DBA PROJECT SCHEDULE (FOLLOW-UP)

# Week 1-3: Proposal Submission and Initial Setup (Already Completed✅)

## Completed Tasks:

* + Submission of project proposal, ERD, and database schema.
  + Database creation and implementation of tables.
  + Basic CRUD operations performed on the tables.

## Student Deliverables:

* + Finalized ERD and database schema.
  + Tables created in the database with dummy data.
  + Queries for CRUD operations.

**Project Proposal  
 DBA & M Fall 2024**

**Title: The Grocery Management System**

**Scenario:**

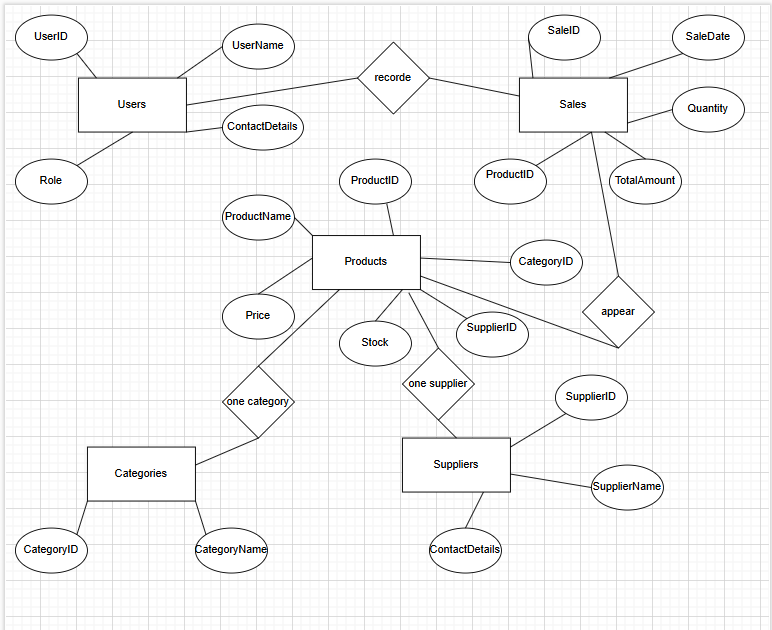
The Grocery Management System (GMS) is designed to optimize the management of products, suppliers, sales, and user accounts for a retail grocery store. The system ensures seamless tracking of inventory, supplier details, sales transactions, and employee records.

Each product is assigned a unique ID and is associated with a category (e.g., dairy, snacks) and a supplier. Categories define groupings of products, while suppliers include details such as names, addresses, and contact numbers.

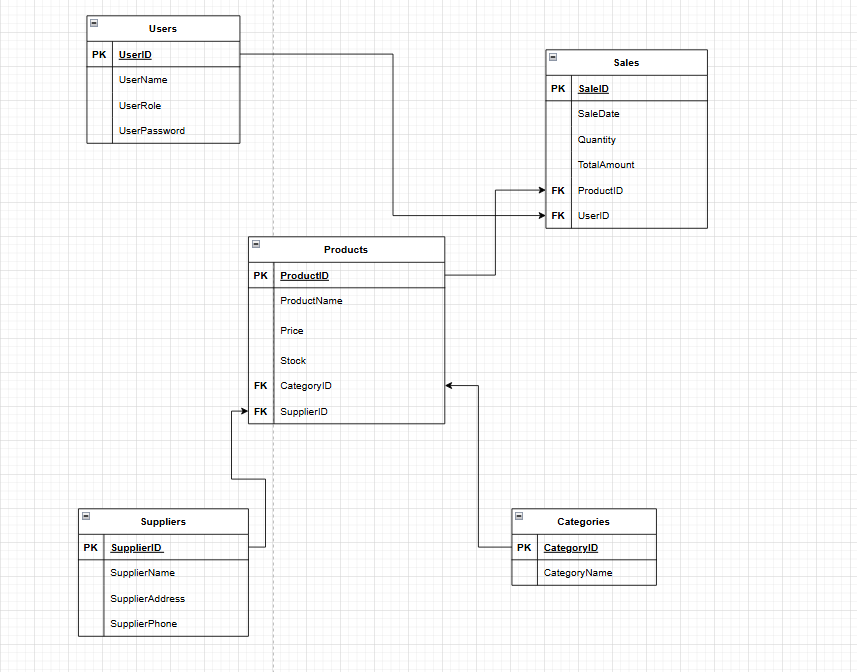
The system enables efficient tracking of sales, logging product quantities, transaction amounts, dates, and the users involved in the process. Users represent store employees or administrators, each assigned roles and secure login credentials.

