AGENDA

1. subQueries - what / why
2. keywords ALL/ANY
3. correlated SQ
4. subqueries in FROM / where

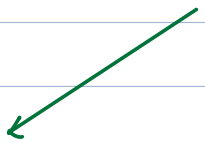
start by 9:05 PM

*) SUBQUERIES:

student

id	Name	psp	batch-id

Q.) find all students where PSP > MAX PSP of b → id = 2



code

S1.) Find MAX PSP of b = 2
S2.) compare...

Q.) All students PSP > PSP of student. id = 18.

① id = 18
② compare

```
select .....
from student s
join student t
on t.id = 18 AND s.id = t.id
s.psp > t.psp;
```

✓

1	yash	20	2	R_1
2	AMAN	40	2	.
3	Naman	30	1	.

Subquery → breaks big prob → small

Advantage:

Your Queries look easier

90% → sq → can be done Natively.

Find all students psp > student_id = 18 (SQL)

1.) find psp of 18
2.) compare....

SQL$_1$: select psp from stud ✓
where id = 18;

SQL$_2$: select * from stud
where psp > ×.....

↓

(2) ⇒

```
select * from stud where
    psp > ( select psp from
        stud where id=18 );
```

✓

syntax → (.....)

** imp.

*) PROBLEMS:

1.) Performance ↓↓ very slow.

```
for i .... N :
    for j .... N :        } O(N^2)
```

1	yash	20	b1	•
2	ANAN	40	b2	2 •
3	.	. - -	-1	2
4	. - - - -	-	2	2

COND: s.id = t.stud_id ⟶ Most of JOINS

✓ (Pk)

#

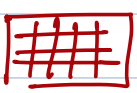
q.) find all students where PSP > MAX PSP of b_id = 2

↓↓↓

```
select * from student where
psp >
    ( select MAX(psp) from
    student where b_id = 2 );
```

#2. Get all films where Avg(rental-rate) of films of that yr > Global Avg Rate.

Getting

#Rows	#Cols	O/P
1	1	1
1	M	single row
M	1	single col
M	N	

$(R_1) \times R_2$ ✗

$(R_1 \times R_2)$ ✗

#

users

id	Name	is-stud	is-ta
1	yash	0	1
2	yash	1	0
3	yash	1	1

O/P → "yash"

Q.) Give Names of stud, which are Also Name of ta.

stud = yash
ta = yash ✓

stud = yash x
ta = x

w/o self JOIN

```
select distinct(name)
from stud s JOIN
ta t ON
s.name = t.name
AND s.is_stud = true AND t.isL ta = true;
```

self JOIN:

```
select distinct(name)
from stud s JOIN
```

stud t . ON

s.name = t.name

AND s.is_stud = true AND t.isL ta= true;

SUBQUERY:

① Get Names of all ta

② Get students present in ta[]

Q1.) (N) select distinct(name) from users where is_ta= true;

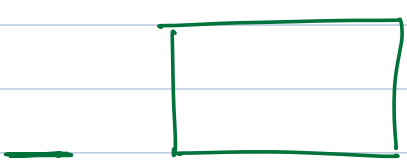
Q2.) select distinct(name) from users

where is_stud = true AND → O(N²)

name IN [x];

↓

Q1



users

id	NAME	is_stud	is_ta	
1	Yash	0	1	✓
2	Yash	1	0	✗
3	SURAJ	1	1	✓

10:08 ⟶ 5 MINS

10:14 PM IST

Subqueries with JOIN:

Q.) Get All stud whose psp > smallest psp of Every batch.

students

id	Name	b-id	M-psp
1	-	1	20.
2	-	2	41.
3	-	3	19.
4	-	4	37.

Name	psp
Yash	47

o/p :: 22 ✓

Prob:

1.) Get Min psp of each batch

2.) Compare & Get all students

Q1.)

```
select MIN(psp) from student
Group by b-id;
```

✓

Q2.)

⟶ student(psp) > MIN psp of all batches...

we will compare Max psp o from all batches with that

b-id	psp
1	20
→ 2	(41)

Max psp

of student . 3 19
. 4 37

q_2 `select Max(Psp) from x;`
↳ (Actually q_1)

(Prob 2.)

q_3: `select * from student where psp > M;`

full subquery:

```
Select * from stud where psp >
-( select Max(P.psp) FROM
    ( select MIN(Psp) psp FROM
        stud Group by b_id ) P );
```

✓

subquery INSIDE FROM ↗ ↘

Rule: All sq inside FROM ⟶ should have alias.

learning →

① SQL creates virtual table → if inside FROM (...)

② you need to give alias → if inside FROM (...)

*) ALL / ANY:

Prev Q

S2.)

another solution:

```
select * from students
    where psp > ALL (
    select MIN(PSP) from students
        group by b_id);
```

student

id 18

PSP 24 > ALL

b_id	PSP	
1	21	✓
2	42	✓
3	19	✓

AND COND

```
select * from students
    where psp > ANY (
    select MIN(PSP) from students
        group by b_id);
```

ANY : OR CONDITION

ALL : AND

*) CORRELATED SQ:

Q.) Get all students whose PSP > Avg psp of own batch.

1.) Get avg psp of batch → ?? (x)
2.) Get all student. psp > .....

Q1.) select avg (PSP) from student where b-id = ...

Q2.) select * from students where PSP > .....

solution →

Mandatory Alias.

```
select * from student s
  where psp > (
    select avg(PSP) from
    student where b_id = s.b-id);
```

↓

```
for i.... N:
    for j .... N:
        k= i+j
```

7) EXISTS (keyword)

Q.) Get all students who are ALSO TA:

student

id	name	Psp.
1	Navan	21-

ta ↓

id	Name	s_id
1	Yash	NULL
2	Navan	1
3	Arun	2

subproblems:

① Get ta id which is student
② Get all student IN ta-id.

→

```
select * from student
where id IN (
    select s.id from ta
    where s.id IS NOT NULL);
```

(W1)

(W2)

```
select * from student s
where id IN ( select s.id
    from ta where
    s_id = s.id )
```

IN → (id=2, id=3) IN ROWS

↳ better solution :

EXIST

for ....
  for j ..... M
    if (i=j ...)
      break;

: for every stud.

syntax: select * FROM students
where id EXISTS (.....)

IM

id=1 (..10th..)

Outer Q
Naman id=18

XXXX

[15,16,..18 21, 22 ..... 2000]
XXX

IN [15 16 17 18 19