8 days:

**Day 6**

**Database:**

Data: raw fact or unprocessed data.

Information: processed data or meaning full data.

Program -🡪

Input , initialization, run time value, file system, database, network etc

Process

Output , display output on console , file system or database system or network or report in different format.

We need to store the data permanently

1. File base system:

Limitation of file base system

1. data redundancy: file system allows to store duplicate record.
2. Data inconsistency :
   1. Format the file : doc, pdf, excel et
   2. Storing the data in file

Id,name,salary

Id Name Salary

Id/Name/Salary

1. Security : read or read/write mode
2. On file doing CRUD Operation create or insert, delete, update and retrieve more complex
3. Database system (RDBMS) : it is as software which help to store the data in table format using column and rows.

DBMS: Database Management System which help to store the data in table format.

Excel sheet:

MS Access:

**DR EF Codd’s Rules**

**12 rules :** 0 to 11

The database which follow 12 rules is known as RDBMS (Relational Database Management System).

Frontend --🡪 React JS 🡨---🡪 Express (node JS)---🡪 MySQL or Mongo DB

React JS using axios 🡨--🡪Rest API 🡨🡪 connect DB🡨-> MySQL or Mongo

Testing testing

Deployment

Docker and Kubernetes with CI and CD tool with Clouse as AWS or Azure

Trainer -🡪sheet1

**TId TName Tech Salary**

100 Raj Java 45abc

101 Ravi Python abc

101 Ravi Python

Student -🡪sheet2

**Sid SName Age TID TName Tech**

1 Meeta 21 100 Raj Java

2 Leeta 22 100 Raj Java

3 Keeta 23

Database Model

Network model

Hierarchical model

Relational model

In RDBMS

Trainer -🡪 table name

**TID TName Tech**

Int varchar(30) float

Number(4) varchar2(40) number(6,2)-🡪

PK (primary key) :if column is pk. That column doesn’t allow duplicate and doesn’t allow null value. Single tale we can create only one column as pk.

100 Ravi Java

101 Raju Python

102 Raj

Student -🡪 table name

Sid SName Age TID

**PK** **FK**

1 Reeta 21 100

2 Meeta 22 100

3 Leeta 23 101

4 Keeta 24

If table contains foreign key is use to connect PK of same table or different table. That column allow only those values which present in PK. It allow duplicate. It allow null value. In single table we can create many fk column.

**RDBMS**

Relational database management system.

It help to store the data in table format.

RDBMS Database

**MySQL, Oracle, SQL Server 2020, Db2, Postgres etc.**

These all database provide tool or UI tool or command prompt to interact with database server.

We need to learn SQL language. (Structured Query Language) which help to interact with RDBMS database. All database generally use 80 to 85 query are same.

SQL mainly divided into 5 sub language

1. DRL or DQL (Data Query language or Data Retrieval language)

The query which start with select come under DRL or DQL. Retrieve the data from database(from table) in different logic.

1. DDL (Data Definition language)

It help create the structure of table or database object.

Create, rename, alter, truncate, drop etc

1. DML (Data Manipulation language)

Deal with data

Insert, delete and update query

1. TCL (Transaction control language)

Commit, rollback and savepoint etc

1. DCL (Data control language)

Create user, drop user

Grant and revoke

MySQL is one of the open source RDBMS table. It was provided by sun micro system. Now it is part of **oracle**.

Connecting mysql database using command prompt

Mysql command line terminal in search box

By default user name is **root** and password :

show databases; this command display all database present in your account.

Database is collection of more than one database or database objects.

**use databaseName;** this command is use to move inside existing database.

**show tables;** this command display all tables present in current database.

Syntax to create new database

**create database databasename**

create database mern\_2025\_batch;

**DBMS RDBMS**

Table relation

Column Attribute

Row tuple

desc tableName; this command help to display table structure

**DRL or DQL**

To view all records from a table

Select \* from tableName; \* means all column present in that table.

Retrieve specific column from a table

Select columName1,columName2,columName3 from tableName;

We can do mathematical on a column if column contains numerical value.

Column alias using as operator

Combining more than one column if column contains string value using concat() pre defined functions.

**select concat(first\_name,' ',last\_name) as Full\_Name, salary+1000 as Gross\_Salary from employee;**

**filter the data**

in SQL to filter the data we use **where clause**

1. Relational operator : > , >=, <, <=, =, !=

**Select \* from tablename where columnName RO value;**

select \* from employee where salary > 10000;

select \* from employee where salary >= 10000;

select \* from employee where manager\_id = 100;

select \* from employee where job\_id='ad\_vp';

select \* from employee where hire\_date > '1999-12-31';

1. Between operator : filter with range

select \* from tableName where columnName between minValue and maxValue;

select \* from employee where salary between 5000 and 10000;

select \* from employee where employee\_id between 120 and 140;

select \* from employee where hire\_date between '1995-01-01' and '1999-12-31';

1. In operator : in operator is use to apply condition for more than one values.

select \* from tableName where columnName in(v1,v2,v3);

select \* from employee where salary in(5000,2500,10000,10200);

select \* from employee where hire\_date in ('1997-03-10','1995-04-24','1999-01-10');

select \* from employee where job\_id in ('SA\_MAN','SA\_REP','ST\_CLERK','ST\_MANAGER');

1. Like operator:

select \* from employee where first\_name = 'Steven';

it check equality

select \* from employee where first\_name like 'Steven';

it check equality as well as support regular expression concept.

% zero or many any data or value

‘S%’ start with S character

select \* from employee where first\_name like 'S%';

‘%n’ end with n character

select \* from employee where first\_name like '%n';

‘%ll%’ contains ll character

select \* from employee where first\_name like '%ll%';

\_ : any 1 character

\_ first character can be anything and second character must be ‘e’ and remaining character can be zero or many.

select \* from employee where first\_name like '\_e%';

1. **Is null : blank or null value**

select \* from employee where manager\_id is null;

1. **Is not null :not blank**

select \* from employee where manager\_id is not null;