The database ensures data integrity and supports real-time updates. Additionally, it provides a complete history of transactions and stock changes to facilitate operational, analytical, and historical reporting.

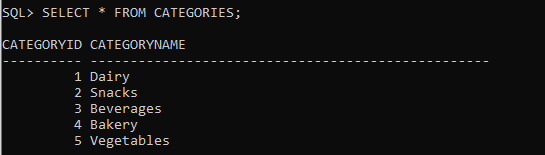
**ERD:**

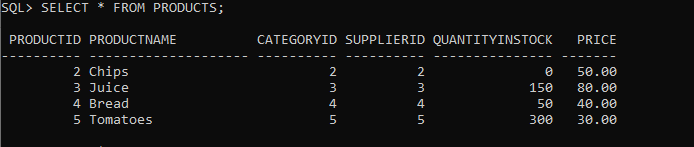
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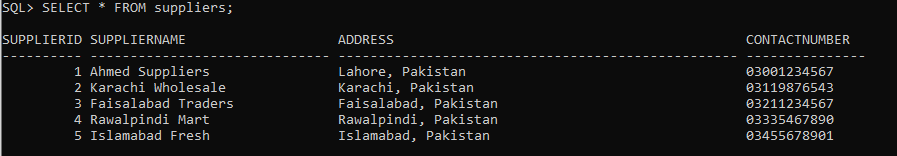
**Conceptual Schema:**

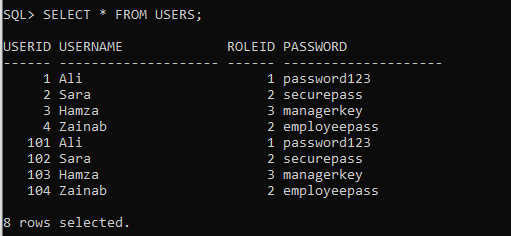
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**Table Creation and CRUD:**

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# Week 4: Tablespaces and Undo Tablespaces

## Focus Topics:

* + Creating tablespaces.
  + Managing tablespaces (extending size, adding data files).
  + Creating and managing undo tablespaces.

## Follow-Up:

* + **Create Tablespaces:**
    - In their projects, students must create separate tablespaces for different modules (e.g., STUDENT\_TBS, FACULTY\_TBS, or BOOKINGS\_TBS for marriage hall).

**Create a tablespace for Products and Categories**

CREATE TABLESPACE PRODUCTS\_TBS

DATAFILE 'C:/Oracle/oradata/GROCERYMSDBMS/DATAFILE/GMS\_PRODUCTS\_TBS.dbf'

SIZE 50M

AUTOEXTEND ON

NEXT 10M

MAXSIZE UNLIMITED;

**Create a tablespace for Sales**

CREATE TABLESPACE SALES\_TBS

DATAFILE 'C:/Oracle/oradata/GROCERYMSDBMS/DATAFILE/GMS\_SALES\_TBS.dbf'

SIZE 50M

AUTOEXTEND ON

NEXT 10M

MAXSIZE UNLIMITED;

**Create a tablespace for Users**

CREATE TABLESPACE USERS\_TBS

DATAFILE 'C:/Oracle/oradata/GROCERYMSDBMS/DATAFILE/GMS\_USERS\_TBS.dbf'

SIZE 50M

AUTOEXTEND ON

NEXT 10M

MAXSIZE UNLIMITED;

**Create a tablespace for Suppliers**

CREATE TABLESPACE SUPPLIERS\_TBS

DATAFILE 'C:/Oracle/oradata/GROCERYMSDBMS/DATAFILE/GMS\_SUPPLIERS\_TBS.dbf'

SIZE 50M

AUTOEXTEND ON

NEXT 10M

MAXSIZE UNLIMITED;

## Manage Extends:

* + - Ensure tablespaces are configured to auto-extend for growing project data.

**Extend the size of PRODUCTS\_TBS by 100 MB**

ALTER DATABASE DATAFILE 'C:/Oracle/oradata/GROCERYMSDBMS/DATAFILE/GMS\_PRODUCTS\_TBS.dbf'

RESIZE 150M;

**Add a new datafile to SALES\_TBS**

ALTER TABLESPACE SALES\_TBS

ADD DATAFILE 'C:/Oracle/oradata/GROCERYMSDBMS/DATAFILE/GMS\_SALES\_TBS\_2.dbf'

SIZE 50M

AUTOEXTEND ON

NEXT 10M

MAXSIZE UNLIMITED;

## Undo Tablespaces:

* + - Set up undo tablespaces to handle rollbacks for CRUD operations during testing.

