Database Environment Creation for Assessments

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Major Project

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CHAPTER 1

INTRODUCTION

1.1 Project Description

The project is used to automate the generation of database environment creation for assessments.

1.1.1 Background of the work

In the recent years, Oracle has introduced various database software namely Oracle 9i, 10g, 12c etc. Working on the software demands heavy system requirements to achieve the task using Oracle Enterprise Manager (GUI Based Oracle Software). To achieve the same in low system requirements we can use command line interface. The process is slow and complex. It is here where our project comes into action. With the help of shell scripting we have automated the process of carrying out various Database Environment Creation processes.

1.1.2 Basic Introduction of the Project

Database Environment Creation for Assessments is a project which helps to automate the setup generation of assessments. Beforehand the trainers would manually generate the requirements and sit for long hours until the tedious process was completed. With the help of shell scripting we have managed to do the required task automatically. The user will just interact with the Menu driven program and the scripts will take care of creating the whole environment setup in the database.

The project deals with the automation of the Hands-on assessment setup generation. In the assessment, the trainees are provided with an issue injected environment and are expected to resolve the issue. The issues injected in the environment during the assessment are similar to the ones faced in the production. The project setup is in Oracle 12C environment and the requirements are developed according to the specifications of the industry. The product should be able to create database, users, tables, tablespace and other requirements with respect to the question paper.

The final output of the product is the issue injected environment according to the hands-on assessment question paper.

1.2 Company Profile

1.2.1 Overview

Infosys Limited (formerly Infosys Technologies Limited) is an Indian multinational corporation that provides business consulting, information technology and outsourcing services. It has its headquarters in Bengaluru, Karnataka, India.

Infosys is the second-largest Indian IT company by 2017 revenues and 596th largest public company in world in terms of revenue. On June 30, 2017, its market capitalization was $34.33 billion. The credit rating of the company is A- (rating by Standard & Poor's).

1.2.2 Domain

The organization works in the following areas:

- Financial services
- Aerospace,
- Retail
- Logistics
- Energy etc.

1.2.3 Products

The organization’s key products and services are:

- NIA - Next Generation Integrated AI Platform (formerly known as Mana)
- Infosys Consulting - a global management consulting service
- Infosys Information Platform (IIP)- Analytics platform
- EdgeVerve Systems which includes Finacle, a global banking platform
- Panaya Cloud Suite
- Skava

CHAPTER 2
TOOLS AND TECHONOLOGY USED

Cent OS

We worked on Cent OS which is flavor of Linux. It gave optimum performance and was compatible with the Oracle 12C software.

ORACLE 12C

Oracle has released many versions of their database software namely 9i, 10g, 11g, and 12c etc. the 'C' in the name stands for cloud. This version had some major changes compared to previous iterations. One of the Major change is Multitenant Architecture. In such architecture we can create various Pluggable Databases with one Container Database as opposed to previous Non-Container Database models.

2.4 Hardware and Software Requirements

2.4.1 Hardware Requirements

- **RAM** : Minimum 64 Bit or Higher
- **Processor** : Core i3
- **Memory** : Minimum 1024 MB Memory

2.4.2 Software Requirements

- **Operating System** : Cent OS/ Windows with Putty
- **Scripting Language** : Shell scripting
- **Database** : Oracle 12c

CHAPTER 3
SOFTWARE REQUIREMENT SPECIFICATIONS

3.1 Introduction

The ETA department of Infosys, trains the newly joined employees and trainees of the company in various technologies based on the requirement in the production side. One such stream is IMSDB. It deals with database infrastructure and administration. The sole aim of the product is to automate the Hands-on Assessment setup generation to save time and reduce errors.

3.2 Functional Requirements

A functional requirement defines the functions of a system or its components. The project has following functional requirements that have been modularized for better understanding. The implementation of each module has been accompanied with explanation and screenshots.

1. Database Management

This module includes the task related to database creation

a. Creation

i. Container Database Creation

1. Empty Container database creation

In this module, the user should be prompted to input the name and ORACLE SID of the database instance and an empty container database with the same name should be created.

```
[oracle@ERSRetailServer1 ~]$ sh emptycdb.sh
Enter Global Database Name:
testcdb1
Enter Total Memory:
600
Do you want to use Automatic Memory Management? (y/n):
y
Copying database files
1% complete
3% complete
11% complete
18% complete
26% complete
37% complete
Creating and starting Oracle instance
40% complete
45% complete
46% complete
47% complete
52% complete
57% complete
58% complete
59% complete
62% complete
Completing Database Creation
66% complete
70% complete
74% complete
85% complete
96% complete
100% complete
Look at the log file "/u01/app/oracle/cfgtoollogs/dbca/testcdb1/testcdb1.log" for further details.

SQL*Plus: Release 12.1.0.2.0 Production on Mon Apr 9 10:42:26 2018

Copyright (c) 1982, 2014, Oracle.  All rights reserved.


Connected to:
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> show pdbs

    CON_ID CON_NAME                       OPEN MODE  RESTRICTED
---------- ------------------------------ ---------- ----------
         2 PDB$SEED                       READ ONLY  NO
SQL>
```

2. Container database with multiple pluggable database

   In this module, the user should be prompted to enter the container database name, ORACLE SID, number of pluggable database and their names and the databases should be created accordingly.

```
[oracle@ERSRetailServer1 ~]$ sh CDB_script.sh
Enter Global Database Name:
RandomB
Enter Total Memory:
1024
Do you want to use Automatic Memory Management? (y/n):
y
Enter Number of PDB(s): (less than 252)
2
Enter name for pdb 0 :
B1
Enter name for pdb 1 :
B2
Copying database files
1% complete
21% complete
38% complete
85% complete
Completing Pluggable Database Creation
100% complete
Look at the log file "/u01/app/oracle/cfgtoollogs/dbca/RandomB/B2/RandomB
.log" for further details.

SQL*Plus: Release 12.1.0.2.0 Production on Fri Apr 6 12:37:32 2018

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Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Product
ion
With the Partitioning, OLAP, Advanced Analytics and Real Application Test
ing options

SQL> show pdbs;

    CON_ID CON_NAME                       OPEN MODE  RESTRICTED
---------- ------------------------------ ---------- ----------
         2 PDB$SEED                       READ ONLY  NO
         3 B1                             READ WRITE NO
         4 B2                             READ WRITE NO
SQL>
```

ii. Non-Container Database Creation

In this module, the user should be prompted to enter the name of the database and ORACLE SID and a non-container database should be created accordingly.

```
[oracle@ERSRetailServer2 ~]$ vim noncon.sh
[oracle@ERSRetailServer2 ~]$ sh noncon.sh
Enter Global Database Name:
noncdb
Enter Total Memory:
1000
Do you want to use Automatic Memory Management? (y/n):
y
Copying database files
1% complete
3% complete
11% complete
18% complete
37% complete
Creating and starting Oracle instance
40% complete
45% complete
50% complete
55% complete
56% complete
60% complete
62% complete
Completing Database Creation
66% complete
70% complete
73% complete
85% complete
96% complete
100% complete
Look at the log file "/u01/app/oracle/cfgtoollogs/dbca/noncdb/noncdb.log" for further details.

SQL*Plus: Release 12.1.0.2.0 Production on Sat Apr 7 12:15:16 2018

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Connected to:
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> show pdbs
SQL>
```

b. Archiving the Database

In this module, the user need to enter the ORACLE SID of the database whose operational mode need to be changed i.e the archival mode of the database need to be changed.

```
[oracle@ERSRetailServer1 ~]$ sqlplus / as sysdba

SQL*Plus: Release 12.1.0.2.0 Production on Mon Apr 9 11:46:49 2018

Copyright (c) 1982, 2014, Oracle.  All rights reserved.


Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Product
ion
With the Partitioning, OLAP, Advanced Analytics and Real Application Test
ing options

SQL> select log_mode from v$database;

LOG_MODE
------------
NOARCHIVELOG

SQL> exit
Disconnected from Oracle Database 12c Enterprise Edition Release 12.1.0.2
.0 - 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Test
ing options
[oracle@ERSRetailServer1 ~]$ sh enable_archiving.sh
Enter Oracle SID:
RandomB
Database closed.
Database dismounted.
ORACLE instance shut down.
ORACLE instance started.

Total System Global Area 1073741824 bytes
Fixed Size                  2932632 bytes
Variable Size             666894440 bytes
Database Buffers          398458880 bytes
Redo Buffers                5455872 bytes
Database mounted.

Database altered.


Database altered.

[oracle@ERSRetailServer1 ~]$ sqlplus / as sysdba

SQL*Plus: Release 12.1.0.2.0 Production on Mon Apr 9 11:47:58 2018

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Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Product
ion
With the Partitioning, OLAP, Advanced Analytics and Real Application Test
ing options

SQL> select log_mode from v$database;

LOG_MODE
```

2. Listener Management

This module includes the task related to listener and net service name.

