

**EX.NO:5**

**DATE:**

## **CREATING VIEWS**

After the completion of this exercise, students will be able to do the following:

- Describe a view
- Create, alter the definition of, and drop a view
- Retrieve data through a view
- Insert, update, and delete data through a view
- Create and use an inline view

### **View:**

A view is a logical table based on a table or another view. A view contains no data but is like a window through which data from tables can be viewed or changed. The tables on which a view is based are called base tables.

### **Advantages of Views:**

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

### **Classification of views:**

1. Simple view
2. Complex view

Feature	Simple	Complex
No. of tables	One	One or more
Contains functions	No	Yes
Contains groups of data	No	Yes
DML operations thr' view	Yes	Not always

**CREATE OR REPLACE FORCE/NOFORCE VIEW view\_name AS Subquery WITH CHECK OPTION CONSTRAINT constraint WITH READ ONLY CONSTRAINT constraint;**

**FORCE** - Creates the view regardless of whether or not the base tables exist.

**NOFORCE** - Creates the view only if the base table exist.

**WITH CHECK OPTION CONSTRAINT**-specifies that only rows accessible to the view can be inserted or updated.

**WITH READ ONLY CONSTRAINT**-ensures that no DML operations can be performed on the View.

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**Example: 1** (Without using Column aliases)

Create a view EMPVU80 that contains details of employees in department80.

**Example 2:**

```
CREATE VIEW empvu80 AS SELECT employee_id, last_name, salary FROM employees  
WHERE department_id=80;
```

**Example:1** (Using column aliases)

```
CREATE VIEW salvu50  
AS SELECT employee_id, id_number, last_name NAME, salary *12 ANN_SALARY  
FROM employees  
WHERE department_id=50;
```

Retrieving data from a view

Example:

```
SELECT * from salvu50;
```

Modifying a view

A view can be altered without dropping, re-creating.

Example: (Simple view)

Modify the EMPVU80 view by using CREATE OR REPLACE.

```
CREATE OR REPLACE VIEW empvu80 (id_number, name, sal, department_id)  
AS SELECT employee_id, first_name, last_name, salary, department_id  
FROM employees  
WHERE department_id=80;
```

**Example:** (complex view)

```
CREATE VIEW dept_sum_vu (name, minsal, maxsal, avgsal)  
AS SELECT d.department_name, MIN(e.salary), MAX(e.salary), AVG(e.salary)  
FROM employees e, department d  
WHERE e.department_id=d.department_id  
GROUP BY d.department_name;
```

**Rules for performing DML operations on view**

- Can perform operations on simple views
- Cannot remove a row if the view contains the following:
  - Group functions
  - Group By clause
  - Distinct keyword
- Cannot modify data in a view if it contains
  - Group functions
  - Group By clause

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- Distinct keyword
- Columns contain by expressions
- Cannot add data thr' a view if it contains
- Group functions
- Group By clause
- Distinct keyword
- Columns contain by expressions
- NOT NULL columns in the base table that are not selected by the view

**Example:** (Using the WITH CHECK OPTION clause)

```
CREATE OR REPLACE VIEW empvu20
```

```
AS SELECT *
```

```
FROM employees
```

```
WHERE department_id=20
```

```
WITH CHECK OPTION CONSTRAINT empvu20_ck;
```

Note: Any attempt to change the department number for any row in the view fails because it violates the WITH CHECK OPTION constraint.

**Example –** (Execute this and note the error)

```
UPDATE empvu20 SET department_id=10 WHERE employee_id=201;
```

### Denying DML operations

#### Use of the WITH READ ONLY option.

Any attempt to perform a DML on any row in the view results in an oracle server error.

Try this code:

```
CREATE OR REPLACE VIEW empvu10(employee_number, employee_name, job_title)
```

```
AS SELECT employee_id, last_name, job_id
```

```
FROM employees
```

```
WHERE department_id=10
```

```
WITH READ ONLY;
```

NAME	NULL?	TYPE
Employee_id	Not null	Number(6)
First_Name		Varchar(20)
Last_Name	Not null	Varchar(25)
Email	Not null	Varchar(25)
Phone_Number		Varchar(20)
Hire_date	Not null	Date
Job_id	Not null	Varchar(10)
Salary		Number(8,2)
Commission_pct		Number(2,2)
Manager_id		Number(6)
Department_id		Number(4)