**Create an Undo Tablespace**

CREATE UNDO TABLESPACE UNDO\_TBS

DATAFILE 'C:/Oracle/oradata/GROCERYMSDBMS/DATAFILE/UNDO\_TBS.dbf'

SIZE 100M

AUTOEXTEND ON

NEXT 20M

MAXSIZE UNLIMITED;

**Configure the database to use the Undo Tablespace**

ALTER SYSTEM SET UNDO\_TABLESPACE = UNDO\_TBS;

## Student Deliverables:

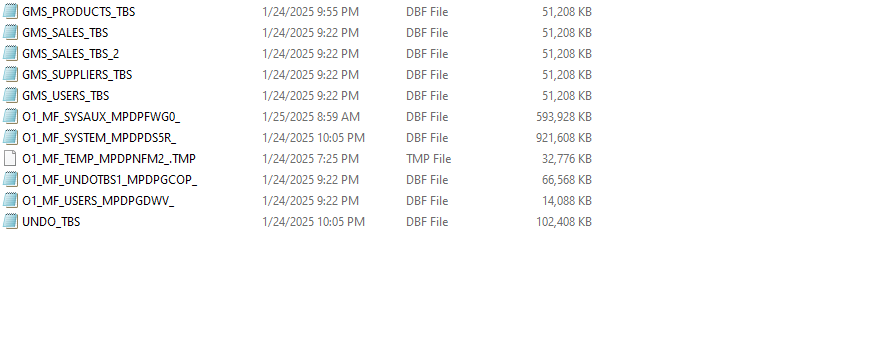
* + Evidence of undo tablespaces configured and used.

**Verify Undo Tablespace**

SELECT tablespace\_name, file\_name, bytes/1024/1024 AS size\_mb

FROM dba\_data\_files

WHERE tablespace\_name = 'UNDO\_TBS';



# Week 5: User Management and Quotas

## Focus Topics:

* + Creating users with password expiry.
  + Assigning quotas to users.
  + Dropping users.

## Follow-Up:

* + **Create Users:**
    - Students should create separate database users for modules in their projects (e.g., ADMIN\_USER, FACULTY\_USER, or CUSTOMER\_USER).

**Create Admin User with password expiry after first login**

CREATE USER ADMIN\_USER IDENTIFIED BY AdminPassword123

DEFAULT TABLESPACE USERS\_TBS

QUOTA 100M ON USERS\_TBS

PASSWORD EXPIRE;

**Create Sales User with password expiry after first login**

CREATE USER SALES\_USER IDENTIFIED BY SalesPassword123

DEFAULT TABLESPACE SALES\_TBS

QUOTA 100M ON SALES\_TBS

PASSWORD EXPIRE;

**Create Products User with password expiry after first login**

CREATE USER PRODUCTS\_USER IDENTIFIED BY ProductsPassword123

DEFAULT TABLESPACE PRODUCTS\_TBS

QUOTA 50M ON PRODUCTS\_TBS

PASSWORD EXPIRE;

**Create Suppliers User with password expiry after first login**

CREATE USER SUPPLIERS\_USER IDENTIFIED BY SuppliersPassword123

DEFAULT TABLESPACE SUPPLIERS\_TBS

QUOTA 50M ON SUPPLIERS\_TBS

PASSWORD EXPIRE;

## Assign Quotas:

* + - Assign specific space quotas to users in their tablespaces.

**Adjust quotas for Admin User**

ALTER USER ADMIN\_USER QUOTA UNLIMITED ON USERS\_TBS;

**Adjust quotas for Sales User**

ALTER USER SALES\_USER QUOTA 200M ON SALES\_TBS;

**Adjust quotas for Products User**

ALTER USER PRODUCTS\_USER QUOTA 100M ON PRODUCTS\_TBS;

**Adjust quotas for Suppliers User**

ALTER USER SUPPLIERS\_USER QUOTA 50M ON SUPPLIERS\_TBS;

## Drop Users:

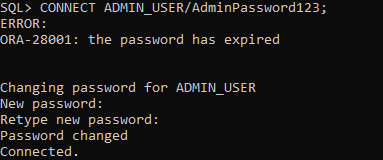
* + - Drop test or redundant users safely as part of user management.