a. Listener

a. Creation of Listener

The user should be prompted for entering the listener name and the port number to create the new listener.

```
[oracle@ERSRetailServer1 ~]$ sh create_listener.sh
Enter the Name of the Listener:
NEW_LISTENER
Enter the PORT Number:
1521
192.168.4.1

LSNRCTL for Linux: Version 12.1.0.2.0 - Production on 09-APR-2018 10:47:3
2

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Starting /u01/app/oracle/product/12.1.0/db_1/bin/tnslsnr: please wait...

TNSLSNR for Linux: Version 12.1.0.2.0 - Production
System parameter file is /u01/app/oracle/product/12.1.0/db_1/network/admi
n/listener.ora
Log messages written to /u01/app/oracle/diag/tnslsnr/ERSRetailServer1/new
_listener/alert/log.xml
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=192.168.4.1)(PORT
=1521)))

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.4.1)(PORT
=1521)))
STATUS of the LISTENER
------------------------
Alias                     NEW_LISTENER
Version                   TNSLSNR for Linux: Version 12.1.0.2.0 - Product
ion
Start Date                09-APR-2018 10:47:32
Uptime                    0 days 0 hr. 0 min. 0 sec
Trace Level               off
Security                  ON: Local OS Authentication
SNMP                      OFF
Listener Parameter File   /u01/app/oracle/product/12.1.0/db_1/network/adm
in/listener.ora
Listener Log File         /u01/app/oracle/diag/tnslsnr/ERSRetailServer1/n
ew_listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=192.168.4.1)(PORT=1521)))
The listener supports no services
The command completed successfully
```

b. Checking the status of listener

This menu will enable to check the status of a listener entered by the user.

```
[oracle@ERSRetailServer1 ~]$ sh listener_status.sh
Enter the Listener Name
NEW_LISTENER

LSNRCTL for Linux: Version 12.1.0.2.0 - Production on 09-APR-2018 11:07:3
7

Copyright (c) 1991, 2014, Oracle.  All rights reserved.

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.4.1)(PORT
=1521)))
STATUS of the LISTENER
------------------------
Alias                     NEW_LISTENER
Version                   TNSLSNR for Linux: Version 12.1.0.2.0 - Product
ion
Start Date                09-APR-2018 10:47:32
Uptime                    0 days 0 hr. 20 min. 5 sec
Trace Level               off
Security                  ON: Local OS Authentication
SNMP                      OFF
Listener Parameter File   /u01/app/oracle/product/12.1.0/db_1/network/adm
in/listener.ora
Listener Log File         /u01/app/oracle/diag/tnslsnr/ERSRetailServer1/n
ew_listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=192.168.4.1)(PORT=1521)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcps)(HOST=ERSRetailServer1.ERSRetail)(
PORT=5500))(Security=(my_wallet_directory=/u01/app/oracle/admin/CDBRetail
C/xdb_wallet))(Presentation=HTTP)(Session=RAW))
Services Summary...
Service "CDBRetailC" has 1 instance(s).
  Instance "CDBRetailC", status READY, has 1 handler(s) for this service.
..
Service "CDBRetailCXDB" has 1 instance(s).
  Instance "CDBRetailC", status READY, has 1 handler(s) for this service.
..
Service "RandomB" has 1 instance(s).
  Instance "RandomB", status READY, has 1 handler(s) for this service...
Service "RandomBXDB" has 1 instance(s).
  Instance "RandomB", status READY, has 1 handler(s) for this service...
Service "b1" has 1 instance(s).
  Instance "RandomB", status READY, has 1 handler(s) for this service...
Service "b2" has 1 instance(s).
  Instance "RandomB", status READY, has 1 handler(s) for this service...
Service "pdbinventory" has 1 instance(s).
  Instance "CDBRetailC", status READY, has 1 handler(s) for this service.
..
Service "pdbsales" has 1 instance(s).
  Instance "CDBRetailC", status READY, has 1 handler(s) for this service.
..
The command completed successfully
[oracle@ERSRetailServer1 ~]$
```

c. Remove the listener

This menu will remove the listener entered by the user.

```
[oracle@ERSRetailServer1 ~]$ cat /u01/app/oracle/product/12.1.0/db_1/netw
ork/admin/listener.ora
# listener.ora Network Configuration File: /u01/app/oracle/product/12.1.0
/db_1/network/admin/listener.ora
# Generated by Oracle configuration tools.

LISTENER =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.4.1)(PORT = 1521))
    )
  )

test =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.4.1)(PORT = 1521))
    )
  )
new_listener =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.4.1)(PORT = 1542))
    )
  )
[oracle@ERSRetailServer1 ~]$ sh remove_listener.sh
Enter the Name of the Listener to Remove:
new_listener
[oracle@ERSRetailServer1 ~]$ cat /u01/app/oracle/product/12.1.0/db_1/netw
ork/admin/listener.ora
# listener.ora Network Configuration File: /u01/app/oracle/product/12.1.0
/db_1/network/admin/listener.ora
# Generated by Oracle configuration tools.

LISTENER =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.4.1)(PORT = 1521))
    )
  )

test =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = TCP)(HOST = 192.168.4.1)(PORT = 1521))
    )
```

d. Start/stop/reload the listener

This menu will enable to start/stop/reload a listener entered by the user.

```
[oracle@ERSRetailServer1 ~]$ sh change_listener_state.sh
Enter the Listener Name:
NEW_LISTENER
1. Start the Listener
2. Stop the Listener
3. Reload the Listener
Enter your choice:
2

LSNRCTL for Linux: Version 12.1.0.2.0 - Production on 09-APR-2018 11:13:5
5

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Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.4.1)(PORT
=1521)))
The command completed successfully

[oracle@ERSRetailServer1 ~]$ sh change_listener_state.sh
Enter the Listener Name:
NEW_LISTENER
1. Start the Listener
2. Stop the Listener
3. Reload the Listener
Enter your choice:
3

LSNRCTL for Linux: Version 12.1.0.2.0 - Production on 09-APR-2018 11:14:3
4

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Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.4.1)(PORT
=1521)))
The command completed successfully
```

```
[oracle@ERSRetailServer1 ~]$ sh change_listener_state.sh
Enter the Listener Name:
NEW_LISTENER
1. Start the Listener
2. Stop the Listener
3. Reload the Listener
Enter your choice:
1

LSNRCTL for Linux: Version 12.1.0.2.0 - Production on 09-APR-2018 11:14:0
3

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Starting /u01/app/oracle/product/12.1.0/db_1/bin/tnslsnr: please wait...

TNSLSNR for Linux: Version 12.1.0.2.0 - Production
System parameter file is /u01/app/oracle/product/12.1.0/db_1/network/admi
n/listener.ora

Log messages written to /u01/app/oracle/diag/tnslsnr/ERSRetailServer1/new
_listener/alert/log.xml
Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=192.168.4.1)(PORT
=1521)))

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=192.168.4.1)(PORT
=1521)))
STATUS of the LISTENER
------------------------
Alias                     NEW_LISTENER
Version                   TNSLSNR for Linux: Version 12.1.0.2.0 - Product
ion
Start Date                09-APR-2018 11:14:03
Uptime                    0 days 0 hr. 0 min. 0 sec
Trace Level               off
Security                  ON: Local OS Authentication
SNMP                      OFF
Listener Parameter File   /u01/app/oracle/product/12.1.0/db_1/network/adm
in/listener.ora
Listener Log File         /u01/app/oracle/diag/tnslsnr/ERSRetailServer1/n
ew_listener/alert/log.xml
Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=192.168.4.1)(PORT=1521)))
The listener supports no services
The command completed successfully
```

b. Net service name

a. Creation of alias name

The user should be prompted to enter the service name, port number, hostname. The net service name should be created with the given name and function.

```
[oracle@ERSRetailServer1 ~]$ sh create_net_service_name.sh
Enter Net Service Name:
new_service
Enter Service Name (Database Name):
B1
Enter Port Number:
1521
Enter Hostname:
192.168.4.1
Enter the Name of Database to Register the Alias Name:
RandomB
ORA-01081: cannot start already-running ORACLE - shut it down first

System altered.


System altered.

[oracle@ERSRetailServer1 ~]$ sqlplus sys/infy123@new_service as sysdba

SQL*Plus: Release 12.1.0.2.0 Production on Fri Apr 13 09:15:09 2018

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ion
With the Partitioning, OLAP, Advanced Analytics and Real Application Test
ing options

SQL> show pdbs;

    CON_ID CON_NAME                       OPEN MODE  RESTRICTED
---------- ------------------------------ ---------- ----------
         3 B1                             READ WRITE NO
```

