EXERCISE 13

Creating Views

1. What are three uses for a view from a DBA's perspective?

1. Security - Restrict access to specific columns or rows of data (users see only what they need).
2. Simplification - Simplify complex SQL queries by storing them as a single view.
3. Data Consistency - Provide a consistent, unchanging interface even if underlying tables or structures change.

2. Create a simple view called view_d_songs that contains the ID, title and artist from the DJs on Demand table for each "New Age" type code. In the subquery, use the alias "Song Title" for the title column.

```
CREATE VIEW view_d_songs AS
SELECT id,
       title AS 'Song Title',
       artist
FROM djs_on_demand WHERE type_code = 'New Age';
```

3. SELECT * FROM view_d_songs. What was returned?

This query will retrieve all rows from the view_d_songs view, showing only
- id
- song title
- artist

but only for records where the type_code = 'New Age';

4. REPLACE view_d_songs. Add type_code to the column list. Use aliases for all columns.

```
CREATE OR REPLACE VIEW view_d_songs AS
SELECT id AS 'song ID',
       title AS 'Song Title',
       artist AS 'Artist Name',
       type_code AS 'Type code',
FROM djs_on_demand
WHERE type_code = 'New Age';
```

Or use alias after the CREATE statement as shown.

5. Jason Tsang, the disk jockey for DJs on Demand, needs a list of the past events and those planned for the coming months so he can make arrangements for each event's equipment setup. As the company manager, you do not want him to have access to the price that clients paid for their events. Create a view for Jason to use that displays the name of the event, the event date, and the theme description. Use aliases for each column name.

```
CREATE VIEW view_event_list AS SELECT
    event_name AS "Event Name",
    event_name AS 'Event Date",
    theme_description AS 'Theme Description"
    FROM events;
```

6. It is company policy that only upper-level management be allowed access to individual employee salaries. The department managers, however, need to know the minimum, maximum, and average salaries, grouped by department. Use the Oracle database to prepare a view that displays the needed information for department managers.

```
CREATE VIEW view_dept_salaries AS
SELECT department_id AS "Department ID",
    MIN(salary) AS "Minimum salary",
    MAX (salary) AS "Maximum salary",
    AVG (salary) AS "Average Salary",
FROM employees
GROUP BY department_id;
```

DML Operations and Views

Use the DESCRIBE statement to verify that you have tables named copy_d_songs, copy_d_events, copy_d_cds, and copy_d_clients in your schema. If you don't, write a query to create a copy of each.

1. Query the data dictionary USER_UPDATABLE_COLUMNS to make sure the columns in the base tables will allow UPDATE, INSERT, or DELETE. All table names in the data dictionary are stored in uppercase.

```
SELECT table_name, column_name,
insertable, updatable, deletable
FROM user_updatable_columns
WHERE table_name = 'COPY_D_SONGS'
  COPY_D_EVENTS, COPY_D_CDS, COPY_D_CLIENTS;
```

Use the same syntax but change table_name of the other tables.

2. Use the CREATE or REPLACE option to create a view of *all* the columns in the copy_d_songs table called view_copy_d_songs.

```
CREATE OR REPLACE VIEW
view_copy_d_songs AS
SELECT *
FROM copy_d_songs;
```

3. Use view_copy_d_songs to INSERT the following data into the underlying copy_d_songs table. Execute a SELECT * from copy_d_songs to verify your DML command. See the graphic.

ID	TITLE	DURATION	ARTIST	TYPE_CODE
88	Mello Jello	2	The What	4

```
INSERT INTO view_copy_d_songs (id, title, duration, artist
typecode) VALUES (88, 'Mello Jello', 2, 'The What', 4);

SELECT * FROM copy_d_songs.
```

4. Create a view based on the DJs on Demand COPY_D_CDS table. Name the view read_copy_d_cds. Select all columns to be included in the view. Add a WHERE clause to restrict the year to 2000. Add the WITH READ ONLY option.

```
CREATE OR REPLACE VIEW read_copy_d_cds
AS SELECT *
FROM copy_d_cds
WHERE year = 2000
WITH READ ONLY;
```

5. Using the read_copy_d_cds view, execute a DELETE FROM read_copy_d_cds WHERE cd_number = 90;

```
DELETE FROM read_copy_d_cds
WHERE cd_number = 90;
```

6. Use REPLACE to modify read_copy_d_cds. Replace the READ ONLY option with WITH CHECK OPTION CONSTRAINT ck_read_copy_d_cds. Execute a SELECT * statement to verify that the view exists.

```
CREATE OR REPLACE VIEW read_copy_d_cds
AS SELECT *
FROM copy_d_cds
WHERE year = 2000
WITH CHECK OPTION CONSTRAINT ck_read_copy_d_cds;

SELECT * FROM read_copy_d_cds;
```

7. Use the read_copy_d_cds view to delete any CD of year 2000 from the underlying copy_d_cds.

```
DELETE FROM read_copy_d_cds;
```

8. Use the read_copy_d_cds view to delete cd_number 90 from the underlying copy_d_cds table.

```
DELETE FROM read_copy_d_cds
WHERE cd_number = 90;
```

9. Use the read_copy_d_cds view to delete year 2001 records.

```
DELETE FROM read_copy_d_cds
WHERE year = 2001;
```

10. Execute a SELECT * statement for the base table copy_d_cds. What rows were deleted?

SELECT * FROM copy_d_cds;

All rows from copy_d_cds where year > 2000 were deleted.

