2%)
SGA
PGA
Apply changes to SPFILE only
The changes are made to both the SPFILE and the running instance which requires that you restart the database to invoke static parameters.
Show SQL
Revert
Apply

PGA:



6. Using **SQL*PLUS**, connect to the database as the **SYS** user. Run the following script to create a user and tablespaces.

```
SQL> create tablespace tbsga datafile 'tbsga.dbf' size 20m reuse;
Tablespace created.

SQL> create temporary tablespace mytemp tempfile 'mytemp.dbf' size 40m reuse;
Tablespace created.

SQL> create user amm identified by amm default tablespace tbsga temporary tablespace mytemp;
User created.

SQL> grant connect,resource,dba to amm;
Grant succeeded.
```

7. In SQL*PLUS, connect as **amm** to run the following script and then log out.

```
SQL> conn amm
```

```
Enter password:
Connected.
SQL> create table tabsga(a number, b number) tablespace tbsga;

Table created.

SQL>
SQL> begin
  2    for i in 1..100000 loop
  3      insert into tabsga values (i, i);
  4    end loop;
  5  end;
  6  /

PL/SQL procedure successfully completed.
SQL> commit;

Commit complete.

SQL>
SQL> alter table tabsga parallel 16;

Table altered.

SQL>
SQL> create or replace procedure testpga( psize number ) as
  2  begin
  3  declare
  4    TYPE nAllotment_tabtyp    IS TABLE OF char(2048) INDEX BY BINARY_INTEGER;
  5    myarray nAllotment_tabtyp;
  6  begin
  7    for i in 1..psize loop
  8      myarray(i) := to_char(i);
  9    end loop;
 10  end;
 11  end;
```

8. Start a **SQL*Plus** session as user **SYS** and then run the following script to make sure parallel queries run during this assignment are using **large pool memory** for better visualization later in Enterprise Manager.

```
SQL> alter system set "_PX_use_large_pool" = TRUE SCOPE=SPFILE;

System altered.

SQL> alter system set "_memory_broker_stat_interval" = 5 SCOPE=SPFILE;

System altered.

SQL> alter system set "_memory_management_tracing" = 31 SCOPE=SPFILE;

System altered.

SQL> alter system set "parallel_execution_message_size" = 36864 SCOPE=SPFILE;
```

System altered.

SQL> alter system set "parallel_adaptive_multi_user" = FALSE SCOPE=SPFILE;

System altered.

SQL> alter system set "parallel_max_servers" = 20 SCOPE=SPFILE;

System altered.

SQL> alter system set "processes" = 100 SCOPE=SPFILE;

System altered.

SQL> alter system set "pga_aggregate_target" = 0 SCOPE=SPFILE;

System altered.

SQL> alter system set "sga_target" = 0 SCOPE=SPFILE;

System altered.

SQL> alter system set "memory_target" = 400M SCOPE=SPFILE;

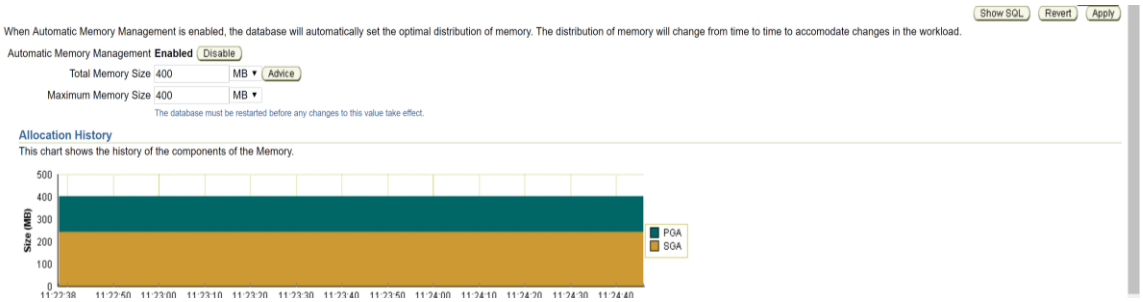
System altered.

