Databases

SQL

* Structured database-🡪 RDBMS
* ACID property
* Relation model is used
* Useful for sharing data
* Examples -🡪 Oracle, MySQL, SQL server, PostgreSQL

NOSQL

* unstructured data
* Usually data is stored in key -value format or JSON format
* CAP theorem
* Example ---MongoDB, Cassandra, CouchbaseDB

GraphDB

* Data is represented in the form of graphs
* Usually used in media applications to store complex relationship
* Example---- NEO4J

Memory Database

* Data is stored in RAM
* Faster access is there but size of data will be small
* Usually used in Research projects
* For Backups it uses RDBMS, MySQL
* Examples MemDB, VoltDB

Data model ---- the way data is organized, is called as data models

1. Hierarchical----- data is stored in tree structured format
2. Network---- data is stored with complex relation, which looks like a network
3. Relational---data is stored in tabular format called as relation.

SQL--🡪 MySQL

ACID property

1. Atomicity: Every transaction works as a single unit. Either all steps will get executed or no steps will get executed.
2. Consistency: After every transaction, data is always in correct state. Example : after withdrawal every time the a/c balance will be in correct state
3. Isolation: When a transaction is going on, intermediate state will be visible to only the current user. And not visible to other users unless transaction is either committed or Rollback.
4. Durability: When the state of transaction is in correct state and it happens for longer period of time then it is called as durability.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| accno | name | custid | mobile | balance | type |
| 111 | Kishori | 1 | 23456 | 11111 | saving |
| 222 | Kishori | 1 | 23456 | 333333 | demat |
| 333 | Kishori | 1 | 23456 | 44444 | current |
| 344 | Rajan | 2 | 44444 | 55555 | Saving |
|  |  |  | 66666 | 66666 | saving |

Primary key---- Minimal subset of columns which identifies the row uniquely is called as primary key.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Orderid | Itemno | Dateof order | Amt | qty |  |
| 1 | 1 |  |  | 2 |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Types of statements

|  |  |  |
| --- | --- | --- |
| Type of statements | Full forms | statements |
| DQL | Data Query language | Select (order by, group by) |
| DML | Data manipulation Language | Insert, update, delete |
| DDL | Data definition language | Create, alter, drop, truncate |
| DCL | Data control language | grant, revoke |
| TCL | Transaction control language | Commit, rollback, savepoint |

DQL ---- Data query language.

1. Display all rows and all columns from emp table

Select \*

From emp;

1. Display only empno, ename and sal column for all rows from emp table

Select empno, ename, sal

From emp;

1. Display empno and name for all employees with salary > 2000

Select empno,ename

From emp

Where sal > 2000;

To install MySQL and load data into database

1. Download MSI file for community server from the given site

<https://dev.mysql.com/downloads/windows/installer/8.0.html>

1. Run MSI file and install MySQL
2. Start MySQL command line client via start menu in windows.
3. Then create a database

Create database if not exists test

1. Change the database

use test

1. Load data from demobldmysql.sql available in directory D:\mysql\_databse

source D:\mysql\_databse\demobldmysql.sql

1. Check data is loaded or not

Select \* from emp;

Select \* from dept;

Select \* from salgrade;

1. To see the column names and its data type use desc command

desc emp;

desc dept;

desc salgrade;

1. To display all employees working as salesman

select \*

-> from emp

-> where job=’SALESMAN’;

1. To display all employees joined on 20 feb 1981

select \*

-> from emp

-> where hiredate='1981-02-20';

11. find all employees whose job is SALESMAN and sal <2000;

Select \*

From emp

Where job=’SLAESMAN’ and sal>2000;

Comparison operators

>, <,>=, <=, =

Logical operators

And , or, not

Arithmetic operators

+,-,/,\*,%

1. Find all employees name, empno , sal and commission and net sal

Ifnull function will replace the null value in comm column by 0 in calculation.

select empno,ename,sal salary,comm,sal+ifnull(comm,0) "net salary"

-> from emp;

1. To find employee with salary either = 2000 or 800 or 1100

Select empno,ename,sal

From emp

Where sal in (2000,800,1100); # Where sal=2000 or sal=800 or sal=1100;

1. To find employee with salary not equal to either = 2000 or 800 or 1100

Select empno,ename,sal

From emp

Where sal not in (2000,800,1100);

1. Select all employees with sal >= 1000 and <= 2500

Select \*

From emp

Where sal between 1000 and 2000; #sal > 1000 and sal < 2000

1. Find all employees who joined in year 1981.

Select \*

From emp

Where hiredate between ‘1981-01-01’ and ‘1981-12-31’

1. Find all employees who have not joined in year 1981.

Select \*

From emp

Where hiredate not between ‘1981-01-01’ and ‘1981-12-31’

1. To find all employees who are working as either CLERK or SALESMAN

Select \*

From emp

Where job in (‘CLERK’,’SALESMAN’);

1. To find all employees who earned no commission

Select \*

From emp

Where comm is null or comm=0;

1. To find all employee who earned commission

Select \*

From emp

Where comm is not null;

1. To find all employees who joined in feb 1982

Select \*

From emp

Where hiredate between ‘1982-02-01’ and ‘ ;