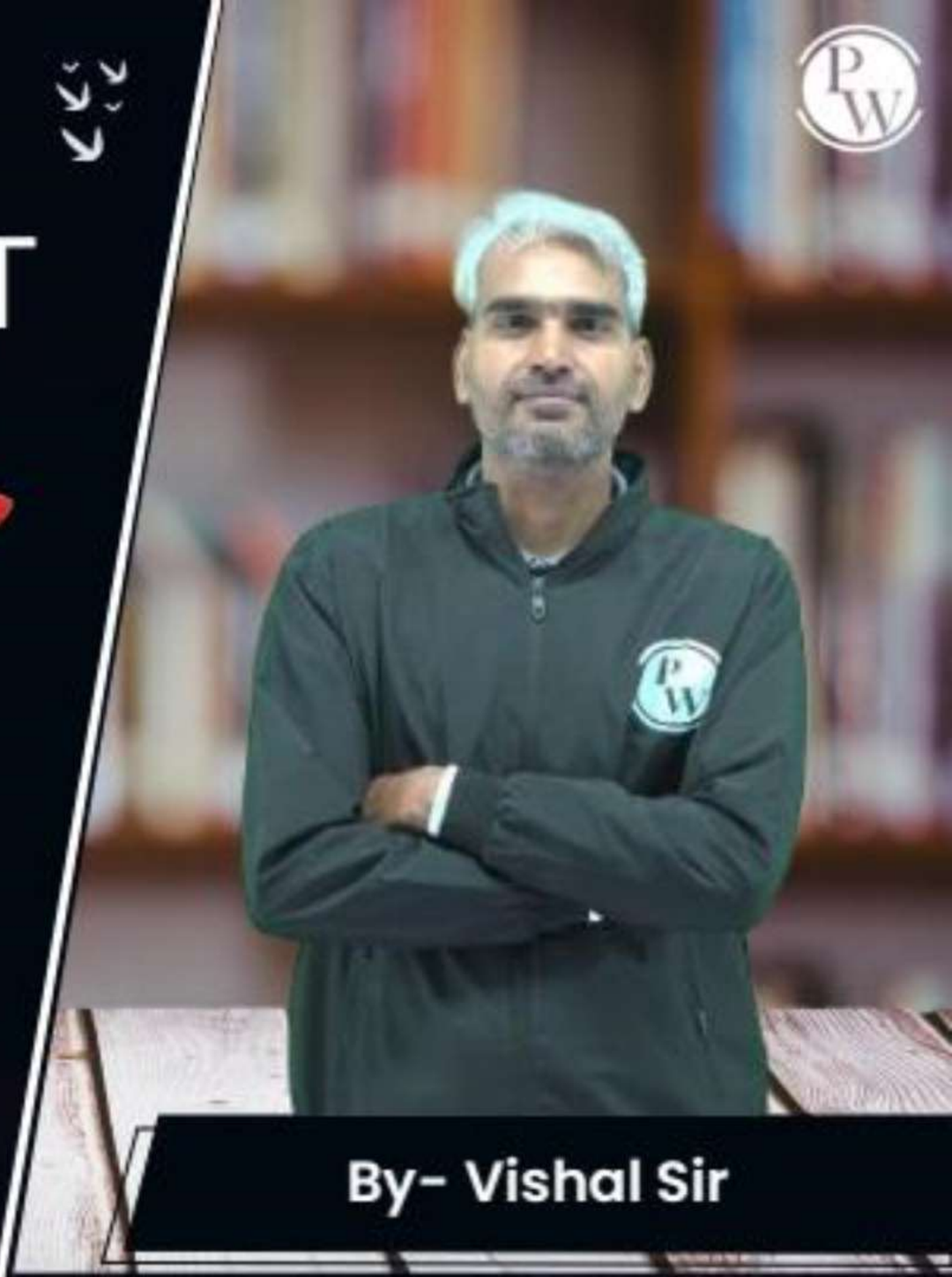
Computer Science & IT

Database Management System

Query Languages

Lecture No. 09



By- Vishal Sir

Recap of Previous Lecture

Topic ANY, ALL and EXISTS operators

Topic Practice questions

Slide

Topics to be Covered

- Topic: AS clause
- Topic: WITH clause
- Topic: Comparison with NULL
- Topic: Comparison with regular expression

Slide

Topic : AS clause

{ Using 'AS' we can rename almost Everything }

AS clause is used to rename a column or table with an alias. New identity

An alias only exists for the duration of the query.

