DBMS : Database Management System

Developer :

Types of applications :

**Websites : url :**

HTML+CSS , Bootstrap

**Web application : url : dynamic** websites

Designing : HTML + CSS, BS

Programming :

IDE : Integrated development environment

.NET : C# : MSSQL

Django : Python : SQLite , MYSQL , MONGODB

CI / LARAVEL : PHP : MYSQL

JSP / SPRING / HYBERNATE : JAVA : MYSQL, ORACLE

ANDROID /FLUTTER : JAVA/KOTLIN : Sqlite , Firebase , MYSQL

XAMRIAN : C# : MSSQL

Database

**Mobile Applications : .apk**

ANDROID / FLUTTER / XAMRIAN :

Designing : xml , programming : c#, java, kotlin ,

Database : sqlite , firebase, mysql, mssql

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Console application : Blue screen command based software

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Desktop application : .exe : notepad++, word,

Stand alone applications : product key : antivirus

DBMS : DBMS stands for Database management system. It is a software that provides facility to store and maintain data.

Many different type of application of DBMS is present :

MYSQL

MSSQL

ORACLE

MSACCESS

MONGODB

FIREBASE …….

According to compactability , any one of them you can use and store your data.

WHAT is the benefit of DBMS over the file management system ? :

1. Security : DBMS saves data from access of un-authorized user.
2. Easy to access : DBMS provides easiest way to fetch a part of data from the large amount of data.
3. Consistency : DBMS assures you to prevent database from the wrong entries . Many validation methods are available that can be applied on the database.
4. Backup of data : DBMS provides facility to make carbon copy of data. If any misshapen be with database you can again restore your data by using backup file. IN DBMS you can also use automatic backup system.

1. Import & Export : Copy – paste system of database it done by using import , export facility.

Database : Database is the collection of multiple tables. In DBMS records are stored in form of tables. But each table should be in a database.

Tables : Tables are the collection of records stored in the form of rows and columns.

In database language : rows are knows as **tuple and** column is knows as **fields**.

SQL : SQL stands for structured query language.

It is used to store and manipulate(change) data of database. It provides different kinds of queries to communicate with DBMS application.

Types of SQL :

SQL

1. DDL(Data definition language) :DDL has some queries that is used to create or manipulate the schema of table.
2. Create :Create command is used to create database or create schema of table.

To create database :

Create database database\_name;

Install wamp and check for the wamp icon

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Ex : create database techpile;

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Create a new table :

Syntax :

Create table table\_name

(

Column\_name data\_type(size),

Column\_name\_2 data\_type(size),

-

-

);

Data type :

Int : 1,2,3,10,10000,888488888

Float : 12.5, 34.6

Varchar(100) : string value : max size : 255 :

Char(100) : string value

Text : large string

Date : yyyy-mm-dd

Enum() : selected choice : gen : enum(‘male’,’female’)

Datetime : yyyy-mm-dd HH:mm:ss

Time : hh:mm:ss

To get current date from the system : curdate()

To get current date and time : now() :

To get current time : time()

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| rollno | Name | mobno | age | Reg\_date |

Create table student

(

Rollno int,

Name varchar(50),

Mobno varchar(20),

Age int ,

Reg\_date Date

);

Employee :

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| sn | Name | mobno | address | post | salary | Join\_date |

Create table employee

(

Sn int,

Name vachar(50),

Mobno varchar(15),

Address text,

Post varchar(100),

Salary int,

Join\_date datetime

);

Primary key : If you define any column as a primary key column then it does not accept duplicate value to be entered . Primary key type column does not accept null value.

Primary key type column used to indentify each column uniquely . it have different value for each entries.

Course:

|  |  |  |
| --- | --- | --- |
| cid | Course\_name (PK) | Head\_name |

Create table course

(

cid int,

course\_name varchar(100) primary key,

head\_name varchar(50)

);

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Auto increment : auto increment is a property of columns where value of column automatic increments by 1. Auto increment property can be applied only on integer type columns.

