**Database**: Database is an organized collection of structured data. (or) Data that is typically stored electronically in a computer system.

We use database when we have to deal with large amount of data at a same place.

We can restrict the position of the data in a database which reduces data breaching and ensures data security.

In a database multiple users can read and write.

It is easy to backup files in data base easily.

data can be retrived / fetched easily.

**DBMS**:

It is used to manage database.We interact with database using dbms.

**Types of databases**:

centralized database

NoSQL database(eg: mongodb)

RDBMS(Relational database)

object oriented database(odbms)

Cloud database

Network database

Heirarchical database

**> installation of MYSQL**

step1 - In chrome search - mysql installer

step2- Click on first link

step3- and click 437 mb 2nd link download

step4-Click on the file and click two times yes and installer setup dialog box will appear.

step5-click on custom and then next.

step6-click on mysql server and click + upto deadend and add it into right box and ni applications mysql shell + upto dead end and add to right box click on next and

then execute.

step7-two times next.

step8- again two times next set password admin.

step9- next next next execute and finish.

step10- path ckecking thispc-> local disk c-> program files-> mysql->server-bin-copy path-in windows-editsystemenvirinment->enivronment variables- path-

shell delete and paste server- ok-down path-edit-new-paste-ok-ok-ok.

step11- in cmd check path as mysql --version.

step12- give mysql -u root -p password is admin - to start the mysql in command prompt..

step13-To show all commands\h

step14- To create a database we use create database database\_name; cmd, to see all the databases "show databases".

**SQL(StructuredQueryLanguage)** is a structured programming language used to manage data.It is used to create,fetch,update and delete the data

from databases through dbms.Sql is used to interact with dbms.

Table - Relation

Rows - Records

Columns - Feilds

Oracle is commercial data source where as mySql is open source RDBMS.

When data is in table format then it is known as relational data.

**SQL commands types:**

Datatype: It is a classifies of data that is stored in variable.It tells the compiler /interpretor what are the operations programmer wants to do with the data.

Datatypes in mysql:

1.Numeric - Integer,floating point(approximate value),fixed point(demical/exact values) types

2.String - char(m)-255, varchar(m)-65k,(non binary strings)

binary, varbinary, (binary strings)

text(tinytext-255b(product descriptions,text-articles/product reviews,mediumtext-16mb,longtext-4gb(comp applications)), blob(binary large object)

(tinyblob-255b,blob-65535b,mediumblob-16777215b,longblob-4gb) (These two are extended versions of varchar and varbinary where we store huge amount of data)

enum(enumerate is used to decrease the storage), set.

3.Date and time-

Date - 'YYYY-MM-DD'

time - 'HH:MM:SS' or 'HHMMSS' or 'HHH:MM:SS'

datetime - 'YYYY-MM-DD HH:MM:SS'

timestamp - 'YYYY-MM-DD HH:MM:SS'

year - 'YYYY'

4.jason(Java Script Object Notation)

5.spatial

->decimal(m,d) or numeric(m,d) -Syntax

->float(p) -Syntax(p means precision).

Tablecreation syntax:

create table table\_name(col1 dtype,

col2 dtype,........

col dtaype);

Table insertion syntax:

insert into table\_name(col1,col2,...)

values(value1,value2,....);

or

insert into table\_name values(col1val1,col2val1,...),(col1val2,col2val2,.....)

We use desc table\_name; to know the table schema and show create table table\_name; to get the table syntax.

To view the table syntax is select \* from table\_name;

To insert multiple values at the same time: insert into table\_name(col1,col2,...)values(val11.val12,..),(val21,val22,...),..;

CRUD operatins:

CREATE: create

READ: select

UPDATE: insert,update,alter,alter-modify

DELETE: drop,truncate,delete.