→ Customer_order (Order_number, Date_of_order, Amount_Received)
(C)

Supplier (Supplier_id, Supplier_name, Order_number)
(S)

'ABC' '5000'

Retrieve the order_number, Corresponding to supplier_name 'ABC', And amount_received is 5000

```
Select   C.Order_number AS C.NO.
  From   Customer_order AS C, Supplier AS S
 Where  (C.order_number = S.order_number
                AND
        S.Supplier_name = 'ABC'
                AND
        C.Amount_Received = 5000)
```

C.NO.

#e.g. Consider a database that has the relation schema EMP (EmpId, EmpName, and DeptName).
An instance of the schema EMP and a SQL query on it are given below:

EMP

EmpId	Emp Name	DeptName
1	XYA	AA
2	XYB	AA
3	XYC	AA
4	XYD	AA
5	XYE	AB
6	XYF	AB
7	XYG	AB
8	XYH	AC
9	XYI	AC
10	XYJ	AC
11	XYK	AD
12	XYL	AD
13	XYM	AE

```
SELECT AVG(EC.Num)
FROM EC
WHERE (DeptName, Num) IN
    (SELECT DeptName, COUNT(EmpId) AS EC(DeptName, Num)
                FROM EMP
                GROUP BY DeptName)
```

The output of executing the SQL query is _____

#e.g. Consider a database that has the relation schema EMP (EmpId, EmpName, and DeptName).
An instance of the schema EMP and a SQL query on it are given below:

```
SELECT AVG(EC.Num)
FROM EC
WHERE (DeptName, Num) IN
    (SELECT DeptName, COUNT(EmpId) AS EC(DeptName, Num)
                                    FROM EMP
                                    GROUP BY DeptName)
```

The output of executing the SQL query is _____

Select Avg (EC.num)
From EC
Where (DeptName, Num) IN (Select DeptName, Count(EmpId) AS EC (DeptName, Num)
From EMP
Group by (DeptName))

tuple with two attributes

independent inner query

∴ Inner query will be executed first

Because of execution of inner query, EC table will be Created

#e.g. Consider a database that has the relation schema EMP (EmpId, EmpName, and DeptName).
An instance of the schema EMP and a SQL query on it are given below:

```
SELECT AVG(EC.Num)
FROM EC
WHERE (DeptName, Num) IN
    (SELECT DeptName, COUNT(EmpId) AS EC(DeptName, Num)
     FROM EMP
     GROUP BY DeptName)
```

The output of executing the SQL query is _____

EC

DeptName	Num
DeptName	Count(EmpID)
AA	4
AB	3
AC	3
AD	2
AE	1

#e.g. Consider a database that has the relation schema EMP (EmpId, EmpName, and DeptName).
An instance of the schema EMP and a SQL query on it are given below:

EC

DeptName	Num
DeptName	Count(EmpID)
AA	4
AB	3
AC	3
AD	2
AE	1

```
(3) SELECT AVG(EC.Num)
(1) FROM EC
(2) WHERE (DeptName, Num) IN
    (SELECT DeptName, COUNT(EmpId) AS EC(DeptName, Num)
     FROM EMP
     GROUP BY DeptName)
```

All tuples of EC table will be selected by where condⁿ.

The output of executing the SQL query is _____

$$\frac{4+3+3+2+1}{5} = \frac{13}{5} = 2.6$$

Topic : WITH clause

The WITH Clause is mainly used to provide a subquery block a name that can be referenced within the main SQL query.

o/p of subquery

New-Schema

- With new_table_name (List of new names to the corresponding attributes) AS Sub-query

We may have multiple sub-query using "With" clause

This Sub-query will Produce an output.