Fees

|  |  |  |  |
| --- | --- | --- | --- |
| Sn | Student\_name | fee | fDate |
|  |  |  |  |

Create table fees

(

Sn int auto\_increment primary key,

Name varchar(50),

Fee int,

fDate date

);

Default : default value is a pre-defined set value for the column which is NULL. When user does not pass any value to the column then default value automatic insert.

Fee\_stucture : sn, course\_name, fee , entrydate

Create table fee\_structure

(

Sn int primary key auto\_increment,

Course\_name varchar(50) default ‘Training’ not null,

Fee int default 50000,

Entrydate datetime

);

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1. Alter : Alter command is used to make any changes in existing schema of table. If you want to add, delete, change any columns of table , you can use alter command.

Alter – add : it is used to add a new column in table schema . You can add column at any place of table.

Syntax : alter table table\_name add column\_name datatype(size);

**To add a new column named Gender :**

Alter table registration add gender varchar(20);

**To add a new column named Gender at the first position of table schema:**

Alter table registration add gender varchar(20) first;

**to add a new column named gender at the specific position of table schema :**

alter table registration add gender varchar(20) after name;

alter table student add dob date after name;

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Alter- drop : Alter -drop is used to remove a column from table.

Syntax :

Alter table table\_name drop column\_name;

Ex : alter table student drop dob;

Alter table student drop name;

alter table student drop address;

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Alter-modify : alter-modify is used to change datatype and size of a existing column

Syntax :

Alter table table\_name modify column\_name new\_data\_type(size);

Ex : alter table student modify reg\_date datetime;

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Alter-change : alter – change is used to replace a column with another column but data stored in column will remain same.

Syntax : alter table table\_name change column\_name new\_column\_name datatype(size);

Ex : alter table student change mobno contactno varchar(30);

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1. Drop : drop is used to remove a database or a table permanently.

Syntax : drop table table\_name;

Drop database database\_name;

1. Truncate : Truncate command is used to remove all records of tables. But it saves the schema of table.

Syntax : truncate table table\_name;

truncate table fees;

SCHEMA –

CREATE – MAKES THE SCHEMA OF TABLE

ALTER – MANIPULATE SCHEMA OF TABLE

DROP – REMOVES THE SCHEMA OF TABLE

TRUNCATE – SAVES THE SCHEMA OF TABLE

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1. DML(Data Manipulation Language) : DML stores some queries that is used to create or manipulate the records of table.
2. Insert : Insert command is used to add a new record in a table.

Syntax :

Insert into table\_name values(value\_1,value\_2,value\_3,………..);

Ex : insert into student values(1 , ‘Priya Rai’ , ‘9089877665’ , 20 , ‘2021-10-21’);

To pass values in some selected columns :

Insert into table\_name (column\_name1,column\_name\_3,…….) values();

Ex : insert into student (rollno,name,age) values (2,'Riya',30);

To insert multiple rows at one time :

Insert into student(age,name) values(30, ‘Vishal Singh’) , (40, ‘Sagar Rai’);

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1. Delete

Select : Select command is used to fetch a part of data from the large amount of data stored in a table.

Select command can be used in many way. And many types of conditions may also apply on the select command to select only desired data.

Syntax of select :

Select column\_names from table\_name ;

Select course,fees from coursefee;

Select cid,course,fees,seat from coursefee;

Select \* from coursefee – To select all column records \* is used

Select column\_names from table\_name where <condition>;

Types of condition :