3. User Management

a. User Account

a. Creation of User Account

Creates a user in the given database

```
[oracle@ERSRetailServer1 ~]$ sh create_user.sh
Enter Oracle SID:
RandomB
Want to create user in Pluggable Database: (y/n)
n
Enter Username :
user2
Enter Password:
infy123
User created successfully
[oracle@ERSRetailServer1 ~]$ sh create_user.sh
Enter Oracle SID:
RandomB
Want to create user in Pluggable Database: (y/n)
y
Enter Username :
user1
Enter Password:
infy123
Enter Pluggable Database Name:
B1
User created successfully
[oracle@ERSRetailServer1 ~]$ sqlplus / as sysdba

SQL*Plus: Release 12.1.0.2.0 Production on Mon Apr 9 16:14:46 2018

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Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Product
ion
With the Partitioning, OLAP, Advanced Analytics and Real Application Test
ing options

SQL> select username from all_users where username like '%USER%';

USERNAME
--------------------------------------------------------------------------
-------
GSMUSER
GSMCATUSER
APEX_PUBLIC_USER
C##USER1
C##USER2
```

```
SQL> alter session set container=B1;

Session altered.

SQL> select username from all_users where username like '%USER%';

USERNAME
--------------------------------------------------------------------------------
-------
GSMUSER
GSMCATUSER
APEX_PUBLIC_USER
C##USER1
C##USER2
USER1

6 rows selected.
```

b. Managing the user accounts

a. Default tablespace: Assigning a default tablespace to a user account

```
[oracle@ERSRetailServer1 ~]$ sh default_tablespace.sh
Enter Oracle SID
RandomB
Enter username:
USER1
Enter name of Default Tablespace:
SYSTEM
Want to rename user in Pluggable Database: (y/n)
y
Enter Pluggable Database Name:
B1
Tablespace Privileges granted successfully
```

```
SQL> select username, default_tablespace from dba_users where username li
ke 'USER1';

USERNAME
--------------------------------------------------------------------------------
-------
DEFAULT_TABLESPACE
------------------------------
USER1
SYSTEM
```

b. Assigning roles: Assigning roles to a user account

Role	User
CDB	CDB
CDB	PDB
PDB	CDB
PDB	PDB

```
[oracle@ERSRetailServer1 ~]$ sh assigning_role.sh
Enter Oracle SID
RandomB
Enter username:
USER1
Enter Role:
TEST2
User exists in Pluggable Database: (y/n)
n
Role exists in Pluggable Database: (y/n)
y
Enter Pluggable Database Name of Role:
B1
Role granted successfully
SQL>  select grantee, granted_role from dba_role_privs where grantee like
 'C##USER1';

GRANTEE
--------------------------------------------------------------------------
-------
GRANTED_ROLE
--------------------------------------------------------------------------
-------
C##USER1
TEST2
```

```
[oracle@ERSRetailServer1 ~]$ sh assigning_role.sh
Enter Oracle SID
RandomB
Enter username:
USER1
Enter Role:
TEST
User exists in Pluggable Database: (y/n)
n
Role exists in Pluggable Database: (y/n)
n
Role granted successfully
```

```
SQL> select grantee, granted_role from dba_role_privs where grantee like
'C##USER1';

GRANTEE
--------------------------------------------------------------------------------
-------
GRANTED_ROLE
--------------------------------------------------------------------------------
-------
C##USER1
C##TEST
```

```
[oracle@ERSRetailServer1 ~]$ sh assigning_role.sh
Enter Oracle SID
RandomB
Enter username:
USER1
Enter Role:
TEST
User exists in Pluggable Database: (y/n)
y
Role exists in Pluggable Database: (y/n)
n
Enter Pluggable Database Name of User:
B1
Role granted successfully
[oracle@ERSRetailServer1 ~]$ sh assigning_role.sh
Enter Oracle SID
RandomB
Enter username:
USER1
Enter Role:
TEST2
User exists in Pluggable Database: (y/n)
y
Role exists in Pluggable Database: (y/n)
y
Enter Pluggable Database Name of User:
B1
Enter Pluggable Database Name of Role:
B1
Role granted successfully
```

```
SQL> select grantee, granted_role from dba_role_privs where grantee like
'USER1';

GRANTEE
--------------------------------------------------------------------------------
-------
GRANTED_ROLE
--------------------------------------------------------------------------------
-------
USER1
```

c. Assigning profiles: Assigning profile to a user account

```
SQL> select username, profile from dba_users where username like '%USER1%
';

USERNAME
--------------------------------------------------------------------------------
-------
PROFILE
--------------------------------------------------------------------------------
-------
C##USER1
DEFAULT

[oracle@ERSRetailServer1 ~]$ sh assigning_profile.sh
Enter Oracle SID
RandomB
Enter username:
USER1
Enter Profile:
PROFILE1
User exists in Pluggable Database: (y/n)
n
profile exists in Pluggable Database: (y/n)
n
Profile granted successfully

SQL> select username, profile from dba_users where username like '%USER1%
';

USERNAME
--------------------------------------------------------------------------------
-------
PROFILE
--------------------------------------------------------------------------------
-------
C##USER1
C##PROFILE1
```

d. Quota Management: Assigning quota on tablespace to a user account

```
[oracle@ERSRetailServer1 ~]$ sh assigning_quota.sh
Enter Oracle SID
RandomB
Enter username:
USER1
Enter name of Tablespace to provide quota on:
USERS
Enter Quota (in MB) of Tablespace (-1 for Unlimited):
10
User exists in Pluggable Database: (y/n)
y
Enter Pluggable Database Name:
B1
Quota granted successfully
[oracle@ERSRetailServer1 ~]$ sh assigning_quota.sh
Enter Oracle SID
RandomB
Enter username:
USER1
Enter name of Tablespace to provide quota on:
SYSTEM
Enter Quota (in MB) of Tablespace (-1 for Unlimited):
5
User exists in Pluggable Database: (y/n)
y
Enter Pluggable Database Name:
B1
Quota granted successfully
SQL> select tablespace_name, username, max_bytes/1048576 max_bytes_mb  fr
om dba_ts_quotas where username like 'USER1';

TABLESPACE_NAME
------------------------------
USERNAME
--------------------------------------------------------------------------
-------
MAX_BYTES_MB
------------
SYSTEM
USER1
           5

USERS
USER1
          10
```

c. Deletion of User Accounts: Deleting a user account

```
SQL> select username from all_users where username like '%USER%';

USERNAME
--------------------------------------------------------------------------------
-------
USER3
USER1
[oracle@ERSRetailServer1 ~]$ sh drop_user.sh
Enter Oracle SID:
RandomB
Is the user in Pluggable Database: (y/n)
y
Enter User Name:
USER3
Enter Pluggable Database Name:
B1
User dropped successfully
SQL> select username from all_users where username like '%USER%';

USERNAME
--------------------------------------------------------------------------------
-------
USER1

SQL> select username from all_users where username like '%USER%';

USERNAME
--------------------------------------------------------------------------------
-------
C##USER1
C##USER3
C##USER4

[oracle@ERSRetailServer1 ~]$ sh drop_user.sh
Enter Oracle SID:
RandomB
Is the user in Pluggable Database: (y/n)
n
Enter User Name:
USER4
User dropped successfully
SQL> select username from all_users where username like '%USER%';

USERNAME
--------------------------------------------------------------------------------
-------
C##USER1
C##USER3
```

b. Roles

a. Creation of role: Creation of a new role

```
[oracle@ERSRetailServer1 ~]$ sh create_role.sh
Enter Oracle SID:
RandomB
Want to create user in Pluggable Database: (y/n)
n
Enter Role
TEST
Role created successfully

SQL> select distinct role from dba_roles;

ROLE
--------------------------------------------------------------------------------
-------
C##TEST
[oracle@ERSRetailServer1 ~]$ sh create_role.sh
Enter Oracle SID:
RandomB
Want to create role in Pluggable Database: (y/n)
y
Enter Role
TESTING
Enter Pluggable Database Name:
B1
Role created successfully
SQL> alter session set container=B1;

Session altered.

SQL> select distinct role from dba_roles;

ROLE
--------------------------------------------------------------------------------
-------
TESTING
```

b. Altering role: Assigning and revoking privileges to a role

```
[oracle@ERSRetailServer1 ~]$ sh alter_role.sh
Enter Oracle SID:
RandomB
Want to alter role in Pluggable Database: (y/n)
n
Enter Role
TEST
Enter GRANT/REVOKE
GRANT
Enter number of system privileges
2
Enter 0 privilege :
CREATE SESSION
Enter 1 privilege :
CREATE TABLE
Enter number of object privileges
2
Enter tablename
T1
Enter 0 privilege :
SELECT
Enter 1 privilege :
INSERT
SQL> select privilege from role_sys_privs where role='C##TEST';

PRIVILEGE
----------------------------------------
CREATE SESSION
CREATE TABLE

SQL> select privilege, table_name from role_tab_privs where role='C##TEST
';

PRIVILEGE
----------------------------------------
TABLE_NAME
--------------------------------------------------------------------------------
-------
SELECT
T1

INSERT
T1
```

```
[oracle@ERSRetailServer1 ~]$ sh alter_role.sh
Enter Oracle SID:
RandomB
Want to alter role in Pluggable Database: (y/n)
n
Enter Role
TEST
Enter GRANT/REVOKE
REVOKE
Enter number of system privileges
1
Enter 0 privilege :
CREATE TABLE
Enter number of object privileges
1
Enter tablename
T1
Enter 0 privilege :
INSERT
SQL> select privilege from role_sys_privs where role='C##TEST';

PRIVILEGE
----------------------------------------
CREATE SESSION

SQL> select privilege, table_name from role_tab_privs where role='C##TEST
';

PRIVILEGE
----------------------------------------
TABLE_NAME
--------------------------------------------------------------------------------
-------
SELECT
T1
```

