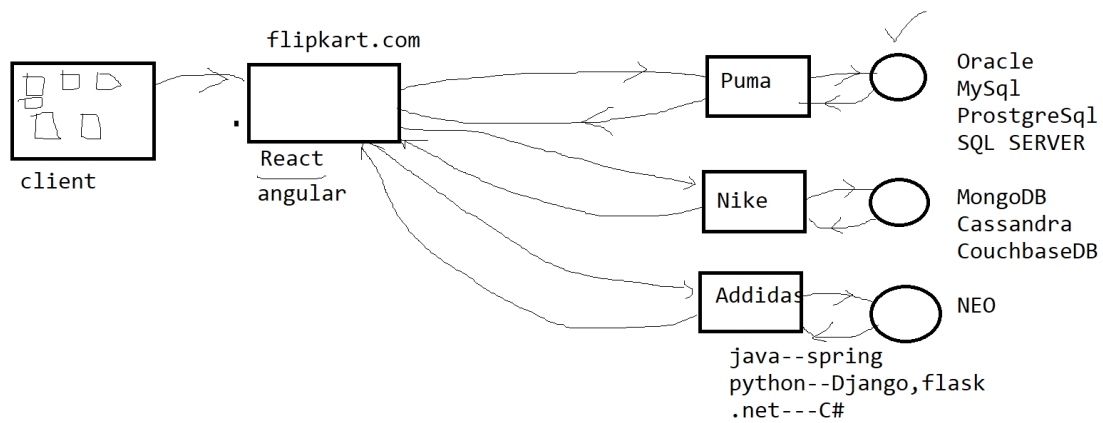Full stack application – these are 4 tier applications

Databases are of various types

1. RDBMS-> Relational Database Management System
   a. Data is structured format
   b. we store the data in the form of table, these tables are called as relations,
   c. example—MySQL, Oracle, PostgreSQL, SQL Server
   d. All these databases use SQL (Structured Query Language)

2. No-SQL->
   a. Data is stored in unstructured way
   b. the data is stored in the form JSON data, document based data.
   c. example MongoDB, Cassandra
3. Graph database.
   a. In some applications data is stored in the form of Graph,
   b. example- NEO4J
4. Memory Database
   a. If your data is stored in the RAM
   b. It is faster, but the size of data will be limited
   c. It needs backup server
   d. Usually, it is used in research applications
   e. example -→MemDB, VoltDB

Download MYSQL Installer

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

Steps to start MySQL

On start button type Mysql > Mysql commandLine client

enter password: <password>

Or

Open command prompt

mysql -u root -p

enter password: <password>

Load the data in MySQL

Use demobldmysql.sql

in front of mysql prompt use following command

mysql> source <path to demobldmysql.sql>

To check whether data exists

1. select * from emp;
2. select * from dept;
3. select * from salgrade

to create database	create database if not exists iacsd0324; or create database iacsd0324;
to change the current database	use iacsd0324;
to see the list of all table	show tables;
to see the list of columns in the table	desc <table name> desc emp;
to see all databases	show databases
to delete the database	drop database <name of the database> drop database mydb;
to delete the existing table	drop table <tablename> drop table emp;
to display all records from table	select * from <tablename> select * from emp;

Types of statements

Types		
DQL	Data query language	select
DML	Data Manipulation language	insert, update, delete
DCL	Data control language	grant, revoke
TCL	Transaction control language	commit, rollback savepoint
DDL	Data definition language	create, drop, truncate

Features of database

1. primary key has to be there
2. no two rows should be identical
3. sequence of columns and Rows does not matter

use of databases

1. sharing of data is easy.
2. accessibility is easy.
3. availability of data is easy.