= : select \* from coursefee where seat=60

select course,fee from coursefee where seat=60

> : seat>60, seat>80 , fees>40000

select course from coursefee where seat>80

< : select \* from coursefee where cid<5 , 1,2,3,4

>= : select \* from coursefee where seat>=80

<= : select \* from coursefee where cid<=5 , 1,2,3,4,5

<> : course<>’CSE’ , seat<>60 , fee<>20000

select course from coursefee where cid<>7

select \* from coursefee where fees<>100000

And : first – true

Second-true

select \* from coursefee where course='CSE' and fees=20000

Or : first – false

Second-true

select \* from coursefee where Head\_name='Mr. Abhay' or

HEAD\_NAME='MR. ABRAM'

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In : select \* from student where year in ('First','second','third','fifth')

SELECT \* FROM coursefee WHERE seat IN ( 60, 80 )

Not in : select \* from table where sn not in (40,50,60)

select \* from coursefee where head\_name not in ('MR. ABHAY','MR. ABRAM')

Between : SELECT \* FROM COURSEFEE WHERE CID BETWEEN 1 AND 5

WHERE SALARY BETWEEN 20000 AND 50000

Is Null : SELECT \* FROM COURSEFEE WHERE FEES IS null

Is Not null :

select \* from coursefee where fees is not null

select name,course from student where roll>5

SELECT COURSE,SEAT FROM COURSEFEE WHERE cid>=4 and cid<=6

select course,seat from coursefee where cid in(4,5,6)

select course,seat from coursefee where cid between 4 and 6

select course,seat from coursefee where cid=4 or cid=5 or cid=6

like : Like operator is used to create custom format of string to compare from a column. Like uses two special operators to create format i.e % and \_ .

% : where college like ‘feroze%’

Where college like ‘%raebareli’

Where college like ‘%raebareli%’

select \* from coursefee where course like 'c%' : select record where first character of course column is C.

select \* from coursefee where head\_name like 'Ms.%'

select \* from coursefee where course like '\_e%' : select records where second character of course is e.

select \* from coursefee where course like 'C%' and fees=20000

\_ : where open\_date like ‘\_\_\_\_\_08\_\_\_’

select \* from coursefee where open\_date like '\_\_\_\_\_08\_\_\_'

= , > , < , >= , <= ,<> , and , or , in , not in , between , is null, is not null, like

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Order by : order by is used only with select command . It is used to arrange selected columns in the ascending or descending order of a column.

Syntax :

Select column\_name from table\_name where <condition> order by column\_name desc/asc

select \* from coursefee where cid between 1 and 6 order by seat

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Limit : select \* from coursefee where cid between 1 and 6 order by seat limit 2

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Aggreagate Function : Aggregate functions are some pre-defined functions of sql. It is used to calculate some values and return only one value. It can be used only on numeric type column.

Sum() : SUM() function is used to add values of a column. It returns only one value .

Syntax : select sum(column\_name) from table\_name;

select sum(column\_name) from table\_name where <condition>;

Count() : count() is used to count number of rows. Count function ignores null value.

Select count(column\_name) from table\_name;

select count(fees) from coursefee

select count(\*) from coursefee where head\_name like 'MR.%'

select count(fees) from coursefee where head\_name like 'MR.%'

select sum(fees),count(\*) from coursefee where head\_name like 'Mr.%'

Avg() : select avg(fees) from coursefee

Min() : select min(fees) from coursefee

Max() : select max(fees) from coursefee

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Create table coursefee

(cid int primary key auto\_increment ,

course varchar(100) ,

fees int ,

seat int default 60,

head\_name varchar(50),

open\_date date );

insert into coursefee(course,fees,seat,head\_name,open\_date) values('CSE' , 20000 , 60,'MR. ABHAY' , CURDATE());

insert into coursefee(course ,seat,head\_name,open\_date) values('Computer Science' ,60,'MR. ABHAY' , CURDATE());

insert into coursefee(course,fees,head\_name,open\_date) values('IT' , 20000 ,'MR. AJEET' , CURDATE());

insert into coursefee(course,fees,seat,head\_name,open\_date) values('CSE' , 40000 , 80,'MR. ABRAM' , CURDATE());

insert into coursefee(course,fees ,head\_name,open\_date) values('Civil Enginnering' , 90000 ,'MR. ABHISHEK' , CURDATE());

insert into coursefee(course, head\_name,open\_date) values('Mechanical' , 'MR. ABRAM' , CURDATE());

insert into coursefee(course,fees,seat,head\_name,open\_date) values('Fashion' , 100000 , 60,'MS. AMRITA' , CURDATE());

insert into coursefee(course,fees,seat,head\_name,open\_date) values('Textile' , 9000 , 120,'MS. AMRITA' , CURDATE())

