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Experiment No. 4

Implementation of Tablespace in Oracle

1. Creating and Managing Tablespaces

- Create a new tablespace named emp_data with an initial size of 20MB.
- Check the size and status of the tablespace using an SQL query.

The screenshot displays the Oracle SQL Developer interface. The top toolbar includes icons for running queries, saving, and other standard database operations. The main window is divided into two panes: 'Worksheet' and 'Query Builder'. The 'Worksheet' pane contains the following SQL script:

```
show user;

desc dba_ts_quotas;

--1.    Creating and Managing Tablespaces

--a. Create a new tablespace named emp_data with an initial size of 20MB.
CREATE TABLESPACE emp_data
DATAFILE 'd:\dfiles\emp_data.dbf' SIZE 20M blocksize 8k;

--b.    Check the size and status of the tablespace using an SQL query.
SELECT dt.tablespace_name, df.bytes/1024/1024 AS size_mb, dt.status
FROM dba_tablespaces dt
JOIN dba_data_files df ON dt.tablespace_name = df.tablespace_name
WHERE dt.tablespace_name = 'EMP_DATA';
```

Below the script, the 'Script Output' pane shows the execution results. It indicates that the task was completed in 0.088 seconds. The output includes the following information:

```
*Action: Re-specify the name.
USER is "SYSTEM"
Name          Null?     Type
-----
TABLESPACE_NAME NOT NULL  VARCHAR2(30)
USERNAME       NOT NULL  VARCHAR2(128)
BYTES          NUMBER
MAX_BYTES      NUMBER
BLOCKS         NUMBER
MAX_BLOCKS     NUMBER
DROPPED        VARCHAR2(3)

TABLESPACE EMP_DATA created.

TABLESPACE UNDO_SPACE created.
```

Below the output, the 'Error starting at line : 29 in command -' message is displayed, indicating an error in the script:

```
ALTER DATABASE DATAFILE 'emp_data.dbf' RESIZE 50M
Error report -
ORA-01516: nonexistent log file, data file, or temporary file "emp_data.dbf" in the current container
01516. 00000 - "nonexistent log file, data file, or temporary file \"%s\" in the current container"
*Cause:      An attempt was made to use ALTER DATABASE to rename
              a log file, data file, or temporary file; or to change attributes
```

The bottom pane shows the 'Messages - Log' section.

2. Resize the Tablespace

- Resize the emp_data tablespace to 50MB
- Verify the size change

```

--2.    Resize the Tablespace
--a.    Resize the emp_data tablespace to 50MB
SELECT file_name
FROM dba_data_files
WHERE tablespace_name = 'EMP_DATA';

ALTER DATABASE DATAFILE '/opt/oracle/homes/OraDBHome21cXE/dbs/d:filesemp_data.dbf' RESIZE 50M;

--b.    Verify the size change
SELECT file_name, bytes/1024/1024 AS size_mb
FROM dba_data_files
WHERE tablespace_name = 'EMP_DATA';

--3 temporary tablespaces
--a.    Create a temporary tablespace and assign it as the default
CREATE TEMPORARY TABLESPACE temp_space
TEMPFILE 'temp_space.dbf' SIZE 50M;

ALTER DATABASE DEFAULT TEMPORARY TABLESPACE temp_space;

----b.  Check the size and status of the tablespace using an SQL query.
SELECT dt.tablespace_name, tf.bytes/1024/1024 AS size_mb, dt.status

```

Script Output x Query Result x

Task completed in 0.073 seconds

01543. 00000 - "tablespace '%s' already exists"
 *Cause: Tried to create a tablespace which already exists
 *Action: Use a different name for the new tablespace

Database altered.

```

--b.    Verify the size change
SELECT file_name, bytes/1024/1024 AS size_mb
FROM dba_data_files
WHERE tablespace_name = 'EMP_DATA';

--3 temporary tablespaces
--a.    Create a temporary tablespace and assign it as the default
CREATE TEMPORARY TABLESPACE temp_space
TEMPFILE 'temp_space.dbf' SIZE 50M;

ALTER DATABASE DEFAULT TEMPORARY TABLESPACE temp_space;

----b.  Check the size and status of the tablespace using an SQL query.
SELECT dt.tablespace_name, tf.bytes/1024/1024 AS size_mb, dt.status