CREATE USER TEST\_USER IDENTIFIED BY Password123;

DROP USER TEST\_USER CASCADE;

## Student Deliverables:

* + Screenshots of password expiry prompts and user access tests.



# Week 6: Privileges, Roles, Profiles, and Indexes

## Focus Topics:

* + Granting and revoking user privileges.
  + Creating roles and profiles.
  + Assigning roles to users.
  + Creating and managing indexes.

## Follow-Up:

* + **Grant and Revoke Privileges:**
    - Grant necessary privileges for CRUD operations and revoke them when no longer needed.

**Grant privileges to ADMIN\_USER for all tables**

GRANT ALL PRIVILEGES ON Products TO ADMIN\_USER;

GRANT ALL PRIVILEGES ON Sales TO ADMIN\_USER;

GRANT ALL PRIVILEGES ON Users TO ADMIN\_USER;

GRANT ALL PRIVILEGES ON Suppliers TO ADMIN\_USER;

**Grant SELECT and INSERT privileges to SALES\_USER**

GRANT SELECT, INSERT ON Sales TO SALES\_USER;

**Grant SELECT, INSERT, and UPDATE privileges to PRODUCTS\_USER**

GRANT SELECT, INSERT, UPDATE ON Products TO PRODUCTS\_USER;

**Grant SELECT privilege to SUPPLIERS\_USER**

GRANT SELECT ON Suppliers TO SUPPLIERS\_USER;

**Revoke INSERT privilege from SALES\_USER**

REVOKE INSERT ON Sales FROM SALES\_USER;

**Revoke ALL privileges from ADMIN\_USER for Products table**

REVOKE ALL PRIVILEGES ON Products FROM ADMIN\_USER;

## Create Roles:

* + - Create roles for groups of users (e.g., READ\_ONLY, DATA\_ENTRY, ADMIN\_ROLE).

**Create READ\_ONLY role for users who only need to query data**

CREATE ROLE READ\_ONLY;

**Create DATA\_ENTRY role for users who need to insert and update data**

CREATE ROLE DATA\_ENTRY;

**Create ADMIN\_ROLE for users with full access**

CREATE ROLE ADMIN\_ROLE;

**Assign privileges to READ\_ONLY role**

GRANT SELECT ON Products TO READ\_ONLY;

GRANT SELECT ON Sales TO READ\_ONLY;

**Assign privileges to DATA\_ENTRY role**

GRANT SELECT, INSERT, UPDATE ON Products TO DATA\_ENTRY;

GRANT SELECT, INSERT, UPDATE ON Sales TO DATA\_ENTRY;

**Assign privileges to ADMIN\_ROLE**

GRANT ALL PRIVILEGES ON Products TO ADMIN\_ROLE;

GRANT ALL PRIVILEGES ON Sales TO ADMIN\_ROLE;

GRANT ALL PRIVILEGES ON Users TO ADMIN\_ROLE;

GRANT ALL PRIVILEGES ON Suppliers TO ADMIN\_ROLE;

**Assign READ\_ONLY role to SUPPLIERS\_USER**

GRANT READ\_ONLY TO SUPPLIERS\_USER;

**Assign DATA\_ENTRY role to PRODUCTS\_USER**

GRANT DATA\_ENTRY TO PRODUCTS\_USER;

**Assign ADMIN\_ROLE to ADMIN\_USER**

GRANT ADMIN\_ROLE TO ADMIN\_USER;

## Profiles:

* + - Define resource limits like session time or idle time.

**Create a profile with session and idle time limits**

CREATE PROFILE LIMITED\_PROFILE

LIMIT

SESSIONS\_PER\_USER 1

IDLE\_TIME 30

CONNECT\_TIME 120;

**Assign the profile to a user**

ALTER USER SALES\_USER PROFILE LIMITED\_PROFILE;

## Indexes:

* + - Identify tables in your project where queries can benefit from indexes (e.g., primary keys, foreign keys, search columns). Create, view, and drop indexes.

