**DATABASE MANAGEMENT SYSTME**

DBMS: dbms is a softweare that is used to manage data at backend side. DBMS provides facility to stroe,

Manipulation and access data from the database.

Dbms also provides many facilities to make sure that right dat is being stored in the database.

Dbms provides table structure to developer to stroe and amange data. There are many applications of dbms is present ,you can manage data.

Like :mysql,mssql,msaccess,oracle,mongodb,sqlite………

To communicate with the all application of dbms,there are is a systematic way,that is sql.

Sql :sql stands for the structure query language .it provides some pre- defined syntax of queries these queries are used to create ,manipulate and access data in the dbms application.

Standard way to store data in dbms is:

Database => rows(tupplels)& column(field).

Types of sql commans

1. DML data manipualation language
2. DDL (Data definition language)
3. TCL(transaction control language)
4. DCL(Data control language)

1.DDL : DDl stand for data definition language.it has some quries list,which specific the schema of table.

That means all ddl commands are applied on the sceema of table .

Create

Alter

Truncate

Drop

Rename

DML: dml stand for data manipulation language . it has some quries that is applied on data/record of table.

DML commands are used to create manipulate and access th records of table.

Insert

Update

Delete

Select

TCL : TCL stands for transaction control language. Tcl has

Some commands that can used to control the transaction of database.

Commit

Roll back;

Save transaction

DCL: dcl stand for data control language . dcl command are used to define users of data that who can access the data and

Who can read and write both on database.

Grant

Revoke

DATA TYPE:

1.Numeric

Integer

Int

Shor int

Long int

Float

Money

2.Char

Char (fixed length string)

Varchar(variable length)

Nchar(multi-language fixed length string)

Nvarchar(multi language variable length string)

Text(long size string)

Date:used to dat in pre-defined fromate like yyy.mmm.ddd

Date :only date:yy:mm:dd

Time:only time : hh.mm:ss

Datetime :collection of date and time :yy:mm:dd hh:mm:ss

Create :create command is used to maek a new database or table.

Syntax. To create database:

Create database database name;

Syntax to create table;

Create table table\_name

(

Field\_name datatype(size),

Field\_name datatype(size)

-

-

-

);

Integrity constrains: integirity constrainsts are used with create command that is used to make sure that integrity of database will not be disturbed.

So integer constraints are some keyword that is used to make sure that your table will hold correct data.

Not null

Default

Unique

Primary

Foreign

Check

Not null :not null defines that this field can not be null for any tuple.

Default: it sets a by default value for fields that wiill be automatic Inserted when this field is null.

Unique:duplicate value is not ,but null is accepted.

Primary key: qnique + not null duplicate value and null value is not accepted.

Foreign key:it sotre a value that is already a primary key column value in another table.

Check:check validates the value that is inseted table before insertion.

Create table employee

(

Emp\_id int primary key,

Emp name char(50),

Salary int check(salary>1000 and salary<50000),

Age int deault(age>20)

);

Insert:insert command is used to add new tupples int tables.

Syntax;

Insert into table name values(value1,valu2,value3….);

Exa;

Insert into employee values(1,’umesh’,5000,’852741963’,20);

Syntax:Insert value is specific column,remain,left,

Insert into employee( columnname1,columnname2…)

Values(value1,value2,value3……..);

BULK INSERTION:you can store multiple rows with single insert command by seprating each rows by comma.

Insert into tabe\_name values(value1,value2,valuue3),(value1,value2,value3),(value1,value2,value3);

Identity:identity property can be used only with integer type column. It is to increment columns value automatic . in some dbms application it is also known as auto increment.

Syntax:

Column\_name data\_type(size)identity(seed,icrement);

Seed: strting value.

Increment:how much value would plus to max value of column

Identity(100,5)

Create a table with id should be primary key and name should have default value user .

Create table traninees

(

Id int primary key indentity(1,1),

Name char(20) default ’user’

);

Select:

Select is a dml command that is used to fatch record that is already saved in table.

Select is used to fetch a part of data from the complex data.

Condition are applied with select command to fetch any specific data from table.

Syntax to select all columns of all rows of table:

Select \* from table\_name;

Select specific column of all rows;

Select column\_name1,column\_name2 from table\_name;

**To select specific rows we apply with select command then only those rows will be selected which satisfied the fiven condition:**

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

Types of condition:

=

Exa:

select emp\_name,salary from employee where emp\_id=102;

>

Exam:

select \* from employee where salary>20000;

>=

Exam

select \* from employee where salary>=20000;

<

Exam

select \* from employee where salary<20000;

<>

Exam:

select \* from employee where department <>'HR';

And:

when you have to apply two condition on each row,then both condition are attached with and operator.

exam select \* from employee where emp\_id =101 and salary=20000;

Or :or is attached two condition . those rows who satisfied any one condtion will be selected.