```

Script Output x Query Result x

SQL | All Rows Fetched: 1 in 0.014 seconds

FILE_NAME	SIZE_MB
1 /opt/oracle/homes/OraDBHome21cXE/dbs/d:filesemp_data.dbf	50

3. Temporary Tablespace

- Create a temporary tablespace and assign it as the default
- Check the size and status of the tablespace using an SQL query.

```
--3 temporary tablespaces
--a. Create a temporary tablespace and assign it as the default
CREATE TEMPORARY TABLESPACE temp_space
TEMPFILE 'temp_space.dbf' SIZE 50M;

ALTER DATABASE DEFAULT TEMPORARY TABLESPACE temp_space;

----b. Check the size and status of the tablespace using an SQL query.
SELECT dt.tablespace_name, tf.bytes/1024/1024 AS size_mb, dt.status
FROM dba_tablespaces dt
JOIN dba_temp_files tf ON dt.tablespace_name = tf.tablespace_name
WHERE dt.tablespace_name = 'TEMP_SPACE';

--4 undo tablespaces
```

Script Output x Query Result x

Task completed in 0.079 seconds

or the current container or is not of a type supported by the request.
Specify the name or number of an existing file of the correct type, as appropriate.
Check the relevant V\$ table for a list of possible files.

Database altered.

Database altered.

TABLESPACE TEMP_SPACE created.

Database altered.

B27_ads.sql x B27_exp1.2.sql x B27_exp1.2.sql x B27_exp2.2.sql x B27_exp2.2.sql x B27_exp2.2.sql x

Worksheet Query Builder

```
SELECT file_name, bytes/1024/1024 AS size_mb
FROM dba_data_files
WHERE tablespace_name = 'EMP_DATA';

--3 temporary tablespaces
--a. Create a temporary tablespace and assign it as the default
CREATE TEMPORARY TABLESPACE temp_space
TEMPFILE 'temp_space.dbf' SIZE 50M;

ALTER DATABASE DEFAULT TEMPORARY TABLESPACE temp_space;

----b. Check the size and status of the tablespace using an SQL query.
SELECT dt.tablespace_name, tf.bytes/1024/1024 AS size_mb, dt.status
FROM dba_tablespaces dt
JOIN dba_temp_files tf ON dt.tablespace_name = tf.tablespace_name
WHERE dt.tablespace_name = 'TEMP_SPACE';

--4 undo tablespaces
```

Script Output x Query Result x

SQL | All Rows Fetched: 1 in 0.019 seconds

	TABLESPACE_NAME	SIZE_MB	STATUS
1	TEMP_SPACE	50	ONLINE

4. Undo Tablespace

- a. Create an undo tablespace
- b. Check the size and status of the tablespace using an SQL query

```
--4 undo tablespaces
--a. Create an undo tablespace
CREATE UNDO TABLESPACE undo_space
DATAFILE 'undo_space.dbf' SIZE 50M;

--b. Check the size and status of the tablespace using an SQL query
SELECT dt.tablespace_name, df.bytes/1024/1024 AS size_mb, dt.status
FROM dba_tablespaces dt
JOIN dba_data_files df ON dt.tablespace_name = df.tablespace_name
WHERE dt.tablespace_name = 'UNDO_SPACE';
```

Script Output x Query Result x

Task completed in 0.051 seconds

MAX_BLOCKS	NUMBER
UNDO_SPACE	50

TABLESPACE EMP_DATA created.

TABLESPACE UNDO_SPACE created.

Error starting at line : 29 in command -
ALTER DATABASE DATAFILE 'emp_data.dbf' RESIZE 50M
Error report -
ORA-01516: nonexistent log file, data file, or temporary file "emp_data.dbf" in the cu

```
--4 undo tablespaces
--a. Create an undo tablespace
CREATE UNDO TABLESPACE undo_space
DATAFILE 'undo_space.dbf' SIZE 50M;

--b. Check the size and status of the tablespace using an SQL query
SELECT dt.tablespace_name, df.bytes/1024/1024 AS size_mb, dt.status
FROM dba_tablespaces dt
JOIN dba_data_files df ON dt.tablespace_name = df.tablespace_name
WHERE dt.tablespace_name = 'UNDO_SPACE';
```

Script Output x Query Result x

SQL | All Rows Fetched: 1 in 0.008 seconds

TABLESPACE_NAME	SIZE_MB	STATUS
UNDO_SPACE	50	ONLINE

5. Create user and assign Tablespace Quotas

- Create user hr_user on the emp_data tablespace and Assign a 10MB quota to HR_USER on the emp_data tablespace
- grant create session, create table to hr_user
- check max_bytes and used_data for hr_user