**Products Table:**

**Primary Key Index**

CREATE UNIQUE INDEX idx\_product\_id ON Products (ProductID);

**Foreign Key Indexes**

CREATE INDEX idx\_products\_category\_id ON Products (CategoryID);

CREATE INDEX idx\_products\_supplier\_id ON Products (SupplierID);

**Sales Table:**

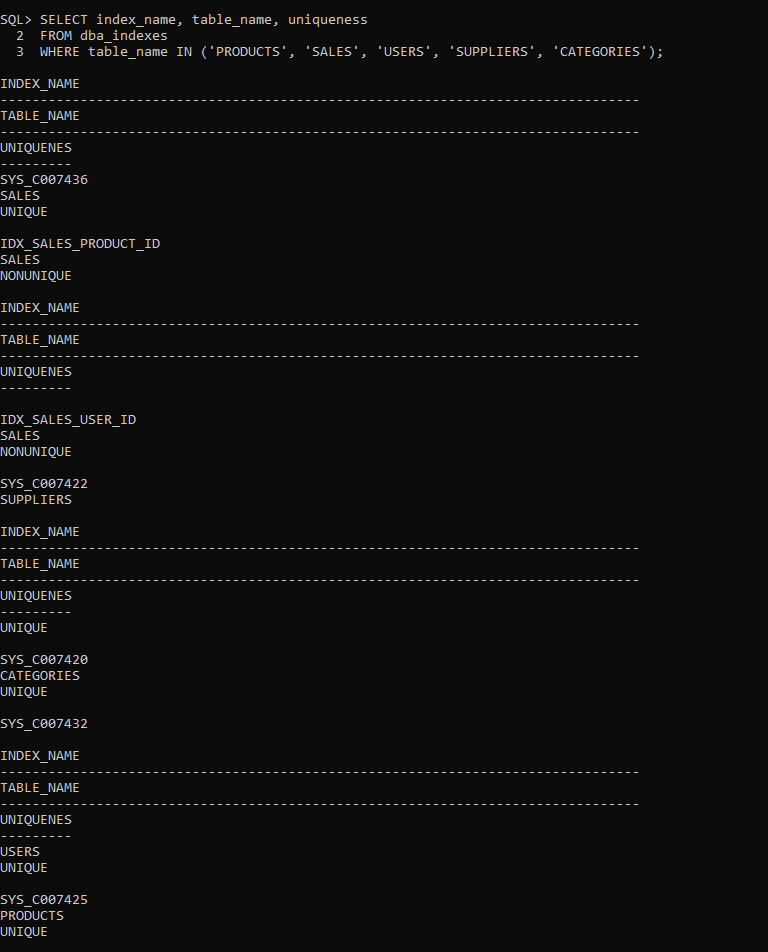
**Primary Key Index**

CREATE UNIQUE INDEX idx\_sale\_id ON Sales (SaleID);

**Foreign Key Indexes**

CREATE INDEX idx\_sales\_product\_id ON Sales (ProductID);

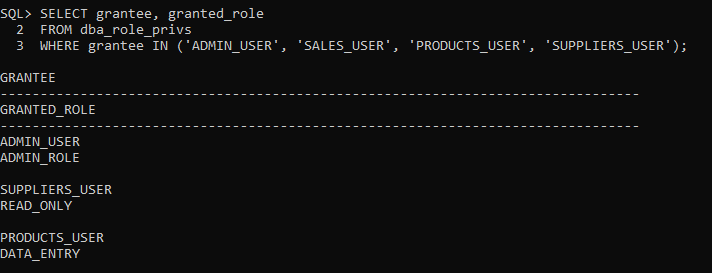
CREATE INDEX idx\_sales\_user\_id ON Sales (UserID);