Exam.

select \* from employee where emp\_id =101 or salary=20000;

In:

Exa:

Select \* from student where batch in(‘batch1’,’bath2’);

Not in:

Exa:

Select \* from student where batch not in(‘batch1’,’bath2’);

Between:

Exa :

Select \* from student where name id between 1 to 6;

Is null:

Exa:

Select \* from student where batch=’batch1’ and picture is null;

Is not null:

Exa:

Select \* from student where batch=’batch1’ and picture is not null;

Like: like operator is used to compare data with a part of data or pattern.when you have concept of part of data or you have a pattern hehalf of that you want to select data from table then like operator is used with condition.

%: ignore characters

\_(underscore): ignore only a single character

Exa:

Select \* from student where name like ‘%kumar%’;

O

Order by:in table data is saved in random manner is you want to arrane data behalf of a column then order by is used .

Exa:

Select \* from student where batch=’batch2’ and picture is null order by name asc

Note: asc for ascending order .

Desc for descending order.

AGGREGATE FUNCTION:

Aggregate function are somme function that operates on multiples values and provides a single output.

Sum()

count()

avg()  
min()

max()

it can be only used select command. It is only used after select keyword to select a value as a column.

It can be applied only on numeric values/columns.

Select sum(fee)

Select count(college)

Select max(fee) from table\_name

Select count(\*) from table\_name

NOTE: count function ignore null values . that means the column which contain null values is not counted by count()

Function.

STRING FUNCTION

Len():

Select len(name) as (length\_columname),lower(name) as student name from ststudent

Upper(): convert string to upperacase

Select upper(name) from table\_name

lower(): convert string to loweracase

Select lower(name) from table\_name

ltrim(): remove extra spaces from the left sides value

rtrim(): remove extra spaces from the right sides value

Select upper(lrim(rtrim(‘techpile technology’)))

Substring():

Select substring(uname,0,13) from studnt

DATE AND TIME FUNCTION

* Getdate(): it is a function which return current date and time.
* Current\_TIMESTAMP: it is a property which returns current date and time.

Select getdate(),current\_TIMESTAMP,

Datename()

Dateadd()

Datediff(): this is show date, month and year differnts

Select datediff(day,’2021-11-25’,’2021-11-11’)

Select datediff(month,’2021-11-25’,getdate())

Select datediff(year,’2021-11-25’,’2021-11-11’)

Convert()

2021-11-08:

Update commond: update is dml command . it is used to modify pre existing record of table.

It is applied on columns if you want to make change value of table then update command is used.

Syntax:

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

Exa:

Update student set name=’ramesh’ where id=2;

Delete command: delete command is a dml command used to remove whole row from the table.

To delete any particular row you can apply condition with delete command.

Syntax:

Delete from table\_name;

// delete all row of table but not permanently .those deleted rows can be restored.

Delete from table\_name where <condition>;

// to delete any specific row from table.

Exa:

Delete from student where id=5;

Alter command: alter is a ddl command used to modify schema table. Many type of modification/changes you can perform by alter command.

1. Add a new column in existing table:

Syntax:

Alter table table\_name add column\_name datatype size constraint;

Exa;

Alte table student add name varchar(20) default=’lucknoow’

1. Drop any column existing column from table:

Syntax:

Alter table table table\_name drop column\_name;

Exa:

Alter table department drop name// for column delete

Alter table student drop constraint ck\_\_salary\_\_25869641// for constraints delete

Both drop(delete) column and constraints:

Alter table student drop constraint pk\_\_teacher\_\_3F33g55,column stid

Important

All table drop:

Syntax:

Drop table table\_name;

For database delte/drop:

Syntax:

Drop database database\_name;

Note:

All dml command used to table name as like

Create table table\_name

Alter table table\_name

Drop table table\_name

Truncate table table\_name

To change data type and size existing columns:

Syntax:

Alter table table\_name alter column\_name data\_type(size);

Exa:

Note : -

By using alter ,you can only increase the size of colum can’t decrease size

Exa:

Alter table department alter headofdept char(100)

Alter table student alter fname varchar(25)

Drop command : -

drop is ddl command used to permanently remove table with schema and record .

that mean drop removes the whole table. Drop removes the existing of table.

Syntax:

Drop table table\_name;

Truncate command : -

Truncate command is used to remove all the saved record of table permanently .  
record delete with truncate command cant’t be restore.

Truncate save the schema of table for future use but remove all record.

Syntax:

Truncate table table\_name;

Top clause : - top clause restrict(stop) the total returning row of select command . top clause specific the total number of rows you want want to select with command.

Exa:

select top 4 \* from employee1

select top 4 emp\_name from employee1

select top 2 \* from employee1 where emp\_name like's%' // from search top first latter of name

subquries : - subquries are quries written within any other query.