New-Schema will be Corresponding to the o/p of Sub-query

Finally we will have Main query

Select _ _ _ _

_ _ _ _

_ _ _

#e.g. Consider the following database table named water_scheme

GATE

water_scheme		
scheme_no	district_name	capacity
1	Ajmer	20
1	Bikaner	10
2	Bikaner	10
3	Bikaner	20
1	Churu	10
2	Churu	20
1	Dungargarh	10

The number of tuples returned by the following SQL query is_____

① ② ③ Main query

```
with total(name, capacity) as
        select district_name, sum(capacity)
        from water_schemes
        group by district_name
with total_avg(capacity) as
        select avg(capacity)
        from total
select name from total, total_avg
        where total.capacity >= total_avg.capacity
```

#e.g. Consider the following database table named water_scheme

total

name	Capacity
district_name	Sum(Capacity)
Ajmer	20
Bikaner	40
Churu	30
Dungargarh	10

The number of tuples returned by the following SQL query is _____

```
with total(name, capacity) as
        select district_name, sum(capacity)
        from water_schemes
        group by district_name
with total_avg(capacity) as
        select avg(capacity)
        from total
select name from total, total_avg
        where total.capacity >= total_avg.capacity
```

① ② ③

Sub-query ①

#e.g. Consider the following database table named water_scheme

total

name	Capacity
district_name	Sum(Capacity)
Ajmer	20
Bikaner	40
Churu	30
Dungargarh	10

total_avg

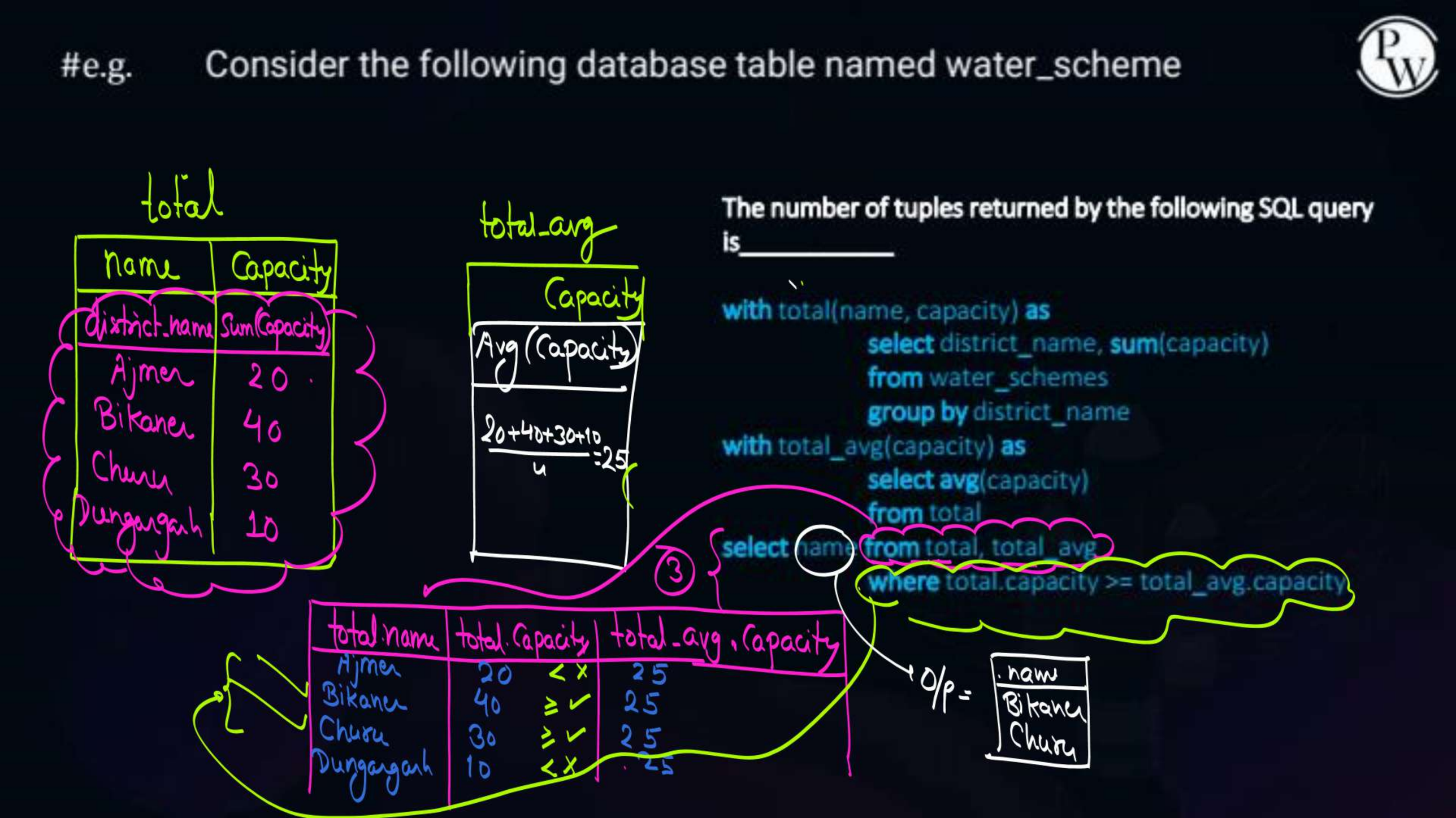
Capacity
Avg(Capacity)
20+40+30+10 / 4 = 25 (2)