DQL

1. to retrieve all the columns and all the rows from table
   select * from emp;
2. to display empno, name, sal of all employees
   select empno,ename,sal from emp;
3. to find all employees with ename= smith
   select * from emp where ename='SMITH'
4. to fins all employees with empno is 7982
   select * from emp where empno=7982
5. to find all employees joined on 12 dec 1980
   select * from emp where hiredate='1980-12-12'
6. to find all employees with sal =1300, and working in dept 20
   select * from emp where sal=1300 and deptno=20
7. to find all employee working on department 10 or sal >2000
   select * from emp where sal>1300 or deptno=10
8. to find all employee working with ename='SMITH' and deptno=10
   select * from emp where ename='SMITH' and deptno=10
9. display data using alias name, if alias name contains space then it is mandatory to
   enclose in '' or ""
   select empno "Employee num",ename Name,job
   from emp;

   operators in where clause

[not] in	to check multiple values with single column, use in operator
[not] between... and	
is [not] null	
[not] like	

10. to find all employees with sal is either 1300 or 1600 or 2000
    select * from emp where sal=1300 or sal=1600   or sal=2000
    select * from emp where sal in (1300 ,1600 ,2000)

11. to find all employees with sal is not either 1300 or 1600 or 2000
    select * from emp where sal not in (1300 ,1600 ,2000)

12. to find all employees with hiredate=1981-06-09'or 1981-11-17

    select * from emp where hiredate='1981-06-09' or hiredate=' 1981-11-17'

    select * from emp where hiredate in ('1981-06-09',' 1981-11-17')

13. to find all employees with name either smith or jone or ward

    select * from emp where ename in ('SMITH','JONE','WARD')

14. to find all employees not working in department either 10 or 20

    select * from emp where deptno not in (10,20)

15. to select all employees with sal >=1500 and <= 2500

    select * from emp where sal>=1500 and sal<=2500

    select * from emp where sal between 1500 and 2500

16. find all employees who joined in jan 24

    select * from emp where hiredate between '2024-01-01' and '2024-01-31'

17. to select all employees with sal not >=1500 and <=2500

    select * from emp where sal not between 1500 and 2500

18. to find all employees who did not earn any commission

select * from emp where comm is null

19. to find all employees who earn some commission

select * from emp where comm is not null and comm!=0;

20.

Various keys in the database

1. primary key→ it is minimal set of column or combination of columns which identifies to row uniquely, and the value cannot be null
   if primary key contains only one column then it is called as simple primary key, but if it contains more than one column then it is called as composite primary key
   Student

sid	sname	course
1001	Rajesh	DAC
1002	Bhavika	DAC

   Marks

sid	cname	marks
1001	java	98
1001	C++	98
1001	Python	98
1002	java	92
1002	C++	95

order table

orderid	itemid	date of order	price	qty	salesid	sname
1001	100	21 march 24	3456	56	23	sharmila
1001	101	21 march 24	200	56	23	sharmila
1002	100	21 march 24	3456	56	23	sharmila
1002	101	21 march 24	200	56	23	sharmila

Roomid	custid	date of booking	price	email
123	10	20 mar 24	5000	asd@gmail.com
124	10	20 mar 24	5000	asd@gmail.com
123	11	21 mar 24	5000	asd11@gmail.com
123	10	20 Apr 24	5000	asd@gmail.com

screen	movienum	seatnum	bookingdate	price	show time		
1	100	1	21 march 24				
3	100	1	21 march 24				
1	100	2	21 march 24				

2. alternate key --- the keys which are candidate keys but not selected as primary key are called as alternate key

3. candidate key
   All possible minimal subset, which may become primary key, is called as candidate key
   example {empid,passportnum,adharno,pannum,mobile,email}

empid	ename	sal	passportno	adharno	pannum	email	mobile	

4. super key-→ any combination of columns that identifies the row uniquely, is called as super key
   {roomid+data of booking, roomid+data of booking+custid, roomid+data of booking+price, roomid+data of booking+email,

Roomid	custid	date of booking	price	email
123	10	20 mar 24	5000	asd@gmail.com
124	10	20 mar 24	5000	asd@gmail.com
123	11	21 mar 24	5000	asd11@gmail.com
123	10	20 Apr 24	5000	asd@gmail.com

5. foreign key-→
    If a column of a table, refers value of some other table's primary key or value of its own table primary key, then it is called as foreign key. and one table can have any number of foreign key.

in emp table deptno is a foreign key, because it references deptno of dept table for validity of data
in employee table mgr column is also a foreign key, because it references empno(primary key) of emp table for validity of data

6. unique key→ any column which identifies the row uniquely, but it may conatin null values
    passportno, adhar number