Alter Role column level

```
SQL> select role, privilege, table_name, column_name from role_tab_privs
where role like '%TEST%';

ROLE       PRIVILEGE       TABLE COLUMN_NAME
---------- --------------- ----- ---------------
C##TEST    SELECT          T1
[oracle@ERSRetailServer1 ~]$ sh alter_role.sh
Enter Oracle SID:
RandomB
Want to alter role in Pluggable Database: (y/n)
n
Enter Role
TEST
Enter GRANT/REVOKE:
GRANT
Enter number of system privileges
0
Enter number of object privileges
1
Enter tablename
t1
Enter 0 privilege :
update
Want to provide a column level privilege:(y/n)
y
Enter the Column Name:
i
SQL> select role, privilege, table_name, column_name from role_tab_privs
where role like '%TEST%';

ROLE       PRIVILEGE       TABLE COLUMN_NAME
---------- --------------- ----- ---------------
C##TEST    SELECT          T1
C##TEST    UPDATE          T1    I
```

Alter role public

```
SQL> select grantee, privilege from dba_sys_privs where grantee like 'PUB
LIC';

GRANTEE
--------------------------------------------------------------------------
-------
PRIVILEGE
----------------------------------------
PUBLIC
CREATE SESSION

[oracle@ERSRetailServer1 ~]$ sh alter_role.sh
Enter Oracle SID:
RandomB
Want to alter role in Pluggable Database: (y/n)
n
Enter Role
Public
Enter GRANT/REVOKE:
GRANT
Enter number of system privileges
1
Enter 0 privilege :
CREATE VIEW
Enter number of object privileges
0
[oracle@ERSRetailServer1 ~]$ cat /u01/script_logs/CreatePrivs.log
CreatePrivs script execution started

Grant succeeded.

SQL>  select grantee, privilege from dba_sys_privs where grantee like 'PU
BLIC';

GRANTEE
--------------------------------------------------------------------------
-------
PRIVILEGE
----------------------------------------
PUBLIC
CREATE SESSION

PUBLIC
CREATE VIEW
```

c. Dropping role: Deleting a role

```
SQL> select role from dba_roles where role like 'TESTING';

ROLE
--------------------------------------------------------------------------------
-------
TESTING

[oracle@ERSRetailServer1 ~]$ sh drop_role.sh
Enter Oracle SID:
RandomB
Want to drop role in Pluggable Database: (y/n)
y
Enter Role :
TESTING
Enter Pluggable Database Name:
B1
Role dropped successfully
SQL> select role from dba_roles where role like 'TESTING';

no rows selected
```

c. Profile Creation

a. Creation of Profile: creating a new profile with given password and resource configuration

```
SQL> select distinct profile from dba_profiles;

PROFILE
--------------------------------------------------------------------------------
-------
ORA_STIG_PROFILE
DEFAULT
```

```
[oracle@ERSRetailServer1 ~]$ sh create_profile.sh
Enter Oracle SID
RandomB
Enter Profile name
Profile1
Want to create Profile in Pluggable Database: (y/n)
n
----Enter the Resource limits----
enter sessions per user(Y/N)
y
1
enter cpu per session(Y/N)
y
1
enter cpu per call(Y/N)
y
1
enter connect time(Y/N)
n
enter logical reads per session(Y/N)
n
enter logical reads per call(Y/N)
n
enter private sga(Y/N)
n
enter composite limit(Y/N)
n
----Enter the password limits-----
Enter No of failed login attempts(Y/N)
y
2
Enter password life time(Y/N)
n
Enter password reuse time(Y/N)
n
Enter maximum usage of password(Y/N)
n
Enter password lock time(Y/N)
n
Enter password grace time(Y/N)
n
Profile created successfully
```

`

```
SQL> select distinct profile from dba_profiles;

PROFILE
------------------------------------------------------------------------
-------
ORA_STIG_PROFILE
C##PROFILE1
DEFAULT
SQL> select * from dba_profiles where profile like 'C##PROFILE1';

PROFILE          RESOURCE_NAME              RESOURCE LIMIT      COM
---------------- -------------------------- -------- ---------- ---
C##PROFILE1      COMPOSITE_LIMIT            KERNEL   DEFAULT    YES
C##PROFILE1      SESSIONS_PER_USER          KERNEL   1          YES
C##PROFILE1      CPU_PER_SESSION            KERNEL   1          YES
C##PROFILE1      CPU_PER_CALL               KERNEL   1          YES
C##PROFILE1      LOGICAL_READS_PER_SESSION  KERNEL   DEFAULT    YES
C##PROFILE1      LOGICAL_READS_PER_CALL     KERNEL   DEFAULT    YES
C##PROFILE1      IDLE_TIME                  KERNEL   DEFAULT    YES
C##PROFILE1      CONNECT_TIME               KERNEL   DEFAULT    YES
C##PROFILE1      PRIVATE_SGA                KERNEL   DEFAULT    YES
C##PROFILE1      FAILED_LOGIN_ATTEMPTS      PASSWORD 2          YES
C##PROFILE1      PASSWORD_LIFE_TIME         PASSWORD DEFAULT    YES

PROFILE          RESOURCE_NAME              RESOURCE LIMIT      COM
---------------- -------------------------- -------- ---------- ---
C##PROFILE1      PASSWORD_REUSE_TIME        PASSWORD DEFAULT    YES
C##PROFILE1      PASSWORD_REUSE_MAX         PASSWORD DEFAULT    YES
C##PROFILE1      PASSWORD_VERIFY_FUNCTION   PASSWORD DEFAULT    YES
C##PROFILE1      PASSWORD_LOCK_TIME         PASSWORD DEFAULT    YES
C##PROFILE1      PASSWORD_GRACE_TIME        PASSWORD DEFAULT    YES

16 rows selected.
```

