SQL:

How can we store data ?

* Notepad ? excel?
* High amount of data, database. A database is a software that stores data in an organized order. It becomes easy to manage the data.

Two types of database: RDBMS, Non-relational DBMS.

RDBMS:

Relational DB management system. So, basically in RDBMS we define or store the data into collection of tables, and the tables have rows and columns. Eg. Oracle, MySql, MsSql etc.

Normalization: It is the process of organizing data to avoid duplication and redundancy.

There are four normal forms:

1. 1NF: 🡪 a single cell can’t hold multiple values. Using 1NF data redundancy increases, as there will be many columns with same data in multiple rows but each row as a whole would be unique.
2. 2NF: 🡪 should satisfy 1NF.

* Should not have any partial dependency on primary key.

1. 3NF: 🡪 should satisfy 2NF

* There should be no transitive dependency for no-prime attributes.
* For e.g, if c is dependent on b and in turn b is dependent on a, then transitively c is dependent on a. This should not happen in 3NF. All the non-prime attributes must only depend on the prime attributes.

1. BCNF: 🡪 go through what is BCNF and also go through the rules of E.F codd.

DATATYPES:

Varchar, int, date, datetime, blob……

Basic SQL Statements:

1. **Data Definition language**: deals with database schema and descriptions of how the data should reside in the database. Create, Alter, Drop, truncate, rename.

Commands: **create database** db\_name;

Use db\_name;

**Drop database** db\_name;

**Create Table** tab\_name(col1 datatype, col2 datatype……);

🡪**Alter to change the name of a table:**

**Alter** table oldtable rename to newname;/

**🡪Alter to change the datatype of a column:**

**Alter** table tablename modify column colname datatype;

**Also**

**Alter table tablename change oldcolumn newcolumn datatype;**

**🡪Alter to add a column:**

**Alter table tablename add column columnname datatype;**

**And after that update accordingly.**

**🡪Alter to change the drop a column:**

**Alter** table drop column colname;

**Truncate** table tablename;

* **Alter to change a column name:**

**Alter table tablename change oldcolumn newcolumn datatype;**

1. **Data Manipulation language:**  Deals with data manipulation and it is used to store the data, update, delete , modify and retrieve the data. Select, Update, Delete, Insert.  
   Commands: Insert into tablename values(col1val, col2val, col3val……); or insert into tablename values(col1name, col2name…) values( col1val, col2val…);

Alter table tab\_name add colname;

Update tab\_name set colname = colvalue;

1. **Data Control language**: 🡪 Includes commands such as grant and mostly concerned with rights and permissions and other controls of the database system. Grant, revoke
2. **Transaction Control language**: 🡪 Deals with the transaction within a database. Commit, rollback, Savepoint.

**Constraints**: Constraints are rules enforced on the table whenever rows are inserted , updated and deleted from a table. It also prevents deletion of a table if there are dependencies from other tables.

1. Not null🡪 specifies that a column must have some value.
2. Unique🡪specifies that a column must have unique values.
3. Primary key🡪 specifies that the values must be unique and not null.
4. Foreign key🡪 it is a column that references a column of another table.  
    How to create a foreign key?  
   🡪 create table tablename (col1 datatype primary key, col2 datatype, col3 datatype, foreign key(col3) references parent table(parentTable primary key));
5. Check 🡪 specifies a condition that must be satisfied by the rows in a table.

alter table orders add constraint check(oid<3);

**\*\*But my sql engine ignores the check constraint so data gets entered which actually should not. This can be overcome by the help of triggers.**

\*\*\*To spool: tee file location

Views: A view is a named , derived, virtual table. A view takes the o/p of a query and treats It as a table.  
Syntax: create view viewname as select colname1, colname2 … from tablename;

e.g: create view testview as select eid, ename from emp\_details;

insert into testview values(11, "aakash");

select \* from emp\_details;

**Operators:**

* **Arithmetic operators(+,-,\*,/)**
* **Relational operators(>,<, =, !=/<>/^=)**
* **Logical operators(AND , or, not)** 🡪**And: is used when every condition satisfies.** 🡪**OR: is used when one of the condition satisfies.**

🡪**Not: is used for inversion of the condition.**

* **Special operators: in, is, between, any/some, all, like**

🡪**in:** is used to select multiple values in a single column**.**

🡪**is:** is used to compare null values.

🡪**like:** it is used on columns which contain string data.Multiple missing characters are represented by “%” and single missing characters are represented by “\_”.

**Functions:**

1. **String functions:**

* **Upper- converts to uppercase; select upper('smith');**
* **Lower- converts to lowercase; select lower('smITh');**
* **Length- returns the length of the string; select length("welcome");**
* **Trim- removes the unnecessary strings from the string. select trim(" welcome ");**

**select trim('z' from 'zzzzzzzzzwelcomezzzzzzzz');**

* **Instr- returns the position of a char in the string.**

**select instr("welcome", "o");**

* **Substr- it will return the substring of a string.** **select substr("welcome" ,2 ,3); 2nd parameter is the starting position and the 3rd parameter is the number of characters after.**
* **Concat- it will join two strings.**

**select concat("welcome", " to technoelevate");**

1. **Number functions:**

* **Sqrt: square root**
* **Mod: returns the remainder**
* **Power: returns the power of value**
* **Truncate: returns a value to the specified number of decimal places. select truncate(40.123456789, 3);  
   select truncate(41234, -3);**

1. **Date functions:**

* **Current\_date/curdate(): returns current date.  
  select current\_date(); select curdate();**
* **Curtime()/current\_time(): select curtime(); select current\_time();**
* **Now()- returns the date as well as time.**
* **Sysdate()- returns your system date and time.**
* **Month()- returns the month , select month("2021-06-28");**
* **Year()- returns the year, select year("2021-06-28");**
* **Day()- returns the day , select day("2021-06-28");**

1. **Aggregate Functions:**

* **These functions perform operations on multiple rows and return single value.**
* **Avg()**
* **Sum()**
* **Min()**
* **Max()**
* **Count()**