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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**

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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

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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	10
7934	MILLER	CLERK	7782	23-JAN-82	1300		10
7566	JONES	MANAGER	7839	02-APR-81	2975		20
	PERNEY	ANALYST	7566	09-DEC-82	3000		20
7900	JAMES	CLERK	7698	03-DEC-81	950		30
7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	30

EMPVU10 View

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

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Why Use Views?

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

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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

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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.

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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
```

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Name	Null?	Type
-----	-----	-----
EMPNO	NOT NULL	NUMBER (4)
ENAME		VARCHAR2 (10)
JOB		VARCHAR2 (9)

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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.

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Retrieving Data from a View

```
SQL> SELECT *  
2 FROM empvu30;
```

EMPLOYEE_	NUMBER	NAME	SALARY
7698	BLAKE	2850	
7654	MARTIN	1250	
7499	ALLEN	1600	
7844	TURNER	1500	
7900	JAMES	950	
7521	WARD	1250	

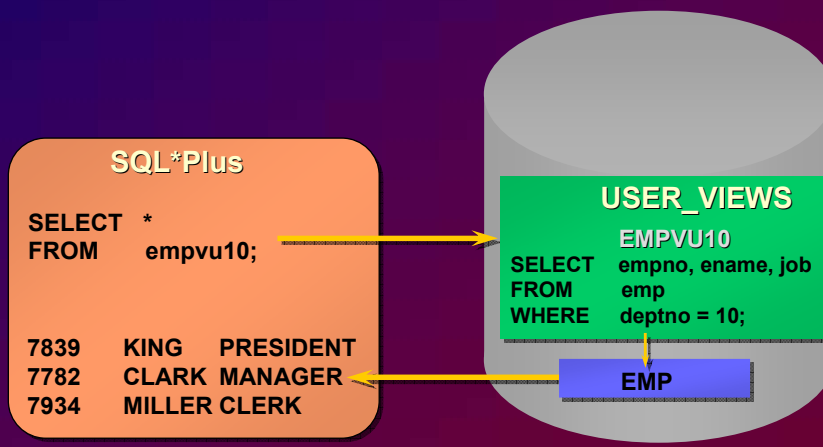
6 rows selected.

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Querying a View



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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.**

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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.
```

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

NAME	MINSAL	MAXSAL	AVGSAL
ACCOUNTING	1300	5000	2916.6667
RESEARCH	800	3000	2175
SALES	950	2850	1566.6667

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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

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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

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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.

```
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.

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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 **ORA-01752**.

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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.
```

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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**

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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**

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