b. Altering profile: Altering an existing profile

```
SQL> select * from dba_profiles where profile like 'PROFILE2';

PROFILE          RESOURCE_NAME                    RESOURCE LIMIT      COM
---------------- -------------------------------- -------- ---------- ---
PROFILE2         COMPOSITE_LIMIT                  KERNEL   DEFAULT    NO
PROFILE2         SESSIONS_PER_USER                KERNEL   UNLIMITED  NO
PROFILE2         CPU_PER_SESSION                  KERNEL   DEFAULT    NO
PROFILE2         CPU_PER_CALL                     KERNEL   DEFAULT    NO
PROFILE2         LOGICAL_READS_PER_SESSION        KERNEL   DEFAULT    NO
PROFILE2         LOGICAL_READS_PER_CALL           KERNEL   DEFAULT    NO
PROFILE2         IDLE_TIME                        KERNEL   DEFAULT    NO
PROFILE2         CONNECT_TIME                     KERNEL   DEFAULT    NO
PROFILE2         PRIVATE_SGA                      KERNEL   DEFAULT    NO
PROFILE2         FAILED_LOGIN_ATTEMPTS            PASSWORD DEFAULT    NO
PROFILE2         PASSWORD_LIFE_TIME               PASSWORD DEFAULT    NO

PROFILE          RESOURCE_NAME                    RESOURCE LIMIT      COM
---------------- -------------------------------- -------- ---------- ---
PROFILE2         PASSWORD_REUSE_TIME              PASSWORD DEFAULT    NO
PROFILE2         PASSWORD_REUSE_MAX               PASSWORD DEFAULT    NO
PROFILE2         PASSWORD_VERIFY_FUNCTION         PASSWORD DEFAULT    NO
PROFILE2         PASSWORD_LOCK_TIME               PASSWORD DEFAULT    NO
PROFILE2         PASSWORD_GRACE_TIME              PASSWORD DEFAULT    NO

[oracle@ERSRetailServer1 ~]$ sh alter_profile.sh
Enter Oracle SID
RandomB
Enter the Profile name to be Altered
PROFILE2
Select the limit to be altered
   1)SESSIONS PER USER
   2)CPU PER SESSION
   3)CPU PER CALL
   4)CONNECT TIME
   5)LOGICAL READS PER SESSION
   6)LOGICAL READS PER CALL
   7)IDLE TIME
   8)PRIVATE SGA
   9)COMPOSITE LIMIT
   10)FAILED LOGIN ATTEMPTS
   11)PASSWORD LIFE TIME
   12)PASSWORD REUSE TIME
   13)PASSWORD REUSE MAX
   14)PASSWORD LOCK TIME
   15)PASSWORD GRACE TIME
7
enter Idle Time
UNLIMITED
Profile is in Pluggable Database: (y/n)
y
Enter Pluggable Database Name:
B1
Profile Altered successfully
```

```
[oracle@ERSRetailServer1 ~]$ sh alter_profile.sh
Enter Oracle SID
RandomB
Enter the Profile name to be Altered
Profile2
Select the limit to be altered
   1)SESSIONS PER USER
   2)CPU PER SESSION
   3)CPU PER CALL
   4)CONNECT TIME
   5)LOGICAL READS PER SESSION
   6)LOGICAL READS PER CALL
   7)IDLE TIME
   8)PRIVATE SGA
   9)COMPOSITE LIMIT
   10)FAILED LOGIN ATTEMPTS
   11)PASSWORD LIFE TIME
   12)PASSWORD REUSE TIME
   13)PASSWORD REUSE MAX
   14)PASSWORD LOCK TIME
   15)PASSWORD GRACE TIME
11
Enter password life time
120
Profile is in Pluggable Database: (y/n)
y
Enter Pluggable Database Name:
B1
Profile Altered successfully
```

```
SQL>  select * from dba_profiles where profile like 'PROFILE2';

PROFILE         RESOURCE_NAME              RESOURCE LIMIT      COM
--------------- -------------------------- -------- ---------- ---
PROFILE2        COMPOSITE_LIMIT            KERNEL   DEFAULT    NO
PROFILE2        SESSIONS_PER_USER          KERNEL   UNLIMITED  NO
PROFILE2        CPU_PER_SESSION            KERNEL   DEFAULT    NO
PROFILE2        CPU_PER_CALL               KERNEL   DEFAULT    NO
PROFILE2        LOGICAL_READS_PER_SESSION  KERNEL   DEFAULT    NO
PROFILE2        LOGICAL_READS_PER_CALL     KERNEL   DEFAULT    NO
PROFILE2        IDLE_TIME                  KERNEL   UNLIMITED  NO
PROFILE2        CONNECT_TIME               KERNEL   DEFAULT    NO
PROFILE2        PRIVATE_SGA                KERNEL   DEFAULT    NO
PROFILE2        FAILED_LOGIN_ATTEMPTS      PASSWORD DEFAULT    NO
PROFILE2        PASSWORD_LIFE_TIME         PASSWORD 120        NO

PROFILE         RESOURCE_NAME              RESOURCE LIMIT      COM
--------------- -------------------------- -------- ---------- ---
PROFILE2        PASSWORD_REUSE_TIME        PASSWORD DEFAULT    NO
PROFILE2        PASSWORD_REUSE_MAX         PASSWORD DEFAULT    NO
PROFILE2        PASSWORD_VERIFY_FUNCTION   PASSWORD DEFAULT    NO
```

Alter Default Profile

```
SQL> select * from dba_profiles where profile like 'DEFAULT';

PROFILE    RESOURCE_NAME         RESOURCE LIMIT        COM
---------- --------------------- -------- ------------ ---
DEFAULT    COMPOSITE_LIMIT       KERNEL   UNLIMITED    NO
DEFAULT    SESSIONS_PER_USER     KERNEL   UNLIMITED    NO
DEFAULT    CPU_PER_SESSION       KERNEL   UNLIMITED    NO
DEFAULT    CPU_PER_CALL          KERNEL   UNLIMITED    NO
DEFAULT    LOGICAL_READS_PER_SE KERNEL   UNLIMITED    NO
           SSION

DEFAULT    LOGICAL_READS_PER_CA KERNEL   UNLIMITED    NO
           LL

DEFAULT    IDLE_TIME             KERNEL   UNLIMITED    NO

PROFILE    RESOURCE_NAME         RESOURCE LIMIT        COM
---------- --------------------- -------- ------------ ---
DEFAULT    CONNECT_TIME          KERNEL   UNLIMITED    NO
DEFAULT    PRIVATE_SGA           KERNEL   UNLIMITED    NO
DEFAULT    FAILED_LOGIN_ATTEMPT PASSWORD 10           NO
           S

DEFAULT    PASSWORD_LIFE_TIME    PASSWORD 180          NO
DEFAULT    PASSWORD_REUSE_TIME   PASSWORD UNLIMITED    NO
DEFAULT    PASSWORD_REUSE_MAX    PASSWORD UNLIMITED    NO
DEFAULT    PASSWORD_VERIFY_FUNC PASSWORD NULL         NO
           TION


PROFILE    RESOURCE_NAME         RESOURCE LIMIT        COM
---------- --------------------- -------- ------------ ---
DEFAULT    PASSWORD_LOCK_TIME    PASSWORD 1            NO
DEFAULT    PASSWORD_GRACE_TIME   PASSWORD 7            NO

16 rows selected.
```

```
[oracle@ERSRetailServer1 ~]$ sh alter_profile.sh
Enter Oracle SID
RandomB
Enter the Profile name to be Altered
Default
Select the limit to be altered
   1)SESSIONS PER USER
   2)CPU PER SESSION
   3)CPU PER CALL
   4)CONNECT TIME
   5)LOGICAL READS PER SESSION
   6)LOGICAL READS PER CALL
   7)IDLE TIME
   8)PRIVATE SGA
   9)COMPOSITE LIMIT
   10)FAILED LOGIN ATTEMPTS
   11)PASSWORD LIFE TIME
   12)PASSWORD REUSE TIME
   13)PASSWORD REUSE MAX
   14)PASSWORD LOCK TIME
   15)PASSWORD GRACE TIME
10
Enter No of failed login attempts
15
Profile is in Pluggable Database: (y/n)
n
Profile Altered successfully
```

```
SQL>  select * from dba_profiles where profile like 'DEFAULT';

PROFILE      RESOURCE_NAME        RESOURCE LIMIT        COM
------------ -------------------- -------- ------------ ---
DEFAULT      COMPOSITE_LIMIT      KERNEL   UNLIMITED    NO
DEFAULT      SESSIONS_PER_USER    KERNEL   UNLIMITED    NO
DEFAULT      CPU_PER_SESSION      KERNEL   UNLIMITED    NO
DEFAULT      CPU_PER_CALL         KERNEL   UNLIMITED    NO
DEFAULT      LOGICAL_READS_PER_SE KERNEL   UNLIMITED    NO
             SSION

DEFAULT      LOGICAL_READS_PER_CA KERNEL   UNLIMITED    NO
             LL

DEFAULT      IDLE_TIME            KERNEL   UNLIMITED    NO

PROFILE      RESOURCE_NAME        RESOURCE LIMIT        COM
------------ -------------------- -------- ------------ ---
DEFAULT      CONNECT_TIME         KERNEL   UNLIMITED    NO
DEFAULT      PRIVATE_SGA          KERNEL   UNLIMITED    NO
DEFAULT      FAILED_LOGIN_ATTEMPT PASSWORD 15           NO
             S

DEFAULT      PASSWORD_LIFE_TIME   PASSWORD 180          NO
DEFAULT      PASSWORD_REUSE_TIME  PASSWORD UNLIMITED    NO
DEFAULT      PASSWORD_REUSE_MAX   PASSWORD UNLIMITED    NO
DEFAULT      PASSWORD_VERIFY_FUNC PASSWORD NULL         NO
             TION


PROFILE      RESOURCE_NAME        RESOURCE LIMIT        COM
------------ -------------------- -------- ------------ ---
DEFAULT      PASSWORD_LOCK_TIME   PASSWORD 1            NO
DEFAULT      PASSWORD_GRACE_TIME  PASSWORD 7            NO

16 rows selected.
```

c. Deleting profile: Deleting a profile

```
SQL> select distinct profile from dba_profiles;

PROFILE
---------------
ORA_STIG_PROFIL
E

C##PROFILE1
PROFILE2
DEFAULT
[oracle@ERSRetailServer1 ~]$ sh drop_profile.sh
Enter Oracle SID
RandomB
Enter Profile name to be Dropped
profile2
Profile is in Pluggable Database: (y/n)
y
Enter Pluggable Database Name:
B1
Profile dropped successfully
SQL> select distinct profile from dba_profiles;

PROFILE
---------------
ORA_STIG_PROFIL
E

C##PROFILE1
DEFAULT
```

4. Storage Management

a. Tablespace

a. Creation: Creating new tablespace with the specified datafiles

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

       TS# NAME                           INC BIG FLA ENC     CON_ID
---------- ------------------------------ --- --- --- --- ----------
         1 SYSAUX                         YES NO  YES               1
         0 SYSTEM                         YES NO  YES               1
         2 UNDOTBS1                       YES NO  YES               1
         4 USERS                          YES NO  YES               1
         3 TEMP                           NO  NO  YES               1
         0 SYSTEM                         YES NO  YES               2
         1 SYSAUX                         YES NO  YES               2
         2 TEMP                           NO  NO  YES               2
         0 SYSTEM                         YES NO  YES               3
         1 SYSAUX                         YES NO  YES               3
         2 TEMP                           NO  NO  YES               3

