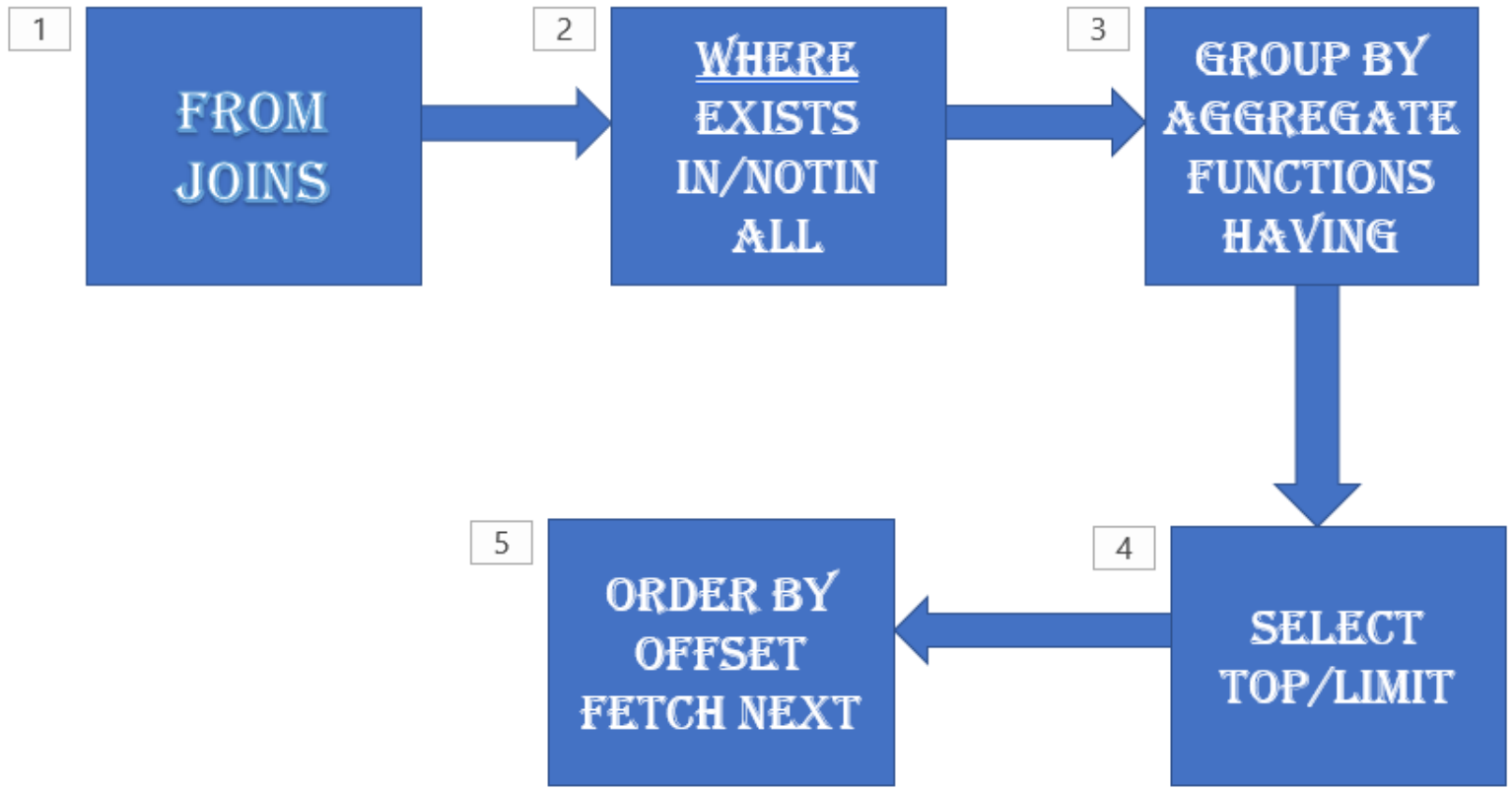
SQL TOPICS

- ***DDL , DML*** *COMMANDS : CRUD operations*
- *PRACTICE* ***SELECT*** *STATEMENT*
- *FILTERS(****HAVING, WHERE ,IN, NOT IN ,BETWEEN****)*
- *AGGREGATION (****GROUP BY, COUNT,SUM, MAX, MIN,AVG****)*
- *ORDER BY & WILDCARDs*
- *JOINS (****INNER, LEFT, RIGHT, FULL , SELF , CROSS****)*
- *WINDOWS FUNCTION (****RANK,ROW_NUMBER,DENSE_RANK,NTILE, CUME_DIST****)*
- *CASE STATEMENT*
- *CTE,SUBQUERIES, TEMP TABLE ,RECURSIVE CTEs*
- *LEAD , LAG , FIRST VALUE , LAST VALUE*
- *STRING FUNCTIONS*

SQL Statements Execution order



Q:We have one table sequence, write a SQL query to get the desired output.