The screenshot shows the SQL Developer interface with a script titled 'B27_exp1.2.sql'. The script contains the following SQL commands:

```
show user;

desc dba_ts_quotas;

--1. Creating and Managing Tablespaces

--a. Create a new tablespace named emp_data with an initial size of 20MB.
CREATE TABLESPACE emp_data
DATAFILE 'd:\dfiles\emp_data.dbf' SIZE 20M blocksize 8k;

--b. Check the size and status of the tablespace using an SQL query.
SELECT dt.tablespace_name, df.bytes/1024/1024 AS size_mb, dt.status
FROM dba_tablespaces dt
JOIN dba_data_files df ON dt.tablespace_name = df.tablespace_name
WHERE dt.tablespace_name = 'EMP_DATA';

--2. Resize the Tablespace
--a. Resize the emp_data tablespace to 50MB
SELECT file_name
FROM dba_data_files
WHERE tablespace_name = 'EMP_DATA';
```

The 'Query Result' pane shows the output of the query for the 'EMP_DATA' tablespace:

TABLESPACE_NAME	SIZE_MB	STATUS
1 EMP_DATA	50	ONLINE

The script continues with the following commands:

```
--5. Create User and Assign Tablespace Quotas
--a. Create user hr_user on the emp_data tablespace and As
CREATE USER b27_user IDENTIFIED BY b27_password
DEFAULT TABLESPACE emp_data
QUOTA 10M ON emp_data;

--b. grant create session, create table to hr_user
GRANT CREATE SESSION, CREATE TABLE TO b27_user;
```

The 'Script Output' pane shows the following error message:

```
Error starting at line : 59 in command -
CREATE UNDO TABLESPACE undo_space
DATAFILE 'undo_space.dbf' SIZE 50M
Error report -
ORA-01543: tablespace 'UNDO_SPACE' already exists
01543. 00000 - "tablespace '%s' already exists"
*Cause: Tried to create a tablespace which already exists
*Action: Use a different name for the new tablespace

User B27_USER created.
```

```
B27_ads.sql x B27_exp1.2.sql x B27_exp1.2.sql x B27_exp2.2.sql x B27_experiment2.sql x
Worksheet Query Builder
--5. Create User and Assign Tablespace Quotas
--a. Create user hr_user on the emp_data tablespace and Assign a 10MB quota to HR_USER
CREATE USER b27_user IDENTIFIED BY b27_password
DEFAULT TABLESPACE emp_data
QUOTA 10M ON emp_data;

--b. grant create session, create table to hr_user
GRANT CREATE SESSION, CREATE TABLE TO b27_user;

-- c. check max_bytes and used_data for hr_user
SELECT tablespace_name, max_bytes/1024/1024 AS max_mb, bytes/1024/1024 AS used_mb
FROM dba_ts_quotas
WHERE username = 'B27_USER' AND tablespace_name = 'EMP_DATA';
```

```
Script Output x Query Result x
Task completed in 0.051 seconds

Error starting at line : 59 in command -
CREATE UNDO TABLESPACE undo_space
DATAFILE 'undo_space.dbf' SIZE 50M
Error report -
ORA-01543: tablespace 'UNDO_SPACE' already exists
01543. 00000 - "tablespace '%s' already exists"
*Cause: Tried to create a tablespace which already exists
*Action: Use a different name for the new tablespace

User B27_USER created.

Grant succeeded.
```

```
-- c. check max_bytes and used_data for hr_user
SELECT tablespace_name, max_bytes/1024/1024 AS max_mb, bytes/1024/1024 AS used_mb
FROM dba_ts_quotas
WHERE username = 'B27_USER' AND tablespace_name = 'EMP_DATA';

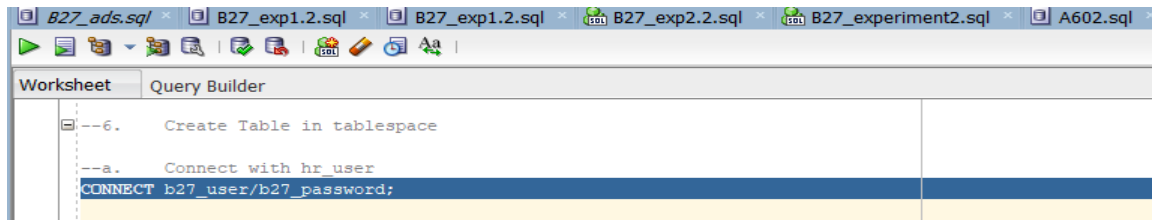
--6. Create Table in tablespace
--a. Connect with hr_user
CONNECT b27_user/b27_password;
```

```
Script Output x Query Result x
All Rows Fetched: 0 in 0.005 seconds
TABLES... MAX_MB USED_MB
```