       TS# NAME                           INC BIG FLA ENC     CON_ID
---------- ------------------------------ --- --- --- --- ----------
         3 USERS                          YES NO  YES               3
         0 SYSTEM                         YES NO  YES               4
         1 SYSAUX                         YES NO  YES               4
         2 TEMP                           NO  NO  YES               4
         3 USERS                          YES NO  YES               4

16 rows selected.
[oracle@ERSRetailServer1 ~]$ sh create_tablespace.sh
Enter Oracle SID:
RandomB
Want to create tablespace in Pluggable Database: (y/n)
y
Enter Tablespace Name :
TBS1
Enter size (K/M/G):
5M
Enter Pluggable Database Name:
B1
Tablespace created successfully
```

```
[oracle@ERSRetailServer1 ~]$ sh create_tablespace.sh
Enter Oracle SID:
RandomB
Want to create tablespace in Pluggable Database: (y/n)
n
Enter Tablespace Name :
TBS2
Enter size (K/M/G):
2M
Enter number of Pluggable database:
2
Enter name for pdb 0 :
B1
Enter name for pdb 1 :
B2
Tablespace created successfully
SQL> select * from v$tablespace;

       TS# NAME                           INC BIG FLA ENC     CON_ID
---------- ------------------------------ --- --- --- --- ----------
         1 SYSAUX                         YES NO  YES             1
         0 SYSTEM                         YES NO  YES             1
         2 UNDOTBS1                       YES NO  YES             1
         4 USERS                          YES NO  YES             1
         3 TEMP                           NO  NO  YES             1
         0 SYSTEM                         YES NO  YES             2
         1 SYSAUX                         YES NO  YES             2
         2 TEMP                           NO  NO  YES             2
         0 SYSTEM                         YES NO  YES             3
         1 SYSAUX                         YES NO  YES             3
         2 TEMP                           NO  NO  YES             3

       TS# NAME                           INC BIG FLA ENC     CON_ID
---------- ------------------------------ --- --- --- --- ----------
         3 USERS                          YES NO  YES             3
         0 SYSTEM                         YES NO  YES             4
         1 SYSAUX                         YES NO  YES             4
         2 TEMP                           NO  NO  YES             4
         3 USERS                          YES NO  YES             4
         4 TBS1                           YES NO  YES             3
         6 TBS2                           YES NO  YES             1
         5 TBS2                           YES NO  YES             3
         4 TBS2                           YES NO  YES             4

20 rows selected.
```

b. Altering: Altering tablespace by resizing datafile or adding new datafiles

```
[oracle@ERSRetailServer1 ~]$ sh alter_tablespace.sh
Enter Oracle SID:
RandomB
Is the tablespace in Pluggable Database: (y/n)
n
Enter tablespace name:
TBS2
Enter new datafile name:
TBS2_02
Enter size of new data file(K\M\G):
5M
Datafile added successfully
```

```
SQL> select name, creation_time, bytes, create_bytes from v$datafile;

NAME
--------------------------------------------------------------------------------
-------
CREATION_       BYTES CREATE_BYTES
--------- ---------- ------------
/u01/app/oracle/oradata/RandomB/B2/TBS2.dbf
13-APR-18    2097152      2097152

/u01/app/oracle/oradata/RandomB/TBS2_02.dbf
13-APR-18    5242880      5242880
```

c. Deleting: Deleting an existing tablespace

```
SQL> select distinct name, con_id from v$tablespace order by con_id;

NAME                 CON_ID
-------------- ----------
SYSAUX                    1
SYSTEM                    1
TBS2                      1
TEMP                      1
UNDOTBS1                  1
USERS                     1
SYSAUX                    2
SYSTEM                    2
TEMP                      2
SYSAUX                    3
SYSTEM                    3

NAME                 CON_ID
-------------- ----------
TBS1                      3
TBS2                      3
TEMP                      3
USERS                     3
SYSAUX                    4
SYSTEM                    4
TBS2                      4
TEMP                      4
USERS                     4

20 rows selected.
[oracle@ERSRetailServer1 ~]$ sh drop_tablespace.sh
Enter Oracle SID:
RandomB
Is the tablespace in Pluggable Database: (y/n)
n
Enter tablespace name:
TBS2
1.Drop tablespace :
2.Drop tablespace including contents:
3.Drop tablespace including contents and datafiles:
Enter your choice:
3
Tablespace dropped successfully
```

```
[oracle@ERSRetailServer1 ~]$ sh drop_tablespace.sh
Enter Oracle SID:
RandomB
Is the tablespace in Pluggable Database: (y/n)
y
Enter tablespace name:
TBS2
1.Drop tablespace :
2.Drop tablespace including contents:
3.Drop tablespace including contents and datafiles:
Enter your choice:
1
Enter Pluggable Database Name:
B1
Tablespace dropped successfully
[oracle@ERSRetailServer1 ~]$ sh drop_tablespace.sh
Enter Oracle SID:
RandomB
Is the tablespace in Pluggable Database: (y/n)
y
Enter tablespace name:
TBS2
1.Drop tablespace :
2.Drop tablespace including contents:
3.Drop tablespace including contents and datafiles:
Enter your choice:
2
Enter Pluggable Database Name:
B2
Tablespace dropped successfully
```

```
SQL> select distinct name, con_id from v$tablespace order by con_id;

NAME                 CON_ID
---------------- ----------
SYSAUX                    1
SYSTEM                    1
TEMP                      1
UNDOTBS1                  1
USERS                     1
SYSAUX                    2
SYSTEM                    2
TEMP                      2
SYSAUX                    3
SYSTEM                    3
TBS1                      3

NAME                 CON_ID
---------------- ----------
TEMP                      3
USERS                     3
SYSAUX                    4
SYSTEM                    4
TEMP                      4
USERS                     4

17 rows selected.
```

5. Data Migration

a. Export

a. Full: Perform full database export operation

```
[oracle@ERSRetailServer1 ~]$ sh export_database.sh
Enter Net Service Name of the database to be exported:
AL_B1
Enter the ORACLE SID:
RandomB

Export: Release 12.1.0.2.0 - Production on Thu Apr 19 09:40:25 2018

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Connected to: Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit
Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Testing opt
ions
Starting "SYSTEM"."SYS_EXPORT_FULL_01":  system/********@AL_B1 directory=exp_dir
 dumpfile=full_exp_AL_B1.dmp logfile=full_exp_AL_B1.log FULL=YES
Master table "SYSTEM"."SYS_EXPORT_FULL_01" successfully loaded/unloaded
******************************************************************************
Dump file set for SYSTEM.SYS_EXPORT_FULL_01 is:
  /u01/app/full_exp_AL_B1.dmp
Job "SYSTEM"."SYS_EXPORT_FULL_01" successfully completed at Thu Apr 19 09:45:46
2018 elapsed 0 00:05:06

Database exported successfully
```

b. Schema: Perform schema level export operation

```
[oracle@ERSRetailServer1 ~]$ sh export_
sh: export_: No such file or directory
[oracle@ERSRetailServer1 ~]$ sh export_schema.sh
Enter Net Service Name of the database to be exported:
AL_B1
Enter the Schema Name:
USER4
Enter the ORACLE SID:
RandomB

Export: Release 12.1.0.2.0 - Production on Thu Apr 19 11:13:10 2018

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ved.

Connected to: Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 -
 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Test
ing options
Starting "SYSTEM"."SYS_EXPORT_SCHEMA_01":  system/********@AL_B1 schemas=
USER4 directory=dir dumpfile=export_schema_USER4.dmp logfile=export_schem
a_USER4.log
Master table "SYSTEM"."SYS_EXPORT_SCHEMA_01" successfully loaded/unloaded
******************************************************************************
*****
Dump file set for SYSTEM.SYS_EXPORT_SCHEMA_01 is:
  /u01/app/export_schema_USER4.dmp
Job "SYSTEM"."SYS_EXPORT_SCHEMA_01" successfully completed at Thu Apr 19
11:13:43 2018 elapsed 0 00:00:32

schema exported successfully _
```

c. Table: Perform table level export operation

```
[oracle@ERSRetailServer1 ~]$ sh export_table.sh
Enter Net Service Name of the database to be exported:
AL_B1
Enter the ORACLE SID:
RandomB
Enter SCHEMA.TABLE name:
USER4.T1

Export: Release 12.1.0.2.0 - Production on Thu Apr 19 10:35:13 2018

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ved.