Name	Sequence
A	1
A	2
A	3
A	5
A	6
A	8
A	9
B	11
C	1
C	2
C	3

Name	Min_Seq	Max_Seq
A	1	3
A	5	6
A	8	9
B	11	11
C	1	3

```
Select Name,MIN(sequence) as MIN_Seq,MAX(sequence) as
MAX_Seq from (
Select Name,sequence,sequence-ROW_NUMBER()over
(partition by name order by name) as diff
from #seq
group by name,sequence
)t
group by name,diff
order by name
```

Q- Write a SQL query to get desired output .

Input table : Airport

SOURCE	DESTINATION
DELHI	MUMBAI
MUMBAI	DELHI
DELHI	PATNA
BANGALORE	PUNE
PUNE	BANGALORE
CHANDIGARH	CHENNAI
PUNE	MUMBAI
HYDERABAD	GOA
GOA	HYDERABAD

Output:-

SOURCE	DESTINATION
DELHI	MUMBAI
DELHI	PATNA
BANGALORE	PUNE
CHANDIGARH	CHENNAI
PUNE	MUMBAI
GOA	HYDERABAD

```
SELECT  DISTINCT
CASE WHEN SOURCE < DESTINATION THEN SOURCE ELSE
DESTINATION END AS SOURCE ,
CASE WHEN SOURCE > DESTINATION THEN SOURCE ELSE
DESTINATION END AS DESTINATION
 FROM #AIRPORT
```

Q: Write the SQL Query to get the desired output .

Input Table: Employee

ID	Name	Salary	Manager_Id
10	Anil	50,000	18
11	Vikas	75,000	16
12	Nisha	40,000	18
13	Nidhi	60,000	17
14	Priya	80,000	18
15	Mohit	45,000	18
16	Rajesh	90,000	-
17	Raman	55,000	16
18	Santosh	65,000	17

Output :

Manager_id	Manager	Avg_salary_under_manager
16	Rajesh	65000
17	Raman	62500
18	Santosh	53750

```
SELECT
A.MANAGER_ID,B.NAME,A.AVG_SALARY_UNDER_MANAGER
FROM #EMPLOYEE B  JOIN
(
SELECT MANAGER_ID , AVG(Salary) AS
AVG_SALARY_UNDER_MANAGER FROM #EMPLOYEE
GROUP BY MANAGER_ID ) A
ON B.ID=A.MANAGER_ID
```

Q: Write a SQL query to get the desired output.

Input Table : Rough

ID
1
2
3
4
5
6
7
8
9
10

```
SELECT T.ID AS COLUMN1,B.ID AS COLUMN2
FROM
(SELECT  ID,ROW_NUMBER() OVER ( ORDER BY
ID ) AS ARN FROM #ROUGH A)  T INNER JOIN
( SELECT  ID,ROW_NUMBER() OVER ( ORDER BY
ID DESC) AS BRN FROM #ROUGH B ) B
ON T.ARN=B.BRN
WHERE T.ID <B.ID
```

Desired Output:

Colum1	Column2
1	10
2	9
3	8
4	7
5	6

Q: Write a SQL query to get desired output ?

