Database

A database system is basically a computer based record keeping system

The collection of data usually referred to as the database

through from this we can say

A Database may be defined as a collection of interrelated data stored together to serve multiple applications.

Purpose of DBMS (Database Management System)

The data should be accurate, private, and protected from Damage.

A DBMS refers to a software that is responsible for storing maintaining and utilizing databases.
A database along with a DBMS is referred to as a database system.

Advantages of Database

→ Reduce Data redundancy (data duplicatio)
→ Control data inconsistency to a large extent
→ Databases facilitate sharing of data
→ Database enforce standards
→ Centralized databases can ensure data security
→ Integrity can be maintained through Databases.

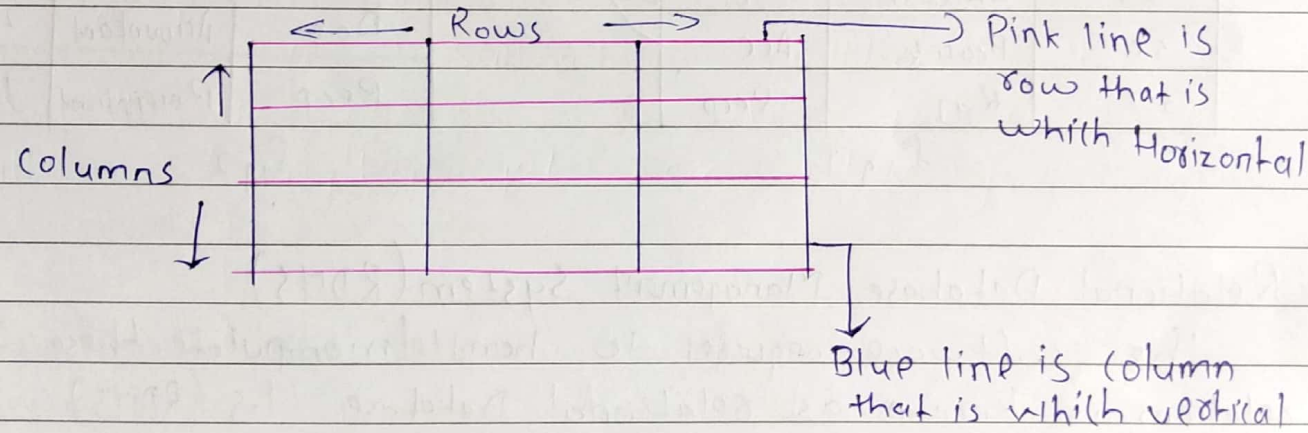
because it is centralized control of the data, thereby minimizing these problems in the database.

Relational Database Model

In relational data model data organized into tables (i.e., rows and columns) These tables are called relations.

→ tuples

Rows go across, ie., from left to right.
Columns are arranged from up to down
Also known as field or attributes



Components of a table

Byte :- A byte is a group of eight bits and is used to store a character.

Data item (field) :- A data item is the smallest unit of named Data. A data item represents one type of information and is often referred to as a field or data element.

Record :- A record is a named collection of data items which represents a complete unit of information

Table :- A table is a named collection of all occurrences of a given type of logical record.

The relational data model is based on a collection of table (relations)

Table:- employee

Eno.	Name	Desig
34	Shubham	Mgr
35	Akash	Dir
36	Pratik	Acc
37	Raj	Recp

fig 1

Table:- Pay

Desig	Designation	Salary
Mgr	Manager	78000
Dir	Director	90000
Acc	Accountant	25000
Recp	Receiptionist	10,000

fig 2

Relational Database Management System (RDMS)

The software required to handle/manipulate these tables relations is known as relational Database M.S (RDMS)

Softwares are Oracle database, Microsoft SQL server, MYSQL (sequel), DB2, etc.

A Relation in a database has the following

- Every value in a relation is atomic (individual) i.e, it cannot be further divided.
- Name of columns are distinct and order of columns is immaterial.
- The rows in the relation are not ordered.

Relational Database Model terms

* A Relation or table is Matrix like structure arrange in Rows and columns.

- Atomicity :- Each column assigned a unique name and must have atomic (indivisible) value. i.e., a value that can not be further subdivided.

- No Duplicity :- No two rows of relational will be identical i.e. in any two rows value in at least one column must be different.

- All items in a column are homogeneous (same) data type.
- Ordering of rows and column is immaterial

* Domain :- It is collection of values from which the value is derived for a column.

* Tuple | Entity | Record :- Rows of a table is called Tuple or Record.

* Attribute | field :- column
* Degree :- Number of columns in a table, for exa :- fig 1 has 3 colums.

* Cardinality :- Number of rows in table, for exa :- fig 1 has 5 rows no.

Keys in Database.

keys :- keys plays an important role in relational database, it is used for identifying unique rows from table and establishes relationship among tables on need.