Connected to: Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 -
 64bit Production
With the Partitioning, OLAP, Advanced Analytics and Real Application Test
ing options
Starting "SYSTEM"."SYS_EXPORT_TABLE_01":  system/********@AL_B1 tables=US
ER4.T1 directory=dir dumpfile=USER4.T1.dmp logfile=USER4.T1.log
Master table "SYSTEM"."SYS_EXPORT_TABLE_01" successfully loaded/unloaded
******************************************************************************
*****
Dump file set for SYSTEM.SYS_EXPORT_TABLE_01 is:
  /u01/app/USER4.T1.dmp
Job "SYSTEM"."SYS_EXPORT_TABLE_01" successfully completed at Thu Apr 19 1
0:36:24 2018 elapsed 0 00:01:07

Table exported successfully
```

6. Backup

a. Full

a. Full Backup: Perform online and offline full backup of database

Offline Full Backup

```
[oracle@ERSRetailServer1 ~]$ sh full_backup.sh
Enter Database name:
RandomB
Enter type of backup (ONLINE/OFFLINE):
OFFLINE
Script Full Backup executed

BS Key  Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
37      Full    660.33M    DISK        00:00:14     16-APR-18
        BP Key: 37   Status: AVAILABLE  Compressed: NO  Tag: TAG20180416T
115333
        Piece Name: /u01/app/oracle/fast_recovery_area/RANDOMB/69296695F7
F49FFAE0530104A8C06BA3/backupset/2018_04_16/o1_mf_nnndf_TAG20180416T11533
3_ff8jh6do_.bkp
  List of Datafiles in backup set 37
  Container ID: 2, PDB Name: PDB$SEED
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  5       Full 1740920    06-APR-18 /u01/app/oracle/oradata/RandomB/pdbse
ed/system01.dbf
  7       Full 1740920    06-APR-18 /u01/app/oracle/oradata/RandomB/pdbse
ed/sysaux01.dbf
```

Online Full Backup

```
RMAN> list backup of database;

using target database control file instead of recovery catalog
specification does not match any backup in the repository
[oracle@ERSRetailServer1 ~]$ sh full_backup.sh
Enter Database name:
RandomB
Enter type of backup (ONLINE/OFFLINE):
ONLINE
Script Full Backup executed
RMAN> list backup summary
2> ;


List of Backups
===============
Key     TY LV S Device Type Completion Time #Pieces #Copies Compressed Ta
g
------- -- -- - ----------- --------------- ------- ------- ---------- --
-
4       B  F  A DISK        16-APR-18       1       1       NO         TA
G20180416T094742
5       B  A  A DISK        16-APR-18       1       1       NO         TA
G20180416T100015
6       B  F  A DISK        16-APR-18       1       1       NO         TA
G20180416T100031
7       B  F  A DISK        16-APR-18       1       1       NO         TA
G20180416T100031
8       B  F  A DISK        16-APR-18       1       1       NO         TA
G20180416T100031
9       B  F  A DISK        16-APR-18       1       1       NO         TA
G20180416T100031
10      B  A  A DISK        16-APR-18       1       1       NO         TA
G20180416T100154
11      B  F  A DISK        16-APR-18       1       1       NO         TA
G20180416T100158
```

b. Incremental: Perform an incremental full backup of database

```
[oracle@ERSRetailServer1 ~]$ sh incremental_full_backup.sh
Enter Database name:
RandomB
Enter level 1 backup:
1. DIFFERENTIAL
2. CUMMULATIVE
1
Script Incremental Backup executed

BS Key  Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
49      Incr 1  1.02M      DISK        00:00:00     17-APR-18
        BP Key: 49   Status: AVAILABLE  Compressed: NO  Tag: TAG20180417T
103951
        Piece Name: /u01/app/oracle/fast_recovery_area/RANDOMB/backupset/
2018_04_17/o1_mf_nnnd1_TAG20180417T103951_ffc0h9l6_.bkp
  List of Datafiles in backup set 49
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  20   1  Incr 2424005    17-APR-18 /u01/app/oracle/oradata/RandomB/TBS3.
dbf
```

c. Differential: Perform differential level 1 backup of database

```
[oracle@ERSRetailServer1 ~]$ sh differential_backup.sh
Enter Database name:
RandomB
Differential Backup done Successfully
BS Key  Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
57      Incr 1  192.00K    DISK        00:00:11     17-APR-18
        BP Key: 57   Status: AVAILABLE  Compressed: NO  Tag: TAG20180417T
111244
        Piece Name: /u01/app/oracle/fast_recovery_area/RANDOMB/6929B30C2A
D8ABDDE0530104A8C079CB/backupset/2018_04_17/o1_mf_nnnd1_TAG20180417T11124
4_ffc2dld3_.bkp
  List of Datafiles in backup set 57
  Container ID: 4, PDB Name: B2
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  11   1  Incr 2425069    17-APR-18 /u01/app/oracle/oradata/RandomB/B2/sy
stem01.dbf
  12   1  Incr 2425069    17-APR-18 /u01/app/oracle/oradata/RandomB/B2/sy
saux01.dbf
  13   1  Incr 2425069    17-APR-18 /u01/app/oracle/oradata/RandomB/B2/B2
_users01.dbf
  22   1  Incr 2425069    17-APR-18 /u01/app/oracle/oradata/RandomB/B2/TB
S3.dbf
```

d. Cumulative: Perform cumulative level 1 backup of database

```
[oracle@ERSRetailServer1 ~]$ sh cumulative_backup.sh
Enter Database name:
RandomB
Cumulative Backup done Successfully
BS Key  Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
53      Incr 1  2.12M      DISK        00:00:17     17-APR-18
        BP Key: 53   Status: AVAILABLE  Compressed: NO  Tag: TAG20180417T
104724
        Piece Name: /u01/app/oracle/fast_recovery_area/RANDOMB/6929B30C2A
D8ABDDE0530104A8C079CB/backupset/2018_04_17/o1_mf_nnnd1_TAG20180417T10472
4_ffc0wfxg_.bkp
  List of Datafiles in backup set 53
  Container ID: 4, PDB Name: B2
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  11   1  Incr 2424241    17-APR-18 /u01/app/oracle/oradata/RandomB/B2/sy
stem01.dbf
  12   1  Incr 2424241    17-APR-18 /u01/app/oracle/oradata/RandomB/B2/sy
saux01.dbf
  13   1  Incr 2424241    17-APR-18 /u01/app/oracle/oradata/RandomB/B2/B2
_users01.dbf
  22   1  Incr 2424241    17-APR-18 /u01/app/oracle/oradata/RandomB/B2/TB
S3.dbf
```

e. Partial backup: Perform partial backup of pluggable database, datafile, tablespace

Partial Datafile Backup

```
[oracle@ERSRetailServer1 ~]$ sh partial_backup.sh
Enter Database Name:
RandomB
1.Perform Partial Backup of pluggable database:
2.Perform Partial Backup of datafile:
3.Perform Partial Backup of tablespace:
Enter your choice:
2
Enter datafile id: (you can get file_id from dba_data_files view)
12
Partial Backup successful
  List of Datafiles in backup set 28
  Container ID: 4, PDB Name: B2
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  12      Full 2350671    16-APR-18 /u01/app/oracle/oradata/RandomB/B2/sy
saux01.dbf
```

Partial Pluggable Database backup

```
[oracle@ERSRetailServer1 ~]$ sh partial_backup.sh
Enter Database Name:
RandomB
1.Perform Partial Backup of pluggable database:
2.Perform Partial Backup of datafile:
3.Perform Partial Backup of tablespace:
Enter your choice:
1
Enter Pluggable Database Name:
B2
Partial Backup successful
  List of Datafiles in backup set 26
  Container ID: 4, PDB Name: B2
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  11      Full 2350254    16-APR-18 /u01/app/oracle/oradata/RandomB/B2/sy
stem01.dbf
  12      Full 2350254    16-APR-18 /u01/app/oracle/oradata/RandomB/B2/sy
saux01.dbf
  13      Full 2350254    16-APR-18 /u01/app/oracle/oradata/RandomB/B2/B2
_users01.dbf
  22      Full 2350254    16-APR-18 /u01/app/oracle/oradata/RandomB/B2/TB
S3.dbf
```

Partial tablespace backup

```
[oracle@ERSRetailServer1 ~]$ sh partial_backup.sh
Enter Database Name:
RandomB
1.Perform Partial Backup of pluggable database:
2.Perform Partial Backup of datafile:
3.Perform Partial Backup of tablespace:
Enter your choice:
3
Enter tablespace name:
TBS1

     FILE# NAME                                     CON_ID
---------- ------------------------------ ----------
         6 TBS1                                      3
        14 TBS1                                      3

How many datafiles of the tablespace you want to backup?
2
Enter 0 datafile number :
6
Enter 1 datafile number :
14
Partial Backup successful
RMAN> list backup of database;


List of Backup Sets
===================

  List of Datafiles in backup set 16
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  6       Full 2349868    16-APR-18 /u01/app/oracle/oradata/RandomB/users
01.dbf