6. Create Table in tablespace

- Connect with hr_user
- Create table employee in table space with attributes emp_id, emp_name, emp_address
- Insert few records in employee table

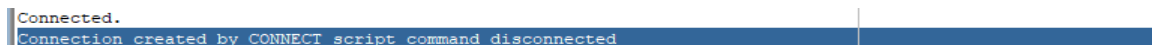
d. check max_bytes and free_space for hr_user



The screenshot shows the SQL Developer interface with a script window open. The script contains the following commands:

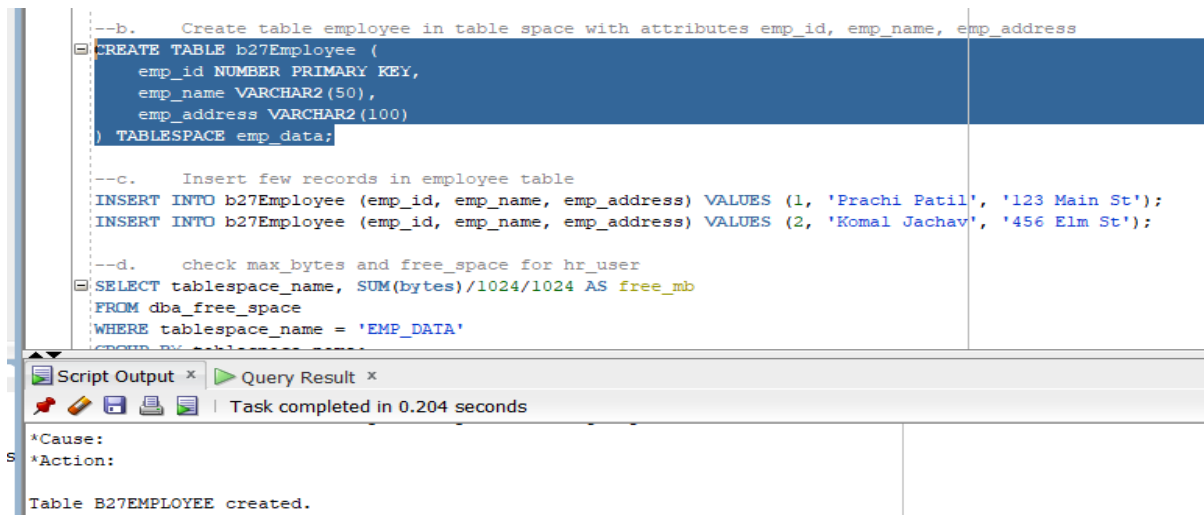
```
--6. Create Table in tablespace
--a. Connect with hr_user
CONNECT b27_user/b27_password;
```

o/p:



The screenshot shows the output of the script execution:

```
Connected.
Connection created by CONNECT script command disconnected
```



The screenshot shows the SQL Developer interface with a script window and a message window. The script contains the following commands:

