**DBMS(Data Base Management System)**

Data base management system is a system which manages the data by retrieving the data by modifying the data and by deleting the data

Types of data base management system:

1.HDBMS(hyrerical data base management system)

2.NDBMS(network)

3.RDBMS(relational)

1.In HDBMS data can be arranged in hierarchal format to manage the data

HDBMS is simple in structure so that we can easily identify which node is accessing which node's information but their is a limitation in HDBMS , each and every sub node or child node should have only one parent node due to the limitation cross communication is not possible and we will get data redundancy problem.

2. In NDBMS data can be arranged in hierarchal format in order to arrange the data with cross communication. Cross communication facility is used to avoid the problem of data redundancy

It is complex in structure so that we cannot easily identify which node is accessing which node's information . if you want to understand accessing process we have to write lengthy quires.

3.RDBMS was exclusively designed to establish relation between to data base objects(tables).

The relationship may be one to one, one to many, many to one and many to many

INTRODUCTION OF SQL:

Sql server is an Rdbms technology which was licensed and marketed by Microsoft .

Actually it was developed by Sybase Corporation in the year 1988 with version 4.0 which is working under "OS2" operation System. In 1988 Sybase corporation was unable to get license from ANSI(American National Standard Institution) then Microsoft purchased the licensee and took 6 years service in order to change the os2 to windows

In 1994 Microsoft released latest version of sql server that is 4.2, which is working under windows operating system

Features Of Sql Server

1.SECURITY
2.DATA REDENDENCY
3.DATA INTEGRITY
4.BACKUP AND RECOVERY
5.LOW IN COST AND Easy TO INSTALL
6.LATEST VERSION OF SQL IS 14.0

System Defined Data types:

1. Numeric data type
2. String Data type
3. Date Data type

1. Numeric Data type:

This data type in sql server are used to provide numeric information into the columns

These Includes:

| Datatype | Size |
|---|---|
| 1. TINYINT | 1 BYTE(8 Bits) |
| 2. SMALLINT | 2 BYTES |
| 3. INT | 4BYTES |
| 4. BIGINT | 8BYTES |

(EXACT NUMERICS: EXACT NUMERICS ALLOWS ONLY NUMBERS BUT NOT DECIMAL VALUES.)

EX:

1. 3,4,5(VALID)
2. 2.4,4.2(INVALID)

(APPROXIMATE NUMBERS: Approximate numbers allows numerics and decimals)

EX: 3, 4.5, 5.3,4,5,(VALID)

| | |
|---|---|
| REAL | 4 BYTES |
| FLOAT | 8BYTES |

2. STRING DATATYPE:IT IS USED TO PROVIDE CHARACTER INFORMATION THESE INCLUDES

| Data type | Size |
|---|---|
| 1. CHAR (N) | 1 BYTE |
| 2. VARCHAR (N) | 1 BYTE |

CHAR (N): it is a fixed lenghth datatype which occupies 1 byte memory by default.

if we supply n values it occupies n bytes of memory. here n is a positive inter. it follows satic memory allocation process

ex: char (10)

VARCHAR (N): it is a variable length datatype which occupies by default 1 byte memory.

here occupies n bytes of memory. here n is a positive inter. it follows satic memory allocation process

ex: sname varchar (10)

Text: it stores maximum 2 gb characters. it follows dynamic memory allocation.

VARCHAR (MAX): it stores 16 gb of characters information. it follows dynamic memory allocation process.

3. DATE TIME: it is used to provide date oriented information into the columns.

| datatype | size | range |
|---|---|---|
| 1. datetime | 16 bytes | 0001-01-01 to 9999-12-31 |

Transac t-Sql: T-sql is a fourth generated intermediate language between user and sql server.

Sub – Languages in T-Sql :

In T sql there existed 4 sub language which includes:

1. DDL(Data Defination Language)
2. DML(Data Manipulation Language)
3. DCL(Data Control Language)
4. TCL(Transaction Control Language)/DTL(Data Transaction Language)

**DDL(Data Defination Language):**DDL is first and primary sub language available in T-sql which is known as definiation level language. It includes the following stmts.

1.Create
2.Alter
3.Drop
4.Truncate

1.Create: It is used to create data base and tables.
Syn: Create table  tablename(col 1 datatype, col 2 datatype……);
Ex: Create table emp(eno int,name varchar(20), city varchar(20));

2.Alter: Alter can be used in 3 ways:

a) By adding new column to the existing table.

Ex: Alter table emp add deptno varchar(30);

b) By changing the data type of an existing table

Ex: alter table emp modify column eno  bigint;

c) By dropping the existing column from existing table

Ex: alter table emp drop column city;

Drop database database name;

DML(Data Manipulation Language):

DML is the second sub language available in TSQL which mainly concentrates on the values of a particular table.  It includes the following stmts.

1. Insert
2. Select
3. Update
4. Delete

1 –Insert Statement: Insert stmt in DML is used to insert the values into a particular table.