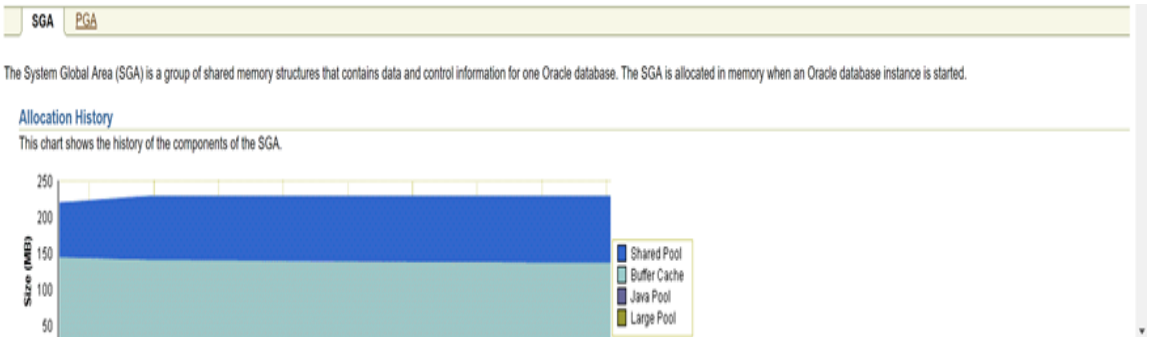
9. Shut down Oracle and then restart Oracle. Write down all memory components in MB.

SQL> shutdown immediate
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> startup
ORACLE instance started.

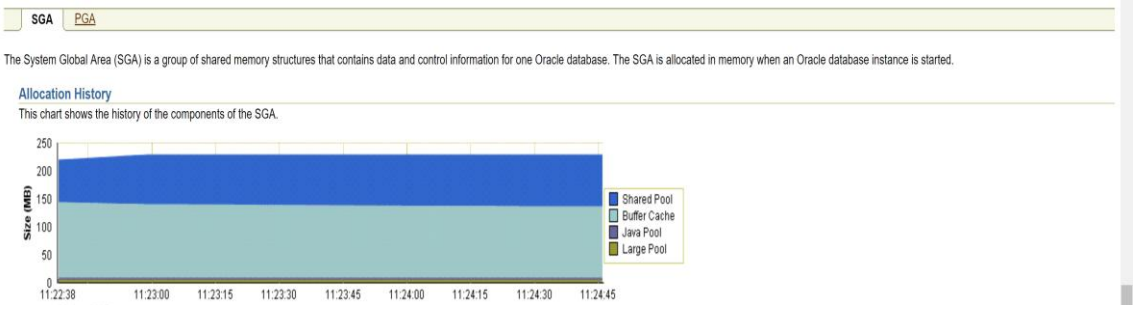
Total System Global Area 417546240 bytes(418MB)
Fixed Size 2176328 bytes(2.18MB)
Variable Size 264243896 bytes(264MB)
Database Buffers 142606336 bytes(143MB)
Redo Buffers 8519680 bytes(8.5MB)
Database mounted.
Database opened.

10. Open your browser window, and log on to Enterprise Manager as user **SYS**. Once on the Home page, click the **Server** tab. On the Server subpage, click **Memory Advisors** link. Write down the Total Memory Size, Maximum Memory Size, and current SGA & PGA allocation or print screen.


Show SQL
Revert
Apply
When Automatic Memory Management is enabled, the database will automatically set the optimal distribution of memory. The distribution of memory will change from time to time to accomodate changes in the workload.
Automatic Memory Management Enabled
Disable
Total Memory Size 400
MB
Advice
Maximum Memory Size 400
MB
The database must be restarted before any changes to this value take effect.
Allocation History
This chart shows the history of the components of the Memory.
Size (MB)
500
400
300
200
100
0
PGA
SGA

