

Views in SQL

What Is a View?

EMPLOYEES table

	EMPLOYEE_ID	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER	HIRE_DATE	JOB_ID	SALARY
1	100	Steven	King	SKING	515.123.4567	17-JUN-87	AD_PRES	24000
2	101	Neena	Kochhar	NKOCHHAR	515.123.4568	21-SEP-89	AD_VP	17000
3	102	Lex	De Haan	LDEHAAN	515.123.4569	13-JAN-93	AD_VP	17000
4	103	Alexander	Hunold					9000
5	104	Bruce	Ernst					6000
6	107	Diana						4200
7	124	Kevin						5800
8	141	Trenna					ST_CLERK	3500
9	142	Curtis					ST_CLERK	3100
10	143	Randall				15-MAR-98	ST_CLERK	2600
11	144	Peter	Vargas	PVARGAS	650.121.2004	09-JUL-98	ST_CLERK	2500
12	149	Eleni	Zlotkey	EZLOTKEY	011.44.1344.429018	29-JAN-00	SA_MAN	10500
13	174	Ellen	Abel	EABEL	011.44.1644.429267	11-MAY-96	SA REP	11000
14	176	Jonathon	Taylor	JTAYLOR	011.44.1644.429265	24-MAR-98	SA REP	8600
15	178	Kimberely	Grant	KGRANT	011.44.1644.429263	24-MAY-99	SA REP	7000
16	200	Jennifer	Whalen	JWHALEN	515.123.4444	17-SEP-87	AD_ASST	4400
17	201	Michael	Hartstein	MHARTSTE	515.123.5555	17-FEB-96	MK_MAN	13000
18	202	Pat	Fay	PFAY	603.123.6666	17-AUG-97	MK REP	6000
19	205	Shelley	Higgins	SHIGGINS	515.123.8080	07-JUN-94	AC_MGR	12000
20	206	William	Gietz	WGIETZ	515.123.8181	07-JUN-94	AC_ACCOUNT	8300

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1	100	Steven	King	SKING	515.123.4567	17-JUN-87	AD_PRES	24000
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Advantages of Views

To restrict
data access

To make complex
queries easy

To provide
data
independence

To present
different views of
the same data



Advantages of Views

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To make complex
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Views restrict access to the data because the view can display selected columns from the table.



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Advantages of Views

Views can be used to make simple queries to retrieve the results of complicated queries. For example, views can be used to query information from multiple tables without the user knowing how to write a join statement.

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Advantages of Views

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Views provide data independence for ad hoc users and application programs. One view can be used to retrieve data from several tables.

To provide
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Advantages of Views

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Views provide groups of users access to data according to their particular criteria.

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Views

- Views in SQL are kind of virtual tables.
- A view also has rows and columns as they are in a real table in the database.
- We can create a view by selecting fields from one or more tables present in the database.
- A View can either have all the rows of a table or specific rows based on certain condition.

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 operations through a view	Yes	Not always

Creating a View

- You embed a subquery in the CREATE VIEW statement:

Syntax:

Create View *view_name*

As *subquery*

Creating a View

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000

- Create **faculty_proff** view, which contains details about professors only

Creating a View

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
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- Create **faculty_proff** view, which contains details about professors only

```
SQL> create view faculty_proff  
2 as select * from faculty  
3 where designation='Proff';
```

View created.

```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
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Creating a View

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```
SQL> create view faculty_proff  
2 as select * from faculty  
3 where designation='Proff';
```

View created.

```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000

- Describe the structure of View by issuing DESCRIBE / DESC command.

Name	Null?	Type
EMPNO	NOT NULL	NUMBER(2)
ENAME		VARCHAR2(10)
QUALIFICATION		VARCHAR2(10)
DESIGNATION		VARCHAR2(10)
DEPTNO		NUMBER(3)
SALARY		NUMBER(8)

Creating a View

- Create a view by using aliases in the subquery:

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
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Creating a View

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2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000

```
SQL> create view Annual_Sal  
2  as select empno,ename, salary*12 As "Annual Salary"  
3  from faculty;
```

```
View created.
```

Creating a View

- Create a view by using aliases in the subquery:

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000

```
SQL> create view Annual_Sal  
2  as select empno,ename, salary*12 As "Annual Salary"  
3  from faculty;
```

View created.

```
SQL> select * from Annual_Sal;
```

EMPNO	ENAME	Annual Salary
1	SANA	840000
2	Bushra	900000
3	Jhon	240000
4	Siraj	960000

Retrieving Data from a View

```
SQL> create view faculty_proff  
2  as select * from faculty  
3  where designation='Proff';
```

View created.



Retrieving Data from a View

```
SQL> create view faculty_proff  
2  as select * from faculty  
3  where designation='Proff';
```

View created.



```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	QUALIFICA	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000

```
SQL> select ename from faculty_proff;
```

ENAME
SANA
Bushra

Modifying a View

- Modify the faculty_proff view by using CREATE OR REPLACE view clause.

```
SQL> create or replace view faculty_proff  
  2  as select empno, ename,deptno  
  3  from faculty  
  4  where designation='Proff';
```

View created.