The number of tuples returned by the following SQL query is _____

```
with total(name, capacity) as
        select district_name, sum(capacity)
        from water_schemes
        group by district_name
with total_avg(capacity) as
        select avg(capacity)
        from total
select name from total, total_avg
        where total.capacity >= total_avg.capacity
```

Sub-query (2)

#e.g. Consider the following database table named water_scheme



Topic : Comparison with NULL

'NULL' is a non-zero unknown value,
and
No two 'NULL' are equal.

EMP

Eid	Ename	Passport_No.
E_1	ABC	123XYZ
E_2	Ram	NULL
E_3	Mohan	279AXL

Retrieve Eids of the Employee with no Passport from EMP table.

```
Select Eid
From EMP
Where Passport_No. = 0
```

Wrong, NULL is not equal to zero

```
Select Eid
From EMP
Where Passport_No. = NULL
```

Wrong, No two NULL are equal

Topic : Comparison with NULL

→ 'NULL' is a non-zero unknown value,
and
No two 'NULL' are equal.

EMP

Eid	Ename	Passport_No.
E_1	ABC	123XYZ
E_2	Ram	NULL
E_3	Mohan	279AXL

No Compare with NULL, operator used is 'IS'

```
Select Eid
From EMP
Where Passport_No. IS NULL
```

} Correct query

Retrieve Eids of the Employee with no Passport from EMP table.

Note:

Complement of 'IS' is 'IS NOT'.

Topic : Regular expression

Query: Retrieve Sids of all students whose name starts with 'A'

- Regular Expression Corresponding to the names starting with A is 'A%'

Topic : Regular expression

'_' represent exactly one character.

Underscore

And

'%' represent 0 or more characters

Any number of characters

Q: Write the regular Expression for the names starting with 'A', third character from the End is 'E', and Contains atleast 8 characters in total.

① 'A_,_,_,_,_,%,E,_,_'

② 'A_,_,%,_,%,_,%,_,%,E,_,_'

③ 'A,_,_,%,_,_,E,_,_'

Topic : Comparison with regular expression

To Compare with regular Expression operator used is LIKE

Complement of 'LIKE' is 'NOT LIKE'

Topic : Regular expression

Student(Sid, Sname, Branch)

Query: Retriere Sids of all students Whose name starts with 'A'

```
Select Sid
    From Student
        Where Sname LIKE 'A%'
```

- 'Except' in SQL ≡ Minus

#Q. H.W.

Consider the relational database with the following four schemes and their respective instances.

Student(sNo, sName, dNo) Dept(dNo, dName)
Course(cNo, cName, dNo) Register(sNo, cNo)

Student

sNo	sName	dNo
S01	James	D01
S02	Rocky	D01
S03	Jackson	D02
S04	Jane	D01
S05	Milli	D02

Dept

dNo	dName
D01	CSE
D02	EEE

Course

cNo	cName	dNo
C11	DS	D01
C12	OS	D01
C21	DE	D02
C22	PT	D02
C23	CV	D03

Register

sNo	cNo
S01	C11
S01	C12
S02	C11
S03	C21
S03	C22
S03	C23
S04	C11
S04	C12
S05	C11
S05	C21

Question Continues in Next Slide

[NAT: 2022: 2M]

#Q.

SQL Query:

```
SELECT * FROM Student AS S
WHERE NOT EXIST
        (SELECT cNo FROM Course WHERE dNo = "D01".
                EXCEPT
        SELECT cNo FROM Register WHERE sNo = S.sNo)
```

The number of rows returned by the above SQL query is _____.

2 mins Summary

- Topic: AS clause
- Topic: WITH clause
- Topic: Comparison with NULL
- Topic: Comparison with regular expression

THANK - YOU