

SQL (Aggregated Function and Set Operations)

- Aggregated function are used with **select clause** and also used by **group by** clause to work on groups if you don't use group by it'll work on entire collection
- Consider the following database

Roll	name	City	Deptno
1	Ajay	Delhi	10
2	Vijay	Kolkata	10
3	Ajay	Mumbai	20
4	Ramesh	Delhi	30
5	Suneeta	Lucknow	40
6	Anita	Kolkata	30
7	Raj	Jaipur	30
8	Ali	Lucknow	40
9	Michael	Cochin	10
10	Pavan	Vijaywada	20
11	Suraj	Hyderabad	10
12	Altaf	Bangaluru	40
13	Ravi	Indore	20
14	Verma	Delhi	20
15	Sharma	Vizag	10

Deptno	Name
10	CSE
20	ECE
30	Civil
40	Mech

- From student database we are counting total no.of students , roll numbers , name , and distinct name (without duplicates)

```
sqlite> .open univ
sqlite> select * from students
...> ;
1|Ajay|Delhi|10
2|Vijay|Kolkata|10
3|Ajay|Mumbai|20
4|Ramesh|Delhi|30
5|Suneeta|Lucknow|40
6|Anita|Kolkata|30
7|Raj|Jaipur|30
8|Ali|Lucknow|40
9|Michael|Cochin|10
10|Pavan|Vijaywada|20
11|Suraj|Hyderabad|10
12|Altaf|Bangaluru|40
13|Ravi|Indore|20
14|Verma|Delhi|20
15|Sharma|Vizag|10
sqlite> select count(*) from students;
15
sqlite> select count(roll) from students;
15
sqlite> select count(name) from students;
15
sqlite> select count(distinct name) from students;
14
```

- From student database we are performing maximum, minimum ,sum , average function and we are also finding max rollno from different city's , performing similar operations in the below example

```

sqlite> select max(roll) from students;
15
sqlite> select min(roll) from students;
1
sqlite> select sum(roll) from students;
120
sqlite> select avg(roll) from students;
8.0
sqlite> select max(roll),city from students group by city;
12|Bangaluru
9|Cochin
14|Delhi
11|Hyderabad
13|Indore
7|Jaipur
6|Kolkata
8|Lucknow
3|Mumbai
10|Vijaywada
15|Vizag
sqlite>

```

```

sqlite> select count(roll),city from students group by city;
1|Bangaluru
1|Cochin
3|Delhi
1|Hyderabad
1|Indore
1|Jaipur
2|Kolkata
2|Lucknow
1|Mumbai
1|Vijaywada
1|Vizag
sqlite> select sum(roll),city from students group by city;
12|Bangaluru
9|Cochin
19|Delhi
11|Hyderabad
13|Indore
7|Jaipur
8|Kolkata
13|Lucknow
3|Mumbai
10|Vijaywada
15|Vizag
sqlite>

```

- Set operations are **Union , Intersection , except**
- The rows or columns taken in set operations must be of **same type** I.e, if one set contains names the other should also contains names only if not well get an error
- Taking 2 database as and performing union , intersection between them

- Union

```
sqlite> select * from students where city='Delhi';
1|Ajay|Delhi|10
4|Ramesh|Delhi|30
14|Verma|Delhi|20
sqlite> select * from students where city='Kolkata';
2|Vijay|Kolkata|10
6|Anita|Kolkata|30
sqlite> select * from students where city='Delhi' union select * from students where city='Mumbai';
1|Ajay|Delhi|10
3|Ajay|Mumbai|20
4|Ramesh|Delhi|30
14|Verma|Delhi|20
sqlite> select name from students where city='Delhi' union select roll,name from students where city='Mumbai';
Error: SELECTs to the left and right of UNION do not have the same number of result columns
sqlite> select name from students where city='Delhi' union select name from students where city='Mumbai';
Ajay
Ramesh
Verma
sqlite>
```

- Intersection

```
sqlite> select name from students where city='Delhi' intersect select name from students where city='Mumbai';
Ajay
sqlite> select name from students where city='Delhi' except select name from students where city='Mumbai';
Ramesh
Verma
sqlite>
```