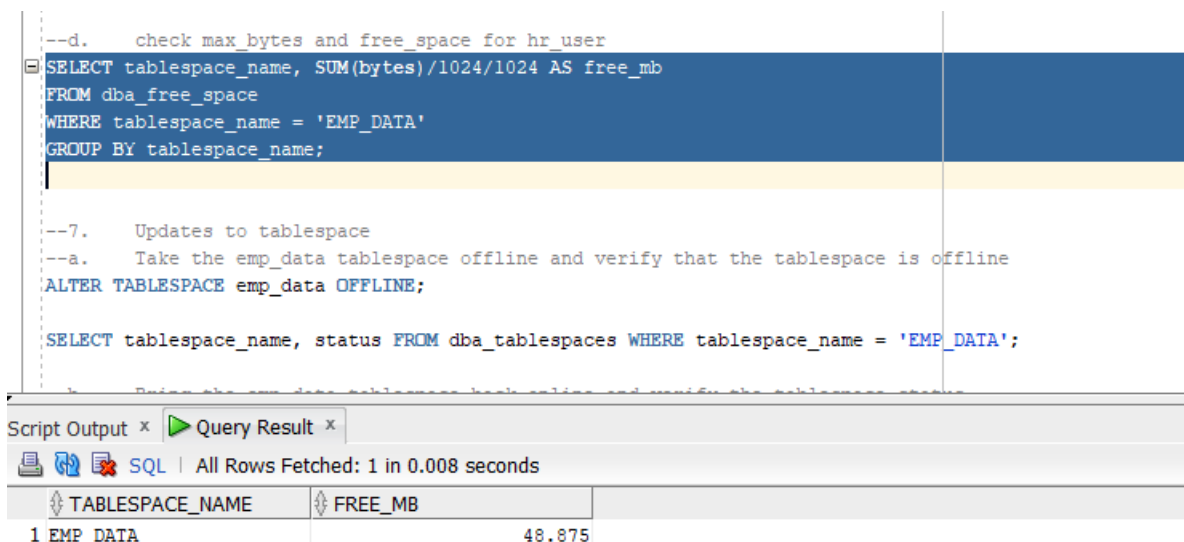
```
--b. Create table employee in table space with attributes emp_id, emp_name, emp_address
CREATE TABLE b27Employee (
  emp_id NUMBER PRIMARY KEY,
  emp_name VARCHAR2(50),
  emp_address VARCHAR2(100)
) TABLESPACE emp_data;

--c. Insert few records in employee table
INSERT INTO b27Employee (emp_id, emp_name, emp_address) VALUES (1, 'Prachi Patil', '123 Main St');
INSERT INTO b27Employee (emp_id, emp_name, emp_address) VALUES (2, 'Komal Jachav', '456 Elm St');

--d. check max_bytes and free_space for hr_user
SELECT tablespace_name, SUM(bytes)/1024/1024 AS free_mb
FROM dba_free_space
WHERE tablespace_name = 'EMP_DATA'
GROUP BY tablespace_name;
```

The message window shows the following message:

```
*Cause:
*Action:
Table B27EMPLOYEE created.
```



The screenshot shows the SQL Developer interface with a script window and a query result window. The script contains the following commands:

```
--d. check max bytes and free_space for hr user
SELECT tablespace_name, SUM(bytes)/1024/1024 AS free_mb
FROM dba_free_space
WHERE tablespace_name = 'EMP_DATA'
GROUP BY tablespace_name;

--7. Updates to tablespace
--a. Take the emp_data tablespace offline and verify that the tablespace is offline
ALTER TABLESPACE emp_data OFFLINE;

SELECT tablespace_name, status FROM dba_tablespaces WHERE tablespace_name = 'EMP_DATA';
```

The query result window shows the following data:

TABLESPACE_NAME	FREE_MB
1 EMP_DATA	48.875

7. Updates to tablespace

- Take the emp_data tablespace offline and verify that the tablespace is offline
- Bring the emp_data tablespace back online and verify the tablespace status
- Remove the quota for HR_USER on the emp_data tablespace and verify the quota removal.

The screenshot shows the SQL Developer interface with a script editor. The script contains the following SQL statements:

```
--7. Updates to tablespace
--a. Take the emp_data tablespace offline and verify that the tablespace is offline
ALTER TABLESPACE emp_data OFFLINE;

SELECT tablespace_name, status FROM dba_tablespaces WHERE tablespace_name = 'EMP_DATA';

--b. Bring the emp_data tablespace back online and verify the tablespace status
ALTER TABLESPACE emp_data ONLINE;

SELECT tablespace_name, status FROM dba_tablespaces WHERE tablespace_name = 'EMP_DATA';

ALTER USER b27_user QUOTA 0 ON emp_data;

--c. Remove the quota for HR_USER on the emp_data tablespace and verify the quota removal.
SELECT tablespace_name, max_bytes
FROM dba_ts_quotas
WHERE username = 'B27_USER' AND tablespace_name = 'EMP_DATA';
```

The Script Output pane shows the following messages:

```
1 row inserted.

TABLESPACE EMP_DATA altered.

TABLESPACE EMP_DATA altered.

User B27_USER altered.

TABLESPACE EMP_DATA altered.

TABLESPACE EMP_DATA altered.
```

The screenshot shows the SQL Developer interface with the same script as above. The Script Output pane shows the following messages:

```
SQL | All Rows Fetched: 0 in 0.004 seconds

TABLES... MAX_BY...
```