11. What are the restrictions on modifying data through a view?

1. The view must be updatable. 2. If the view has with READ ONLY, no INSERT, UPDATE, or DELETE is allowed. 3. If the view has with check option, any inserted or updated row must satisfy the view's WHERE condition. 4. A view must include the primary key of the table.

12. What is Moore's Law? Do you consider that it will continue to apply indefinitely? Support your opinion with research from the internet.

Moore's Law: Moore's Law states that the number of transistor on a microchip double approximately every 18-20 months, which results in computers becoming faster and cheaper over time.

Likely No, * Transistors cannot continue shrinking forever.
* Heat and power constraints limit further scaling.

13. What is the "singularity" in terms of computing?

The technological singularity is a theoretical point in the future when artificial intelligence surpasses human intelligence to the extent that it can improve itself without human input.

At this point, technological growth would become unpredictable and extremely rapid - leading to major changes in civilization.

Managing Views

1. Create a view from the copy_d_songs table called view_copy_d_songs that includes only the title and artist. Execute a SELECT * statement to verify that the view exists.

```
CREATE OR REPLACE VIEW
view_copy_d_songs AS
SELECT title, artist
FROM copy_d_songs;

SELECT * FROM view_copy_d_songs;
```

2. Issue a DROP view_copy_d_songs. Execute a SELECT * statement to verify that the view has been deleted.

```
DROP VIEW view_copy_d_songs;

SELECT * FROM view_copy_d_songs;
```

3. Create a query that selects the last name and salary from the Oracle database. Rank the salaries from highest to lowest for the top three employees.

```
SELECT lastname, salary
FROM employees
ORDER BY salary DESC
FETCH FIRST 3 ROWS ONLY;
```

```
SELECT lastname, salary
FROM (
    SELECT lastname, salary
    FROM employees
    ORDER BY salary DESC
)
WHERE ROWNUM <= 3;
```

4. Construct an inline view from the Oracle database that lists the last name, salary, department ID, and maximum salary for each department. Hint: One query will need to calculate maximum salary by department ID.

```
SELECT e.lastname, e.salary,
e.department_id, d.max_salary FROM employees e
JOIN( SELECT department_id, MAX(salary) AS max_salary
    FROM employees
    GROUP BY department_id) d.
```

5. Create a query that will return the staff members of Global Fast Foods ranked by salary from lowest to highest.

```
SELECT *
FROM global_fast_foods_staff
ORDER BY salary ASC;
```

Indexes and Synonyms

1. What is an index and what is it used for?

An index is a database object that improves the speed of data retrieval. It works like the index in a book - allowing the database to find rows faster without scanning the entire

2. What is a ROWID, and how is it used?

ROWID is a unique address for each row in an Oracle table. It tells the exact physical storage location of the row on disk. Quickly access specific rows. Identify duplicate rows.

3. When will an index be created automatically?

Oracle automatically creates an index when:
A primary key or unique constraint is created on a column

4. Create a nonunique index (foreign key) for the DJs on Demand column (cd_number) in the D_TRACK_LISTINGS table. Use the Oracle Application Express SQL Workshop Data Browser to confirm that the index was created.

```
CREATE INDEX idx_cd_number
    ON d_track_listings (cd_number);
SELECT index_name, table_name
FROM user_indexes WHERE table_name = 'D_TRACK_LISTINGS';
```

5. Use the join statement to display the indexes and uniqueness that exist in the data dictionary for the DJs on Demand D_SONGS table.

```
SELECT i.index_name, i.table_name, i.uniqueness
FROM user_indexes i
JOIN user_ind_columns c
    ON i.index_name = c.index_name
WHERE i.table_name = 'D_SONGS';
```

6. Use a SELECT statement to display the index_name, table_name, and uniqueness from the data dictionary USER_INDEXES for the DJs on Demand D_EVENTS table.

```
SELECT index_name, table_name, uniqueness
FROM user_indexes
WHERE table_name = 'D_EVENTS';
```

7. Write a query to create a synonym called dj_tracks for the DJs on Demand d_track_listings table.

```
CREATE SYNONYM dj_tracks
FOR d_track_listings;
SELECT * FROM dj_tracks;
```

8. Create a function-based index for the last_name column in DJs on Demand D_PARTNERS table that makes it possible not to have to capitalize the table name for searches. Write a SELECT statement that would use this index.

```
CREATE INDEX idx_upper_lastname
    ON d_partners (UPPER(last_name));
SELECT * FROM d_partners
WHERE UPPER(last_name) = UPPER('Smith');
```

9. Create a synonym for the D_TRACK_LISTINGS table. Confirm that it has been created by querying the data dictionary.

```
CREATE SYNONYM track_listing_syn FOR
D_track_listings;
SELECT SYNONYM_NAME, TABLE_OWNER, TABLE_NAME
FROM USER_SYNONYMS WHERE SYNONYM_NAME = 'TRACK_LISTINGS_SYN';
```

10. Drop the synonym that you created in question

```
DROP SYNONYM Track_listings_syn;
SELECT SYNONYM_NAME
FROM USER_SYNONYMS
WHERE SYNONYM_NAME = 'TRACK_LISTINGS_SYN';
```

Evaluation Procedure	Marks awarded
Query(5)	5
Execution (5)	5
Viva(5)	5
Total (15)	15
Faculty Signature	