BS Key  Type LV Size       Device Type Elapsed Time Completion Time
------- ---- -- ---------- ----------- ------------ ---------------
18      Full    1.03M      DISK        00:00:00     16-APR-18
        BP Key: 18   Status: AVAILABLE  Compressed: NO  Tag: TAG20180416T
105149
        Piece Name: /u01/app/oracle/fast_recovery_area/RANDOMB/6929AE2983
4AAA5DE0530104A8C08819/backupset/2018_04_16/o1_mf_nnndf_TAG20180416T10514
9_ff8dqfb8_.bkp
  List of Datafiles in backup set 18
  Container ID: 3, PDB Name: B1
  File LV Type Ckp SCN    Ckp Time  Name
  ---- -- ---- ---------- --------- ----
  14      Full 2349906    16-APR-18 /u01/app/oracle/oradata/RandomB/B1/TB
S1.dbf
```

7. RMAN Configuration

This module should enable the user to change the default RMAN configurations.

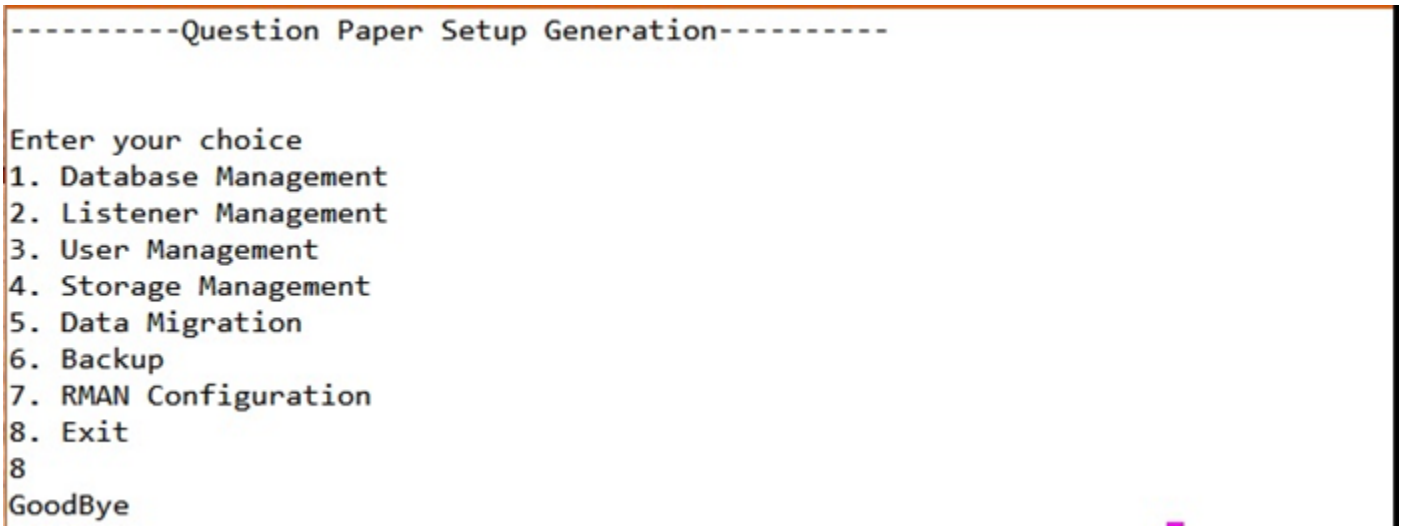
```
[oracle@ERSRetailServer1 Question_Paper_Setup_Generation_Project]$ sh rman_confi
guration.sh
Enter Oracle SID:
RandomB
Want to change Retention Policy (y/n):
y
Enter the type of Retention Policy:
1.None
2.Number of Backups
3.Number of days
3
Enter number of days to configure:
5

Retention Policy changed
Want to change Backup Optimization (y/n):
Want to change default device type (y/n):
n
Want to change Parallelism (y/n):
n
Want to change Maxsetsize (y/n):
n
Want to change Controlfile autobackup (y/n):
n
Configuration done successfully
RMAN> show all;

RMAN configuration parameters for database with db_unique_name RANDOMB are:
CONFIGURE RETENTION POLICY TO RECOVERY WINDOW OF 5 DAYS;
CONFIGURE BACKUP OPTIMIZATION OFF;
CONFIGURE DEFAULT DEVICE TYPE TO DISK; # default
CONFIGURE CONTROLFILE AUTOBACKUP ON; # default
CONFIGURE CONTROLFILE AUTOBACKUP FORMAT FOR DEVICE TYPE DISK TO '%F'; # default
CONFIGURE DEVICE TYPE DISK PARALLELISM 1 BACKUP TYPE TO BACKUPSET; # default
CONFIGURE DATAFILE BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default
CONFIGURE ARCHIVELOG BACKUP COPIES FOR DEVICE TYPE DISK TO 1; # default
CONFIGURE MAXSETSIZE TO UNLIMITED; # default
CONFIGURE ENCRYPTION FOR DATABASE OFF; # default
CONFIGURE ENCRYPTION ALGORITHM 'AES128'; # default
CONFIGURE COMPRESSION ALGORITHM 'BASIC' AS OF RELEASE 'DEFAULT' OPTIMIZE FOR LOA
D TRUE ; # default
CONFIGURE RMAN OUTPUT TO KEEP FOR 7 DAYS; # default
CONFIGURE ARCHIVELOG DELETION POLICY TO NONE; # default
CONFIGURE SNAPSHOT CONTROLFILE NAME TO '/u01/app/oracle/product/12.1.0/db_1/dbs/
snapcf_RandomB.f'; # default
```

8. Exit

This menu helps the user to exit from the menu.



3.4 Non Functional Requirements

3.4.1 Performance

An effective, easy and efficient way of automating the process of setup generation in database.

3.4.2 Security

Security of data is very important. Server must be highly protected from the virus and hackers.

3.4.3 Maintenance

All code shall be fully documented and patterned. Maintenance of server and data is done on regular basis.

CHAPTER 7

SOFTWARE TESTING

This section includes the different testing systems directed to the item. It conjointly delineates the checked application alongside the different achievable experiments in it.

The PC code improvement cycle doesn't break point to PC code advancement however conjointly incorporate testing segment as well, in order to affirm the models of the work. PC code Testing is one among the various segments of any PC code advancement. Essentially the checking is dispensed by a group of analyzers the outcomes and activities territory unit recorded amid a test archive which can be unbroken for future reference. While playing the testing in the event of some unforeseen issue if any embrace bugs territory unit discovered then the stock is sent back to the occasion group to amend a comparative and redesigned. The check cases region unit performed in different ways that just to affirm the created item is without bug and works reliably with client necessities.

A test case is an arrangement of conditions or factors under which a tester will decide if a framework under test fulfills necessities or works accurately. The way toward creating test cases can likewise help discover issues in the necessities or outline of an application. Test case acts as the beginning stage of the test execution, and in the wake of applying an arrangement of info values; the application has a complete result and leaves the framework at some end point or otherwise called execution post condition.

Part of Test-Driven Development (TDD) is unit testing, a realistic strategy that receives a procedure to building a thing by techniques for steady testing and refresh. TDD needs the

developers at first create coming up short test of units. By then, they make code and refactor the application till test passes is not finished. TDD routinely realizes an express and obvious code base. Unit testing incorporates only those attributes, which are crucial for execution. At the point when most of the units in a program has been seen to work in the maximum profitable, error interstate possible and greater fragments of the program can be surveyed by strategies for combination testing.

7.1 Test cases

7.1.1 Unit Testing

It is a level of software testing where single components are tested. The purpose is to validate that each component of software performs as designed. It usually has one or more input and usually a single output. It is performed by using the White Box Testing strategy.

It is an item change arranged in which the smallest testable parts of a system, called units, are independently and unreservedly inspected for suitable operation. It should be possible physically, however, is frequently mechanized. It is a piece of test-driven change, a calm disapproved of the system that embraces a particular methodology to building a thing by strategies for persistent testing and alteration. Test-driven change requires that planners at first make missing the mark test of unit. By then, they form code and refactor the application until the test passes. TDD typically achieves an express and obvious code base.

It is normally computerized, however, may even now be executed physically. The IEEE doesn't support

one above the further. To detach a component and approve its accuracy is a goal of unit testing. A physical way to deal with unit testing is utilize a well-ordered training report. On the other hand, if not arranged precisely, an indiscreet manual unit experiment may execute as a reconciliation experiment that includes numerous product segments, and therefore block the accomplishment of most if not the greater part of the objectives built up for unit testing.

7.1.2 Integration Testing

Integration Testing is a procedure under which diverse modules or sub modules incorporated together to test whether the coordinated framework is functioning according to expected yield by comparing observed output.

CONCLUSION

The project deals with the automation of the Hands-on assessment setup generation. In the assessment, the trainees are provided with an issue injected environment and are expected to resolve the issue. The issues injected in the environment during the assessment are similar to the ones faced in the production. The project setup is in Oracle 12C environment and the requirements are developed according to the specifications of the industry. The product should be able to create database, users, tables, tablespace and other requirements with respect to the question paper.

The final output of the product is the issue injected environment according to the hands-on assessment question paper.

BIBLIOGRAPHY

https://docs.oracle.com

Infosys Learning Platform – ILP