Database Management system

Types of databases

1. SQL
    a. Structured data
    b. data should be secure.
    c. Transaction control is needed.
    example : oracle, mysql,sql server, postgrSQL
2. NoSQL
    a. unstructured
    b. data should be secure.
    c. No transaction control
    examples: mongodb, CouchbaseDB, Cassndra
3. GraphDB
    a. unstructured
    b. display should be in graph format
    examples : NEO4j
4. Memory databases
    a. if the size of data is small, and faster access is needed.
    example MemDB, VoltDB
5. Disk based databases.
    a. These databases are available on the same machine on which it is installed

eamples : SQLite3, MS-ACCESS

uses of SQL databases

1. Share of data is easy
2. data is secure, it supports transaction control
3. managing data becomes easy.
4. retrieval of data is easy.

Types of statements available

Types of statement		
DQL	Data Query Language	select
DCL	Data Control Language	grant , revoke
TCL	Transaction control language	commit, rollback, savepoint
DDL	Data definition language	create, alter,truncate,drop
DML	Data Manipulation language	Insert, update delete

ACID property

1. Automicity---If a transaction contains many steps, then either all will happen or none will happen, entire transaction will get executed as a single unit
2. consistency--→ after every transaction the data will be correct state
3. isolation--→ the intermediate changes in the transaction are not visible to all users, is called as isolation
4. durability--→ the correctness data after every transaction, will be ther for longer duration.
    Data gets stored in table format in SQL

1. Table is also called as relation.
2. Columns -→ attribute/ fields/ columns
3. record--→ record/ row/ tuple

Install mysql

https://dev.mysql.com/downloads/installer/

MySQL store data internally in the form files, called as table space,
It stores data in various types of files

1. control file---→ these files are used to store metadata
2. data file-→ these files are used to store data
3. redolog files-→ these files are used to store all changes happening to data, and can be used at the time of commit, and rollback

To create database in mysql

create database if not exists <name of the database

create database if not exists acts 0324

To load data from SQL file

mysql> source <filename>

Operators in mysql

Arithmetic operators	+, -, /, *, %
logical operators	and or not
relational operators	=, !=, >=,<=,>,<

Operators

[not] between ... and ...	To check the range of values we use between and operator, the given values are inclusive
[not] in	to check multiple values = with either or, the use in
is [not] null	to check null values we use this operator
[not] like	to check the pattern in the field we use like and not like operator in this % symbol represents 0 or more characters and _ represents exactly one character

DQL --→ Data query language

1. to display all fields and all rows from emp table
   select * from emp

2. to display empno,ename for all employees
   select empno,ename from emp;

3. to display all employees with sal > 2000
   select * from emp
   where sal>2000;

4. to display all employees with job=salesman
   select * from emp
   where job='Salesman'

5. to display all employees joined on '1981-12-03'
   select * from emp
   -> where hiredate='1981-12-03'

6. to display all employees with job=salesman
   and deptno=10
   select * from emp
   where job='Salesman' and deptno=10;

7. display all employees working as CLERK and sal >1500

select * from emp
where job='CLERK' and sal>1500

8. display all employees with sal=1500 or 2000 or 3000
   select * from emp
   where sal in (1500,2000,300)
9. display all employees with sal not either 1500 or 2000 or 3000
   select * from emp
   where sal not in (1500,2000,300)
10. display all employees with job clerk, salesman or manager

select * from emp

where job in ('clerk','slaesman','manager')

11. display all employees who work in deptno 10 or 20 and sal > 1500

select * from emp

where deptno in (10,20) and sal > 1500;

12. display all employees with sal >=1500 and <= 2500

select * from emp

   where sal between 1500 and 2000;

13. display all employees with sal not> =1500 and <= 2500

select * from emp

   where sal not between 1500 and 2000;
14. display all employee with commission is null
   select * from emp
   -> where comm is null;

15. display all employee with commission is null

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select * from emp
  -> where comm is null;
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15. to find all names starts with A

select * from emp where ename like ‘A%’	select * from emp where ename REGEXP ‘^A’

16.

17. to find all names ends with N

select * from emp where ename like ‘%N’	select * from emp where ename regexp ‘N$’

18. to find all names which has E at 2nd last position

select * from emp where ename like ‘%E_’	select * from emp where ename regexp ‘E.$

19. to display all employees with name starts with either A or M

select * from emp where ename like 'A%' or ename like 'M%'	select * from emp where ename regexp ‘^[AM]’

20. to display all employees with name starts with A and ends with N or starts with m and ends with R

select * from emp where ename like ‘A%N’ or ename like ‘M%R’	select * from emp where ename regexp ‘^A.*N$\|^M.*R$’

21. display all employees with name starts with A and l is 3 rd position and ends with N or starts with J and ends with either S or N

select * from emp where ename like ‘A_L%N’ or ename like ‘j%S’ or ename like ‘j%N’	select * from emp where ename regexp ‘^A.L.*N$\|^J.*[SN]$

22. display all employees with name N occurs at either 2 nd position or 3 rd position or starts with J and N at 3rd last position

select * from emp where ename like '_N%' or ename like '__N%' or ename like 'J%N__';	select * from emp where ename regexp '^..?N|^j.*N..$'

23. display all employees with name does not start with either J or M

select * from emp where ename not like 'J%' and ename not like 'M%'	select * from emp where ename regexp ' [^JM]'

Regular expression

^	it will check the pattern at the beginning
$	it will check the pattern at the end
[a-zA-Z]	will match with any alphabet
[0-9]	will match with any one digit
.	match with any one character
[^0-9]	any character other than 0-9
*	0 or more occurrences
+	1 or more occurrences
?	0 or 1 occurrences
{m}	exactly m occurrences
{m,n}	minimum m occurrences or maximum n occurrences
abc|pqr|mns	to match with either abc or pqr or mns

b*a*n	bn,ban, baaaaaaaaan
[0-9]{100}	
[0-9]*	this is 123
^or	origami, organ normal
or$	tailor, minor
A.?b	Ab , Axb Axxxxxb Abcdsgsdd

1. to display empno,name,sal for all employees
   select empno,name,sal from emp;
2. to display empno,name,sal,comm and netsal for all employees
   where netsal = sal+comm
   select empno,ename name,sal salary,comm,sal+ifnull(comm,0) "net sal" from emp;

3.