Input Table : Salary

ID	Fname	Lname	Salary
1	Vishal	Kaushal	8000
2	Akshay	Kumar	9000
3	Zishan	Khan	3000
4	Khan	Zishan	5000
5	Katrina	Kaif	10000
6	Kaushal	Vishal	4000

Output :

Fname	Lname	Salary
Vishal	Kaushal	12000
Akshay	Kumar	9000
Zishan	Khan	8000
Katrina	Kaif	10000

```
SELECT FNAME,LNAME, S1+S2 AS TOTAL FROM (
SELECT A.ID,A.FNAME,A.LNAME, ISNULL(A.SALARY,0) AS
S1,ISNULL(B.SALARY,0) AS S2,
CASE WHEN A.ID<B.ID THEN 1
WHEN A.ID>B.ID THEN 0
ELSE 1 END AS T
FROM #SALARY A
LEFT JOIN #SALARY B ON A.FNAME=B.LNAME AND A.LNAME=B.FNAME
) D
WHERE T=1
```

- We have one table Demosales , write Sql query to get desired output.

Input :Demosales

OrderId	ProdId	Qty
O1	P1	5
O2	P2	1
O3	P3	3

```
WITH CTE (ORDERID,ProdId,QTY,ROWS) AS
( SELECT ORDERID,ProdId,QTY, 1 FROM #demosales
  UNION ALL
  SELECT ORDERID,ProdId,QTY,ROWS+1 FROM CTE
  WHERE ROWS < QTY)
SELECT ORDERID , ProdId , 1 AS  [Count] FROM CTE
ORDER BY ORDERID;
```

Desired Output :

OrderId	ProdId	Count
O1	P1	1
O1	P1	1
O1	P1	1
O1	P1	1
O1	P1	1
O2	P2	1
O3	P3	1
O3	P3	1
O3	P3	1

Q: Write a SQL query to get the Desired output from Input Table.

Input Table: Employee

Empid	Name	Gender	Department
1	Alexa	Female	IT
2	Naman	Male	Finance
3	Rita	Female	Finance
4	Priya	Female	HR
5	Shivangi	Female	HR
6	Rahul	Male	IT
7	Tanya	Female	Finance
8	Arun	Male	HR
9	Lakshya	Male	IT
10	Deepika	Female	HR

Output :

Department	TotalMale	TotalFemale
Finance	1	2
HR	1	3
IT	2	1

```
SELECT DEPARTMENT , SUM(CASE WHEN GENDER ='MALE'
THEN 1 ELSE 0 END) AS TOTALMALE,
SUM(CASE WHEN GENDER ='FEMALE' THEN 1 ELSE 0 END)
AS TOTALFEMALE
 FROM #EMPLOYEE
 GROUP BY DEPARTMENT
```

Q: Write a SQL query to get the desired output (missing number from the input series)

Input :Missing_rows

ID
1
3
4
5
6
9
12

```
WITH CTE
AS
(SELECT 1 AS SEQ ,( SELECT MAX(ID) FROM #MISSING_ROWS)AS
MAXSEQ
UNION ALL
SELECT SEQ+1 ,MAXSEQ FROM CTE WHERE SEQ < MAXSEQ )
SELECT SEQ FROM CTE WHERE SEQ NOT IN (SELECT ID FROM
#MISSING_ROWS)
```

Output :

Seq
2
7
8
10
11

Q: Write the SQL query to get the desired output.

Input Table: Gender

ID	Name	Gender
1	Anita	Male
2	Rakesh	Female
3	Arjun	Female
4	John	Female
5	Deepika	Male
6	Shivani	Male

Output :

ID	Name	Gender
1	Anita	Female
2	Rakesh	Male
3	Arjun	Male
4	John	Male
5	Deepika	Female
6	Shivani	Female

```
Select ID,NAME, CASE WHEN GENDER='MALE' THEN 'FEMALE'
WHEN GENDER='Female' THEN 'MALE' END  AS GENDER from
#gender – Select records

--Update table
Update #gender
Set Gender =(CASE WHEN GENDER='MALE' THEN 'FEMALE'
WHEN GENDER='Female' THEN 'MALE' END )
```

Q: Write the SQL query to get the desired output.

Input Table A, B

ID
1
1
1
1
1
2
2
2
2
2

ID
1
1
1
1
1
0
0
0
0
0

```
SELECT * FROM #B  WHERE ID NOT IN (SELECT ID
FROM #A)
UNION ALL
SELECT * FROM #B WHERE ID IN (SELECT ID FROM #A)
UNION ALL
SELECT * FROM #A WHERE ID NOT IN (SELECT ID FROM
#B)
```

Desired Output:

ID
0
0
0
0
0
1
1
1
1
1
2
2
2
2
2

Q: Write SQL query to get the max value from Rows?