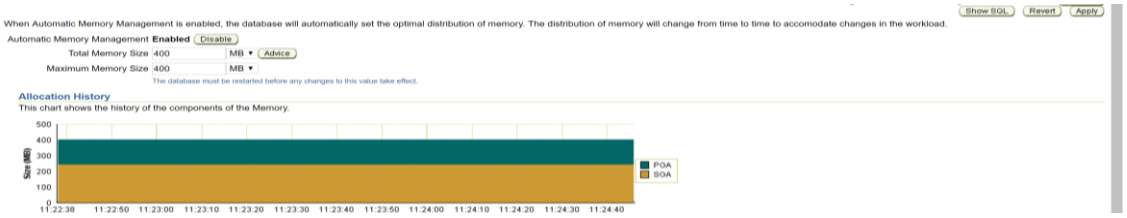

SGA
PGA
The System Global Area (SGA) is a group of shared memory structures that contains data and control information for one Oracle database. The SGA is allocated in memory when an Oracle database instance is started.
Allocation History
This chart shows the history of the components of the SGA.
Size (MB)
250
200
150
100
50
Shared Pool
Buffer Cache
Java Pool
Large Pool

SGA:


SGA
PGA
The System Global Area (SGA) is a group of shared memory structures that contains data and control information for one Oracle database. The SGA is allocated in memory when an Oracle database instance is started.
Allocation History
This chart shows the history of the components of the SGA.
Size (MB)
250
200
150
100
50
0
11:22:38
11:23:00
11:23:15
11:23:30
11:23:45
11:24:00
11:24:15
11:24:30
11:24:45
Shared Pool
Buffer Cache
Java Pool
Large Pool


Current Allocation
Automatic Shared Memory Management Enabled
Total SGA Size (MB) 240
SGA Component Current Allocation (MB)
Shared Pool 92
Buffer Cache 128
Large Pool 4
Java Pool 4
Other 12
Shared Pool (38.3%)
Buffer Cache (53.3%)
Large Pool (1.7%)
Java Pool (1.7%)
Other (5%)
SGA
PGA
Apply changes to SPFILE only
Show SQL
Revert
Apply
Database | Setup | Preferences | Help | Logout

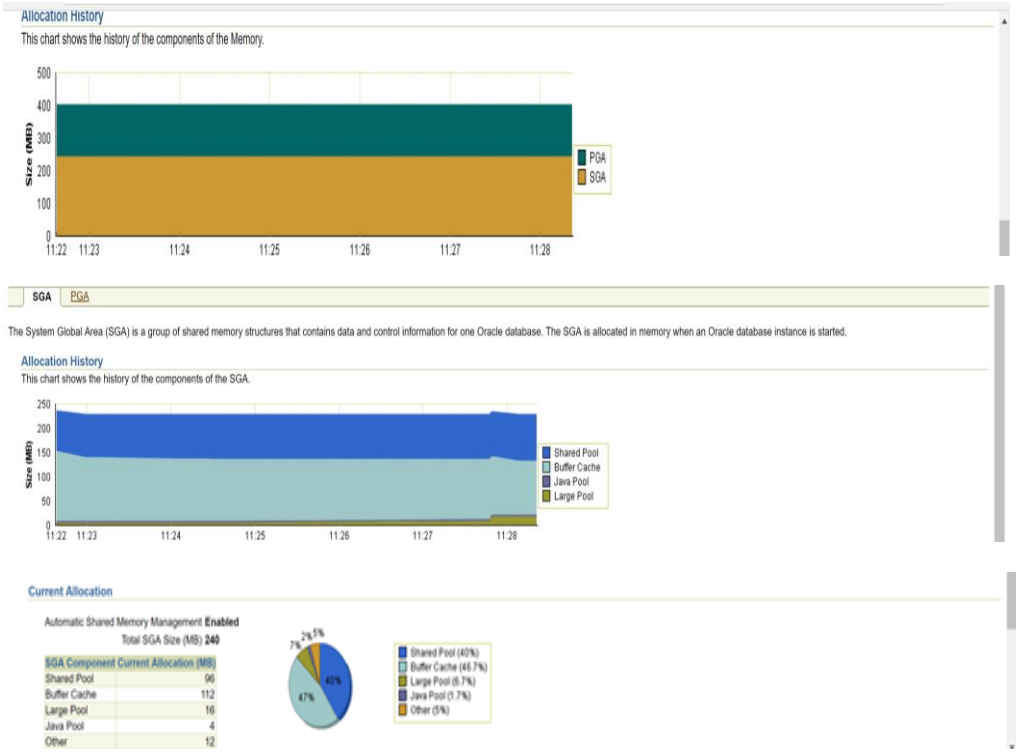
PGA:


