DBMS

Database: Group of interrelated records
DBMS: A software that manages this.

Advantages:
1) control redundancy
2) Easy maintainance
3) Reduced search time.
4) Backup.

Attributes.

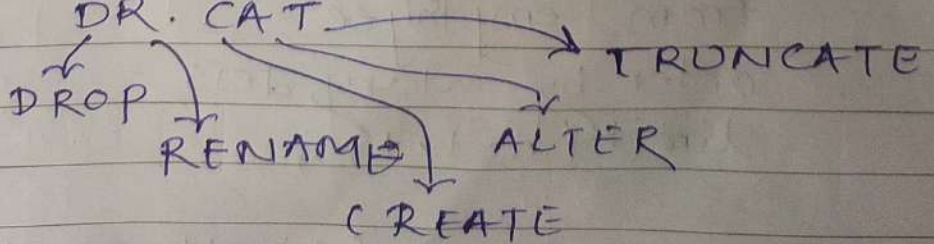
(1) simple - (can't be divided further) eg. age
(2) composite: address, name.
(3) Multi-valued attributes: mobile number
(4) Derived attributes: age can be derived from DOB
(5) key attributes. - primary key

keys in SQL

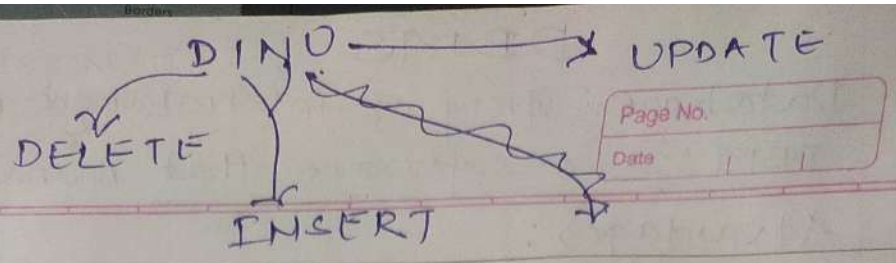
(1) super key: combination of attributes that identifies a record uniquely.
(2) canditate key: min. of subset of super key that identifies a record uniquely.
(3) Primary key:
(4) Alternate key: ~~left~~ candidate key other that primary key.
(5) Foreign key.

Types of SQL command.

1. Data Definition language:
CREATE, ALTER, DROP, TRUNCATE



2) DML



3) DCL : Data control Language
GRANT, REVOKE

4) TCL :
COMMIT, ROLLBACK, SAVEPOINT

5) DQL :
SELECT

constraints in SQL

1) NOT NULL
2) UNIQUE
3) P.K (primary key)
4) foreign key
5) CHECK (It's just a checking condition)

AGGREGATE FUNCTIONS.

① COUNT() 2) SUM() 3) AVG()
4) MAX() 5) MIN().

Imp SQL queries:

① Nth highest salary.

i)

```
select salary
from employee
order by salary desc
limit (n-1, 1);
```

(I don't use this one)

ii) select salary for 3rd highest.
from employee
where salary not in (
select salary from employee
order by salary desc
limit 2
)
order by ~~de~~ salary desc
limit 1.

(I use this one).

(2) create copy of a table.
i) only schema →

```
CREATE TABLE T_NAME LIKE
    OLD_T_NAME;
```

ii) Data and schema..

```
CREATE TABLE T_NAME
SELECT * FROM OLD_T_NAME;
```

ACID properties

- Atomicity → Trans either gets successful or fails (there's no in b/w state)
- consistency → correct read and right operations (consistent data reading)
- Isolation → isolated transaction (every trans.)
- Durability → saving of data ~~and~~ even after DB failure

Data Integrity:

① Domain Integrity: restricting the type, format and the volume of the data recorded.

② Entity Integrity: The purpose is to ensure that the data is not recorded multiple times.

③ Referencial integrity: remove duplicate data records.

④ User defined integrity: fulfill specific requirements.

Difference b/w.:

	Delete	Truncate	Drop.
①			
i)	delete rows or row based on condition	i) can delete whole data from table (structure remain intact)	i) removes whole table (schema too)
ii)	can undo	ii) cannot undo	ii) can't undo
iii)	DML	iii) DDL	iii) DDL.
②	Where	Having	
	① applies cond^ on a single record. individually	② applies condn on group of records.	

③ GROUP BY — grouping data
ORDER BY — ordering data.

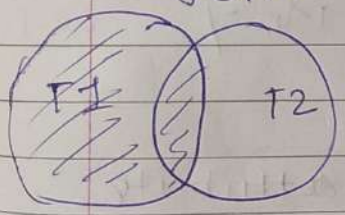
④ CHAR — static → fixed length
VARCHAR — dynamic → variable length

⑤ UNION — join data column wise
JOINS — joins data row-wise

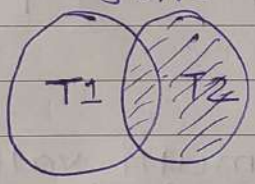
⑥ IN — (kind of forms a list to check)
EXISTS — if it exists or not.

Different types of SQL JOINS:

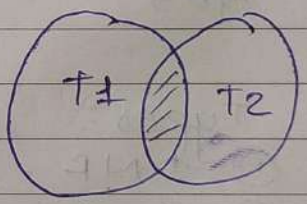
① LEFT JOIN



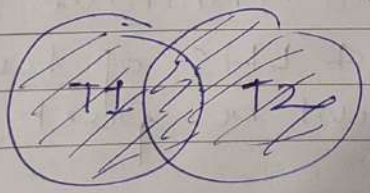
② RIGHT JOIN



③ INNER JOIN

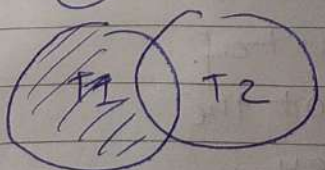


④ FULL OUTER JOIN



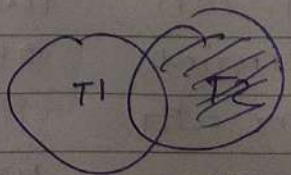
⑤ SELF JOIN

⑥



LEFT EXCLUSIVE JOIN

⑦



RIGHT EXCLUSIVE

⑧ CROSS JOIN.

Normalization

- technique to reduce redundancy in table.

Anamolies with redundant data:

① INSERT → gotta insert redundant data everytime for insertions. (memory issues too)

② UPDATE → UPDATION issues due to presence of data in a lot of places.

③ DELETE → you might delete something permentaly just to delete something related to it.

roll no.	name	branch	hoD	office_tel
401	Akon	CSE	Mr.X	123
402	Bkon	CSE	Mr.X	123
403	ckon	IT	Mr.Y	321

Types:

① 1NF - no multi-valued attribute.
② 2NF - 1NF & no partial dependency.
③ 3NF - 2NF & no transitive dependency.
④ BCNF: 3NF & LHS of functional dependancy must be part of super key.

non-prime attr can determine prime attr.

attribute in table depends on a part of P.K not the whole key.

when a non-prime attri. depends on other non-prime attribute rather dependent on prime attr.

Pattern Matching in SQL

- LIKE clause is used for pattern matching.

% → 0 or more characters

_ (underscore) → 1 character.

select name of students whose name start with 'pa'

- select name from students where name like "pa%";

Character manipulation functions:

① Upper() ② Lower() ③ Initcap()
④ Length() ⑤ concat()

Views in SQL

A virtual table based on the result set of an SQL statement.

```
CREATE VIEW as abc
Select col1, col2, col3
from student
where condition;
```