Input Table : Maxrows

Name	Amount1	Amount2	Amount3
Vishal	5000	6800	4300
Rahul	3500	1000	2200
Simran	9800	9999	9990
Sukarn	5600	7757	8897
Vijay	6647	9898	10000

Output:

Name	MaxAmt
Vishal	6800
Rahul	3500
Simran	9999
Sukarn	8897
Vijay	10000

```
SELECT Name,
   (SELECT MAX(Amount)
      FROM (VALUES
(Amount1),(Amount2),(Amount3)) AS
A(Amount))   AS Maxamt
 FROM #maxrow
```

```
Select Name,Max(AMT) as Maxamt  from (
Select Name,Amount1 AS AMT from #maxrow
union all
Select Name,amount2 from #maxrow
union all
Select name,amount3 from #maxrow   ) A
group by Name
```

Q: Write SQL query to get desired output.

Input Table : Teams

Teamname
INDIA
AUSTRALIA
ENGLAND
NEWZEALAND

Output:

Matches
AUSTRALIA – INDIA
AUSTRALIA – NEWZEALAND
AUSTRALIA – ENGLAND
ENGLAND- INDIA
ENGLAND – NEWZEALAND
INDIA - NEWZEALAND

```
Select CONCAT(A.Teamname,' - ',B.Teamname) As MATCHES from #teams
A,#teams B
where A.teamname <B.teamname
order by A.Teamname
```

Q: Write the SQL query to get the desired Output ?

Input Table : Name

ID	Name
1	VISHAL
2	VISHAL
3	VISHAL
4	KAUSHAL
5	KAUSHAL
6	KAUSHAL

Output :

NAME
VISHAL
KAUSHAL
VISHAL
KAUSHAL
VISHAL
KAUSHAL

```
WITH CTE AS (
Select Name,ROW_NUMBER() over (Partition by Name
order by name) as RN
from #ab
)
select Name from CTE order by RN,NAME desc
```

Q: Write SQL query to get the desired output.

Input Table : Attendance

Date	Attendance
2021-07-01	1,2,3,4,6
2021-07-02	1,3,4,5
2021-07-03	1,2,3,4,5,6
2021-07-04	1,2,5

Output:

Date	Present count
2021-07-01	5
2021-07-02	4
2021-07-03	6
2021-07-04	3

```
 Select Date, LEN(Attendance)-LEN(REPLACE(Attendance,',',''))+1
as [Present count] from #attendance
```

Q: Write a SQL query to get the desired output? (Cumulative difference)

Input Table : ABCD

ID	Date	Amount
1	2019-07-01	100
2	2019-07-01	120
3	2019-07-01	110
4	2019-07-02	160
5	2019-07-02	700
6	2019-07-03	200
7	2019-07-03	50

Output:

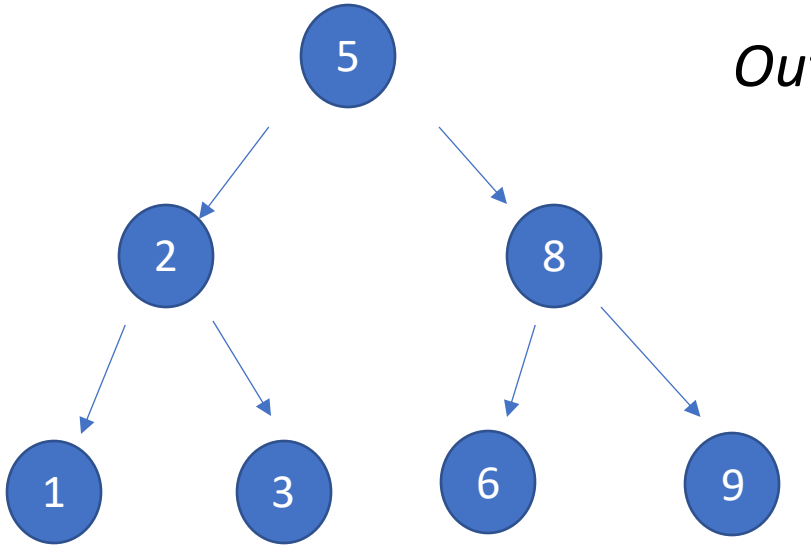
Date	Difference
2019-07-01	330
2019-07-02	530
2019-07-03	-280

```
WITH CTE AS (
SELECT TOP 1 RN,DATE,TOTAL,TOTAL AS DIFFERENCE FROM
 (SELECT   DATE,SUM(AMOUNT) OVER (PARTITION BY DATE ORDER
BY DATE ) AS TOTAL,
DENSE_RANK() OVER (ORDER BY DATE ) AS RN
 FROM #ABCD  ) A
 UNION ALL
 SELECT A.RN, A.DATE, A.TOTAL, A.TOTAL - CTE.DIFFERENCE
FROM (SELECT   DATE,SUM(AMOUNT) OVER (PARTITION BY DATE
ORDER BY DATE ) AS TOTAL,
DENSE_RANK() OVER (ORDER BY DATE ) AS RN
 FROM #ABCD  ) A INNER JOIN CTE
ON A.RN-1= CTE.RN
)
SELECT DISTINCT DATE,DIFFERENCE FROM CTE
```