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```
CREATE TABLE Employee (  
    Employee_id    NUMBER(6)    NOT NULL,  
    First_Name     VARCHAR2(20),  
    Last_Name      VARCHAR2(25) NOT NULL,  
    Email          VARCHAR2(25) NOT NULL,  
    Phone_Number   VARCHAR2(20),  
    Hire_date      DATE          NOT NULL,  
    Job_id         VARCHAR2(10) NOT NULL,  
    Salary         NUMBER(8,2),  
    Commission_pct NUMBER(2,2),  
    Manager_id     NUMBER(6),  
    Department_id  NUMBER(4),  
    CONSTRAINT pk_employee PRIMARY KEY (Employee_id)  
);
```

```
INSERT INTO Employee (Employee_id, First_Name, Last_Name, Email, Phone_Number,  
Hire_date, Job_id, Salary, Commission_pct, Manager_id, Department_id)  
VALUES (101, 'Amit', 'Sharma', 'amit.sharma@example.com', '9123456789',  
TO_DATE('2021-03-01', 'YYYY-MM-DD'), 'IT_PROG', 60000, NULL, 100, 50);
```

```
INSERT INTO Employee (Employee_id, First_Name, Last_Name, Email, Phone_Number,  
Hire_date, Job_id, Salary, Commission_pct, Manager_id, Department_id)  
VALUES (102, 'Sita', 'Patel', 'sita.patel@example.com', '9123456790', TO_DATE('2020-05-12',  
'YYYY-MM-DD'), 'HR_REP', 45000, NULL, 101, 30);
```

```
INSERT INTO Employee (Employee_id, First_Name, Last_Name, Email, Phone_Number,  
Hire_date, Job_id, Salary, Commission_pct, Manager_id, Department_id) VALUES (103,  
'Rahul', 'Verma', 'rahul.verma@example.com', '9123456791', TO_DATE('2019-07-23',  
'YYYY-MM-DD'), 'SA_MAN', 70000, 0.1, 101, 80);
```

```
INSERT INTO Employee (Employee_id, First_Name, Last_Name, Email, Phone_Number,  
Hire_date, Job_id, Salary, Commission_pct, Manager_id, Department_id) VALUES (104, 'Priya',  
'Singh', 'priya.singh@example.com', '9123456792', TO_DATE('2022-08-17', 'YYYY-MM-DD'),  
'FI_ACCOUNT', 50000, NULL, 102, 50);
```

```
INSERT INTO Employee (Employee_id, First_Name, Last_Name, Email, Phone_Number,  
Hire_date, Job_id, Salary, Commission_pct, Manager_id, Department_id) VALUES (105,  
'Rohan', 'Reddy', 'rohan.reddy@example.com', '9123456793', TO_DATE('2020-11-02',  
'YYYY-MM-DD'), 'ST_CLERK', 35000, NULL, 101, 50);
```

```
INSERT INTO Employee (Employee_id, First_Name, Last_Name, Email, Phone_Number,  
Hire_date, Job_id, Salary, Commission_pct, Manager_id, Department_id) VALUES (106,  
'Kiran', 'Nair', 'kiran.nair@example.com', '9123456794', TO_DATE('2018-09-25',  
'YYYY-MM-DD'), 'IT_PROG', 65000, NULL, 100, 60);
```

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INSERT INTO Employee (Employee\_id, First\_Name, Last\_Name, Email, Phone\_Number, Hire\_date, Job\_id, Salary, Commission\_pct, Manager\_id, Department\_id) VALUES (107, 'Anjali', 'Desai', 'anjali.desai@example.com', '9123456795', TO\_DATE('2021-12-05', 'YYYY-MM-DD'), 'HR\_REP', 47000, NULL, 102, 30);

EDIT	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY	COMMISSION_PCT	MANAGER_ID	DEPARTMENT_ID
	101	Amit	Sharma	amit.sharma@example.com	9123456789	03/01/2021	IT_PROG	60000	-	100	50
	102	Sita	Patel	sita.patel@example.com	9123456790	05/12/2020	HR_REP	45000	-	101	30
	103	Rahul	Verma	rahul.verma@example.com	9123456791	07/23/2019	SA_MAN	70000	.1	101	80
	104	Priya	Singh	priya.singh@example.com	9123456792	08/17/2022	FL_ACCOUNT	50000	-	102	50
	105	Rohan	Reddy	rohan.reddy@example.com	9123456793	11/02/2020	ST_CLERK	35000	-	101	50
	106	Kiran	Nair	kiran.nair@example.com	9123456794	09/25/2018	IT_PROG	65000	-	100	60
	107	Anjali	Desai	anjali.desai@example.com	9123456795	12/05/2021	HR_REP	47000	-	102	30

row(s) 1 - 7 of 7

**Find the Solution for the following:**

1. Create a view called EMPLOYEE\_VU based on the employee numbers, employee names and department numbers from the EMPLOYEES table. Change the heading for the employee name to EMPLOYEE.

