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Creating Views

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Objectives

After completing this lesson, you should be able to do the following:

- Describe a view
- Create a view
- Retrieve data through a view
- Alter the definition of a view
- Insert, update, and delete data through a view
- Drop a view

Database Objects

Object	Description
Table	Basic unit of storage; composed of rows and columns
View	Logically represents subsets of data from one or more tables
Sequence	Generates primary key values
Index	Improves the performance of some queries
Synonym	Alternative name for an object

What Is a View?

EMP Table

EMPNO	ENAME	JOB	MGR	HIREDATE	SAL	COMM	DEPTNO
7839	KING	PRESIDENT		17-NOV-81	5000		10
7782	CLARK	MANAGER	7839	09-JUN-81	1500	300	
7876	ADAMS	CLERK	7788	12-JAN-83	1100		20
7369	SMITH	CLERK	7902	17-DEC-80	800		20
7902	FORD	ANALYST	7566	03-DEC-81	3000		20
7698	BLAKE	MANAGER	7839	01-MAY-81	2850		

EMPVU10 View

EMPNO	ENAME	JOB
7839	KING	PRESIDENT
7782	CLARK	MANAGER
7934	MILLER	CLERK

Why Use Views?

- To restrict database access
- To make complex queries easy
- To allow data independence
- To present different views of the same data

Simple Views and Complex Views

Feature	Simple Views	Complex Views
Number of tables	One	One or more
Contain functions	No	Yes
Contain groups of data	No	Yes
DML through view	Yes	Not always

Creating a View

- You embed a subquery within the CREATE VIEW statement.

```
CREATE [OR REPLACE] [FORCE|NOFORCE] VIEW view
  [(alias[, alias]...)]
AS subquery
[WITH CHECK OPTION [CONSTRAINT constraint]]
[WITH READ ONLY]
```

- The subquery can contain complex SELECT syntax.
- The subquery cannot contain an ORDER BY clause.

Creating a View

- Create a view, EMPVU10, that contains details of employees in department 10.

```
SQL> CREATE VIEW     empvu10
  2  AS SELECT       empno, ename, job
  3  FROM            emp
  4  WHERE           deptno = 10;
View created.
```

- Describe the structure of the view by using the SQL*Plus DESCRIBE command.

```
SQL> DESCRIBE empvu10
```

Creating a View

- Create a view by using column aliases in the subquery.

```
SQL> CREATE VIEW     salvu30
  2  AS SELECT       empno EMPLOYEE_NUMBER, ename NAME,
  3                  sal SALARY
  4  FROM            emp
  5  WHERE           deptno = 30;
View created.
```

- Select the columns from this view by the given alias names.

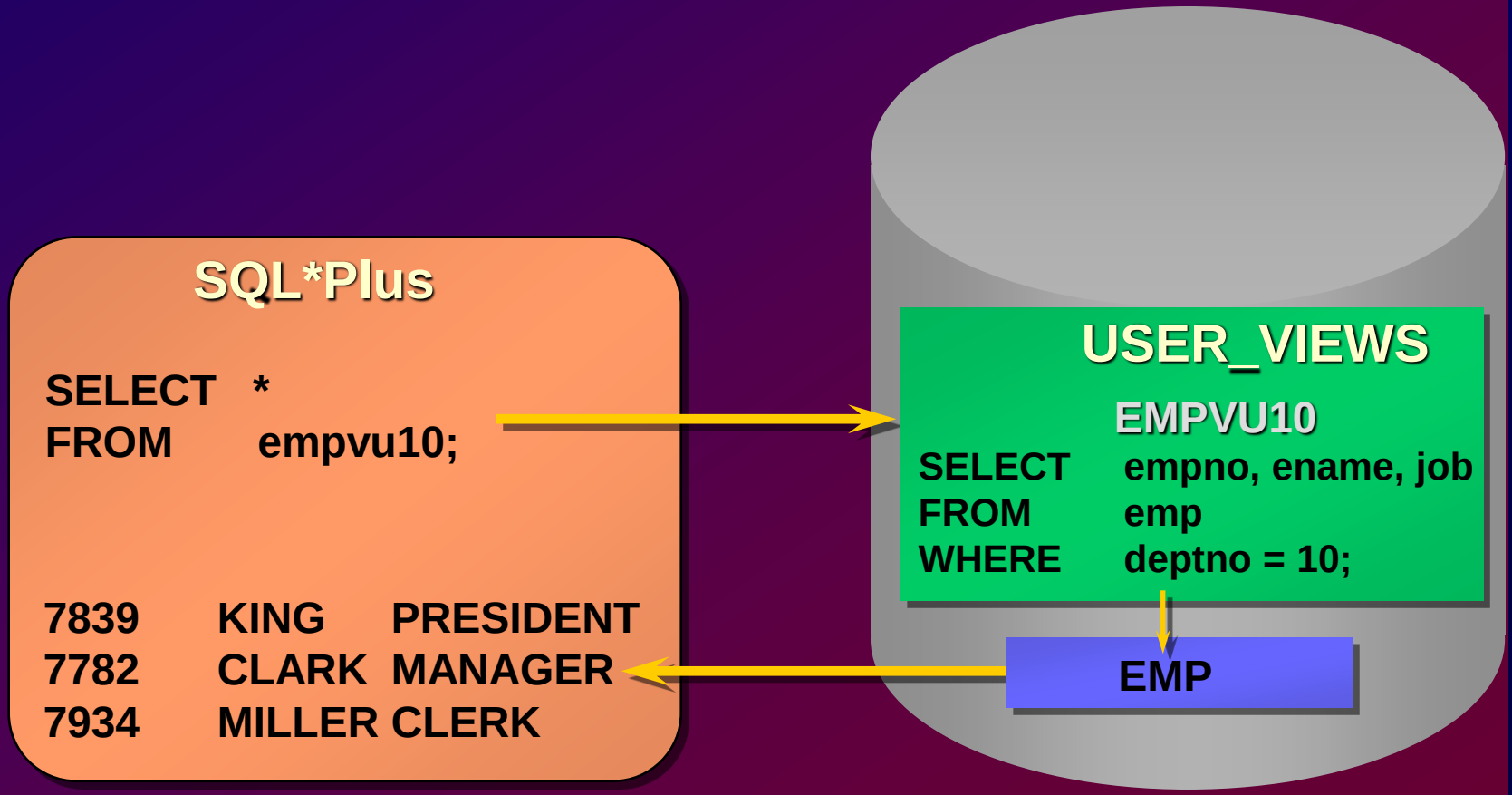
Retrieving Data from a View

```
SQL>   SELECT *
  2    FROM    salvu30;
```

```
EMPLOYEE_NUMBER NAME           SALARY
--------------- ---------- ----------
           7698 BLAKE            2850
           7654 MARTIN           1250
           7499 ALLEN            1600
           7844 TURNER           1500
           7900 JAMES             950
           7521 WARD             1250

6 rows selected.
```