Show SQL
Revert
Apply
When Automatic Memory Management is enabled, the database will automatically set the optimal distribution of memory. The distribution of memory will change from time to time to accomodate changes in the workload.
Automatic Memory Management Enabled
Disable
Total Memory Size 400
MB
Advice
Maximum Memory Size 400
MB
The database must be restarted before any changes to this value take effect.
Allocation History
This chart shows the history of the components of the Memory.
Size (MB)
500
400
300
200
100
0
PGA
SGA

11. From the same DOS SQL*PLUS session, connect as user **amm** (password amm), and execute the following script. This script starts a parallel query with a degree of parallelism set to 12. Refresh OEM and take a screen print of **SGA Allocation History.**

SQL> select /*+ PARALLEL (s 12) */ count(*) from (select /*+ parallel(s 12) */ * from tabsga s group by a);

```
  COUNT(*)
----------
    100000
```

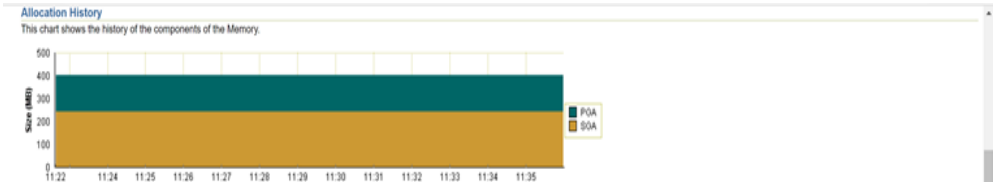


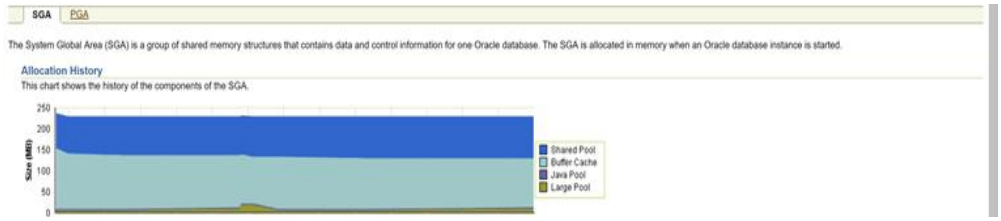
12. ***Take a 5 minute break.*** From the same session, execute another script as follows. This script starts the same parallel query with a degree of parallelism set to 24. Refresh OEM and take a screen print of **SGA Allocation History.**

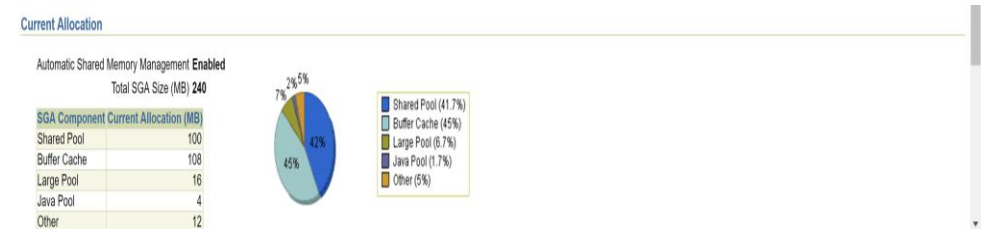
SQL> select /*+ PARALLEL(s 24) */ count(*) from (select /*+ parallel(s 24) */ * from tabsga s group by a);

```
  COUNT(*)
```