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1. Update : UPDATE command is used to set values in columns in existing records. Update command is used to make changes in pre-existing records.

Syntax :

Update table\_name set column\_name=value : it’ll update value to the all records

update coursefee set open\_date=curdate() ;

Update table\_name set column\_name=value where <condition>;

update coursefee set seat=80,head\_name='Mr. Ajeet' where cid<=5

DELETE : DELEte command is used to remove a row from the table. It does not delete records permanently . Records deleted by delete command can be rollbacked.

Delete command can not be used to remove a single column from the table. It’ll remove the whole row.

Syntax : delete from table\_name where <condition>;

Example : delete from tbl ; - it’ll remove all records from table like truncate .

Delete from tbl where sn=5 ; it’ll remove only those records where value of sn column is 5;

Example :

DCL(Data Control Language) :

Grant : Grant is used to give permissions to the users . permissions may be like write read and many more.

Revoke : Revoke command is used to take back to the given permissions to the user.

Rename : Rename command is used to change name of table.

Syntax : rename table table\_name to new\_table\_name ;

Ex : rename table student to studentdetail

1. TCL(Transaction Control Language):Commit, rollback, savepoint

Commit : Commit command is used to save permanently to the transactions of database.

In database autocommit mode is activated by-default. Autocommit mode of database saves all transaction of database permanently.

If you do not want to save transactions permanently you have to set autocommit mode=0 in database.

Syntax : commit;

Rollback : Rollback is used to undo the database transaction that is not saved permanently in the database.

If you have saved your transactions permanently by using commit command then it can not be rollbacked.

Syntax : rollback;

SET TRANSACTION : Set transaction is used to provide a specific name to the all transaction of database.

Syntax :

Set transaction transaction\_name;

Savepoint : Savepoint is used to set name for the each collection of records. The benefit of savepoint is you can rollback you transaction to the particular savepoint;

Syntax to create a savepoint :

Savepoint savepoint\_name;

Syntax to rollback till a specific savepoint :

Rollback to savepoint\_name;

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ACID : Atomicity , Consistency , Isolation , Durability

|  |  |  |
| --- | --- | --- |
| Amit | Shivam |  |
| 3000 | 4000 |  |
| -1000 | +1000 |  |
| 2000 | 5000 |  |

Set autocommit=0;

Table : schema/Structure + Records

Student :

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sn | name | Email | address | age |
| 1 | Riya | r@gmail.com | lucknow | 20 |

Schema : When you need to store any data in table firstly you have to create schema of table. Schema defines the maximum records that can be stored in a table.

And it provides a name to each records of table.

Record – Table schema – create

DB -> TABLE->

Create database database\_name;

Create table tbl

(

);

Record save :

|  |  |  |  |
| --- | --- | --- | --- |
| sn | Course\_name | Seat | date |
| 1 | CSE | 60 | 2021-08-01 |
| Null | IT | Null | 2021-08-21 |
| null | null | 80 | null |

Insert into tbl (sn,course\_name,seat,date) values(1, ‘CSE’, 60 , curdate())

Insert into tbl (sn,course\_name,seat,date) values(1, ‘CSE’, 60 , ‘2021-08-01’)

Insert into tbl (course\_name,date) values(‘IT’, ‘2021-08-21’),(‘EC’,CURDATE()),(‘CE’,CURDATE())