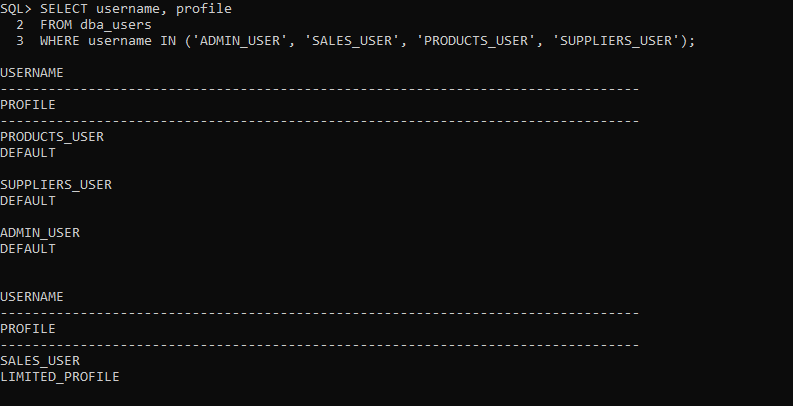


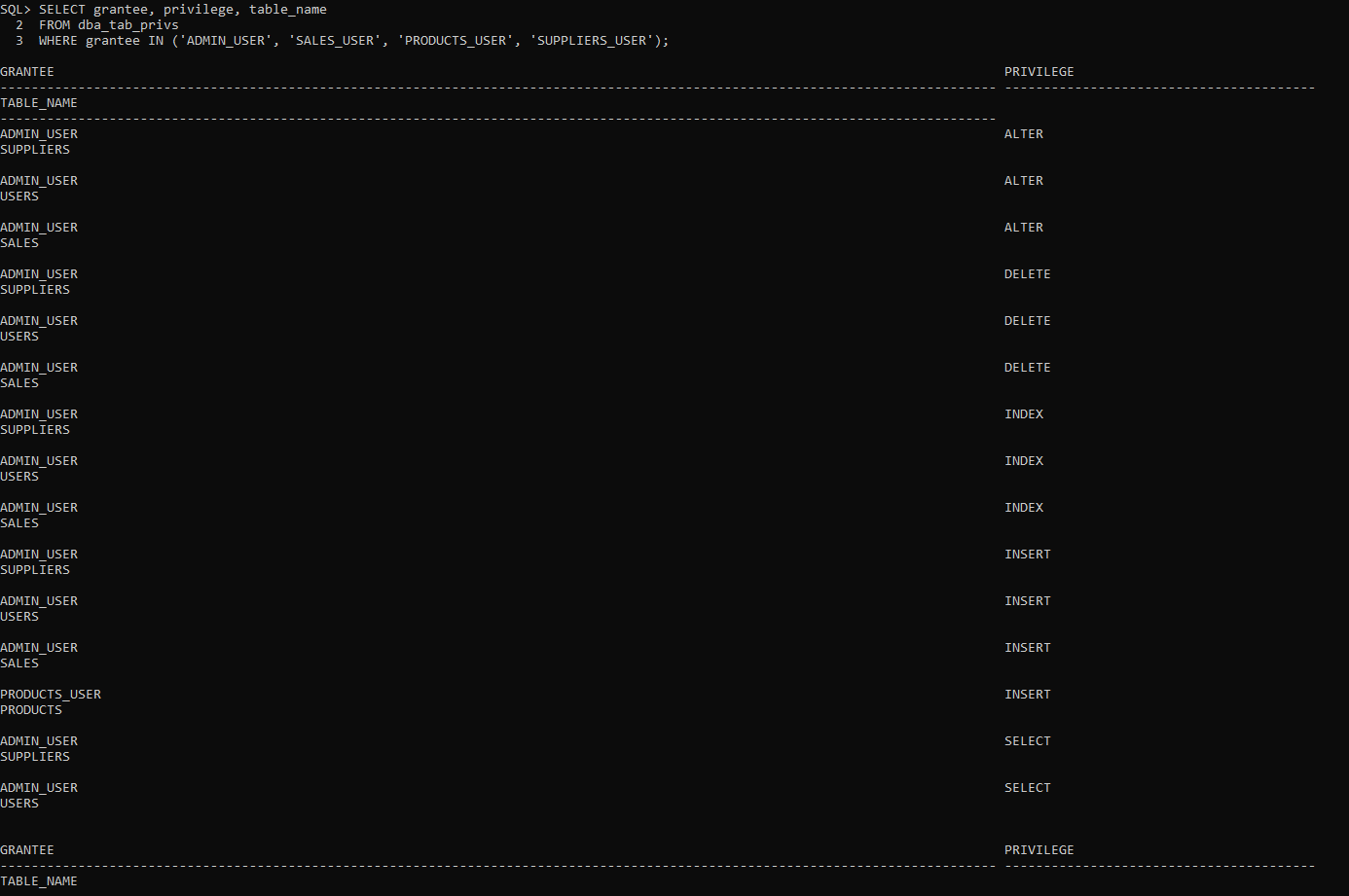
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## Student Deliverables:

* + Output showing assigned roles and privileges.







