Computer - Charles Babbage → known as the difference Engine.

Sybase RDBMS → used by Sybase.

Database Technology

Date: / / Page no:

⇒ SQL

⇒ DBT RDBMS → relational DBMS

Intro to Oracle RDBMS + OODBMS (Object Oriented DBMS) → ORDBMS (Object Relational)

Intro to NOSQL (Not only SQL) (new technology)
(type of DBMS)

MongoDB v3.2 (Mongoose DB)

⇒ My SQL →

(Input) (Processing) (output)

Data → Computer → Information

(Raw facts) (Meaningless) 022-22021984

work done to convert raw data into meaningful information

(Meaningful data)
↳ data on whose basis, you can take some action, or the mangement take some decision.)

Database → Collection of large amounts of data.

10 20 30
40 50 60

Various DBMS available ex:- MS Excel, dBase, FoxBase, DBvista, Dataeare, Foxpro

ANSI definition → DBMS is a collection of programs to Insert, update, delete & process.

MS Excel → 53% of work done in IT industry.

* MS Excel program is known as Macro (VBA programming)

Date: / / Page no:

MySQL (RDBMS → Relational DBMS)

DBMS vs RDBMS → MS Excel → MySQL, MS SQL Server

File / Table

DEPT

DEPNO	DNAME	LOC
10	Abc	MU
20	DeF	DL
30	Ghi	PU

Field → Attributes / Columns

Record / Tuple

a. Field
b. Record
c. File

a. Attributes / Column
b. Tuple / Row / Entity
c. Table, Relation, Entity class.

Diff b/w DBMS vs RDBMS

1) diffⁿ nomenaclature.
2) Relationship b/w 2 files has to be maintained programatically.

Employee Table

Dept Tab

ENO (primary key)	EName	Sal	DeptNO (foreign Key)
101	Sudh	200	10
102	Sudha	100	20

Constraints

2) In RDBMS relationship b/w 2 two can be specified at time of table creation (e.g foreign Key constraint)
3) More time needed for s/w development vs less time for s/w development
4) In DBMS we have high network traffic, in RDBMS we have low network traffic
5) slow & expensive vs faster & cheaper (in terms of network traffic & cheaper network traffic, network, Infra cost) (in terms of hardware, network traffic costs)

Internet data, data cost money.

Delhi

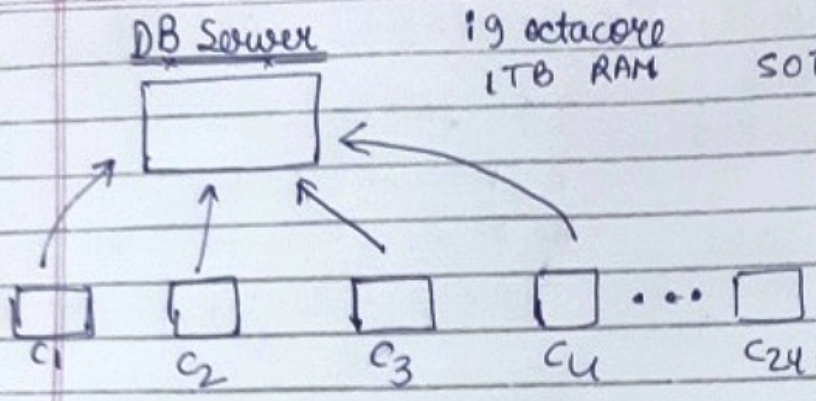
Server — Employee Data (million)

Pune — client — accessing Sal > 5000

DBMS → files from delhi copy to Pune, → then go back.