Q: Write a SQL query to get the nodes of BINARY tree ?

Input Table : Binary

Node	Parent
1	2
3	2
6	8
9	8
2	5
8	5
5	Null




```
Select Distinct A.node,
CASE WHEN B.Node is null THEN 'LEAF'
WHEN A.parent is null THEN 'ROOT'
ELSE 'INNER' END as node from #binary A
left join #binary B
on A.node=B.parent
```

Output:

Node	Type
1	Leaf
2	Inner
3	Leaf
5	Root
6	Leaf
8	Inner
9	Leaf

Q: Write a SQL query to get desired output ?

Input Table : Salary

ID	Fname	Lname	Salary
1	Vishal	Kaushal	8000
2	Akshay	Kumar	9000
3	Zishan	Khan	3000
4	Khan	Zishan	5000
5	Katrina	Kaif	10000
6	Kaushal	Vishal	4000

Output :

Fname	Lname	Salary
Vishal	Kaushal	12000
Akshay	Kumar	9000
Zishan	Khan	8000
Katrina	Kaif	10000

```
SELECT FNAME,LNAME, S1+S2 AS TOTAL FROM (
SELECT A.ID,A.FNAME,A.LNAME, ISNULL(A.SALARY,0) AS
S1,ISNULL(B.SALARY,0) AS S2,
CASE WHEN A.ID<B.ID THEN 1
WHEN A.ID>B.ID THEN 0
ELSE 1 END AS T
FROM #SALARY A
LEFT JOIN #SALARY B ON A.FNAME=B.LNAME AND A.LNAME=B.FNAME
) D
WHERE T=1
```

Q: Write the SQL query to get desired output.

Input table : Employee

Empid	Name	MonthID	Bonus
1	VISHAL	1	20000
2	VISHAL	6	45000
3	RAHUL	2	73000
4	RAHUL	9	15000

Table : Month

MonthID	Month
1	Jan
2	Feb
3	Mar
4	Apr
5	May
6	Jun
7	Jul
8	Aug
9	Sep
10	Oct
11	Nov
12	Dec

```
With CTE As
(
Select distinct
A.Empid,A.Name,B.Monthname,B.Monthid from #employee
A , #month B
)
Select C.EMPID,C.NAME,Monthname,E.Bonus from CTE C
left join #employee E
on  C.EMpid=E.empid
and C.MOnthid=E.monthid
order by EMPID,C.Monthid
```

Output:

Empid	Name	Month	Bonus
1	VISHAL	Jan	20000
2	VISHAL	Feb	Null
3	VISHAL	Mar	Null
4	VISHAL	Apr	Null
5	VISHAL	May	Null
6	VISHAL	Jun	45000
7	VISHAL	July	Null
8	VISHAL	Aug	Null
9	VISHAL	Sep	Null
10	VISHAL	Oct	Null
11	VISHAL	Nov	Null
12	VISHAL	Dec	Null
13	RAHUL	Jan	Null
14	RAHUL	Feb	73000
15	RAHUL	Mar	Null
16	RAHUL	Apr	Null
17	RAHUL	May	Null
18	RAHUL	Jun	Null
19	RAHUL	July	Null
20	RAHUL	Aug	Null
21	RAHUL	Sep	15000
22	RAHUL	Oct	Null
23	RAHUL	Nov	Null
24	RAHUL	Dec	Null