```
CREATE VIEW EMPLOYEE_VU AS
SELECT Employee_id,
       First_Name || ' ' || Last_Name AS EMPLOYEE,
       Department_id
FROM Employee;
```

2. Display the contents of the EMPLOYEE\_VU view.

```
SELECT * FROM EMPLOYEE_VU;
```

EMPLOYEE_ID	EMPLOYEE	DEPARTMENT_ID
101	Amit Sharma	50
102	Sita Patel	30
103	Rahul Verma	80
104	Priya Singh	50
105	Rohan Reddy	50
106	Kiran Nair	60
107	Anjali Desai	30

7 rows returned in 0.03 seconds [Download](#)

3. Select the view name and text from the USER\_VIEWS data dictionary views.

```
SELECT view_name, text
FROM user_views
WHERE view_name = 'EMPLOYEE_VU';
```

VIEW_NAME	TEXT
EMPLOYEE_VU	SELECT Employee_id, First_Name    ' '    Last_Name AS EMPLOYEE, Department_id FROM Employee

1 rows returned in 0.02 seconds      [Download](#)

4. Using your EMPLOYEES\_VU view, enter a query to display all employees names and department.

**SELECT EMPLOYEE, Department\_id**  
**FROM EMPLOYEE\_VU;**

EMPLOYEE	DEPARTMENT_ID
Amit Sharma	50
Sita Patel	30
Rahul Verma	80
Priya Singh	50
Rohan Reddy	50
Kiran Nair	60
Anjali Desai	30

7 rows returned in 0.00 seconds

5. Create a view named DEPT50 that contains the employee number, employee last names and department numbers for all employees in department 50. Label the view columns EMPNO, EMPLOYEE and DEPTNO. Do not allow an employee to be reassigned to another department through the view.

**CREATE VIEW DEPT50 AS**  
**SELECT Employee\_id AS EMPNO,**  
     **Last\_Name AS EMPLOYEE,**  
     **Department\_id AS DEPTNO**  
**FROM Employee**  
**WHERE Department\_id = 50**  
**WITH READ ONLY;**

6. Display the structure and contents of the DEPT50 view.

**DESC DEPT50;**

Object Type **VIEW** Object **DEPT50**

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
<u>DEPT50</u>	<u>EMPNO</u>	NUMBER	-	6	0	-	-	-	-
	<u>EMPLOYEE</u>	VARCHAR2	25	-	-	-	-	-	-
	<u>DEPTNO</u>	NUMBER	-	4	0	-	✓	-	-
1 - 3									

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**SELECT \* FROM DEPT50;**

EMPNO	EMPLOYEE	DEPTNO
101	Sharma	50
104	Singh	50
105	Reddy	50

3 rows returned in 0.00 seconds

7. Attempt to reassign Matos to department 80.

**UPDATE DEPT50**

**SET DEPTNO = 80**

**WHERE EMPLOYEE = 'Matos';**

This should fail due to the READ ONLY constraint.

ORA-42399: cannot perform a DML operation on a read-only view

8. Create a view called SALARY\_VU based on the employee last names, department names, salaries, and salary grades for all employees. Use the Employees, DEPARTMENTS and JOB\_GRADE tables. Label the column Employee, Department, salary, and Grade respectively.

**CREATE VIEW SALARY\_VU AS**

**SELECT**

**e.Last\_Name AS Employee,**

**d.Dept\_name AS Department,**

**e.Salary AS Salary,**

**jk.Grade\_level AS Grade**

**FROM**

**Employee e**

**JOIN**

**Department d ON e.Department\_id = d.Dept\_id**

**JOIN**

**Job\_Grade jg ON e.Salary BETWEEN jg.Lowest\_sal AND jg.Highest\_sal;**

**SELECT \* FROM SALARY\_VU;**

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EMPLOYEE	DEPARTMENT	SALARY	GRADE
Reddy	IT	35000	A
Patel	HR	45000	A
Desai	HR	47000	A
Singh	IT	50000	A
Sharma	IT	60000	B
Nair	Finance	65000	B
Verma	Sales	70000	B

7 rows returned in 0.01 seconds

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**RESULT:**

Hence, views are created and executed successfully.