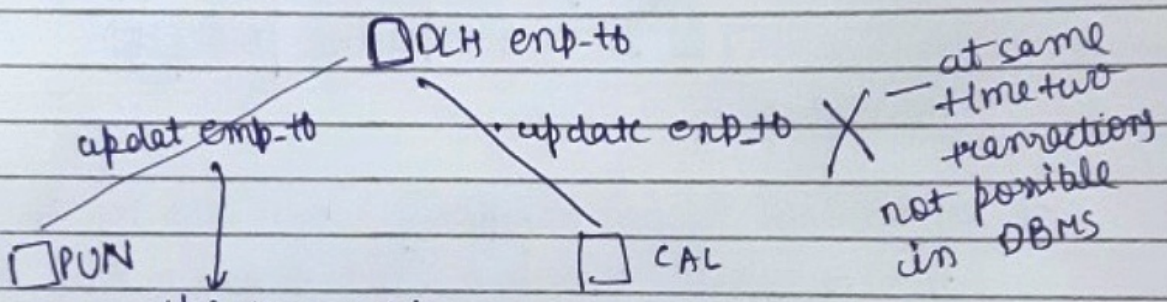
RDBMS → done on server

Date: / / Page no:



6) Processing on Server machine (known as Client-Server architecture)

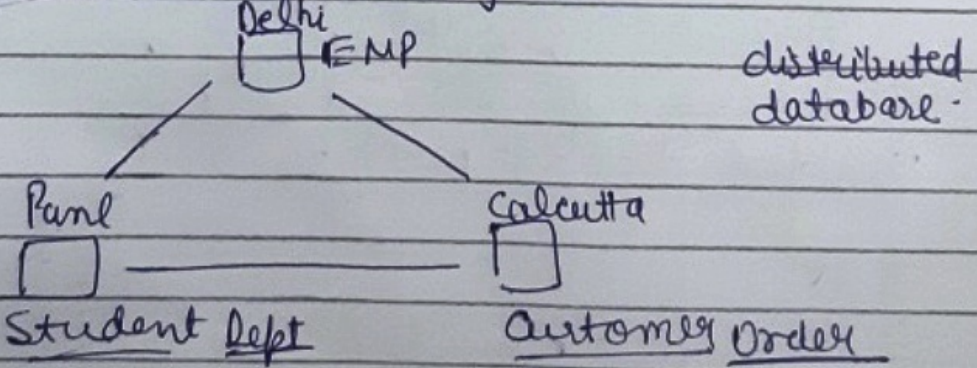
7) Most of the RDBMS support client server architecture (the exception MS Access → local database)
, Paradox ↳ on same machine



lock emp_tb so for all other client it's readonly.

8 In RDBMS if CAL trying to update same row as PUN then its not possible at same time.

8 DBMS → file level locking (not suitable for multi user)
RDBMS → row level locking. (Suitable)



What is the benefit of keeping databases distributed rather than keeping them at one place?

Date: / / Page no:

(9) In DBMS distributed databases not support, while RDBMS support distributed databases.

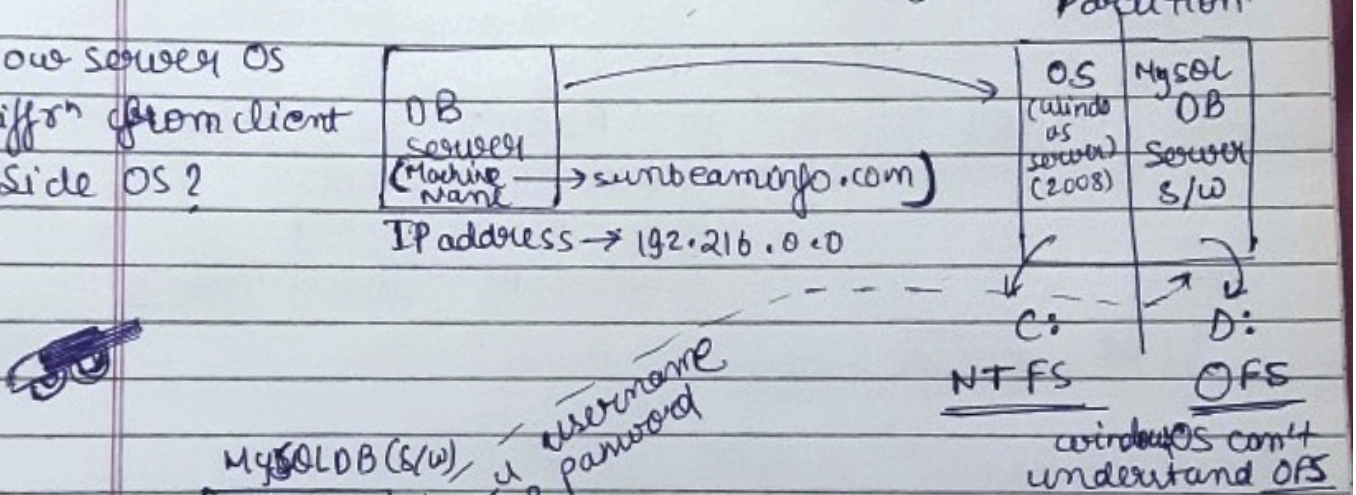
eg:- Distributed databases :- (Banking System, book myshow .com, Railway reservation system)

(10) In DBMS, there is no security.