INSERT INTO TBL(SEAT) values(80)

create database college;

create table login

(

Sn int,

Userid varchar(30),

Password varchar(10),

);

Insert into login(sn,userid,password) values(1, ‘Techpilest21101’,’ABCD’);

------------------------------------------------

Create table registration

(

Rollno int primary key,

Name varchar(50),

Father\_name varchar(50),

Dob date ,

Gender varchar(20),

Mobno varchar(20),

Emailid varchar(100),

College varchar(100),

Course varchar(30),

Branch varchar(30),

Year varchar(30)

);

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AND OR <> :

Where rollno between 1 and 10 and per>60

Where year=’First’ or year=’Second’

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KEYS :

PRIMARY KEY :it does not accept null value , and does not accept duplicate value.

UNIQUE KEY : PRIMARY KEY+NULL : Unique key is used to store unique records in a column. It is used to identify each row uniquely just as the primary key.

But primary key does not accept null value , but unique key accepts NULL value.

COMPOSITE KEY : Collection of primary keys is composite key. Composite key is used to identify each records of table by collection of two columns.

create table st

(

sn int ,

name varchar(20),

emailid varchar(20) ,

primary key(sn,emailid)

)

Table : Schema +Records

DDL : create , alter, drop , truncate

DML : insert , select , update, delete

= , > , < , >= ,<= ,<> , and , or , in , between , not in , is null , is not null , like

Order by , limit

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Update : Update command is used to make changes in the pre-existing records of table.

Syntax :

Update table\_name set column\_name=Value where <condition>;

Ex : update coursefee set fees=30000 where cid=6;

Update coursefee set fees=10000,seat=60 Where cid in (1,2,4,7)

Update coursefee set fees=10000,seat=60 Where cid=1 or cid=2 or cid=4 or cid=7

Update coursefee set fees=10000,seat=60 Where open\_date like ‘%24’

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Delete : Delete command is used to remove a whole record from the table.

By using delete command you can remove value of a single column. Delete command does not removes all records permanently . Records deleted by delete command , can be restored.

Syntax : delete from table\_name where <condition>;

If you are using delete command without condition then it’ll remove all records from the table.

delete from coursefee;

Delete from coursefee where cid=6

DCL : Data Control Language

Grant : grant command is used to apply permissions to the users . You can add read , write , delete many type of permissions to a database user.

Revoke : REVOKE command Is used to take back to the given permissions to the database user.

rename : rename command is used to change name of tables of a database.

Syntax : rename table table\_name to new\_table\_name;

Ex : rename table coursefee to coursedetails;

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TCL : Transaction control language :

commit : Commit command is used to save database transaction permanently in the database.



Syntax : commit;

By default in all DBMS applications , auto commit mode of database is active , so all database transaction saved permanently. You can use a command

Set autocommit=0; to block all transactions saved permanently in the database.

ACID : Atomicity , Consistency , Isolation , Durability

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rollback : Rollback command is used to delete all database transactions that is not saved permanently by using commit command.

Syntax : rollback;

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savepoint :Savepoint is used to provide name to the each bulk of transactions. So that you can rollback to a particular transaction by using savepoint name.

syntax : savepoint savepoint\_name;

to rollback a particular savepoint : rollback to savepoint\_name;

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Keys : Keys are some important features of columns which used to specify which type of value it can held .

Primary key :Primary key type columns does not accepts neither Null value nor duplicate value.

Create table tbl

(

Sn int primary key,

Name varchar(50)

);

Unique Key : Unique key is same as primary key where it is used to uniquely identify the rows of table.

Unique key = Primary key+ NULL value

Create table login

(

Userid varchar(20) unique key,

Password varchar(30)

);

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Composite key : Collection of more than one primary type columns is called composite key.

create table tptstudent

(

sn int,

name varchar(40),

email vachar(100) ,

primary key(sn,email)

)

When two columns of a tables used to uniquely identify each row of table , this concept is known as composite key.