# Week 7: Data Dictionary, Flashback, and Recovery

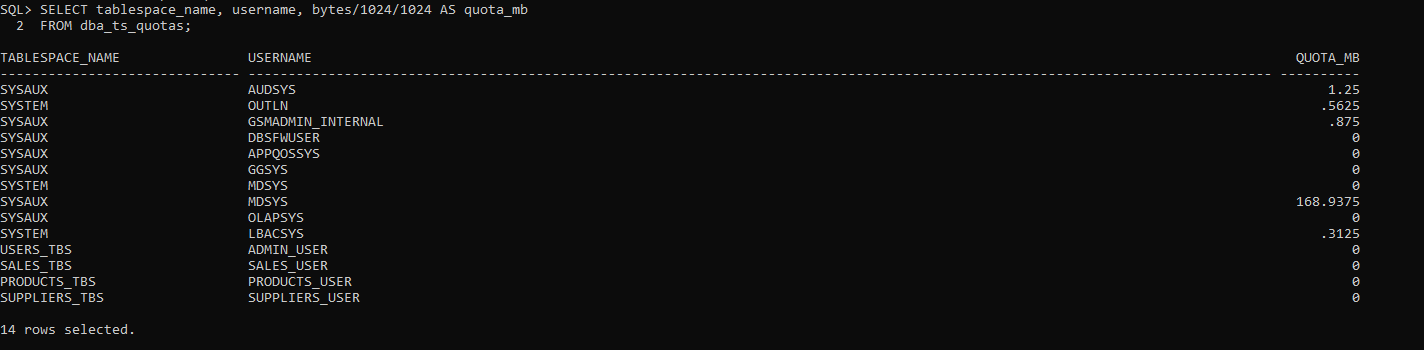
## Focus Topics:

* + Using the Data Dictionary.
  + Flashback operations.
  + Recovery using RMAN.

## Follow-Up:

* + **Data Dictionary:**
    - Students must query the data dictionary to validate tablespaces, users, and privileges.