Syn: INSERT INTO TABLENAME VALUES(VAL1,VAL2,VAL3…..);

INSERT INTO EMP VALUES(10,”RAMEHS”,50000);

2-SELECT: In DML is used to retrieve the data from a specific table. It  is known as “Base Retrieval Statement”

In SQL server 2005 “SELECT” stmt is divided from DML and It was placed under a separated sub language called DRL/DQL.

DML(DATA MANIPULATION LANGUAGE):

1.Insert

2. Update

3.Delete

DRL/DQL:

1.Select

Syn: SELECT(*/COLUMNS LIST) FROM TABLE NAME;

The Symbol * Specifies all columns and their corresponding rows. Columns list specified particular columns and their corresponding rows.

SELECT * FROM EMP;

SELECT NAME FROM EMP;

WHERE Clause: WHERE clause is sql server is sued to place the condition on a specific colulmn.

It is also associated with “SELECT” , “UPDATE” and “DELETE” STMTS.

Syn: SELECT (*/COLUMNS LIST) FROM TABLE NAME (WHERE CONDITION)

EX:

1.Write a quary to display emp details who are working under 9th department.

SELECT * FORM EMP WHRER DEPTNO=9;

2. WAQ to display emp details whose salary is greter than 3000 and less than 50000.

SELECT * FROM EMP WHERER SAL>3000 AND SAL<5000

3. WAQ to display emp details whose department no. is null

SELECT * FORM EMP WHRE DEPNO IS NULL

NOTE: To compare NULL values in sql server we have to use a special operator i.e “IS” operator.

**UPDATE STMT:**

Updte stmt in DML is used to modify the values in a particular table.

Syn: UPDATE TABLENAME SET COLUMNNAME=NEWVALUE(WHERE CONDITION)

Ex: UPDATE EMP SET SAL=SAL+100;

UPDATE EMP SET SAL=SAL+300 WHERE NAME=”RAMESH”;

**DELETE STMT:** **DELETE** STMT in DML is used to delete the values from a specific table without disturbing its structure(Columns).

Syn: DELETE FROM TABLENAME(WHRE CONDITION)

Ex: DELETE FROM EMP WHERE EMPNOs=2;

'To create table

Create table emp(id int(3),name varchar(20),sal float(7,2),dob datetime);

To insert values in table

insert into emp values(5,"padma",43000,1889-08-08');

To add new column in existed table

alter table emp add column age int;

To modify existing column data type

alter table emp modify name varchar(30);

To drop existing table one column

alter table emp drop column age;

To change existed table column name

Alter table emp change column sal salary float(8,2);

To display only datatypes in table

Desc emp;

To Rename table

Alter table emp rename to employees;

Trucate table

Truncate emp;

To select one column in table

Select name from emp;

To select 1st, 2nd,5th column in table

Select 1st,2nd,5th from emp;

To select all columns data in table

Select * from emp;

To update data in table

Update emp set sal=90000 where empid=1;

To delete particular record

Order by one column ascending order

Select sal from emp order by sal;

Order by one column decending order

Select sal from emp order by sal desc;

Using order by to get highest two salaries

Select sal from emp order by sal desc limit 2;

Using order by to get particular records (ex: from 3 record to 7th record)

Select sal from emp order by sal limit 3,7;(In Ascending order)

Select sal from emp order by sal desc limit 3,7;(In descending order)

To delete a particular record in a table

Delete from emp where empid=1;

Distinct column

Select distinct sal from emp order by sal;

To get top two highest salries

Select sal from emp order by desc sal limit 2;

Alias name

Select sal as salary from emp;

Select sal+100 from emp;

Select sal+300 as HRA from emp;

To count records in table

Select count(*) from emp

Like(it display name starts with r)

Select name from emp where name like ‘r%’

(it display name end with r)

Select name from emp where name like ‘%r%’

"**Where**"= used to place conditions on a specific coloum it is also associate with select,update,delete statments

Syntax  select * from tablename(where condition);

ex:-write a query to display employe details who are working under 10th department?

 select  * from emp where departmentnum=10;

ex:-write a query to display emp details whose salary gretaer than 20000?

  select * from emp where sal>20000;

ex:-write a query to dislay emp details whoes emp name is either ramu or bheem?

    select * from emp where name=ramu or name=bheem;

**"Alias":**it is a one mechanism which allows users to provide a meaningfull name to newly

always alias are used only for temporarly displaying purpose

they will not be stored

ex:-write a query to display salary,pf,hra of every emp

  select sal, sal*30/100 as pf, sal*20/100 as hra from emp;

**"Orderby"**=it is used to arrange the table data in asending or desending order

 syntax= select * from table name(where condition) order by coloumname(asc or desc);

ex:-write a query to display emp details in desendimg order based on sal

  select * from emp order by sal desc;