RDBMS – logging in security (mysql DB uname & password)
– Command level security (CREATE USER → not everyone have)
– Object level security (Permission to access tables of other users)
– OS cannot access the table

(11) DBMS – allow access to data through OS.

How server OS diff^{n} from client side OS?



Oracle Inc. → largest S/W company in the world.
↳ #1 commercial DB overall programming has to be done in Assembly.

Date: / / Page no:

⇒ Various RDBMS available. — Informix (fastest, in terms of processing speed)
— Oracle (most popular RDBMS)
— Sybase
— DB2 → good RDBMS
— My SQL → IBM (mainframe computer)
— Ms Access → single user.
— Postgres → open source.

1. Create an Oracle Account.
2. Subscribe to Oracle, MySQL, and Java Newsletter.
3. Subscribe to ↳ magazine.
4. Oracle – 63% of world commercial database market.
in client-server environment.
83% in Internet environment.
works on 113 OS.

MS SQL server – good RDBMS
– competition for Oracle.
– 16% - 17% of market.
– only works with windows OS.

What database used in android?

⇒ MySQL was launched by a Swedish company 1995.
open source RDBMS; most widely used (42% of open source)
→ Following open source projects that require a RDBMS often use MySQL Eg; facebook, Twitter(X), Flickr, Instagram, Google (though not for searches), YouTube, wordpress
→ Google use Bigtable for searches.
→ MySQL is a part of widely used LAMP open-source web application software stack.

SQL is common for all RDBMS

Date: / / Page no:

L → Linux
A → Apache web server
M → MySQL
P → Perl, Python or PHP

W → Windows
A
M
P

M → MacOS
A
M
P

X - X - Windows
A
M
P

⇒ MySQL :- various S/W development tools from MySQL :-
↳ what they do.

Workbench
Connectors
Notifier
Enterprise Backup

MySQL database
- MySQL DB server S/W
- store table data, retrieve table data, secure the table data, etc.

SQL – CRUD

conforms to { ANSI standards (e.g. 1 char = 1 Byte)
ISO standards (for quality Assurance)

- founded by IBM (1975-77)
- Initially created using C/C++ (90%)
- Assembly language (10%)
- earlier known as ROBE (relational query by Example)
- IBM gave ROBE free of cost to ANSI.
- ANSI renamed ROBE to SQL.
- now controlled by ANSI (and hence common for all RDBMS)
- in 2005, entire source code of SQL written in Java.

MySQL-PL (programming language)
- used for database programming

How to transport from one DB to other DB of different type?

~~ORACL~~ MySQL → Oracle:

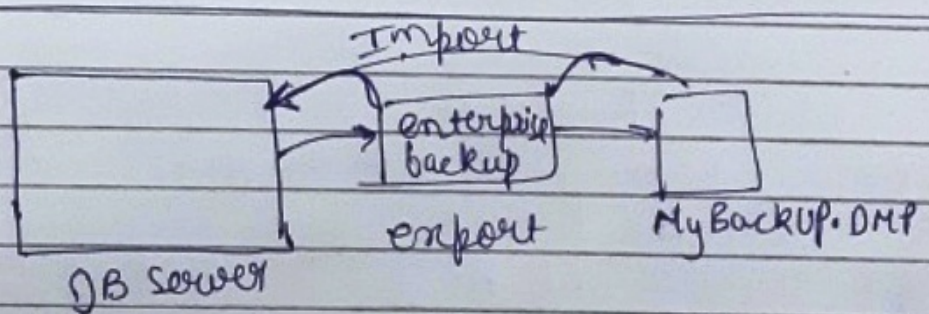
Date: / / Page no:

MySQL Command line client
→ MySQL client s/w
→ connect to MySQL database, run SQL commands, run mySQL commands, run MySQL-PL programs.
→ char based. (text based)

MySQL Workbench
→ MySQL client s/w
→ GUI

MySQL Enterprise Backup:-
used to copy the table data.
used to take backups (EXPORT) - used to restore from the backups. (IMPORT)

→ Every row in Table is a file, which helps us achieve ~~for~~ row-level locking.
Table is not a file.