100000







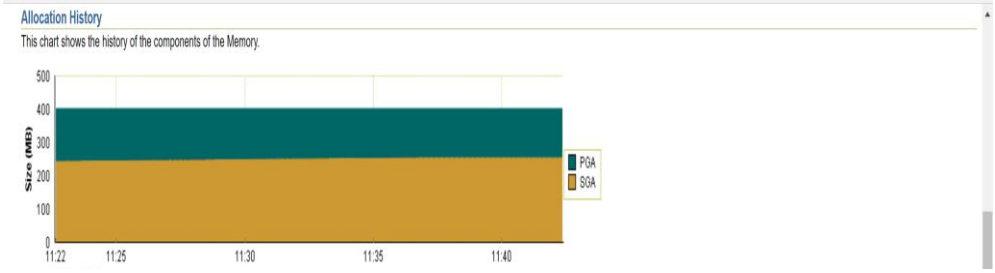
13. From the same session, execute the following script. This script invokes a PL/SQL procedure that build a big array in memory.

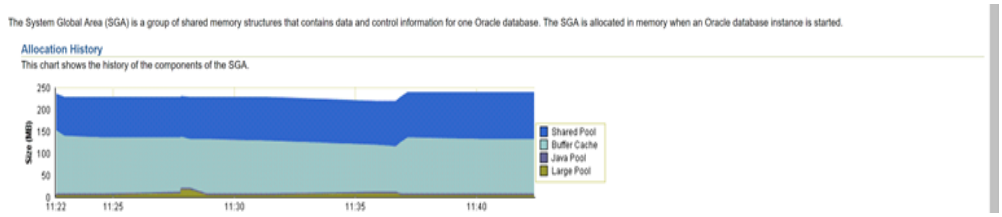
```
SQL> create or replace procedure testpga( psize number ) as
  2  begin
  3  declare
  4    TYPE nAllotment_tabtyp    IS TABLE OF char(2048) INDEX BY BINARY_INTEGER;
  5    myarray nAllotment_tabtyp;
  6  begin
  7    for i in 1..psize loop
  8      myarray(i) := to_char(i);
  9    end loop;
 10  end;
 11  end;
 12  /
```

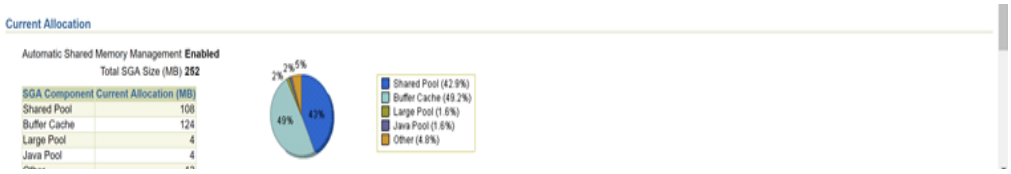
Procedure created.

```
SQL> Exec testpga(300000)
```

PL/SQL procedure successfully completed.







14. Exit from your SQL*Plus session. Using SQL*PLUS, connect to the database as the **SYS** user. Execute the following script to clean up the environment.

SQL> drop user amm cascade;
User dropped.

SQL> drop tablespace tbsga including contents and datafiles;
Tablespace dropped.

SQL> drop tablespace mytemp including contents and datafiles;
Tablespace dropped.

15. Using **SQL*PLUS**, connect to the database as the **SYS** user to reconfigure Oracle memory components:

a. Disable *Automatic Memory Management*.

SQL>ALTER SYSTEM SET MEMORY_TARGET=0;
System altered.

b. Change sga_target to 480MB

SQL>ALTER SYSTEM SET SGA_TARGET= 400M;
System altered.

c. Change Database buffer cache to 135 MB

SQL>ALTER SYSTEM SET DB_CACHE_SIZE= 135M;
System altered.

d. Change Shared pool to 123 MB

SQL>ALTER SYSTEM SET SHARED_POOL_SIZE= 123M;

System altered.

e. Change Large pool to 15 MB

SQL>ALTER SYSTEM SET LARGE_POOL_SIZE= 15M;

System altered.

f. Change JAVA pool to 9 MB

SQL>ALTER SYSTEM SET JAVA_POOL_SIZE= 9M;

System altered.

g. Change pga_aggregate_target to 80 MB

SQL>ALTER SYSTEM SET PGA_AGGREGATE_TARGET= 80M;

System altered.