Sub queries are always written ().

Sub queries can be used with select ,update,delete,any command subquery should always return only one column.

If you want to use result of another queries within a query then subsueries are used.

Exa:

select \* from employee1 where salary=(select min(salary)from employee

particular column update : -

update employee1 set salary=(select min(salary)+500 from employee1) where emp\_id=1005;

distinct(unique) : - distinct used with select command. Used to select set of unique value only.

Exa:

select distinct salary from employee1

select distinct \* from employee1

select distinct salary from employee1 orderby

Joining:

Joining is used to select record from two or more tables where all table has some comon field

Type of joining ;

1 inner joining

2 left outer joining

3 right outer joining

4 full outter joining

5 cross joining

6 self joining

1 inner joining : inner join selects only common record of all tables

**Syntax:**

**Select** table\_name.column\_name(s ) from frist table name inner join

Second table name on frist table\_name .column\_name=second\_table\_name.common\_coloumn\_name

Select table\_name from frist table name inner join second table on

Frist\_table\_name\_common\_column\_name=second

2 left joining: left join is used to sselect all record from left table and only matched records from second table

The value is not present in second table then by default null value is put at the place.

Select table\_name .column\_name(s) from left\_table\_name left join right\_table\_name on

Left\_table\_name.common\_column\_name=right\_table\_name.common\_column\_name;

Right joining: right join is used to select all records from right table and only matched .common record from second table.

Syntax

Select table\_name.column\_name(s) from left\_table right join right\_table on

Left table.common\_column\_name =right table\_name.common\_column\_name;

3 full outer joining:

Syantax

Select table\_name.column\_name second\_column\_name from second column\_name full outer join first\_column\_name on table\_name.common\_column\_name=second\_table\_name.common\_column\_name;

Group by: group by claused to make group of one or more records that has same value based on a column.

When you are using group by clasued with select statement you can only select the column which are using in group by or you can any aggregate function with select.

Syntax:

Select column\_name,aggregate(column\_name) from table\_name group by column\_name

Exa:

Select depid,count(\*) ,sum(fee) from student group by depid;

Having:

T-SQL

t- sql stand for transact sql. It provides some advanced tools to perfrom different operation in database.

Tools of sql:

User-defined variable

Control flow statement

Begin-end

If-else

While

Try-catch

------------------------------------------------------------------------------------user deifned variable : user defined variable are just a name used to store data from the outside world.in T-sql mainly variable are declared with pre-fix declare and always variable are with following syntax

DECALRE @ \_ variable\_name data\_type(size),………..

Exa:

DECLARE

@name varchar(100),

@salary int;

By default value of user-defined variable is null.

Assign value to the variable:

There is two way to assign value to the variable :

1. By using set keyword:

Set keyword is used to assing any value to the single one variable

DECLARE @name varchar(100),

@salary int;

set @name='Techpile';

set @salary=50000;

select @name as username,@salary as usersalary;

2.By using select keyword: select keyword is used to set values to the variales.but suing select you can set multiples vaues to different variables at one time .

Syntax:

Select @variable\_name=value,

@variable\_name=value………..

Exa:

DECLARE @name varchar(100),

@salary varchar;

select @name='umesh',@salary='4000';

select @name=emp\_name,@salary=salary from employee

select @name as username,@salary+10000 as salary;

select @name+@salary as total;

T-SQL

Standard sql – ddl,dml

Batch or script

Triggers

User-defined variavle

Stored procedure

User defined function

How to create sql query with case:

Case:

Case is used to select any column/field based on the given condition . so normally case is used to apply condition within a query.

Syntax:

Case when <condition> then statement end

select emp\_name,case when salary between 15000 and 30000 then 'jr employee' end

from employee1;

output:

suraj jr employee

suraj jr employee

manish jr employee

abhishek NULL

deepak jr employee

dev jr employee

ved NULL

abrar NULL

vinay NULL

satish jr employee

mahesh jr employee

if-else:

case when <condition> then statement

else <statement> end

exa:

select emp\_name,case when salary between 15000 and 30000 then 'jr employee'

else 'sn,employee' end from employee1

output:

suraj jr employee

suraj jr employee

manish jr employee

abhishek sn,employee

deepak jr employee

dev jr employee

ved sn,employee

abrar sn,employee

vinay sn,employee

satish jr employee

mahesh jr employee

select emp\_name,case when salary between 15000 and 30000 then 'jr employee'

else concat((salary+1000),'') end from employee1

**ladder if else:**

case when <condtion> then statement

when <condition> then statement

when <condition> then statement

-

-

else statement

end

exa:

select emp\_name,salary,case when salary between 1000 and 20000 then 'jr employee'

when salary between 20001 and 40000 then 'sr. developer'

when salary>40000 then'project manager' end,emp\_id

from employee1

output:

suraj 20000 jr employee 1001

suraj 20000 jr employee 1002

manish 30000 sr. developer 1003

abhishek 40000 sr. developer 1004

deepak 15000 jr employee 1005

dev 25000 sr. developer 1006

ved 45000 project manager 1007

abrar 50000 project manager 1008

vinay 45000 project manager 1009

satish 20000 jr employee 1010

mahesh 25000 sr. developer 1011

BEGIN-END:

BEGIN \_END is a keyword of sql also known as control flow statement.BEGIN-End contains BATCH(collection off script) that is used to define ragge of it or else or any condition statement.