Modifying a View

- Modify the faculty_proff view by using CREATE OR REPLACE view clause.

```
SQL> create or replace view faculty_proff  
  2  as select empno, ename,deptno  
  3  from faculty  
  4  where designation='Proff';
```

View created.

```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	DEPTNO
1	SANA	11
2	Bushra	22

Creating a Complex View

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

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFCAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000

```
SQL> select * from dept;
```

DEPTNO	DNAME	LOC
22	IT	Mum
11	Comp	mumbai
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

6 rows selected.

The example in the slide creates a complex view of department names, minimum salaries, maximum salaries, and average salaries by department.]

Creating a Complex View

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

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFCAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000

```
SQL> select * from dept;
```

DEPTNO	DNAME	LOC
22	IT	Mum
11	Comp	mumbai
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

6 rows selected.

The example in the slide creates a complex view of department names, minimum salaries, maximum salaries, and average salaries by department.]

```
SQL> create view dept_report
2 (Dept_name, minsal,maxsal,avgsal)
3 as select d.dname, min(f.salary), max(f.salary), avg(f.salary)
4 from faculty f join dept d
5 on (f.deptno=d.deptno)
6 group by d.dname;
```

View created.

```
SQL> select * from dept_report;
```

DEPT_NAME	MINSL	MAXSL	AUGSL
ACCOUNTING	20000	20000	20000
IT	75000	75000	75000
Comp	70000	70000	70000
RESEARCH	80000	80000	80000

Rules for Performing DML Operations on a View

- You can usually 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

DML Operations on Simple View

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000

```
SQL> create view faculty_proff  
2 as select * from faculty  
3 where designation='Proff';
```

View created.

```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000

- Now insert one row in faculty_proff view
- check the content of faculty_proff view
- Will this update faculty table also ??? check it out

DML Operations on Simple View

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
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```
SQL> create view faculty_proff  
2 as select * from faculty  
3 where designation='Proff';
```

View created.

```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000

- Now insert one row in faculty_proff view

```
SQL> insert into faculty_proff values(10,'Maya','BE','Proff',11,50000);
```

1 row created.

```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
10	Maya	BE	Proff	11	50000

- check the content of faculty_proff view
- Will this update faculty table also ??? check it out

```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
10	Maya	BE	Proff	11	50000

DML Operations on Simple View

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000

```
SQL> create view faculty_proff  
2 as select * from faculty  
3 where designation='Proff';
```

View created.

```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000

- Now insert one row in faculty_proff view

```
SQL> insert into faculty_proff values(10,'Maya','BE','Proff',11,50000);  
1 row created.
```

```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
10	Maya	BE	Proff	11	50000

- check the content of faculty_proff view

- Will this update faculty table also ??? check it out

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000
10	Maya	BE	Proff	11	50000

DML Operations on Simple View

```
SQL> create view new_fact  
2 as select ename, designation from faculty;
```

View created.

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000

```
SQL> select * from new_fact;
```

ENAME	DESIGNATIO
SANA	Proff
Bushra	Proff
Jhon	Lab Asst.
Siraj	manager
Maya	Proff

- Now insert one row in faculty_proff view

```
SQL> insert into new_fact values('Seema','Lecturer');
```

DML Operations on Simple View

```
SQL> create view new_fact  
2 as select ename, designation from faculty;
```

View created.

```
SQL> select * from faculty;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000

```
SQL> select * from new_fact;
```

ENAME	DESIGNATIO
SANA	Proff
Bushra	Proff
Jhon	Lab Asst.
Siraj	manager
Maya	Proff

- Now insert one row in faculty_proff view

```
SQL> insert into new_fact values('Seema','Lecturer');  
insert into new_fact values('Seema','Lecturer')  
*  
ERROR at line 1:  
ORA-01400: cannot insert NULL into ("SCOTT"."FACULTY"."EMPNO")
```

Denying DML Operations

- You can ensure that no DML operations occur by adding the WITH READ ONLY option to your view definition.
- Any attempt to perform a DML operation on any row in the view results in an Oracle server error.



Denying DML Operations

- You can ensure that no DML operations occur by adding the WITH READ ONLY option to your view definition.
- Any attempt to perform a DML operation on any row in the view results in an Oracle server error.



```
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;
CREATE VIEW succeeded.
```

```
SQL> select * from faculty;
```

Denying DML Operations

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
3	Jhon	diploma	Lab Asst.	10	20000
4	Siraj	MBA	manager	20	80000
10	Maya	BE	Proff	11	50000

```
SQL> create or replace view faculty_proff  
2  as select * from faculty  
3  where designation='Proff'  
4  with read only;
```

View created.

```
SQL> select * from faculty_proff;
```

EMPNO	ENAME	QUALIFICAT	DESIGNATIO	DEPTNO	SALARY
1	SANA	ME	Proff	11	70000
2	Bushra	ME	Proff	22	75000
10	Maya	BE	Proff	11	50000

- Try to insert or delete from faculty_proff view

```
SQL> insert into faculty_proff values(20,'Harry','BE','Manager',20,50000);  
insert into faculty_proff values(20,'Harry','BE','Manager',20,50000)  
*  
ERROR at line 1:  
ORA-01733: virtual column not allowed here
```

```
SQL> delete from faculty_proff where empno=10;
```

```
delete from faculty_proff where empno=10
```

```
*
```

```
ERROR at line 1:
```

```
ORA-01752: cannot delete from view without exactly one key-preserved table
```

Removing a View

You can remove a view without losing data because a view is based on underlying tables in the database.

```
DROP VIEW view;
```

```
DROP VIEW empvu80;  
DROP VIEW empvu80 succeeded.
```