16. Shutdown and restart Oracle.

a. What's the size of each memory component?

SQL> shutdown immediate

Database closed.

Database dismounted.

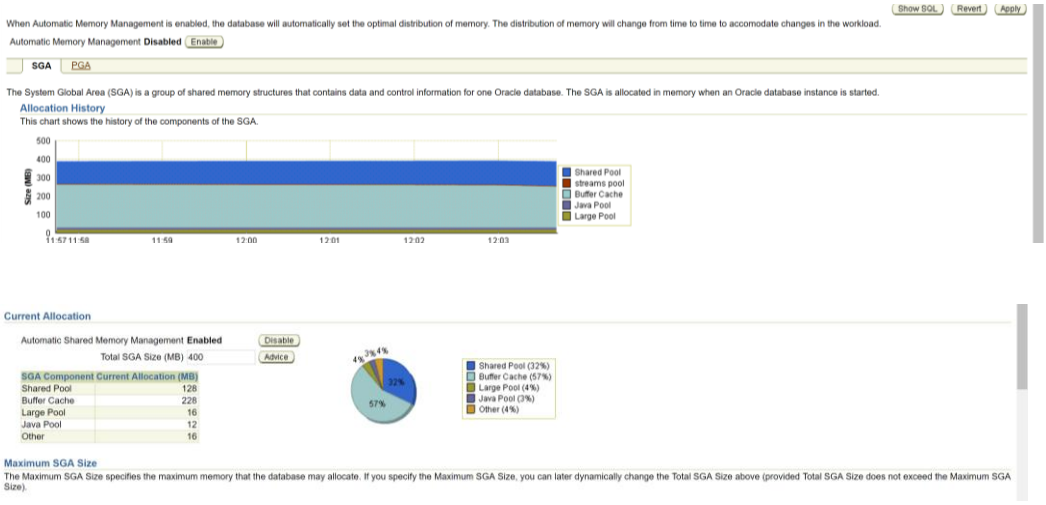
ORACLE instance shut down.

SQL> startup mount

ORACLE instance started.

Total System Global Area 417546240 bytes
Fixed Size 2176328 bytes
Variable Size 163580600 bytes
Database Buffers 243269632 bytes
Redo Buffers 8519680 bytes
Database mounted.

b. Invoke Oracle Enterprise Manger (OEM), enter **sys** as the username, connect as **SYSDBA**, and then click **Login.** Take a screen print of the current memory allocation.



17a. Invoke **SQL*PLUS** to create a ***new*** PFILE from the SPFILE. Place the PFILE in the directory C:\app**YourID**\admin**InstanceName**\pfile with the file name format init**InstanceName**.ora. You must specify the full path of both parameters (PFILE and SPFILE).

SQL> CREATE PFILE='S:\app\sdevagup\admin\sdevagupDBA\pfile\initsdevagupDBA.ora' FROM SPFILE='S:\app\sdevagup\product\11.2.0\dbhome_1\database\SPFILEsdevagupDBA.ora';

File created.

b. Use Word to view the new PFILE you created (C:\app**YourID**\admin**InstanceName**\pfile\init**InstanceName**.ora). Please write down db_cache_size, java_pool_size, large_pool_size, and shared_pool_size in MB.