**drop**: drop table table\_name;(Used to delete table) /drop database database\_name;

**truncate**: truncate table table\_name;(Used to delete /erase the data from table)

**default**: Used to set a default value to the feild.(default 'value')

**not null**: Used to set the feild to not take null values.(feild\_name datatype not null)

**select**: select col1,col2,.... from table\_name; or select col1,col2,... from table\_name where condition

**update**: update table\_name set col1\_name=value,col2\_name=value,...,n where condition;

**delete**: delete from table\_name where condition

**alter**: *1.alter table table\_name rename* new\_tablename;(to change table name)

*2.alter table table\_name add col\_name datatype* after/first col\_name ,add col2\_name dtype,...; (To add new columns to table).

3.*alter table table\_name drop column* col1\_name,drop column col2\_name,......; (To drop columns)

4.alter table table\_name modify col\_name new\_dtype,modify col\_name new\_dtype,....,n;(Modify is used to modify/change the dtype of a column)

5.alter table table\_name rename column old\_colname to new-colname,rename column old\_colname to new\_colname,....;(used to rename the col\_name)

6.alter table table\_name change column old\_colname new\_colname dtype;(used to change both columnname and dtype)

**PRIMARY KEYS**: A primary key is a combination unique constraint as well as not null constraint.

auto\_increment : Automatically increases one number.it is used for only int dtypes.

**Aggregate Functions**:

1.Sum - sum(col\_name) from tablename;

2.Min - min(col\_name) from tablename;

3.Max - max(col\_name) from tablename;

4.Count - count(col\_name) from tablename;

5.Average - avg(col\_name) from tablename;

\*\*order by: it is used to display the list of table values in asc order/desc order.

Syntax:select col1,col2 from table\_name order by col\_name(which is to be depended on to order table) asc/desc;

\*\*limit: It is used to restrict the display of list upto the limit.

\*\*distinct: It is used to display unique items of the mentioned column. syntax: distict col\_name from table\_name;

\*\*Group by:A GROUP BY statement sorts data by grouping it based on column(s) you specify in the query and is used with aggregate functions.

**Create a dumpfile By using cmd prompt copying one database to other:**

C:\Program Files\MySQL\MySQL Server 8.0\bin>mysqldump -u root -p database\_name>"C:\Users\DELL\OneDrive\Desktop\new\_file\_name.sql"

Enter password: \*\*\*\*\*

**By using mysql cmd line importing the data base to other:**

1.create a database.

2.Use the database.Then type source(space) path where the database is stored and then change all the backward slashes to forward slashes.

mysql> source C:/Users/DELL/OneDrive/Desktop/copyofpython.sql or source(path of dumpfile(change \ to /)

**To copy data from one table to other:**

1.Create a new table & use 'like' to get the copying table's schema.

create table new\_tablename like old\_tablename;

2.Now use the below syntax to copy data to new table.

insert into new\_tablename select \* from old\_tablename;

**OPERATORS**:

1.Arithmetic--> +,-,\*,/,%,div,mod

2.Logical--> AND/&&,OR/||,between,in(),not in(),not between

3.Assignment--> =,:=(assignment)

4.Comparision--> >,<,>=,<=,!=,NOT/<>

Constraints ensures integrity of database.They include:

Primary key,foreign key,not null,unique,default and etc..

\*\* Unique accepts null value where as primary key won't allow null values.

**concat**: We use concat to add/combine the strings.It displays null when the string has a null value.

concat\_ws: We use concat\_ws(with seperator) to add/combine the strings even though some of them has null values.It omits the null values except for the first place and displays the string

**Foreign key**: It is a constraint,imposed on a column/feild to maintain relationship b/w two tables.We define a key as a foreign key when it is a

primary key in the other/parent table.We use that primary key in the child table as foreign key.

Syntax: foreign key(column)

references parent\_table\_name(pri\_key\_col)

**Referential action**:

1.on update:

cascade(updates)|set default(won't be changed)|restrict(won't be changed)|no action(won't br changed)|set null(updates null every time)

2.on delete:

cascade(updates)|set default(won't be changed)|restrict(won't be changed)|no action(won't br changed)|set null(updates null every time)

**Relationships**:

1.One to One :Eg:Adhar.

2.One to Many :It is the most used one.Eg:teacher and class one customer can buy many products.

3.Many to Many:Eg: many students can enroll in multiple courses.