**Tablespaces:**

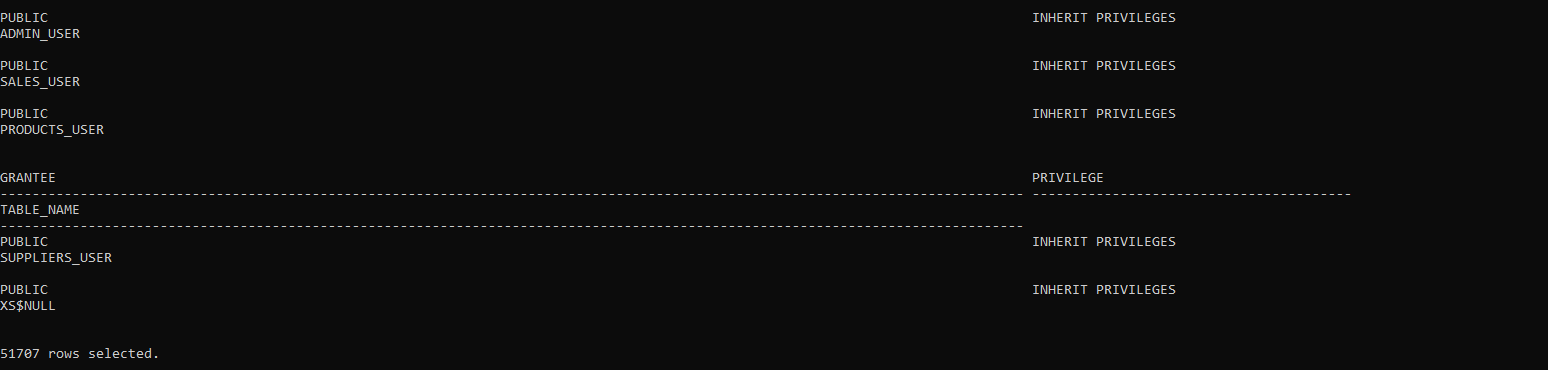


**Users:**

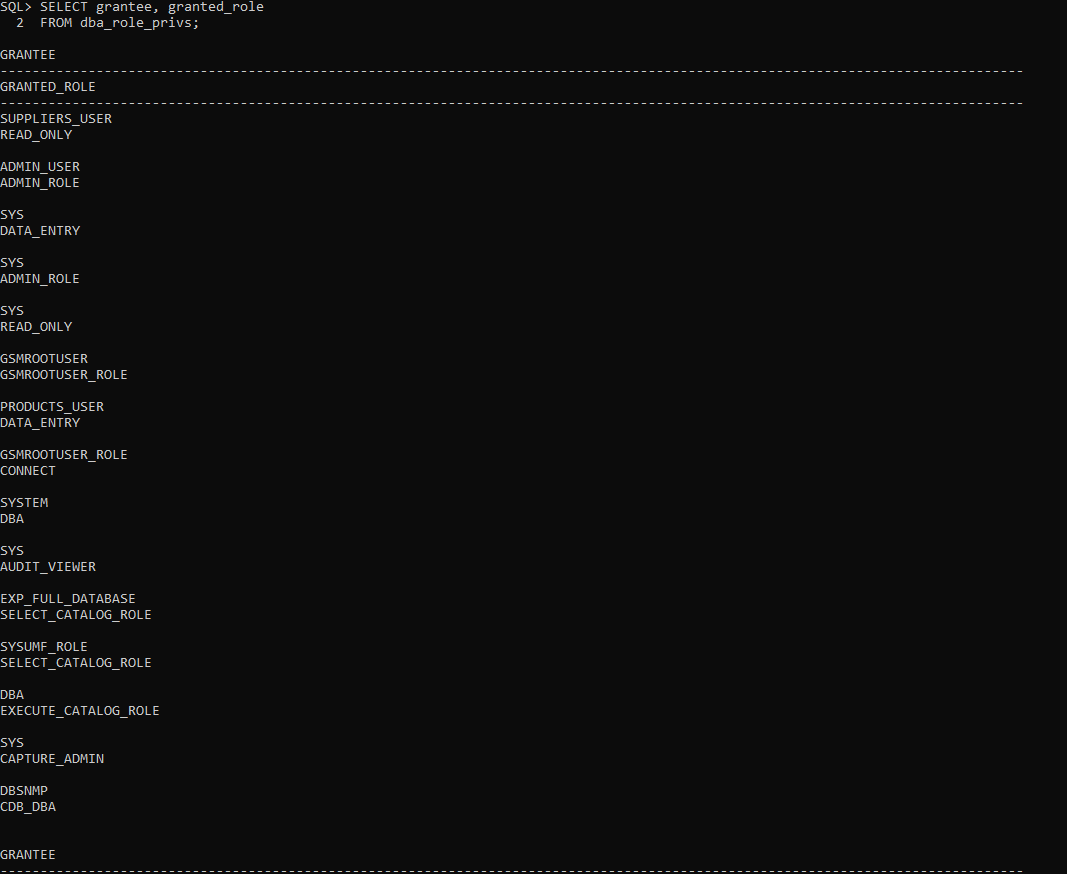
SELECT username, account\_status, profile FROM dba\_users;

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SELECT grantee, privilege, table\_name FROM dba\_tab\_privs;

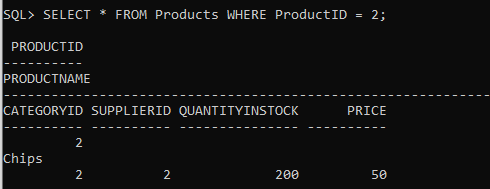
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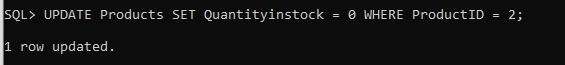
**Roles:**

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## Flashback:

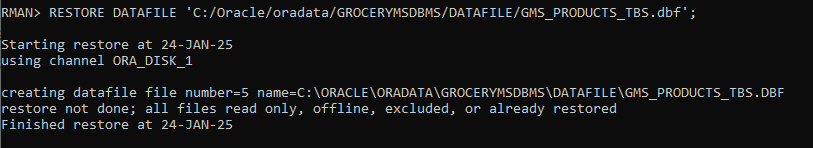
* + - Simulate data loss or update mistakes in their projects and use flashback to recover data.





## Recovery Using RMAN:

* + - Simulate data file corruption and recover using RMAN for a module in their project.



## Student Deliverables:

* + Data dictionary queries and results.
  + Flashback queries and recovery steps.
  + RMAN backup and recovery scripts.

SELECT tablespace\_name, file\_name FROM dba\_data\_files;

STARTUP MOUNT;

rman target /

RESTORE DATAFILE 'C:/Oracle/oradata/GROCERYMSDBMS/DATAFILE/GMS\_PRODUCTS\_TBS.dbf';

# Week 8: Data Dictionary, Flashback, and Recovery

* **Project Viva.**
* **Additional topics (if any).**

# Summary of Deliverables Over 8 Weeks

1. Week 4: Tablespace management.
2. Week 5: User creation, quota assignment, and management.
3. Week 6: Privileges, roles, profiles, and indexes.
4. Week 7: Data dictionary queries, flashback recovery, and RMAN recovery.
5. Week 8: Project viva & additional topics (if any).