sdevagupdba.__db_cache_size=222298112(222MB)
sdevagupdba.__java_pool_size=12582912(12.5MB)
sdevagupdba.__large_pool_size=16777216(17MB)
sdevagupdba.__oracle_base='S:\app\Suchit'#ORACLE_BASE set from environment
s**devagupdba.__pga_aggregate_target=83886080(84MB)**
sdevagupdba.__sga_target=419430400(419MB)
sdevagupdba.__shared_io_pool_size=0
sdevagupdba.__shared_pool_size=150994944(151MB)
sdevagupdba.__streams_pool_size=4194304
*._memory_broker_stat_interval=5
*._memory_management_tracing=31
*._PX_use_large_pool=TRUE
*.audit_file_dest='S:\app\sdevagup\admin\sdevagupDBA\adump'
*.audit_trail='db'
*.compatible='11.2.0.0.0'
*.control_files='S:\app\sdevagup\oradata\sdevagupDBA\control01.ctl','S:\app\sdevagup\flash_recovery_area\sdevagupDBA\control02.ctl'
***.db_block_size=8192**
***.db_cache_size=142606336(143MB)**
*.db_domain=''
*.db_name='sdevagupDB'
*.db_recovery_file_dest='S:\app\sdevagup\flash_recovery_area'
*.db_recovery_file_dest_size=4102029312
*.db_unique_name='sdevagupDBA'
*.diagnostic_dest='S:\app\sdevagup'
*.dispatchers='(PROTOCOL=TCP) (SERVICE=sdevagupDBAXDB)'
***.java_pool_size=12582912(13MB)**
***.large_pool_size=16777216(17MB)**
*.local_listener='LISTENER_sdevagupDBA'
*.memory_target=0
*.open_cursors=300
*.parallel_adaptive_multi_user=FALSE
*.parallel_execution_message_size=36864
*.parallel_max_servers=20
***.pga_aggregate_target=83886080(84MB)**
*.processes=100
*.remote_login_passwordfile='EXCLUSIVE'
***.sga_target=419430400(419MB)**
***.shared_pool_size=130023424(130MB)**
*.undo_tablespace='UNDOTBS1'

18. Shut down the database and then restart Oracle Instance with open it in **read-only** mode.

SQL> shutdown immediate
Database closed.
Database dismounted.
ORACLE instance shut down.

```
SQL> startup mount
ORACLE instance started.

Total System Global Area  417546240 bytes
Fixed Size                 2176328 bytes
Variable Size            184552120 bytes
Database Buffers         222298112 bytes
Redo Buffers               8519680 bytes
Database mounted.
SQL> ALTER DATABASE OPEN READ ONLY;

Database altered.
```

19. Note: Please make sure you completed Lab#1B, which unlocked user Scott and set up a password.
From the existing Windows SQL*Plus session, connect as user Scott password Tiger. Browse the DEPT table and then insert a row into the DEPT table as follows:
INSERT INTO DEPT VALUES (50, 'Leagal','Seattle'); What happens?

```
SQL> connect scott
Enter password:
Connected.
SQL> SELECT * FROM DEPT;

    DEPTNO DNAME          LOC
---------- -------------- -------------
        10 ACCOUNTING     NEW YORK
        20 RESEARCH       DALLAS
        30 SALES          CHICAGO
        40 OPERATIONS     BOSTON

SQL> INSERT INTO DEPT VALUES (50, 'Leagal','Seattle');
ERROR:
ORA-01756: quoted string not properly terminated
```

20a. Put the database back in **read-write** mode.

```
SQL> connect sys as sysdba
Enter password:
Connected.
SQL> shutdown immediate
Database closed.
Database dismounted.
ORACLE instance shut down.
SQL> startup
ORACLE instance started.

Total System Global Area  417546240 bytes
Fixed Size                 2176328 bytes
Variable Size            188746424 bytes
Database Buffers         218103808 bytes
Redo Buffers               8519680 bytes
Database mounted.
```

Database opened.

b. Connect user Scott and insert the following row into the DEPT table.
INSERT INTO DEPT VALUES (50, 'Legal', 'Seattle');
Query the DEPT table to list all the records.

```
SQL> connect scott
Enter password:
Connected.
SQL> INSERT INTO DEPT VALUES (50, 'Legal', 'Seattle');

1 row created.

SQL> SELECT * FROM DEPT;

    DEPTNO DNAME          LOC
---------- -------------- -------------
        50 Legal          Seattle
        10 ACCOUNTING     NEW YORK
        20 RESEARCH       DALLAS
        30 SALES          CHICAGO
        40 OPERATIONS     BOSTON
```