DECLARE @salary int,

@action int

set @salary=20000

set @action=1

if(@action=2)

BEGIN

update employee1 set salary=@salary+100 where salary=@salary

select \* from employee1

END

else

BEGIN

select \* from employee

END

Output:

**Sr name salary department email**

100 riya rai 30000 software developer priya@gmail.com

101 ram sing 20000 app developer ram@gmail.com

102 suraj 30000 marketting sh@gmail.com

103 siya singh 30000 HR siya@gmail.com

104 ajad NULL NULL riya@gmail.com

BEGIN-END can be nested.

BEGIN-END is used to define blocks of condition and flow control statement like if, else,while

Etc.

If(condition)

BEGIN

//Batch

END

ELSE If(condition)

BEGIN

//batch

END

TRY-CATCH:try catch is used to handle run time of queries due to some wrong entries or anything else.

Run time errors of ueriese is handled by try-catch in sql .

Catch come always after try block.

Catch block execute only if there is any error

In try block.

If there is any possibility or error in any line of code then those lines are put into try block with a error free meassage or any code within catch block.

Syntax:

BEGIN try

// statement

End try

BEGIN CATCH

//statement

END CATCH

STORED PROCEDURE : stroes procedures is collection of some pre-written quries /database command.

Benefits of stored procedure is it proides code -reusability and security to the database operations

Syntax:

**To create procedure:**

Create procedure procedure\_name

As

Begin

// sql statement

End

We can create procedure in 2 ways:

1. Stored procedure with parameter
2. Stored procedure without parameter

TCL COMMAND

Tcl stand for transaction control language .it is used to control operations of database.

Commit

Rollback

Save transaction

Are some commands of tcl.

1.commit : commit is a single command used to save transaction of database parmanantly.

Insert,update,delete,are some autocommit type command

that means you do not need to save it separately after execution.

ACID property(atomicity consistency isolation)

Automicity : all or none :all transaction should be successful or not.

Consistency : after transaction and before taransaction database should be same.

Isolation : one transaction of database should not effect to the another transaction of db.

Durability : each database should have a backup system in case any accident occurs with database.

ROLLBACK: rollback sets database to the initial position.

Syntax:

Begin transaction

Rollback

Exa:

select \* from employee

begin transaction

insert into employee values('suresh','40000','manager','salini@gamil.com');

delete from employee where emp\_id=101

commit

begin transaction

rollback

select \* from employee

You can rollback those transaction which are written in buffer memory.

Those transaction which are written with ‘’begin’’ transaction and did commited those can be rollbacked.

Begin transaction

Insert

Update

Delete

Commit;

To remove autp-commit sustem of db,transaction are written within begin transaction.

Like : ->

begin transaction

begin transaction

// sql statements

Commit;

Implicit control : controlling of transaction is done via database.

Explicit control : controlling of transaction id done via user.

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

1. Save transaction : save transaction is used to set pointer to the particular lacation of data saved in buffer memory. And create seprate memory for transactions

Executed after pointer.

It is used so that you can rollback to the specific number of transaction.

Syntax:

Begin transaction

Save transaction<pointer\_name>

Sql statement

Exp:

begin transaction

insert into employee (emp\_name) values('mahima')

save transaction t1

insert into employee (emp\_name) values('mahi')

begin transaction

rollback transaction t1

RENAME COMMAND : rename is used to change name of existing table of columns .

In mssql rename command is acutually used as a stored procedure .

Syntax:

To rename table\_name

Exa:

Sp\_rename ‘dbo.old\_table\_name’,’new\_table\_name’

Syntax to remove column\_name:

Exec sp\_rename ‘table\_name.old\_column\_name’,’newcolumn\_name’,’column’

Exa:

exec sp\_rename 'employeedetail.emp\_name','labour\_name','column'

Rename command is mysql:

Rename table oldtable\_name to newtable\_name

To copy whole table data to a new table :

Exa:

Syntax:

Select \* into newtable from oldtable

Eax: select \* into umesh from employeedetail

test

6.

select s.name,avg(s.fee)from student s inner join classes c on s.class\_id=c.class\_id where c.category=’computer’