Types of keys

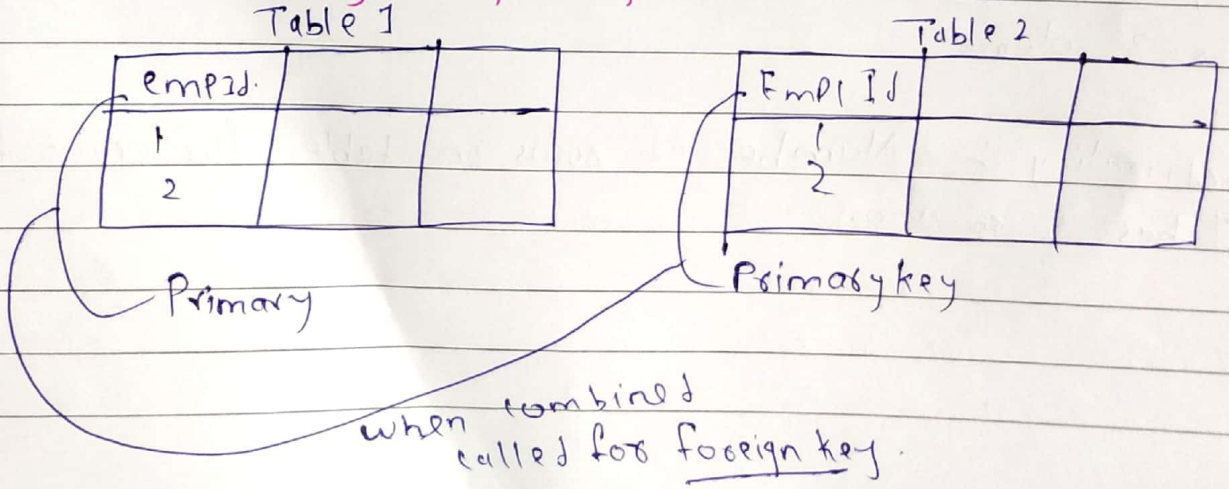
(i) Primary key :- A Primary key is a column or set of columns in a table that uniquely identifies tuples (rows) in that table.

The primary key consists of more than one attribute, it is called composite - primary key or Candidate key.

(ii) Alternate key :- Out of all candidate keys, only one gets selelted as primary key, remaining keys are known as alternate or secondary keys.

(iii) foreign key :- Foreign keys are the columns of a table that points to the primary key of another table. They act as a cross reference between tables.

let us see by rough figure for exa:-



SQL – Structured Query language

- SQL is used to access any database
- SQL stores the commands that are to be used in databases which are generally accepted by all RDBMS

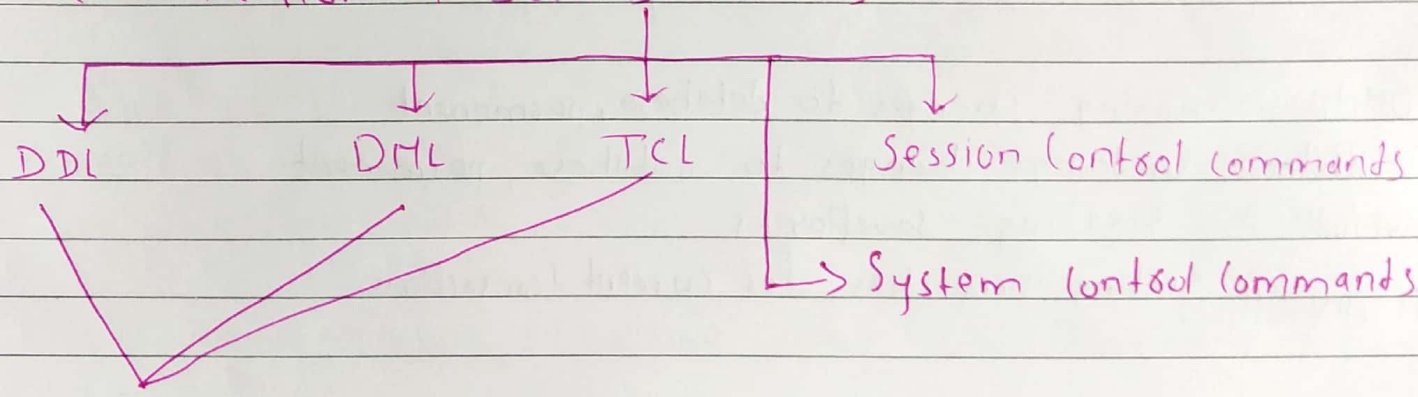
- SQL is a language which provides interface to create relational database and to operate upon them.

- Various versions of SQL are available. First version was developed in 1970 by San Jose Research laboratory of IBM.

- In 1992, 2003, 2008 some updates were added.

- SQL is being used by beginners and skilled users

Classification of SQL statements



We discussed only these three only.

DDL (Data Definition language :- The SQL DDL contains set of command which sets up, changes or removes data structures from the database. These data structure can be tables or other database objects.

(i) Create, alter, and drop schema objects
(ii) Grant and revoke privileges and roles
(iii) Maintenance commands.

(2) DML (Data Manipulation language) Commands.

A Data manipulation language (DML) is a language that enables users to access or manipulate data as organized by the appropriate data model.

→ the retrival of information stored in the database
→ the insertion of new " "
→ the deletion of information from the database
→ the modification of data stored in the database.

(3) TCL (Transaction Control language)

A transaction is one complete unit of work.
A transaction is successfully completed known as COMMIT

COMMIT → making changes to database, permanent
ROLLBACK → Undoing changes to database, permanent
SAVEPOINT → creating savepoints
SET TRANSACTION → setting properties for current transactions.