Karachi Stock Exchange

Date: / / Page no:

MySQL - SQL (Structured query language)
↳ common for all (hence also known as standard query language)

DDL → data definition language (Create, alter, drop)
DML → data manipulation language (Insert, update, delete)
DCL → Data control language (Grant, Revoke) (Create user)
DQL → Data Query language. (Select)
DTL/TCL → transaction control language (commit, rollback, savepoint)

Notan ANSI Standard.

DDL → Truncate, Rename
↳ delete & commit.

extra in MySQL RDBMS and Oracle RDBMS

extra in Oracle RDBMS only:-
DML (Merge, Upsert) → update & Insert
↳ Merge data of two tables.

Rules for Tablename:-
1) max 30 characters
2) A-Z, 0-9, a-z, _
3) Under Linux & Unix, table_name & column_name are case-sensitive. But Windows & MacOS are not case-sensitive.
4) Tablename has to begin with alphabet.
2024EMP ✗ → error
EMP2024 ✓ → allowed.
5) Special characters $, #, _ are allowed.
6) In MySQL, to use reserved characters such as # in tablename and columnname, enclose it in back quotes.
" back-quotes. `EMP#`

134 reserved words in tablename → MySQL Documentation.

Date: / / Page no:

Oracle Documentation https://docs.oracle.com.
Java Documentation

EMP

EMPNO	ENAME	SAL	CITY	DOB
	char	float		date

MySQL Datatypes:-

char: It allows any character (could be alphanumeric also)
varchar: It allows any " (")
→ max^m 255 characters | char is fixed length
default width 1
→ max^m 65535 character.
No default width (width has to be specified)
→ variable length

⇒ char(20) → padded with blanks (wastage of space)
AMIT_____
varchar(20) → not padded with blanks. (conserve space)
AMIT

⇒ Due to fixed length of char, searching & retrieval is fast.

Char v/s Varchar
Searching performance vs Harddisk space.

⇒ char → PAN NO., Mobile NO., UIDAI → fixed length
varchar → city, name etc.

⇒ long text - allows any character (could be alpha-numeric)
- max 4,294,967,295 characters (4GB-1)
eg: Remarks, Comments, Resume, Experience.
- this datatype, used for those columns, that are only for storage & display purposes.

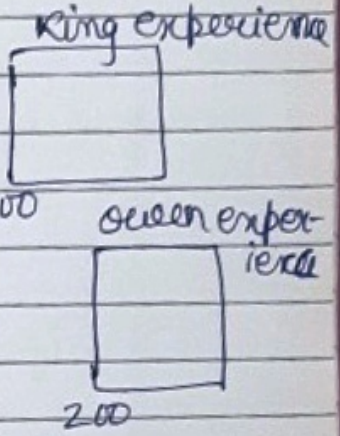
Date: / / Page no:

- not used for those columns that would be used for searching variable length.
- width does not have to be specified for this datatype

EXPERIENCE longtext.

longtext

ENum	EName	EExperience	Sal
101	Ring	100	5000
102	Queen	200	6000



these are harddisk pointer known as locator for longtext MySQL stores Experience outside table, and address stored in column to maintain performance.

- MySQL maintain a LOCATOR (hard disk pointer) from the longtext column to the longtext data.

⇒ BLOB → Binary large OBject.

LongBlob:- allows upto 4 GB-1 bytes of binary data.
Eg:- Barcodes, QRcodes, fingerprints, Biometric, Photographs, charts, graphs, maps, Sound.

Sound $\xrightarrow{\text{convert to binary}}$ Binary.

- stores the data as character string of 1's and 0's.
- this is the multimedia datatype of MySQL.