**"Groupby"**=it is used to divide the table into different gruops based on a specific coloum

 syntax= select (coloumlist) from tablename groupby coloumname;

ex:-write a query to display max salary from emp department wise

select max(sal)  from emp group by department;

**"Having"=** it is used to evaluate a condition along with groupby class generally to evalutae condition we will use where clause but where class is not supported by groupby class in such situations we will use having class

syntax select (coloumlist) from tablename group by columname (havingcondition);

ex:- query to display pf,hra and departmentwise whose department avgsal>10000

select sal*30/100 as pf, sal*20/100 as hra group by department having avg(sal>10000);

**Count(*)=**This count function will count the num of row from perticular table

syntax select count * from tablename;

**Count(coloumname**)=It will count num of values availabe in a specific coloum

syntax select count(sal) from emp;

**Distinct**=It is used to display differnt values avialble in a specific coloum

syntax= select distinct(cololunname) from tablename;

**Data Integrity**=It is data validation process or data checking process, before going to store users supplied information sql server verifies whether user is supplying valid information or not.

If it is valid then that data can be stored directly otherwise server rises an error msg.

We can achive data integrity in 3 ways.

1.Datatypes

2.Constrains

3.Triggers

**Constrains:-**

It is conditions on columns. If we perform any operation against to the constrains the server rises an error msg.

Types they are 6 types of Constrains

1.Notnull

2.Unique

3.Check

4.Primarykey

5.Foreign key

6.Default

**Notnull=** When we place notnull constrain on a perticular column thn that column does not accept any null value.

**Unique=** If u place unique constrain on a perticular column that column doesnt accept any duplicate values. It should accept any unique values.unique constarin accept only one value.

**Check**= It is used to place range conditions on numeric columns

**Primarykey**= When we place a primarykey constrain on a perticular column then that column doesnot accept duplicate values,nullvalues and data is arranged in asending order.

create table dept(did int(20) primary key, dname varchar(20));

**Forgein**= Every foreign key must be a primary key in another table. Foreign key can accept duplicate vaues as well as null values. Foreign key has take the value from its corresponding primary key

Example create table emp(deptid int(3) primary key,city varchar(20) unique);

create table emp (id int(20), name varchar(29),did int(20), foreign key(did) references dept(did));

Joins:(Dept with primary key & Emp with Foreign key)

It is used to select the data from multiple tables using single select statement.

In real time senario base table will be split into multiple sub tables, this process is known as normalization.

Types of joints

1.Innerjoin

2.Outerjoin

3.Crossjoin

**Innerjoin**=It is used to select the data from multiple tables using single select statement, but this process will be going based on equiti conditions.

To performe this innerjoin operation in sql server we have to maintain common valued column between given tables

syntax select table1.column1,table2.column2 and table2.column1,table2.column2 from table1,table2 where table1.columncolumn=table2.commoncolumn

Ex: select emp.name,dept.dname from emp,dept where emp.did=dept.did;

**Outerjoin**=use to select the matched records as wel as unmachetd records from giventables

it is an extension of innerjoin

In outer join we have 3 cateogerious

1.leftouterjoin

2.Rightouterjoin

3.fullouterjoin

**1.Leftouterjoin=**It select the matched records from given table and unmatched records from leftside table.

synatx select table1.column1,table1.column2 table2.column1,table2.column2 from table1 left outer join table2 on(table1.commoncolumn=table2.commoncolumn);

select emp.name,dept.dname from emp left outer join dept on(emp.did=dept.did);

**2.Rightouterjoin**=It select the matches record from given table and unmatched records only from right side table

synatx select table1.column1,table1.column2 table2.column1,table2.column2 from table1 right outer join table2 on(table1.commoncolumn=table2.commoncolumn);

Ex: select emp.name,dept.dname from emp right outer join dept on(emp.did=dept.did);

**3.Fullouterjoin=**It select matches records and unmatched records from the given tables.

syntax select table1.column1,table1.column2 table2.column1,table2.column2 from table1 full outer join table2 on(table1.commoncolumn=table2.commoncolumn);

Ex: select emp.name,dept.dname from emp left outer join dept on(emp.did=dept.did) union select emp.name,dept.dname from emp right outer join dept on(emp.did=dept.did);

**Crossjoin**=it is rarely used in the organizations because it produces the product of 2 tables(mod tables)

To performe crossjoin we need not to maintain any common valued columns in the given tables

syntax select * from table1,table2;

Subqueries:-

It is nothing but a selected statement nested with another select statement.

Always a subquery sends values to its neariest main query

(Note:-sql server first executes sub query based on subquery values main query will get executed.)

ex:- write a query to display empdetails who are working under krish dept?

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select * from emp where deptno=(select deptno from emp where empname="krish");
```

ex:-write a query to display empdetails whos salary is greater than highest sal of 10th dept?

```
select * from emp where sal>(select max(sal) from emp where deptno=10);
```