Querying a View



Modifying a View

- Modify the EMPVU10 view by using CREATE OR REPLACE VIEW clause. Add an alias for each column name.

```
SQL> CREATE OR REPLACE VIEW empvu10
  2          (employee_number, employee_name, job_title)
  3   AS SELECT       empno, ename, job
  4   FROM            emp
  5   WHERE           deptno = 10;
View created.
```

- Column aliases in the CREATE VIEW clause are listed in the same order as the columns in the subquery.

Creating a Complex View

Create a complex view that contains group functions to display values from two tables.

```
SQL> CREATE VIEW     dept_sum_vu
  2                  (name, minsal, maxsal, avgsal)
  3  AS SELECT       d.dname, MIN(e.sal), MAX(e.sal),
  4                  AVG(e.sal)
  5  FROM            emp e, dept d
  6  WHERE           e.deptno = d.deptno
  7  GROUP BY        d.dname;
View created.
```

The example on the slide creates a complex view of the department names, minimum salary, maximum salary, and average salary by the department. Note that alternative names have been specified for the view. This is a requirement if any column of the view is derived from a function or an expression.

Rules for Performing DML Operations on a View

- You can perform DML operations on simple views.
- You cannot remove a row if the view contains the following:
  - Group functions
  - A GROUP BY clause
  - The DISTINCT keyword

Rules for Performing DML Operations on a View

- You cannot modify data in a view if it contains:
  - Any of the conditions mentioned in the previous slide
  - Columns defined by expressions
  - The ROWNUM pseudocolumn
- You cannot add data if:
  - The view contains any of the conditions mentioned above or in the previous slide
  - There are NOT NULL columns in the base tables that are not selected by the view

Using the WITH CHECK OPTION Clause

- You can ensure that DML on the view stays within the domain of the view by using the WITH CHECK OPTION clause.

```
SQL> CREATE OR REPLACE VIEW empvu20
  2   AS SELECT       *
  3   FROM            emp
  4   WHERE           deptno = 20
  5   WITH CHECK OPTION CONSTRAINT empvu20_ck;
View created.
```

- Any attempt to change the department number for any row in the view will fail because it violates the WITH CHECK OPTION constraint.

Denying DML Operations

- You can ensure that no DML operations occur by adding the WITH READ ONLY option to your view definition.

```
SQL> CREATE OR REPLACE VIEW empvu10
  2         (employee_number, employee_name, job_title)
  3  AS SELECT       empno, ename, job
  4  FROM            emp
  5  WHERE           deptno = 10
  6  WITH READ ONLY;
View created.
```

- Any attempt to perform a DML on any row in the view will result in Oracle Server error.

Removing a View

Remove a view without losing data because a view is based on underlying tables in the database.

```
DROP VIEW view;
```

```
SQL> DROP VIEW empvu10;
View dropped.
```

Summary

- A view is derived from data in other tables or other views.
- A view provides the following advantages:
  - Restricts database access
  - Simplifies queries
  - Provides data independence
  - Allows multiple views of the same data
  - Can be dropped without removing the underlying data

Practice Overview

- Creating a simple view
- Creating a complex view
- Creating a view with a check constraint
- Attempting to modify data in the view
- Displaying view definitions
- Removing views