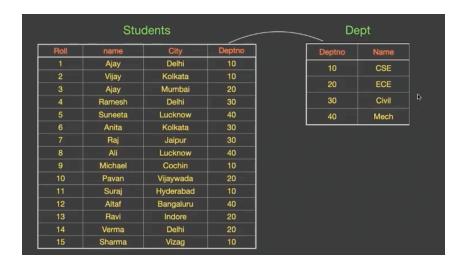
SQL (Aggregated Function and Set Operations)

- 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



• 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
    ...>;
lAjay|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(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;
sqlite> select min(roll) from students;
sqlite> select sum(roll) from students;
120
sqlite> select avg(roll) from students;
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
 Cochin
3 Delhi
 Hyderabad
 Indore
 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>
```